



**Waterloo Region  
District School Board**

## **REQUEST FOR TENDER**

**Forest Heights Collegiate Institute – Family Studies Renovation, Partial Window &  
Brick Replacement, Column Repair, Asphalt Replacement & Barrier Free  
Washroom**

**Tender #7274-RW-22**

**ISSUE DATE: March 25, 2022**

**ELECTRONIC SUBMISSIONS will be received by the Bidding System, no  
later than 2:00 p.m. local time, on April 13, 2022**

## TABLE OF CONTENTS

<u>SECTION NUMBER</u>	<u>TITLE</u>	<u>NO. OF PAGES</u>
<b>DIVISION 00 – BIDDING AND CONTRACT DOCUMENTS</b>		
00 01 00	Consultant/Professional Seals	1
00 21 13	Instructions to Bidders	18
00 21 14	Vendors of Record	11
00 21 15	Scope of Work	2
00 31 34	Subsurface Investigation Report (PDF)	2
00 31 34A	Appendix 003134A – Soils Report	2
00 41 13	Bid Form Sample	2
00 41 13A	Asset and Warranty Card	2
00 41 13B	Vendor Performance Evaluation Form	4
00 41 73	Supplementary Bid Information	4
00 56 13	Definitions Stipulated Price	2
00 72 13	Terms and Conditions	12
00 73 03	Supplementary Conditions	72
<b>DIVISION 01 - GENERAL REQUIREMENTS</b>		
01 14 00	Work Restrictions	2
01 19 00	Specifications and Documents	2
01 21 00	Allowances	4
01 31 00	Project Management and Coordination	6
01 32 00	Construction Progress Documents	4
01 33 00	Submittal Procedures	6
01 35 17	Fire Safety Requirements	8
01 35 17A	Appendix 013517A – Hot Work Permit	2
01 35 23	Health and Safety	6
01 35 43	Hazardous Materials	4
01 35 43A	Appendix 013543A – Asbestos Audit	63
01 42 00	References	6
01 45 00	Quality Control	8
01 51 00	Temporary Utilities	6
01 53 00	Temporary Construction Facilities	6
01 61 00	Product Requirements	6
01 70 00	Examination and Preparation	4
01 73 30	Execution and Cutting and Patching	4
01 74 00	Cleaning and Waste Processing	4
01 78 10	Closeout Submittals and Requirements	6
01 78 40	Maintenance Requirements	4
01 79 00	Demonstration and Training	4

## TABLE OF CONTENTS

<u>SECTION NUMBER</u>	<u>TITLE</u>	<u>NO. OF PAGES</u>
<b>DIVISION 02 – EXISTING CONDITIONS</b>		
02224	Demolition & Salvage	3
02270	Erosion Control	2
02510	Asphalt Paving	6
02510	Concrete Curbs & Paving	4
02911	Topsoil and Finish Grading	3
02911	Sodding	4
<b>DIVISION 03 – CONCRETE</b>		
03033	Concrete Restoration	6
03300	Cast in Place Concrete	4
03345	Concrete Floor Finishing	3
<b>DIVISION 04 – MASONRY</b>		
04100	Mortar	2
04200	Masonry	6
04210	Brick Replacement	7
<b>DIVISION 05 – METALS</b>		
05500	Metal Fabrications	4
<b>DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES</b>		
06100	Rough Carpentry	3
06400	Cabinetwork	10
<b>DIVISION 07 – THERMAL AND MOISTURE PROTECTION</b>		
07196	Air Barrier	5
07200	Thermal Insulation	2
07219	Foamed-in-place Cavity Wall Insulation	3
07840	Firestopping	3
07900	Sealants	4
<b>DIVISION 08 – DOORS AND OPENINGS</b>		
08100	Metal Doors and Frames	5
08710	Finish Hardware	4
08800	Glazing	4
08900	Aluminum Windows	5

## TABLE OF CONTENTS

<u>SECTION NUMBER</u>	<u>TITLE</u>	<u>NO. OF PAGES</u>
<b>DIVISION 09 – FINISHES</b>		
09250	Gypsum Board	10
09310	Ceramic Tile	6
09410	Portland Cement Terrazzo	4
09510	Acoustical Ceilings	5
09650	Resilient Flooring	5
09720	Vinyl Wall Protection	5
09900	Painting	5
<b>DIVISION 10 – SPECIALTIES</b>		
10100	Whiteboards and Tackboards	3
10500	Lockers	2
10650	Operable Glass Partition	4
10800	Washroom Accessories	4
<b>DIVISION 20 – MECHANICAL</b>		
20 00 00	General	24
22 00 00	Plumbing & Drainage	12
23 00 00	Heating, Ventilation and Air Conditioning	22
25 00 00	Integrated Automation (Incl. 4 Graphical Diagrams)	7
<b>DIVISION 26 – ELECTRICAL</b>		
26 00 00	General	28
<b>DIVISION 27 – COMMUNICATIONS</b>		
27 00 00	Communications	7
<b>DIVISION 28 – ELECTRICAL SAFETY AND SECURITY</b>		
28 00 00	Electronic Safety and Security	9



---

## TABLE OF CONTENTS

<u>SECTION NUMBER</u>	<u>TITLE</u>	<u>NO. OF PAGES</u>
---------------------------	--------------	-------------------------

### APPENDIX X – SCHEDULES AND DETAILS

00850	LIST OF DRAWINGS	1
00860	ROOM FINISH SCHEDULE	1
00861	DOOR AND FRAME SCHEDULE	1
00865	COLOUR SCHEDULE	4
00870	LIST OF DETAIL DRAWINGS	2
	DETAILS	45

1.1 The following professional seals and signatures are provided as required by Paragraph 1.21.1 (4) Division C of the Ontario Building Code and apply to the areas of expertise for which each consultant was commissioned.

1.1.1 **CONSULTANT – KINGSLAND + Architects Inc.**

This seal governs:

All Architectural Documents and Sections of these Specifications.



1.1.2 **MECHANICAL - MNE Engineering Inc.**

This seal governs:

All Mechanical Documents and Sections of these Specifications



1.1.3 **ELECTRICAL – MNE Engineering Inc.**

This seal governs:

All Electrical Documents and Sections of these Specifications



**END OF SECTION**

---

## SECTION 00 21 13 – INSTRUCTIONS TO BIDDERS

### 1.0 INTRODUCTION

#### 1.1. Single Point of Contact

In relation to this procurement process, all communication shall be directed to:

Rebecca Witteman  
Senior Procurement Specialist  
Waterloo Region District School Board

All request for information, instructions or clarifications shall be directed to the Single Point of Contact only. Requests should be made through the Bidding System by clicking on the “Submit a Question” button found within the bid detail of the specified Tender.

Vendors shall not communicate with other Waterloo Region District School Board (“Board”) employees or agents regarding this tender prior to award. Any attempt by a Vendor to bypass or influence the procurement process may result in disqualification of their Submission.

The Board will not be responsible for any verbal statement, instruction, or representations. In case of difference between any verbal information and written document, the written document shall govern. Information obtained from any source, other than the Single Point of Contact in writing, shall not be relied upon.

#### 1.2. Consultant

The Board has hired the following consultant to assist in the preparation of this Tender: Kingsland + Architects Inc.

Addenda will be the Board’s only form of communication. The Board will assemble addenda as required.

The consultant and any sub consultants are not to be contacted by any interested parties from the Tender issue date to the bid award notification. The consultant or any sub consultants will not respond to any direct communication.

The Board will be responsible for the contract administration of the project after the purchase order has been issued or the contract has been signed by the Board

#### 1.3. About the Waterloo Region District School Board

The Waterloo Region District School Board is a provincially funded institution reporting to the Ministry of Education of Ontario and is one of the larger school boards in Ontario, operating 121 school locations and serving approximately 64,000 students in the Region of Waterloo.

#### 1.4. Electronic Bid Submission and Bid Results

All Bids shall be submitted through the Bidding System only. Bidders must have a Bidding System Vendor Account and shall ensure the account is created with the Bidders full legal company name.

Hard copy Bid Submission will not be accepted by the Board.

Bids will not be accepted after the Closing Date and Time.

There will be no public opening for this Tender.

Once an award is made, the successful Bidder will be named on the Bidding System, and an award notification will be sent.

#### 1.5. Bid Submission

- .1 Bidders must include the appropriate submission requirements and mandatory forms specified in this section.
- .2 Bidders shall have a "Vendor Account" in the Bidding System and be registered as a "plan taker" for this Bid Solicitation Document. Only the plan takers will have access to download this Bid Solicitation Document, receive addenda email notifications, download addenda and to submit their Bid electronically through the Bidding System.
- .3 The onus is on the Bidder to ensure that the Bid is received and acknowledged in the Bidding System on or before the Closing Time. The Closing Time shall be determined by the Bidding System's web clock. The timing of the Bid submission shall be based on when the Bid is RECEIVED by the Bidding System, not when a Bid is submitted by a Bidder.
- .4 Bidders shall allow sufficient time to upload their Bid submission and attachment(s) (if applicable) and to resolve any issues that may arise as Bid transmission can be delayed in an "internet traffic jam" due to file transfer size, transmission speed, and other electronic considerations.
- .5 Upon receiving a Bid, the Bidding System will send a confirmation email to the Bidder advising that the Bid was submitted successfully. If a Bidder does not receive a confirmation email despite submitting a Bid, the Bidder should contact technical support of the service provider hosting the Bidding System via email: [support@bidsandtenders.ca](mailto:support@bidsandtenders.ca)
- .6 The Bidding System will not accept Bids after the Closing Time as determined by the Bidding System's web clock. Bids submitted by fax or paper copy or any other format will not be accepted.

- .7 The Board hereby consent to the use of an Electronic Signature for the signing of all documents requested hereunder. Acceptable forms of signatures include, but are not limited to, the typing of the Bidder's authorized signing officer's name or the inclusion of an image of the Bidder's authorized signing officer's signature, so long as the electronic signature is sufficient to identify the Bidder's authorized signing officer. The Bidder's authorized signing officer agrees that whatever form of electronic signature is provided constitutes a signature for the purpose of executing all documents requested hereunder.

#### **1.6. Withdrawal of Bid Submission / Irrevocable Period**

Bidders may withdraw or edit and resubmit a Bid in the Bidding System at any time prior to the Closing Date and Time. The most recent submission or withdrawal received in the Bidding System on or before the Closing Time shall prevail and shall overwrite all previous submission(s) and withdrawal(s). The Closing Time shall be determined by the web clock within the Bidding System. After such time, requests to withdraw Bid Submissions will not be considered.

Bids will be irrevocable by the Bidder, and open for acceptance by the Board, for **60 (sixty)** days following the Closing Date

#### **1.7. Bid Review**

- .1 All Bids received on or before the Closing Time will be reviewed for compliance based on this Bid Solicitation Document. Non-compliant Bids may be rejected. Bids not meeting any of the mandatory requirements included in this Bid Solicitation Document may be disqualified. Bidders may be contacted to clarify its submissions.
- .2 It is the Bidder's responsibility to satisfy the Board that the Bidder can comply with the requirements contained within this Bid Solicitation Document and that the Bidder possesses the necessary inventory, equipment, facilities, resources and staff to perform the Work specified in this Bid Solicitation Document. Bidders may be required to submit evidence of above in a form acceptable to the Board. Substitution of materials, equipment, or methods different from that outlined in the terms of reference will not be accepted unless provided for within this Bid Solicitation Document or with the written approval from the Board.
- .3 The Board also reserve the right to examine Bidder's facilities, equipment and visit the sub-contractors or sub-consultants proposed or Bidder's existing and past clients. The award decision may be revised based on the above.
- .4 The Board will not be responsible for travel costs (including, but not limited to, time and mileage) if travel is required. No additional charges will be accepted by the Board for any cost incurred by the Bidder or any other party in participating in the Bid evaluations.

- .5 The Board may, in their sole discretion, check references, conduct credit checks, review the litigation history and history of professional liability or other insurance claims, and obtain any other type of information that might aid the Board in its selection. The Board reserve the right to consider all or any information received from all available sources, whether internally or externally obtained. The Board may disqualify any Bid from further consideration based on results of reference or credit checks or review of litigation or claim history. The foregoing may include the Board's own experiences with the respective Bidder(s) or any of the subcontractors and sub-consultants proposed in its Bid.

### **1.8. Tie Bids**

Where two (2) or more Bids have been received reflecting the same, compliant lowest Bid price, the time stamp for date and time submission in the Bidding System will dictate the award (earliest submission shall prevail).

### **1.9. Award Recommendation**

- .1 Subject to the reserved rights of the Board and availability of funds, the lowest compliant Bid will be recommended for award.
- .2 The documents listed below will be incorporated as deemed necessary by the Board, into the Contract with the Successful Bidder. If there is a discrepancy between the wording of one document and the wording of any other document that appears on the list, the wording of the document that first appears on the list shall take precedence:
- .3 Board approved change orders or Contract or Agreement amendment.
- .4 Purchase Order, Contract or Agreement executed with the Bidder including exhibits.
- .5 Bid Solicitation Document issued by the Board, including addenda, if applicable.
- .6 Bid submitted by the Bidder.
- .7 There shall be no obligation on the Board as a result of seeking Bids or conducting the procurement process and the Board reserve the right to cancel the Bid Solicitation, issue a revised request, or to pursue any other course of action which would aid in meeting their needs.

### **1.10. Documents Required for Award**

Within ten (10) working days of receiving a request from the Board, the Bidder (the "Recommended Bidder") shall provide the following:

- .1 Insurance certificate with coverage specified in the Bid Solicitation Document.
- .2 WSIB clearance certificate valid on date of award or an exemption letter (if applicable and requested).
- .3 Contract security, if applicable as specified in the Bid Solicitation Document.
- .4 An executed Board issued Form of Agreement, duly signed by the authorized signatory.
- .5 Any other submittal specified in the Bid Solicitation Document as a requirement of award.

In addition to all of the Board' other remedies, if a Recommended Bidder fails to execute the Form of Agreement or satisfy any other applicable conditions within ten (10) days of notice of selection, the Board may, in their sole and absolute discretion and without incurring any liability, rescind the selection of that Bidder.

#### **1.11. Confirmation to Proceed**

No work shall commence until each of the Board's Procurement Services has issued a purchase order, contract, or letter of intent to the Successful Bidder. Goods/Service or Work, as described shall not commence until all the required documents have been submitted to Procurement Services and the Form of Agreement executed by the Successful Bidder and the Board. For payment purposes, a Purchase Order shall be generated and issued to the Successful Bidder. The Purchase Order number must appear on all invoices in order to ensure prompt payment.

#### **1.12. Site Visit**

Bidders are strongly encouraged to attend the non-mandatory site meeting as per details provided in this section and sign the attendance sheet. The Board may not provide another opportunity to visit the site. However, absence from this site meeting will not disqualify any Bidder.

Site Meet Location and Time: Refer to Section 1.18 Time Table.

Bidders shall attend the site meeting at their own risk and hold the Board harmless for any issues or damages arising out of their attendance of the site meeting.

Bidders are encouraged to bring their own measuring tape, camera or other portable tools as required to the site meeting. Bidders are solely responsible for making their own assessment of the site.

Prior to entering a WRDSB building, all visitors must comply with all WRDSB Covid protocols including:



- Complete the Ontario COVID-19 School Screening:[covid-19.ontario.ca/school-screening/](https://covid-19.ontario.ca/school-screening/) and follow directions provided;
- Sign into the main office for contact tracing purposes and where confirmation of screening will occur;
- Wear medical grade mask and eye protection;
- Maintain physical distancing (2m/6.5ft);
- The size of the groups at the site meet(s) will be limited as per current Public Health Recommendations.

### **1.13. Intentionally Deleted**

### **1.14. Communication**

For the purpose of this Tender, the only contact for all Bidders, subcontractors if any, and any third-party suppliers of goods or services for all queries, questions and notifications, from the Tender issue date to the bid award notification date is to be directed to the submit a question feature in this bidding system:

### **1.15. From Issue Date to Deadline for Questions/Queries**

Questions must be received by the Board's Single Point of Contact no later than the deadline for questions noted in the Anticipated Project Schedule.

If a Bidder finds any discrepancies, ambiguities or omissions within the Request for Tender (RFT) documents, or requires any clarifications regarding the RFT documents, questions and clarifications must be sent to the Board's Single Point of Contact through the Bidding System by clicking on the "Submit a Question" button found within the bid details page of that opportunity. Bidders are strongly encouraged to ask clear and concise question(s) citing the relevant section of the Bid Solicitation Document.

The Board has endeavoured to provide complete, correct information and estimates to enable Bidders to properly assess and determine the scope and complexity of the Work prior to submitting a Bid. Bidders are solely responsible for determining if they require additional information or if anything appears incorrect or incomplete. The onus is on the Bidder to contact the Board's Single Point of Contact prior to the Deadline for Questions indicated in this document, if they have any questions or queries whatsoever or find omissions from or discrepancies in this Bid Solicitation document, unnecessary restrictions in the terms of reference, or should they be in doubt as to the meaning of any part of this document. Written answers or clarifications to issues of substance will be shared with all Bidders in the form of an Addendum.

### **1.16. After the release of the Bid Results Notification / Debriefing Requests**

In accordance with the Broader Public Sector Procurement Directive, unsuccessful Bidders are entitled to a debriefing in order to receive feedback with respect to their Bid submission. In order to obtain a debriefing, Bidders shall contact the

Board's Single Point of Contact listed in this Bid Solicitation Document in writing with their request within sixty (60) days of the award notification.

### 1.17. Consequences of not following the Proponent Contact Protocol

Communication initiated by the Proponent, subcontractors, or third-party suppliers of goods or services during the blackout period, to the Board or consultant may be grounds for disqualification from the Tender.

Communication by Proponents, subcontractors, or third-party suppliers of goods or services, to the consultant or the Board, other than the Board contact from the issue date to the Tender to receiving the award non award notification, may be grounds for disqualification from the Tender.

### 1.18. Anticipated Time Table

The following table represents the anticipated project timelines. This timeline is an estimate only, and may be subject to change by the Board at any time.

DESCRIPTION	DATE
Issue Date	March 25, 2022
Non-Mandatory Site Meet	March 30, 2022 3:00 pm local time Forest Heights Collegiate Institute 255 Fischer-Hallman Road, Kitchener <b>Designated Mtg Area:</b> Main parking lot
Deadline for Questions	April 8, 2022
Closing Date and Time	April 13, 2022, 2:00 pm local time
Anticipated Contract Start / Work begins	July 1, 2022
Substantial Completion Date	August 24, 2022
Deemed Complete Date	September 28, 2022

### 1.19. Blackout Period

A black out period shall exist between the deadline for questions and the date of award. During this period, there shall be no communication between the Bidders,

the Board or any Board consultants, unless initiated by the Board' Single Point of Contact.

#### **1.20. Deadline for Questions**

Questions must be received by the Single Point of Contact no later than the deadline for questions noted in the Anticipated Project Schedule.

If a Bidder finds any discrepancies or omissions within the Request for Tender (RFT) documents, or requires any clarifications regarding the RFT documents, questions and clarifications must be sent to the Single Point of Contact through the Bidding System by clicking on the "Submit a Question" button found within the bid details page of that opportunity.

The Board shall not be bound by any verbal instruction or information provided by any Board employee or consultant of the Board. Only responses provided in an Addendum shall form part of this Bid Solicitation Document.

#### **1.21. Addenda**

All Addenda issued through the Bidding System shall form part of the Tender Document.

Any questions and clarifications regarding the terms of reference shall be requested through the Bidding System by the date noted above. Those that are deemed pertinent to the Tender document will be addressed in the form of an Addendum.

Bidders shall acknowledge the receipt of all Addenda in the Bidding System prior to the submission of their bid. Where Addenda has been issued, the system will not allow the Bidder to submit a bid prior to acknowledging all Addenda.

Where an Addendum is issued after a bid has been submitted, the Bidding System will automatically withdraw the submitted bid. The submission status will change to incomplete and will not be accepted by the Board as a submitted bid. It is the responsibility of the Bidder to acknowledge all Addenda and ensure the bid has been received by the Bidding System. Bidder should check the Bidding System for Addenda up until the closing date and time.

Addenda cannot be acknowledged after the Closing Date and Time.

#### **1.22. Warranty and Maintenance**

The Awarded Bidder, at the time of substantial completion shall furnish a written warranty covering material, maintenance, and work performed under the contract for a minimum period of two (2) years from the date of completion. Individual sections may extend warranties beyond the two year time frame. The Awarded

Bidder is responsible for all required maintenance complete with materials and labour during the warranty period.

## 2.0 BOARD PURCHASE ORDER

Goods/Service or Work, as described shall not commence until all of the required documents have been submitted to Procurement Services and the CCDC 2 executed by the Awarded Bidder(s) and the Board. For Payment purposes, a Purchase Order shall be generated and issued to the Awarded Bidder(s). The Purchase Order number must appear on all invoices in order to ensure prompt payment.

## 3.0 THE BID CONTRACT

.1 The bidders and the Owner acknowledge that it is their intention to create a process contract (the "Bid Contract") between the Owner and any bidder whose Bid meets the Mandatory Requirements. The bidders and the Owner further acknowledge that, if a Bid Contract is created between the Owner and one or more of the bidders, the terms of the Bid Contract are represented by the Bid Documents.

## 4.0 DEFINITIONS

4.1. Capitalized terms not otherwise defined in this Section or elsewhere in these Instructions to Bidders shall have the meanings ascribed to them in the Contract. All references in these Instructions to Bidders to "Section" or "paragraph" shall, unless specifically indicated otherwise, refer to a Section or paragraph of these Instructions to Bidders.

- .1 "**Bid**" means the Base Bid Form and all other documents submitted by a bidder in accordance with these Instructions to Bidders.
- .2 "**Single Point of Contact**" means the Procurement Specialist of the WRDSB, NOT the prime Consultant.
- .3 "**Bid Documents**" has the meaning set out in item 7, Instructions to Bidders.
- .4 "**Bid Form**" means the Base Bid Form or any of the Supplementary Bid Forms listed in paragraph 6.1.2, section 00 21 13.
- .5 "**Black-Out Period**" is the period between the deadline for asking questions or making queries, to the Bid Award Notification.
- .6 "**Board**" means the Waterloo Region District School Board.
- .7 "**Consultant**" means Prime Consultant retained by the Board and identified in these documents.
- .8 "**Contract**" means the written agreement to be signed between the Owner and the successful bidder in the form of CCDC 2 – 2008 stipulated price contract, as amended by supplementary conditions.

- .9 **“Evaluation Score”** has the meaning set out in item 12.0 Bid Evaluation, Section 00 21 13.
- .10 **“Evaluation Team”** means the committee / team appointed to guide, monitor and direct this bid process and evaluate Bids.
- .11 **“Irrevocability Period”** has the meaning set out in Item 4.2, Section 00 72 13.
- .12 **“Mandatory Requirements”** has the meaning set out in item 12, Section 00 21 13.
- .13 **“Project Manager”** or Project Coordinator can be used interchangeably and is the Board’s representative for the project.
- .14 **“Submission Deadline”** is the date and time identified in Item 1.18, Section 00 21 13.

#### 4.2. VENDORS OF RECORD

- .1 Bidders must be approved as a Vendor of Record by the Owner. Bids received from contractors who have not been approved prior to the Tender period will be returned unopened.
- .2 The Owner reserves the right to issue an addendum naming additional pre-qualified general contractors and additional pre-qualified Subcontractors and Suppliers.

#### 5.0 BID DOCUMENTS

- .1 The following documents form the basis of this bid process (collectively the “Bid Documents”):
  - .1 Instructions to Bidders.
  - .2 Bid Forms comprising the Base Bid Form and, where required, the Supplementary Bid Form – List of Subcontractors, Supplementary Bid Form – Itemized, Separate and Alternative Prices, and Supplementary Bid Form – Unit Prices.
  - .3 CCDC 2 – 2008 stipulated price contract comprised of the Agreement Between Owner and Contractor, Definitions, and General Conditions of the Stipulated Price Contract.
  - .4 Supplementary Conditions.
  - .5 Specifications (as per table of contents).
  - .6 Drawings (as per list of Drawings).
  - .7 Any Reports or Studies, including, but not limited to, Asbestos, Hazardous Materials and Sub-Surface soil conditions included with the specifications or addenda.
  - .8 Addenda issued prior to the Submission Deadline.

- 5.2. Check Bid Documents for completeness upon receipt. Inform the Board's Single Point of Contact immediately, should any documents be missing or incomplete and/or upon finding any discrepancies or omissions.
- 5.3. The Bid Documents are made available only for the purpose of submitting Bids for the Project. Availability and/or use of the Bid Documents do not confer a license or grant for any other purpose.

## 6.0 PROHIBITION ON LOBBYING / COLLUSION

- 6.1. Bidders and/or any representatives employed or retained by them are strictly prohibited from engaging in conduct which is or could reasonably be considered as any form of political or other lobbying, or as an attempt to influence the outcome of this bid process.
- 6.2. A bidder shall not discuss or communicate directly or indirectly with any other bidder any information whatsoever regarding the preparation of a Bid. Bidders shall prepare and submit Bids independently and without any communication, knowledge, comparison of information, or arrangement, direct or indirect, with any other bidder.
- 6.3. Failure of any bidder to comply with this Section may result in the disqualification of the bidder and the rejection of its Bid.

## 7.0 CONFLICT OF INTEREST

- 7.1. Bidders shall disclose all perceived, potential and actual Conflicts of Interest. For the purposes of this bid process, "Conflict of Interest" includes:
  - .1 any situation or circumstance where, in relation to this bid process and/or the Contract, the bidder's other commitments, relationships or financial interests could or could be perceived to exercise an improper influence over the objective, unbiased and impartial exercise of independent judgment by any member of the Evaluation Team, the Board, or the Owner;
  - .2 any situation or circumstance where any person(s) employed by the Owner in any capacity, or any member of the Board:
    - .1 has a direct or indirect financial interest in the award of the Contract to any bidder;
    - .2 is currently employed by, or is a subcontractor or a consultant to a bidder;
    - .3 is negotiating or has an arrangement concerning future employment or contracting with any bidder;
    - .4 has an ownership interest in, or is an officer or director of, any bidder.
- 7.2. If a bidder discovers, at any time, any perceived, potential or actual Conflict of Interest, the bidder shall promptly disclose the perceived, potential or actual Conflict of Interest by sending a written statement in the manner described in

paragraph 8. Failure of any bidder to comply with this Section may result in the disqualification of the bidder and the rejection of its Bid.

- 7.3.** Without limiting the generality of Section 22, the Owner may, in its sole discretion:
- .1 exclude any bidder and its Bid on the grounds of Conflict of Interest;
  - .2 waive any and all perceived, potential or actual Conflicts of Interest upon such terms and conditions as the Owner, in its sole discretion, requires to satisfy itself that the Conflict of Interest has been appropriately managed, mitigated and minimized.

## **8.0 SITE INVESTIGATION**

- .1 Any soils investigation, environmental, geotechnical or other reports prepared or obtained with respect to the Place of the Work (collectively the "Reports") are available from the Consultant. Where the Work involves existing buildings, structures, facilities, plant or equipment, any reports, data or as-built drawings concerning such buildings, structures, facilities, plant or equipment (collectively the "Data") are available from the Consultant. The Reports should not be considered a representation of the site conditions of the entire Place of the Work, and the Reports and Data are provided for general information and guidance purposes only. Neither the Owner nor the Consultant guarantees the accuracy or completeness of the Reports or the Data, nor does either assume any responsibility for any interpretations or conclusions that bidders may make or draw from the Reports or the Data.
- .2 Each bidder is solely responsible, at its own cost and expense, to carry out its own independent research and due diligence, or to perform any other investigations considered necessary by the bidder to satisfy itself as to all existing conditions, circumstances and limitations affecting the Work, including the existence and/or locations of utilities and underground services. The bidders' obligations set out in this paragraph apply irrespective of any Reports, Data or any information contained in the Bid Documents.
- .3 No allowances will be made for additional costs and no claims will be entertained in connection with conditions which could reasonably have been ascertained by investigation or other due diligence undertaken prior to the Submission Deadline, and/or in connection with Work which is required and which is reasonably inferable from the Bid Documents, the Reports and/or Data as being necessary.

## **9.0 DESIGNATED SUBSTANCES**

1. Asbestos Audit, prepared by MTE Consultants Inc. for each facility is available in the tender package as well as at the school's main office. A

duplicate set is also available in the Facility Services department located at the Education Centre. Unless otherwise specifically covered by Cash Allowance or Contingency Allowance for known asbestos materials, include in this contract for the removal under abatement, in compliance with O.Reg. 278/05, of all known asbestos containing materials, as identified in the audit, within 600mm of all new services, materials, and equipment, and/or as required to complete the work. No claims for extra cost will be accepted for areas known to contain asbestos containing materials.

2. Comply with applicable legislation regarding asbestos. Should the Contractor encounter asbestos, not noted in the above Asbestos Audit, that would be disturbed during the course of the Work they should stop the work in that immediate area and report the same to the Board Contact.
3. Preliminary paint samples were collected within the work area to determine if lead-based paints are present. The analytical results are available in the tender package along with a Designated Substance Report (DSR) (for lead paint), where lead-based paints were identified or were deemed highly suspected.
4. Disturbance or demolition of lead-based paints, surface coatings, sheetings, mortar, piping or solders shall be conducted by the Contractor in accordance with the procedures noted in the Environmental Abatement Council of Canada (EACC) "Lead Guideline" (October 2014) and/or the Ministry of Labour (MOL) "Lead on Construction Projects" guideline (April 2011). The extent of procedures required depends on the type of work to be conducted.
5. In addition to asbestos and/or lead, silica, and mercury are present in all WRDSB facilities. New construction, renovations or alterations require compliance by the Contractor with the applicable legislation. Other designated substances (i. e. acrylonitrile, arsenic, benzene, coke oven emissions, isocyanates, ethyl oxide, and vinyl chloride) are not encountered in WRDSB facilities as significant constituents or in a form that would represent an exposure concern.
6. Examples of common building materials that are considered as containing the additional designated substances are listed below:
  1. Lead - paints and coatings, lead sheeting, pigment mortar, lead piping, lead solder and fittings. In addition to the procedures outlined for lead paint and coatings in the DSR, the Contractor shall inform all workers of the presence of paint finishes that are lead containing. Disturbance of lead-containing paints or surface coatings shall be conducted in accordance with the procedures outlined in the Environmental Abatement Council of Canada (EACC) "Lead Guideline" (October 2014) and/or the Ministry of Labour (MOL) "Lead on Construction Projects" guideline (April 2011). The extent of procedures required depends on the



type of work to be conducted. Carefully demolish and recycle of any lead sheeting, piping, solder and fittings. Waste to be handled and disposed of in accordance with O.Reg. 347. Contractor to ensure workers use appropriate PPE and follow the appropriate methods for removal stipulated by the MOL Lead on Construction Guidelines.

2. Silica - concrete, brick, stone, terrazzo, refractory brick as well as in plaster drywall, acoustic ceiling tiles, drywall joint compound, mortars, and adhesives in low concentrations. All work involving the demolition silica-containing materials shall follow the procedures outlined in the MOL "Silica on Construction Projects" guideline. Type 1 operations may be necessary based on the type of work conducted and the Contractor shall implement dust suppression methods and protect workers.
3. Mercury - thermometers, barometers, thermostats, gauges, electrical switches, and lighting products including fluorescent light bulbs and a variety of High Intensity Discharge (HID) lamps as mercury vapour, metal halide and high pressure sodium lamps. Lamps and other devices that require demolition are to be handled with care and kept intact to avoid potential exposure. Any mercury-containing lamps or other equipment that are demolished are to be recycled. Waste to be handled and disposed of in accordance with O.Reg. 347.

## **10.0 INSTRUCTIONS FOR COMPLETING THE BID**

### **10.1. Listing of Subcontractors:**

- .1 Where required by the Bid Documents, bidders shall complete and submit a Supplementary Bid Form – List of Subcontractors, naming the Subcontractors and Suppliers which the bidder will employ to perform an item of the Work called for by the Contract. Failure of the bidder to list Subcontractors and Suppliers, where required, may result in the Bid being declared non-compliant.
- .2 Where the Owner has provided a Vendor of Record list, for any one or more Subcontractors and/or Suppliers to perform or supply an item of the Work called for by the Contract, bidders shall select a subcontractor or supplier from that Vendor of Record list to perform or supply that item of Work. Failure to do so shall result in the Bid being declared non-compliant.
- .3 Where a bidder lists more than one Subcontractor or Supplier to perform or supply an item of the Work listed, the Subcontractor or Supplier that is listed last shall be deemed to be the Subcontractor or Supplier to be employed by the bidder to perform or supply such item of the Work.
- .4 Where a bidder lists "own forces" in place of a Subcontractor, the bidder shall carry out such item of the Work with its own forces. Where "own forces" have

been listed by a bidder, the Owner reserves the right to obtain information from the bidder and from third parties respecting the qualifications and experience of the bidder's "own forces" for such item of the Work.

**10.2. Itemized, Separate and Alternative Prices:**

- .1 Where required by the Bid Documents, bidders shall complete and submit a Supplementary Bid Form – Itemized, Separate and Alternative Prices. The Owner reserves the right to accept or reject any or all itemized, separate and alternative prices submitted, and such prices shall remain in effect for the duration of the Contract. Failure to submit an itemized, separate or alternative price where required may result in the Bid being declared non-compliant.

**10.3. Unit Prices:**

- .1 Where required by the Bid Documents, bidders shall complete and submit a Supplementary Bid Form – Unit Prices. Unit prices shall be in effect for the duration of the Contract and may be used to calculate the cost of additional work under the Contract. The Owner reserves the right to accept or reject any or all unit prices submitted, and such prices shall remain in effect for the duration of the Contract. Failure to submit a unit price where required may result in the Bid being declared non-compliant.

**11.0 BID EVALUATION**

**11.1. Mandatory Requirements.** Only bidders that submit Bids which the Evaluation Team determines meet all of the mandatory requirements set out below (collectively the "Mandatory Requirements") on a "pass/fail" basis will be eligible to be considered for an award of the Contract:

- .1 The Bid includes the Base Bid Form.
- .2 The bidder is a valid Vendor of Record.
- .3 Where a mandatory site meeting was scheduled and held, the bidder attended the mandatory site meeting.
- .4 The Bid includes the Security Documents.
- .5 The Bid includes valid Vendor of Record Subcontractors and/or Suppliers.
- .6 The Bid substantially complies with the other requirements of the Bid Documents.

**11.2. Point Based Evaluation Criteria.** Only Bids which meet all of the Mandatory Requirements will be evaluated by the Evaluation Team and awarded points based on criteria set out below.

- .1 As few as zero (0) points will be awarded for each evaluation category; the maximum points available for each evaluation category are set out below.
- .2 The total points awarded to a bidder will be that bidder's "Evaluation Score".

CRITERIA	Points Available
<b><i>Mandatory bid documents</i></b>	Pass/Fail
Bid price offered / bid price as adjusted by the amount of any itemized, separate and/or alternative price(s) which the Owner, in its discretion, decides to accept.	100%
<b>MAXIMUM POINTS AVAILABLE</b>	100

**12.0 AWARD OF THE CONTRACT, DOCUMENTS TO BE DELIVERED, AND EXECUTION OF THE CONTRACT**

- 12.1.** Within ten (10) Working Days of receiving an award letter from the Owner, and prior to commencing the Work, the successful bidder shall deliver to the Owner:
- .1 the performance bond and the labour and material payment bond described in the Bid Documents, the forms of such bonds to comply with the requirements of the Contract;
  - .2 certified true copies of the insurance policies required by the Contract or certificates of insurance, at the option of the Owner;
  - .3 a current WSIB clearance certificate;
  - .4 the bidder’s health and safety policy for the Project; and
  - .5 a copy of the notice of project issued by the Ministry of Labour for the Project.
- 12.2.** The successful bidder shall execute the Contract and shall deliver the executed original to the Owner within ten (10) Working Days of the bidder’s receipt of the same.

**13.0 PUBLIC STATEMENTS, CONFIDENTIALITY, AND MFIPPA**

- 13.1.** Bidders shall not publish, issue or make any statements or news release, electronic or otherwise, concerning their or any other Bid, this bid process, the evaluation of the Bids, the award of the contract, or cancellation of this bid process, without the express written consent of the Owner. The Owner’s award of the Contract to a bidder does not constitute a general endorsement of that bidder’s products or services.
- 13.2.** All information provided by or obtained from the Owner in connection with this bid process is the sole property of the Owner and must be treated as confidential. Such information is not to be used for any purpose other than preparing a Bid.
- 13.3.** By submitting a Bid, bidders acknowledge that the contents of their Bids will be disclosed, on a confidential basis, to the Evaluation Team and may be disclosed to members of the Board and the Owner’s staff, agents and advisors for the purpose of evaluating or participating in the evaluation of the Bids. The Owner will use reasonable efforts to protect pricing, commercial terms, and other sensitive

---

and confidential information provided by the bidders as part of a Bid (the “Confidential Material”), however, the Owner accepts no liability in the event that the Confidential Material, or any part of it, is disclosed even if the Evaluation Team, the Owner, its staff, agents, advisors or any other person associated with the Board or the Owner may have been negligent with respect to such disclosure.

- 13.4. Information provided in the Bids may be presented at public meetings of the Board and may be disclosed to the public. In addition, the Owner may be required to disclose information provided in the Bids pursuant to the provisions of the Municipal Freedom of Information and Protection of Privacy Act or other legislation. By submitting a Bid each bidder agrees to such disclosure and releases the Evaluation Team, the Owner, the Board, and the Consultant from any liability for the same.

#### 14.0 RELEVANT POLICIES

- .1 The Board has a number of relevant policies regarding tenders and bidders should familiarize themselves with the following policies:
  - .1 Purchasing Policy- [www.wrdsb.ca/about-the-wrdsb/procurement-services](http://www.wrdsb.ca/about-the-wrdsb/procurement-services)
  - .2 Conflict of Interest - Employees or Trustees - <https://www.wrdsb.ca/wp-content/uploads/4005-Procurement.pdf>
  - .3 Acceptance of Hospitality or Gifts - <https://www.wrdsb.ca/wp-content/uploads/4005-Procurement.pdf>
  - .4 The Board also has emergency response procedures: - [www.wrdsb.ca](http://www.wrdsb.ca)

**END OF SECTION**

## SECTION 00 21 14 – VENDORS OF RECORD

### 1.0 INTRODUCTION

- 1.1. The **Waterloo Region District School Board**, in an effort to build an improved supplier database and to obtain exceptional long term value, has implemented a Vendors of Record list. This tender is open to those who are currently registered under the Board’s Vendor Registration System.
- 1.2. Only those General Contractors and Subcontractors noted below may submit bids in their particular fields. Refer to specification sections for products, suppliers and installers that will be required in addition to the Vendors of Record noted below.

### 2.0 VENDOR REGISTRATION PROCESS

- 2.1. To become a Vendor of Record for future business opportunities, go to the Board’s public website at [www.wrdsb.ca](http://www.wrdsb.ca) and refer to *About Us - Purchasing Services - Vendor Registration*, and submit the completed application, as per instructions on the website.

### 3.0 PRIME / GENERAL CONTRACTORS

- 3.1. Any bid submission from bidders other than Vendors of Record contractors listed below or identified by Addendum will have their bid ruled informal.
- 3.2. The Owner reserves the right to issue an addendum naming additional general contractors as a Vendor of Record.
- 3.3. The following Prime / General Contractors are Vendors of Record with the Board and are invited to submit bids:

General Contractor	Phone	Email
Bestco Construction (2005) Ltd	(905) 304-4597	estimating@bestcoconstruction.com
Caird-Hall Construction Inc.	(905) 634-0903	caird-hall@bell.net
Collaborative Structures Limited	(519) 658-2750	jblackler@collaborativestructures.com
Complete Building Systems Inc.	(519) 576-5800	estimating@completebuildingsystems.ca
CRD Construction	(519) 822-1801	sbock@crdconstruction.on.ca
D. Grant Construction Limited	(519) 652-2949	swillis@dgrantconstruction.com
Dakon Construction	(519) 746-0920	james@dakon.ca
Elgin Contracting and Restoration Ltd.	(519) 633-9969	info@elgincontracting.com
Gateman-Milloy Inc.	(519) 748-6500	info@gatemanmilloy.com

Golden Gate Contracting Inc	(905) 844-1122	estimation@ggcontracting.ca
K&L Construction (Ontario) Ltd	(519) 472-7164	todd.hodgins@kandlconstruction.com
Melloul Blamey Construction	(519) 886-8850	teresa.oreilly@melloul.com
Nith Valley Construction Ltd	(519) 662-1324	mail@nithvalley.com
PM Contracting Ltd	(519) 576-8327	sarahziegler@pm.on.ca
Pre-Eng Contracting Ltd.	(905) 738-6866	info@pre-eng.com
Reid & Deleye Contractors Ltd	(519) 688-2600	gregd@reid-deleye.com
RENOKREW	(416) 604-7042	info@renokrew.com
SG Cunningham Ltd	(519) 886-2730	allan@cunningham.on.ca
Sierra Construction	(519) 421-7413	info@sierraconstruction.ca
SPEC Construction Inc.	(519) 650-4030	info@spec-build.com
STM Construction Ltd	(519) 756-7030	robertbox@stmconstruction.com
Struct-Con Construction Ltd.	(905) 791-5445	harpreet@struct-con.ca
Tambro Construction	(519) 766-1234	btami@tambro.com
TRP Construction	(905) 336-1041	info@trpconstruction.ca
Van Horne Construction Ltd	(905) 677-5150	otekin@vanhorne.ca
Zehr Levesque Inc.	(519) 576-2233	estimating@zehrgroup.ca

#### 4.0 SUBCONTRACTORS

- 4.1. Bidders shall select only a Subcontractor or Supplier listed below to perform or supply an item of Work indicated. Failure to do so shall result in a Bid being ruled informal.
- 4.2. The Owner reserves the right to issue an addendum naming additional Subcontractors and Suppliers as a Vendor of Record.
- 4.3. The following Subcontractors are Vendors of Record with the Board and are invited to submit bids to the General Contractors:

Mechanical Contractor	Phone	Email
AAA Air Conditioning Inc	(519) 747-9051	igrant.aaaac@gmail.com
AIM Industrial Inc.	(519) 747-2255	craigd@aimindustrial.ca
Arcadian Projects Inc.	(519) 804-9697	cory@arcadianprojects.ca
Black & McDonald Limited	(905) 560-3100	sfernandes@blackandmcdonald.com
Brenner Mechanical Inc	(519) 746-0439	clanglois@brenner.ca

C.N. Mechanical Contractors Limited	(519) 404-8235	mclaughlin5284@rogers.com
CJ's Express Plumbing & Electrical	(519) 621-3111	noliveira@cjsexpress.ca
Conestogo Mechanical Inc	(519) 579-6740	wquickfall@conestogomech.com
Dean Lane Contractors Inc	(519) 585-0903	dean@dean-lane.com
Dordan Mechanical Inc.	(519) 662-9900	danielg@dordanmech.com
Jas 3 Limited	(519) 741-8643	jeffs@jas3heatingcooling.ca
Jay Stewart Mechanical	(519) 576-2663	admin@jaystewart.ca
Keith's Plumbing & Heating Inc.	(905) 544-8118	andrena@keithsph.com
LJ Barton Mechanical Inc.	(905) 304-1976	estimating@ljbarton.com
Nelco Mechanical Ltd	(519) 744-6511	mhobson@nelcomech.com
Reitzel Heating & Sheet Metal	(519) 884-3510	alan@reitzelheating.ca
Roberts Bros Sheet Metal Contractors Ltd.	(519) 633-1507	robertsbros@bellnet.ca
Roberts Onsite Inc	(519) 578-2230	dmagnus@robertsonsite.ca
SCT Mechanical Inc.	(519) 626-0268	jscott@sctmechanical.com
Sutherland-Schultz Ltd	(519) 653-4123	info@sutherland-schultz.com
Touchstone Building Technologies Inc.	(519) 997-2792	info@touchstonebti.ca
Trade-Mark Industrial Inc	(519) 570-1511	tmoore@trade-markind.com
Velocity Mechanical Inc	(519) 896-1119	quotes@velocitymechanical.com
Vollmer Inc.	(519) 966-6100	mshaw@vollmer.ca
Wellington Plumbing & Heating Ltd.	(519) 821-4130	kyle@wellington-plumbing-hvac.com
Yorktowne Air Inc.	(905) 532-9699	klipien@yorktownear.ca

Electrical Contractor	Phone	Email
AIM Industrial Inc.	(519) 747-2255	craigd@aimindustrial.ca
Arcadian Projects Inc.	(519) 804-9697	cory@arcadianprojects.ca
Atlas Electric Corp.	(289) 386-3601	atlaselectricgta@gmail.com
Boshart Electric Ltd.	(519) 662-1220	patf@boshartelectric.com
CJ's Express Plumbing & Electrical	(519) 621-3111	noliveira@cjsexpress.ca
D&D Electric Ltd	(519) 603-2924	jquehl@ddelectric.ca

Eby Electric Inc.	(519) 635-7642	todd@ebyelectric.com
Eclipse Technology Solutions Inc.	(905) 593-1770	jbacon@eclipsetechnology.ca
Edge Electrical Solutions Inc.	(519) 747-3343	Kevin@EdgeElectricalSolutions.ca
Fairway Electrical Services Incorporated	(905) 304-1133	cherd@fairwayelectrical.com
Harold Stecho Electric Ltd	(519) 746-0047	steves@stechoc.ca
JM Electrical Contracting	(519) 572-3148	johnmader@sympatico.ca
Juno Electric	(519) 821-4890	steno@junoelectric.ca
KW E Inc Electrical Contractors	(519) 653-6989	jim@kweinc.com
Live Electric	(519) 265-8566	estimates@live-electric.ca
Mendler Electric Inc.	(519) 616-1733	mendlers@rogers.com
Millers Electric Ltd	(519) 742-3465	scottg@meltd.on.ca
MJM Electric Limited	(519) 824-1989	mlang.mjm@gmail.com
Nadelec Contracting Inc	(905) 875-5239	john.nadelec@gmail.com
Nelco Mechanical Ltd	(519) 744-6511	mhobson@nelcomech.com
Pfaff Electric Limited	(519) 235-0909	jeff@pfaffelectric.com
Roberts Onsite Inc	(519) 578-2230	dmagnus@robertsonsite.ca
Sentry Electric Inc	(705) 436-4530	info@sentryelectric.ca
Sutherland-Schultz Ltd	(519) 653-4123	info@sutherland-schultz.com
Toth Inc	(519) 696-3916	tothelectric@rogers.com
Trade Mark Industrial Inc	(519) 570-1511	tmoore@trade-markind.com
Trade Service Group Inc.	(519) 591-8851	mikewernie@tradeservicegroup.com
Vollmer Inc.	(519) 966-6100	mshaw@vollmer.ca

Excavation Contractor	Phone	Email
A&A Paving	(519) 744-3005	aandapaving@bellnet.ca
Alfred Fach Excavating Ltd	(519) 658-5021	afach@alfredfachexcavating.ca
Brantco Construction	(519) 622-1600	tdemartin@brantco.ca
Capital Paving	(519) 822-4511	cdowne@capitalpaving.on.ca
Cox Construction Limited	(519) 824-6570	engineer@coxconstruction.ca
Encora Enterprises Ltd. o/a EX-L Excavating and Site Services	(519) 821-3123	pfinamore@encora.ca



Forwell Landscape and Excavating	(519) 465-1144	flx5@live.com
G. Melo Excavating Ltd.	(519) 623-3572	srand@gmeloex.com
Hersey Demolition Inc.	(519) 824-5097	rick@herseydemo.ca
J. Weber Contracting Limited	(519) 648-3302	murray@jwebercontracting.com
Kieswetter Excavating Inc.	(519) 699-4445	lee@kieswetter.com
Melo Landscaping & Concrete Work	(519) 623-3572	srand@gmeloex.com
Moser Landscape Group	(519) 886-9231	troy.s@moserlandscapegroup.ca
Pacific Paving Limited	(905) 670-7730	admin@pacificpaving.ca
Richard Schaefer & Sons Haulage Ltd	(519) 742-0132	t.schaefer@rogers.com
Schouten Environmental Inc	(519) 577-8989	brant@schouten.ca
T. Musselman Excavating	(519) 634-1113	aghent@musselmanexcavating.com

Abatement Contractor	Phone	Email
A & O Contracting Inc	(905) 828-6868	anthony@aandocontracting.com
Azbest Environmental	(226) 751-5059	hank@azbest.ca
Biggs & Narciso Construction	(905) 470-8788	james@biggsandnarciso.com
Caliber Environmental Construction Services Inc.	(905) 884-5500	jimball@caliberenv.com
EAN Construction	(519) 603-0109	info@eanconstruction.com
Enviro-cor Enterprises	(519) 753-0993	kelly@enviro-cor.ca
FPR Environmental Inc	(519) 568-8222	frank@asbestosmouldexperts.com
GB Environmental Services	(905) 984-3455	gflett@gbenvironmental.net
I&I Construction Services Ltd	(905) 884-1290	tbarron@iandi.ca
Jobi Construction Ltd.	(519) 227-1181	bparsons@jobiconstruction.com
Power Environmental Power Vac	(905) 318-0622	info@powervachamilton.ca
Puroclean Property Restoration	(519) 653-8030	jreis@puroclean.com
Reitzel Bros. Environmental	(519) 648-2237	ddeleon@ags-environmental.com
Schouten Environmental Inc	(519) 577-8989	brant@schouten.ca
Zero Environmental Inc.	(519) 772-5500	info@zeroenvironmental.com

Paving Contractor	Phone	Email
5 Star Paving Cambridge Inc	(519) 624-1712	derek@5starpaving.com
A&A Paving	(519) 744-3005	aandapaving@bellnet.ca
Alex Paving Ltd	(519) 743-5332	chris@alexpaving.com
Capital Paving	(519) 822-4511	cdowne@capitalpaving.on.ca
Cox Construction Limited	(519) 824-6570	engineer@coxconstruction.ca
KW Cornerstone Paving Ltd	(519) 743-6411	matt.sawatzky@kwcornerstone.com
Melrose Paving Co. Ltd.	(416) 697-8410	selim@melrosepaving.com
Pacific Paving Limited	(905) 670-7730	admin@pacificpaving.ca
Quality Paving 1994 Ltd	(519) 743-8338	dtittley@qualitypaving.ca
Steed and Evans	(519) 744-7315	gens@steedevans.on.ca
T Weber Co Ltd	(519) 742-2051	robin@tweber.ca
Brantco Construction	(519) 662-1600	tdemartin@brantco.ca

Landscaping Contractor	Phone	Email
5 Star Paving Cambridge Inc	(519) 624-1712	derek@5starpaving.com
A&A Paving	(519) 744-3005	aandapaving@bellnet.ca
All Season Property Maintenance	(519) 591-4537	stfarias@rogers.com
AllGreen Tree Service	(519) 669-0857	mikehayes.allgreen@gmail.com
Benjamin Tree Farm	(519) 699-5000	info@benjamintreefarm.com
Brantco Construction	(519) 662-1600	tdemartin@brantco.ca
Cambium Site Contracting Inc	(519) 927-3766	amh@cabiumsite.com
Clintar Landscape Management	(519) 748-4732	jmaloney@clintar.com
Copperhill Group Ltd.	(519) 577-5557	daniel@copperhillgroup.com
Cori Construction	(519) 623-3858	craig@coriconst.ca
CSL Group Ltd	(905) 648-7949	sales@cslgroup.ca
Davan Group Inc.	(905) 659-3123	alan@davanlandscape.com
Duench Contractors Inc.	(519) 622-9216	duenchcontractors@live.ca
Dundee Nursery and Landscaping	(519) 696-3087	dudeenursery@rogers.com
Earthscape	(519) 804-6854	bethany@earthscapeplay.com
Forestell Designed Landscapes	(519) 362-1194	info@forestell.com

Forwell Landscape and Excavating	(519) 465-1144	flx5@live.com
Fran Isley Incorporated o/a Isley Landscaping and Maintenance	(519) 241-9953	mikeisleylandscaping@rogers.com
Freiburger Landscaping	(519) 895-0122	t-d.beirness@sympatico.ca
Grounds Guys	(800) 361-5296	chris@3sixtygroundscare.com
Hardscape Concrete & Interlock	(519) 620-9596	hardscape@bellnet.ca
Hidden Valley Landscaping Inc	(519) 880-8344	Hiddenvally@bellnet.ca
J. Weber Contracting Limited	(519) 648-3302	murray@jwebercontracting.com
Kieswetter Excavating Inc.	(519) 699-4445	lee@kieswetter.com
KW Cornerstone Paving Ltd	(519) 743-6411	matt.sawatzky@kwcornerstone.com
Laven Associates Limited	(905) 670-5144	paul@lavenassociates.com
Locke Landscaping Inc	(519) 579-8749	johnlockelandscaping@gmail.com
Melo Landscaping & Concrete Work	(519) 623-3572	srand@gmeloex.com
Moore Property Maintenance	(519) 893-3101	ron@moorepropertymaintenance.com
Moser Landscape Group	(519) 886-9231	troy.s@moserlandscapegroup.ca
Pine Corner Tree Farm Inc	(519) 638-2734	jack@pinecorner.ca
Richard Schaefer & Sons Haulage Ltd	(519) 742-0132	t.schaefer@rogers.com
Schaefer Landscaping Inc	(519) 648-9759	schaeferlandscaping@gmail.com
Swiss Hills Limited	(519) 664-1179	hcosford@rogers.com
T. Musselman Excavating	(519) 634-1113	aghent@musselmanexcavating.com
TNT Property Maintenance	(519) 895-0450	linda@tntpropertymaintenance.com
Twin City Interloc	(519) 745-8854	paul@twincityinterloc.com
Ultimate Property Maintenance	(226) 622-2078	jonnyk08@hotmail.com

Masonry Contractor	Phone	Email
1138483 On Ltd Bender Construction	(519) 323-2742	info@benderconstruction.ca
Advanced Masonry Inc	(519) 846-2121	dkocher@advancedmasonry.ca
Blockwall Masonry Ltd	(905) 669-0033	blockwall@bellnet.ca
Brownstone Masonry	(905) 856-3115	brownstonemason@bellnet.ca
Core Tec. Contracting	(519) 620-7100	eddy@coretec.ca

Elgin Contracting and Restoration Ltd.	(519) 633-9969	info@elgincontracting.com
G & B Masonry Ltd	(519) 220-8437	matt@gandbmasonry.ca
GA Masonry	(519) 648-2285	bgeorge@gamasonry.com
J.V.H. Masonry Ltd.	(905) 479-2959	jvhmasonry@rogers.com
Jeffrey Custom Masonry Ltd.	(519) 275-1279	brad_jeffrey@wightman.ca
Konia Masonry Corp.	(519) 664-1112	main@koniamasonry.com
R Dekoninck Masonry Inc.	(519) 582-3003	rdekoninckmasonry@gmail.com

Millwork Contractor	Phone	Email
Baywood Interiors Ltd	(519) 748-9577	johnl@baywoodinteriors.com
Bendt Kitchens and Millwork Inc.	(519) 743-7418	jody@bendt.ca
BEZ Industries	(519) 579-3880	john@bezindustries.com
CCW Inc	(519) 886-2728	hermes.alvarez@ccwinc.com
DM Millwork Ltd	(519) 743-1556	dmmillwork@gto.net
GL Industries Ltd	(519) 787-4379	gary@glindustries.ca
Harris Corporate Interiors Inc.	(905) 563-6111	danny@hciinc.ca
HSCJ Millwork Inc.	(226) 606-3171	sam@hscjservices.com
Interior Store Display Installations	(519) 895-0532	garry@interiorstoredisplay.com
Leedwood Ltd.	(519) 805-3556	ryan@leedwood.ca
Second Generation Furnishings	(905) 738-1403	robert@2ndgen.ca
Top Millwork Interiors Inc.	(416) 736-9868	topmillwork@msn.com
VDCM Architectural Woodwork Inc.	(519) 743-4409	estimating@vdcmltd.ca
Wood Design Ltd	(905) 595-1281	wooddesign.ltd@gmail.com

Roofing Contractor	Phone	Email
A.M. Roofing Systems Inc.	(905) 529-5111	mike@amroofingsystems.com
Atlas-Apex Roofing (Kitchener) Inc.	(519) 894-4422	inquiries@atlas-apex.com
Dean-Thackeray Roofing Company Ltd	(519) 745-7386	patrick.dtr@bellnet.ca
Flynn Canada Ltd	(519) 624-8797	Joseph.Raposo@flynn.ca

LaFleche Roofing Services	(800) 387-1549	chris@laflecheroofing.com
Nedlaw Roofing Limited	(519) 648-2218	adam@nedlawroofing.com
Roque Roofing Inc.	(905) 525-9689	sarah@roqueroofing.com
Schreiber Brothers Ltd	(905) 561-7780	marinos@schreiberrroofing.com
Semple Gooder Roofing Limited	(519) 623-3300	jsottile@semplegooder.com
Spinton Roofing Limited	(905) 575-3686	mira@spintonroofing.com
Triumph Roofing & Sheet Metal Inc.	(416) 534-8877	info@triumphinc.ca
Wm. Green Roofing Ltd.	(519) 822-6414	sbrookes@wmgreenroofing.ca

Window Contractor	Phone	Email
Aerloc Industries Ltd.	(905) 628-6061	peterdendekkerjr@aerloc.com
Alwind Industries Ltd	(905) 738-4266	gm@alwind.com
Barton Glass	(905) 385-3599	pdhbartonglass@quickclic.net
Festival City Glass Ltd.	(519) 271-5182	festivalcityglass@gmail.com
Glass Canada Limited	(519) 642-4100	rdamstra@glass-canada.com
Kitchener Glass Ltd	(519) 744-5201	paul@kitchenerglass.com
KW Glass Systems Inc	(519) 725-9305	rick@kwglass.com
Peninsula Glass Inc.	(905) 735-2901	tim@peninsulaglass.ca
Shantz Windows	(519) 669-2629	bruce@shantzwindows.com
Sherwood Windows Group	(416) 675-3262	bhorton@sherwoodwindows.com
Windspec Inc	(905) 738-8311	wferri@windspec.com

Flooring Contractor	Phone	Email
Flooring Plus	(519) 747-5131	vartan@flooringplus.ca
M&M Carpet Inc.	(905) 279-7875	mmcarpet@bellnet.ca
Nufloors Simcoe	(519) 426-2619	garnatfloor@eastlink.ca
Rick's Carpet and Flooring	(519) 449-2362	gcouwenberg@rickscarpet.ca
S L Marcella Carpets Ltd	(519) 885-2357	nick@marcellacarpets.ca
The Belluz Group Ltd.	(905) 385-8999	abraham@belluzgroup.ca
Twin City Tile Co Ltd	(519) 743-4179	matt@twincitytile.com
Voll's Contract Flooring	(519) 669-1151	dkirch@vollscontract.ca

Zet Master Limited	(905) 789-6560	konrad@zetmaster.com
--------------------	----------------	----------------------

Painting Contractor	Phone	Email
Aves & Shaw Painting	(519) 742-3486	avesandshawltd@rogers.com
CertaPro Painters of Waterloo	(519) 616-1167	adyck@certapro.com
Expert Painting Inc	(519) 635-8106	expertpainting@hotmail.com
Gateway Painting Ltd.	(519) 500-0772	info@gwpainting.ca
Mike McMahon's Painting Ltd	(519) 744-0169	mikes.painting.ltd@sympatico.ca
Northern Painters (div Connco Group Ltd)	(800) 465-6985	northpaint@conncogroup.com
Platinum Painting & Decorating Inc.	(905) 790-2111	sandro@platinumpaintdecor.com
Westwood Painting Services Inc.	(905) 575-8458	westwoodpainting@cogeco.net

Sprinkler Install Contractor	Phone	Email
C&H Fire Supression Systems	(519) 742-6030	Justin@chfireinc.com
EPI Fire Protection Inc	(416) 746-2225	jzafrani@epi-fps.ca
Georgian Bay Fire & Safety	(519) 543-5115	psmith@gbfire.com
Ideal Fire Suppression Systems	(519) 878-6776	ty@ifss.ca
LifeSafetySecurity Inc.	(844) 715-7288	rappleyard@lifesafetysecurity.com
Richardson Fire Systems Inc.	(519) 650-8057	matt.fromm@richardsonfire.com
Spira Fire Protection Ltd	(519) 823-1150	ken@spira.ca
Troy Life & Fire Safety	(519) 650-2972	tim.hallman@troylfs.com
Western Fire Protection Inc.	(519) 641-3059	todd@westernfire.ca

**END OF SECTION**

**THIS PAGE LEFT INTENTIONALLY BLANK**

**SECTION 00 21 15 – SCOPE OF WORK**



**THIS PAGE LEFT INTENTIONALLY BLANK**

## **SECTION 00 31 34 – SUBSURFACE INVESTIGATION REPORT**

### **1.0 GENERAL**

#### **1.1. RELATED SECTIONS**

- .1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.2. SUBSURFACE INVESTIGATION REPORT**

- .1 An investigation report with respect to the applicable building site and important immediate affected surroundings, is titled as follows:
  - .1 Title:
  - .2 Dated:
  - .3 Prepared By:
- .2 A copy of this detailed investigation report is included as an appendix to this section.
- .3 The subsurface investigation report records properties of the soils, subgrade conditions, and offers recommendations for the design of foundations.
- .4 The report as prepared primarily for the use of the Consultants.
- .5 The recommendations given shall not be construed as a requirement of this Contract unless also contained in the Contract Documents.
- .6 The report, by its nature, cannot reveal all conditions that exist or can or might occur on the subject site. Should subsurface conditions be found or be a concern thereto, or to vary substantially from the investigation report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract Price accruing to the Owner.

**END OF SECTION**



# Forest Heights Collegiate Institute

## 2021 Asbestos Audit Update Report

**Project Location:**

255 Fischer-Hallman Road, Kitchener, ON

**Prepared for:**

Waterloo Region District School Board  
51 Ardelt Avenue, Kitchener, ON

**Prepared by:**

MTE Consultants  
520 Bingemans Centre Drive  
Kitchener, ON N2B 3X9

July 26, 2021

**MTE File No.:** C34532-921





MTE Consultants

520 Bingham Centre Drive, Kitchener, Ontario N2B 3X9

July 26, 2021

MTE File No.: C34532-921

Waterloo Region District School Board  
51 Ardelt Avenue  
Kitchener, Ontario N2C 2R5

**RE: 2021 Asbestos Audit Update – Forest Heights Collegiate Institute  
255 Fischer-Hallman Road, Kitchener, Ontario**

## **1.0 Introduction**

MTE Consultants Inc. (MTE) was authorized by the Waterloo Region District School Board (WRDSB) to conduct the 2021 Asbestos Audit Update for the subject building.

The purpose of the assignment was to re-assess and document the location, type, and condition of identified asbestos-containing materials (ACM) present within the building and make appropriate recommendations for management, abatement or remedial activities, as required.

The audit was conducted in accordance with the Ontario Ministry of Labour, *Regulation 278/05- Designated Substance-Asbestos on Construction Projects and in Buildings and Repair Operations* (O. Reg. 278/05). This report shall replace previous audit reports.

## **2.0 Scope of Work**

The Scope of Work for this assessment was completed by MTE and included the following activities:

- Review of existing and historical reports and documentation pertaining to ACM within the building;
- Visual inspection to assess the condition of previously identified ACM, excluding portable structures;
- Collection of building material samples that are suspect ACM, as applicable;
- Submission of samples to an accredited laboratory, as applicable;
- Photographic log of damaged materials; and
- Preparation of this report with findings and recommendations.

## **3.0 Methodology and Assessment Criteria**

This inspection was conducted by visual and laboratory identification methods for the assessment of ACM and their corresponding location, use, condition, and friability. The areas outlined in Section 2.0 were inspected limited to building components, materials and service connections. Notwithstanding that reasonable attempts were made to identify all ACMs, the

possibility of concealed material exists and may not become visible until substantial demolition has occurred and therefore are currently undocumented and did not include the following.

- Locations that may be hazardous to the surveyor, such as electrical equipment;
- Where invasive inspection could cause consequential damage to the property or impair the integrity of the equipment, such as roof systems, underground services or components of mechanical equipment;
- Locations concealed by building finishes that require substantial demolition or removal for access or determination of quantities;
- Materials that is present in such an inconsistent fashion that without complete removal of finishes, the extent cannot be determined.
- Non-permanent items or personal contents, furnishings; and
- Settled dust or airborne agents unless otherwise stated.

### 3.1 Condition of ACM

During the audit process the general condition of ACMs were observed and noted. Materials which are damaged can pose an increased exposure risk to workers, building occupants and the public. While assessing damage can be subjective, abatement items were grouped into two categories to aid in remedial prioritization.

#### *Monitor Annually*

These are items which display minor isolated damage; however, do not pose an immediate risk to workers from exposure to asbestos fibres due to the current condition of the material and/or location. No remediation is required at this time; however, these items should be monitored on a yearly basis for evidence of continued degradation. Should the condition of the material change, an evaluation should be completed by a competent person to determine remedial action.

#### *Abatement Action Required*

These are items which display damage and may pose potential risk to workers from exposure to asbestos fibres due to the physical condition and/or location of the material. Clean-up, repair or removal of these materials is required as soon as reasonably possible.

## 4.0 Findings

An inspection of the building was conducted by MTE on July 16, 19, 2021. The two-storey school was constructed in 1964 with additions in 1970 and 1987. The inspection did not include areas of post 1990 construction or renovation (where all building finishes have been removed and replaced), as applicable.

The Asbestos Management Database is provided in **Appendix A** and associated Figures are provided in **Appendix B**. These together provide a current summary of the ACM identified throughout the building.

A summary of the damaged ACM identified at the time of the inspection is provided in **Appendix C**.

The bulk asbestos sample location and analytical summary is provided in **Appendix C**.

#### 4.1 Analytical Results

During this inspection, no samples were collected.

#### 4.2 Removed ACM

No ACM has been removed since the previous audit.

#### 4.3 Discovery of Additional ACM

No additional ACM or suspect ACM was identified.

#### 4.4 Damaged ACM

Damaged ACM was identified. Refer to **Appendix C, Tables 1 and 2** for a detailed summary of required actions, specific to each material. At the time of the audit, all other ACM at the building was noted to be in good condition.

### 5.0 Recommendations

#### 5.1 Remedial

Damaged ACM was identified. Refer to Appendix C, Tables 1 and 2 for a detailed summary of required actions, specific to each material. At the time of the audit, all other ACM at the building was noted to be in good condition.

Type 1 abatement Operations may be conducted internally by trained and qualified WRDSB staff. All other abatement work must be conducted by certified asbestos contractors trained and qualified to conduct the type of work required.

All asbestos work must be conducted by staff and/or contractors who are trained and experienced in the type of asbestos operations required, and should be overseen by a qualified third party Health, Safety and Environmental professional. In order to conduct Type 3 asbestos operations, contractors must be certified as Asbestos Abatement Workers AAW (Trade code 253W) and Asbestos Abatement Supervisors AAS (Trade code 253S) by The Ministry of Training, Colleges and Universities (Ministry of Advanced Education and Skills Development) as prescribed by Section 20 of O. Reg. 278/05.

#### 5.2 Long Term Management

This audit was conducted for the long term management of ACM within the building. Prior to future construction or renovation projects, additional assessments and/or sampling may be required.

There are no requirements under current legislation to remove ACM from a building simply because it is present. However, O. Reg. 278/05 requires that an Asbestos Management Plan

be implemented and maintained. Asbestos awareness training should be provided for staff that may come in contact with ACM during routine duties or in emergency situations.

ACM that will be disturbed, or will likely be disturbed, during building maintenance, renovations, construction, or demolition activities must be handled and disposed of in accordance with the procedures prescribed by O. Reg. 278/05.

ACM may also be present in concealed locations. If any construction, renovation, alteration, or maintenance activities are required or planned, invasive inspections of concealed locations for potential ACM must be performed prior to such activities. Should any suspect ACM be discovered, work should cease and the materials should not be disturbed. Suspect ACM must be treated as asbestos-containing or sampled and proven to not contain asbestos. Any activities that require disturbance of ACM must be performed in accordance with O. Reg. 278/05.

## 6.0 Limitations

Services performed by **MTE Consultants Inc.** (MTE) were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the Environmental Engineering & Consulting profession. No other representation expressed or implied as to the accuracy of the information, conclusions or recommendations is included or intended in this report.

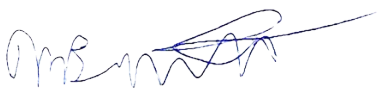
This report was completed for the sole use of MTE and the Client. It was completed in accordance with the approved Scope of Work referred to in Section 0. As such, this report may not deal with all issues potentially applicable to the site and may omit issues that are or may be of interest to the reader. MTE makes no representation that the present report has dealt with all-important environmental features, except as provided in the Scope of Work. All findings and conclusions presented in this report are based on site conditions, as they existed during the time period of the investigation. This report is not intended to be exhaustive in scope or to imply a risk-free facility.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based upon it, are the responsibility of such third parties. MTE accepts no responsibility for liabilities incurred by or damages, if any, suffered by any third party as a result of decisions made or actions taken, based upon this report. Others with interest in the site should undertake their own investigations and studies to determine how or if the condition affects them or their plans.

It should be recognized that the passage of time might affect the views, conclusions and recommendations (if any) provided in this report because environmental conditions of a property can change. Should additional or new information become available, MTE recommends that it be brought to our attention in order that we may re-assess the contents of this report.

All of which is respectfully submitted,

### MTE Consultants Inc.



**Michael Bennett**  
Indoor Environments Technologist  
519-743-6500 ext. 1459  
[mbennett@mte85.com](mailto:mbennett@mte85.com)

**Paul Semeniuk, B.E.S., C.E.T.**  
Manager, Indoor Environments  
519-743-6500 ext. 1324  
[psemeniuk@mte85.com](mailto:psemeniuk@mte85.com)

PXS: apm  
Attach.

M:\34532\921\1 - Reports\0 - Ready For Review\Forest Heights C.\Report 2021\34532-921\_2021\_07\_26\_Rpt - Asbestos Audit - Forest Heights CI.docx



# Appendix A

---

## **Asbestos Management Database**



**School Name**  
**Forest Heights Collegiate Institute**  
**Date Built:**  
 Original: 1964  
 Addition(s): 1970, 1987

**Legend:**  
 HM - Homogenous Material - homogeneous with previously sampled material  
 SL - Sample Location - Material Sampled  
 VC - Visually Confirmed - Material not sampled, deemed ACM  
 NF - Non-Friable  
 F- Friable

**Notes:**  
 All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  
 Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
<b>Structure/Additions</b>										
	Throughout Building	Structure	Deck	Steel	-	Non ACM	-	-	-	-
	Throughout Building	Structure	Concrete	Concrete	-	Non ACM	-	-	-	-
	Throughout Building	Façade	Brick Veneer	Brick and Mortar	-	Non ACM	VC	-	-	-
	Throughout Building	Not Inspected	Not Inspected	Roofing Materials	NF	Suspect ACM	VC	Sample prior to disturbance	-	-
	Original Building	Wall Cavity	Vermiculite	-	F	ACM	HM	33752-200-S01	7-Jul-12	Amphibole
	Original Building	Windows	Interior Pane	Light Grey Sealant	-	Non ACM	SL	S07	13-Apr-18	ND
	Original Building	Windows	Interior Frames	White Sealant	-	Non ACM	SL	S08	13-Apr-18	ND
	Original Building	Windows	Exterior Pane	Beige Sealant	NF	ACM	SL	S10	13-Apr-18	1% Chrysotile
	Original Building	Doors	Exterior Frame	Grey Sealant	NF	ACM	SL	S06	13-Apr-18	7% Chrysotile
	Original Building	Doors	Interior Pane	Black Sealant	-	Non ACM	SL	S05	13-Apr-18	ND
	Original Building	Façade/Windows	Exterior Siding/Frames	Grey Sealant	-	Non ACM	SL	S09	13-Apr-18	ND
	Original Building	Mastic	Mastic	Floor Tile Mastic	NF	ACM	SL	S02	13-Apr-18	3% Chrysotile
	1970 Addition	Mastic	Mastic	Floor Tile Mastic	-	Non ACM	SL	S01	31-Oct-18	ND
	1970 Addition	Doors	Interior Pane	Black Sealant	-	Non ACM	SL	S05	13-Apr-18	ND
	Exterior	Overhang	Plaster	Textured	-	Non ACM	SL	34532-903-S01ABC	10-Jul-15	ND
<b>Basement</b>										
B6-0	Storage	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
B6-0	Storage	Wall	Ceramic Tile	-	-	Non ACM	-	-	-	-
B6-0	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
B6-0	Storage	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
B6-0	Storage	Ceiling	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
B6-1	Exercise Room	Floor	Laminate	-	-	Non ACM	-	-	-	-
B6-1	Exercise Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
B6-1	Exercise Room	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (Post 1990)	-	Non ACM	-	-	-	-
B6-1	Exercise Room	Upper Ceiling	Drywall	Post 2008	-	Non ACM	-	-	-	-
B6-1	Exercise Room	Piping	Pipe Insulation	Fibreglass & PVC Fittings	-	Non ACM	-	-	-	-
B6-5	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Green	NF	ACM	SL	S10abc	21-Apr-08	0.3 Chrysotile
B6-5	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Mastic	NF	ACM	SL	S10abc	21-Apr-08	2.2 Chrysotile
B6-5	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	<b>HM</b> - Homogenous Material - homogeneous with previously sampled material <b>SL</b> - Sample Location - Material Sampled <b>VC</b> - Visually Confirmed - Material not sampled, deemed ACM <b>NF</b> - Non-Friable <b>F</b> - Friable	<b>All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.</b>
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		<b>Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.</b>

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
B6-5	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (Post 1990)	-	Non ACM	SL	S11abc	21-Apr-08	ND
B6-5	Classroom	Above Ceiling	Texture Coat	Plaster	-	Non ACM	HM	S07	21-Apr-08	ND
B6-7	Exercise Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
B6-7	Exercise Room	Floor	Rubber	-	-	Non ACM	-	-	-	-
B6-7	Exercise Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
B6-7	Exercise Room	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (Post 1990)	-	Non ACM	-	-	-	-
B6-7	Exercise Room	Above Ceiling	Texture Coat	Plaster	-	Non ACM	HM	S07	21-Apr-08	ND
B6-7	Exercise Room	Ducting	Duct Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
B6-8	Exercise Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
B6-8	Exercise Room	Floor	Rubber	-	-	Non ACM	-	-	-	-
B6-8	Exercise Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
B6-8	Exercise Room	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (Post 1990)	-	Non ACM	-	-	-	-
B6-8	Exercise Room	Above Ceiling	Texture Coat	Plaster	-	Non ACM	HM	S07	21-Apr-08	ND
B6-8	Exercise Room	Ducting	Duct Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
B6-9	Storage	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
B6-9	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
B6-9	Storage	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
B6-10	Pump Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
B6-10	Pump Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
B6-10	Pump Room	Deck	Concrete	-	-	Non ACM	-	-	-	-
B6-10	Pump Room	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
B6-10	Pump Room	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
B6-10	Pump Room	Piping	Pipe Insulation	Mag Block	F	ACM	SL	S01abc	21-Apr-08	25% Amosite
B6-11	Tank Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
B6-11	Tank Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
B6-11	Tank Room	Deck	Concrete	-	-	Non ACM	-	-	-	-
B6-11	Tank Room	Tank	Hot Water Tank	Insulation	F	ACM	SL	1680.288-07	June, 1990	50-75% Chrysotile
B6-11	Tank Room	Tank	Hot Water Tank	Uninsulated	-	Non ACM	-	-	-	-
B6-11	Tank Room	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
B6-11	Tank Room	Piping	Pipe Insulation	Mag Block	F	ACM	HM	S01	21-Apr-08	25% Amosite
B6-12	Electrical Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
B6-12	Electrical Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
B6-12	Electrical Room	Above Ceiling	Texture Coat	Plaster	-	Non ACM	HM	S07	21-Apr-08	ND
B6-12	Electrical Room	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
<b>Forest Heights Collegiate Institute</b>	<b>HM</b> - Homogenous Material - homogeneous with previously sampled material <b>SL</b> - Sample Location - Material Sampled <b>VC</b> - Visually Confirmed - Material not sampled, deemed ACM <b>NF</b> - Non-Friable <b>F</b> - Friable	<b>All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.</b>
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		<b>Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.</b>

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
B6-12	Electrical Room	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
B6-14	Corridor	Floor	Vinyl Floor Tile 12"x 12"	Grey Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
B6-14	Corridor	Wall	Concrete	Concrete Block	-	Non ACM	-	-	-	-
B6-14	Corridor	Ceiling	Drywall	Drywall Joint Compound (Post-2008)	-	Non ACM	-	-	-	-
B6-15	Corridor	Floor	Vinyl Floor Tile 12"x 12"	Grey Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
B6-15	Corridor	Floor	Concrete	Concrete Block	-	Non ACM	-	-	-	-
B6-15	Corridor	Ceiling	Drywall	Drywall Joint Compound (Post-2008)	-	Non ACM	-	-	-	-
B6-19	Boiler Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
B6-19	Boiler Room	Floor	Vinyl Floor Tile 12"x 12"	Grey Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
B6-19	Boiler Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
B6-19	Boiler Room	Deck	Concrete	-	-	Non ACM	-	-	-	-
B6-19	Boiler Room	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
B6-19	Boiler Room	Ducting	Flex Joint	-	NF	ACM	VC	Sample prior to disturbance.	-	-
C-B6	Corridor	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
C-B6	Corridor	Wall	Concrete	-	-	Non ACM	-	-	-	-
C-B6	Corridor	Wall	Ceramic Tile	-	-	Non ACM	-	-	-	-
C-B6	Corridor	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (Post 1990)	-	Non ACM	-	-	-	-
C-B6	Corridor	Ceiling	Ceiling Tile 2' x 4'	Textured Random Pinhole	-	Non ACM	SL	S04abc	21-Apr-08	ND
C-B6	Corridor	Ceiling	Ceiling Tile 2' x 4'	Textured Medium Pinhole	-	Non ACM	SL	S05abc	21-Apr-08	ND
C-B6	Corridor	Deck	Metal Pan	Steel	-	Non ACM	-	-	-	-
C-B6	Corridor	Piping	Pipe Insulation	Horsehair	-	Non ACM	-	-	-	-
C-B6A	Corridor	Floor	Vinyl Floor Tile 12"x 12"	Grey Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
C-B6A	Corridor	Floor	Concrete	Concrete Block	-	Non ACM	-	-	-	-
C-B6A	Corridor	Ceiling	Drywall	Drywall Joint Compound (Post-2008)	-	Non ACM	-	-	-	-
903	Stairwell	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
903	Stairwell	Wall	Concrete	Concrete Block	-	Non ACM	-	-	-	-
903	Stairwell	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
<b>First Floor</b>										
1	Gym	Floor	Wood	-	-	Non ACM	-	-	-	-
1	Gym	Wall	Concrete	-	-	Non ACM	-	-	-	-
1	Gym	Ceiling	Open to Structure	-	-	Non ACM	-	-	-	-
1	Gym	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-



**School Name**  
**Forest Heights Collegiate Institute**  
**Date Built:**  
 Original: 1964  
 Addition(s): 1970, 1987

**Legend:**  
 HM - Homogenous Material - homogeneous with previously sampled material  
 SL - Sample Location - Material Sampled  
 VC - Visually Confirmed - Material not sampled, deemed ACM  
 NF - Non-Friable  
 F- Friable

**Notes:**  
 All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  
 Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
1	Gym	Piping	Pipe Fitting	Fibreglass/PVC	-	Non ACM	-	-	-	-
1-1	Custodian Room	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
1-1	Custodian Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
1-1	Custodian Room	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
1-1	Custodian Room	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
1-2	Washroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
1-2	Girls Washroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
1-2	Washroom	Ceiling	Ceiling Tile 2 x 2	Short Fissure Random Pinhole 2005	-	Non ACM	-	-	-	-
1-2	Washroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
1-2	Washroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
1-4	Classroom	Floor	Vinyl Floor Tile 12"x 12"	White with Black Fleck	-	Non ACM	HM	S05	10-Jul-15	ND
1-4	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
1-4	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
1-4	Classroom	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 1990)	-	Non ACM	-	-	-	-
1-4	Classroom	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
1-4	Classroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
1-4	Classroom	Ducting	Duct Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
1-4	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
1-4	Classroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
1A	Storage	Floor	Vinyl Floor Tile 9"x 9"	Red	NF	ACM	HM	32523-FHSS-810-S25	21-Apr-08	7.5% Chrysotile
1A	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
1A	Storage	Deck	Concrete	-	-	Non ACM	-	-	-	-
1B	Storage	Floor	Vinyl Floor Tile 9"x 9"	Red	NF	ACM	HM	32523-FHSS-810-S25	21-Apr-08	7.5% Chrysotile
1B	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
1B	Storage	Deck	Concrete	-	-	Non ACM	-	-	-	-
1-4A		Floor	Vinyl Floor Tile 9"x 9"	Green with White	NF	ACM	HM	32523-FHSS-B615-S02	21-Apr-08	3.2% Chrysotile
1-4A		Wall	Concrete	-	-	Non ACM	-	-	-	-
1-4A		Wall	Drywall	Drywall Joint Compound	-	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
1-4A		Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
1-4A		Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
1-4B	Alarmed Room	Floor	Ceramic Tile	-	-	-	-	-	-	-
1-4B	Alarmed Room	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
1-4B	Alarmed Room	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
1-4B	Alarmed Room	Wall	Concrete	Concrete Block	-	Non ACM	-	-	-	-





<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
1-4B	Alarmed Room	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 1990)	-	Non ACM		-	-	-
1-4C	Alarmed Room	Floor	Ceramic Tile	-	-	-	-	-	-	-
1-4C	Alarmed Room	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
1-4C	Alarmed Room	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
1-4C	Alarmed Room	Wall	Concrete	Concrete Block	-	Non ACM		-	-	-
1-4C	Alarmed Room	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 1990)	-	Non ACM		-	-	-
2	Gym	Floor	Wood	-	-	Non ACM	-	-	-	-
2	Gym	Wall	Concrete	-	-	Non ACM	-	-	-	-
2	Gym	Ceiling	Open to Structure	-	-	Non ACM	-	-	-	-
2	Gym	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
2	Gym	Piping	Pipe Fitting	Fibreglass/PVC	-	Non ACM	-	-	-	-
2	Gym	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
2A	Storage	Floor	Vinyl Floor Tile 9"x 9"	Red	NF	ACM	HM	32523-FHSS-810-S25	21-Apr-08	7.5% Chrysotile
2A	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
2A	Storage	Deck	Concrete	-	-	Non ACM	-	-	-	-
2A	Storage	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
2B	Storage	Floor	Vinyl Floor Tile 9"x 9"	Red	NF	ACM	HM	32523-FHSS-810-S25	21-Apr-08	7.5% Chrysotile
2B	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
2B	Storage	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
2B	Storage	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2B	Storage	Deck	Concrete	-	-	Non ACM	-	-	-	-
2-2	Office	Floor	Vinyl Floor Tile 12"x 12"	Green	NF	ACM	HM	S10ABC	21-Apr-08	2% Chrysotile
2-2	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-2	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
2-2	Office	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile - Large Pinhole	NF	ACM	HM	S23ABC	21-Apr-08	2.5 Amosite
2-2	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-2A	Washroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
2-2A	Washroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-2A	Washroom	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile - Large Pinhole	NF	ACM	HM	S23ABC	21-Apr-08	2.5 Amosite
2-2A	Washroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-2B	Staff Room	Floor	Vinyl Floor Tile 12"x 12"	Green	NF	ACM	HM	S10ABC	21-Apr-08	2% Chrysotile
2-2B	Staff Room	Floor	Carpet	-	-	Non ACM	-	-	-	-
2-2B	Staff Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
2-2B	Staff Room	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile - Large Pinhole	NF	ACM	HM	S23ABC	21-Apr-08	2.5 Amosite



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.
<b>Date Built:</b>		Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
Original: 1964		
Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
2-2B	Staff Room	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-4	Office	Floor	Vinyl Floor Tile 12"x 12"	Green	NF	ACM	HM	S10ABC	21-Apr-08	2% Chrysotile
2-4	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-4	Office	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile	NF	ACM	HM	32523-FHSS-B615-S03	21-Apr-08	2.3% Amosite
2-4	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-4A	Office	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
2-4A	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-4A	Office	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile	NF	ACM	HM	32523-FHSS-B615-S03	21-Apr-08	2.3% Amosite
2-4A	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-4B	Office Corridor	Floor	Vinyl Floor Tile 12"x 12"	Green	NF	ACM	HM	S10ABC	21-Apr-08	2% Chrysotile
2-4B	Office Corridor	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-4B	Office Corridor	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile	NF	ACM	HM	32523-FHSS-B615-S03	21-Apr-08	2.3% Amosite
2-4B	Office Corridor	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-6	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	HM	S34ABC	2011	ND
2-6	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
2-6	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-6	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (post 1990)	-	Non ACM	-	-	-	-
2-6	Classroom	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
2-6	Classroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-6A	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	HM	S34ABC	2011	ND
2-6A	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-6A	Office	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
2-6A	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-6B	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	HM	S34ABC	2011	ND
2-6B	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-6B	Office	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
2-6B	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-6C	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	HM	S34ABC	2011	ND
2-6C	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-6C	Office	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
2-6C	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-6D	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	HM	S34ABC	2011	ND
2-6D	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-6D	Office	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
2-6D	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-6E	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	HM	S34ABC	2011	ND
2-6E	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-6E	Office	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
2-6E	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-6F	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	HM	S34ABC	2011	ND
2-6F	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-6F	Office	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
2-6F	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-7	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	HM	S34ABC	2011	ND
2-7	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-7	Office	Ceiling	Ceiling Tile 2 x 2	Short Fissure Random Pinhole (Post 2018)	-	Non ACM	-	-	-	-
2-7	Office	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
2-7	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
2-7A	Storage	Floor	Vinyl Floor Tile 9"x 9"	Beige, Burgundy White	NF	ACM	HM	S09	10-Jul-15	5.9% Chrysotile
2-7A	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
2-7A	Storage	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-8	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	HM	S34ABC	2011	ND
2-8	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
2-8	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
2-8	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (post 1990)	-	Non ACM	-	-	-	-
2-8	Classroom	Ceiling	Ceiling Tile 1' x 1'	Cellulose	-	Non ACM	-	-	-	-
3	Gym	Floor	Wood	-	-	Non ACM	-	-	-	-
3	Gym	Wall	Concrete	-	-	Non ACM	-	-	-	-
3	Gym	Ceiling	Open to Structure	-	-	Non ACM	-	-	-	-
3	Gym	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
3	Gym	Piping	Pipe Fitting	Fibreglass/PVC	-	Non ACM	-	-	-	-
3A	Storage	Floor	Vinyl Floor Tile 9"x 9"	Red	NF	ACM	HM	32523-FHSS-810-S25	21-Apr-08	7.5% Chrysotile
3A	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
3A	Storage	Deck	Concrete	-	-	Non ACM	-	-	-	-
3B	Storage	Floor	Vinyl Floor Tile 9"x 9"	Red	NF	ACM	HM	32523-FHSS-810-S25	21-Apr-08	7.5% Chrysotile
3B	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
3B	Storage	Ceiling	Concrete	-	-	Non ACM	-	-	-	-
3-2A	-	Floor	Vinyl Floor Tile 9"x 9"	Grey with Black and White Streaks	NF	ACM	HM	S19abc	21-Apr-08	2.8% Chrysotile





<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
3-2A	-	Wall	Concrete	-	-	Non ACM	-	-	-	-
3-2A	-	Wall	Drywall	Drywall Joint Compound	-	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
3-2A	-	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile - Large Pinhole	NF	ACM	HM	S23ABC	21-Apr-08	2.5 Amosite
3-2A	-	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
3-2B	-	Floor	Vinyl Floor Tile 9"x 9"	Grey with Black and White Streaks	NF	ACM	HM	S19abc	21-Apr-08	2.8% Chrysotile
3-2B	-	Wall	Concrete	-	-	Non ACM	-	-	-	-
3-2B	-	Wall	Drywall	Drywall Joint Compound	-	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
3-2B	-	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile - Large Pinhole	NF	ACM	HM	S23ABC	21-Apr-08	2.5 Amosite
3-2B	-	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
3-2	-	Floor	Vinyl Floor Tile 9"x 9"	Grey with Black and White Streaks	NF	ACM	SL	S19abc	21-Apr-08	2.8% Chrysotile
3-2	-	Wall	Concrete	-	-	Non ACM	-	-	-	-
3-2	-	Wall	Drywall	Drywall Joint Compound	-	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
3-2	-	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile - Large Pinhole	NF	ACM	HM	S23ABC	21-Apr-08	2.5 Amosite
3-2	-	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
3-4	Classroom	Floor	12"x12" Floor Tile	Beige Dense Fleck (Post 2008)	-	Non ACM	-	-	-	-
3-4	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
3-4	Classroom	Ceiling	Ceiling Tile 2' x 4'	Thick Fissure Random Pinhole	-	Non ACM	SL	S22abc	21-Apr-08	ND
3-4	Classroom	Ceiling	Ceiling Tile 1' x 1'	Acoustic Ceiling Tile - Cellulose	-	Non ACM	-	-	-	-
3-4	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
3-5	Classroom	Floor	Vinyl Sheet Flooring	Grey (Post 2018)	-	Non ACM	-	-	-	-
3-5	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
3-5	Classroom	Ceiling	Acoustical Panels	Fibre	-	Non ACM	-	-	-	-
3-5	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
3-5	Classroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
3-6	Classroom	Floor	12"x12" Floor Tile	Beige Dense Fleck (Post 2008)	-	Non ACM	-	-	-	-
3-6	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
3-6	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole	-	Non ACM	HM	S16	21-Apr-08	ND
3-6	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
3-8	Classroom	Floor	Vinyl Floor Tile 9"x 9"	Beige	NF	ACM	HM	S09	10-Jul-15	5.9% Chrysotile
3-8	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
3-8	Classroom	Wall	Drywall	Drywall Joint Compound	-	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
3-8	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (Post 1990)	-	Non ACM	SL	S16abc	21-Apr-08	ND
3-8	Classroom	Ceiling	Ceiling Tile 1' x 1'	Acoustic Ceiling Tile - Cellulose	-	Non ACM	-	-	-	-
3-9	Classroom	Floor	Carpet	-	-	Non ACM	-	-	-	-



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>  All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
3-9	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
3-9	Classroom	Ceiling	Ceiling Tile 2' x 4'	Long Fissure Random Pinhole	-	Non ACM	SL	S17abc	21-Apr-08	ND
3-9	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
3-9	Classroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
3-10	Washroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
3-10	Washroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
3-10	Washroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (Post 1990)	-	Non ACM	-	-	-	-
3-10	Washroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
4-2	Classroom	Floor	Vinyl Floor Tile 9"x 9"	Grey with Black & White Streaks	NF	ACM	HM	32523-FHSS-B63-S06ABC	21-Apr-08	2.3% Chrysotile
4-2	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	-	-	-	-
4-2	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-2	Classroom	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 1990)	-	Non ACM	-	-	-	-
4-2A	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	-	-	-	-
4-2A	Classroom	Wall	Concrete	Beige Dense Fleck (Post 2008)	-	Non ACM	-	-	-	-
4-2A	Classroom	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 1990)	-	Non ACM	-	-	-	-
4-2B	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	-	-	-	-
4-2B	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-2B	Classroom	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 1990)	-	Non ACM	-	-	-	-
4-2C	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	-	-	-	-
4-2C	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-2C	Classroom	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 1990)	-	Non ACM	-	-	-	-
4-3	Tuck Shop	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
4-3	Tuck Shop	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-3	Tuck Shop	Deck	Concrete	-	-	Non ACM	-	-	-	-
4-4	Storage	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
4-4	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-4	Storage	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
4-5	Washroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
4-5	Washroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-5	Washroom	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 1990)	-	Non ACM	-	-	-	-
4-5	Washroom	Deck	Concrete	-	-	Non ACM	-	-	-	-
4-5	Washroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
4-5	Washroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
4-6	Kitchen	Floor	Concrete	-	-	Non ACM	-	-	-	-



	<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
	Forest Heights Collegiate Institute	<b>HM</b> - Homogenous Material - homogeneous with previously sampled material <b>SL</b> - Sample Location - Material Sampled <b>VC</b> - Visually Confirmed - Material not sampled, deemed ACM <b>NF</b> - Non-Friable <b>F</b> - Friable	<b>All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.</b>
	<b>Date Built:</b>		
	Original: 1964		<b>Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.</b>
Addition(s): 1970, 1987			

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
4-6	Kitchen	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-6	Kitchen	Ceiling	Ceiling Tile 2' x 2'	Metal	-	Non ACM	-	-	-	-
4-6	Kitchen	Deck	Concrete	-	-	Non ACM	-	-	-	-
4-6A	Kitchen	Floor	Concrete	-	-	Non ACM	-	-	-	-
4-6A	Kitchen	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-6A	Kitchen	Ceiling	Ceiling Tile 2' x 2'	Metal	-	Non ACM	-	-	-	-
4-6A	Kitchen	Deck	Concrete	-	-	Non ACM	-	-	-	-
4-6B	Kitchen - Not Inspected									
4-6C	Kitchen	Floor	Concrete	-	-	Non ACM	-	-	-	-
4-6C	Kitchen	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-6C	Kitchen	Ceiling	Ceiling Tile 2' x 2'	Metal	-	Non ACM	-	-	-	-
4-6C	Kitchen	Deck	Concrete	-	-	Non ACM	-	-	-	-
4-6D	Kitchen	Floor	Concrete	-	-	Non ACM	-	-	-	-
4-6D	Kitchen	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-6D	Kitchen	Ceiling	Ceiling Tile 2' x 2'	Metal	-	Non ACM	-	-	-	-
4-6D	Kitchen	Deck	Concrete	-	-	Non ACM	-	-	-	-
4-6E	Kitchen	Floor	Concrete	-	-	Non ACM	-	-	-	-
4-6E	Kitchen	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-6E	Kitchen	Ceiling	Ceiling Tile 2' x 2'	Metal	-	Non ACM	-	-	-	-
4-6E	Kitchen	Deck	Concrete	-	-	Non ACM	-	-	-	-
4-7	Library	Floor	Carpet	-	-	Non ACM	-	-	-	-
4-7	Library	Wall	Drywall	Drywall Joint Compound	-	Non ACM	SL	S03	13-Apr-18	ND
4-7	Library	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1992)	-	Non ACM	-	-	-	-
4-7B	Computer Lab	Floor	Vinyl Floor Tile 12"x 12"	Light Beige Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
4-7B	Computer Lab	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
4-7B	Computer Lab	Floor	Vinyl Floor Tile 12"x 12"	Dark Beige Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
4-7B	Computer Lab	Wall	Drywall	Drywall Joint Compound	-	Non ACM	SL	S03	13-Apr-18	ND
4-7B	Computer Lab	Wall	Brick	-	-	Non ACM	-	-	-	-
4-7B	Computer Lab	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1992)	-	Non ACM	-	-	-	-
4-7C	Library Entrance	Floor	Vinyl Floor Tile 12"x 12"	Light Beige Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
4-7C	Library Entrance	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
4-7C	Library Entrance	Floor	Vinyl Floor Tile 12"x 12"	Dark Beige Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
4-7C	Library Entrance	Wall	Drywall	Drywall Joint Compound	-	Non ACM	SL	S03	13-Apr-18	ND
4-7C	Library Entrance	Ceiling	Drywall	Drywall Joint Compound	-	Non ACM	SL	S03	13-Apr-18	ND



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.
<b>Date Built:</b>		Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
Original: 1964		
Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
4-7D	Storage	Floor	Vinyl Floor Tile 12"x 12"	Dark Beige Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
4-7D	Storage	Wall	Drywall	Drywall Joint Compound	-	Non ACM	HM	S03	13-Apr-18	ND
4-7D	Storage	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1992)	-	Non ACM	-	-	-	-
4-7E	Seminar	Floor	Carpet	-	-	Non ACM	-	-	-	-
4-7E	Seminar	Wall	Drywall	Drywall Joint Compound	-	Non ACM	HM	S03	13-Apr-18	ND
4-7E	Seminar	Ceiling	Ceiling Tile 2' x 2'	Fibreglass	-	Non ACM	-	-	-	-
4-7E	Seminar	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1992)	-	Non ACM	-	-	-	-
4-7F	Computer Lab	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
4-7F	Computer Lab	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-7F	Computer Lab	Wall	Drywall	Drywall Joint Compound	-	Non ACM	HM	S03	13-Apr-18	ND
4-7F	Computer Lab	Ceiling	Ceiling Tile 2' x 2'	Fibreglass	-	Non ACM	-	-	-	-
4-7F	Computer Lab	Ducting	Duct Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
4-8	Office	Floor	Vinyl Sheet Flooring	Beige Dense Fleck (Post 2005)	-	Non ACM	HM	S34ABC	2011	ND
4-8	Office	Floor	Carpet	-	-	Non ACM	-	-	-	-
4-8	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
4-8	Office	Wall	Wood Panels	Wood	-	Non ACM	-	-	-	-
4-8	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1992)	-	Non ACM	-	-	-	-
4-8	Office	Ceiling	Ceiling Tile 1 x 1	Medium and Small Pinhole	NF	ACM	HM	32523-FHSS-812-S23	21-Apr-08	2.5% Amosite
4-8	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
4-8A	Office	Floor	Vinyl Sheet Flooring	Blue (Post 2018)	-	Non ACM	-	-	-	-
4-8A	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
4-8A	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-8A	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1992)	-	Non ACM	-	-	-	-
4-8B	Office	Floor	Vinyl Sheet Flooring	Blue (Post 2018)	-	Non ACM	-	-	-	-
4-8B	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
4-8B	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-8B	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1992)	-	Non ACM	-	-	-	-
4-8C	Office	Floor	Vinyl Sheet Flooring	Blue (Post 2018)	-	Non ACM	-	-	-	-
4-8C	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
4-8C	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
4-8C	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1992)	-	Non ACM	-	-	-	-
4-8D	Washroom	Floor	Vinyl Sheet Flooring	Blue (Post 2018)	-	Non ACM	-	-	-	-
4-8D	Washroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
4-8D	Washroom	Ceiling	Ceiling Tile 1 x 1	Medium and Small Pinhole	NF	ACM	HM	32523-FHSS-812-S23	21-Apr-08	2.5% Amosite





<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>  All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
4-8D	Washroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
4-8E	Washroom	Floor	Vinyl Sheet Flooring	Blue (Post 2018)	-	Non ACM	-	-	-	-
4-8E	Washroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
4-8E	Washroom	Ceiling	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
4-8F	Kitchen	Floor	Vinyl Sheet Flooring	Blue (Post 2018)	-	Non ACM	-	-	-	-
4-8F	Kitchen	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
4-8F	Kitchen	Ceiling	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
4-8G	Storage	Floor	Vinyl Floor Tile 9"x 9"	Brown with White, Orange	NF	ACM	HM	S06	10-Jul-15	3.65% Chrysotile
4-8G	Storage	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
4-8G	Storage	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
4-8H	Washroom	Floor	Vinyl Sheet Flooring	Blue (Post 2018)	-	Non ACM	-	-	-	-
4-8H	Washroom	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
4-8H	Washroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1992)	-	Non ACM	-	-	-	-
4-8J	Washroom	Floor	Vinyl Sheet Flooring	Blue (Post 2018)	-	Non ACM	-	-	-	-
4-8J	Washroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
4-8J	Washroom	Ceiling	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-1	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-1	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-1	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-1	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-1	Office	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
5-1	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-1A	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-1A	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-1A	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-1A	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-1A	Office	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
5-1A	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-2	Computer Lab	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2005)	-	Non ACM	HM	S34ABC	2011	ND
5-2	Computer Lab	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-2	Computer Lab	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
5-2	Computer Lab	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1990)	-	Non ACM	-	-	-	-
5-2	Computer Lab	Ceiling	Ceiling Tile 1' x 1'	Cellulose	-	Non ACM	-	-	-	-
5-2A	Computer Lab	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2005)	-	Non ACM	HM	S34ABC	2011	ND



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
5-2A	Computer Lab	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-2A	Computer Lab	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
5-2A	Computer Lab	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1990)	-	Non ACM	-	-	-	-
5-2A	Computer Lab	Ceiling	Ceiling Tile 1' x 1'	Cellulose	-	Non ACM	-	-	-	-
5-3	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-3	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-3	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-3	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-3	Office	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
5-3	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-3A	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-3A	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-3A	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-3A	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-3A	Office	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
5-3A	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-3B	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-3B	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-3B	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-3B	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-3B	Office	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
5-3B	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-3C	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-3C	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-3C	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-3C	Office	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
5-3C	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-3D	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-3D	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-3D	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-3D	Office	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
5-3D	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-3E	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-3E	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-



**School Name**  
**Forest Heights Collegiate Institute**  
**Date Built:**  
 Original: 1964  
 Addition(s): 1970, 1987

**Legend:**  
 HM - Homogenous Material - homogeneous with previously sampled material  
 SL - Sample Location - Material Sampled  
 VC - Visually Confirmed - Material not sampled, deemed ACM  
 NF - Non-Friable  
 F- Friable

**Notes:**  
 All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  
 Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
5-3E	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-3E	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-3E	Office	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
5-3E	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-3F	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-3F	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-3F	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-3F	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-3F	Office	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
5-3F	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-3G	Office	Floor	Vinyl Floor Tile 12"x 12"	Green with White Streaks	NF	ACM	HM	32523-FHSS-812-S23	21-Apr-08	3.2% Chrysotile
5-3G	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-3G	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-3G	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-3G	Office	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
5-3G	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-3H	Office	Floor	Vinyl Floor Tile 12"x 12"	Green with White Streaks	NF	ACM	HM	32523-FHSS-812-S23	21-Apr-08	3.2% Chrysotile
5-3H	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-3H	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-3H	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-3H	Office	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
5-3H	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-3J	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-3J	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-3J	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-3J	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-3J	Office	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
5-3J	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-4	Office	Floor	Vinyl Floor Tile 9"x 9"	Green with White Streaks	NF	ACM	HM	32523--FHSS-B615-S02ABC	21-Apr-08	3.2 Chrysotile
5-4	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-4	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
5-4	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1990)	-	Non ACM	-	-	-	-
5-4	Office	Ceiling	Ceiling Tile 1' x 1'	Cellulose	-	Non ACM	-	-	-	-
5-5	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige with Brown Specks	NF	ACM	HM	S11	10-Jul-15	0.79% Chrysotile





<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>  All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
5-5	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-5	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-5	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
5-5	Classroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-5	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
5-5A	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige with Brown Specks	NF	ACM	HM	S11	10-Jul-15	0.79% Chrysotile
5-5A	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-5A	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-5A	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
5-6	Classroom	Floor	Beige Dense Fleck	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-6	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-6	Classroom	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-6	Classroom	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-6	Classroom	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
5-6	Classroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-7	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige with Brown Specks	NF	ACM	HM	S11	10-Jul-15	0.79% Chrysotile
5-7	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-7	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-7	Office	Ceiling	Ceiling Tile 2' x 2'	Fibreglass	-	Non ACM	-	-	-	-
5-7A	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige with Brown Specks	NF	ACM	HM	S11	10-Jul-15	0.79% Chrysotile
5-7A	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-7A	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-7A	Office	Ceiling	Ceiling Tile 2' x 2'	Fibreglass	-	Non ACM	-	-	-	-
5-7B	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige with Brown Specks	NF	ACM	HM	S11	10-Jul-15	0.79% Chrysotile
5-7B	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-7B	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-7B	Office	Ceiling	Ceiling Tile 2' x 2'	Fibreglass	-	Non ACM	-	-	-	-
5-7C	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige with Brown Specks	NF	ACM	HM	S11	10-Jul-15	0.79% Chrysotile
5-7C	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-7C	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-7C	Office	Ceiling	Ceiling Tile 2' x 2'	Fibreglass	-	Non ACM	-	-	-	-
5-7D	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige with Brown Specks	NF	ACM	HM	S11	10-Jul-15	0.79% Chrysotile
5-7D	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-7D	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile





<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
5-7D	Office	Ceiling	Ceiling Tile 2' x 2'	Fibreglass	-	Non ACM	-	-	-	-
5-7E	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige with Brown Specks	NF	ACM	HM	S11	10-Jul-15	0.79% Chrysotile
5-7E	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-7E	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-7E	Office	Ceiling	Ceiling Tile 2' x 2'	Fibreglass	-	Non ACM	-	-	-	-
5-8	Classroom	Floor	Beige Dense Fleck	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-8	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-8	Classroom	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-8	Classroom	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
5-8	Classroom	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
5-8	Classroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-9	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige with Brown Specks	NF	ACM	HM	S11	10-Jul-15	0.79% Chrysotile
5-9	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-9	Office	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-9	Office	Ceiling	Ceiling Tile 2' x 2'	Fibreglass	-	Non ACM	-	-	-	-
5-10	Classroom	Floor	Beige Dense Fleck	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-10	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-10	Classroom	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-10	Classroom	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 2008)	-	Non ACM	-	-	-	-
5-10	Classroom	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
5-10	Classroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-12	Classroom	Floor	Beige Dense Fleck	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
5-12	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
5-12	Classroom	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-12	Classroom	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (1990)	-	Non ACM	-	-	-	-
5-12	Classroom	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
5-12	Classroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
5-14	Washroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
5-14	Washroom	Wall	Ceramic Tile	-	-	Non ACM	-	-	-	-
5-14	Washroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1990)	-	Non ACM	-	-	-	-
5-14	Washroom	Ceiling	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
5-14	Washroom	Piping	Pipe Insulation	Horsehair	-	Non ACM	-	-	-	-
5-14	Washroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
5-14	Washroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
<b>Forest Heights Collegiate Institute</b>	<b>HM</b> - Homogenous Material - homogeneous with previously sampled material <b>SL</b> - Sample Location - Material Sampled <b>VC</b> - Visually Confirmed - Material not sampled, deemed ACM <b>NF</b> - Non-Friable <b>F</b> - Friable	<b>All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.</b>
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		<b>Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.</b>

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
6-1	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-1	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-1	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-1A	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-1A	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-1A	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-1B	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-1B	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-1B	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-1C	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-1C	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-1C	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-2	Weight Room	Floor	Concrete	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-2	Weight Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-2	Weight Room	Ceiling	Open to Structure	-	-	Non ACM	-	-	-	-
6-2	Weight Room	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
6-2	Weight Room	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
6-3	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-3	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-3	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-3A	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-3A	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-3A	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-3B	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-3B	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-3B	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-3C	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-3C	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-3C	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-5	Storage	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-5	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-5	Storage	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-5A	Storage	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-5A	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	<b>HM</b> - Homogenous Material - homogeneous with previously sampled material <b>SL</b> - Sample Location - Material Sampled <b>VC</b> - Visually Confirmed - Material not sampled, deemed ACM <b>NF</b> - Non-Friable <b>F</b> - Friable	<b>All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.</b>
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		<b>Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.</b>

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
6-5A	Storage	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-7	Storage	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2008)	-	Non ACM	-	-	-	-
6-7	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-7	Storage	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-9A	Storage	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-9A	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-9A	Storage	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-11	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-11	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-11	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-11A	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-11A	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-11A	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-11B	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-11B	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-11B	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-13	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-13	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-13	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-13A	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-13A	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-13A	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-13B	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-13B	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-13B	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-13C	Changeroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-13C	Changeroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-13C	Changeroom	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-13D	Custodial	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
6-13D	Custodial	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-13D	Custodial	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-13D	Custodial	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
6-13D	Custodial	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
6-15	Receiving	Floor	Concrete	-	-	Non ACM	-	-	-	-



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
6-15	Receiving	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-15	Receiving	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-15	Receiving	Deck	Concrete	-	-	Non ACM	-	-	-	-
6-15A	Washroom	Floor	Ceramic Tile	-	-	Non ACM	-	-	-	-
6-15A	Washroom	Wall	Drywall	Post 2008 Renovation	-	Non ACM	-	-	-	-
6-15A	Washroom	Ceiling	Drywall	Post 2008 Renovation	-	Non ACM	-	-	-	-
6-17	Custodian Office	Floor	Vinyl Floor Tile 12"x 12"	Grey Dense Fleck (Post 2008)	-	Non ACM	-	-	-	-
6-17	Custodian Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-17	Custodian Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (Post 2008)	-	Non ACM	-	-	-	-
6-20	Classroom	Floor	Vinyl Floor Tile 9"x 9"	Beige/Burgundy/White	NF	ACM	HM	S09	10-Jul-15	5.9% Chrysotile
6-20	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-20	Classroom	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 2008)	-	Non ACM	-	-	-	-
6-20	Classroom	Ceiling	Ceiling Tile 1' x 1'	Medium & Small Pinhole	-	Non ACM	SL	S07	10-Jul-15	ND
6-20	Classroom	Ducting	Duct Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
6-22	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Flock	-	Non ACM	HM	S34abc	18-Nov-11	ND
6-22	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-22	Classroom	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
6-22	Classroom	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 2008)	-	Non ACM	-	-	-	-
6-22A	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Flock	-	Non ACM	HM	S34abc	18-Nov-11	ND
6-22A	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-22A	Classroom	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
6-22A	Classroom	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 2008)	-	Non ACM	-	-	-	-
6-24	Custodial Office	Floor	Concrete	-	-	Non ACM	-	-	-	-
6-24	Custodial Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-24	Custodial Office	Deck	Concrete	-	-	Non ACM	-	-	-	-
6-25	Classroom	Floor	12"x12" Floor Tile	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
6-25	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-25	Classroom	Wall	Plaster	-	-	Non ACM	SL	S20	21-Apr-08	ND
6-25	Classroom	Ceiling	Ceiling Tile 2' x 4'	Thick Fissure Random Pinhole	-	Non ACM	SL	S22abc	21-Apr-08	ND
6-25	Classroom	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile - Large Pinhole	NF	ACM	HM	S23ABC	21-Apr-08	2.5 Amosite
6-25	Classroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
6-25	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
6-25A		Floor	12"x12" Floor Tile	Beige Dense Fleck (Post 2005)	-	Non ACM	-	-	-	-
6-25A		Wall	Concrete	-	-	Non ACM	-	-	-	-





<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
6-25A	-	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
6-25A	-	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile - Large Pinhole	NF	ACM	HM	S23ABC	21-Apr-08	2.5 Amosite
6-25A	-	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
6-27	Lab	Floor	Vinyl Floor Tile 12"x 12"	Beige with Brown Fleck	NF	ACM	SL	S15abc	21-Apr-08	0.75% Chrysotile
6-27	Lab	Floor	Floor Tile Mastic	Yellow/Black Mastic	-	Non ACM	SL	S15abc	21-Apr-08	Trace
6-27	Lab	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-27	Lab	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-27	Lab	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (2004)	-	Non ACM	-	-	-	-
6-27	Lab	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile - Large Pinhole	NF	ACM	HM	S23ABC	21-Apr-08	2.5 Amosite
6-27	Lab	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
6-27	Lab	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
6-28	Class Room	Floor	Vinyl Floor Tile 9"x 9"	Grey with White and Black	NF	ACM	SL	S06	10-Jul-15	3.65% Chrysotile
6-28	Class Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-28	Class Room	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1990)	-	Non ACM	-	-	-	-
6-28	Class Room	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
6-28	Class Room	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
6-30	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck	-	Non ACM	HM	S34abc	18-Nov-11	ND
6-30	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-30	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-30	Classroom	Ceiling	Ceiling Tile 2' x 4'	Pinhole (Post 2008)	-	Non ACM	-	-	-	-
6-30	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
6-30	Classroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
6-32	Office	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck	-	Non ACM	HM	S34abc	18-Nov-11	ND
6-32	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
6-32	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
6-32	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1990)	-	Non ACM	-	-	-	-
6-32	Office	Ceiling	Ceiling Tile 1' x 1'	Medium & Small Pinhole	-	Non ACM	HM	S07	10-Jul-15	ND
7-0	Custodial Room	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
7-0	Custodial Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
7-0	Custodial Room	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
7-0A	Storage	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense fleck	-	Non ACM	HM	S34ABC	2011	ND
7-0A	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
7-0A	Storage	Counter	Transite	Transite	NF	ACM	VC	Sample prior to disturbance.		
7-0A	Storage	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile - Large Pinhole	NF	ACM	HM	S23ABC	21-Apr-08	2.5 Amosite



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
<b>Forest Heights Collegiate Institute</b>	<b>HM</b> - Homogenous Material - homogeneous with previously sampled material <b>SL</b> - Sample Location - Material Sampled <b>VC</b> - Visually Confirmed - Material not sampled, deemed ACM <b>NF</b> - Non-Friable <b>F</b> - Friable	<b>All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.</b>
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		<b>Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.</b>

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
7-0A	Storage	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
7-1	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense fleck (Post 2008)	-	Non ACM	-	-	-	-
7-1	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
7-1	Classroom	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
7-1	Classroom	Ceiling	Ceiling Tile 2' x 4'	Pinhole	-	Non ACM	-	-	-	-
7-1	Classroom	Above Ceiling	Fire Proofing	Sprayed	-	Non ACM	-	-	-	-
7-2	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense fleck	-	Non ACM	HM	S34ABC	2011	ND
7-2	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
7-2	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
7-2	Classroom	Ceiling	Ceiling Tile 2' x 4'	Thick Fissure Random Pinhole	NF	ACM	SL	S29abc	21-Apr-08	2.7% Amosite
7-2A	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense fleck	-	Non ACM	HM	S34ABC	2011	ND
7-2A	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
7-2A	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
7-2A	Classroom	Counters	Counter Top	Transite	NF	ACM	VC	Sample prior to disturbance.	-	-
7-2A	Classroom	Ceiling	Ceiling Tile 2' x 4'	Thick Fissure Random Pinhole	NF	ACM	SL	S29abc	21-Apr-08	2.7% Amosite
7-3	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense fleck (Post 2008)	-	Non ACM	-	-	-	-
7-3	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
7-3	Classroom	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
7-3	Classroom	Ceiling	Ceiling Tile 2' x 4'	Pinhole (Post 2005)	-	Non ACM	-	-	-	-
7-3	Classroom	Above Ceiling	Fire Proofing	Sprayed	-	Non ACM	-	-	-	-
7-4	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense fleck	-	Non ACM	HM	S34ABC	2011	ND
7-4	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
7-4	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
7-4	Classroom	Ceiling	Ceiling Tile 2' x 4'	Pinhole (Post 2005)	-	Non ACM	-	-	-	-
7-4	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large Pinhole - Cellulose	-	Non ACM	-	-	-	-
7-4A	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense fleck	-	Non ACM	HM	S34ABC	2011	ND
7-4A	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
7-4A	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
7-4A	Classroom	Counters	Counter Top	Transite	NF	ACM	VC	Sample prior to disturbance.	-	-
7-4A	Classroom	Ceiling	Ceiling Tile 2' x 4'	Pinhole (Post 2005)	-	Non ACM	-	-	-	-
7-4A	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large Pinhole - Cellulose	-	Non ACM	-	-	-	-
7-5	Lab	Floor	Vinyl Floor Tile 12"x 12"	Blue Dense Fleck (post 2008)	-	Non ACM	-	-	-	-
7-5	Lab	Wall	Concrete	-	-	Non ACM	-	-	-	-
7-5	Lab	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1990)	-	Non ACM	-	-	-	-



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	<b>HM</b> - Homogenous Material - homogeneous with previously sampled material <b>SL</b> - Sample Location - Material Sampled <b>VC</b> - Visually Confirmed - Material not sampled, deemed ACM <b>NF</b> - Non-Friable <b>F</b> - Friable	<b>All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.</b>
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		<b>Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.</b>

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
7-5	Lab	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
7-5	Lab	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
7-5	Lab	Counters	Counter Top	Transite	NF	ACM	VC	Sample prior to disturbance.	-	-
7-6	Custodial Room	Floor	Vinyl Floor Tile 9"x 9"	Beige Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
7-6	Custodial Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
7-6	Custodial Room	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
7-7	Washroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
7-7	Washroom	Wall	Ceramic Tile	-	-	Non ACM	-	-	-	-
7-7	Washroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1990)	-	Non ACM	-	-	-	-
7-7	Washroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
7-7	Washroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
7-8	Electrical	Floor	Concrete	-	-	Non ACM	-	-	-	-
7-8	Electrical	Wall	Concrete	-	-	Non ACM	-	-	-	-
7-8	Electrical	Ceiling	Drywall	Drywall Joint Compound (Post 2008)	-	Non ACM	-	-	-	-
8-1	Classroom	Floor	Concrete	-	-	Non ACM	-	-	-	-
8-1	Classroom	Floor	Vinyl Floor Tile 12"x12"	Beige Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
8-1	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-1	Classroom	Ceiling	Acoustical Panels	Fibre	-	Non ACM	-	-	-	-
8-1	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
8-1	Classroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
8-3	Classroom	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-3	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-3	Classroom	Ceiling	Acoustical Panels	Fibre	-	Non ACM	-	-	-	-
8-3	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
8-3	Classroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
8-5	Communication	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-5	Communication	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-5	Communication	Ceiling	Acoustical Panels	Fibre	-	Non ACM	-	-	-	-
8-5	Communication	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
8-5	Communication	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
8-5B	Storage	Floor	Carpet	-	-	Non ACM	-	-	-	-
8-5B	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-5B	Storage	Ceiling	Acoustical Panels	Fibre	-	Non ACM	-	-	-	-
8-5B	Storage	Deck	Metal Pan	Steel	-	Non ACM	-	-	-	-



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
8-5B	Storage	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
8-5B	Storage	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
8-6	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
8-6	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-6	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole 2005	-	Non ACM	-	-	-	-
8-6	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
8-6	Classroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
8-6	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
8-7	Classroom	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-7	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-7	Classroom	Ceiling	Acoustical Panels	Fibre	-	Non ACM	-	-	-	-
8-7	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
8-7	Classroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
8-7A	Classroom	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-7A	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
8-7A	Classroom	Ceiling	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
8-7B	Classroom	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-7B	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
8-7B	Classroom	Ceiling	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
8-7C	Stairwell	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-7C	Stairwell	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
8-7C	Stairwell	Deck	Steel	-	-	Non ACM	-	-	-	-
8-7D	Classroom	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-7D	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
8-7D	Classroom	Ceiling	Wood Framing	Wood	-	Non ACM	-	-	-	-
8-8	Classroom	Floor	Vinyl Sheet Flooring	Grey (Post 2018)	-	Non ACM	-	-	-	-
8-8	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-8	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
8-8	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole	-	Non ACM	HM	S16	21-Apr-08	ND
8-8	Classroom	Ceiling	Ceiling Tile 1' x 1'	Acoustic Ceiling Tile - Cellulose	-	Non ACM	-	-	-	-
8-8	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
8-9	Classroom	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-9	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
8-9	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-





<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
8-9	Classroom	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
8-9	Classroom	Ceiling	Ceiling Tile 2' x 4'	Long Fissure Random Pinhole	-	Non ACM	HM	S28	21-Apr-08	ND
8-9	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
8-9	Classroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
8-9A	Classroom	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-9A	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
8-9A	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-9A	Classroom	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
8-9A	Classroom	Ceiling	Ceiling Tile 2' x 4'	Long Fissure Random Pinhole	-	Non ACM	HM	S28	21-Apr-08	ND
8-10	Classroom	Floor	Vinyl Floor Tile 9"x 9"	Red and Brown	NF	ACM	SL	S25abc	21-Apr-08	7.5% Chrysotile
8-10	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-10	Classroom	Ceiling	Ceiling Tile 1 x 1	Large Random Pinhole	NF	ACM	HM	S23	21-Apr-08	2.5% Amosite
8-10	Classroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
8-11	Computer Lab	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-11	Computer Lab	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
8-11	Computer Lab	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
8-11	Computer Lab	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-11	Computer Lab	Ceiling	Ceiling Tile 2' x 4'	Long Fissure Random Pinhole	-	Non ACM	HM	S28	21-Apr-08	ND
8-11A	Classroom	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-11A	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
8-11A	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-11A	Classroom	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
8-11A	Classroom	Ceiling	Ceiling Tile 2' x 4'	Long Fissure Random Pinhole	-	Non ACM	SL	S28abc	21-Apr-08	ND
8-11A	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
8-12	Kiln Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
8-12	Kiln Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-12	Kiln Room	Ceiling	Ceiling Tile 1 x 1	Large Random Pinhole	NF	ACM	SL	S23abc	21-Apr-08	2.5% Amosite
8-12	Kiln Room	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
8-12A	Workroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense fleck	-	Non ACM	HM	S34ABC	2011	ND
8-12A	Workroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-12A	Workroom	Counter	Transite	Transite	NF	ACM	VC	Sample prior to disturbance.		
8-12A	Workroom	Ceiling	Ceiling Tile 1' x 1'	Cellulose	-	Non ACM	-	-	-	-
8-13	Classroom	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-13	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>  All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material	
<b>Date Built:</b>	SL - Sample Location - Material Sampled	
Original: 1964	VC - Visually Confirmed - Material not sampled, deemed ACM	
Addition(s): 1970, 1987	NF - Non-Friable	
	F- Friable	

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
8-13	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-13	Classroom	Wall	Wood Panel	-	-	Non ACM	-	-	-	-
8-13	Classroom	Ceiling	Acoustical Panels	Fibre	-	Non ACM	-	-	-	-
8-13	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
8-13	Classroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
8-14	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
8-14	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-14	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole	-	Non ACM	HM	S16	21-Apr-08	ND
8-14	Classroom	Ceiling	Ceiling Tile 1' x 1'	Acoustic Ceiling Tile - Cellulose	-	Non ACM	-	-	-	-
8-15	Classroom	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-15	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
8-15	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-15	Classroom	Wall	Wood Panel	-	-	Non ACM	-	-	-	-
8-15	Classroom	Wall	Pegboard	Transite	NF	ACM	VC	Sample prior to disturbance.		
8-15	Classroom	Ceiling	Acoustical Panels	Fibre	-	Non ACM	-	-	-	-
8-15	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
8-15	Classroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
8-15A	Office	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-15A	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
8-15A	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-15A	Office	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
8-15B	Office	Floor	Hardwood	Wood	-	Non ACM	-	-	-	-
8-15B	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
8-15B	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
8-15B	Office	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
9-1	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Cream Oatmeal	-	Non ACM	SL	S30abc	21-Apr-08	ND
9-1	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
9-1	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1990)	-	Non ACM	-	-	-	-
9-1	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
9-1	Classroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
9-2	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense fleck	-	Non ACM	-	-	-	-
9-2	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
9-2	Classroom	Wall	Plaster	-	-	Non ACM	SL	S27abcd	21-Apr-08	ND
9-2	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
9-2	Classroom	Ceiling	Ceiling Tile 1' x 1'	Medium and Small Pinhole	-	Non ACM	HM	S07	10-Jul-15	ND
9-2	Classroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
9-3	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Cream Oatmeal	-	Non ACM	HM	S30	21-Apr-08	ND
9-3	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
9-3	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
9-3	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1990)	-	Non ACM	-	-	-	-
9-3	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large Pinhole - Cellulose	-	Non ACM	-	-	-	-
9-4	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense fleck	-	Non ACM	-	-	-	-
9-4	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
9-4	Classroom	Wall	Plaster	-	-	Non ACM	SL	S27abcd	21-Apr-08	ND
9-4	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
9-4	Classroom	Ceiling	Ceiling Tile 1' x 1'	Medium and Small Pinhole	-	Non ACM	HM	S07	10-Jul-15	ND
9-5	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense fleck	-	Non ACM	-	-	-	-
9-5	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
9-5	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
9-5	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1990)	-	Non ACM	-	-	-	-
9-5	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large Pinhole - Cellulose	-	Non ACM	-	-	-	-
9-6	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense fleck	-	Non ACM	-	-	-	-
9-6	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
9-6	Classroom	Wall	Plaster	-	-	Non ACM	SL	S27abcd	21-Apr-08	ND
9-6	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
9-6	Classroom	Ceiling	Ceiling Tile 1' x 1'	Medium and Small Pinhole	-	Non ACM	HM	S07	10-Jul-15	ND
9-7	Washroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
9-7	Washroom	Wall	Ceramic Tile	Green	-	Non ACM	-	-	-	-
9-7	Washroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1990)	-	Non ACM	-	-	-	-
9-7	Washroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
9-7	Washroom	Piping	Pipe Fitting	Fibreglass/PVC	-	Non ACM	-	-	-	-
9-8	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense fleck	-	Non ACM	-	-	-	-
9-8	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
9-8	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
9-8	Classroom	Ceiling	Ceiling Tile 1' x 1'	Medium and Small Pinhole	-	Non ACM	HM	S07	10-Jul-15	ND
9-8	Classroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
C1	Corridor	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
C1	Corridor	Wall	Concrete	-	-	Non ACM	-	-	-	-



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
C1	Corridor	Ceiling	Ceiling Tile 2 x 2	Short Fissure Random Pinhole 2005	-	Non ACM	-	-	-	-
C1	Corridor	Ceiling	Ceiling Tile 2 x 2	Long Fissure Random Pinhole	NF	ACM	SL	S35acb	11/18/2011	2.5% Amosite
C1	Corridor	Ceiling	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
C1	Corridor	Ducting	Duct Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
C1	Corridor	Piping	Pipe Insulation	Horsehair	-	Non ACM	-	-	-	-
C1	Corridor	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
C1	Corridor	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
C2	Corridor	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
C2	Corridor	Wall	Concrete	-	-	Non ACM	-	-	-	-
C2	Corridor	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
C2	Corridor	Ceiling	Ceiling Tile 2 x 2	Short Fissure Random Pinhole	-	Non ACM	HM	S33abc	18-Nov-11	ND
C2	Corridor	Ceiling	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
C2	Corridor	Ducting	Duct Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
C2	Corridor	Piping	Pipe Insulation	Horsehair	-	Non ACM	-	-	-	-
C2	Corridor	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
C3	Corridor	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
C3	Corridor	Wall	Concrete	-	-	Non ACM	-	-	-	-
C3	Corridor	Ceiling	Ceiling Tile 2 x 2	Short Fissure Random Pinhole	-	Non ACM	SL	S24ABC	21-Apr-08	ND
C3	Corridor	Deck	Metal Pan	Steel	-	Non ACM	-	-	-	-
C4	Corridor	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
C4	Corridor	Wall	Concrete	-	-	Non ACM	-	-	-	-
C4	Corridor	Ceiling	Ceiling Tile 2 x 2	Short Fissure Random Pinhole 2005	-	Non ACM	-	-	-	-
C4	Corridor	Ceiling	Ceiling Tile 2 x 2	Long Fissure Random Pinhole	NF	ACM	SL	S35acb	11/18/2011	2.5% Amosite
C4	Corridor	Ceiling	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
C4	Corridor	Ducting	Duct Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
C4	Corridor	Piping	Pipe Insulation	Horsehair	-	Non ACM	-	-	-	-
C4	Corridor	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
C4	Corridor	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
C4A	Entrance	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
C4A	Entrance	Wall	Concrete	-	-	Non ACM	-	-	-	-
C4A	Entrance	Wall	Ceramic Tile	-	-	Non ACM	-	-	-	-
C4A	Entrance	Wall	Stone	-	-	Non ACM	-	-	-	-
C4A	Entrance	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
C4A	Entrance	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole 2005	-	Non ACM	-	-	-	-





<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>  All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material	
<b>Date Built:</b>	SL - Sample Location - Material Sampled	
Original: 1964	VC - Visually Confirmed - Material not sampled, deemed ACM	
Addition(s): 1970, 1987	NF - Non-Friable	
	F- Friable	

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
C4B	Gym Entrances	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
C4B	Gym Entrances	Wall	Concrete	-	-	Non ACM	-	-	-	-
C4B	Gym Entrances	Deck	Concrete	-	-	Non ACM	-	-	-	-
C4B	Gym Entrances	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
C4B	Gym Entrances	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
C4C	Gym Entrances	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
C4C	Gym Entrances	Wall	Concrete	-	-	Non ACM	-	-	-	-
C4C	Gym Entrances	Deck	Concrete	-	-	Non ACM	-	-	-	-
C4C	Gym Entrances	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
C4C	Gym Entrances	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
C5	Corridor	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
C5	Corridor	Wall	Concrete	-	-	Non ACM	-	-	-	-
C5	Corridor	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
C5	Corridor	Ceiling	Ceiling Tile 2 x 2	Short Fissure Random Pinhole	-	Non ACM	HM	S33abc	18-Nov-11	ND
C5	Corridor	Ceiling	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
C5	Corridor	Ducting	Duct Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
C5	Corridor	Piping	Pipe Insulation	Horsehair	-	Non ACM	-	-	-	-
C5	Corridor	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
C5	Corridor	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
C6	Corridor	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
C6	Corridor	Wall	Concrete	-	-	Non ACM	-	-	-	-
C6	Corridor	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 2008)	-	Non ACM	-	-	-	-
C6	Corridor	Ceiling	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
C6	Corridor	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
C6	Corridor	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
C7	Corridor	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
C7	Corridor	Wall	Concrete	-	-	Non ACM	-	-	-	-
C7	Corridor	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 2008)	-	Non ACM	-	-	-	-
C7	Corridor	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
C8	Corridor	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
C8	Corridor	Wall	Concrete	-	-	Non ACM	-	-	-	-
C8	Corridor	Ceiling	Ceiling Tile 2' x 2'	Gypsum	-	Non ACM	-	-	-	-
C9	Corridor	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
C9	Corridor	Wall	Concrete	-	-	Non ACM	-	-	-	-



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
<b>Forest Heights Collegiate Institute</b>	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
C9	Corridor	Ceiling	Ceiling Tile 2' x 2'	Gypsum	-	Non ACM	-	-	-	-
C9	Corridor	Deck	Metal Pan	Steel	-	Non ACM	-	-	-	-
CF1	Cafeteria	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck	-	Non ACM	HM	S34abc	18-Nov-11	ND
CF1	Cafeteria	Wall	Concrete	-	-	Non ACM	-	-	-	-
CF1	Cafeteria	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
CF1	Cafeteria	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
CF2	Cafeteria	Floor	Vinyl Floor Tile 12"x12"	Beige Dense Fleck (Post 2015)	-	Non ACM	-	-	-	-
CF2	Cafeteria	Wall	Concrete	-	-	Non ACM	-	-	-	-
CF2	Cafeteria	Ceiling	Ceiling Tile 2 x 2	Short Fissure Random Pinhole	-	Non ACM	HM	34532-400-FHSS-C4-S33	18-Nov-11	ND
CF2	Cafeteria	Ceiling	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
CF2	Cafeteria	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
CF2	Cafeteria	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
F1	Washroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
F1	Washroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
F1	Washroom	Ceiling	Ceiling Tile 2' x 2'	Large & Small (Gypsum)	-	Non ACM	-	-	-	-
F1	Washroom	Deck	Metal Pan	Steel	-	Non ACM	-	-	-	-
F1	Washroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
F1	Washroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
F2	Cafeteria	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck	-	Non ACM	HM	S34abc	18-Nov-11	ND
F2	Cafeteria	Wall	Concrete	-	-	Non ACM	-	-	-	-
F2	Cafeteria	Wall	Texture Coat	-	F	ACM	HM	S32abcde	21-Apr-08	3.5% Chrysotile
F2	Cafeteria	Ceiling	Texture Coat	-	F	ACM	SL	S32abcde	21-Apr-08	3.5% Chrysotile
F2	Cafeteria	Ducting	Duct Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
F2	Cafeteria	Ceiling	Ceiling Tile 1 x 1	Acoustic Ceiling Tile	NF	ACM	HM	32523-FHSS-B615-S03	21-Apr-08	2.3% Amosite
F2A	Storage	Floor	Vinyl Floor Tile 9"x 9"	Beige, Burgundy White	NF	ACM	HM	S09	10-Jul-15	5.9% Chrysotile
F2A	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
F2A	Storage	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
F2A	Storage	Ceiling	Ceiling Tile 2 x 2	Long Fissure Random Pinhole	-	Non ACM	HM	S11	10-Jul-15	ND
F2A-B	Storage	Floor	Vinyl Floor Tile 9"x 9"	Beige, Burgundy White	NF	ACM	HM	S09	10-Jul-15	5.9% Chrysotile
F2A-B	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
F2A-B	Storage	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
F2A-B	Storage	Ceiling	Ceiling Tile 2 x 2	Long Fissure Random Pinhole	-	Non ACM	HM	S11	10-Jul-15	ND
F2B	Storage	Floor	Vinyl Floor Tile 9"x 9"	Beige, Burgundy White	NF	ACM	HM	S09	10-Jul-15	5.9% Chrysotile
F2B	Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	<b>HM</b> - Homogenous Material - homogeneous with previously sampled material <b>SL</b> - Sample Location - Material Sampled <b>VC</b> - Visually Confirmed - Material not sampled, deemed ACM <b>NF</b> - Non-Friable <b>F</b> - Friable	<b>All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.</b>
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		<b>Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.</b>

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
F2B	Storage	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
F2B	Storage	Ceiling	Ceiling Tile 2 x 2	Long Fissure Random Pinhole	-	Non ACM	HM	S11	10-Jul-15	ND
F2C	Facilities Office	Floor	Carpet	-	-	Non ACM	-	-	-	-
F2C	Facilities Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
F2C	Facilities Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
F2C	Facilities Office	Ceiling	Ceiling Tile 2 x 4	Long Fissure Random Pinhole (2010)	-	Non ACM	-	-	-	-
F2C-D	Washroom	Floor	Vinyl Floor Tile 9"x 9"	Beige Dense Fleck (Post 2018)	-	Non ACM	-	-	-	-
F2C-D	Washroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
F2C-D	Washroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
F2C-D	Washroom	Ceiling	Ceiling Tile 2 x 4	Long Fissure Random Pinhole (2010)	-	Non ACM	-	-	-	-
F2E	Bookroom	Floor	Vinyl Floor Tile 9"x 9"	Brown with White Streaks	NF	ACM	HM	S11	10-Jul-15	0.79% Chrysotile
F2E	Bookroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
F2E	Bookroom	Ceiling	Ceiling Tile 1 x 1	Large and Small Pinhole	NF	ACM	HM	S03	21-Apr-08	2.3% Amosite
F2E	Bookroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
F2E	Bookroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
F2F	Not Inspected									
F2G	Stage	Floor	Wood	-	-	Non ACM	-	-	-	-
F2G	Stage	Wall	Concrete	-	-	Non ACM	-	-	-	-
F2G	Stage	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
F2G	Stage	Ducting	Duct Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
F2H	Cafeteria	Floor	Vinyl Floor Tile 12"x 12"	Beige Dense Fleck	-	Non ACM	HM	S34abc	18-Nov-11	ND
F2H	Cafeteria	Wall	Concrete	-	-	Non ACM	-	-	-	-
F2H	Cafeteria	Ceiling	Ceiling Tile 2 x 4	Short Fissure Random Pinhole (Post 2008)	-	Non ACM	-	-	-	-
F3	Washroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
F3	Washroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
F3	Washroom	Ceiling	Ceiling Tile 2' x 2'	Large & Small (Gypsum)	-	Non ACM	-	-	-	-
F3	Washroom	Deck	Metal Pan	Steel	-	Non ACM	-	-	-	-
F3	Washroom	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
F3	Washroom	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
901	Stairwell/Exit	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
901	Stairwell/Exit	Floor	Ceramic Tile	6" x 6" Brown	-	Non ACM	-	-	-	-
901	Stairwell/Exit	Wall	Concrete	-	-	Non ACM	-	-	-	-
901	Stairwell/Exit	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
902	Stairwell/Exit	Floor	Terrazzo	-	-	Non ACM	-	-	-	-



	<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>	
	Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable		All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.
	<b>Date Built:</b>			
	Original: 1964 Addition(s): 1970, 1987			Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
902	Stairwell/Exit	Floor	Ceramic Tile	6" x 6" Brown	-	Non ACM	-	-	-	-
902	Stairwell/Exit	Wall	Concrete	-	-	Non ACM	-	-	-	-
903	Stairwell	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
903	Stairwell	Wall	Concrete	-	-	Non ACM	-	-	-	-
903	Stairwell	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
904	Stairwell	Floor	Concrete	-	-	Non ACM	-	-	-	-
904	Stairwell	Wall	Concrete	-	-	Non ACM	-	-	-	-
904	Stairwell	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
904	Stairwell	Ceiling	Texture Coat	-	F	ACM	SL	S32abcde	21-Apr-08	3.5% Chrysotile
905	Stairwell	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
909	Stairwell	Wall	Concrete	-	-	Non ACM	-	-	-	-
909	Stairwell	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
909	Stairwell	Piping	Pipe Insulation	Fibreglass insulation	-	Non ACM	-	-	-	-
909	Stairwell	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
909	Stairwell	Floor	Concrete	-	-	Non ACM	-	-	-	-
909	Stairwell	Wall	Concrete	-	-	Non ACM	-	-	-	-
909	Stairwell	Deck	Concrete	-	-	Non ACM	-	-	-	-
910	Stairwell	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
910	Stairwell	Wall	Concrete	-	-	Non ACM	-	-	-	-
910	Stairwell	Ceiling	Ceiling Tile 2 x 2	Large Fissured Random Pinhole	-	Non ACM	HM	S10	10-Jul-15	ND
<b>Second Floor</b>										
S-3	Fan Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
S-3	Fan Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
S-3	Fan Room	Deck	Concrete	-	-	Non ACM	-	-	-	-
S-3	Fan Room	Piping	Insulation	Fibreglass	-	Non ACM	-	-	-	-
S-3	Fan Room	Ducting	Flex Joint	-	NF	ACM	VC	Sample prior to disturbance.	-	-
S-3	Fan Room	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
S-3	Fan Room	Ducting	Duct Parging	-	F	ACM	SL	S14abc	21-Apr-08	70% Chrysotile
S-3	Fan Room	Piping	Piping	Pipe Insulation	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite
S-3	Fan Room	Insulation	Vermiculite	-	-	Non ACM	SL	S13ABC	21-Apr-08	ND
S-3	Fan Room	Insulation	Building Paper	-	-	Non ACM	SL	S12ABC	21-Apr-08	ND
S4-2	Gym Stands	Floor	Concrete	-	-	Non ACM	-	-	-	-





	<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
	Forest Heights Collegiate Institute	<b>HM</b> - Homogenous Material - homogeneous with previously sampled material <b>SL</b> - Sample Location - Material Sampled <b>VC</b> - Visually Confirmed - Material not sampled, deemed ACM <b>NF</b> - Non-Friable <b>F</b> - Friable	<b>All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.</b>
	<b>Date Built:</b>		
	Original: 1964		<b>Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.</b>
Addition(s): 1970, 1987			

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
S4-2	Gym Stands	Wall	Concrete	-	-	Non ACM	-	-	-	-
S4-2	Gym Stands	Ceiling	Steel Deck	-	-	Non ACM	-	-	-	-
S4-6	Mechanical Equipment Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
S4-6	Mechanical Equipment Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
S4-6	Mechanical Equipment Room	Deck	Concrete	-	-	Non ACM	-	-	-	-
S4-6	Mechanical Equipment Room	Piping	Piping	Pipe Insulation	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite
S4-6A	Mechanical Equipment Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
S4-6A	Mechanical Equipment Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
S4-6A	Mechanical Equipment Room	Deck	Concrete	-	-	Non ACM	-	-	-	-
S4-6B	Mechanical Equipment Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
S4-6B	Mechanical Equipment Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
S4-6B	Mechanical Equipment Room	Deck	Concrete	-	-	Non ACM	-	-	-	-
S5	Corridor	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
S5	Corridor	Wall	Concrete	-	-	Non ACM	-	-	-	-
S5	Corridor	Ceiling	Ceiling Tile 2' x 2'	Large & Small (Gypsum)	-	Non ACM	-	-	-	-
S5	Corridor	Upper Ceiling	Drywall	No Drywall Joint Compound	-	Non ACM	-	-	-	-
S5	Corridor	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
S5	Corridor	Upper Walls	Troweled Insulation	Fireproofing	-	Non ACM	HM	34532-903-S02ABC	3/20/2015	ND
S5-1	Fan Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
S5-1	Fan Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
S5-1	Fan Room	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S5-1	Fan Room	Ducting	Flex Joint	-	NF	ACM	-	-	-	-
S5-2	Classroom	Floor	Vinyl Floor Tile 9"x 9"	Burgundy	NF	ACM	HM	S08	21-Apr-08	3.5% Chrysotile
S5-2	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S5-2	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S5-2	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S5-2	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S5-3	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S5-3	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S5-3	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S5-3	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S5-3	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole	NF	ACM	HM	S03ABC	21-Apr-08	2.3 Amosite
S5-3	Classroom	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
S5-3A	Office	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
S5-3A	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
S5-3A	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S5-3A	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S5-3A	Office	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole	NF	ACM	HM	S03ABC	21-Apr-08	2.3 Amosite
S5-3A	Office	Ceiling	Ceiling Tile 1 x 1	Mastic	NF	ACM	HM	S01	13-Apr-18	3% Amosite
S5-4	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S5-4	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S5-4	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S5-4	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S5-4	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S5-5	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S5-5	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S5-5	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S5-5	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S5-5	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S5-6	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S5-6	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S5-6	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S5-6	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S5-6	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S5-7	Washroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
S5-7	Washroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S5-7	Washroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S5-7	Washroom	Ceiling	Drywall	No Drywall Joint Compound	-	Non ACM	-	-	-	-
S5-8	Washroom	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
S5-8	Washroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S5-8	Washroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S5-8	Washroom	Ceiling	Drywall	No Drywall Joint Compound	-	Non ACM	-	-	-	-
S6	Hallway	Floor	Terrazzo	-	-	Non ACM	-	-	-	-
S6	Hallway	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6	Hallway	Ceiling	Ceiling Tile 2' x 2'	Large & Small (Gypsum)	-	Non ACM	-	-	-	-
S6	Hallway	Ceiling	Drywall	No Drywall Joint Compound	-	Non ACM	-	-	-	-
S6	Hallway	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
S6	Hallway	Upper Walls	Troweled Insulation	Fireproofing	-	Non ACM	SL	34532-903-S02ABC	3/20/2015	ND



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>  All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.  Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.
Forest Heights Collegiate Institute	HM - Homogenous Material - homogeneous with previously sampled material SL - Sample Location - Material Sampled VC - Visually Confirmed - Material not sampled, deemed ACM NF - Non-Friable F- Friable	
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
S6A	Custodial Room	Terrazzo	-	Floor	-	Non ACM	-	-	-	-
S6A	Custodial Room	Concrete	-	Wall	-	Non ACM	-	-	-	-
S6A	Custodial Room	Plaster	-	Ceiling	-	Non ACM	S20, S27	21-Apr-08	ND	Non ACM
S6A	Custodial Room	Pipe Insulation	Fibreglass insulation	Above Ceiling	-	Non ACM	-	-	-	-
S6B	Custodial Room	Terrazzo	-	Floor	-	Non ACM	-	-	-	-
S6B	Custodial Room	Concrete	-	Wall	-	Non ACM	-	-	-	-
S6B	Custodial Room	Plaster	-	Ceiling	-	Non ACM	S20, S27	21-Apr-08	ND	Non ACM
S6B	Custodial Room	Piping	Piping	Pipe Insulation	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite
S6B	Custodial Room	Pipe Insulation	Fibreglass insulation	Above Ceiling	-	Non ACM	-	-	-	-
S6-1	Mechanical Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
S6-1	Mechanical Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-1	Mechanical Room	Deck	Concrete	-	-	Non ACM	-	-	-	-
S6-1	Mechanical Room	Ducting	Flex Joint	-	NF	ACM	VC	-	-	-
S6-1	Mechanical Room	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
S6-1	Mechanical Room	Piping	Piping	Pipe Insulation	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite
S6-2	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-2	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-2	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-2	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-2	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-3	Classroom	Floor	Vinyl Floor Tile 9"x 9"	Burgundy	NF	ACM	HM	S08	21-Apr-08	3.5% Chrysotile
S6-3	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-3	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-3	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-3	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-4	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	SL	S09abc	21-Apr-08	ND
S6-4	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-4	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-4	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-4	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-5	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-5	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-5	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-5	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	<b>HM</b> - Homogenous Material - homogeneous with previously sampled material <b>SL</b> - Sample Location - Material Sampled <b>VC</b> - Visually Confirmed - Material not sampled, deemed ACM <b>NF</b> - Non-Friable <b>F</b> - Friable	<b>All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.</b>
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		<b>Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.</b>

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
S6-5	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-6	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-6	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-6	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-6	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-6	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-7	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-7	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-7	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-7	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-7	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-8	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-8	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-8	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-8	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-8	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-9	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-9	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-9	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-9	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-9	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-9A	Office	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-9A	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-9A	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-9A	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-9A	Office	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-11	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-11	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-11	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-11	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-11	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-11B	Office	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-11B	Office	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-11B	Office	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND





<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	<b>HM</b> - Homogenous Material - homogeneous with previously sampled material <b>SL</b> - Sample Location - Material Sampled <b>VC</b> - Visually Confirmed - Material not sampled, deemed ACM <b>NF</b> - Non-Friable <b>F</b> - Friable	<b>All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.</b>
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		<b>Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.</b>

WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
S6-11B	Office	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-11B	Office	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-12	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-12	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-12	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-12	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-12	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-13	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-13	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-13	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-13	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-13	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-14	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-14	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-14	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-14	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-14	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-15	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-15	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-15	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-15	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-15	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-16	Classroom	Floor	Vinyl Floor Tile 12"x 12"	Brown	-	Non ACM	HM	S09	21-Apr-08	ND
S6-16	Classroom	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-16	Classroom	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-16	Classroom	Ceiling	Ceiling Tile 2' x 4'	Short Fissure Random Pinhole (1994)	-	Non ACM	-	-	-	-
S6-16	Classroom	Ceiling	Ceiling Tile 1' x 1'	Large and Small Random Pinhole (Cellulose)	-	Non ACM	-	-	-	-
S6-18	Fan Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
S6-18	Fan Room	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
S6-18	Fan Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-18	Fan Room	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-18	Fan Room	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-18	Fan Room	Ducting	Flex Joint	-	NF	ACM	VC	Sample prior to disturbance.	-	-
S6-18A	Fan Room Storage	Floor	Concrete	-	-	Non ACM	-	-	-	-



<b>School Name</b>	<b>Legend:</b>	<b>Notes:</b>
Forest Heights Collegiate Institute	<b>HM</b> - Homogenous Material - homogeneous with previously sampled material <b>SL</b> - Sample Location - Material Sampled <b>VC</b> - Visually Confirmed - Material not sampled, deemed ACM <b>NF</b> - Non-Friable <b>F</b> - Friable	<b>All quantities provided on Figures, if known. Refer to the Asbestos Audit Update Report for condition of ACM and recommended actions.</b>
<b>Date Built:</b>		
Original: 1964 Addition(s): 1970, 1987		<b>Dates provided in Material Description/Room Description columns indicates date of installation/renovation and confirms the finishes as non-ACM.</b>

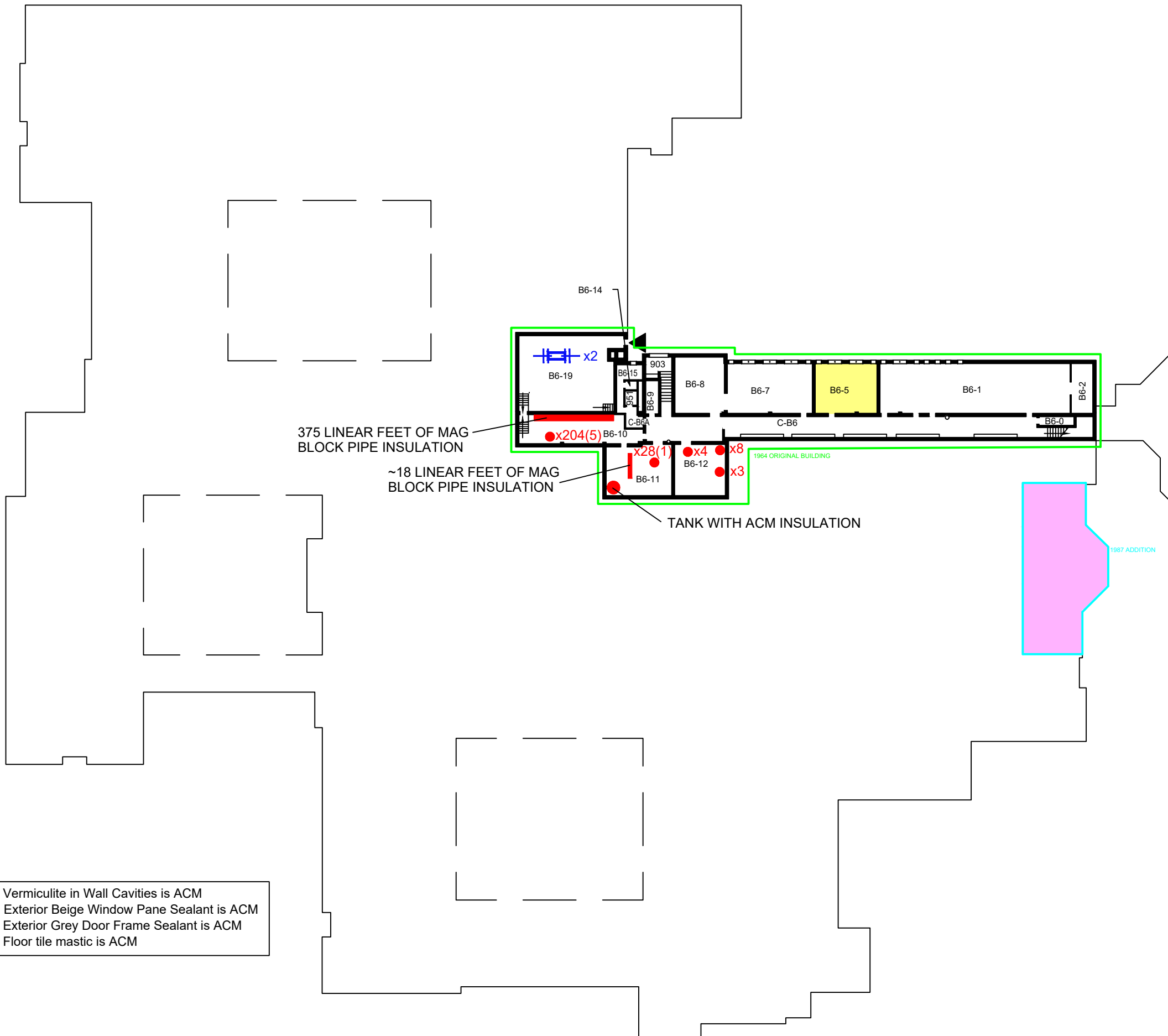
WRDSB Fixed Reference Number	Room Description	Inspected Item	Inspected Material	Material Description	Friability	Asbestos Classification	Sample / Identification Summary	Sample ID	Sample Date	% Asbestos & Fibre Type
S6-18A	Fan Room Storage	Wall	Drywall	Drywall Joint Compound	NF	ACM	HM	S04	13-Apr-18	1 - 3% Chrysotile
S6-18A	Fan Room Storage	Wall	Concrete	-	-	Non ACM	-	-	-	-
S6-18A	Fan Room Storage	Wall	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S6-18A	Fan Room Storage	Ceiling	Plaster	-	-	Non ACM	HM	S20, S27	21-Apr-08	ND
S-8	Fan Room	Floor	Concrete	-	-	Non ACM	-	-	-	-
S-8	Fan Room	Wall	Concrete	-	-	Non ACM	-	-	-	-
S-8	Fan Room	Deck	Concrete	-	-	Non ACM	-	-	-	-
S-8	Fan Room	Piping	Insulation	Fibreglass	-	Non ACM	-	-	-	-
S-8	Fan Room	Ducting	Flex Joint	-	NF	ACM	-	-	-	-
S-8	Fan Room	Piping	Pipe Fitting	Parged Cement	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite, 1-5% Chrysotile
S-8	Fan Room	Ducting	Duct Parging	-	F	ACM	SL	S14abc	21-Apr-08	70% Chrysotile
S-8	Fan Room	Piping	Piping	Pipe Insulation	F	ACM	HM	1680.288-06	13-Jun-90	50-75% Amosite
S-8	Fan Room	Insulation	Vermiculite	-	-	Non ACM	SL	S13ABC	21-Apr-08	ND
S-8	Fan Room	Insulation	Building Paper	-	-	Non ACM	SL	S12ABC	21-Apr-08	ND
<b>Summary of Potential ACM Hidden or Not Assessed</b>										
	Throughout Building	Not Inspected	Not Inspected	Wall Cavity Insulation						
	Throughout Building	Not Inspected	Not Inspected	Door Core Insulation						

# Appendix B

---

## Figures





Original Building - Vermiculite in Wall Cavities is ACM  
 Original Building - Exterior Beige Window Pane Sealant is ACM  
 Original Building - Exterior Grey Door Frame Sealant is ACM  
 Original Building - Floor tile mastic is ACM

**NOTES:**  
 ALL DRAWINGS TO BE REFERENCED WITH THE ASSOCIATED REPORT. LOCATIONS AND QUANTITIES ARE APPROXIMATE.  
 ALL KNOWN OR SUSPECT ASBESTOS-CONTAINING MATERIALS AND/OR DESIGNATED MATERIALS ARE NOT DEPICTED ON THIS DRAWING. REFER TO THE REPORT FOR A COMPLETE LIST OF IDENTIFIED MATERIALS.  
 THIS FIGURE IS COLOUR DEPENDENT. PHOTOCOPIES MAY ALTER INTERPRETATION OF THE FIGURE. ALWAYS REFER TO ORIGINAL DRAWINGS AND REPORT.

**Legend**

13 Fixed Reference Number

No Access

Post 1986 Construction

**Asbestos-Containing Materials (ACM):**

- Floor Tile
- Rolled Flooring
- Ceiling Tile
- Friable Soft Textured Ceiling
- Non-Friable Hard Textured Ceiling
- Spray-On Fire Proofing
- Transite (Asbestos Cement) Paneling
- Duct Insulation
- Pipe Fitting Insulation w Quantity (Brackets Indicate # of Damaged Fittings)
- Pipe Insulation (Vertical and Horizontal)
- Transite (Asbestos Cement) Pipe (Vertical and Horizontal)
- Duct Expansion Joints w Quantity (Brackets Indicate # of Damaged Joints)
- Friable Debris

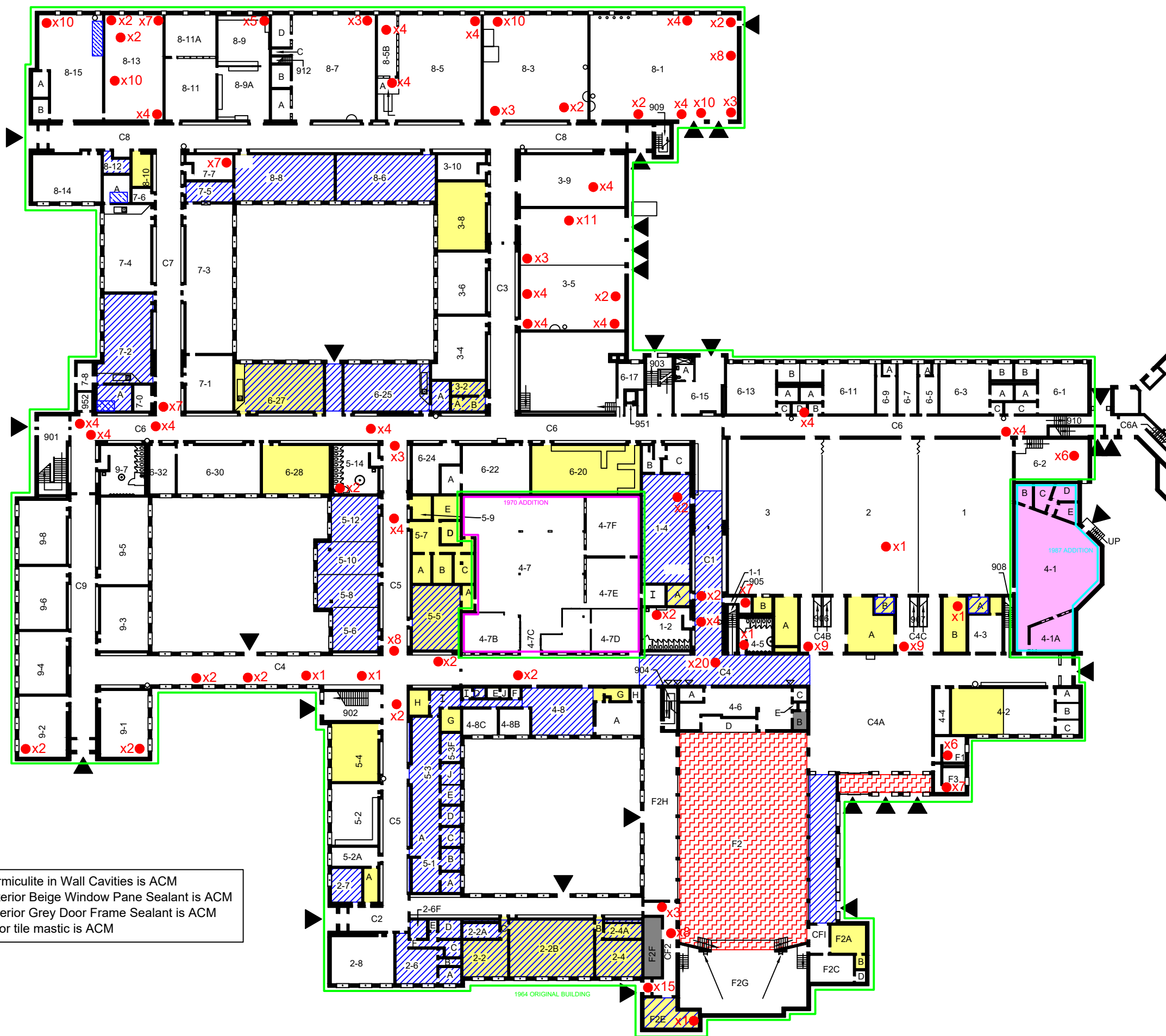


**CLIENT**  
 WATERLOO REGION DISTRICT SCHOOL BOARD

**PROJECT**  
 2021 ASBESTOS AUDIT UPDATE

**DRAWING**  
 FOREST HEIGHTS COLLEGIATE INSTITUTE  
 BASEMENT

Project Manager	P. Semeniuk	Date	November 2021
Design By	WRDSB	Project No.	34532-921
Drawn By	P. Semeniuk	Drawing No.	1.0
Scale	N.T.S.		



Original Building - Vermiculite in Wall Cavities is ACM  
 Original Building - Exterior Beige Window Pane Sealant is ACM  
 Original Building - Exterior Grey Door Frame Sealant is ACM  
 Original Building - Floor tile mastic is ACM

**NOTES:**  
 ALL DRAWINGS TO BE REFERENCED WITH THE ASSOCIATED REPORT. LOCATIONS AND QUANTITIES ARE APPROXIMATE.  
 ALL KNOWN OR SUSPECT ASBESTOS-CONTAINING MATERIALS AND/OR DESIGNATED MATERIALS ARE NOT DEPICTED ON THIS DRAWING. REFER TO THE REPORT FOR A COMPLETE LIST OF IDENTIFIED MATERIALS.  
 THIS FIGURE IS COLOUR DEPENDENT. PHOTOCOPIES MAY ALTER INTERPRETATION OF THE FIGURE. ALWAYS REFER TO ORIGINAL DRAWINGS AND REPORT.

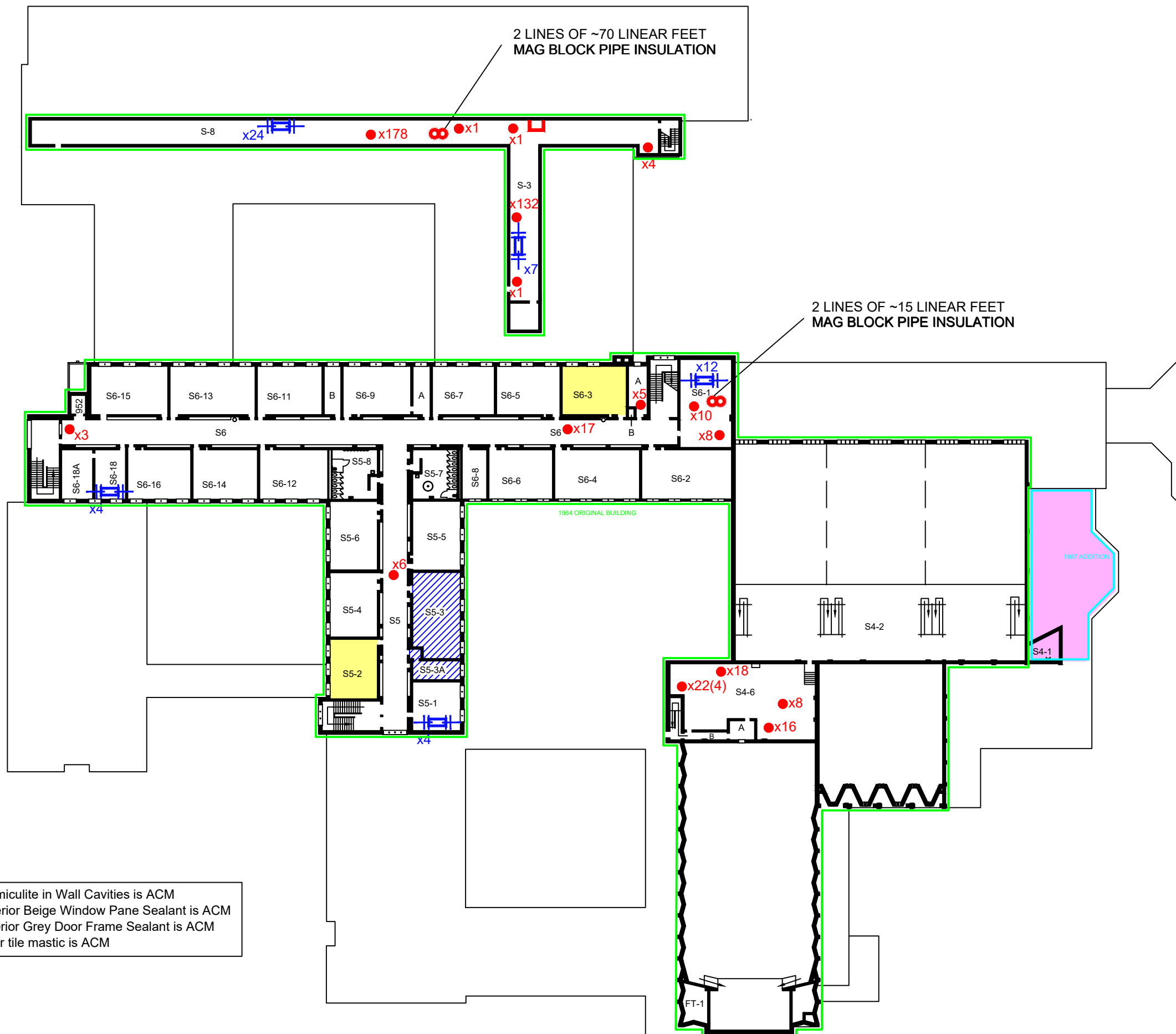
**Legend**  
 13 Fixed Reference Number  
 No Access  
 Post 1986 Construction

**Asbestos-Containing Materials (ACM):**

- Floor Tile
- Rolled Flooring
- Ceiling Tile
- Friable Soft Textured Ceiling
- Non-Friable Hard Textured Ceiling
- Spray-On Fire Proofing
- Transite (Asbestos Cement) Paneling
- Duct Insulation
- Pipe Fitting Insulation w Quantity (Brackets Indicate # of Damaged Fittings)
- Pipe Insulation (Vertical and Horizontal)
- Transite (Asbestos Cement) Pipe (Vertical and Horizontal)
- Duct Expansion Joints w Quantity (Brackets Indicate # of Damaged Joints)
- Friable Debris



CLIENT		WATERLOO REGION DISTRICT SCHOOL BOARD	
PROJECT		2021 ASBESTOS AUDIT UPDATE	
DRAWING		FOREST HEIGHTS COLLEGIATE INSTITUTE	
		LEVEL ONE	
Project Manager	P. Semeniuk	Date	November 2021
Design By	WRDSB	Project No.	34532-921
Drawn By	P. Semeniuk	Drawing No.	2.0
Scale	N.T.S.		



Original Building - Vermiculite in Wall Cavities is ACM  
 Original Building - Exterior Beige Window Pane Sealant is ACM  
 Original Building - Exterior Grey Door Frame Sealant is ACM  
 Original Building - Floor tile mastic is ACM

**NOTES:**  
 ALL DRAWINGS TO BE REFERENCED WITH THE ASSOCIATED REPORT. LOCATIONS AND QUANTITIES ARE APPROXIMATE.  
 ALL KNOWN OR SUSPECT ASBESTOS-CONTAINING MATERIALS AND/OR DESIGNATED MATERIALS ARE NOT DEPICTED ON THIS DRAWING. REFER TO THE REPORT FOR A COMPLETE LIST OF IDENTIFIED MATERIALS.  
 THIS FIGURE IS COLOUR DEPENDENT. PHOTOCOPIES MAY ALTER INTERPRETATION OF THE FIGURE. ALWAYS REFER TO ORIGINAL DRAWINGS AND REPORT.

**Legend**

- 13 Fixed Reference Number
- No Access
- Post 1986 Construction

**Asbestos-Containing Materials (ACM):**

- Floor Tile
- Rolled Flooring
- Ceiling Tile
- Friable Soft Textured Ceiling
- Non-Friable Hard Textured Ceiling
- Spray-On Fire Proofing
- Transite (Asbestos Cement) Paneling
- Duct Insulation
- Pipe Fitting Insulation w Quantity (Brackets Indicate # of Damaged Fittings)
- Pipe Insulation (Vertical and Horizontal)
- Transite (Asbestos Cement) Pipe (Vertical and Horizontal)
- Duct Expansion Joints w Quantity (Brackets Indicate # of Damaged Joints)
- Friable Debris



**CLIENT**  
 WATERLOO REGION DISTRICT SCHOOL BOARD

**PROJECT**  
 2021 ASBESTOS AUDIT UPDATE

**DRAWING**  
 FOREST HEIGHTS COLLEGIATE INSTITUTE  
 SECOND FLOOR

Project Manager	P. Semeniuk	Date	November 2021
Design By	WRDSB	Project No.	34532-921
Drawn By	P. Semeniuk	Drawing No.	3.0
Scale	N.T.S.		

# Appendix C

---

## Tables











TABLE 1 - INTERNAL ABATEMENT MANAGEMENT						
Forest Heights Collegiate Institute						
Material	WRDSB Fixed Reference Number	Material Description	Approximate Quantity	Photograph - Context	Photograph - Detail	Required Action
Asbestos Friable	B6-11	Insulation on Pipe Fittings	1 Fitting			Monitor Annually
Asbestos Friable	B6-10	Insulation on Pipe Fittings	1 Fitting			Monitor Annually
Asbestos Friable	B6-10	Insulation on Pipe Fittings	2 Fittings			Monitor Annually
Asbestos Friable	B6-10	Insulation on Pipe Fittings	2 Fittings			Monitor Annually

Table 1 and 2 - Damaged Materials - Forest Heights CI











TABLE 1 - INTERNAL ABATEMENT MANAGEMENT						
Forest Heights Collegiate Institute						
Material	WRDSB Fixed Reference Number	Material Description	Approximate Quantity	Photograph - Context	Photograph - Detail	Required Action
Asbestos Friable	S4-6	Insulation on Pipe Fittings	3 Fittings			Monitor Annually
Asbestos Friable	S4-6	Insulation on Pipe Fittings	1 Fitting			Monitor Annually
Asbestos Non-Friable	F2A	9"x9" Brown Floor Tiles	5 Tiles			Monitor Annually
Asbestos Non-Friable	F2E	2'x4' Ceiling Tile pinhole	3 Tiles			Monitor Annually

Table 1 and 2 - Damaged Materials - Forest Heights CI











TABLE 1 - INTERNAL ABATEMENT MANAGEMENT						
Forest Heights Collegiate Institute						
Material	WRDSB Fixed Reference Number	Material Description	Approximate Quantity	Photograph - Context	Photograph - Detail	Required Action
Asbestos Non-Friable	F2	Soft Texture Coat	<1m			Monitor Annually
Asbestos Non-Friable	1-4A	2'x4' Ceiling Tile Long Fissure Random Pinhole	1 Tile			Monitor Annually
Asbestos Non-Friable	1A	9"x9" Brown with White Floor Tile	2 Tiles			Monitor Annually
Asbestos Non-Friable	4-3	9"x9" Green with White Floor Tile	1 Tile			Monitor Annually

Table 1 and 2 - Damaged Materials - Forest Heights CI











TABLE 1 - INTERNAL ABATEMENT MANAGEMENT						
Forest Heights Collegiate Institute						
Material	WRDSB Fixed Reference Number	Material Description	Approximate Quantity	Photograph - Context	Photograph - Detail	Required Action
Asbestos Non-Friable	2-7A	9"x9" Brown Floor Tile	1 Tile			Monitor Annually
Asbestos Non-Friable	3A	9"x9" Brown with White Floor Tile	5 Tiles			Monitor Annually
Asbestos Non-Friable	6-27	12"x12" Tan with brown and white Floor Tile	5 Tiles			Monitor Annually
Asbestos Non-Friable	7-2	2'x4' Ceiling Tile Long Fissure Random Pinhole	25 Tiles			Monitor Annually

Table 1 and 2 - Damaged Materials - Forest Heights CI











TABLE 1 - INTERNAL ABATEMENT MANAGEMENT						
Forest Heights Collegiate Institute						
Material	WRDSB Fixed Reference Number	Material Description	Approximate Quantity	Photograph - Context	Photograph - Detail	Required Action
Asbestos Non-Friable	7-2	2'x4' Ceiling Tile Long Fissure Random Pinhole	1 Tile			Repair/Removal in accordance with O. Reg. 278/05 as a Type 1 Operation
Asbestos Non-Friable	F2	1'x1' Ceiling Tiles - Large and Small Pinhole	Throughout Room			Monitor Annually
Asbestos Non-Friable	1-4A	1'x1' Ceiling Tiles - Large and Small Pinhole	1 Tile			Monitor Annually
Asbestos Non-Friable	2B	1'x1' Ceiling Tiles - Large and Small Pinhole	3 Tiles			

Table 1 and 2 - Damaged Materials - Forest Heights CI









TABLE 1 - INTERNAL ABATEMENT MANAGEMENT						
Forest Heights Collegiate Institute						
Material	WRDSB Fixed Reference Number	Material Description	Approximate Quantity	Photograph - Context	Photograph - Detail	Required Action
Asbestos Non-Friable	2-6B	1'x1' Ceiling Tiles - Large and Small Pinhole	1 Tile			Monitor Annually
Asbestos Non-Friable	2-6C	1'x1' Ceiling Tiles - Large and Small Pinhole	3 Tiles			Monitor Annually
Asbestos Non-Friable	2-6D	1'x1' Ceiling Tiles - Large and Small Pinhole	1 Tile			Monitor Annually
Asbestos Non-Friable	3-2	1'x1' Ceiling Tiles - Large and Small Pinhole	3 Tiles			Monitor Annually

Table 1 and 2 - Damaged Materials - Forest Heights CI




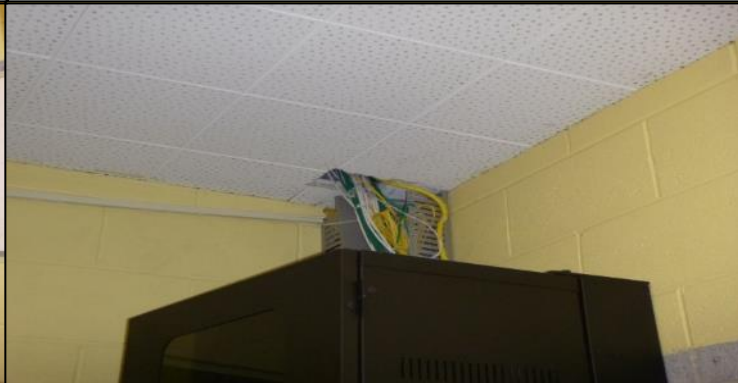








TABLE 1 - INTERNAL ABATEMENT MANAGEMENT						
Forest Heights Collegiate Institute						
Material	WRDSB Fixed Reference Number	Material Description	Approximate Quantity	Photograph - Context	Photograph - Detail	Required Action
Asbestos Non-Friable	3-2B	1'x1' Ceiling Tiles - Large and Small Pinhole	1 Tile			Monitor Annually
Asbestos Non-Friable	7-2A	1'x1' Ceiling Tiles - Large and Small Pinhole	15 Tiles			Monitor Annually
Asbestos Non-Friable	7-4A	1'x1' Ceiling Tiles - Large and Small Pinhole	6 Tiles			Monitor Annually
Asbestos Non-Friable	8-12	1'x1' Ceiling Tiles - Large and Small Pinhole	11 Tiles			Monitor Annually

Table 1 and 2 - Damaged Materials - Forest Heights CI

TABLE 1 - INTERNAL ABATEMENT MANAGEMENT						
Forest Heights Collegiate Institute						
Material	WRDSB Fixed Reference Number	Material Description	Approximate Quantity	Photograph - Context	Photograph - Detail	Required Action
Asbestos Non-Friable	Throughout	1'x1' Ceiling Tiles - Large and Small Pinhole  (Damaged at Drop Ceiling Hanger Locations)	-			Monitor Annually
<p>Notes:</p> <p>1) A copy of this report should be provided to all prospective contractors prior to tender or quotation, in accordance with Section 30 of the Occupational Health and Safety Act.</p> <p>2) Recommended actions are the minimum required actions, as prescribed by the appropriate Acts, regulations, guidelines, standards, codes and general best practice measures. The Contractor may choose to alter the approach and combine or break out sections of work. This is acceptable provided that the appropriate Acts, regulations, guidelines, standards and codes are followed and afford protection for the health and safety of workers, occupants and the public that is at least equal to the protection that would be provided by complying with the minimum requirements.</p> <p>3) All waste generated is subject to characterization and disposal in accordance with Ontario Regulation 347.</p>						

<b>TABLE 2 - EXTERNAL ABATEMENT MANAGEMENT</b>						
<b>Forest Heights Collegiate Institute</b>						
<b>Material</b>	<b>WRDSB Fixed Reference Number</b>	<b>Material Description</b>	<b>Approximate Quantity</b>	<b>Photograph - Context</b>	<b>Photograph - Detail</b>	<b>Required Action</b>
<b>None Identified During Inspection</b>						
<p>Notes:</p> <p>1) A copy of this report should be provided to all prospective contractors prior to tender or quotation, in accordance with Section 30 of the Occupational Health and Safety Act.</p> <p>2) Recommended actions are the minimum required actions, as prescribed by the appropriate Acts, regulations, guidelines, standards, codes and general best practice measures. The Contractor may choose to alter the approach and combine or break out sections of work. This is acceptable provided that the appropriate Acts, regulations, guidelines, standards and codes are followed and afford protection for the health and safety of workers, occupants and the public that is at least equal to the protection that would be provided by complying with the minimum requirements.</p> <p>3) All waste generated is subject to characterization and disposal in accordance with Ontario Regulation 347.</p>						

TABLE 3: BULK ASBESTOS SAMPLING SUMMARY					
Sample #	Location	Material Description	Asbestos Content (%)	Fibre Type	Is Material ACM
<b>2008 Asbestos Audit Update</b>					
32523-FHSS-B619-S01a	B009	Insulation - Mag Block	25	Amosite	Yes
32523-FHSS-B619-S01b	B009		NA	Amosite	Yes
32523-FHSS-B619-S01c	B009		NA	Amosite	Yes
32523-FHSS-B615-S02a	-	9"x9" Floor Tile -Green	3.2	Chrysotile	Yes
32523-FHSS-B615-S02b	-		NA	Chrysotile	Yes
32523-FHSS-B615-S02c	-		NA	Chrysotile	Yes
32523-FHSS-B615-S03a	-	1' x 1' Ceiling Tile	2.3	Amosite	Yes
32523-FHSS-B615-S03b	-		NA	Amosite	Yes
32523-FHSS-B615-S03c	-		NA	Amosite	Yes
32523-FHSS-CB6-S04a	B004	2' x 4' Ceiling Tile	ND	-	No
32523-FHSS-CB6-S04b	B004		ND	-	No
32523-FHSS-CB6-S04c	B004		ND	-	No
32523-FHSS-CB6-S05a	B004	2' x 4' Ceiling Tile	ND	-	No
32523-FHSS-CB6-S05b	B004		ND	-	No
32523-FHSS-CB6-S05c	B004		ND	-	No
32523-FHSS-B63-S06a	B001	9"x9" Floor Tile -Grey	2.3	Chrysotile	Yes
32523-FHSS-B63-S06b	B001		NA	Chrysotile	Yes
32523-FHSS-B63-S06c	B001		NA	Chrysotile	Yes
32523-FHSS-B62-S07a	B001	Plaster - Texture Coat Finish	ND	-	No
32523-FHSS-B62-S07b	B001		ND	-	No
32523-FHSS-B62-S07c	B001		ND	-	No
32523-FHSS-B64-S08a	B001	9"x9" Floor Tile - Burgundy	3.5	Chrysotile	Yes
32523-FHSS-B64-S08b	B001		NA	Chrysotile	Yes
32523-FHSS-B64-S08c	B001		NA	Chrysotile	Yes
32523-FHSS-B64-S09a	B001	12"x12" Floor Tile - Brown	ND	-	No
32523-FHSS-B64-S09b	B001		ND	-	No
32523-FHSS-B64-S09c	B001		ND	-	No
32523-FHSS-B65-S10a	B002	12"x12" Floor Tile - Green	0.3	Chrysotile	Yes
32523-FHSS-B65-S10b	B002		Layer 1: Trace Layer 2 (mastic): 2.2	Chrysotile	Yes
32523-FHSS-B65-S10c	B002		0.3	Chrysotile	Yes
32523-FHSS-B65-S11a	B002	2' x 4' Ceiling Tile	ND	-	No
32523-FHSS-B65-S11b	B002		ND	-	No
32523-FHSS-B65-S11c	B002		ND	-	No
32523-FHSS-58-S12a	1157	Insulation - Paper	ND	-	No
32523-FHSS-58-S12b	1157		ND	-	No
32523-FHSS-58-S12c	1157		ND	-	No
32523-FHSS-58-S13a	1157	Insulation - Vermiculite	ND	-	No
32523-FHSS-58-S13b	1157		ND	-	No
32523-FHSS-58-S13c	1157		ND	-	No
32523-FHSS-58-S14a	1157	Insulation - Duct Parging	70	Chrysotile	Yes
32523-FHSS-58-S14b	1157		NA	Chrysotile	Yes
32523-FHSS-58-S14c	1157		NA	Chrysotile	Yes
32523-FHSS-627-S15a	1161	Floor Tile - Olive	Layer 1: 0.75 Layer 2: Trace	Chrysotile	Yes
32523-FHSS-627-S15b	1161		Layer 2:Trace	Chrysotile	Yes
32523-FHSS-627-S15c	1161		Layer 2: Trace	Chrysotile	Yes
32523-FHSS-38-S16a	1035	2' x 4' Ceiling Tile	ND	-	No
32523-FHSS-38-S16b	1035		ND	-	No
32523-FHSS-38-S16c	1035		ND	-	No

Table 3 - Sample Summary Table - Forest Heights CI



TABLE 3: BULK ASBESTOS SAMPLING SUMMARY					
Sample #	Location	Material Description	Asbestos Content (%)	Fibre Type	Is Material ACM
32523-FHSS-39-S17a	1026	2' x 4' Ceiling Tile	ND	-	No
32523-FHSS-39-S17b	1026		ND	-	No
32523-FHSS-39-S17c	1026		ND	-	No
32523-FHSS-C6-S18a	1105	Plaster - Texture Coat	ND	-	No
32523-FHSS-C6-S18b	1105		ND	-	No
32523-FHSS-C6-S18c	1105		ND	-	No
<b>32523-FHSS-32-S19a</b>	<b>1031</b>	<b>9"x9" Floor Tile - Grey</b>	<b>2.8</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32523-FHSS-32-S19b</b>	<b>1031</b>		<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32523-FHSS-32-S19c</b>	<b>1031</b>		Layer 2: ND	-	No
32523-FHSS-625-S20a	1063	Plaster - Wall plaster	ND	-	No
32523-FHSS-625-S20b	1063		ND	-	No
32523-FHSS-625-S20c	1063		ND	-	No
<b>32523-FHSS-71-S21a</b>	<b>1053</b>	<b>Floor Tile - Olive/Green</b>	<b>1.2</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32523-FHSS-71-S21b</b>	<b>1053</b>		<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32523-FHSS-71-S21c</b>	<b>1053</b>		<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
32523-FHSS-34-S22a	1033	2' x 4' Ceiling Tile	ND	-	No
32523-FHSS-34-S22b	1033		ND	-	No
32523-FHSS-34-S22c	1033		ND	-	No
<b>32523-FHSS-812-S23a</b>	<b>1043</b>	<b>1' x 1' Ceiling Tile</b>	<b>2.5</b>	<b>Amosite</b>	<b>Yes</b>
<b>32523-FHSS-812-S23b</b>	<b>1043</b>		<b>NA</b>	<b>Amosite</b>	<b>Yes</b>
<b>32523-FHSS-812-S23c</b>	<b>1043</b>		<b>NA</b>	<b>Amosite</b>	<b>Yes</b>
32523-FHSS-C3-S24a	1029	2' x 2' Ceiling Tile	ND	-	No
32523-FHSS-C3-S24b	1029		ND	-	No
32523-FHSS-C3-S24c	1029		ND	-	No
<b>32523-FHSS-810-S25a</b>	<b>1042</b>	<b>9"x9" Floor Tile - Red/Brown</b>	<b>7.5</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32523-FHSS-810-S25b</b>	<b>1042</b>		<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32523-FHSS-810-S25c</b>	<b>1042</b>		<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
32523-FHSS-627A-S26a	1161	1' x 1' Ceiling Tile	ND	-	No
32523-FHSS-627A-S26b	1161		ND	-	No
32523-FHSS-627A-S26c	1161		ND	-	No
32523-FHSS-92-S27a	1063	Plaster - Wall plaster	ND	-	No
32523-FHSS-92-S27b	1063		ND	-	No
32523-FHSS-92-S27c	1063		ND	-	No
32523-FHSS-92-S27d	1063		ND	-	No
32523-FHSS-8-11a-S28a	1014	2' x 4' Ceiling Tile	ND	-	No
32523-FHSS-8-11a-S28b	1014		ND	-	No
32523-FHSS-8-11a-S28c	1014		ND	-	No
<b>32523-FHSS-72-S29a</b>	<b>1048</b>	<b>2' x 4' Ceiling Tile</b>	<b>2.7</b>	<b>Amosite</b>	<b>Yes</b>
<b>32523-FHSS-72-S29b</b>	<b>1048</b>		<b>NA</b>	<b>Amosite</b>	<b>Yes</b>
<b>32523-FHSS-72-S29c</b>	<b>1048</b>		<b>NA</b>	<b>Amosite</b>	<b>Yes</b>
32523-FHSS-91-S30a	1064	12"x12" Floor Tile - Crème/Oatmeal	ND	-	No
32523-FHSS-91-S30b	1064		ND	-	No
32523-FHSS-91-S30c	1064		ND	-	No
<b>32523-FHSS-811-S31a</b>	<b>1011</b>	<b>12"x12" Floor Tile - Beige/Dark Brown</b>	<b>0.75</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32523-FHSS-811-S31b</b>	<b>1011</b>		Layer 2: ND	-	No
<b>32523-FHSS-811-S31c</b>	<b>1011</b>		Layer 2: ND	-	No
<b>32523-FHSS-F2-S32a</b>	<b>1095</b>	<b>Plaster - Texture Coat Finish</b>	<b>3.5</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32523-FHSS-F2-S32b</b>	<b>1095</b>		<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32523-FHSS-F2-S32c</b>	<b>1095</b>		<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32523-FHSS-F2-S32d</b>	<b>1095</b>		<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>
<b>32523-FHSS-F2-S32e</b>	<b>1095</b>		<b>NA</b>	<b>Chrysotile</b>	<b>Yes</b>

Table 3 - Sample Summary Table - Forest Heights CI

TABLE 3: BULK ASBESTOS SAMPLING SUMMARY					
Sample #	Location	Material Description	Asbestos Content (%)	Fibre Type	Is Material ACM
<b>2011 Asbestos Audit Update</b>					
34532-400-FHSS-C4-S33a	1062	2'x2' Ceiling Tile - Short Fissure Random Pinhole	ND	-	No
34532-400-FHSS-C4-S33b	1062		ND	-	No
34532-400-FHSS-C4-S33c	1062		ND	-	No
34532-400-FHSS-F-2-S34a	1095	12"x12" Floor Tile - Beige oatmeal	ND	-	No
34532-400-FHSS-F-2-S34b	1095		ND	-	No
34532-400-FHSS-F-2-S34c	1095		ND	-	No
34532-400-FHSS-C-4-S35a	1062	2'x2' Ceiling Tile - Long Fissure Random Pinhole	2.5	Amosite	Yes
34532-400-FHSS-C-4-S35b	1062		NA	Amosite	Yes
34532-400-FHSS-C-4-S35c	1062		NA	Amosite	Yes
34532-400-FHSS-8-14-S36a	1045	9"x9" Floor Tile - Beige with brown streaks	Layer 1: 7.5 Layer 2: 1.9	Chrysotile	Yes
34532-400-FHSS-8-14-S36b	1045		NA	Chrysotile	Yes
34532-400-FHSS-8-14-S36c	1045		NA	Chrysotile	Yes
<b>2012 Asbestos Audit Update</b>					
33752-200-S01	1048	Vermiculite - 9-8/7-2 Wall Cavity	Present	Amphibole Asbestos	Yes
<b>2015 Asbestos Audit Update</b>					
34532-903-S01A	Exterior	Plaster Overhang - Texture	ND	-	No
34532-903-S01B	Exterior		ND	-	No
34532-903-S01C	Exterior		ND	-	No
34532-903-S02A	2001	Fire Proofing - Trowel Applied	ND	-	No
34532-903-S02B	2001		ND	-	No
34532-903-S02C	2001		ND	-	No
<b>2015 Asbestos Audit Update - June 10, 2015</b>					
B000 - S01A	B000	Drywall Joint Compound	ND	-	No
B001 - S01B	B001		ND	-	No
B001 -S01C	B001		ND	-	No
1035-S02A	1035	9"x9" Floor Tile - Brown and White	3.72	Chrysotile	Yes
1035 -S02B	1035		NA	Chrysotile	Yes
1035 - S02C	1035		NA	Chrysotile	Yes
1035 - S03A	1035	Mastic	<0.5	Chrysotile	No
1035 - S03B	1035		<0.5	Chrysotile	No
1035 - S03C	1035		<0.5	Chrysotile	No
1024 - S04A	1024	12"x12" Floor Tile - Brown Dense Fleck	ND	-	No
1024 - S04B	1024		ND	-	No
1024 - S04C	1024		ND	-	No
1038 - S05A	1038	12"x12" Floor Tile - White with Blue Specks	ND	-	No
1038 - S05B	1038		ND	-	No
1038 - S05C	1038		ND	-	No
1098 - S06A	1098	9"x9" Floor Tile - Brown with White, Orange	3.65	Chrysotile	Yes
1098 - S06B	1098		NA	Chrysotile	Yes
1098 - S06C	1098		NA	Chrysotile	Yes
1100 - S07A	1100	1x1 Ceiling Tile - Medium & Small Pinhole	ND	-	No
1100 - S07B	1100		ND	-	No
1100 - S07C	1100		ND	-	No
1101 - S08A	1101	9"x9" Floor Tile - Grey with White and Black	5.99	Chrysotile	Yes
1101 - S08B	1101		NA	Chrysotile	Yes
1101 - S08C	1101		NA	Chrysotile	Yes
1104 - S09A	1104	9"x9" Floor Tile - Beige, Burgundy, White	5.9	Chrysotile	Yes
1104 - S09B	1104		NA	Chrysotile	Yes
1104 - S09C	1104		NA	Chrysotile	Yes

Table 3 - Sample Summary Table - Forest Heights CI

TABLE 3: BULK ASBESTOS SAMPLING SUMMARY					
Sample #	Location	Material Description	Asbestos Content (%)	Fibre Type	Is Material ACM
1072 - S10A	1072	2x2 Ceiling Tile - Long Fissure Random Pinhole	ND	-	No
1072 - S10B	1072		ND	-	No
1072 - S10C	1072		ND	-	No
1154 - S11A	1154	12"x12" Floor Tile - Beige with Brown Specks	0.79	Chrysotile	Yes
1154 - S11B	1154		NA	Chrysotile	Yes
1154 - S11C	1154		NA	Chrysotile	Yes
<b>January 18, 2017 Sampling</b>					
S01A	1098	Mastic	ND	-	No
S01B	1098		ND	-	No
S01C	1098		ND	-	No
S02A	1098	Gypsum/Plaster Board	ND	-	No
S02B	1098		ND	-	No
S02C	1098		ND	-	No
<b>2018 Asbestos Audit Update</b>					
S01A	1083	1'x1' Ceiling Tile Mastic	ND	-	No
S01B			3	Amosite	Yes
S01C			NA	Amosite	Yes
S02A	1160	1964 Floor Tile Mastic	ND	-	No
S02B	1104		3	Chrysotile	Yes
S02C	1162		NA	Chrysotile	Yes
S02D	1154		NA	Chrysotile	Yes
S02E	1059		3	Chrysotile	Yes
S02F	1042		NA	Chrysotile	Yes
S02G	1038		NA	Chrysotile	Yes
S03A	1151	1970 Drywall Joint Compound	ND	-	No
S03B			ND	-	No
S03C			ND	-	No
S04A	1154	1964 Drywall Joint Compound	3	Chrysotile	Yes
S04B	1154		NA	Chrysotile	Yes
S04C	1147		NA	Chrysotile	Yes
S04D	1146		1	Chrysotile	Yes
S04E	1038		NA	Chrysotile	Yes
S05A	Corridor	Interior Door Window Pane Black Sealant	ND	-	No
S05B			ND	-	No
S05C			ND	-	No
S06A	Classroom	Interior Door Grey Sealant	7	Chrysotile	Yes
S06B			NA	Chrysotile	Yes
S06C			NA	Chrysotile	Yes
S07A	Corridor	Interior Light Grey on Window Pane	ND	-	No
S07B			ND	-	No
S07C			ND	-	No
S08A	Corridor	Interior Door Frame White Sealant	ND	-	No
S08B			ND	-	No
S08C			ND	-	No
S09A	Exterior	Façade Grey Sealant	ND	-	No
S09B			ND	-	No
S09C			ND	-	No

Table 3 - Sample Summary Table - Forest Heights CI

TABLE 3: BULK ASBESTOS SAMPLING SUMMARY					
Sample #	Location	Material Description	Asbestos Content (%)	Fibre Type	Is Material ACM
S10A	Exterior	Beige Window Pane Sealant	1	Chrysotile	Yes
S10B			NA	Chrysotile	Yes
S10C			NA	Chrysotile	Yes
S01A	1151	Interior Black Door Pane Sealant (1970)	ND	-	No
S01B	1151		ND	-	No
S01C	1151		ND	-	No
S02A	1152	Floor Tile Mastic (1970)	ND	-	No
S02B	1152		ND	-	No
S02C	1152		ND	-	No
<b>NA:</b> Not Analyzed due to stop positive method <b>ND:</b> No asbestos fibres detected above the laboratory minimum detection limit					
<p>A bulk material sample containing 0.5% or more asbestos therefore establishes that material as asbestos-containing. In accordance with Table 1 of O. Reg. 278/05, a minimum number of samples for the material to be classified as non asbestos. A homogeneous material is defined by O. Reg. 278/05 "as material that is uniform in colour and texture". Homogeneous samples are identified by an alphabetical suffix to sample names to represent multiple samples of a homogeneous material. When a homogeneous material is analysed it is determined to be asbestos-containing upon the first positive detection of asbestos equal to or greater than 0.5%. Subsequent samples of the same material are therefore not analysed. Some bulk samples are comprised of multiple layers and as such will require multiple analysis. In such cases each layer is isolated at the laboratory and analysed individually to determine asbestos content. As a result the laboratory may report additional samples beyond the submitted number of samples or include multiple analyses as subsets within a sample.</p>					

Table 3 - Sample Summary Table - Forest Heights CI

**THIS PAGE LEFT INTENTIONALLY BLANK**

**Appendix 003134-A**

**Soils Report**

**THIS PAGE LEFT INTENTIONALLY BLANK**





**Waterloo Region  
District School Board**

**Appendix B – Price Bid Form Sample**

**Instructions: Bid price shall be submitted through the Bidding System only**

Description	Unit of Measure	Quantity	Bid Price *	Total
xxx, as per tender documents.	Lump Sum	1		

---

**END OF SECTION**



## Appendix D - VENDOR PERFORMANCE EVALUATION FORM AND GUIDELINES

The Board, in an effort to build an improved supplier base and to obtain exceptional long term value, has undertaken a project to register vendors. In conjunction, performance of vendors, either Prime and/or Sub that are involved with this project may be evaluated.

The evaluation may occur at or near substantial completion.

An evaluation may also occur at any stage of the project in order to request and implement a corrective action to facilitate the successful completion of the project.

The Board will evaluate prime contractors.

Prime contractors will evaluate sub-contractors that do not meet expectations and forward the results to the Board. The Board will initiate a request for corrective action to the subcontractor. This is separate from any corrective action that the prime contractor may have. Prime contractors may address the evaluation form and processes at the start up meeting, but it is the responsibility of the prime contractor and the subcontractors to communicate, understand and adhere to the evaluation form and guidelines.

The Board will forward Performance Evaluations to the evaluated prime contractor and/or Subcontractor, here after referred to as Vendor.

A Vendor Performance Evaluation that:

1) Meets or exceeds expectations:

Is a very powerful tool that the evaluated vendor can forward as references to prospective clients giving a very accurate indication of their performance and abilities.

As such, upon request, a vendor performance evaluation will be completed and forwarded to the same vendor, who can then forward it on to their prospective client.

2) Is below expectations:

Will be forwarded to the vendor with a Request for Corrective Action.

The Board will also lower the project size capability of the vendor at this time.

Upon the vendor's successful completion and demonstration of the Request for Corrective Action, the Board may increase the project size capability of the vendor.

The Board or vendor upon the successful completion of the Request for Corrective Action may request a meeting in order to move forward in a positive manner.

Procurement Services will provide clarification and/or direction regarding the Request for Corrective Action, if requested, however the Vendor Performance Evaluation will remain as issued.

The Vendor Performance Evaluation, Requests for corrective action, and the vendor's corresponding corrective action will be filed at the Board.

The Vendor Performance Evaluation may be revised and or modified at any time without notice.



Business Services Division

Procurement Services

**VENDOR PERFORMANCE EVALUATION**

Vendor Name: \_\_\_\_\_

Project Name: \_\_\_\_\_

Tender Number: \_\_\_\_\_

Classification:  Prime Contractor  Subcontractor

CHECK ONE					
Not Applicable	Far below expectations: inadequate, containing little detail insufficient knowledge	Does not fully meet expectations: limited knowledge and requirements	Meets expectations: demonstrates ability and knowledge to address basic requirements	Exceeds expectations: demonstrates clear, concise knowledge of requirements	Far exceeds expectations: highly comprehensive, excellent response

1. **Safety & Security:** (Understands & follows requirement guides)  
Comments: \_\_\_\_\_

	1	2	3	4	5
--	---	---	---	---	---

2. **Site Supervision:**  
Comments: \_\_\_\_\_

	1	2	3	4	5
--	---	---	---	---	---

3. **Billing Accuracy:**  
Comments: \_\_\_\_\_

	1	2	3	4	5
--	---	---	---	---	---

4. **Ability to Minimize Deficiencies:**  
(Timing, follow up, documentation of actions)  
Comments: \_\_\_\_\_

	1	2	3	4	5
--	---	---	---	---	---

5. **Ability to Maintain Schedule & React to Changes:**  
(Completeness of work, providing appropriate manpower)  
Comments: \_\_\_\_\_

	1	2	3	4	5
--	---	---	---	---	---

6. **Ability to stay focused on Scope:** (Does not seek additional work)  
Comments: \_\_\_\_\_

	1	2	3	4	5
--	---	---	---	---	---

7. **Approximate dollar value evaluated:**

0-50,000	50,000. – 500,000.	500,000. +
----------	--------------------	------------

8. **Additional Comments:** \_\_\_\_\_

Score: \_\_\_\_\_

General Contractor: \_\_\_\_\_ Date: \_\_\_\_\_  
(If evaluating subcontractor) (company name) (Project Manager) (signature)

Project Evaluator: \_\_\_\_\_ Date: \_\_\_\_\_  
(print name) (signature)

Manager: \_\_\_\_\_ Date: \_\_\_\_\_  
(print name) (signature)

Procurement Services action taken: File Corrective Action (overall average score <3/individual score<3)

Procurement Manager: \_\_\_\_\_ Date: \_\_\_\_\_  
(or designate) (print name) (signature)

Original –Vendor File Electronic copy- to Vendor  
Corrective Action documentation to be filed with Vendor Performance Evaluation  
I:/Purchasing/Buyers/Bids/Templates/Doc Templates –All/RFT Construction/APPENDIX F –Vendor Performance Evaluation Form

**SECTION 00 41 73 - SUPPLEMENTARY BID INFORMATION**

If requested, the **Supplementary Bid Information** must be completed and submitted at time of the tender closing through the electronic Bidding System only. All pricing is plus HST.

**GENERAL CONTRACTOR**

1.1 A Site Supervisor and Project Manager, assigned to manage and supervise the Work, must be named in the Bidder’s Contact Information section through the electronic Bidding System only. Personnel will be subject to approval by the Board and cannot be changed without prior written approval from the Board.

Title	Name *	E-mail *	Cell Phone Number *
Project Manager			
Site Supervisor			

**Part 2 ALTERNATIVE PRICES**

2.1 The following are the prices for the alternative work listed hereunder. Such Alternative Work and amounts are NOT included in the Bid Price.

ITEM	AMOUNT
	\$
	\$
	\$

**Part 3 ITEMIZED PRICES**

3.1 The following are the prices for the items of work listed hereunder. Such Work and amounts ARE included in the Bid Price.

3.2 The Board reserves the right to modify the Scope of Work and reduce the contract price accordingly, based upon the prices indicated

ITEM	AMOUNT
	\$
	\$
	\$

**Part 4 IDENTIFIED PRICES**

4.1 The following are the values of work listed hereunder. Such work and amounts ARE included in the Bid Price.

4.2 The Board has requested these prices for information purposes only and does not intend to modify any Scope of Work based on the prices indicated.

ITEM	AMOUNT
	\$
	\$
	\$



## 1.0 GENERAL

### 1.1. DEFINITIONS DECLARATION

- .1 CCDC 2-2008 Edition, Stipulated Price Contract as may be amended, forms the basis of Definitions between the Owner and Contractor.
- .2 These Definitions are bound to the CCDC 2 Definitions and CCDC 2 General Conditions.

### 1.2. SUPPLEMENTARY WORDS AND TERMS TO CCDC 2-2008

- .1 The following words and terms are additional to the CCDC 2 Definitions.
- .2 Addendum: A document that amends the Bid Documents during the Bidding Period and becomes part of the Contract Documents when a Contract is executed. (Plural: Addenda).
- .3 Agreement: The signed and sealed legal instrument binding parties in a Contract, describing in strict terms their mutual arrangement, roles and responsibilities, commencement, and completion responsibilities.
- .4 Alternative Price: The amount stipulated by a Bidder for an Alternative and stated as an addition, a deduction, or no change to the Bid Price.
- .5 Authorities: Those having jurisdiction under law over Work or Parts thereof.
- .6 Bid: To offer as a Bid stating for what price a Contractor will assume a Contract.
- .7 Bid Documents: A set of documents consisting of the Instructions to Bidders, Bid Form, Contract Documents, and other information issued for the benefit of Bidders to prepare and submit a Bid.
- .8 Bid Form: The specific and detailed form used to collect information about a Bid.
- .9 Bidding: The process of preparing and submitting a Bid.
- .10 Construction Documents: The Drawings and Project Manual. When combined with a Contract and Contract conditions, these documents form the Contract Documents.
- .11 Contingency Allowance: An additional monetary amount added to a Project cost estimate and designated to cover unpredictable or unforeseen items of Work. The amount is usually based on some percentage of the estimated cost and expended and adjusted by Change Order. It is not intended to cover additions to the scope of Work.
- .12 General Conditions: That part of the Contract Documents which sets forth many of the rights, responsibilities and relationships of the parties involved in a Contract.

- .13 Exposed: Visible at completion of Work, in useable areas as well as interior of closets, cabinets, drawers, storage and service rooms, stairwells and exterior surfaces.
- .14 Instructions To Bidders: Instructions contained in the Bid Documents to convey an Owner's expectations and criteria associated with submitting a Bid.
- .15 Section: A portion of a Project Specification covering one or more segments of the total Work or requirements. Sections are included in a Project manual as required to meet Project requirements.
- .16 Standard: A document describing a grade or a level of quality, which has been established by a recognized agency or organization, utilizing an internal voting process.
- .17 Separate Price: A separate price for work to be added to the base price if selected by the Owner. This price type is not a part of the base bid price.
- .18 Stipulated Price: An amount set forth in a Stipulated Price Contract as the total payment for the performance of the Work. Sometimes referred to as a stipulated sum or a lump sum stipulated price.
- .19 Tender: Refer to definition of Bid.
- .20 Unit Price: The amount payable for a single unit of Work as stated in a Schedule of Prices.
- .21 Install: To remove from site storage, move or transport to intended location, install in position, connect to utilities, repair site caused damage, and make ready for use.
- .22 Supply: To acquire or purchase, ship or transport to the site, unload, remove packaging to permit inspection for damage, re-package, replace damaged items, and safely store on-site.
- .23 Provide: To Supply and Install
- .24 Wherever words 'approved', 'selected', 'satisfactory', 'directed', 'permitted', 'inspected', 'instructed', 'required', 'submit', 'ordered', 'reviewed', 'reported to', or similar words or phrases are used in Contract Documents, it shall be understood, unless context provides otherwise, that words 'by Consultant' or 'to Consultants' follow.
- .25 Words 'by others' when used in Specifications or on Drawings shall not mean by someone other than Contractor. Only means by which something shown or specified shall be indicated as not being in Contract is by initials 'NIC' or words 'not in Contract', 'by Owner', or 'by Other Contractor'.

**END OF SECTION**

## SECTION 00 72 13 – TERMS AND CONDITIONS

### 1.0 PROVISIONS

#### 1.1. Proceedings Against the Board

- .1 The Proponent represents and warrants that the Proponent is not a party to any suits, actions, litigation proceedings, arbitration's, alternative dispute resolutions, investigations or claims by or against or otherwise involving the Board and the Proponent. The Board will reject the bid in the view of the current, pending or threatened litigation, arbitration, alternative dispute resolution or disputes involving the Board and Proponent. The Awarded Bidder may also be required, at the discretion of the Board, to sign a Certificate in a form satisfactory to the Board confirming that the Awarded Bidder is not associated with any company involved in litigation with the Board.

#### 1.2. Standard of Behaviour

- .1 The Board will not knowingly purchase goods and/or services from Awarded Bidders who operate in contravention of local and international laws. Proponents submitting bids are in fact agreeing that they do not purchase or use products that are in contravention of local and international laws. If a product and/or service supplied to the Board is discovered to be in contravention, the Board reserves the right to rectify the issue with the Awarded Bidder that may include the cancellation of the contract.

#### 1.3. Federal, Provincial, Regional and Municipal Laws

- .1 The Awarded Bidder must stay current and comply with, for the durations of the agreement, all current laws and bylaws.
- .2 No Smoking and Scent –Free
  - .1 The Province has legislated under the Smoke Free Ontario Act that smoking is not permitted on any Board owned properties. Furthermore, most Board properties are “scent free”. Smoking will not be permitted on-site. Offenders will be asked to leave the site, and infractions could result in corrective action and or fine.

#### 1.4. Professional Conduct

- .1 All contractors must conduct themselves in a professional manner at all times when dealing with Board staff, with the public, and while working on site. Unprofessional conduct could result in immediate termination of the contract.

## 1.5. Sustainable Purchasing

The procurement needs of the Board represent a significant level of responsibility to demonstrate leadership and support for greener business practices. Integrating environmental performance and impact into supply chain decisions is a commitment to improvement of the environment and the quality of life.

Green procurement shall be viewed in the context of achieving value for money for the total life-cycle costs. It requires the inclusion of environmental impact considerations into the procurement process, including planning, acquisition, use and disposal. Value for money shall include the consideration of many environmental tangible and intangible factors when determining the total life-cycle costs and environmental impact.

## 1.6. Paramountcy Clause

.1 Proponents who have additional and/or supplementary agreements that require the Board's signature prior to providing the required products and/or services to the Board must submit that said draft agreement with their bid. No additional agreements will be accepted by the Board after the closing date Tender time of the Tender. In the event of any conflict between the provisions of the terms of the Awarded Bidder's additional and/or supplementary agreement(s) and the provisions of this Tender document, the terms of the Tender contract shall govern.

## 1.7. Freedom of Information

.1 To comply with the Freedom of Information and Protection of Privacy Act, all bids submitted to the Board become the property of the Board, and as such, are subject to the Freedom of Information and Protection of Privacy Act. Clearly identify any portion of the bid submission that could cause injury if disclosed.

## 1.8. Criminal Background Checks and Collection of Personal Information

.1 The Board must comply with Regulation 521 (Collection of Personal Information) to the Education Act with respect to criminal background checks and offence declarations.

.2 If required by the Board, the Awarded Bidder will provide the Board, or designate with a Criminal Background Check covering offences under the Criminal Code, the Controlled Drugs and Substances Act, and any other offences which would be revealed by a search of the automated Criminal Records Retrieval System.

- .3 An Offence Declaration in a Board-approved form for every individual or employee of the Awarded Bidder who may come into direct contact with Board staff and/or students on a regular basis at any Board site prior to the occurrence, and on or before September 1 each year thereafter is required. The Board will determine in its sole discretion whether an individual or employee of the Awarded Bidder come into direct contact with pupils on a regular basis.
- .4 Termination of contracts and indemnification by the Awarded Bidder will result from noncompliance.

### **1.9. Accessibility**

- .1 Proponents shall comply with the provisions of the Accessibility for Ontarians with Disabilities Act, 2005, and the Regulations there under with regard to the provision of its goods or service to persons with disabilities. Proponents acknowledge that pursuant to the Accessibility for Ontarians with Disabilities Act, 2005, the Board must, in deciding to purchase goods or service through its procurement process, consider the accessibility for persons with disabilities to such goods or service.

## **2.0 COMMUNICATION**

### **2.1. Verbal Communication**

- .1 Neither the Board nor Board consultant will provide verbal direction or clarification during the tender process. As a result, verbal recollections will not be considered valid.

### **2.2. Request for Clarification**

- .1 The Board reserves the right to seek clarification and supplementary information from Proponents after the Bid Submission Deadline. The response received by the Board from a Proponent shall, if accepted by the Board, form an integral part of that Proponent's proposal.

## **3.0 SPECIFICATIONS**

### **3.1. Materials**

- .1 Bid only on new materials in perfect condition. Demonstrators, seconds or defective materials are unacceptable. Any materials found not to be in a new

condition or as specified will be returned to the Awarded Bidder at the Awarded Bidder's expense.

- .2 Proponents, if requested by the Board, must furnish with their bid a materials safety data sheet (M.S.D.S.), for all products they are bidding on, where applicable. This is a requirement of the Occupational Health and Safety Act. Subsequently, should any business result from this Tender, the Board will not accept any additional charges or surcharges related to the supplying of M.S.D.S. for any item(s) on this Tender.
- .3 All electrical equipment and components must bear a C.S.A. or Electrical Safety Association (E.S.A.) label.
- .4 Bid prices must be for goods and/or services exactly as specified.

#### **4.0 BID PREPARATION**

The Board will not be liable for any costs incurred by the Proponent for the preparation of their bid.

##### **4.1. Online Submission Forms**

- .1 All forms are submitted online through the bidding system.
- .2 The bidder's signature has the authority to bind the Proponent.

##### **4.2. Bid Price**

- .1 Bid prices are to be shown as all applicable taxes extra.
- .2 Bid prices must be held firm until the project is completed to the satisfaction of the Board.
- .3 The bid price herein constitutes the total costs to the Board for all work involved in the respective items and that this cost also includes all insurance, transportation charges, use of all tools and equipment, supervision, bonds, overhead expense, warranty, all profits and all other work, services, conditions furnished in accordance with the requirements of the contract documents.
- .4 Bid prices must be in Canadian Funds.
- .5 Period for which bids are irrevocable after the tender submission deadline is: 60 days.

##### **4.3. Bonding Requirements**

Bonding is requested if the Board estimates that the project is equal or greater than \$200,000.00.

- .1 Bid Amount



Bonding requirements are based on the total bid amount INCLUSIVE of ALL applicable taxes.

## .2 Bid Deposit Bond & Agreement to Bond

Bid submissions must be accompanied by a bid deposit in the form of a digital Bid Bond in an electronically verifiable and enforceable (e-Bond) format in the amount of 10% of the total Bid Submission (inclusive of HST) made payable to the Waterloo Region District School Board (the 'Board') as surety that, if the Bid is accepted, a Contract will be entered into for the proper performance of the work. For more information, contact your surety company or visit the Surety Association of Canada website.

Bid Submissions must be accompanied by an Agreement to Bond in the form of a digital Bond in an electronically verifiable and enforceable (e-Bond), completed and executed by the Bidder's Surety. The Agreement to Bond shall provide for a Performance Bond for 50% of the total Bid Submission, and a Labour and Material Payment Bond for 50% of the total Bid Submission.

Bidders shall upload their digital Bid Deposit Bond and Agreement to Bond separately to the Bidding System, in the bid submission files labeled "Bid Deposit Bond" & "Agreement to Bond". All instruction and details for accessing authentication shall be included with the digital Bonds uploaded in the Bidding System. Do not include and/or upload Performance Bond and Labour and Materials Bond in this section.

Bids that do not contain the bid deposit(s) in the required amount will be declared non-compliant and will be rejected. A scanned PDF copy of bonds or original certified cheque, bank draft, money order, etc. are not acceptable as Bid deposit and will result in your Bid being rejected.

The bid deposit of the Bidder whose submission is accepted shall be forfeited by the Bidder should the Bidder fail to execute a Contract or provide the necessary documents as required within this Bid Solicitation document (including but not necessary limited to: signed agreement, satisfactory security, insurance certificate, appropriate Workplace Safety and Insurance Board letter of clearance certificate) within the time stipulated as a written notice from the Board.

For bid amounts where Bonding is not requested, the Awarded Bidder agrees to pay to the Board the difference in costs between the bid submitted and the final contract should the Awarded Bidder fail to either execute or deliver the contract documents in accordance with the Bid Solicitation within ten (10) working days of written notification of the award of the contract.

## .3 Performance Securities

For bid amounts where bonding is required, inclusive of all taxes, upon award the successful Bidder shall provide a digital Bid Performance and Labour and Materials Bond in an electronically verifiable and enforceable (e-Bond) format in the amount(s) of not less than 50% Performance Bond and a 50% Labour and Materials Bond of the total Contract Value made payable to the Waterloo Region District School Board (the 'Board') as surety that, if the Bid is accepted, a Contract will be entered into for the proper performance of the work. For more information, contact your surety company or visit the Surety Association of Canada website.

If the successful Bidder fails to provide a performance bond when requested, the Board may declare the bid deposit forfeited and the Bidder will be held responsible for any increased costs or damages incurred by the Board. Any Bidder who fails to provide all required documents within the timelines provided, or otherwise fails to enter into an agreement with the Board upon notice of being the successful Bidder may be subject to future bidding constraints by the Board.

Performance surety shall guarantee all conditions as set out in the contract, including proper execution of the work and for all matters for which the successful Bidder is responsible for throughout the two (2) year period of maintenance and warranty.

Any costs associated with performance surety are the responsibility and cost of the Bidder.

Bonds must be submitted through the Bidding System within ten (10) days of receiving the Intent to Award.

#### **4.4. INSURANCE**

##### **.1 Proof of WSIB Coverage (Onsite work only)**

If the Proponent does not provide a policy endorsement for Employer's Liability and Voluntary Compensation, the Proponent shall submit a valid certificate of WSIB coverage to the Board, with the tender submission and any subsequent policy renewal, referencing this Agreement. The Proponent shall ensure that each Subcontractor complies with the WSIB requirements set out in this Article by obtaining similar types of coverage if the Subcontractor does not provide a policy endorsement for Employer's Liability and Voluntary Compensation.

##### **.2 Insurance (Onsite Construction work only)**

The proponent is to reference CCDC2-2008 GC 11.1 Insurance and ensure that this section is adhered to.

### .3 **General & Vehicle**

General and vehicle liability insurance covering incidents of property damage or bodily injury (including death) for owned and non-owned vehicle accidents occurring during the work in this Tender, or actions of the employees of the Awarded Bidder while acting within the scope of their duties as required in this Tender shall be maintained. Verification of current "Good Standing" may be requested.

The inclusive per incident minimum amount of coverage is: Two Million Dollars (\$2,000,000).

## 5.0 **BID EVALUATION**

Preference will be given to the lowest compliant bid.

The "lowest bid price" shall be used to determine the lowest compliant bid. Alternate prices, separate prices and any substitutions that may affect the contract price shall not be considered in determining the "lowest bid price".

The Proponent will not be awarded the tender if the Site Supervisor and/or Project Manager identified by the Proponent are not deemed suitable by the Board.

If the Board has a sense that the Proponent with "lowest bid price" has capacity issues, then the Board will meet with the Proponent after the tender closing date and prior to the Board awarding the Tender.

At the meeting the Proponent will present the following in written form:

1. The Proponent's capacity resource plan documents which illustrates how the Proponent determines capacity.
2. The level of capacity the Proponent and its resources would be with the award of the Tender.
3. An evaluation of recent projects that the Proponent has completed, where the Proponent was at equal or greater capacity as it relates to the capacity resources available.

In order for the Proponent's bid to be considered the lowest compliant bid the Proponent will to the Board's satisfaction have presented in written from the information requested.

## **6.0 BID RESULTS NOTIFICATION**

The Board will forward the results notification to <https://wrdsb.bidsandtenders.ca> listing the Awarded Bidder and Bid Price.

## **7.0 AWARD NOTIFICATION**

No shipment is to be made or work to commence until a purchase order, contract, or letter of intent is issued by Procurement Services to the Awarded Bidder.

### **Construction Projects**

For construction projects above \$200,000 the Awarded Bidder may be required to execute a "Canadian Standard Form of Construction Contract to a Stipulated Sum" (revised 2008) CCDC 2, 2008 including amendments thereto as set out in this Tender.

The Awarded Bidder shall execute the said formal contract as called for, within seven (7) working days after notification of acceptance of their Tender or forfeit the amount of Bid Bond enclosed in the Tender.

## **8.0 POST AWARD**

### **8.1. Bonding (Construction)**

Upon receiving the Intent to Award letter, the Bidder is solely responsible for submitting Bonding documents through the Bidding System. Payments to the Awarded Bidder will not be processed without bonding being submitted. Failure to submit bonding within seven (7) working days may result in the cancellation of the contract.

### **8.2. Purchase Order**

For Payment purposes, a Purchase Order shall be generated and issued to the Awarded Bidder(s). The Purchase Order number must appear on all invoices in order to ensure prompt payment.

### **8.3. Changes**

The Board may order changes in the material or work, in writing, with the contract sum being adjusted accordingly. All changes for additional material or work must be agreed upon and submitted in writing to the Board.

## **9.0 SUBCONTRACTING**

### **9.1. Subcontracting**

Subcontracting, beyond the original list of subcontractors submitted with bid submission, of any portion of the work outlined in these specifications will not be permitted without prior written consent of the Board.

If approval is granted, any work undertaken by subcontractors shall be as set forth in this Tender document and the use of subcontractors shall in no way relieve the Awarded Bidder of their responsibilities.

The Board reserves the right to reject a proposed subcontractor for any reasonable cause.

### **9.2. Assignment**

Any business resulting from this Tender call shall not be assigned to any other company (or individual) without prior written approval of the Board.

## **10.0 FORCE MAJEURE**

If Delays in a failure of performance by either party under the Contract shall not constitute default hereunder or give rise to any claim for damages if and to the extent caused by occurrences beyond the control of the party affected, including but not limited to decrees of Government, acts of God, fires, floods, explosions, pandemics, riots, war, rebellion, sabotage and atomic or nuclear incidents, lawful acts of public authorities, or delays caused by common carriers, which cannot reasonably be foreseen or provided against. However, lack of finances, strikes, or other concerted acts by workers, delay or failure arising out to the nature of the work to be done, or from the normal actions of the elements or from any normal difficulties which may be encountered in the performance of the Work, having regard to the nature thereof, shall in no event be deemed to be a cause beyond a party's control. If in the reasonable opinion of either party to this Contract that performance of the Contract is made impossible by force majeure, then either party shall notify the other in writing and the Board shall either terminate the Contract forthwith without any future payments being made or authorize the Vendor to

continue performance of the Contract with such adjustments as may be required by the existence of the force majeure and agreed upon by both parties.

## **11.0 TERMINATION**

### **11.1. Sufficient Cause**

The Board reserves the right to terminate any contract Tender purchase order resulting from this Tender call for sufficient cause, such as: non-performance, late deliveries, inferior quality, pricing problems, customer service, etc. Should such action be necessary, the Board would provide written notice to the Awarded Bidder.

### **11.2. Funding Out**

Should the Board fail to appropriate funds to enable payments including multi-year agreements, the Board may cancel the contract without termination charges, provided the Awarded Bidder receive thirty (30) days written notice of such termination from the Board.

## **12.0 RESULT DISPUTE PROCESS**

Subsequent to a debriefing a Proponent may dispute the decision of the Board. The process outlined below is to be followed:

The Proponent is to file in writing their protest with the Manager of Procurement by certified mail, within force 15 business days of the Debriefing. The Protest Notice shall include:

- (i) The name and address of the Proponent.
- (ii) Identification of the RFX.
- (iii) Detailed and factual statement of the grounds for protest.
- (iv) Supporting documentation.
- (v) Desired relief, action ruling.

The Manager of Procurement will respond to the Proponent, by certified mail, within 20 business days of receiving the written notice.

If a resolution cannot be met, the Proponent must contact the Superintendent of Business and Financial Services by certified mail, within 10 business days of receiving the first response from the Manager of Procurement. The decision by the



Superintendent of Business and Financial Services will be deemed final and the Proponent will receive written notice within 20 business days.

### **13.0 RIGHTS OF THE BOARD**

In addition to any other express rights or any other rights which may be implied in the circumstances, the Board reserves the right to:

(i) Reject any bid received from a Proponent which is party to any past or existing suits, actions, and litigation proceedings, arbitration's, alternative dispute resolutions, investigations, vendor performance evaluations that are below expectations or claims by or against or otherwise involving the Board and the Proponent. Note: the Awarded Bidder(s) may also be required, at the discretion of the Board, to sign a Certificate in a form satisfactory to the Board confirming that the Awarded Bidder(s) is not associated with any company involved in litigation with the Board.

(ii) make public the names of any or all Proponents;

(iii) request written clarification or the submission of supplementary written information from any Proponent;

(iv) waive formalities and accept Bids which substantially comply with the requirements of this tender;

(v) verify with any Proponent or with a third party any information set out in a Bid;

(vi) disqualify any Proponent whose Bid contains misrepresentations or any other inaccurate or misleading information;

(vii) disqualify any Proponent or the Bid of any Proponent who has engaged in conduct prohibited by this tender;

(viii) make changes, including substantial changes, to this tender provided that those changes are issued by way of addenda in the manner set out in this tender;

(ix) accept or reject a Bid if only one Bid is submitted;

(x) accept or reject the lowest or any bid not necessarily accepted by the Board;

(xi) select any Proponent other than the Proponent whose Bid reflects the highest compliant score to the Board;

(xii) cancel this TENDER process at any stage;

(xiii) cancel this TENDER process at any stage and issue a new TENDER for the same or similar services with a minimum substantial change in scope of 10%;

(xiv) accept any Bid in whole or in part;

(xv) discuss with any Proponent different or additional terms to those contemplated in this tender or in any Proponent's Bid;

(xvi) reject any or all Bids in its absolute discretion;

(xvii) negotiate with the leading Proponent prior to award;

(xviii) evaluate and accept Proponent's alternatives whereby possible efficiencies may prove to be advantageous to the Board;

(xix) to all Bids, responses, inquiries, or other related correspondence in reference to this tender , and all reports, charts, and other documentation submitted by Proponents shall become the property of the Waterloo Region District School the Board when received; and the Board shall not be liable for any expenses, costs associated with the preparation and submittal of any proposal(s), or for any travel and or per diem costs that are incurred including any or all product samples that may be requested during the evaluation stage of the proposal, losses or any direct or indirect damages incurred or suffered by any Proponent or any third party resulting from the Board exercising any of its rights under this TENDER or exercising any rights, which may be implied in the circumstances.

By submitting its Bid, the Proponent authorizes the collection by the Board of the information set out under (v), (vi) and (vii) in the manner contemplated in those subparagraphs.

### **13.1. Volume and Exclusivity**

The Board makes no guarantee of the value or volume of work to be assigned to the Awarded Bidder. Any agreement executed with the Awarded Bidder may not be an exclusive contract for the provision of the described goods/services.

**END OF SECTION**

**SUPPLEMENTARY CONDITIONS & AMENDMENTS TO STANDARD CONSTRUCTION  
DOCUMENT CCDC2 -2008 STIPULATED PRICE SUBCONTRACT**

**(the “Supplementary Conditions”)**

**AGREEMENT, DEFINITIONS, AND  
GENERAL CONDITIONS**

The Standard Construction Document CCDC 2 2008 for a Stipulated Price Contract, English version, consisting of the Agreement Between *Owner* and Contractor, Definitions and General Conditions of the Stipulated Price Contract, Parts 1 to 12 inclusive, governing same, together with the changes with the new *Construction Act* is hereby made part of these *Contract Documents*, with the following amendments, additions and modifications:

**AGREEMENT BETWEEN OWNER AND CONTRACTOR**

**SC1 ARTICLE A-3 – CONTRACT DOCUMENTS**

SC1.1	3.1	<p><u>Add</u> the following documents to the list of <i>Contract Documents</i> in Article A-3.1:</p> <ul style="list-style-type: none"> <li>• Waterloo Region District School Board’s Supplementary Conditions &amp; Amendments to Standard Construction Document CCDC2 -2008 Stipulated Price Subcontract, November 2020 Version, including any Special Supplementary Conditions listed in Appendix 2 thereto</li> <li>• <i>Drawings</i></li> <li>• <i>Specifications</i></li> <li>• Performance Bond (Form 32 -Performance Bond under Section 85.1 of the <i>Act</i>)</li> <li>• Labour and Material Payment Bond (Form 31 – Labour and Material Payment Bond under Section 85.1 of the <i>Act</i>) <b>[NTD: Remove documents and references if not applicable.]</b></li> </ul>
-------	-----	---

**SC2 ARTICLE A-5 – PAYMENT**

SC2.1	5.1	<p>In Article A-5.1 after the word “Subject to” <u>insert</u> the words “GC 13.2 and”</p> <p>-and-</p> <p><u>delete</u> the words “and, where such legislation or regulations do not exist or apply, subject to a holdback of ten + two percent (10+2%)” and <u>replace</u> them with “and the <i>Owner’s</i> right to issue <i>Notices of Non-Payment.</i>”</p>
SC2.2	5.1.1	<p><u>Delete</u> the words “amount certified by the <i>Consultant</i> together” in subparagraph 5.1.1 and <u>replace</u> them with “allowable amount set out in a <i>Proper Invoice</i>”.</p>

SC2.3	5.1.2	<p><u>Delete</u> subparagraph 5.1.2 in its entirety and <u>replace</u> it with the following:</p> <p>“.2 upon <i>Substantial Performance of the Work</i>, as certified by the <i>Consultant</i>, and on the 61st day after the publication of the certificate of <i>Substantial Performance of the Work</i> in accordance with the <i>Act</i>, there being no claims for lien registered against the title to the <i>Place of the Work</i>, pay the <i>Contractor</i> the unpaid balance of the holdback together with such <i>Value Added Taxes</i> as may be applicable to such payment, less any amount stated in the <i>Owner’s Notice of Non-Payment</i>,”</p>
SC2.4	5.1.3	<p><u>Delete</u> subparagraph 5.1.3 in its entirety and <u>replace</u> it with the following:</p> <p>“.3 upon receipt of the final certificate for payment from the <i>Consultant</i>, and on the 61<sup>st</sup> day after the date on which the <i>Contractor</i> completes the <i>Work</i>, there being no claims for lien registered against the title to the <i>Place of the Work</i>, pay the <i>Contractor</i> the unpaid balance of the <i>Contract Price</i> together with such <i>Value Added Taxes</i> as may be applicable to such payment , and”</p>
SC2.5	5.3.1	<p><u>Delete</u> paragraph 5.3.1 in its entirety and <u>replace</u> it with the following:</p> <p>“.1 Should either party fail to make payments as they become due under the terms of the <i>Contract</i> or in an award by arbitration or court, interest shall also become due and payable on such unpaid amounts at the prejudgment interest rate prescribed by the <i>Courts of Justice Act</i> (Ontario), as it may change from time to time.”</p>

**SC3 \*NEW\* ARTICLE A-9 – CONFLICT OF INTEREST**

SC3.1	Article A-9	<p><u>Add</u> new ARTICLE A-9 CONFLICT OF INTEREST as follows:</p> <p><b>“ARTICLE A-9 CONFLICT OF INTEREST</b></p> <p>9.1 The <i>Contractor</i>, <i>Subcontractors</i> and <i>Suppliers</i> and any of their respective advisors, partners, directors, officers, employees, agents, and volunteers shall not engage in any activity or provide any services where such activity or the provision of such services creates a conflict of interest (actually or potentially, in the sole opinion of the <i>Owner</i>) with the provision of the <i>Work</i> pursuant to the <i>Contract</i>. The <i>Contractor</i> acknowledges and agrees that a conflict of interest, as</p>
-------	-------------	--

		<p>described in this Article A-9, includes, but is not limited to, the use of <i>Confidential Information</i> where the <i>Owner</i> has not specifically authorized such use.</p> <p>9.2 The <i>Contractor</i> shall disclose to the <i>Owner</i>, in writing, without delay, any actual or potential situation that may be reasonably interpreted as either a conflict of interest or a potential conflict of interest, including the retention of any <i>Subcontractor</i> or <i>Supplier</i> that is directly or indirectly affiliated with or related to the <i>Contractor</i>.</p> <p>9.3 The <i>Contractor</i> covenants and agrees that it will not hire or retain the services of any employee or previous employee of the <i>Owner</i> where to do so constitutes a breach by such employee or previous employee of the <i>Owner's</i> conflict of interest policy, as it may be amended from time to time, until after completion of the <i>Work</i> under the <i>Contract</i>.</p> <p>9.4 It is of the essence of the <i>Contract</i> that the <i>Owner</i> shall not have direct or indirect liability to any <i>Subcontractor</i> or <i>Supplier</i>, and that the <i>Owner</i> relies on the maintenance of an arm's-length relationship between the <i>Contractor</i> and its <i>Subcontractors and Suppliers</i>. Consistent with this fundamental term of the <i>Contract</i>, the <i>Contractor</i> will not enter into any agreement or understanding with any <i>Subcontractor</i> or <i>Supplier</i>, whether as part of any contract or any written or oral collateral agreement, pursuant to which the parties thereto agree to cooperate in the presentation of a claim for payment against the <i>Owner</i>, directly or through the <i>Contractor</i>, where such claim is, in whole or in part, in respect of a disputed claim by the <i>Subcontractor</i> or <i>Supplier</i> against the <i>Contractor</i>, where the payment to the <i>Subcontractor</i> or <i>Supplier</i> by the <i>Contractor</i> is agreed to be conditional or contingent on the ability to recover those amounts or a portion thereof from the <i>Owner</i>, failing which the <i>Contractor</i> shall be saved harmless from all or a portion of those claims. The <i>Contractor</i> acknowledges that any such agreement would undermine the required arm's-length relationship and constitute a conflict of interest. For greater certainty, the <i>Contractor</i> shall only be entitled to advance claims against the <i>Owner</i> for amounts pertaining to <i>Subcontractor</i> or <i>Supplier</i> claims where the <i>Contractor</i> has actually paid or unconditionally acknowledged liability for those claims or where those claims are the subject of litigation or binding arbitration between the <i>Subcontractor</i> or <i>Supplier</i> and the <i>Contractor</i> has been found liable for those claims.</p>
--	--	--

		<p>9.5 Notwithstanding paragraph 7.1.2 of GC 7.1 - OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, OR TERMINATE THE CONTRACT, a breach of this Article A-9 by the <i>Contractor</i>, any of the <i>Subcontractors</i>, or any of their respective advisors, partners, directors, officers, employees, agents, and volunteers shall entitle the <i>Owner</i> to terminate the <i>Contract</i>, in addition to any other rights and remedies that the <i>Owner</i> has in the <i>Contract</i>, in law, or in equity."</p>
--	--	--

**SC4 \*NEW\* ARTICLE A-10 TIME OF THE ESSENCE**

SC4.1	Article A-10	<p><u>Add</u> the following new Article A-10 as follows:</p> <p><b>"ARTICLE A-10 TIME OF THE ESSENCE</b></p> <p>10.1 It is agreed that one of the reasons the <i>Contractor</i> was selected by the <i>Owner</i> for this <i>Contract</i> is the <i>Contractor's</i> representation and covenant that it will attain <i>Substantial Performance of the Work</i> within the <i>Contract Time</i> stated in Article A-1 of this <i>Contract</i>.</p> <p>10.2 The <i>Contractor</i> acknowledges and agrees that it is responsible to marshal its resources and those of its <i>Subcontractors and Suppliers</i> in a manner which will permit timely attainment of the <i>Substantial Performance of the Work</i>. The <i>Contractor</i> agrees that time is of the essence of this <i>Contract</i>."</p>
-------	--------------	---

**SC5 DEFINITIONS**

SC5.1	Consultant	<p><u>Amend</u> the definition of "Consultant" by <u>adding</u> the following to the end of the definition:</p> <p>"For the purposes of the <i>Contract</i>, the terms "<i>Consultant</i>", "<i>Architect</i>" and "<i>Engineer</i>" shall be considered synonymous."</p>
SC5.2	Act	<p><u>Add</u> the following definition:</p> <p><b>"27. Act</b></p> <p><i>Act</i> means the <i>Construction Act</i>, R.S.O. 1990, c. C.30, as amended, including all regulations passed under it that are</p>



		enforceable as of the date of execution of this <i>Contract</i> . For certainty, the first procurement process for the <i>Project</i> (i.e. the “improvement” as that term is defined in the <i>Act</i> ) was commenced on or after October 1, 2019).”
SC5.3	Adjudication	<p><u>Add</u> the following definition:</p> <p><b>“28. Adjudication</b></p> <p><i>Adjudication</i> means construction dispute interim adjudication as defined under the <i>Act</i>.”</p>
SC5.4	Confidential Information	<p><u>Add</u> the following definition:</p> <p><b>“29. Confidential Information</b></p> <p><i>Confidential Information</i> means all the information or material of the <i>Owner</i> 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 <i>Contractor</i> at any time, but <i>Confidential Information</i> shall not include information that:</p> <ul style="list-style-type: none"> <li>.1 is or becomes generally available to the public without fault or breach on the part of the <i>Contractor</i>, including without limitation breach of any duty of confidentiality owed by the <i>Contractor</i> to the <i>Owner</i> or to any third party, but only after that information becomes generally available to the public;</li> <li>.2 the <i>Contractor</i> can demonstrate to have been rightfully obtained by the <i>Contractor</i> from a third party who had the right to transfer or disclose it to the <i>Contractor</i> free of any obligation of confidence;</li> <li>.3 the <i>Contractor</i> can demonstrate to have been rightfully known to or in the possession of the <i>Contractor</i> at the time of disclosure, free of any obligation of confidence; or</li> <li>.4 is independently developed by the <i>Contractor</i> without use of any <i>Confidential Information</i>.”</li> </ul>
SC5.5	Construction Schedule	<p><u>Add</u> the following definition:</p> <p><b>“30. Construction Schedule or construction schedule</b></p> <p><i>Construction Schedule</i> means the schedule for the performance of the <i>Work</i> provided by the <i>Contractor</i> pursuant to GC 3.5,</p>

		including any amendments to the <i>Construction Schedule</i> made pursuant to the <i>Contract Documents</i> .”
SC5.6	Construction Schedule Update	<p><u>Add</u> the following definition:</p> <p><b>“31. Construction Schedule Update</b></p> <p><i>Construction Schedule Update</i> means an update to the <i>Construction Schedule</i> by the <i>Contractor</i> using Microsoft Project (or other approved scheduling software) that accurately depicts the progress of the <i>Work</i> relative to the critical path established in the <i>Construction Schedule</i> approved in GC 3.5.1 (or any approved successor <i>Construction Schedule</i>), aligns with the currently approved date for <i>Substantial Performance of the Work</i>, shows up-to-date projected major activity sequences and durations, and shows any changes or delays in anticipated completion dates of major activities in the <i>Work</i> relative to the last <i>Construction Schedule Update</i>, and includes the following minimum deliverables:</p> <p>(a) a record version of the updated <i>Construction Schedule</i> in .pdf format;</p> <p>(b) an editable copy of the updated <i>Construction Schedule</i> in native format (e.g. .mpp format for Microsoft Project).”</p>
SC5.7	Direct Costs	<p><u>Add</u> the following definition:</p> <p><b>“32. Direct Costs</b></p> <p><i>Direct Costs</i> are the reasonable costs of performing the contract or subcontract including costs related to the additional supply of services or materials (including equipment rentals), insurance and surety bond premiums, and costs resulting from seasonal conditions, that would not have been incurred, but do not include indirect damages suffered, such as loss of profit, productivity or opportunity, or any head office overhead costs.”</p>
SC5.8	EFT	<p><u>Add</u> the following definition:</p> <p><b>“33. EFT</b></p> <p><i>EFT</i> has the definition given to it under GC 5.3.2.”</p>
SC5.9	Force Majeure	<p><u>Add</u> the following definition:</p> <p><b>“34. Force Majeure</b></p>

		<p><i>Force Majeure</i> means any cause, beyond either parties' control, other than bankruptcy or insolvency, which prevents the performance by a party, or both, of any of their respective obligations under the <i>Contract</i> and the event of <i>Force Majeure</i> did not arise from a party's default and could not be avoided or mitigated by the exercise of reasonable effort or foresight. <i>Force Majeure</i> includes: <i>Labour Disputes</i>; fire; unusual delay by common carriers or unavoidable casualties; delays in obtaining permits or licenses; civil disturbance; emergency acts, orders, legislation, regulations or directives of any government or other public authority; acts of a public enemy; war; riot; sabotage; blockage embargo; lightning; earthquake; adverse weather conditions but only if substantially beyond the weather norms of the <i>Place of the Work</i>; acts of God; or declared epidemic or pandemic outbreak or other public health emergency (e.g. SARS, COVID-19)."</p>
SC5.10	Install	<p><u>Add</u> the following definition:</p> <p><b>“35. Install</b></p> <p><i>Install</i> means install and connect. <i>Install</i> has this meaning whether or not the first letter is capitalized.”</p>
SC5.11	Labour Dispute	<p><u>Add</u> the following definition:</p> <p><b>“36. Labour Dispute</b></p> <p><i>Labour Dispute</i> means any lawful or unlawful labour problems, work stoppage, labour disruption, strike, job action, slow down, lock-outs, picketing, refusal to work or continue to work, refusal to supply materials, cessation or work or other labour controversy which does, or might, affect the <i>Work</i>.”</p>
SC5.12	Notice of Non-Payment	<p><u>Add</u> the following definition:</p> <p><b>“37. Notice of Non-Payment</b></p> <p><i>Notice of Non-Payment</i> means a notice of non-payment of holdback (Form 6) or a notice of non-payment (Form 1.1) under the <i>Act</i>, as applicable to the circumstances.”</p>
SC5.13	OHSA	<p><u>Add</u> the following definition:</p> <p><b>“38. OHSA</b></p> <p><i>OHSA</i> means the <i>Occupational Health and Safety Act</i>, R.S.O. 1990, c. O.1, as amended, including all regulations thereto.”</p>

SC5.14	Overhead	<p><u>Add</u> the following definition:</p> <p><b>“39. Overhead</b></p> <p><i>Overhead</i> means all site and head office operations and facilities, all site and head office administration and supervision; all duties and taxes for permits and licenses required by the authorities having jurisdiction at the <i>Place of the Work</i>; all requirements of Division 1, including but not limited to submittals, warranty, quality control, calculations, testing and inspections; meals and accommodations; and, tools, expendables and clean-up costs.”</p>
SC5.15	Payment Period	<p><u>Add</u> the following definition:</p> <p><b>“40. Payment Period</b></p> <p><i>Payment Period</i> has the definition given to it under GC 5.2.1.”</p>
SC5.16	Pre-Invoice Submission Meeting	<p><u>Add</u> the following definition:</p> <p><b>“41. Pre-Invoice Submission Meeting</b></p> <p><i>Pre-Invoice Submission Meeting</i> has the definition given to it under GC 5.2.1.”</p>
SC5.17	Proper Invoice	<p><u>Add</u> the following definition:</p> <p><b>“42. Proper Invoice</b></p> <p><i>Proper Invoice</i> means a “proper invoice” as that term is defined in Section 6.1 of the <i>Act</i>, including the minimum requirements set out in Appendix “1” of the Supplementary Conditions.”</p>
SC5.18	Proper Invoice Submission Date	<p><u>Add</u> the following definition:</p> <p><b>“43. Proper Invoice Submission Date</b></p> <p><i>Proper Invoice Submission Date</i> has the definition given to it under GC 5.2.2.1.”</p>
SC5.19	Request for Information (RFI)	<p><u>Add</u> the following definition:</p> <p><b>“44. Request for Information (RFI)</b></p> <p><i>Request for Information</i> or <i>RFI</i> means written documentation sent by the <i>Contractor</i> to the <i>Owner</i> or to the <i>Owner’s</i> representative or the <i>Consultant</i> requesting written clarification(s) and/or interpretation(s) of the <i>Drawings</i> and/or <i>Specifications</i>, <i>Contract</i> requirements and/or other pertinent</p>

		information required to complete the <i>Work</i> of the <i>Contract</i> without applying for a change or changes to the <i>Work</i> .”

**GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT**

Where a General Condition or paragraph of the General Conditions of the *Contract* is deleted by these amendments, the numbering of the remaining General Conditions or paragraphs shall remain unchanged, unless stated otherwise herein, and the numbering of the deleted item will be retained, unused.

**PART 1 GENERAL PROVISIONS**

**sc6 GC 1.1 CONTRACT DOCUMENTS**

SC6.1	1.1.6	<p><u>Add</u> the following to the end of paragraph 1.1.6:</p> <p>“The <i>Specifications</i> 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 <i>Contract Documents</i> will be construed to place responsibility on the <i>Owner</i> or the <i>Consultant</i> to settle disputes among the <i>Subcontractors</i> and <i>Suppliers</i> with respect to such divisions. The <i>Drawings</i> are, in part, diagrammatic and are intended to convey the scope of the <i>Work</i> and indicate general and appropriate locations, arrangements and sizes of fixtures, equipment and outlets. The <i>Contractor</i> shall obtain more accurate information about the locations, arrangements and sizes from study and coordination of the <i>Drawings</i>, including <i>Shop Drawings</i> and shall become familiar with conditions and spaces affecting those matters before proceedings with the <i>Work</i>. Where site conditions require reasonable minor changes where the change requires only the additional labour of one half hour or less, the <i>Contractor</i> shall make such changes at no additional cost to the <i>Owner</i>. Similarly, where known conditions or existing conditions interfere with new installation and require relocation, the <i>Contractor</i> shall include such relocation in the <i>Work</i>. The <i>Contractor</i> 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 <i>Contact Documents</i>, wherever located and whenever issued, which compile information of similar content and may consist of drawings, tables and/or lists.”</p>
SC6.2	1.1.7.1	<p><u>Delete</u> paragraph 1.1.7.1 in its entirety and <u>replace</u> it with the following:</p>

		<p>“.1 the order of priority of documents, from highest to lowest, shall be:</p> <ul style="list-style-type: none"> <li>- the Supplementary Conditions;</li> <li>- the Agreement between the <i>Owner</i> and the <i>Contractor</i>,</li> <li>- the Definitions</li> <li>- the General Conditions,</li> <li>- Division 1 of the <i>Specifications</i>,</li> <li>- technical <i>Specifications</i>,</li> <li>- material and finishing schedules</li> <li>- the <i>Drawings</i>.”</li> </ul>
SC6.3	1.1.7.5 to 1.1.7.8	<p><u>Add</u> new subparagraphs 1.1.7.5, 1.1.7.6, 1.1.7.7 and 1.1.7.8 as follows:</p> <p>“1.1.7.5 Noted materials and annotations on the <i>Drawings</i> shall govern over the graphic representation of the <i>Drawings</i>.</p> <p>1.1.7.6 Finishes in the room finish schedules shall govern over those shown on the <i>Drawings</i>.</p> <p>1.1.7.7 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 <i>Consultant</i> or its sub-<i>Consultants</i> are to remain with each of the applicable drawing disciplines.</p> <p>1.1.7.8 Should reference standards contained in the <i>Specifications</i> conflict with the <i>Specifications</i>, the <i>Specifications</i> shall govern. Should reference standards and <i>Specifications</i> conflict with each other or if certain requirements of the <i>Specifications</i> conflict with other requirements of the <i>Specifications</i>, the more stringent requirements shall govern.”</p>
SC6.4	1.1.8	<p><u>Delete</u> paragraph 1.1.8 in its entirety and <u>replace</u> it with the following:</p> <p>“1.1.8 The <i>Consultant</i>, on behalf of the <i>Owner</i> shall provide the <i>Contractor</i> without charge, PDF copies of the <i>Contract Documents</i>.</p>

**SC7 GC 1.3 RIGHTS AND REMEDIES**

SC7.1	1.3.2	<p>In paragraph 1.3.2 <u>delete</u> the word “No” from the beginning of the paragraph and <u>replace</u> it with the words:</p> <p>“Except with respect to the requirements set out in paragraphs 2.2.13, 6.4.1, 6.5.4, 6.6.1 and 8.2.2, no...”</p>
-------	-------	---

**SC8 \*NEW\* GC 1.5 EXAMINATION OF DOCUMENTS AND SITE**

SC8.1	1.5	<p><u>Add</u> new GC 1.5 – EXAMINATION OF DOCUMENTS AND SITE as follows:</p> <p><b>“GC 1.5 EXAMINATION OF DOCUMENTS AND SITE</b></p> <p>1.5.1 The <i>Contractor</i> declares and represents that in tendering for the <i>Work</i>, and in entering into a <i>Contract</i> with the <i>Owner</i> for the performance of the <i>Work</i>, it has investigated for itself the character of the <i>Work</i> to be done, based on information generally available from a visit to the <i>Place of the Work</i> and to the standard set out under GC 3.14.1 The <i>Contractor</i> has assumed and does hereby assume all risk of known conditions now existing or arising in the course of the <i>Work</i> which might or could make the <i>Work</i>, or any items thereof more expensive in character, or more onerous to fulfil, than was contemplated or known when the tender was made or the <i>Contract</i> signed.</p> <p>1.5.2 The <i>Contractor</i> also declares that in tendering for the <i>Work</i> and in entering into this <i>Contract</i>, the <i>Contractor</i> did not and does not rely upon information furnished by the <i>Owner</i> or any of its agents or servants respecting the nature or confirmation of the ground at the site of the <i>Work</i>, or the location, character, quality or quantity of the materials to be removed or to be employed in the construction of <i>Work</i>, or the character of the construction machinery and equipment or facilities needed to perform the <i>Work</i>, or the general and local performance of the work under the <i>Contract</i> and expressly waives and releases the <i>Owner</i> from all claims with respect to the said information with respect to the <i>Work</i>.</p> <p>1.5.3 <i>Contractor</i> further represents, warrants and acknowledges that it considered and took into account in the <i>Contract Price</i> all reasonably known impacts and restrictions arising from the COVID-19 pandemic, including without limitation corresponding legislative changes that may impact performance of the <i>Project</i>, various weather conditions that</p>
-------	-----	---



		may affect the <i>Work</i> , the availability of supplies and labour or other conditions or risks that the <i>Contractor</i> knew about or reasonably ought to have known about prior to the date of the <i>Contract</i> .”
--	--	---

**PART 2 ADMINISTRATION OF THE CONTRACT**

**SC9 GC 2.2 ROLE OF THE CONSULTANT**

SC9.1	2.2.4	<u>Delete</u> paragraph 2.2.4 in its entirety.
SC9.2	2.2.5	<u>Delete</u> paragraph 2.2.5 and <u>replace</u> it with the following:  “2.2.5 Upon receipt of an application for payment that satisfies the requirement of a <i>Proper Invoice</i> , based on the <i>Consultant's</i> observations and evaluation of the <i>Contractor's</i> application for payment, the <i>Consultant</i> will determine the amounts owing to the <i>Contractor</i> under the <i>Contract</i> and will issue certificates for payment as provided in Article A-5 - PAYMENT, GC 5.3 PROGRESS PAYMENT, GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK, and GC 5.7 - FINAL PAYMENT. If the <i>Consultant</i> determines that the amount payable to the <i>Contractor</i> differs from the amount stated in a <i>Proper Invoice</i> , the <i>Consultant</i> shall notify the <i>Owner</i> as provided in GC 5.3.1.2 and prepare a draft of the applicable <i>Notice of Non-Payment</i> for the amount in dispute.”
SC9.3	2.2.7	<u>Delete</u> the words “Except with respect to GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER”.
SC9.4	2.2.13	At paragraph 2.2.13, <u>insert</u> the following at end of that paragraph:  “If, in the opinion of the <i>Contractor</i> , the <i>Supplemental Instruction</i> involves an adjustment in the <i>Contract Price</i> or in the <i>Contract Time</i> , it shall, within ten (10) <i>Working Days</i> of receipt of a <i>Supplemental Instruction</i> , provide the <i>Consultant</i> 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 <i>Supplemental Instruction</i> by the <i>Contractor</i> , without any adjustment in the <i>Contract Price</i> or <i>Contract Time</i> .”

**SC10 GC 2.3 REVIEW AND INSPECTION OF THE WORK**

SC10.1	2.3.2	<u>Amend</u> paragraph 2.3.2 by <u>adding</u> the words “and <i>Owner</i> ” after the words “ <i>Consultant</i> ” in the second and third lines.
SC10.2	2.3.3	<u>Delete</u> paragraph 2.3.3 in its entirety and <u>replace</u> it with the following:  “2.3.3 The <i>Contractor</i> shall furnish promptly two copies to the <i>Consultant</i> and one copy to the <i>Owner</i> of all certificates and inspection reports relating to the <i>Work</i> .”
SC10.3	2.3.4	In paragraph 2.3.4 <u>add</u> the word “review” after the word “inspections” in the first and second lines of paragraph 2.3.4.
SC10.4	2.3.5	In paragraph 2.3.5 in the first line after the word “ <i>Consultant</i> ”, <u>add</u> “or the <i>Owner</i> ”.
SC10.5	2.3.8	<u>Add</u> a new paragraph 2.3.8 as follows:  “2.3.8 The <i>Consultant</i> will conduct periodic reviews of the <i>Work</i> in progress, to determine general conformance with the requirements of the <i>Contract Documents</i> . Such reviews, or lack thereof, shall not give rise to any claims by the <i>Contractor</i> in connection with construction means, methods, techniques, sequences and procedures, nor in connection with construction safety at the <i>Place of Work</i> , responsibility for which belongs exclusively to the <i>Contractor</i> .”

**SC11 GC 2.4 DEFECTIVE WORK**

SC11.1	2.4.1	<u>Amend</u> GC 2.4.1 by inserting “, the <i>Owner</i> and/or its agent” in the first sentence following “rejected by the <i>Consultant</i> ”.
SC11.2	2.4.1.1 to 2.4.1.2	<u>Add</u> new paragraphs 2.4.1.1 and 2.4.1.2 as follows:  “2.4.1.1 The <i>Contractor</i> shall rectify, in a manner acceptable to the <i>Consultant</i> and to the <i>Owner through the Consultant</i> all defective work and deficiencies throughout the <i>Work</i> , whether or not they are specifically identified by the <i>Consultant</i> .  2.4.1.2 The <i>Contractor</i> shall prioritize the correction of any defective work, which, in the sole discretion of the <i>Owner through the Consultant</i> , adversely affects the day to day operations of the <i>Owner</i> or which, in the sole discretion of the <i>Consultant</i> , adversely affects the progress of the <i>Work</i> .”

SC11.3	2.4.2	<p><u>Delete</u> paragraph 2.4.2 in its entirety and <u>replace</u> it with the following:</p> <p>“2.4.2 The <i>Contractor</i> shall promptly pay the <i>Owner</i> for costs incurred by the <i>Owner</i>, the <i>Owner’s</i> own forces or the <i>Owner’s</i> other contractors, for work destroyed or damaged or any alterations necessitated by the <i>Contractor’s</i> removal, replacement or re-execution of defective work.”</p>
SC11.4	2.4.4	<p><u>Add</u> new paragraph 2.4.4 as follows:</p> <p>“2.4.4 Neither acceptance of the <i>Work</i> by the <i>Consultant</i> or the <i>Owner</i>, nor any failure by the <i>Consultant</i> or the <i>Owner</i> to identify, observe or warn of defective <i>Work</i> or any deficiency in the <i>Work</i> shall relieve the <i>Contractor</i> from the sole responsibility for rectifying such defect or deficiency at the <i>Contractor’s</i> sole cost, even where such failure to identify, observe or warn is negligent.”</p>

**PART 3 EXECUTION OF THE WORK**

**SC12 GC 3.1 CONTROL OF THE WORK**

SC12.1	3.1.2	<p>Amend paragraph 3.1.2 by <u>inserting</u> the words “Construction Schedule” after the word “sequences”.</p>
SC12.2	3.1.3 & 3.1.4	<p><u>Add</u> new paragraphs 3.1.3 and 3.1.4 as follows:</p> <p>“3.1.3 Prior to commencing individual procurement, fabrication and construction activities, the <i>Contractor</i> shall verify at the <i>Place of the Work</i>, all relevant measurements and levels necessary for proper and complete fabrication, assembly and installation of the <i>Work</i> and shall further carefully compare such field measurements and conditions with the requirements of the <i>Contract Documents</i>. Where dimensions are not included or exact locations are not apparent, the <i>Contractor</i> shall immediately notify the <i>Consultant</i> in writing and obtain written instructions from the <i>Consultant</i> before proceedings with any part of the affected <i>Work</i>.</p> <p>3.1.4 Notwithstanding the provisions of paragraphs 3.1.1 and 3.1.2, the <i>Owner</i> shall have access to the site at all times to monitor all aspects of construction. Such access shall in no circumstances affect the obligations of the <i>Contractor</i> to fulfill its contractual obligations.”</p>

**SC13 GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS**

SC13.1	3.2.2.1	<u>Delete</u> paragraph 3.2.2.1 in its entirety.
SC13.2	3.2.2.2	<u>Delete</u> paragraph 3.2.2.2 in its entirety.
SC13.3	3.2.2.3	<u>Delete</u> paragraph 3.2.2.3 in its entirety.
SC13.4	3.2.2.4	<u>Delete</u> paragraph 3.2.2.4 in its entirety.
SC13.5	3.2.3.2	<u>Delete</u> paragraph 3.2.3.2 and <u>replace</u> it with the following:  “.2 co-ordinate and schedule the activities and work of other contractors and the <i>Owner's</i> own forces with the <i>Work</i> of the <i>Contractor</i> and connect as specified or shown in the <i>Contract Documents</i> .”
SC13.6	3.2.3.4	<u>Add</u> new paragraph 3.2.3.4 as follows:  “.4 Subject to GC 9.4 CONSTRUCTION SAFETY, for the <i>Owner's</i> own forces and for other contractors, assume overall responsibility for compliance with all aspects of the applicable health and safety legislation in force at the <i>Place of the Work</i> , including all of the responsibilities of the “constructor”, pursuant to the <i>OHSA</i> .”

**SC14 GC 3.3 TEMPORARY WORK**

SC14.1	3.3.2	In paragraph 3.3.2, in the second line after the words “where required by law”, insert “or by the <i>Consultant</i> ”.
--------	-------	--

**SC15 GC 3.4 DOCUMENT REVIEW**

SC15.1	3.4.1	<u>Delete</u> paragraph 3.4.1 in its entirety and <u>replace</u> it with the following:  “3.4.1 The <i>Contractor</i> shall review the <i>Contract Documents</i> and shall report promptly to the <i>Consultant</i> any error, inconsistency, or omission the <i>Contractor</i> may discover. Such review by the <i>Contractor</i> shall be undertaken with the standard of care described in paragraph 3.14.1 of the <i>Contract</i> . Except for its obligation to make such review and report the result, the <i>Contractor</i> does not assume any responsibility to the <i>Owner</i> or to the <i>Consultant</i> for the accuracy of the <i>Contract Documents</i> . Provided it has exercised the degree of care and skill described in this paragraph 3.4.1, the <i>Contractor</i> shall not be liable for damage or costs resulting from such errors, inconsistencies, or
--------	-------	---

		omissions in the <i>Contract Documents</i> , which the <i>Contractor</i> could not reasonably have discovered through the exercise of the required standard of care.”
SC15.2	3.4.2 & 3.4.3	<p><u>Add</u> new paragraphs 3.4.2 and 3.4.3 as follows:</p> <p>“3.4.2 If, at any time, the <i>Contractor</i> finds errors, inconsistencies, or omissions in the <i>Contract Documents</i> or has any doubt as to the meaning or intent of any part thereof, including laying out of the Work, the <i>Contractor</i> shall immediately notify the <i>Consultant</i>, and request instructions, a <i>Supplemental Instruction</i>, <i>Change Order</i>, or <i>Change Directive</i>, as the case may require, and the <i>Contractor</i> shall not proceed with the work affected until the <i>Contractor</i> has received such instructions, a <i>Supplemental Instruction</i>, <i>Change Order</i> or <i>Change Directive</i>. Neither the <i>Owner</i> nor the <i>Consultant</i> will be responsible for the consequences of any action of the <i>Contractor</i> based on oral instructions.</p> <p>3.4.3 Errors, inconsistencies and/or omissions in the <i>Drawings</i> and/or <i>Specifications</i> which do not allow completion of the <i>Work</i> of the <i>Contract</i> shall be brought to the <i>Consultant’s</i> attention prior to the execution of the <i>Contract</i> by means of an <i>RFI</i>.”</p>

**SC16 GC 3.5 CONSTRUCTION SCHEDULE**

SC16.1	3.5.1	<p><u>Delete</u> paragraph 3.5.1 in its entirety and <u>replace</u> with the following:</p> <p>“3.5.1 The <i>Contractor</i> shall:</p> <p>.1 within five (5) calendar days of receiving written confirmation of the award of the <i>Contract</i>, prepare and submit to the <i>Owner</i> and the <i>Consultant</i> for their review and approval, a construction schedule in the format indicated below that indicates the timing of the activities of the <i>Work</i> and provides sufficient detail of the critical events and their inter-relationship to demonstrate the <i>Work</i> will be performed in conformity with the <i>Contract Time</i> and in accordance with the <i>Contract Documents</i>. Such schedule is to include a delivery schedule for <i>Products</i> whose delivery is critical to the schedule for the <i>Work</i> or are required by the <i>Contract</i> to be included in a <i>Products</i> delivery schedule. The <i>Contractor</i> shall employ construction scheduling software, being the latest version of “Microsoft Project”, that permits the progress of the <i>Work</i></p>
--------	-------	--

		<p>to be monitored in relation to the critical path established in the schedule. The <i>Contractor</i> shall provide such schedule and any successor or revised schedules in both electronic format and hard copy. Once accepted by the <i>Owner</i> and the <i>Consultant</i>, the construction schedule submitted by the <i>Contractor</i> shall become the baseline “<b>Construction Schedule</b>”;</p> <p>.2 provide the expertise and resources, such resources including manpower and equipment, as are necessary on a best efforts basis to maintain progress under the accepted baseline <i>Construction Schedule</i> or revised construction schedule accepted by the <i>Owner</i> pursuant to GC 3.5 CONSTRUCTION SCHEDULE, which includes without limitation, the <i>Contractor’s</i> use of all possible and, if necessary, extraordinary measures, to bring the progress of the <i>Work</i> into compliance with the <i>Construction Schedule</i>, such as (i) increasing the presence of its own forces at the <i>Place of the Work</i>; (ii) directing any <i>Subcontractors</i> or <i>Suppliers</i> to increase their labour forces and equipment; (iii) working overtime and extra shifts; and (iv) providing any additional supervision and coordination of the <i>Project</i>, all at the <i>Contractor’s</i> own cost and expense save and except where GC 6.5.1, 6.5.2, or 6.5.3 apply; and,</p> <p>.3 monitor the progress of the <i>Work</i> on a weekly basis relative to the baseline <i>Construction Schedule</i>, or any revised <i>Construction Schedule</i> accepted by the <i>Owner</i> pursuant to GC 3.5 CONSTRUCTION SCHEDULE, deliver a <i>Construction Schedule Update</i> to the <i>Consultant</i> and <i>Owner</i> with each application for payment, at a minimum, or as may be reasonably required by the <i>Consultant</i> and advise the <i>Consultant</i> and the <i>Owner</i> weekly in writing of any variation from the baseline or slippage in the schedule; and,</p> <p>.4 if after applying the expertise and resources required under paragraph 3.5.1.2, the <i>Contractor</i> forms the opinion that the slippage in schedule reported in paragraph 3.5.1.3 cannot be recovered by the <i>Contractor</i>, it shall, in the same notice provided under paragraph 3.5.1.3, indicate to the <i>Consultant</i> if the <i>Contractor</i> intends to apply for an extension of <i>Contract Time</i> as provided in PART 6 — CHANGES IN THE WORK; and,</p>
--	--	---

		.5 ensure that the <i>Contract Price</i> shall include all costs required to phase or stage the <i>Work</i> .”
SC16.2	3.5.2 & 3.5.3	<p><u>Add</u> new paragraphs 3.5.2 and 3.5.3 as follows:</p> <p>“3.5.2 If, at any time, it should appear to the <i>Owner</i> or the <i>Consultant</i> that the actual progress of the <i>Work</i> is behind schedule or is likely to become behind schedule, or if the <i>Contractor</i> has given notice of such to the <i>Owner</i> or the <i>Consultant</i> pursuant to subparagraph 3.5.1.3, the <i>Contractor</i> shall, either at the request of the <i>Owner</i> or the <i>Consultant</i>, or following giving notice pursuant to subparagraph 3.5.1.3, take appropriate steps to cause the actual progress of the <i>Work</i> to conform to the schedule or minimize the resulting delay. Within five (5) calendar days of the request by the <i>Owner</i> or the <i>Consultant</i> or the notice being given pursuant to subparagraph 3.5.1.3, the <i>Contractor</i> shall produce and present to the <i>Owner</i> and the <i>Consultant</i> a plan demonstrating how the <i>Contractor</i> will achieve the recovery of the last accepted schedule.</p> <p>3.5.3 The <i>Contractor</i> is responsible for performing the <i>Work</i> within the <i>Contract Time</i>. Any schedule submissions revised from the accepted baseline construction schedule or revised schedule accepted by the <i>Owner</i> pursuant to GC 3.5 CONSTRUCTION SCHEDULE, during construction are not deemed to be approved extensions to the <i>Contract Time</i>. All extensions to the <i>Contract Time</i> must be made in accordance with PART 6 – CHANGES IN THE WORK. “</p>

**SC17 GC 3.6 SUPERVISION**

SC17.1	3.6.1	<p><u>Delete</u> paragraph 3.6.1 in its entirety and <u>replace</u> with the following:</p> <p>“3.6.1 The <i>Contractor</i> shall employ a competent full-time superintendent, acceptable to the <i>Owner</i> and <i>Consultant</i>, who shall be in full time attendance at the <i>Place of Work</i> while the <i>Work</i> is being performed. The superintendent shall not be changed by the <i>Contractor</i> without valid reason which shall be provided in writing and shall not be changed without prior consultation with and agreement by the <i>Owner</i> and the <i>Consultant</i>. The <i>Contractor</i> shall replace the superintendent within 7 <i>Working Days</i> of the <i>Owner’s</i> written notification, if the superintendent’s performance is not acceptable to the <i>Owner</i>. The <i>Contractor</i> shall provide the <i>Owner</i> and the <i>Consultant</i> with the names, addresses and telephone numbers of the</p>
--------	-------	---



		superintendent referred to in this paragraph 3.6.1 and other responsible persons who may be contacted for emergency and other reasons during non-working hours.”
SC17.2	3.6.2	<p><u>Delete</u> paragraph 3.6.2 in its entirety and <u>replace</u> with the following:</p> <p>“3.6.2 The superintendent, and any project manager appointed by the <i>Contractor</i>, shall represent the <i>Contractor</i> at the <i>Place of Work</i> and shall have full authority to act on written instructions given by the <i>Consultant</i> and/or the <i>Owner</i>. Instructions given to the superintendent or the project manager shall be deemed to have been given to the <i>Contractor</i> and both the superintendent and any project manager shall have full authority to act on behalf of the <i>Contractor</i> and bind the <i>Contractor</i> in matters related to the <i>Contract</i>.”</p>
SC17.3	3.6.3 to 3.6.6	<p><u>Add</u> new paragraph 3.6.3, 3.6.4, 3.6.5 and 3.6.6 as follows:</p> <p>“3.6.3 The <i>Owner</i> may, at any time during the course of the <i>Work</i>, request the replacement of the appointed representative(s). Immediately upon receipt of the request, the <i>Contractor</i> shall make arrangements to appoint an acceptable replacement, which is approved by the <i>Owner</i>.</p> <p><b>SC40</b> 3.6.4 The supervisory staff assigned to the <i>Project</i> shall also be fully competent to implement efficiently all requirements for scheduling, coordination, field engineering, reviews, inspections and submittals defined in the <i>Specifications</i>, and have a minimum 5 years documented “Superintendent/Project Management” experience.</p> <p><b>SC41</b> 3.6.5 The <i>Consultant and Owner</i> shall reserve the right to review the record of experience and credentials of supervisory staff assigned to the <i>Project</i> prior to commencement of the <i>Work</i>.</p> <p><b>SC42</b> 3.6.6 A superintendent assigned to the <i>Work</i> shall be “Gold Seal Certified” as per the Canadian Construction Association; or a superintendent that can demonstrate the requisite experience and success related to the <i>Project</i> to the sole satisfaction of the <i>Owner</i>.”</p>

**SC18 GC 3.7 SUBCONTRACTORS AND SUPPLIERS**

SC18.1	3.7.1.1	In paragraph 3.7.1.1 <u>add</u> to the end of the second line the words “including any warranties and service agreements which extend beyond the term of the <i>Contract</i> .”
SC18.2	3.7.1.2	In subparagraph 3.7.1.2 after the words “the <i>Contract Documents</i> ” <u>add</u> the words “including any required surety bonding”.
SC18.3	3.7.2	<u>Delete</u> paragraph 3.7.2. in its entirety and <u>replace</u> it with the following:  “3.7.2 The substitution of any <i>Subcontractor</i> and/or <i>Suppliers</i> after submission of the <i>Contractor’s</i> bid will not be accepted unless a valid reason is given in writing to and approved by the <i>Owner</i> , whose approval may be arbitrarily withheld. The reason for substitution must be provided to the <i>Owner</i> and to the original <i>Subcontractor</i> and/or <i>Supplier</i> and the <i>Subcontractor</i> and/or <i>Supplier</i> shall be given the opportunity to reply to the <i>Contractor</i> and <i>Owner</i> . The <i>Contractor</i> shall be fully aware of the capability of each <i>Subcontractor</i> and/or <i>Supplier</i> included in its bid, including but not limited to technical ability, financial stability and ability to maintain the proposed construction schedule.”
SC18.4	3.7.7, 3.7.8 & 3.7.9	<u>Add</u> new paragraphs 3.7.7, 3.7.8, and 3.7.9 as follows:  “3.7.7 The <i>Consultant</i> or the <i>Owner</i> , acting reasonably, may from time to time require the <i>Contractor</i> to remove from the <i>Project</i> any personnel of the <i>Contractor</i> , including project managers, superintendents or <i>Subcontractors</i> . Such persons shall be replaced by the <i>Contractor</i> in a timely fashion to the satisfaction of the <i>Consultant</i> or the <i>Owner</i> , as the case may be, at no cost to the <i>Owner</i> .  3.7.8 Where provided in the <i>Contract</i> , the <i>Owner</i> may assign to the <i>Contractor</i> , and the <i>Contractor</i> agrees to accept, any contract procured by the <i>Owner</i> for <i>Work</i> or services required on the <i>Project</i> that has been pre-tendered or pre-negotiated by the <i>Owner</i> , and upon such assignment, the <i>Owner</i> shall have no further liability to any party for such contract.  3.7.9 The <i>Contractor</i> covenants that each subcontract or supply contract which the <i>Contractor</i> enters into for the purpose of performing the <i>Work</i> shall expressly provide for the assignment thereof to the <i>Owner</i> (at the option of the <i>Owner</i> ) and the assumption by the <i>Owner</i> of the obligations of the <i>Contractor</i>

		<p>thereunder, upon the termination of the <i>Contract</i> and upon written notice by the <i>Owner</i> to the other parties to such subcontracts or supply contracts, without the imposition of further terms or conditions; provided, however, that until the <i>Owner</i> has given such notice, nothing herein contained shall be deemed to create any contractual or other liability upon the <i>Owner</i> for the performance of obligations under such subcontracts or supply contracts and the <i>Contractor</i> shall be fully responsible for all of its obligations and liabilities (if any) under such subcontracts and supply contracts.”</p>
--	--	---

**SC19 GC 3.8 LABOUR AND PRODUCTS**

SC19.1	3.8.2	<p><u>Delete</u> paragraph 3.8.2 and <u>substitute</u> with the following:</p> <p>“3.8.2 <i>Products</i> 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 <i>Place of the Work</i>, unless otherwise specified. <i>Products</i> which are not specified shall be of a quality consistent with those specified and their use acceptable to the <i>Consultant</i>. <i>Products</i> brought on to the <i>Place of the Work</i> by the <i>Contractor</i> shall be deemed to be the property of the <i>Owner</i>, but the <i>Owner</i> shall be under no liability for loss thereof or damage thereto arising from any cause whatsoever. The said <i>Products</i> shall be at the sole risk of the <i>Contractor</i>. Workmanship shall be, in every respect, first class and the <i>Work</i> shall be performed in accordance with the best modern industry practice.”</p>
SC19.2	3.8.3	<p><u>Amend</u> paragraph 3.8.3 by <u>adding</u> the words, “..., agents, <i>Subcontractors</i> and <i>Suppliers</i>...” after the word “employees” in the first line.</p>
SC19.3	3.8.4 to 3.8.8	<p><u>Add</u> new paragraphs 3.8.4, 3.8.5, 3.8.6, 3.8.7, and 3.8.8 as follows:</p> <p>“3.8.4 Upon receipt of a <i>Notice in Writing</i> from the <i>Owner</i>, the <i>Contractor</i> shall immediately remove from the <i>Place of the Work</i>, tradesmen and labourers or anyone whose conduct jeopardizes the safety of the <i>Owner’s</i> operations or who are considered by the <i>Owner</i> or the <i>Consultant</i> to be unskilled or otherwise objectionable. Immediately upon receipt of the</p>

		<p>request, the <i>Contractor</i> shall make arrangements to appoint an acceptable replacement.</p> <p>3.8.5 The <i>Contractor</i> shall cooperate with the <i>Owner</i> and its representatives and shall take all reasonable and necessary actions to maintain stable and harmonious labour relations with respect to the <i>Work</i> at the <i>Place of the Work</i>, including cooperation to attempt to avoid <i>Work</i> stoppages, trade union jurisdictional disputes and other <i>Labour Disputes</i>. Any costs arising from labour disputes shall be at the sole expense of the <i>Contractor</i>.</p> <p>3.8.6 The cost for overtime required beyond the normal <i>Working Day</i> to complete individual construction operations of a continuous nature, such as pouring or finishing of concrete or similar work, or <i>Work</i> that the <i>Contractor</i> elects to perform at overtime rates without the <i>Owner</i> requesting it, shall not be chargeable to the <i>Owner</i>.</p> <p>3.8.7 All manufactured <i>Products</i> which are identified by their proprietary names or by part or catalogue number in the <i>Specifications</i> shall be used by the <i>Contractor</i>. No substitutes for such specified <i>Products</i> shall be used without the written approval of the <i>Owner</i> and the <i>Consultant</i>. Substitutes will only be considered by the <i>Consultant</i> when submitted in sufficient time to permit proper review and investigation. When requesting approval for the use of substitutes, the <i>Contractor</i> shall include in its submission any proposed change in the <i>Contract Price</i>. The <i>Contractor</i> shall use all proprietary <i>Products</i> in strict accordance with the manufacturer's directions. Where there is a choice of proprietary <i>Products</i> specified for one use, the <i>Contractor</i> may select any one of the <i>Products</i> so specified for this use.</p> <p>3.8.8 Materials, appliances, equipment and other <i>Products</i> are sometimes specified by reference to brand names, proprietary names, trademarks or symbols. In such cases, the name of a manufacturer, distributor, <i>Supplier</i> or dealer is sometimes given to assist the <i>Contractor</i> to find a source <i>Supplier</i>. This shall not relieve the <i>Contractor</i> from its responsibility from finding its own source of supply even if the source names no longer supplies the <i>Product</i> specified. If the <i>Contractor</i> is unable to obtain the specified <i>Product</i>, the <i>Contractor</i> shall supply a substitute product equal to or better than the specified <i>Product</i>, as approved by the <i>Consultant</i> with no extra compensation.</p>
--	--	--

		Should the <i>Contractor</i> be unable to obtain a substitute <i>Product</i> equal to or superior to the specified <i>Product</i> and the <i>Owner</i> accepts a different <i>Product</i> , the <i>Contract Price</i> shall be adjusted accordingly, as approved by the <i>Consultant</i> ."
--	--	--

**SC20 GC 3.9 DOCUMENTS AT THE SITE**

SC20.1	3.9.1	<u>Delete</u> paragraph 3.9.1 in its entirety and <u>substitute</u> the following: "3.9.1 The <i>Contractor</i> shall keep one copy of the current <i>Contract Documents</i> , <i>Supplemental Instructions</i> , contemplated <i>Change Orders</i> , <i>Change Orders</i> , <i>Change Directives</i> , cash allowance disbursement authorizations, reviewed <i>Shop Drawings</i> , submittals, reports and records of meeting at the <i>Place of the Work</i> , in good order and available to the <i>Owner</i> and <i>Consultant</i> ."
--------	-------	--

**SC21 GC 3.10 SHOP DRAWINGS**

SC21.1	3.10.1	<u>Delete</u> paragraph 3.10.1 in its entirety and <u>replace</u> with the following: "3.10.1 The <i>Contractor</i> shall provide shop drawings as described in the <i>Contract Documents</i> and as the <i>Consultant</i> may reasonably request."
SC21.2	3.10.3	<u>Delete</u> paragraph 3.10.3 and <u>replace</u> it with the following: "3.10.3 The <i>Contractor</i> shall prepare a <i>Shop Drawings</i> schedule acceptable to the <i>Owner</i> and the <i>Consultant</i> prior to the first application for payment. A draft of the proposed <i>Shop Drawings</i> schedule shall be submitted by the <i>Contractor</i> to the <i>Consultant</i> and the <i>Owner</i> for approval. The draft <i>Shop Drawings</i> schedule shall clearly indicate the phasing of <i>Shop Drawings</i> submissions. The <i>Contractor</i> shall periodically re-submit the <i>Shop Drawings</i> schedule to correspond to changes in the <i>Construction Schedule</i> ."
SC21.3	3.10.9	<u>Delete</u> paragraph 3.10.9 in its entirety and <u>substitute</u> the following: "3.10.9 At the time of providing <i>Shop Drawings</i> , the <i>Contractor</i> shall advise the <i>Consultant</i> in writing of any deviations in <i>Shop Drawings</i> from the requirements of the <i>Contract Documents</i> . The <i>Consultant</i> 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.”
SC21.4	3.10.1 3 to 3.10.1 7	<p><u>Add</u> new paragraphs 3.10.13, 3.10.14, 3.10.15, 3.10.16, and 3.10.17 as follows:</p> <p>“3.10.13 Reviewed <i>Shop Drawings</i> shall not authorize a change in the <i>Contract Price</i> and/or the <i>Contract Time</i>.</p> <p>3.10.14 Except where the parties have agreed to a different <i>Shop Drawings</i> schedule pursuant to paragraph 3.10.3, the <i>Contractor</i> shall comply with the requirements for <i>Shop Drawings</i> submissions stated in the <i>Specifications</i>.</p> <p>3.10.15 The <i>Contractor</i> shall not use the term “by others” on <i>Shop Drawings</i> or other submittals. The related trade, <i>Subcontractor</i> or <i>Supplier</i> shall be stated.</p> <p>3.10.16 Certain <i>Specifications</i> sections require the <i>Shop Drawings</i> to bear the seal and signature of a professional engineer. Such professional engineer must be registered in the jurisdiction of the <i>Place of the Work</i> and shall have expertise in the area of practice reflected in the <i>Shop Drawings</i>.</p> <p>3.10.17 The <i>Consultant</i> will review and return <i>Shop Drawings</i> and submittals in accordance with the schedule agreed upon in paragraph 3.10.3, The <i>Contractor</i> shall allow the <i>Consultant</i> a minimum of 10 <i>Working Days</i> to review <i>Shop Drawings</i> from the date of receipt. If resubmission of <i>Shop Drawings</i> is required, a further 10 <i>Working Day</i> period is required for the <i>Consultant’s</i> review.”</p>

**SC22 GC 3.11 USE OF THE WORK**

SC22.1	3.11.1	In the second line between the words “permits, or” <u>add</u> , “by direction of the <i>Owner</i> or <i>Consultant</i> ”.
SC22.2	3.11.3	<p><u>Add</u> new paragraph 3.11.3 as follows:</p> <p>“3.11.3 The <i>Owner</i> shall have the right to enter or occupy the <i>Work</i> in whole or in part for the purpose of placing fittings and equipment, or for other use before <i>Substantial Performance of the Work</i>, if, in the opinion of the <i>Consultant</i>, such entry and occupation does not prevent or substantially interfere with the</p>

		<p><i>Contractor</i> in the performance of the <i>Contract</i> within the <i>Contract Time</i>. Such entry or occupation shall neither be considered as acceptance of the <i>Work</i>, nor in any way relieve the <i>Contractor</i> from its responsibility to complete the <i>Contract</i>.”</p>
--	--	---

**SC23 GC 3.12 CUTTING AND REMEDIAL WORK**

SC23.1	3.12.5 & 3.12.6	<p><u>Add</u> new paragraphs 3.12.5 and 3.12.6 as follows:</p> <p>“3.12.5 Unless specifically stated otherwise in the <i>Specifications</i>, the <i>Contractor</i> shall do all cutting and making good necessary for the proper installation and performance of the <i>Work</i>.</p> <p>3.12.6 To avoid unnecessary cutting, the <i>Contractor</i> shall lay out its work and advise the <i>Subcontractors</i>, when necessary, where to leave holes for installation of pipes and other work.”</p>
--------	-----------------------	--

**SC24 GC 3.13 CLEAN UP**

SC24.1	3.13.1	<p>At the end of the paragraph 3.13.1, <u>add</u> the following:</p> <p>“The <i>Contractor</i> shall remove accumulated waste and debris at least once a week as a minimum or as required by the nature of the <i>Work</i>.”</p>
SC24.2	3.13.2	<p>In paragraph 3.13.2, in the fourth line <u>Add</u> the word “materials” between the word “tools” and the words “<i>Construction Equipment</i>”.</p>
SC24.3	3.13.3	<p>In paragraph 3.13.3, in the first and second lines <u>Add</u> the word “materials” between the word “tools” and the words “<i>Construction Equipment</i>”</p> <p>-and-</p> <p>In paragraph 3.13.3 <u>delete</u> the words “Prior to application for the final payment,” and <u>replace</u> them with “As a condition precedent to submitting its application for final payment,”.</p>
SC24.4	3.13.4 & 3.13.5	<p><u>Add</u> new paragraphs 3.13.4 and 3.13.5 as follows:</p> <p>“3.13.4 The <i>Contractor</i> shall clean up garbage during and after construction and maintain the <i>Place of the Work</i> in a neat and orderly condition on a daily basis. Prior to leaving the <i>Place of the Work</i> and following completion of the <i>Work</i>, the <i>Contractor</i> shall make good all damage to the building and its components</p>



		<p>caused by the performance of the <i>Work</i> or by any <i>Subcontractor</i> or <i>Supplier</i>. The <i>Contractor</i> shall leave the <i>Place of the Work</i> in a clean and finished state; remove all <i>Construction Equipment</i> and materials; remove all paint, stains, labels, dirt, etc. from the <i>Place of the Work</i>; and touch up all damaged painted areas (if applicable). The <i>Contractor</i> shall be responsible for restoring those areas of the <i>Place of the Work</i>, impacted by the <i>Work</i>, to their original condition.”</p> <p>3.13.5 Without limitation to or waiver of the <i>Owner’s</i> other rights and remedies, the <i>Owner</i> shall have the right to back charge to the <i>Contractor</i> the cost of damage to the site caused by transportation in and out of the <i>Place of the Work</i> by the <i>Contractor</i>, <i>Subcontractors</i> or <i>Suppliers</i>, if not repaired before final payment.</p> <p>3.13.6 The <i>Contractor</i> shall dispose of debris at a location and in a manner acceptable to the <i>Owner</i> (and to the authorities having jurisdiction at the <i>Place of the Work</i> and at the disposal area) and the <i>Contractor</i> shall cover containers with tarpaulins.”</p>
--	--	--

**SC25 \*NEW\* GC 3.14 CONTRACTOR STANDARD OF CARE**

SC25.1	3.14	<p><u>Add</u> a new GC 3.14 – CONTRACTOR STANDARD OF CARE as follows:</p> <p><b>“GC 3.14 CONTRACTOR STANDARD OF CARE</b></p> <p>“3.14.1 In performing its services and obligations under the <i>Contract</i>, the <i>Contractor</i> shall exercise the standard of care, skill and diligence that would normally be provided by an experienced and prudent contractor supplying similar services for similar projects. The <i>Contractor</i> acknowledges and agrees that throughout the <i>Contract</i>, the performance of the <i>Contractor’s</i> obligations, duties and responsibilities shall be interpreted in accordance with this standard. The <i>Contractor</i> shall exercise the same standard of care, skill and diligence in respect of any <i>Products</i>, personnel or procedures which it may recommend to the <i>Owner</i> or employ on the <i>Project</i>.</p> <p>3.14.2 The <i>Contractor</i> further represents, covenants and warrants to the <i>Owner</i> that:</p>
--------	------	--

		<p>.1 the personnel it assigns to the <i>Project</i> are appropriately experienced;</p> <p>.2 it has a sufficient staff of qualified and competent personnel to replace any of its appointed representatives, subject to the <i>Owner's</i> approval, in the event of death, incapacity, removal or resignation; and</p> <p>.3 there are no pending, threatened or anticipated claims, liabilities or contingent liabilities that would have a material effect on the financial ability of the <i>Contractor</i> to perform its work under the <i>Contract</i>.”</p>
--	--	--

**SC26 \*NEW\* GC 3.15 OCCUPANCY OF THE WORK**

SC26.1	3.15.1	<p><u>Add</u> a new GC 3.15 – OCCUPANCY OF THE WORK as follows:</p> <p><b>“GC 3.15 OCCUPANCY OF THE WORK</b></p> <p>3.15.1 The <i>Owner</i> reserves the right to take possession of and use for any intended purpose any portion or all of the undelivered portion of the <i>Project</i> even though the <i>Work</i> may not be substantially performed, progress of the work shall continue in such a way that it will not interfere with use of the occupied space or operation of the facility. The taking of possession or use of any such portion of the <i>Project</i> shall not be deemed to be the <i>Owner's</i> acknowledgement or acceptance of the <i>Work</i> or the <i>Project</i>, nor shall it relieve the <i>Contractor</i> of any of its obligations under the <i>Contract</i>.</p> <p>3.15.2 Whether the <i>Project</i> contemplates <i>Work</i> by way of renovations in buildings which will be in use or be occupied during the course of the <i>Work</i> or where the <i>Project</i> involves <i>Work</i> that is adjacent to a structure which is in use or is occupied, the <i>Contractor</i>, without in any way limiting its responsibilities under the <i>Contract</i>, shall take all reasonable steps to avoid interference with fire exits, building access and egress, continuity of electric power and all other utilities, the operation of HVAC systems, to suppress dust and noise and to avoid conditions likely to propagate mould or fungus of any kind and all other steps reasonably necessary to promote and maintain the safety and comfort of the users and occupants of such structures or adjacent structures.”</p>
--------	--------	--

**PART 4 ALLOWANCES**

**SC27 GC 4.1 CASH ALLOWANCES**

SC27.1	4.1.1	<u>Delete</u> the second sentence in paragraph 4.1.1.
SC27.2	4.1.4	<u>Delete</u> paragraph 4.1.4 in its entirety and <u>replace</u> it with the following:  “4.1.4 Where the actual cost of the <i>Work</i> under any cash allowance exceeds the amount of the allowance, any unexpended amounts from other cash allowances shall be reallocated, at the <i>Consultant’s</i> direction, to cover the shortfall, and, in that case, there shall be no additional amount added to the <i>Contract Price</i> for overhead and profit. Only where the actual cost of the <i>Work</i> under all cash allowances exceeds the total amount of all cash allowances shall the <i>Contractor</i> be compensated for the excess incurred and substantiated, plus an amount for overhead and profit on the excess only, as set out in the <i>Contract Documents</i> .”
SC27.3	4.1.5	<u>Delete</u> paragraph 4.1.5 in its entirety and <u>substitute</u> the following:  “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 <i>Contract Price</i> by <i>Change Order</i> without any adjustment for the <i>Contractor’s</i> overhead and profit on such amount.”
SC27.4	4.1.8 & 4.1.9	<u>Add</u> new paragraphs 4.1.8 and 4.1.9 as follows:  “4.1.8 The <i>Owner</i> reserves the right to call, or to have the <i>Contractor</i> call, for competitive bids for portions of the <i>Work</i> , which are to be paid for from cash allowances.  4.1.9 Cash allowances cover the net cost to the <i>Contractor</i> of services, <i>Products</i> , <i>Construction Equipment</i> , freight, unloading, handling, storage, installation, provincial sales tax, and other authorized expenses incurred in performing any <i>Work</i> stipulated under the cash allowances but does not include any <i>Value Added Taxes</i> payable by the <i>Owner</i> and the <i>Contractor</i> .”

**PART 5 PAYMENT**

**SC28 GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER**

SC28.1	5.1	<u>Delete</u> GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER and all paragraphs thereunder, including any reference to GC 5.1 throughout the <i>Contract</i> .
--------	-----	--

**SC29 GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT**

SC29.1	5.2.1	<p><u>Delete</u> paragraph 5.2.1 and <u>replace</u> it with the following:</p> <p>“5.2.1 Upon execution of the <i>Contract</i>, and in any event prior to the <i>Contractor</i> submitting its first application for payment, the <i>Owner</i> shall issue a purchase order to the <i>Contractor</i> for the performance of the <i>Contract</i>. The number indicated on such purchase order must be clearly identifiable on all applications for payment. Applications for payment shall be dated the last day of each month or an alternative day of each month agreed to in writing by the parties, with each month representing one payment period under the <i>Contract</i> (each a “<b>Payment Period</b>”). Within 3 calendar days of the end of each <i>Payment Period</i>, the <i>Contractor</i> will submit a draft application for payment to the <i>Owner</i> and the <i>Consultant</i>. Upon receipt of the draft application for payment, and within 7 calendar days, a representative of each of the <i>Contractor</i>, <i>Owner</i>, and the <i>Consultant</i> shall attend a meeting to discuss and review the work completed during the <i>Payment Period</i>, including quantities, if applicable (the “<b>Pre-Invoice Submission Meeting</b>”). In the event that the scheduled date for the <i>Pre-Invoice Submission Meeting</i> is not a <i>Working Day</i>, the <i>Pre-Invoice Submission Meeting</i> shall occur on the next <i>Working Day</i>. The <i>Contractor</i> shall bring with it to the <i>Pre-Invoice Submission Meeting</i> the following:</p> <ol style="list-style-type: none"> <li>.1 a copy of the draft application for payment;</li> <li>.2 any documents the <i>Contractor</i> is required to bring to the <i>Pre-Invoice Submission Meeting</i> as stipulated in the <i>Contract Documents</i> or as reasonably requested by the <i>Owner</i>; and</li> <li>.3 any other documents reasonably requested, in advance, by the <i>Owner</i> or the <i>Consultant</i>.”</li> </ol>
SC29.2	5.2.2	<u>Delete</u> paragraph 5.2.2 in its entirety and <u>replace</u> it with the following:

		<p>“5.2.2 Applications for payment shall be given in accordance with the following requirements:</p> <ul style="list-style-type: none"> <li>.1 within 5 calendar days following the <i>Pre-Invoice Submission Meeting</i>, the <i>Contractor</i> shall deliver its application for payment to the <i>Owner</i> and to the <i>Consultant</i> for <i>Work</i> performed during the <i>Payment Period</i> (“<b>Proper Invoice Submission Date</b>”) subject to the following: <ul style="list-style-type: none"> <li>.1 if the fifth calendar day following the <i>Pre-Invoice Submission Meeting</i>, to which an invoice relates falls on a day that is not a <i>Working Day</i>, the <i>Proper Invoice Submission Date</i> shall be deemed to fall on the next <i>Working Day</i>.</li> </ul> </li> <li>.2 the application for payment must be delivered to the <i>Owner</i> and to the <i>Consultant</i> in the same manner as a <i>Notice in Writing</i> during the hours of 9:00 am to 4:00pm (EST) on the <i>Proper Invoice Submission Date</i>. Delivery to the <i>Owner</i> shall be to the following address: finance-ap@wrdsb.ca</li> <li>.3 If an application for payment is received after 4:00 p.m. (EST) on the applicable <i>Proper Invoice Submission Date</i>, the application for payment will not be considered or reviewed by the <i>Owner</i> and <i>Consultant</i> until the next <i>Proper Invoice Submission Date</i>. Notwithstanding the foregoing, the <i>Owner</i> in its sole and absolute discretion may elect to accept an application for payment submitted after 4:00 p.m. on the applicable <i>Proper Invoice Submission Date</i>; however, such acceptance shall not be construed as a waiver of any of its rights or waive or release the <i>Contractor’s</i> obligations to strictly comply with the requirements prescribed in this subparagraph 5.2.2.3.</li> <li>.4 No applications for payment shall be accepted by the <i>Owner</i> prior to the <i>Proper Invoice Submission Date</i>.”</li> </ul>
SC29.3	5.2.3	<p><u>Delete</u> paragraph 5.2.3 and <u>replace</u> it with the following:</p> <p>“5.2.3 The amount claimed shall be for the value, proportionate to the amount of the <i>Contract</i>, of <i>Work</i> performed and <i>Products</i> delivered and incorporated into the <i>Work</i> as of the last date of</p>

		the applicable <i>Payment Period</i> . Materials may also be deemed to be supplied to an improvement, for payment purposes, when, in the <i>Owner's</i> opinion, they are placed and properly secured on the land on which the improvement is made, or placed upon land designated by the <i>Owner</i> or agent of the <i>Owner</i> , but placing the materials on the land so designated does not, of itself, make that land subject to a lien. 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. No amount claimed shall include <i>Products</i> delivered to the <i>Place of the Work</i> unless the <i>Products</i> are free and clear of all security interests, liens, and other claims of third parties.”
SC29.4	5.2.4	After the word “ <i>Consultant</i> ” in paragraph 5.2.4 <u>add</u> the words “and the <i>Owner</i> ”
SC29.5	5.2.5	After the word “ <i>Consultant</i> ” in the first line of paragraph 5.2.5 <u>add</u> the words “or the <i>Owner</i> ”  -and-  In the second line, <u>delete</u> the word “ <i>Consultant</i> ” and <u>replace</u> it with “ <i>Owner</i> ”.
SC29.6	5.2.7	<u>Delete</u> paragraph 5.2.7 and <u>replace</u> it with the following:  “5.2.7 The <i>Contractor</i> shall prepare and maintain current as-built drawings which shall consist of the <i>Drawings</i> and <i>Specifications</i> revised by the <i>Contractor</i> during the <i>Work</i> , showing changes to the <i>Drawings</i> and <i>Specifications</i> , which current as-built drawings shall be maintained by the <i>Contractor</i> and made available to the <i>Consultant</i> for review with each application for progress payment. The <i>Consultant</i> shall recommend to the <i>Owner</i> that the <i>Owner</i> retain a reasonable amount for the value of the as-built drawings not presented for review.”

**SC30 GC 5.3**

**PROGRESS PAYMENT**

SC30.1	5.3.1. 1	<u>Add</u> the following words to the end of subparagraph 5.3.1.1:  “and confirm whether all of the criteria for a <i>Proper Invoice</i> are satisfied. If not, the application for payment will be returned to the
--------	-------------	---

		<i>Contractor</i> with reasons from the <i>Owner</i> or the <i>Consultant</i> setting out why the application for payment is not a valid <i>Proper Invoice</i> .”
SC30.2	5.3.1.2	<p><u>Delete</u> paragraph 5.3.1.2 and <u>replace</u> it with the following:</p> <p>“5.3.1.2 Following receipt of a <i>Proper Invoice</i>, the <i>Consultant</i>:</p> <p>.1 will issue to the <i>Owner</i> with a copy to the <i>Contractor</i>, a certificate for payment in the amount applied for, or</p> <p>.2 if the <i>Consultant</i> finds that such other amount is properly due under the application for payment or otherwise finds that the application for payment must be amended, it shall notify the <i>Owner</i> and prepare an applicable <i>Notice of Non-Payment</i> (Form 1.1) with reasons for the amendment.”</p>
SC30.3	5.3.1.3	<p><u>Delete</u> subparagraph 5.3.1.3 in its entirety and <u>substitute</u> as follows:</p> <p>“.3 the <i>Owner</i> shall make payment to the <i>Contractor</i> on account no later than 28 calendar days after the receipt by the <i>Owner</i> of a <i>Proper Invoice</i>, subject to the delivery by the <i>Owner</i> of a <i>Notice of Non-Payment</i> (Form 1.1).”</p>
SC30.4	5.3.2 to 5.3.7	<p><u>Add</u> new paragraphs 5.3.2, 5.3.3, 5.3.4, 5.3.5, 5.3.6, and 5.3.7 as follows:</p> <p>“5.3.2 All payments to the <i>Contractor</i> shall be processed using electronic funds transfer (“<b>EFT</b>”) and deposited directly to the <i>Contractor’s</i> bank account unless agreed to otherwise by the <i>Contractor</i> and the <i>Owner</i> in writing. Prior to the <i>Contractor</i> submitting its <i>Proper Invoice</i>, the <i>Owner</i> shall provide the <i>Contractor</i> with the necessary documents to facilitate EFT payments.</p> <p>5.3.3 Payment shall be deemed to have been made to the <i>Contractor</i> on the date in which funds are transferred via EFT to the <i>Contractor’s</i> bank account.</p> <p>5.3.4 In the event that the <i>Owner</i> disputes the amount claimed as payable in the <i>Proper Invoice</i>, within 14 calendar days of receipt of the <i>Proper Invoice</i>, the <i>Owner</i> shall provide to the <i>Contractor</i>, a <i>Notice of Non-Payment</i> (Form 1.1).</p> <p>5.3.5 Where the <i>Owner</i> has delivered a <i>Notice of Non-Payment</i>, as specified under paragraph 5.3.1.3 or 5.3.4, the <i>Owner</i> and the</p>



		<p><i>Contractor</i> shall first engage in good faith negotiations to resolve the dispute. If within 10 calendar days following the issuance of a <i>Notice of Non-Payment</i>, the <i>Owner</i> and the <i>Contractor</i> cannot resolve the dispute, either party may issue a notice of adjudication in a form prescribed under the <i>Act</i>. The <i>Owner</i> and <i>Contractor</i> will then submit the dispute to <i>Adjudication</i> as set out under PART 8 – DISPUTE RESOLUTION.</p> <p>5.3.6 The amounts disputed and described under the <i>Notice of Non-Payment</i> shall be held by the <i>Owner</i> until all disputed amounts of the <i>Proper Invoice</i> have been resolved pursuant to PART 8 – DISPUTE RESOLUTION. Any portion of the <i>Proper Invoice</i> which is not the subject of the <i>Notice of Non-Payment</i> shall be payable within the time period set out in paragraph 5.3.1.3.</p> <p>5.3.7 The <i>Contractor</i> represents, warrants, and covenants to the <i>Owner</i> that it is familiar with its prompt payment and trust obligations under the <i>Act</i> and will take all required steps and measures to ensure that it complies with the applicable prompt payment and trust provisions under the <i>Act</i> including, without limitation, section 8.1 of the <i>Act</i>. Evidence of the <i>Contractor’s</i> compliance under this GC 5.3.7, including evidence demonstrating that all EFTs by the <i>Owner</i> to the <i>Contractor</i> are kept in a bank account in the <i>Contractor’s</i> name, will be made available to the <i>Owner</i> within 5 <i>Working Days</i> following receipt by the <i>Contractor</i> of a <i>Notice in Writing</i> making such request.”</p>
--	--	--

SC31 GC 5.4

**SUBSTANTIAL PERFORMANCE OF THE WORK**

SC31.1	5.4.2	<p><u>Delete</u> paragraph 5.4.2 in its entirety and <u>substitute</u> the following:</p> <p>“5.4.2 The <i>Consultant</i> will review the <i>Work</i> to verify the validity of the application and shall promptly, and in any event, no later than 30 calendar days after receipt of the <i>Contractor’s</i> complete deficiency list and application:</p> <p>.1 prepare a final deficiency list incorporating all items to be completed or corrected. Each item is to have an indicated value for correction or completion. Determination of the value for <i>Substantial Performance</i> of the <i>Work</i> is defined in GC 5.10 – DEFICIENCY HOLDBACK. The final deficiency list complete with values is to be included with</p>
--------	-------	---

		<p>the <i>Consultant's</i> draft verification and shall be reviewed with the <i>Owner</i> prior to 5.4.2.2.</p> <p>.2 having completed 5.4.2.1:</p> <p>.1 the <i>Consultant</i> shall advise the <i>Contractor</i> in writing that the <i>Work</i> or the designated portion of the <i>Work</i> is not substantially performed and give reasons why, or</p> <p>.2 the <i>Consultant</i> shall state the date of <i>Substantial Performance of the Work</i> in a certificate and issue a copy of that certificate to each the <i>Owner</i> and the <i>Contractor</i>.”</p>
SC31.2	5.4.3	<p><u>Delete</u> paragraph 5.4.3 in its entirety and <u>substitute</u> the following:</p> <p>“5.4.3 Following the issuance of the certificate of <i>Substantial Performance of the Work</i> referenced in subparagraph 5.4.2.2.2:</p> <p>.1 the <i>Contractor</i> shall complete the <i>Work</i> within sixty (60) calendar days;</p> <p>.2 no payments will be processed nor will any <i>Proper Invoices</i> be received by the <i>Owner</i> between <i>Substantial Performance of the Work</i> and the completion of the <i>Work</i>;</p> <p>.3 The <i>Owner</i> reserves the right to contract out any or all unfinished <i>Work</i> if it has not been completed within sixty (60) days of <i>Substantial Performance of the Work</i> without prejudice to any other right or remedy and without affecting the warranty period. The cost of completing the <i>Work</i> including <i>Owner</i> and <i>Consultant</i> wages and materials shall be deducted from the <i>Contract Price</i>.”</p>
SC31.3	5.4.4 to 5.4.6	<p><u>Add</u> new paragraphs 5.4.4, 5.4.5 and 5.4.6:</p> <p>“5.4.4 The <i>Contractor</i> shall publish, in a construction trade newspaper in the area of the location of the <i>Work</i>, a copy of the certificate of <i>Substantial Performance of the Work</i> referred to in GC 5.4.2.2.2 within seven (7) days of receiving a copy of the certificate signed by the <i>Consultant</i>, and the <i>Contractor</i> shall provide suitable evidence of the publication to the <i>Consultant</i> and the <i>Owner</i>. If the <i>Contractor</i> fails to publish such notice, the <i>Owner</i> shall be at liberty to publish said certificate and back-charge the <i>Contractor</i> its reasonable costs for doing so.</p>

		<p>5.4.5 Prior to submitting its written application for <i>Substantial Performance of the Work</i>, the <i>Contractor</i> shall submit to the <i>Consultant</i>:</p> <ul style="list-style-type: none"><li>.1 statutory declaration in the form of CCDC 9;</li><li>.2 WSIB clearance certificate showing good standing;</li><li>.3 updated insurance certificate;</li><li>.4 guarantees;</li><li>.5 warranties;</li><li>.6 certificates;</li><li>.7 final testing and balancing reports;</li><li>.8 distribution system diagrams;</li><li>.9 spare parts;</li><li>.10 maintenance manuals;</li><li>.11 samples;</li><li>.12 reports and correspondence from authorities having jurisdiction in the <i>Place of the Work</i>;</li><li>.13 shop drawings;</li><li>.14 inspection certificates;</li><li>.15 red-lined record drawings from the construction trailer in two copies.</li></ul> <p>and other materials or documentation required to be submitted under the <i>Contract</i>, together with written proof acceptable to the <i>Owner</i> and the <i>Consultant</i> that the <i>Work</i> has been substantially performed in conformance with the requirements of municipal, governmental, and utility authorities having jurisdiction in the <i>Place of the Work</i>. The <i>Consultant</i> shall refuse to certify <i>Substantial Performance of the Work</i> if the submittals referred to in this paragraph 5.4.5 are not provided by the <i>Contractor</i>.</p> <p>5.4.6 The <i>Owner</i> shall withhold, from amounts otherwise payable to the <i>Contractor</i>, an amount not to exceed one (1) percent of the <i>Contract Price</i> as security for the obligation of the <i>Contractor</i> to deliver two copies of the red-lined record drawings.”</p>
--	--	--

**SC32 GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK**

SC32.1	5.5.1.3	<p><u>Add</u> new subparagraph 5.5.1.3 as follows:</p> <p>“.3 submit a statement that no written notices of lien have been received by the <i>Contractor</i>.”</p>
SC32.2	5.5.2	<p><u>Amend</u> paragraph 5.5.2 by <u>adding</u> the following sentence to the end of that paragraph:</p> <p>“Where after thirty (30) days following the publication of the certificate of <i>Substantial Performance of the Work</i>, pursuant to GC 5.4.4, the value of the <i>Work</i> remaining to be complete under the <i>Contract</i>, plus the estimated cost to repair any remaining deficiencies, exceeds the amount of the unpaid balance of the <i>Contract Price</i> (as determined by the <i>Payment Certifier</i>, acting reasonably), the <i>Owner</i> may publish a <i>Notice of Non-Payment</i> of holdback in accordance with the <i>Act</i> (Form 6) and retain an amount from the holdback to supplement the unpaid value of the <i>Contract Price</i> to secure the correction of deficiencies and completion of the <i>Work</i>. Such amounts may include all <i>Consultant</i> and <i>Owner</i> costs including any and all staff and material costs, design, tendering and contractor and supplier costs related to the correction of deficiencies and/or warranty claims.”</p>
SC32.3	5.5.3	<p><u>Delete</u> paragraph 5.5.3 in its entirety.</p>
SC32.4	5.5.4	<p><u>Delete</u> the first and second sentences in paragraph 5.5.4 and <u>replace</u> them with the following:</p> <p>“There being no claims for lien registered against title to the <i>Place of the Work</i>, as confirmed by a title search of the <i>Place of the Work</i> and there being no claims for lien or written notices of lien delivered to the <i>Owner</i>, the holdback amount authorized by the certificate for payment of the holdback amount issued by the <i>Consultant</i>, pursuant to GC 5.5.2, is due and payable on the 61st calendar day following the publication of the certificate of <i>Substantial Performance of the Work</i> referred to in GC 5.4.4. ”</p>
SC32.5	5.5.5	<p><u>Delete</u> paragraph 5.5.5 in its entirety and <u>replace</u> it with the following:</p> <p>“5.5.5 Notwithstanding the <i>Owner’s</i> obligation to make payment of the holdback amount in accordance with GC 5.5.4, the processing of such payment remains subject to the <i>Owner’s</i> internal EFT timing limitations. The <i>Owner</i> covenants, and the <i>Contractor</i> agrees, that payment of the holdback shall be made by EFT at the first opportunity during the <i>Owner’s</i> normal processing of</p>

		EFTs upon the holdback becoming due in accordance with GC 5.5.4.”
--	--	---

**SC33 GC 5.6 PROGRESSIVE RELEASE OF HOLDBACK**

SC33.1	5.6	<u>Delete</u> GC 5.6 in its entirety.
--------	-----	---------------------------------------

**SC34 GC 5.7 FINAL PAYMENT**

SC34.1	5.7.1	<p>In paragraph 5.7.1, <u>delete</u> the words “an application for final payment” and <u>replace</u> them with the following:</p> <p>“an application for final payment that complies with the requirements for a <i>Proper Invoice</i>, accompanied by any documents or materials not yet delivered pursuant to paragraph 5.4.5, together with complete and final as-built drawings. The <i>Contractor</i> shall also provided written certification that there are no outstanding claims, pending claims or future claims from the <i>Contractor</i> or their <i>Subcontractors</i> or <i>Suppliers</i>. The <i>Consultant</i> shall promptly inform the <i>Owner</i> of the receipt the application for final payment and confirm whether all of the criteria for a <i>Proper Invoice</i> are satisfied. If not, the application for payment will be returned to the <i>Contractor</i> with reasons from the <i>Owner</i> or the <i>Consultant</i> setting out why it is not a valid <i>Proper Invoice</i>.”</p>
SC34.2	5.7.2	<p><u>Delete</u> the words “10 calendar days” and <u>replace</u> them with “5 calendar days” from paragraph 5.7.2.</p> <p>-and-</p> <p><u>delete</u> the words “advise the <i>Contractor</i> in writing that the application is valid or give reasons why it is not valid.” and <u>replace</u> them with the following:</p> <p>.1 no later than 5 calendar days after the receipt of the <i>Proper Invoice</i> for final payment, the <i>Consultant</i> will issue to the <i>Owner</i> and copy to the <i>Contractor</i>, a certificate for final payment in the amount applied for, or</p> <p>.2 if the <i>Consultant</i> finds that such other amount is properly due under the <i>Proper Invoice</i> for final payment or otherwise finds that the <i>Proper Invoice</i> for final payment must be amended, it</p>

		shall notify the <i>Owner</i> and prepare a draft <i>Notice of Non-Payment</i> (Form 1.1) with reasons for the amendment.”
SC34.3	5.7.3	<u>Delete</u> paragraph 5.7.3 in its entirety and <u>replace</u> it with the following: “5.7.3 Where the <i>Owner</i> has delivered a <i>Notice of Non-Payment</i> , as specified under paragraph 5.7.2, the <i>Owner</i> and the <i>Contractor</i> shall first engage in good faith negotiations to resolve the dispute. If within 10 calendar days following the issuance of a <i>Notice of Non-Payment</i> , the <i>Owner</i> and <i>Contractor</i> cannot resolve the dispute, either party may issue a notice of adjudication in a form prescribed under the <i>Act</i> . The <i>Owner</i> and <i>Contractor</i> will then submit the dispute to <i>Adjudication</i> as set out under PART 8 – DISPUTE RESOLUTION.”
SC34.4	5.7.4	<u>Delete</u> from the second line of paragraph 5.7.4 the words, “5 calendar days after the issuance of” and <u>substitute</u> the words “28 calendar days after receipt of a <i>Proper Invoice</i> for final payment, subject to the delivery by the <i>Owner</i> of a <i>Notice of Non-Payment</i> (Form 1.1)”.
SC34.5	5.7.5	<u>Add</u> new paragraph 5.7.5 as follows: “5.7.5 The amounts disputed and described under the <i>Notice of Non-Payment</i> shall be held by the <i>Owner</i> until all disputed portions of the <i>Proper Invoice</i> for final payment have been resolved pursuant to PART 8 – DISPUTE RESOLUTION. Any portion of the <i>Proper Invoice</i> which is not the subject of the <i>Notice of Non-Payment</i> shall be payable within the time period set out in paragraph 5.7.4.”

**SC35 GC 5.8 WITHHOLDING OF PAYMENT**

SC35.1	5.8.1	<u>Delete</u> paragraph 5.8.1 and <u>replace</u> with the following: “5.8.1 If because of conditions reasonably beyond the control of the <i>Contractor</i> , there are items of work that cannot be performed, payment in full for that portion of the <i>Work</i> which has been performed as certified by the <i>Consultant</i> shall not be withheld or delayed by the <i>Owner</i> on account thereof, but the <i>Owner</i> may withhold, subject to its requirement to issue a <i>Notice of Non-Payment</i> under the <i>Act</i> , until the remaining portion of the <i>Work</i> is finished, only such an amount that the <i>Consultant</i> determines is sufficient and reasonable to cover the cost of performing such remaining work. The remaining work shall be valued as deficient work as defined in GC 5.10.1.”
--------	-------	--

**SC36 \*NEW\* GC 5.10 DEFICIENCY HOLDBACK**

SC36.1	5.10.1	<p><u>Add</u> new GC 5.10 – DEFICIENCY HOLDBACK as follows:</p> <p><b>“GC 5.10 DEFICIENCY HOLDBACK</b></p> <p>5.10.1 Notwithstanding any provisions contained in the <i>Contract Documents</i> concerning certification and release of monies to the <i>Contractor</i>, the <i>Owner</i> reserves the right to establish a deficiency holdback, at the time of the review for <i>Substantial Performance of the Work</i>, based on a 200% dollar value of the deficiencies listed by the <i>Consultant</i>. The value of work outstanding for the calculation of <i>Substantial Performance of the Work</i> under the <i>Act</i> shall utilize the 100% dollar value. No individual deficiency will be valued at less than two hundred dollars (\$200.00). The deficiency holdback shall be due and payable to the <i>Contractor</i> on the 61<sup>st</sup> day following completion of all of the deficiencies listed by the <i>Consultant</i>, there being no claims for lien registered against the title to the <i>Place of the Work</i> issued in accordance with the <i>Act</i>, and less any amounts disputed under an <i>Owner’s Notice of Non-Payment</i> (Form 1.1).”</p>
--------	--------	---

**PART 6 CHANGES IN THE WORK**

**SC37 GC 6.1 OWNER’S RIGHT TO MAKE CHANGES**

SC37.1	6.1.2	<p><u>Add</u> the following to the end of paragraph 6.1.2:</p> <p>“This requirement is of the essence and it is the express intention of the parties that any claims by the <i>Contractor</i> for a change in the <i>Contract Price</i> and/or <i>Contract Time</i> shall be barred unless there has been strict compliance with PART 6 - CHANGES IN THE WORK. No verbal dealings between the parties and no implied acceptance of alterations or additions to the <i>Work</i> and no claims that the <i>Owner</i> has been unjustly enriched by any alteration or addition to the <i>Work</i>, whether in fact there is any such unjust enrichment or not, shall be the basis of a claim for additional payment under this <i>Contract</i> or a claim for any extension of the <i>Contract Time</i>.”</p>
SC37.2	6.1.3 to 6.1.8	<p><u>Add</u> new paragraphs 6.1.3, 6.1.4, 6.1.5, 6.1.6, 6.1.7 and 6.1.8 as follows:</p> <p>“6.1.3 The <i>Contractor</i> agrees that changes resulting from construction coordination, including but not limited to, site surface</p>

	<p>conditions, site coordination, and <i>Subcontractor and Supplier</i> coordination are included in the <i>Contract Price</i> and the <i>Contractor</i> shall be precluded from making any claim for a change in the <i>Contract Price</i> as a result of such changes.</p> <p>6.1.4 Labour costs shall be actual, prevailing rates at the <i>Place of the Work</i> paid to workers, plus statutory charges on labour including WSIB, unemployment insurance, Canada pension, vacation pay, hospitalization and medical insurance. The <i>Contractor</i> shall provide these rates, when requested by the <i>Consultant</i>, for review and/or agreement.</p> <p>6.1.5 Quotations for changes to the <i>Work</i> shall only include <i>Direct Costs</i> and be accompanied by itemized breakdowns together with detailed, substantiating quotations or cost vouchers from <i>Subcontractors</i> and <i>Suppliers</i>, submitted in a format acceptable to the <i>Consultant</i> and shall include any <i>Direct Costs</i> associated with extensions in <i>Contract Time</i>.</p> <p>6.1.6 When both additions and deletions covering related <i>Work</i> or substitutions are involved in a change to the <i>Work</i>, payment, including <i>Overhead</i> and profit, shall be calculated on the basis of the net difference, if any, with respect to that change in the <i>Work</i>.</p> <p>6.1.7 No extension to the <i>Contract Time</i> shall be granted for changes in the <i>Work</i> unless the <i>Contractor</i> can clearly demonstrate that such changes significantly alter the overall construction schedule submitted at the commencement of the <i>Work</i>. Extensions of <i>Contract Time</i> and all associated costs, if approved, shall be included in the relevant <i>Change Order</i>.</p> <p>6.1.8 When a change in the <i>Work</i> is proposed or required, the <i>Contractor</i> shall within 10 calendar days submit to the <i>Consultant</i> for review a claim for a change in <i>Contract Price</i> and/or <i>Contract Time</i>. Should 10 calendar days be insufficient to prepare the submission, the <i>Contractor</i> shall within 5 calendar days, advise the <i>Consultant</i> in writing of the proposed date of submission of the claim. Claims submitted after the dates prescribed herein will not be considered.”</p>
--	--



SC38 GC 6.2 CHANGE ORDER

SC38.1	6.2.1	<p>In paragraph 6.2.1 after the last sentence in the paragraph <u>add</u> the following:</p> <p>“The adjustment in the <i>Contract Time</i> and the <i>Contract Price</i> shall include an adjustment, if any, for delay or for the impact that the change in the <i>Work</i> has on the <i>Work</i> of the <i>Contractor</i>, and once such adjustment is made, the <i>Contractor</i> shall be precluded from making any further claims for delay or impact with respect to the change in the <i>Work</i>.”</p>
SC38.2	6.2.3 to 6.2.5	<p><u>Add</u> new paragraphs 6.2.3, 6.2.4, and 6.2.5 as follows:</p> <p>“6.2.3 The value of a change shall be determined in one or more of the following methods as directed by the <i>Consultant</i>:</p> <ul style="list-style-type: none"> <li>.1 by estimate and acceptance of a lump sum;</li> <li>.2 by negotiated unit prices which include the <i>Contractor’s</i> overhead and profit, or;</li> <li>.3 by the actual <i>Direct Cost</i> to the <i>Owner</i>, such costs to be the actual cost after all credits included in the change have been deducted, plus the following ranges of mark-up on such costs: <ul style="list-style-type: none"> <li>.1 Contractor on Work of their own forces, 5% overhead, 5 % profit</li> <li>.2 Sub-Contractor on Work of their own forces, 5% overhead, 5% profit</li> <li>.3 Contractor on Work of Sub-Contractor, 5% overhead only,</li> </ul> <p style="margin-left: 40px;">the above includes for all site and office related overhead costs.</p> </li> </ul> <p>6.2.4 All quotations shall include <i>Direct Costs</i> and be submitted in a complete manner listing:</p> <ul style="list-style-type: none"> <li>.1 quantity of each material,</li> <li>.2 unit cost of each material,</li> <li>.3 man hours involved,</li> </ul>

		<p>.4 cost per hour, .5 <i>Subcontractor</i> quotations submitted listing items 1 to 4 above and item 6 below. .6 mark-up.</p> <p>6.2.5 The <i>Owner</i> and the <i>Consultant</i> will not be responsible for delays to the <i>Work</i> resulting from late, incomplete or inadequately broken-down valuations submitted by the <i>Contractor</i>.”</p>
SC38.3		

**SC39 GC 6.3 CHANGE DIRECTIVE**

SC39.1	6.3.6.1	<p><u>Amend</u> paragraph 6.3.6.1 by deleting the final period and adding the following:</p> <p>“.1 Five percent (5%) for profit plus five percent (5%) for overhead on work by the <i>Contractor’s</i> own forces up to the value of \$15,000 and five percent (5%) for profit plus three percent (3%) for <i>Overhead</i> on work by the <i>Contractor’s</i> own forces in excess of \$15,000 and,</p> <p>.2 5 percent (5%) fee on amounts paid to <i>Subcontractors</i> or <i>Suppliers</i> under subparagraph 6.3.7.9 for changes up to the value of \$15,000 and five percent (5%) on changes over \$15,000.</p> <p>Unless a <i>Subcontractor’s</i> or <i>Supplier’s</i> price has been approved by the <i>Owner</i>, the <i>Subcontractor</i> or <i>Supplier</i> shall be entitled to its actual net cost as determined in accordance with paragraph 6.3.7, plus ten percent (5%) for profit and five percent (5%) for <i>Overhead</i> on such actual net cost for changes in the <i>Work</i>, up to the value of \$15,000 and five percent (5%) for profit and three percent (3%) for overhead on such actual net cost changes in the <i>Work</i> in excess of \$15,000.”</p>
SC39.2	6.3.6.2	<p><u>Delete</u> paragraph 6.3.6.2 and <u>replace</u> it with the following:</p> <p>“.2 If a change in the <i>Work</i> results in a net decrease in the <i>Contract Price</i> in excess of \$15,000 the amount of the credit shall be the net cost, with deduction for <i>Overhead</i> and profit. If a change in the <i>Work</i> results in a net decrease in the <i>Contract Price</i> of \$15,000 or less, the amount of the credit shall be the net cost, without deduction for <i>Overhead</i> or profit.</p>

SC39.3	6.3.7. 1	In subparagraph 6.3.7.1 after the words “in the direct employ of the <i>Contractor</i> ” <u>add</u> the words “while directly engaged in the work attributable to the change”.
SC39.4	6.3.7	At the end of paragraph 6.3.7 <u>add</u> the following:  “All other costs attributable to the change in the <i>Work</i> including the costs of all administrative or supervisory personnel are included in <i>Overhead</i> and profit calculated in accordance with the provisions of paragraph 6.1.5.”

**SC40 GC 6.4 CONCEALED OR UNKNOWN CONDITIONS**

SC40.1	6.4.1	<p><u>Delete</u> paragraph 6.4.1 in its entirety and <u>replace</u> with the following:</p> <p>“6.4.1.1 Prior to the submission of the bid on which the <i>Contract</i> was awarded, the <i>Contractor</i> confirms that it carefully investigated the <i>Place of the Work</i> and carried out such tests as it deemed appropriate and, in doing so, applied to that investigation the degree of care and skill required by paragraph 3.14.1. If the <i>Contractor</i> has not conducted such careful investigation, it is deemed to assume all risk of conditions or circumstances now existing or arising in the course of the <i>Work</i> which could make the <i>Work</i> more expensive or more difficult to perform than was contemplated at the time the <i>Contract</i> was executed. No allowances will be made for additional costs and no claims by the <i>Contractor</i> will be entertained in connection with conditions which could reasonably have been ascertained by such investigation or other due diligence undertaken prior to the execution of the <i>Contract</i>.</p> <p>6.4.1.2 No claim by the <i>Contractor</i> will be considered by the <i>Owner</i> or the <i>Consultant</i> in connection with conditions which could reasonably have been ascertained by such investigation or other due diligence undertaken prior to the execution of the <i>Contract</i>.</p> <p>6.4.1.3 The <i>Contractor</i> expressly acknowledges that, prior to the submission of the bid on which the <i>Contract</i> was awarded, the <i>Contractor</i> may have been prevented from carefully investigating the <i>Place of the Work</i> as a result of <i>Force Majeure</i>. Understanding such limitations, the <i>Contractor</i> proceeded with its bid. The <i>Contractor</i> shall not, therefore, make any claim arising from <i>Force Majeure</i> conditions which</p>
--------	-------	--

		may have prevented the <i>Contractor</i> from fulfilling its obligations under this GC 6.4.”
SC40.2	6.4.2	<p><u>Amend</u> paragraph 6.4.2 by <u>adding</u> a new first sentence as follows:</p> <p>“Having regard to paragraph 6.4.1, if the <i>Contractor</i> believes that the conditions of the <i>Place of the Work</i> differ materially from those reasonably anticipated, differ materially from those indicated in the <i>Contract Documents</i> or were concealed from discovery notwithstanding the conduct of the investigation described in paragraph 6.4.1, it shall provide the <i>Owner</i> and the <i>Consultant</i> with <i>Notice in Writing</i> no later than five (5) <i>Working Days</i> after the first observation of such conditions.”</p> <p>-and-</p> <p><u>amend</u> the existing second sentence of paragraph 6.4.2 in the second line, following the word “materially” by <u>adding</u> the words “or were concealed from discovery notwithstanding the conduct of the investigation described in paragraph 6.4.1,”.</p>
SC40.3	6.4.3	<p><u>Delete</u> paragraph 6.4.3 in its entirety and <u>substitute</u> the following:</p> <p>“6.4.3 If the <i>Consultant</i> makes a finding pursuant to paragraph 6.4.2 that no change in the <i>Contract Price</i> or the <i>Contract Time</i> is justified, the <i>Consultant</i> shall report in writing the reasons for this finding to the <i>Owner</i> and the <i>Contractor</i>.”</p>
SC40.4	6.4.5	<p><u>Add</u> new paragraph 6.4.5 as follows:</p> <p>“6.4.5 No claims for additional compensation or for an extension of <i>Contract Time</i> shall be allowed if the <i>Contractor</i> fails to give <i>Notice in Writing</i> to the <i>Owner</i> or <i>Consultant</i>, as required by paragraph 6.4.2.”</p>

**SC41 GC 6.5**

**DELAYS**

SC41.1	6.5.1	In paragraph 6.5.1 <u>delete</u> the words after the word “for” in the fourth line and <u>replace</u> them with the words “...reasonable <i>Direct Costs</i> directly flowing from the delay, but excluding any consequential, indirect or special damages (including, without limitation, loss of profits, loss of opportunity or loss of productivity).”
SC41.2	6.5.2	In paragraph 6.5.2,

		<p><u>delete</u> the words “not issued as the result of an act or fault of the <i>Contractor</i> or any person employed or engaged by the <i>Contractor</i> directly or indirectly,” and <u>replace</u> them with “issued on account of a direct breach, violation, contravention, or a failure to abide by any laws, ordinances, rules, regulations, or codes by the <i>Owner</i>, the <i>Owner’s</i> other contractor(s), or the <i>Consultant</i>, and relating to the <i>Work</i> or the <i>Place of the Work</i>,”</p> <p>-and-</p> <p><u>delete</u> the words after the word “for” in the fourth line of paragraph 6.5.2, and <u>replace</u> them with the words “...reasonable <i>Direct Costs</i> directly flowing from the delay, but excluding any consequential, indirect or special damages (including, without limitation, loss of profits, loss of opportunity or loss of productivity).”</p>
SC41.3	6.5.3	<p><u>Delete</u> paragraph 6.5.3 in its entirety and <u>replace</u> with the following:</p> <p>“6.5.3 If either party is delayed in the performance of their obligations under this <i>Contract</i> by <i>Force Majeure</i>, then the <i>Contract Time</i> shall be extended for such reasonable time as the <i>Owner</i> and the <i>Contractor</i> shall agree. The extension of time shall not be less than the time lost as a result of the event causing the delay, unless the parties agree to a shorter extension. Neither party shall be entitled to payment for costs incurred by such delays. Upon reaching agreement on the extension of the <i>Contract Time</i> attributable to the <i>Force Majeure</i> event, the <i>Owner</i> and the <i>Contractor</i> shall execute a <i>Change Order</i> indicating the length of the extension to the <i>Contract Time</i> and confirming that there are no costs payable by the either party for the extension of <i>Contract Time</i>. However, if at the time an event of <i>Force Majeure</i> arises a party is in default of its obligations under the <i>Contract</i> and has received a notice of default pursuant to PART 7 – DEFAULT NOTICE, this paragraph 6.5.3 shall not excuse a party from its obligation to cure the default(s). For greater certainty, the defaulting party, to the extent possible, must continue to address and cure the default notwithstanding an event of <i>Force Majeure</i>.”</p>
SC41.4	6.5.4	<p><u>Delete</u> paragraph 6.5.4 in its entirety and <u>replace</u> it with the following:</p> <p>“6.5.4 No extension or compensation shall be made for delay or impact on the <i>Work</i> unless notice in writing of a claim is given to the <i>Consultant</i> not later than ten (10) <i>Working Days</i> after the commencement of the delays or impact on the <i>Work</i>, provided</p>

		<p>however, that, in the case of a continuing cause of delay or impact on the <i>Work</i>, only one notice of claim shall be necessary.”</p>
<p>SC41.5</p>	<p>6.5.6 to 6.5.8</p>	<p><u>Add</u> new paragraphs 6.5.6, 6.5.7 and 6.5.8 as follows:</p> <p>“6.5.6 If the <i>Contractor</i> is delayed in the performance of the <i>Work</i> by an act or omission of the <i>Contractor</i> or anyone directly or indirectly employed or engaged by the <i>Contractor</i>, or by any cause within the <i>Contractor’s</i> control, then (i) firstly, at its expense, and to the extent possible, the <i>Contractor</i> shall accelerate the work and/or provide overtime work to recover time lost by a delay arising under this paragraph 6.5.6, and (ii) secondly, where it is not possible for the <i>Contractor</i> to recover the time lost by implementing acceleration measures and/or overtime work, the <i>Contract Time</i> may be extended for such reasonable time as the <i>Owner</i> may decide in consultation with the <i>Consultant</i> and the <i>Contractor</i>. The <i>Owner</i> shall be reimbursed by the <i>Contractor</i> for all reasonable costs incurred by the <i>Owner</i> as the result of such delay, including, but not limited to, <i>Owner’s</i> staff costs, the cost of all additional services required by the <i>Owner</i> from the <i>Consultant</i> or any sub-consultants, project managers, or others employed or engaged by the <i>Owner</i>, and in particular, the costs of the <i>Consultant’s</i> services during the period between the date of <i>Substantial Performance of the Work</i> stated in Article A-1 herein, as the same may be extended through the provision of these General Conditions, and any later or actual date of <i>Substantial Performance of the Work</i> achieved by the <i>Contractor</i>.</p> <p>6.5.7 Without limiting the obligations of the <i>Contractor</i> described in GC 3.2 – CONSTRUCTION BY OWNER OR OTHER CONTRACTORS or GC 9.4 – CONSTRUCTION SAFETY, the <i>Owner</i> or <i>Consultant</i> may, by <i>Notice in Writing</i>, direct the <i>Contractor</i> to stop the <i>Work</i> where the <i>Owner</i> or <i>Consultant</i> determines that there is an imminent risk to the safety of persons or property at the <i>Place of the Work</i>. In the event that the <i>Contractor</i> receives such notice, it shall immediately stop the <i>Work</i> and secure the site. The <i>Contractor</i> shall not be entitled to an extension of the <i>Contract Time</i> or to an increase in the <i>Contract Price</i> unless the resulting delay, if any, would entitle the <i>Contractor</i> to an extension of the <i>Contact Time</i> or the reimbursement of the <i>Contractor’s</i> costs as provided in paragraphs 6.5.1, 6.5.2 or 6.5.3.</p>

		6.5.8 No claim for delay shall be made and the <i>Contract Time</i> shall not be extended due to climatic conditions or arising from the <i>Contractor's</i> efforts to maintain the <i>Construction Schedule</i> ."
--	--	--

**PART 7 DEFAULT NOTICE**

**SC42 GC 7.1 OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT**

SC42.1	7.1.3.4	<u>Add</u> a new subparagraph 7.1.3.4 as follows:  ".4 an "acceptable schedule" as referred to in subparagraph 7.1.3.2. means a schedule approved by the <i>Consultant</i> and the <i>Owner</i> wherein the default can be corrected within the balance of the <i>Contract Time</i> and shall not cause delay to any other aspect of the <i>Work</i> or the work of other contractors, and in no event shall it be deemed to give a right to extend the <i>Contract Time</i> ."
SC42.2	7.1.4.1	<u>Delete</u> subparagraph 7.1.4.1 and <u>replace</u> it with the following:  ".1 correct such default and deduct the cost, including <i>Owner's</i> expenses, thereof from any payment then or thereafter due the <i>Contractor</i> ."
SC42.3	7.1.4.2	<u>Delete</u> subparagraph 7.1.4.2 and <u>replace</u> it with the following:  ".2 by providing <i>Notice in Writing</i> to the <i>Contractor</i> , terminate the <i>Contractor's</i> right to continue with the <i>Work</i> in whole or in part or terminate the <i>Contract</i> , and publish a notice of termination (Form 8) in accordance with the <i>Act</i> ."
SC42.4	7.1.5.3	In subparagraph 7.1.5.3 <u>delete</u> the words: "however, if such cost of finishing the <i>Work</i> is less than the unpaid balance of the <i>Contract Price</i> , the <i>Owner</i> shall pay the <i>Contractor</i> the difference"
SC42.5	7.1.6	<u>Delete</u> paragraph 7.1.6 in its entirety.
SC42.6	7.1.6 to 7.1.10	<u>Add</u> new paragraphs 7.1.6, 7.1.7, 7.1.8, 7.1.9 and 7.1.10 as follows:  "7.1.6 In addition to its right to terminate the <i>Contract</i> set out herein, the <i>Owner</i> may terminate this <i>Contract</i> at any time for any other reason and without cause upon giving the <i>Contractor</i> fifteen (15) <i>Working Days Notice in Writing</i> to that effect. In such event, the <i>Contractor</i> shall be entitled to be paid for all <i>Work</i> performed including reasonable profit, for loss sustained

		<p>upon <i>Products</i> and <i>Construction Equipment</i>, and such other damages as the <i>Contractor</i> may have sustained as a result of the termination of the <i>Contract</i>, but in no event shall the <i>Contractor</i> be entitled to be compensated for any loss of profit on unperformed portions of the <i>Work</i>, or indirect, special, or consequential damages incurred.</p> <p>7.1.7 The <i>Owner</i> may suspend <i>Work</i> under this <i>Contract</i> at any time for any reason and without cause upon giving the <i>Contractor</i> <i>Notice in Writing</i> to that effect. In such event, the <i>Contractor</i> shall be entitled to be paid for all <i>Work</i> performed to the date of suspension and be compensated for all actual costs incurred arising from the suspension, including reasonable profit, for loss sustained upon <i>Products</i> and <i>Construction Equipment</i>, and such other damages as the <i>Contractor</i> may have sustained as a result of the suspension of the <i>Work</i>, but in no event shall the <i>Contractor</i> be entitled to be compensated for any indirect, special, or consequential damages incurred. In the event that the suspension continues for more than thirty (30) calendar days, the <i>Contract</i> shall be deemed to be terminated and the provisions of paragraph 7.1.6 shall apply.</p> <p>7.1.8 In the case of either a termination of the <i>Contract</i> or a suspension of the <i>Work</i> under GC 7.1 - OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, OR TERMINATE THE CONTRACT or GC 7.2 - CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the <i>Contractor</i> shall use its best commercial efforts to mitigate the financial consequences to the <i>Owner</i> arising out of the termination or suspension, as the case may be.</p> <p>7.1.9 Upon the resumption of the <i>Work</i> following a suspension under GC 7.1 - OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, OR TERMINATE THE CONTRACT or GC 7.2 - CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the <i>Contractor</i> will endeavour to minimize the delay and financial consequences arising out of the suspension.</p> <p>7.1.10 The <i>Contractor's</i> obligations under the <i>Contract</i> as to quality, correction, and warranty of the <i>Work</i> performed by the <i>Contractor</i> up to the time of termination or suspension shall</p>
--	--	--



		continue after such termination of the <i>Contract</i> or suspension of the <i>Work</i> .”
--	--	--

**SC43 GC 7.2 CONTRACTOR’S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT**

SC43.1	7.2.2	<p><u>Delete</u> paragraph 7.2.2 and <u>replace</u> it with the following:</p> <p>“7.2.2 If the <i>Work</i> is suspended or otherwise delayed for a period of 40 consecutive <i>Working Days</i> or more under a stop work order issued by a court or other public authority on account of a breach, violation, contravention, or a failure to abide by any laws, ordinances, rules, regulations, or codes directly by the <i>Owner</i>, the <i>Owner’s</i> other contractor(s), or the <i>Consultant</i>, and relating to the <i>Work</i> or the <i>Place of the Work</i>, the <i>Contractor</i> may, without prejudice to any other right or remedy the <i>Contractor</i> may have, terminate the <i>Contract</i> by giving the <i>Owner</i> Notice in <i>Writing</i> to that effect.”</p>
SC43.2	7.2.3 .1	<u>Delete</u> subparagraph 7.2.3.1 in its entirety.
SC43.3	7.2.3 .2	<u>Delete</u> subparagraph 7.2.3.2 in its entirety.
SC43.4	7.2.3 .4	In subparagraph 7.2.3.4, <u>delete</u> the words "except for GC 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER".
SC43.5	7.2.5	<p><u>Renumber</u> paragraph 7.2.5 as paragraph 7.2.6. and <u>add</u> a new paragraph 7.2.5 as follows:</p> <p>“7.2.5 If the default cannot be corrected within the 5 <i>Working Days</i> specified in paragraph 7.2.4, the <i>Owner</i> shall be deemed to have cured the default if it:</p> <ul style="list-style-type: none"> <li>.1 commences correction of the default within the specified time;</li> <li>.2 provides the <i>Contractor</i> with an acceptable schedule for such correction; and,</li> <li>.3 completes the correction in accordance with such schedule.”</li> </ul>

SC43.6	7.2.6	<p><u>Delete</u> paragraph 7.2.6 entirely and <u>replace</u> with the following:</p> <p>“7.2.6 If the <i>Contractor</i> terminates the <i>Contract</i> under the conditions described in GC 7.2 – CONTRACTOR’S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the <i>Contractor</i> shall be entitled to be paid for all <i>Work</i> performed to the date of termination, as determined by the <i>Consultant</i>. The <i>Contractor</i> shall also be entitled to recover the direct costs associated with termination, including the costs of demobilization and losses sustained on <i>Products</i> and <i>Construction Equipment</i>. The <i>Contractor</i> shall not be entitled to any recovery for any special, indirect or consequential losses, including loss of profit.”</p>
SC43.7	7.2.7 to 7.2.9	<p><u>Add</u> new paragraphs 7.2.7, 7.2.8 and 7.2.9 as follows:</p> <p>“7.2.7 The <i>Contractor</i> shall not be entitled to give notice of the <i>Owner’s</i> default or terminate the <i>Contract</i> in the event the <i>Owner</i> withholds certificates or payment or both in accordance with the <i>Contract</i> because of:</p> <p>.1 the <i>Contractor’s</i> failure to pay all legitimate claims promptly,</p> <p>or</p> <p>.2 the failure of the <i>Contractor</i> to discharge construction liens which are registered against the title to the <i>Place of the Work</i>.</p> <p>7.2.8 The <i>Contractor’s</i> obligations under the <i>Contract</i> as to quality, correction and warranty of the <i>Work</i> performed by the <i>Contractor</i> up to the effective date of termination shall continue in force and shall survive termination of this <i>Contract</i> by the <i>Contractor</i>.</p> <p>7.2.9 If the <i>Contractor</i> suspends the <i>Work</i> or terminates the <i>Contract</i> as provided for in GC 7.2 – CONTRACTOR’S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the <i>Contractor</i> shall ensure the site and the <i>Work</i> are left in a safe, secure condition as required by authorities having jurisdiction at the <i>Place of the Work</i> and the <i>Contract Documents</i>.”</p>

**SC44 GC 8.1**

**AUTHORITY OF THE CONSULTANT**

SC44.1	8.1.3	<p><u>Delete</u> paragraph 8.1.3 in its entirety and <u>substitute</u> as follows:</p>
--------	-------	--

		<p>“8.1.3 If a dispute is not resolved promptly, the <i>Consultant</i> will give such instruction as in the <i>Consultant’s</i> opinion are necessary for the proper performance of the <i>Work</i> and to prevent delays pending settlement of the dispute. The parties shall act immediately according to such instructions, it being understood that by doing so neither party will jeopardize any claim the party may have.”</p>
--	--	--

**SC45 GC 8.2**

**NEGOTIATION, MEDIATION AND ARBITRATION**

SC45.1	8.2.1	<p><u>Amend</u> paragraph 8.2.1 by changing part of the second line from “shall appoint a <i>Project Mediator</i>” to “may appoint a <i>Project Mediator</i>, except that such an appointment shall only be made if both the <i>Owner</i> and the <i>Contractor</i> agree.”</p>
SC45.2	8.2.4	<p><u>Amend</u> paragraph 8.2.4 by changing part of the second line from “the parties shall request the <i>Project Mediator</i>” to “and subject to paragraph 8.2.1 the parties may request the <i>Project Mediator</i>”.</p>
SC45.3	8.2.6 to 8.2.8	<p><u>Delete</u> paragraphs 8.2.6, 8.2.7 and 8.2.8 in their entirety.</p>
SC45.4	8.2.6	<p><u>Add</u> new paragraph 8.2.6 as follows:  “8.2.6 The dispute may be finally resolved by arbitration under the Rules for Arbitration of Construction Disputes as provided in CCDC 40 in effect at the time of bid closing, provided that both the <i>Contractor</i> and the <i>Owner</i> agree. If the <i>Contractor</i> and the <i>Owner</i> agree to resolve the dispute by arbitration, the arbitration shall be conducted in the jurisdiction of the <i>Place of the Work</i>.”</p>
SC45.5	8.2.9 , 8.2.1 0 & 8.2.1 1	<p><u>Add</u> a new paragraphs 8.2.9, 8.2.10, and 8.2.11 as follows:  “8.2.9 Prior to delivering a notice of <i>Adjudication</i> in a form prescribed by the <i>Act</i>, the parties agree to first address all disputes by attending at least one meeting with the <i>Owner’s</i> representative, the <i>Consultant’s</i> representative, and the <i>Contractor’s</i> representative, prior to commencing an <i>Adjudication</i>. The parties agree that such steps will be taken to resolve any disputes in a timely and cost effective manner. If a resolution to the dispute(s) is not made at such a meeting, any party who plans to commence an <i>Adjudication</i> shall provide the other party with 5 <i>Working Days’ Notice in Writing</i> of its intention to issue a notice of <i>Adjudication</i>.”</p>

		<p>8.2.10 Other than where the <i>Contractor</i> is obliged to commence an <i>Adjudication</i> pursuant to an undertaking under the <i>Act</i>, neither the <i>Owner</i> nor the <i>Contractor</i> shall commence an <i>Adjudication</i> during the <i>Restricted Period</i>.</p> <p>8.2.11 Where either party has delivered a notice of <i>Adjudication</i> in a form prescribed by the <i>Act</i>, the procedures and rules set out under the <i>Act</i> and the regulations thereto shall govern the <i>Adjudication</i>.”</p>
--	--	---

**SC46 GC 9.1 PROTECTION OF WORK AND PROPERTY**

SC46.1	9.1.1 .1	<p><u>Delete</u> subparagraph 9.1.1.1 in its entirety and <u>substitute</u> the following: “.1 errors in the <i>Contract Documents</i> which the <i>Contractor</i> could not have discovered applying the standard of care described in paragraph 3.14.1;”</p>
SC46.2	9.1.2	<p><u>Delete</u> paragraph 9.1.2 in its entirety and <u>substitute</u> as follows: “9.1.2 Before commencing any <i>Work</i>, the <i>Contractor</i> shall determine the locations of all underground or hidden utilities and structures indicated in or inferable from the <i>Contract Documents</i>, or that are inferable from an inspection of the <i>Place of the Work</i> exercising the degree of care and skill described in paragraph 3.14.1.”</p>
SC46.3	9.1.5	<p><u>Add</u> new paragraph 9.1.5 as follows: “9.1.5 With respect to any damage to which paragraphs 9.1.3 or 9.1.4 apply, the <i>Contractor</i> shall neither undertake to repair or replace any damage whatsoever to the work of other contractors, or to adjoining property, nor acknowledge that the same was caused or occasioned by the <i>Contractor</i>, without first consulting the <i>Owner</i> and receiving written instructions as to the course of action to be followed from either the <i>Owner</i> or the <i>Consultant</i>. Where, however, there is danger to life, the environment, or public safety, the <i>Contractor</i> shall take such emergency action as it deems necessary to remove the danger.”</p>

**SC47 GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES**

SC47.1	9.2.5 .5	<p><u>Add</u> a new subparagraph 9.2.5.5 as follows:</p> <p>“.5 in addition to the steps described in subparagraph 9.2.5.3, take any further steps it deems necessary to mitigate or stabilize any conditions resulting from encountering toxic or hazardous substances or materials.”</p>
SC47.2	9.2.6	<p><u>Add</u> the following to paragraph 9.2.6, after the word “responsible” in the second line:</p> <p>“or whether any toxic or hazardous substances or materials already at the <i>Place of the Work</i> (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the <i>Contractor</i> or anyone for whom the <i>Contractor</i> 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 damages to the property of the <i>Owner</i> or others,”.</p>
SC47.3	9.2.8	<p><u>Add</u> the following to paragraph 9.2.8, after the word “responsible” in the second line:</p> <p>“or whether any toxic or hazardous substances or materials already at the <i>Place of the Work</i> (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the <i>Contractor</i> or anyone for whom the <i>Contractor</i> 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 damages to the property of the <i>Owner</i> or others,”.</p>
SC47.4	9.2.1 0	<p><u>Add</u> new paragraph 9.2.10 as follows:</p> <p>“9.2.10 The <i>Contractor</i>, <i>Subcontractors</i> and <i>Suppliers</i> shall not bring on to the <i>Place of the Work</i> any toxic or hazardous substances and materials except as required in order to perform the <i>Work</i>. If such toxic or hazardous substances or materials are required, storage in quantities sufficient to allow work to proceed to the end of any current work week only shall be permitted. All such toxic and hazardous materials and substances shall be handled and disposed of only in accordance with all laws and regulations that are applicable at the <i>Place of the Work</i>.”</p>

**SC48 GC 9.4 CONSTRUCTION SAFETY**

SC48.1	9.4.1	<p><u>Delete</u> paragraph 9.4.1 in its entirety and <u>substitute</u> as follows:</p> <p>“9.4.1 The <i>Contractor</i> shall be solely responsible for construction safety at the <i>Place of the Work</i> and for compliance with the rules, regulations, and practices required by the <i>OHSA</i>, including, but not limited to those of the "constructor", and shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the <i>Work</i>. Without limiting the foregoing, the <i>Contractor</i> shall be solely responsible for construction safety in respect of its <i>Consultants</i>, other <i>Consultants</i>, <i>Subcontractors</i> and <i>Suppliers</i>, the <i>Owner's</i> own forces, and other contractors, subcontractors, and suppliers during the course of the <i>Project</i>.”</p>
SC48.2	9.4.2 to 9.4.1 0	<p><u>Add</u> new paragraphs 9.4.2 to 9.4.10 as follows:</p> <p>9.4.2 Prior to the commencement of the <i>Work</i>, the <i>Contractor</i> shall submit to the <i>Owner</i>:</p> <ul style="list-style-type: none"> <li>.1 the evidence of workers' compensation compliance required by GC 10.4.1;</li> <li>.2 copies of the <i>Contractor's</i> insurance policies having application to the <i>Project</i> or certificates of insurance, at the option of the <i>Owner</i>;</li> <li>.3 documentation setting out the <i>Contractor's</i> in-house safety programs;</li> <li>.4 a copy of the "Notice of Project" filed with the Ministry of Labour;</li> <li>.5 copies of any documentation or notices to be filed or delivered to the authorities having jurisdiction for the regulation of occupational health and safety at the <i>Place of the Work</i>.</li> </ul> <p>9.4.3 The <i>Contractor</i> shall indemnify and save harmless the <i>Owner</i>, its agents, trustees, officers, directors, employees, consultants, successors, appointees, and assigns from and against the consequences of any and all safety infractions committed by the <i>Contractor</i> under the occupational health and safety legislation in force at the <i>Place of the Work</i> including the</p>

		<p>payment of legal fees and disbursements on a substantial indemnity basis.</p> <p>9.4.4 The <i>Owner</i> undertakes to include in its contracts with other contractors and in its instructions to its own forces the requirement that the other contractor or its own forces, as the case may be, comply with the policies and procedures of and the directions and instructions from the <i>Contractor</i> with respect to occupational health and safety and related matters.</p> <p>9.4.5 If the <i>Owner</i> is of the reasonable opinion that the <i>Contractor</i> has not taken such precautions as are necessary to ensure compliance with the requirements of paragraph 9.4.1, the <i>Owner</i> may take any remedial measures which it deems necessary, including stopping the performance of all or any portion of the <i>Work</i>, and the <i>Owner</i> may use its employees, the <i>Contractor</i>, any <i>Subcontractor</i> or any other contractors to perform such remedial measures.</p> <p>9.4.6 The <i>Contractor</i> shall file any notices or any similar document required pursuant to the <i>Contract</i> or the safety regulations in force at the <i>Place of the Work</i>. This duty of the <i>Contractor</i> will be considered to be included in the <i>Work</i> and no separate payment therefore will be made to the <i>Contractor</i>.</p> <p>9.4.7 Unless otherwise provided in the <i>Contract Documents</i>, the <i>Contractor</i> shall develop, maintain and supervise for the duration of the <i>Work</i> a comprehensive safety program that will effectively incorporate and implement all required safety precautions. The program shall, at a minimum, respond fully to the applicable safety regulations and general construction practices for the safety of persons or property, including, without limitation, any general safety rules and regulations of the <i>Owner</i> and any workers' compensation or occupational health and safety statutes or regulations in force at the <i>Place of the Work</i>.</p> <p>9.4.8 The <i>Contractor</i> shall provide a copy of the safety program described in paragraph 9.4.7 hereof to the <i>Consultant</i> for delivery to the <i>Owner</i> prior to the commencement of the <i>Work</i>, and shall, ensure, as far as it is reasonably practical to do so, that every employer and worker performing work in respect of the <i>Project</i> complies with such program.</p>
--	--	---

		<p>9.4.9 The <i>Contractor</i> shall arrange regular safety meetings, and shall supply and maintain, at its own expense, at its office or other well-known place at the job site, safety equipment necessary to protect the workers and general public against accident or injury as prescribed by the authorities having jurisdiction at the <i>Place of the Work</i>, including, without limitation, articles necessary for administering first-aid to any person and an emergency procedure for the immediate removal of any injured person to a hospital or a doctor’s care.</p> <p>9.4.10 The <i>Contractor</i> shall promptly report in writing to the <i>Owner</i> and the <i>Consultant</i> all accidents of any sort arising out of or in connection with the performance of the <i>Work</i>, whether on or adjacent to the job site, giving full details and statement of witnesses. If death or serious injuries or damages are caused, the accident shall be promptly reported by the <i>Contractor</i> to the <i>Owner</i> and the <i>Consultant</i> by telephone or messenger in addition to any reporting required under the applicable safety regulations.”</p>
--	--	---

**SC49 GC 10.1 TAXES AND DUTIES**

SC49.1	10.1.2	<p><u>Amend</u> paragraph 10.1.2 by <u>adding</u> the following sentence to the end of the paragraph:</p> <p>“For greater certainty, the <i>Contractor</i> shall not be entitled to any mark-up for overhead or profit on any increase in such taxes and duties and the <i>Owner</i> shall not be entitled to any credit relating to mark-up for overhead or profit on any decrease in such taxes. The <i>Contractor</i> shall provide a detailed breakdown of <u>Additional</u> taxes if requested by the <i>Owner</i> in a form satisfactory to the <i>Owner</i>.”</p>
SC49.2	10.1.3	<p><u>Add</u> new paragraph 10.1.3 as follows:</p> <p>“10.1.3                   Where the <i>Owner</i> is entitled to an exemption or a recovery of sales taxes, customs duties, excise taxes or <i>Value Added Taxes</i> applicable to the <i>Contract</i>, the <i>Contractor</i> shall, at the request of the <i>Owner</i>, 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 <i>Owner</i>. The <i>Contractor</i> agrees to endorse over to the <i>Owner</i> any cheques received from the federal or provincial governments, or any other taxing authority, as may be required to give effect to this paragraph.”</p>



**SC50 GC 10.2 LAWS, NOTICES, PERMITS, AND FEES**

SC50.1	10.2.5	<p><u>Amend</u> paragraph 10.2.5 by <u>adding</u> the words “Subject to paragraph 3.4” at the beginning of the paragraph.</p> <p>-and-</p> <p><u>Add</u> the following to the end of the second sentence:</p> <p>“...and no further <i>Work</i> on the affected components of the <i>Contract</i> shall proceed until these directives have been obtained by the <i>Contractor</i> from the <i>Consultant</i>.”</p>
SC50.2	10.2.6	<p><u>Amend</u> paragraph 10.2.6 by <u>adding</u> the following sentence to the end of the paragraph:</p> <p>“In the event the <i>Owner</i> suffers loss or damage as a result of the <i>Contractor’s</i> failure to comply with paragraph 10.2.5 and notwithstanding any limitations described in paragraph 12.1.1, the <i>Contractor</i> agrees to indemnify and to hold harmless the <i>Owner</i> and the <i>Consultant</i> from and against any claims, demands, losses, costs, damages, actions suits or proceedings resulting from such failure by the <i>Contractor</i>.”</p>
SC50.3	10.2.7	<p><u>Amend</u> paragraph 10.2.7 by inserting the words “which changes were not, or could not have reasonably been known to the <i>Owner</i> or to the <i>Contractor</i>, as applicable, at the time of bid closing and which changes did not arise as a result of a public emergency or other <i>Force Majeure</i> event” to the second line, after the words “authorities having jurisdiction”.</p>
SC50.4	10.2.8	<p><u>Add</u> new paragraph 10.2.8 as follows:</p> <p>“10.2.8       The <i>Contractor</i> shall furnish all certificates that are required or given by the appropriate governmental authorities as evidence that the <i>Work</i> as installed conforms with the laws and regulations of authorities having jurisdiction, including certificates of compliance for the <i>Owner’s</i> occupancy or partial occupancy. The certificates are to be final certificates giving complete clearance of the <i>Work</i>, in the event that such governmental authorities furnish such certificates.”</p>

**SC51 GC 10.4 WORKERS’ COMPENSATION**

SC51.1	10.4.1	<p><u>Delete</u> paragraph 10.4.1 and <u>replace</u> with the following:</p>
--------	--------	--

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

**SC52 GC 11.1 INSURANCE**

SC52.1	11.1	<p><u>Delete</u> entirety of GC 11.1 and <u>replace</u> with the following:</p> <p><b>“GC 11.1 INSURANCE</b></p> <p>11.1.1 Without restricting the generality of GC 12 – INDEMNIFICATION, the <i>Contractor</i> shall provide, maintain, and pay for the insurance coverages specified in GC 11.1 – INSURANCE. Unless otherwise stipulated, the duration of each insurance policy shall be from the date of commencement of the <i>Work</i> until the expiration of the warranty periods set out in the <i>Contract Documents</i>. Prior to commencement of the <i>Work</i> and upon the placement, renewal, <u>amendment</u>, or extension of all or any part of the insurance, the <i>Contractor</i> shall promptly provide the <i>Owner</i> with confirmation of coverage and, if required, a certified true copy of the policies certified by an authorized representative of the insurer together with copies of any <u>amending</u> endorsements.</p> <p><b>.1 General Liability Insurance</b></p> <p>General liability insurance shall be in the name of the <i>Contractor</i>, with the <i>Owner</i> and the <i>Consultant</i> named as <u>Additional insureds</u>, with limits of not less than \$2,000,000.00 inclusive per occurrence for bodily injury, death, and damage to property, including loss of use thereof, for itself and each of its employees, <i>Subcontractors</i> and/or agents. The insurance coverage shall not be less than the insurance required by IBC Form 2100, or its equivalent <u>replacement</u>, provided that IBC Form 2100 shall contain the latest edition of the relevant CCDC endorsement form. To achieve the desired limit,</p>
--------	------	---

		<p>umbrella, or excess liability insurance may be used. All liability coverage shall be maintained for completed operations hazards from the date of <i>Substantial Performance of the Work</i>, as set out in the certificate of <i>Substantial Performance of the Work</i>, on an ongoing basis for a period of 6 years following <i>Substantial Performance of the Work</i>. Where the <i>Contractor</i> maintains a single, blanket policy, the <u>Addition</u> of the <i>Owner</i> and the <i>Consultant</i> is limited to liability arising out of the <i>Project</i> and all operations necessary or incidental thereto. The policy shall be endorsed to provide the <i>Owner</i> with not less than 30 days' notice, in writing, in advance of any cancellation and of change or <u>amendment</u> restricting coverage.</p> <p><b>.2 Automobile Liability Insurance</b></p> <p>Automobile liability insurance in respect of licensed vehicles shall limits of not less than \$2,000,000.00 inclusive per occurrence for bodily injury, death and damage to property, covering all licensed vehicles <i>owned</i> or leased by the <i>Contractor</i>, and endorsed to provide the <i>Owner</i> with not less than 30 days' notice, in writing, in advance of any cancellation, change or <u>amendment</u> restricting coverage. Where the policy has been issued pursuant to a government-operated automobile insurance system, the <i>Contractor</i> shall provide the <i>Owner</i> with confirmation of automobile insurance coverage for all automobiles registered in the name of the <i>Contractor</i>.</p> <p><b>.3 Aircraft and Watercraft Liability Insurance</b></p> <p>Where determined necessary by the <i>Contractor</i>, acting reasonably, aircraft and watercraft liability insurance will be obtained in accordance with the provisions of paragraph 11.1.3. Aircraft and watercraft liability insurance with respect to owned or non-owned aircraft and watercraft if used directly or indirectly in the performance of the <i>Work</i>, including use of <u>Additional</u> premises, shall be subject to limits of not less than \$2,000,000.00 inclusive per occurrence for bodily injury, death and damage to property, including loss of use thereof and limits of not less than \$2,000,000.00 for aircraft passenger hazard. Such insurance shall be in a form acceptable to the <i>Owner</i>. The policies shall be endorsed to provide the <i>Owner</i> with not less than 30 days' notice, in writing, in advance of cancellation, change or <u>amendment</u> restricting coverage.</p> <p><b>.4 Property and Boiler and Machinery Insurance</b></p>
--	--	---

		<p>(1) Builder's Risk property insurance shall be in the name of the <i>Contractor</i> with the <i>Owner</i> and the <i>Consultant</i> named as <u>Additional</u> insureds. The policy shall insure against all risks of direct physical loss or damage to the property insured which shall include all property included in the <i>Work</i>, whether owned by the <i>Contractor</i> or the owner or owned by others, so long as the property forms part of the <i>Work</i>. The property insured also includes all materials and supplies necessary to complete the work, whether installed in the work temporarily or permanently, in storage on the project site, or in transit to the project site, as well as temporary buildings, scaffolding, falsework forms, hoardings, excavation, site preparation and similar work. The insurance shall be for not less than the sum of the amount of the contract price and the full value of products that are specified to be provided by the owner for incorporation into the work, if applicable, with the deductible of \$10,000.00 payable by the contractor. The insurance shall include the foregoing and, otherwise, shall not be less than the insurance required by IBC Form 4042 or its equivalent <u>replacement</u> provided that the IBC Form 4042 shall include the latest <u>Addition</u> of the relevant CCDC endorsement form. The coverage shall be based on a completed value form and shall be maintained continuously until ten (10) days after the date of the final certificate of payment.</p> <p>(2) Boiler and machinery insurance shall be in the name of the <i>Contractor</i>, with the <i>Owner</i> and the <i>Consultant</i> named as <u>Additional</u> insureds, for not less than the <u>replacement</u> value of the boilers, pressure vessels and other insurable objects forming part of the <i>Work</i>. The insurance provided shall not be less than the insurance provided by the "Comprehensive Boiler and Machinery Form" and shall be maintained continuously from commencement of use or operation of the property insured and until 10 days after the date of the final certificate for payment.</p> <p>(3) The policies shall allow for partial or total use or occupancy of the <i>Work</i>.</p> <p>(4) The policies shall provide that, in the case of a loss or damage, payment shall be made to the <i>Owner</i> and the <i>Contractor</i> as their respective interests may appear. The <i>Contractor</i> shall act on behalf of the <i>Owner</i> for the purpose of adjusting the amount of such loss or damage payment with the</p>
--	--	---

		<p>insurers. When the extent of the loss or damage is determined, the <i>Contractor</i> shall proceed to restore the <i>Work</i>. Loss or damage shall not affect the rights and obligations of either party under the <i>Contract</i> except that the <i>Contractor</i> shall be entitled to such reasonable extension of the <i>Contract Time</i>, relative to the extent of the loss or damage, as determined by the <i>Owner</i>, in its sole discretion.</p> <p>(5) The <i>Contractor</i> shall be entitled to receive from the <i>Owner</i>, in <u>Addition</u> to the amount due under the <i>Contract</i>, the amount at which the <i>Owner's</i> interest in restoration of the <i>Work</i> has been appraised, such amount to be paid as the restoration of the <i>Work</i> proceeds and as provided in GC 5.2 – APPLICATIONS FOR PROGRESS PAYMENT and GC 5.3 – PROGRESS PAYMENT. In <u>Addition</u>, the <i>Contractor</i> shall be entitled to receive from the payments made by the insurer the amount of the <i>Contractor's</i> interest in the restoration of the <i>Work</i>.</p> <p>(6) In the case of loss or damage to the <i>Work</i> arising from the work of other contractors, or the <i>Owner's</i> own forces, the <i>Owner</i>, in accordance with the <i>Owner's</i> obligations under paragraph 3.2.2.4 of GC 3.2 – CONSTRUCTION BY OWNER OR OTHER CONTRACTORS, shall pay the <i>Contractor</i> the cost of restoring the <i>Work</i> as the restoration of the <i>Work</i> proceeds and as provided in GC 5.2 – APPLICATIONS FOR PROGRESS PAYMENT and GC 5.3 – PROGRESS PAYMENT.</p> <p><b>.5 Contractors' Equipment Insurance</b></p> <p>"All risks" contractors' equipment insurance covering construction machinery and equipment used by the <i>Contractor</i> for the performance of the <i>Work</i>, excluding boiler insurance, shall be in a form acceptable to the <i>Owner</i> and shall not allow subrogation claims by the insurer against the <i>Owner</i>. The policies shall be endorsed to provide the <i>Owner</i> with not less than 30 days' notice, in writing, in advance of cancellation, change or <u>amendment</u> restricting coverage. Subject to satisfactory proof of financial capability by the <i>Contractor</i> for self-insurance of his equipment, the <i>Owner</i> agrees to waive the equipment insurance requirement.</p> <p>11.1.2 The <i>Contractor</i> shall be responsible for deductible amounts under the policies except where such amounts may</p>
--	--	---

		<p>be excluded from the <i>Contractor's</i> responsibility by the terms of GC 9.1 - PROTECTION OF WORK AND PROPERTY and GC 9.2 - DAMAGES AND MUTUAL RESPONSIBILITY.</p> <p>11.1.3 Where the full insurable value of the <i>Work</i> is substantially less than the <i>Contract Price</i>, the <i>Owner</i> may reduce the amount of insurance required to waive the course of construction insurance requirement.</p> <p>11.1.4 If the <i>Contractor</i> fails to provide or maintain insurance as required by the <i>Contract Documents</i>, then the <i>Owner</i> shall have the right to provide and maintain such insurance and provide evidence of same to the <i>Contractor</i>. The <i>Contractor</i> shall pay the costs thereof to the <i>Owner</i> on demand, or the <i>Owner</i> may deduct the amount that is due or may become due to the <i>Contractor</i>.</p> <p>11.1.5 All required insurance policies shall be with insurers licensed to underwrite insurance in the jurisdiction of the <i>Place of the Work</i>."</p>
--	--	---

**SC53 GC 11.2 CONTRACT SECURITY**

SC53.1	11.2.1	<p><u>Delete</u> paragraph 11.2.1 and <u>replace</u> it with the following:</p> <p>"11.2.1 If required by the <i>Contract Documents</i>, the <i>Contractor</i> shall, prior to the execution of the <i>Contract</i> and within 7 calendar days of receiving <i>Notice in Writing</i> to do so, furnish a performance bond and labour and material payment bond which meets the requirements under paragraph 11.2.2."</p>
SC53.2	11.2.2	<p><u>Delete</u> paragraph 11.2.2 and <u>replace</u> it with the following:</p> <p>"11.2.2 The performance bond and labour and material payment bond, if required, shall:</p> <ul style="list-style-type: none"> <li>.1 be issued by a duly licensed surety company, which has been approved by the <i>Owner</i> and is permitted under the <i>Construction Act</i>,</li> <li>.2 be issued by an insurer licensed under the <i>Insurance Act</i> (Ontario) and authorized to transact a business of suretyship in the Province of Ontario;</li> <li>.3 shall be in the form prescribed by the <i>Act</i>;</li> </ul>

		<p>.4 have a coverage limit of at least 50 per cent of the <i>Contract Price</i>, or such other percentage of the <i>Contract Price</i> as stated in the <i>Contract Documents</i>;</p> <p>.5 extends protection to <i>Subcontractors</i>, <i>Suppliers</i>, and any other persons supplying labour or materials to the <i>Project</i>; and</p> <p>.4 shall be maintained in good standing until the fulfillment of the <i>Contract</i>, including all warranty and maintenance periods set out in the <i>Contract Documents</i>.”</p>
SC53.3	11.2.3	<p><u>Add</u> new paragraph 11.2.3 as follows:</p> <p>“11.2.3 It is the intention of the parties that the performance bond shall be applicable to all of the <i>Contractor’s</i> obligations in the <i>Contract Document</i> and, wherever a performance bond is provided with language which conflicts with this intention, it shall be deemed to be amended to comply. The <i>Contractor</i> represents and warrants to the <i>Owner</i> that it has provided its surety with a copy of the <i>Contract Documents</i> prior to the issuance of such bonds.”</p>

**SC54 GC 12.1 INDEMNIFICATION**

SC54.1	12.1	<p><u>Delete</u> GC 12.1 – INDEMNIFICATION in its entirety and <u>substitute</u> as follows:</p> <p>“12.1.1 The <i>Contractor</i> shall indemnify and hold harmless the <i>Owner</i>, its parent, subsidiaries and affiliates, their respective partners, trustees, officers, directors, agents and employees and the <i>Consultant</i> from and against any and all claims, liabilities, expenses, demands, losses, damages, actions, costs, suits, or proceedings (hereinafter called “claims”), whether in respect of claims suffered by the <i>Owner</i> or in respect of claims by third parties, that directly or indirectly arise out of, or are attributable to, the acts or omissions of the <i>Contractor</i>, its employees, agents, <i>Subcontractors</i>, <i>Suppliers</i> or any other persons for whom it is in law responsible (including, without limitation, claims that directly or indirectly arise out of, or are attributable to, loss of use or damage to the <i>Work</i>, the <i>Owner’s</i> property or equipment, the <i>Contractor’s</i> property or equipment or equipment or property adjacent to the <i>Place of the Work</i> or death or injury to the <i>Contractor’s</i> personnel).</p>
--------	------	---

		12.1.2 The provisions of GC 12.1 - INDEMNIFICATION shall survive the termination of the <i>Contract</i> , howsoever caused and no payment or partial payment, no issuance of a final certificate of payment and no occupancy in whole or in part of the <i>Work</i> shall constitute a waiver or release of any of the provisions of GC 12.1.”
--	--	--

**SC55 GC 12.2 WAIVER OF CLAIMS**

SC55.1	12.2.1	In paragraph 12.2.1 in the fourth line after the word “limitation” <u>add</u> the words “claims for delay pursuant to GC 6.5 DELAYS”  -and-  <u>add</u> the words “(collectively “Claims”)” after “ <i>Substantial Performance of the Work</i> ” in the sixth line.
SC55.2	12.2.1 .1	In subparagraph 12.2.1.1 change the word “claims” to “Claims” and change the word “claim” to “Claim”.
SC55.3	12.2.1 .2	In subparagraph 12.2.1.2 change the word “claims” to “Claims”.
SC55.4	12.2.1 .3	<u>Delete</u> subparagraph 12.2.1.3 in its entirety.
SC55.5	12.2.1 .4	In paragraph 12.2.1.4 change the word “claims” to “Claims”.
SC55.6	12.2.2	In paragraph 12.2.2 <u>delete</u> the words “in paragraphs 12.2.1.2 and 12.2.1.3” and <u>replace</u> them with “in paragraph 12.2.1.2”  -and-  change the word “claims” to “Claims” in both instances and change the word “claim” to “Claim”.
SC55.7	12.2.3	<u>Delete</u> paragraph 12.2.3 in its entirety.
SC55.8	12.2.4	<u>Delete</u> paragraph 12.2.4 in its entirety.
SC55.9	12.2.5	<u>Delete</u> paragraph 12.2.5 in its entirety.
SC55.10	12.2.6	In paragraph 12.2.6 change the word “claim” to “Claim” in all instances in the paragraph.
SC55.11	12.2.7	In paragraph 12.2.7 change “The party” to “The <i>Contractor</i> ”



		-and-  change the word “claim” to “Claim” in all instances in the paragraph.
SC55.12	12.2.8	In paragraph 12.2.8 <u>delete</u> the words “under paragraphs 12.2.1 or 12.2.3” and <u>replace</u> them with “under paragraph 12.2.1”  -and-  change both instances of the words “the party” to “the <i>Contractor</i> ”. Change the word “claim” to “Claim” in all instances in the paragraph.
SC55.13	12.2.9	<u>Delete</u> paragraph 12.2.9 in its entirety.
SC55.14	12.2.10	<u>Delete</u> paragraph 12.2.10 in its entirety.

**SC56 GC 12.3 WARRANTY**

SC56.1	12.3.2	<u>Delete</u> from the first line of paragraph 12.3.2 the word, “The” and <u>substitute</u> with the words “Subject to paragraph 3.4.1, the...”
SC56.2	12.3.7 to 12.3.12	<u>Add</u> new paragraphs 12.3.7 to 12.3.12 as follows:  “12.3.7 Where required by the <i>Contract Documents</i> , the <i>Contractor</i> shall provide a maintenance bond as security for the performance of the <i>Contractor’s</i> obligations as set out in GC 12.3 WARRANTY.  12.3.8 The <i>Contractor</i> shall provide fully and properly completed and signed copies of all warranties and guarantees required by the <i>Contract Documents</i> , containing:  .1 the proper name of the <i>Owner</i> ; .2 the proper name and address of the <i>Project</i> ; .3 the date the warranty commences, which shall be at the “date of <i>Substantial Performance of the Work</i> ” unless otherwise agreed upon by the <i>Consultant</i> in writing. .4 a clear definition of what is being warranted and/or guaranteed as required by the <i>Contract Documents</i> ; and .5 the signature and seal (if required by the governing law of the <i>Contract</i> ) of the company issuing the warranty, countersigned by the <i>Contractor</i> .”

	<p>12.3.9 Should any <i>Work</i> be repaired or replaced during the time period for which it is covered by the specified warranty, a new warranty shall be provided under the same conditions and for the same period as specified herein before. The new warranty shall commence at the completion of the repair or replacement.</p> <p>12.3.10 The <i>Contractor</i> shall ensure that its <i>Subcontractors</i> are bound to the requirements of GC 12.3 – WARRANTY for the <i>Subcontractor's</i> portion of the <i>Work</i>.</p> <p>12.3.11 The <i>Contractor</i> shall ensure that all warranties, guarantees or other obligations for <i>Work</i>, services or <i>Products</i> performed or supplied by any <i>Subcontractor</i>, <i>Supplier</i> or other person in connection with the <i>Work</i> are obtained and available for the direct benefit of the <i>Owner</i>. In the alternative, the <i>Contractor</i> shall assign to the <i>Owner</i> all warranties, guarantees or other obligations for <i>Work</i>, services or <i>Products</i> performed or supplied by any <i>Subcontractor</i>, <i>Supplier</i> or other person in connection with the <i>Work</i> and such assignment shall be with the consent of the assigning party, where required by law, or by the terms of that party's contract. Such assignment shall be in addition to, and shall in no way limit, the warranty rights of the <i>Owner</i> under the <i>Contract Documents</i>.</p> <p>12.3.12 The <i>Contractor</i> shall commence or correct any deficiency within 2 <i>Working Days</i> after receiving a <i>Notice in Writing</i> from the <i>Owner</i> or the <i>Consultant</i>, and shall complete the <i>Work</i> as expeditiously as possible, except in the case where the deficiency prevents maintaining security or where basic systems essential to the ongoing business of the <i>Owner</i> and/or its tenants cannot be maintained operational as designed. In those circumstances all necessary corrections and/or installations of temporary replacements shall be carried out immediately as an emergency service. Should the <i>Contractor</i> fail to provide this emergency service within 8 hours of a request being made during the normal business hours of the <i>Contractor</i>, the <i>Owner</i> is authorized, notwithstanding GC 3.1, to carry out all necessary repairs or replacements at the <i>Contractor's</i> expense."</p>
--	---

**\*NEW\* PART 13 OTHER PROVISIONS**

**SC57 GC 13.1 OWNERSHIP OF MATERIALS**

SC57.1	13.1	<p><u>Add</u> new GC 13.1 – OWNERSHIP OF MATERIALS as follows:</p> <p><b>“GC 13.1 OWNERSHIP OF MATERIALS</b></p> <p>“13.1.1 Unless otherwise specified, all materials existing at the <i>Place of the Work</i> at the time of execution of the <i>Contract</i> shall remain the property of the <i>Owner</i>. All <i>Work</i> and <i>Products</i> delivered to the <i>Place of the Work</i> by the <i>Contractor</i> shall be the property of the <i>Owner</i>. The <i>Contractor</i> shall remove all surplus or rejected materials as its property when notified in writing to do so by the <i>Consultant</i>.”</p>
--------	------	---

**SC58 GC 13.2 CONSTRUCTION LIENS**

SC58.1	13.2	<p><u>Add</u> new GC 13.2 – CONSTRUCTION LIENS as follows:</p> <p><b>“GC 13.2 LIENS</b></p> <p>13.2.1 Notwithstanding any other provision in the <i>Contract</i>, the <i>Consultant</i> shall not be obligated to issue a certificate, and the <i>Owner</i> shall not be obligated to make payment, subject to the <i>Owner’s</i> requirement to issue a <i>Notice of Non-Payment</i> (Form 1.1) to the <i>Contractor</i>, if at the time such certificate or payment was otherwise due:</p> <ul style="list-style-type: none"><li>.1 a claim for lien has been registered against the <i>Project</i> lands by a <i>Subcontractor</i> or a <i>Supplier</i> that has not been vacated or discharged by the <i>Contractor</i> in accordance with the requirements of this <i>Contract</i>, or</li><li>.2 if the <i>Owner</i> or a mortgagee of the <i>Project</i> lands has received a written notice of a lien that has not been resolved by the <i>Contractor</i> through the posting of security or otherwise.</li></ul> <p>13.2.2 In the event a construction lien arising from the performance of the <i>Work</i> is registered or preserved against the <i>Project</i> lands by a <i>Subcontractor</i> or a <i>Supplier</i>, or a written notice of a lien is given or a construction lien action is commenced</p>
--------	------	--

		<p>against the <i>Owner</i> by a <i>Subcontractor</i> or a <i>Supplier</i>, then the <i>Contractor</i> shall, at its own expense:</p> <ul style="list-style-type: none"><li>.1 within 10 calendar days of registration of the construction lien, vacate or discharge the lien from title to the premises (i.e. the <i>Place of the Work</i>). If the lien is merely vacated, the <i>Contractor</i> shall, if requested, undertake the <i>Owner's</i> defence of any subsequent action commenced in respect of the lien, at the <i>Contractor's</i> sole expense;</li><li>.2 within 10 calendar days of receiving notice of a written notice of a lien, post security with the Ontario Superior Court of Justice so that the written notice of a lien no longer binds the parties upon whom it was served; and</li><li>.3 satisfy all judgments and pay all costs arising from such construction liens and actions and fully indemnify the <i>Owner</i> against all costs and expenses arising from same, including legal costs on a full indemnity basis.</li></ul> <p>13.2.3 In the event that the <i>Contractor</i> fails or refuses to comply with its obligations pursuant to paragraph 13.2.2, the <i>Owner</i> shall, at its option, be entitled to take all steps necessary to address any such construction liens including, without limitation and in addition to the <i>Owner's</i> rights under paragraph 13.2.4, the posting of security with the Ontario Superior Court of Justice to vacate the claim for lien from title to the <i>Project</i> lands, and in so doing will be entitled to a full indemnity from the <i>Contractor</i> for all legal fees, security, disbursements and other costs incurred and will be entitled to deduct same from amounts otherwise owing to the <i>Contractor</i>.</p> <p>13.2.4 In the event that any <i>Subcontractor</i> or <i>Supplier</i> registers any claim for lien with respect to all or part of the <i>Place of Work</i>, the <i>Owner</i> shall have the right to withhold, in addition to the statutory holdback, the full amount of said claim for lien plus either: (a) \$250,000 if the claim for lien is in excess of \$1,000,000 or (b) 25% of the value of the claim for lien and to bring a motion to vacate the registration of said claim for lien and any associated certificate of action in respect of that lien, in accordance with Section 44 of the <i>Act</i>, by paying into court as security the amount withheld.</p>
--	--	---

		13.2.5 Nothing in this GC 13.2 serves to preclude the <i>Contractor</i> from preserving and perfecting its lien in the event of non-payment by the <i>Owner</i> .”
--	--	--

**APPENDIX 1**  
**to the Supplementary Conditions**

**Project-specific requirements for a “*Proper Invoice*”**

To satisfy the requirements for a *Proper Invoice*, the following criteria, as may be applicable in each case, must be included with the *Contractor’s* application for payment:

- .1 the written bill or request for payment must be in writing;
- .2 the *Contractor’s* name and current address;
- .3 the *Contractor’s* HST registration number;
- .4 the date the application for payment was prepared by the *Contractor*;
- .5 the period of time in which the services or materials were supplied to the *Owner*;
- .6 the purchase order number provided by the *Owner*;
- .7 reference to the provisions of the *Contract* under which payment is being sought (e.g. GC 5.3 – PROGRESS PAYMENTS for progress payments, GC 5.4 – SUBSTANTIAL PERFORMANCE OF THE WORK, GC 5.7 – FINAL PAYMENT for final payment, etc.);
- .8 a description, including quantities where appropriate, of the services or materials, or a portion thereof, that were supplied and form the basis of the *Contractor’s* request for payment;
- .9 the amount the *Contractor* is requesting to be paid by the *Owner*, set out in a statement based on the schedule of values approved under GC 5.2.5, separating out any statutory or other holdbacks, set-offs and HST;
- .10 a sworn Statutory Declaration in the form CCDC 9A-2018, only for second and subsequent progress payments;
- .11 a current Workplace Safety Insurance Board clearance certificate;
- .12 a pre-approved schedule of values, supplied by the *Contractor*, for Divisions 1 through 14 of the *Specifications* (or equivalent Construction Specifications Institute Masterformat) of the *Work*, aggregating the total amount of the *Contract Price*, including all supporting invoicing;
- .13 a separate pre-approved schedule of values, supplied by each *Subcontractor*, for each of Division 15, 16, and 17 of the *Specifications* (or equivalent Construction

- Specifications Institute Masterformat) of the *Work*, aggregating the total amount of the *Contract Price*, including all supporting invoicing;
- .14 invoices and other supporting documentation for all claims against the cash allowance;
  - .15 a current, acceptable, and up to date *Construction Schedule Update*;
  - .16 if requested by the *Owner*, a current and valid certificate(s) of insurance as required under GC 11.1 – INSURANCE;
  - .17 the name, title, telephone number and mailing address of the person at the place of business of the *Contractor* to whom payment is to be directed;
  - .18 a current, up to date, and approved *Shop Drawing* log;
  - .19 in the case of the *Contractor's* application for final payment, in addition to the foregoing requirements (as applicable):
    - (a) any documents or materials not yet delivered pursuant to paragraph 5.4.5, together with complete and final as-built drawings;
    - (b) the *Contractor's* written request for release of the deficiency holdback, including a statement that no written notices of lien have been received by it;
    - (c) the *Contractor's* written certification that there are no outstanding claims, pending claims or future claims from the *Contractor* or their *Subcontractors* or *Suppliers*; and
    - (d) sufficient evidence of the *Contractor's* compliance with GC 3.13.3.

**END OF AMENDMENTS TO CCDC 2 - 2008**

## **SECTION 01 14 00 – WORK RESTRICTIONS**

### **1.0 GENERAL**

#### **1.1. SECTION INCLUDES**

- .1 Connecting to existing services
- .2 Special scheduling requirements

#### **1.2. RELATED SECTIONS**

- .1 Section 01 53 00 - Temporary Construction.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.3. EXISTING SERVICES**

- .1 Notify Owner and Consultant and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Consultant and Owner, forty-eight (48) hours of notice for necessary interruption of mechanical or electrical service throughout course of work.
  - .1 Keep duration of interruptions minimum.
  - .2 Perform interruptions after normal working hours of occupants, preferably on weekends.
- .3 Provide for vehicular, pedestrian and personnel traffic.
- .4 Construct barriers in accordance with Section 01 53 00.

#### **1.4. AFTER HOURS WORK**

- .1 Schedule Work with school staff through the Board's contact so as to limit disruption to school operations. Include for any overtime, to ensure orderly and continuous progression of Work and operation of school.
- .2 Direct calls from Contractors to Board staff to adjust alarms and to arrange for access will not be accepted. All correspondence must be through the Project Manager.
- .3 Arrange 48 hours in advance with Board to obtain an access card and adjust security alarms for after hours Work.
- .4 Bidders are cautioned that the Board will be compensated by the Contractor for false alarms. Any costs associated with each false alarm will be levied against the Contractor for false fire alarm activation or security alarm activation. These costs may include, but are not limited to:



- .1 Fines or penalties imposed by the local Fire Services,
- .2 Fines or penalties imposed by the local Police Services,
- .3 Overtime costs borne by the Board.
- .5 Contractors are responsible for ensuring doors and windows are secured prior to leaving school.
- .6 Unless specifically stated otherwise school activities take precedence over Contractor's activities.

**1.5. SPECIAL REQUIREMENTS**

- .1 Schedule and perform work in occupied areas to Board Representative's approval.
- .2 Schedule and perform noise generating work to Board Representative's approval.
- .3 Submit schedule of special requirements or disruptions in accordance with Section 01 33 00.
- .4 All Contractor personnel are restricted to the job site and necessary access routes. No personnel shall visit other areas or buildings without specific authorization.

**END OF SECTION**

## **SECTION 01 19 00 – SPECIFICATIONS AND DOCUMENTS**

### **1.0 GENERAL**

#### **1.1. RELATED DOCUMENTS**

- .1 This section describes requirements applicable to all sections within Divisions 02 to 49.

#### **1.2. WORDS AND TERMS**

- .1 Conform to definitions and their defined meanings in the Agreement and Definitions portion of CCDC 2 for Supplementary Words and Terms listed in Section 00 56 13.

#### **1.3. COMPLEMENTARY DOCUMENTS**

- .1 Generally, drawings indicate graphically, the dimensions and location of components and equipment. Specifications indicate specific components, assemblies, and identify quality.
- .2 Drawings, specifications, diagrams and schedules are complementary, each to the other, and what is required by one, to be binding as if required by all.
- .3 Should any conflict or discrepancy appear between documents, which leaves doubt as to the intent or meaning, apply the Precedence of Documents article below or obtain guidance or direction from Consultant.
- .4 Examine all discipline drawings, specifications, schedules, diagrams and related Work to ensure that Work can be satisfactorily executed.
- .5 All specification sections of the Project Manual and Drawings are affected by requirements of Division 01 sections.

#### **1.4. PRECEDENCE OF DOCUMENTS**

- .1 In the event of conflict within and between the Contract Documents, the order of priority within specifications and drawings for this project are - from highest to lowest:
  - .1 the Agreement and Definitions between the Owner and the Construction
  - .2 the Defined Terms, Definitions;
  - .3 Supplementary Conditions;
  - .4 the General Conditions;
  - .5 Sections of Division 01 of the specifications;
  - .6 Technical specifications Sections of Divisions 02 through 49 of the specifications.

- .7 Schedules and Keynotes:
  - .1 Material and finishing schedules within the specifications, then;
  - .2 Material and finishing schedules on drawings, then;
  - .3 Keynotes and definitions thereto, then;
- .8 Drawings:
  - .1 Drawings of larger scale shall govern over those of smaller scale of the same date, then;
  - .2 Dimensions shown on drawings shall govern over dimensions scaled from drawings, then;
  - .3 Location of utility outlets indicated on architectural detail drawings takes precedence over positions or mounting heights located on mechanical or electrical Drawings.
- .9 Later dated documents shall govern over earlier documents of the same type.

#### **1.5. SPECIFICATION GRAMMAR**

- .1 Specifications are written in the imperative command mode, in an abbreviated form.
- .2 Imperative language of the technical sections is always directed to the Contractor identified as a primary constructor, as sole executor of the Contract, unless specifically noted otherwise.
  - .1 This form of imperative command mode statement requires the primary constructor to perform such action or Work.
  - .2 Perform all requirements of the Contract Documents whether stated imperatively or otherwise.
- .3 Division of the Work among subcontractors, suppliers, or others is solely the prime constructor's responsibility. The Consultant(s) and specification authors assume no responsibility to function or act as an arbiter to establish subcontract scope or limits between sections or divisions of Work.

**END OF SECTION**

## **SECTION 01 21 00 – ALLOWANCES**

### **1.0 GENERAL**

#### **1.1. RELATED SECTIONS**

- .1 Section 01 45 00 – Quality Control.
- .2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.2. GENERAL**

- .1 Allowances included herein are for items of Work which could not be fully quantified prior to Bidding.
- .2 Expend each allowance as directed by the Consultant. Work covered by allowances shall be performed for such amounts and by such persons as directed by Consultant.
- .3 Funds will be expended by means of Cash Allowance allocations and contingency allowance allocations.
- .4 Progress payments for Work and Products authorized under allowances will be made in accordance with the payment terms set out in the Conditions of the Contract.
- .5 The Contractor shall bid the work involved and submit the Bids received to the Consultant and the Board, for approval
- .6 The Contractor shall submit 3 bids unless directed by the Board.

#### **1.3. CASH ALLOWANCES**

- .1 Cash allowances, cover the net cost to the Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage, installation where indicated, and other authorized expenses incurred in performing the Work. Cash allowances shall not be included by a subcontractor in the amount for their subcontract work.
- .2 Supply only allowances shall include:
  - .1 Net cost of Products.
  - .2 Delivery to Site.
  - .3 Applicable taxes and duties, excluding HST.
- .3 Supply and install allowances shall include:
  - .1 Net cost of Products.
  - .2 Delivery to Site.
  - .3 Unloading, storing, handling or products on site.
  - .4 Installation, finishing and commissioning of products.

- .5 Applicable taxes and duties, excluding HST.
- .4 Inspection and testing allowances shall include:
  - .1 Net cost of inspection and testing services.
  - .2 Applicable taxes and duties, excluding HST.
- .5 Other costs related to work covered by cash allowances are not covered by the allowance, but shall be included in the Contract Price.
- .6 Where costs under a cash allowance exceed the amount of the allowance, the Contractor will be compensated for any excess incurred and substantiated plus an allowance for overhead and profit as set out in the Contract Documents.
- .7 Progress payments on accounts of work authorized under cash allowances shall be included in the monthly certificate for payment.
- .8 Submit, before application for final payment, copies of all invoices and statements from suppliers and subcontractors for work which has been paid from cash allowances.

#### 1.4. ALLOWANCES SCHEDULE

Include in the Bid Price a cash allowance of to address the cost of the following items: (Consultant to modify/edit list as required)

- .1 Designated Substance Removal.  
\$5,000.00  
(Additional removal not already identified in the ACM Summary report)
- .2 Independent Testing & Inspection (soil, concrete, mortar, structural steel, air barrier, paving, painting)  
\$ 6,500.00  
(As directed by the Consultant)
- .3 Window coverings  
\$ 10,000.00  
(Additional window coverings not addressed elsewhere in the specification)
- .4 Gas service connection fees  
\$ \_\_\_\_\_  
(When required)
- .5 Hydro service connection fees  
\$ \_\_\_\_\_  
(When required)

- .6 Water service connection fees  
\$ \_\_\_\_\_  
(When required)
  
  - .7 Data cabling installation and network equipment  
\$ 27,000.00  
(Including terminations not addressed elsewhere in the documents)
  
  - .8 Voice cabling installation and telephone equipment  
\$ \_\_\_\_\_
  
  - .9 Access Control & Intrusion Detection Systems (security systems)  
\$ 2,500.00  
(Where not otherwise identified in the Contract Documents and including all cabling)
  
  - .10 Video surveillance system  
\$ \_\_\_\_\_  
(Where not otherwise identified in the Contract Documents and including all cabling)
  
  - .11 Camera and television monitor systems in Family Studies 6.20, 6.21, 6.22  
  
\$ 10,000.00  
(Including all cabling and hardware)
- Total of All Allowances:**  
**\$ 55,000.00**

**END OF SECTION**

**THIS PAGE LEFT INTENTIONALLY BLANK**

## **SECTION 01 31 00 – PROJECT MANAGING AND COORDINATION**

### **1.0 GENERAL**

#### **1.1. RELATED SECTIONS**

- .1 Section 01 32 00 - Construction Progress Documentation.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 53 00 – Temporary Construction Facilities
- .4 Section 01 61 00 – Product Requirements
- .5 Section 01 78 10 – Closeout Submittals and Requirements
- .6 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.2. PROJECT COORDINATION**

- .1 Perform coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities and construction Work, with progress of Work of other contractors, under instructions of the Consultant.
- .2 The Contractor shall have total control of the Work and shall effectively direct and supervise the Work so as to ensure conformity with the Contract Documents and within the Contract Time.
- .3 The Contractor shall be solely responsible for the construction means, methods, sequences, and procedures and for coordinating parts of the Work under the contract.
- .4 Co-ordinate progress of the Work, progress schedules, submittals, use of site, temporary utilities, construction facilities, safety regulations and fire protection, as per authorities having jurisdiction codes.
- .5 The Consultant has the authority to stop the Work:
  - .1 whenever they observe or are made aware of unsafe conditions.
  - .2 whenever it is deemed necessary to protect the interests of the Board,
  - .3 whenever materials or workmanship are in contravention to the Contract Documents

#### **1.3. SITE SUPERVISOR AND PROJECT MANAGER**

- .1 If requested, the Contractor shall provide the Consultant, in writing, the name of the Project Manager and Site Supervisor, and proof of competent experience in similar projects.
- .2 Performance of the Contractors Project Manager and Site Supervisor
  - .1 If the Board and or the Consultant become concerned with any of: Site Safety, Project Schedule, or general compliance with the tender



- documents due to the performance of the Site Supervisor or Project Manager, the Consultant and or the Board will identify the concerns in writing to the Contractor.
- .2 The Contractor shall respond in writing to the Board and Consultant with a corrective action for each item within 24 hours.
  - .3 If it is found that any of the corrections are not immediately implemented, the Consultant and the Board shall meet with the General Contractor to review the credentials including curriculum vitae and comparable experience of a replacement Site Supervisor and or Project Manager proposed by that Contractor.
  - .4 All outstanding concerns initiating the replacement of the personnel will be immediately addressed to the satisfaction of the Consultant and the Board.
- .3 If the Board and or the Consultant become concerned with site safety, project schedule or general compliance with the tender documents due to the performance of the Site Supervisor or the Project Manager, the Consultant or the Board will issue the concerns in writing to the Contractor. The Contractor shall respond in writing within 24 hours to the Consultant and the Board. If any of the corrections are not immediately implemented, the Consultant or the Board will schedule a meeting with the Consultant, General Contractor and the Board. At this meeting the Contractor will introduce the new Project Manager, and or Site Supervisor and present the Curriculum Vitae for each showing proof of comparable experience in similar projects. The Contractor will then address the outstanding concerns to the satisfaction of the Consultant and the Board.
- .4 The Project Manager, and/or Site Supervisor shall not be replaced by the Contractor without prior written approval from the Board and the Consultant.

#### **1.4. PERMITS**

- .1 **The Board will obtain & pay for all building permits, but the Contractor is responsible for all other permits, including electrical inspection and fire alarm verification.**

#### **1.5. CONSTRUCTION DOCUMENTS**

- .1 The Consultant will provide the Contractor with PDF copies of both the drawings and the specification and CAD format files of the drawings at no charge to the Contractor. All printing will be at the cost of the Contractor including the AS-BUILT documents.

## 1.6. PRECONSTRUCTION MEETING

- .1 Immediately prior to construction and upon notification by the Consultant of a time and date, the Contractor shall attend the preconstruction meeting at a location as determined by the Consultant, along with authoritative representatives of certain key subcontractors as specifically indicated in the conference notice. Agenda to include following:
  - .1 Appointment of official representative of participants in Work.
  - .2 Project communications procedures
  - .3 Schedule of Work, progress scheduling (including long lead items, cash allowance items) as specified in Section 01 32 00.
  - .4 Schedule of submission of shop drawings, samples, colour chips as specified in Section 01 33 00.
  - .5 Requirements for temporary facilities, washrooms, refuse bin, site sign, offices, storage sheds, utilities, fences as specified in Section 01 53 00.
  - .6 Delivery schedule of specified equipment as specified in Section 01 61 00.
  - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.
  - .8 Owner furnished products.
  - .9 Record drawings as specified in Section 01 78 10.
  - .10 Maintenance material and data as specified in Section 01 78 10.
  - .11 Take-over procedures, acceptance, and warranties as specified in Section 01 78 10.
  - .12 Monthly progress claims, administrative procedures, photographs, and holdbacks.
  - .13 Appointment of inspection and testing agencies
  - .14 Insurances and transcript of policies.
  - .15 Review Vendor Performance Evaluation for the Contractor and Subcontractors
  - .16 Hot Work Permit Process
  - .17 Security Access, Fire Alarm shut down procedures
  - .18 Any other items as required by owner, contractor or Consultant.

## 1.7. ON-SITE DOCUMENTS

- .1 Maintain at job site at all times, one copy (written or digital) each of the following:
  - .1 Complete set of Contract drawings.

- .2 Specifications.
- .3 All Addenda.
- .4 Site Instructions and Sketches
- .5 Reviewed shop drawings and samples.
- .6 Change Orders and Contemplated Change Orders.
- .7 Other modifications to Contract.
- .8 Site Instructions
- .9 Colour schedule
- .10 Hardware List
- .11 Field test reports.
- .12 Copy of approved Work schedule.
- .13 Manufacturers' installation and application instructions.
- .14 Progress reports and meeting minutes.
- .15 Approved building permit documents.
- .16 Copy of current Ontario Building Code and National Building Code.
- .17 CSA Standard, CGSB Specifications. ASTM Documents and other standards referenced to in the specifications.
- .18 Labour conditions and wage schedules.
- .19 Applicable current editions of municipal regulations and by-laws.  
Current building codes, complete with addenda bulletins applicable to the Place of the Work.

#### **1.8. SCHEDULES**

- .1 Within three weeks following the award of the Contract, submit a detailed, trade by trade progress schedule for the work in a bar chart form acceptable to the Consultant.
- .2 Submit preliminary construction progress schedule as specified in Section 01 32 00 to Consultant coordinated with Consultant's project schedule.
- .3 After review, revise and resubmit schedule to comply with revised project schedule.
- .4 During progress of Work revise and resubmit as directed by Consultant.
- .5 Provide schedule updates every month with request for Payment, for duration of Contract.

#### **1.9. CONSTRUCTION PROGRESS MEETINGS**

- .1 Prior to the commencement of the Work, the Contractor together with the Consultant shall mutually agree to a sequence for holding regular "on site meetings".

- .2 The Contractor will organize site meetings. Ensure persons, whose presence is required, are present and relative information is available to allow meetings to be conducted efficiently.
- .3 Contractor, major subcontractors and consultants involved in Work are to be in attendance.
- .4 Post and forward copies of progress schedules for advice of Subcontractors, Owner and Consultant.
- .5 Notify parties minimum five (5) days prior to meetings.
- .6 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within two (2) days after meeting.
- .7 Agenda to include following:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Review of Work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction schedule.
  - .5 Review of off-site fabrication delivery schedules.
  - .6 Corrective measures and procedures to regain projected schedule.
  - .7 Revision to construction schedule.
  - .8 Progress schedule, during succeeding work period.
  - .9 Review submittal schedules: expedite as required.
  - .10 Maintenance of quality standards.
  - .11 Review proposed changes for effect on construction schedule and on completion date.
  - .12 Review site security issues.
  - .13 Other business.
- .8 Schedule additional meetings, to expedite progress, should work require it.
- .9 Keep Owner and Consultant informed of progress, of delays and potential delays during all stages of Work. Do everything possible to meet progress schedule
- .10 Schedule and administer pre-installation meetings when specified in sections and when required to coordinate related or affected Work.

#### **1.10. SUBMITTALS**

- .1 Prepare and issue submittals to Consultant for review.
- .2 Submit preliminary Shop Drawings, product data and samples for review for compliance with Contract Documents; for field dimensions and clearances, for relation to available space, and for relation to Work of other contracts. After review, revise and resubmit for transmittal to Consultant.
- .3 Submit requests for payment for review, and for transmittal to Consultant.

- .4 Submit requests for interpretation of Contract Documents, and obtain instructions through Consultant.
- .5 Process substitutions through Consultant.
- .6 Process change orders through Consultant.
- .7 Deliver closeout submittals for review and preliminary inspections, for transmittal to Consultant.

#### **1.11. RECORD (AS-BUILT) DOCUMENTS AND SAMPLES**

- .1 Procedures for record as-built documents and samples as specified in Section 01 78 10.
- .2 Keep as-built documents and samples available for inspection by Consultant.

#### **1.12. CLOSEOUT PROCEDURES**

- .1 Take-over procedures, acceptance, and warranties as specified Section 01 78 10
- .2 Notify Consultant and Board when Work is considered ready for Substantial Performance.
- .3 Accompany Consultant and Board on preliminary inspection to determine items listed for completion or correction.
- .4 Comply with Consultant's instructions for correction of items of Work listed in executed certificate of Substantial Performance.
- .5 Notify Consultant of instructions for completion of items of Work determined in Consultant's final inspection.

**END OF SECTION**

## **SECTION 01 32 00 – CONSTRUCTION PROGRESS DOCUMENTATION**

### **1.0 GENERAL**

#### **1.1. RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.2. SCHEDULES**

- .1 Within seven 7 days following the award of the Contract, submit a detailed cash flow chart broken down on a monthly basis, in a manner acceptable to the Consultant. Cash flow chart shall indicate anticipated Contractor's monthly progress billings from commencement of work until completion.
- .2 Update cash flow chart whenever changes occur to scheduling and in manner and at times satisfactory to Consultant.
- .3 Submit schedule of values at least fourteen (14) days before the first application
- .4 Submit schedules as follows:
  - .1 Submittal Schedule for Shop Drawings and Product Data.
  - .2 Submittal Schedule for Samples.
  - .3 Submittal Schedule for timeliness of Owner-furnished Products.
  - .4 Product Delivery Schedule.
  - .5 Cash Allowance Schedule for acquiring Products and Installation.
  - .6 Shutdown or closure activity.

#### **1.3. CONSTRUCTION PROGRESS SCHEDULING**

- .1 Submit initial schedule to the Consultant and the Board in duplicate within seven (7) days after following the award.
- .2 Schedule Format.
  - .1 Prepare schedule in form of a horizontal bar chart.
  - .2 Split horizontally for projected and actual performance.
  - .3 Provide horizontal time scale identifying each Working Day of each week.
- .3 Schedule Submission.
  - .1 Consultant will review schedule and return reviewed copies within five (5) days after receipt.
  - .2 Submit schedules in electronic format, forward to the Consultant and Owner as a pdf. file.

- .3 Resubmit finalized schedule within five (5) days after return of review copy.
- .4 Submit revised progress schedule with each application for payment.
- .5 Distribute copies of revised schedule to:
  - .1 Job site office.
  - .2 Subcontractors.
  - .3 Other concerned parties.
- .6 Instruct Consultant to report to Contractor within ten (10) days, any problems anticipated by timetable shown in schedule.
- .4 Submit revised schedules with Application for Payment, identifying changes since previous version.
- .5 Select either of the following paragraphs to identify the type and format of schedule required.
- .6 Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- .7 Indicate estimated percentage of completion for each item of Work at each submission.
- .8 Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and required by Allowances.
- .9 Include dates for commencement and completion of each major element of construction:
  - .1 Site clearing.
  - .2 Site utilities.
  - .3 Foundation Work.
  - .4 Structural framing.
  - .5 Subcontractor Work.
  - .6 Equipment Installations.
  - .7 Finishes.
- .10 Indicate projected percentage of completion of each item as of first day of month.
- .11 Indicate progress of each activity to date of submission schedule.
- .12 Indicate changes occurring since previous submission of schedule:
  - .1 Major changes in scope.
  - .2 Activities modified since previous submission.
  - .3 Revised projections of progress and completion.
  - .4 Other identifiable changes.
- .13 Provide a written report to define:

- .1 Problem areas, anticipated delays, and impact on schedule.
- .2 Corrective action recommended and its effect.
- .3 Effect of changes on schedules of other subcontractors.

#### **1.4. PROGRESS PHOTOGRAPHS**

- .1 Digital Photography:
  - .1 Submit electronic copy of progress photographs of project, Digital format, minimum 300 in megapixel resolution.
  - .2 Identification: Name and number of project and date of exposure indicated.
  - .3 Provide both interior and exterior photographs.
  - .4 Number of Viewpoints: Locations of viewpoints determined by Consultant.
  - .5 Frequency: Monthly with progress statement. Provide the required number of pictures to accurately reflect the submitted progress percentage.

#### **1.5. SHOP DRAWING SUBMITTAL SCHEDULE**

- .1 Include schedule for submitting shop drawings, product data, samples
- .2 Indicate dates for submitting, review time, resubmission time, and last date for meeting fabrication schedule.
- .3 Include dates when shop drawings and samples will be required for Owner-furnished products.
- .4 Include dates when reviewed submittals will be required from Consultant.
- .5 Provide final signed off copies of the shop drawings in digital format to the Board.

**END OF SECTION**



**THIS PAGE LEFT INTENTIONALLY BLANK**

## **SECTION 01 33 00 – SUBMITTAL PROCEDURES**

### **2.0 GENERAL**

#### **2.1. RELATED SECTIONS**

- .1 Section 01 32 00 - Construction Progress Documentation.
- .2 Section 01 78 10 - Closeout Submittals.
- .3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **2.2. ADMINISTRATIVE**

- .1 Submit to Consultant submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Work affected by submittal shall not proceed until review is complete.
- .3 Present Shop Drawings, product data, samples and mock-ups in Metric (SI) units. Shop drawings containing imperial measurements will be rejected.
- .4 Where items or information is not manufactured or produced in SI Metric units, converted values within the metric measurement to the next largest imperial size available. Tolerances of .0625 acceptable.
- .5 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents.
- .6 Submittals not stamped, signed, dated, identified as to specific project, and attesting to their being reviewed will be returned without being examined and shall be considered rejected.
- .7 Shop drawings which require the approval of a legally constituted authority having jurisdiction shall be submitted by Contractor to such authority for approval. Such shop drawings shall receive final approval of authority having jurisdiction before Consultant's final review.
- .8 No work, requiring a shop drawing submission, shall be commenced until the submission has received Consultant's final review. Only shop drawings bearing Consultant's review stamp are to be sent and used on the job site.
- .9 Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

- .10 Shop drawings shall not contain substituted materials unless such substitutions have been requested in advance and approved by Consultant.
- .11 Verify field measurements and affected adjacent Work are coordinated.
- .12 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
- .13 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.
- .14 Keep one (1) reviewed copy of each submission on site.

### **2.3. 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 The term "design team" means Consultant and Sub-consultants whether Sub-consultants are employees of Consultant or not, and includes structural, mechanical, electrical, etc.
- .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 Allow fourteen (14) days for Consultant's review of each submission.
- .5 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.
- .6 Make changes in Shop Drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of any revisions other than those requested.
- .7 Accompany submissions with transmittal letter, containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .8 Submissions shall 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 other parts of the Work.
- .9 After Consultant's review, distribute copies.
- .10 Submit Shop Drawings in Pdf. format for each requirement requested in specification Sections and as consultant may reasonably request.
- .11 Submit product data sheets or brochures in Pdf. format for requirements requested in specification sections and as requested by Consultant where Shop Drawings will not be prepared due to standardized manufacture of product.
- .12 Delete information not applicable to project.
- .13 Supplement standard information to provide details applicable to project.
- .14 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, the drawings will be stamped as reviewed or reviewed as modified and will be returned. At this point fabrication and installation of Work may proceed. If Shop Drawings are rejected, noted copy will be returned and re-submission of corrected Shop Drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .15 Signed drawings shall be returned to and retained by Contractor who is then responsible for distribution of copies of corrected shop drawing to

appropriate Subcontractors for appropriate action and to municipal building department for their records of those subjects required by authorities.

- .16 The Consultant's review is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean the Consultant approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and this review shall not relieve the Contractor of his responsibility for meeting the requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades.

#### **2.4. SAMPLES**

- .1 Submit for review to the Consultant three (3) samples as requested in respective specification Sections.
- .2 Submit samples with identifying labels bearing material or component description, manufacturer's name and brand name, Contractor's name, project name, location in which material or component is to be used, and date.
- .3 Deliver samples prepay any shipping charges involved for delivering samples to destination point and returning to point of origin if required.
- .4 Provide samples of special products, assemblies, or components when so specified.
- .5 No work requiring a sample submission shall commence until submission has received Consultant's final review.
- .6 Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .7 Where colour, pattern or texture is criterion, submit full range of samples.
- .8 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.
- .9 Make changes in samples which Consultant may require, consistent with Contract Documents.
- .10 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

#### **2.5. MOCK-UP**

- .1 Erect mock-ups to Section 01 45 00.

## **2.6. CERTIFICATES AND TRANSCRIPTS**

- .1 Immediately after award of Contract, and prior to commencing the work submit the performance bond and the labour and materials payment bond as described in the bid documents.
- .2 Submit transcription of certified true copies of insurance immediately after award of Contract.
- .3 A current WSIB clearance certificate
- .4 The bidder's health and safety policy for the project.
- .5 A copy of the notice of project issued by the ministry of labour for the project
- .6 Building materials, components and elements specified without the use of trade or proprietary names shall meet requirements specified. If requested by Consultant, submit evidence of meeting requirements specified. Evidence shall consist of certification based on tests carried out by an independent testing agency. Certification based on previous tests for same materials, components or elements is acceptable. Certification shall be in form of written test reports prepared by testing agency.

**END OF SECTION**

**THIS PAGE LEFT INTENTIONALLY BLANK**

## **SECTION 01 35 17 – FIRE SAFETY PROCEDURES**

### **1.0 GENERAL**

#### **1.1. RELATED SECTIONS**

- .1 Section 01 14 00 – Work Restrictions.
- .2 Section 01 31 00 - Project Managing and Coordination.
- .3 Section 01 33 00 - Submittal Procedures.
- .4 Section 01 35 23 – Health and Safety
- .5 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.2. FIRE SAFETY PLAN**

- .1 Contractors and their personnel will be familiar with this section and its requirements.
- .2 The contractor must take all necessary precautions during the carrying out of the work to prevent the possibility of fire occurring.

#### **1.3. FIRE PROTECTION**

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by the governing codes, regulations and bylaws.
- .2 The contractor will, at all times, when welding, brazing and performing any operation with an open flame, combustible adhesives or flammable solvents keep a portable, operable fire extinguisher within 3 meters of the operation.

#### **1.4. HOT WORK**

- .1 Take all precautions to Work safely and to provide the necessary protection to persons and property from Hot Work. This includes, but is not limited to Brazing, Cutting, Grinding, Soldering, Thawing Pipe, Torch Applied Roofing and Welding. With all such activity these steps are to be followed:
  - .1 Whenever possible, complete Hot Work in a welding shop or out of doors at the school.
  - .2 Flammable liquids, dust lint and oily deposits to be removed from within 50-ft (15m) of Work. Remove other combustibles where possible. Otherwise protect with fire-resistive tarpaulins or metal shields.
  - .3 Explosive atmosphere in area eliminated. Floors swept clean. Combustible floors wet down, covered with damp sand or fire-resistive tarpaulins.



- .4 All wall and floor openings covered. Fire-resistive tarpaulins suspended beneath Work.
- .5 For on-site Work (indoor and out of doors), advise the Head Custodian, Principal, Consultant (if assigned) and Project Coordinator prior to Work being performed, and of related dangers.
- .6 Where the Fire Alarm system is required to be set to stand-by to discourage false alarms from smoke detectors provide a firewatch throughout the building or structure being worked on. NEVER put the fire alarm system in stand-by mode when the building is occupied by staff or students.
- .7 In the event of a fire as a result of the Hot Work, notify the fire department immediately. Report incident to the head custodian, the Consultant, if assigned, and Project Coordinator immediately, whether extinguished or not. Provide a fire incident report to the Board.
- .8 Barriers must be set up to protect staff and students (i.e. pylons, shields, and caution tape) from exposure to arc flash and smoke migration.
- .9 Have all necessary doors, windows and/or drapes closed. Confer with the Head Custodian to shut down all fan systems in the area to reduce or eliminate smoke distribution.
- .10 Provide and keep fire extinguishers handy and in good Working condition. Temporarily cover all smoke detectors in area during time of Work.
- .11 Provide a fire watch/spot check for several hours after Work is completed. Uncover smoke detectors.
- .12 On new construction, the requirements of the Hot Wok permit may be waived, until such time as either Substantial Completion or Occupancy is granted, whichever comes first.
- .13 On additions to existing buildings, the requirements for Hot Work permits shall remain in place.

#### **1.5. HOT WORK PERMIT**

- .1 **A sample Hot Work Permit is attached to the specifications – refer to Appendix 013517-A**
- .2 Each permit is valid for seven (7) days only and must be renewed prior to its expiration date
- .3 The contractor must obtain Hot Work Permits from the School Board's representative prior to the start of work.

- .4 The contractor must complete the form as required and must keep the form on site.
- .5 Return each completed form to the School Board's representative on date of expiration.
- .6 The most current version of the Permit and its requirements shall be used for the purposes of the Work.

#### **1.6. FIRE PROTECTION SYSTEMS**

- .1 Any Modifications to Fire Alarm system and its devices including service, additions and changes in device location must be performed only by a Certified Fire Alarm Technician as per the Ontario Fire Code section 1.1, subsection 1.1.5.
- .2 The Contractor will receive from the Board's contact a contact number for the monitoring service and a school system number.
- .3 Bidders are cautioned that the Board will be reimbursed for the cost of false alarms. Refer to Section 01 14 00 Work Restrictions, Para. 1.4.4.
- .4 An approved inspection firm shall verify all new fire alarm devices, in accordance to CSA regulations. Certificate of Verification is required before occupancy.

#### **1.7. FIRE ALARM SHUT-DOWN PROCEDURE**

- .1 Do not shut the system down unless necessary. Plan the operation required to reduce system down time to the least amount possible.
- .2 Wherever possible, shut down only the zone needing Work and schedule this down time in unoccupied school hours. Allow for this in your bid pricing.
- .3 Discuss the possible down time with the head custodian and principal prior to any partial or whole system shut down.
- .4 The school or building administration shall advise all staff of fire alarm system shut down. This will include instructions to call 911 if they see a fire and when system is back on line.
- .5 Prior to alarm system shutdown and upon restoring the fire alarm system individuals supervising the shut down must contact Direct Detect at 519-741-2494 and have on hand the School System Account Number (this number can be found on the decal on the fire alarm panel). The School System Account Number will start with the prefix 209
  - .1 The Contractor shall provide full detail to the monitoring company as requested including building number and name (as identified on the fire alarm monitoring panel), contact name, company name, length of time system is down. Call shall be placed just prior to any shut down.

- .6 A fire patrol will need to be established and will include the following at the Contractor's expense:
  - .1 Patrol all halls and high-risk areas affected.
  - .2 Fire patrol shall have access to a phone and call 911 if they see a fire.
  - .3 Report all other problems they encounter.
  - .4 Remain on patrol until system is back on.
- .7 Contact Direct Detect at 519-741-2494 and inform them when the system is put back on line.
- .8 An activated system must not be reset until authorized by the Fire Department and the cause of the alarm has been investigated.

### **1.8. FIRE PROTECTION EQUIPMENT IMPAIRMENT**

- .1 Fire Protection Equipment referred to in this section includes sprinkler systems, special fire suppression systems, and kitchen hood suppression systems.
- .2 The Contractor will take all precautions including restrict all Hot Work operations and shut down hazardous processes during all Fire protection equipment impairment.
- .3 Do not shut the Fire protection equipment down unless necessary Plan the operation required to reduce system impairment time to the least amount possible.
- .4 Wherever possible, shut down only the Fire protection equipment needing Work and schedule this impairment time for unoccupied school hours. Allow for this in your bid pricing.
- .5 Discuss the possible down time with the head custodian and principal prior to any partial or whole system impairment.
- .6 The school administration shall advise all staff of Fire protection equipment shut down. This will include instructions to call 911 if they see a fire and when system is back on line
- .7 The Contractor will plan to use temporary protection such as extra extinguishers, charged hose lines and temporary sprinkler protection during all Fire protection equipment impairment.
- .8 If the sprinkler system is restorable, either in whole or in part, the Contractor or sub-Contractor shall assign someone to restore the system promptly in the event of a fire.
- .9 A fire patrol may need to be established and will include the following at the Contractor's expense:
  - .1 Patrol all halls and high-risk areas affected.
  - .2 Fire patrol shall have access to a phone and call 911 if they see a fire.

- .3 Report all other problems they encounter.
- .4 Remain on patrol until system is back on.
- .10 The Contractor shall inform all sub trades that the Board has a Red Tag Permit System and it shall be used for all Fire protection equipment impairment.
- .11 For ease of use, a Factory Mutual hanging wall kit has been place at all Board Fire protection equipment locations. Supplies of Red Tag Permits are provided there.

### **1.9. FIRE ALARM MODIFICATIONS AND MAINTENANCE**

- .1 Very important changes to Ontario Building Code as they relate to the Standard for the Verification of Fire Alarm Systems CAN/ULC-S537-M have taken effect December 24, 1999. (Minister's Ruling 99-BC-01)
  - .1 Clause 5.1; "Addition of conventional field device(s), or modification(s), to existing input circuit(s) or output circuit(s) shall require re-verification of all devices served by those input circuit(s) or output circuit(s)." If one device is added to a zone, the entire zone or in the case of a single zone panel the entire system is to be verified.
  - .2 Clause 5.2 "Addition of input circuit(s) or output circuit(s) to an existing fire alarm system shall require verification of the new circuit(s) in accordance with this standard, and shall also require all previously existing circuit(s) to be tested as follows:
    - .3 TEST: One conventional field device on each circuit shall be operated to confirm activation of all output circuits in accordance with the systems design." Even though no other zones have been touched, one device per input zone is to be tested when the Fire Alarm system is modified.
    - .4 Clause 5.5 "Where a transponder is added to an existing system, the transponder shall be verified in accordance with subsections 3.2, Wiring; and subsection 3.3 Control Units; and with CAN/ULC-S536, Standard for the Inspection and Testing of Fire Alarm Systems as well as re-verification of existing field devices and verification of new conventional field devices." If a new addressable device is added to a system, the new device is to be tested; as well a test must be conducted on all addressable devices on the loop.
    - .5 Clause 5.6 "Where an existing fire alarm system control unit is replaced with a new control unit, it shall be verified in accordance with CAN/ULC-S536, Standard for the Inspection and Testing of Fire Alarm Systems.

Replacement of any control panel will require the testing of all existing fire alarm devices.

- .2 The Contractor and sub-Contractors shall include in the bid price for the above ULC Standards requirements referenced in the Ontario Building Code.

#### **1.10. INSTALLATION AND/OR REPAIR OF ROOFING**

- .1 The Contractor will review with the Consultant and the Board's representative of the location of any asphalt kettles and the dates the kettles will be in use. The Contractor, in the course of performing roofing work, will ensure all personnel utilize the following precautions:
  - .1 Use only kettles equipped with thermometers or gauges in good working order.
  - .2 Locate kettles in a safe place outside of building.
  - .3 Maintain continuous supervision while kettles are in operation and provide metal covers for the kettles to smother any flames in case of fire.
  - .4 All roofing materials stored in locations no closer than 15 meters to any structures.

#### **1.11. FIRE DEPARTMENT ACCESS**

- .1 Designated fire routes must be maintained. Fire Department must be advised of any work that would impede fire apparatus response.

#### **1.12. SMOKING PRECAUTIONS**

- .1 Smoking is not permitted anywhere on Board properties. Workers who wish to smoke must leave the property, and not within sight of students. Any worker found to be in contravention of the Ontario Smoke Free Act will be subject to legislated fines.

#### **1.13. FLAMMABLE LIQUIDS**

- .1 The handling and storage on site of flammable liquids are to be governed by the current National Fire Code of Canada.
- .2 Flammable liquids such as gasoline, kerosene and naphtha may be kept for ready use in quantities not exceeding 10 imperial gallons provided they are stored in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval.
- .3 Transfer of flammable liquids is prohibited within buildings.

- .4 Transfer of flammable liquids must not be carried out in the vicinity of open flame or any type of heat producing devices.
- .5 Flammable liquids having a flash point below 100° F (37.7°C) such as naphtha or gasoline must not be used as solvents or cleaning agents.
- .6 Flammable waste liquids, for disposal, must be stored in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum.

**END OF SECTION**

**THIS PAGE LEFT INTENTIONALLY BLANK**

### Contractor Hot Work Permit

1. Take all precautions to Work safely and to provide the necessary protection to persons and property from Hot Work. This includes, but is not limited to Brazing, Cutting, Grinding, Soldering, Thawing Pipe, Torch Applied Roofing and Welding. With all such activity these steps are to be followed:
  - A. Whenever possible, complete Hot Work in a welding shop or out of doors at the school.
  - B. Flammable liquids, dust lint and oily deposits to be removed from within 50-ft (15m) of Work. Remove other combustibles where possible. Otherwise protect with fire-resistive tarpaulins or metal shields.
  - C. Explosive atmosphere in area eliminated. Floors swept clean. Combustible floors wet down, covered with damp sand or fire-resistive tarpaulins.
  - D. All wall and floor openings covered. Fire-resistive tarpaulins suspended beneath Work.
  - E. For Work on walls or ceilings, remove combustibles away on other side.
2. For on-site Work (indoor, out of doors), advise the Head Custodian and Principal prior to Work being performed, and of related dangers.
3. In the event of a fire as a result of the Hot Work, notify the fire department and the head custodian immediately, whether extinguished or not.
4. Barriers must be set up to protect staff and students (i.e. pylons, shields, and caution tape) from exposure to arc flash and smoke migration.
5. Have all necessary doors, windows and/or drapes closed. Request of the head custodian to shut down all fan systems in the area to reduce or eliminate smoke distribution.
6. Provide and keep fire extinguishers handy and in good Working condition. Temporarily cover all smoke detectors in area during time of Work.
7. Provide a fire watch/spot check for several hours after Work is completed. Uncover smoke detectors.





# Appendix - 013517-A

Facility Services

## CONTRACTOR HOT WORK PERMIT

**STOP!**

**Avoid hot work or seek an alternative method if possible.**

This hot work permit is required for any temporary operation involving open flames or producing heat and/or sparks. This includes but is not limited to: brazing, cutting, grinding, soldering, torch-applied roofing and welding.

**A SEPARATE PERMIT IS REQUIRED FOR EACH AREA**

- Board Supervisor/ Manager/Proj. Coordinator Responsibilities:
- Verify precautions taken in Section A
  - Complete and retain Part 1
  - Complete Section B prior to commencement of Hot Works
  - Issue Part 2 to Contractor completing Hot Work & Post
  - Obtain Part 2 when Fire Monitoring complete
  - Return Part 1 and Part 2 to Controller, Facility Services

- Contractor Responsibilities:
- Verify precautions taken in Section A
  - Complete Section C during each day that Hot Works takes place
  - Return Part 2 to Board Supervisor/ Manager/Proj. Coordinator

**PART 1**

Section A Indicate Precautions Taken
<input type="checkbox"/> Available sprinklers, hose streams, and extinguishers available and in service
<b>Within 35' or 11m of hot work</b>
<input type="checkbox"/> Flammable liquid, dust, lint and oily deposits removed
<input type="checkbox"/> Explosive atmosphere in area eliminated
<input type="checkbox"/> Floors swept clean
<input type="checkbox"/> All wall and floor openings covered
<input type="checkbox"/> Combustible floors covered with fire resistant sheets
<input type="checkbox"/> Protect or shut down ducts that might carry sparks/smoke
<b>Hot work on walls, ceiling or roofs</b>
<input type="checkbox"/> Construction is noncombustible and without combustible covering or insulation
<input type="checkbox"/> Combustible materials on other side of walls, ceilings or roofs moved away
<input type="checkbox"/> Combustible structure wetted down
<b>Hot work on enclosed equipment</b>
<input type="checkbox"/> Enclosed equipment cleaned of all combustible material
<input type="checkbox"/> Containers purged of flammable liquid/vapour
<input type="checkbox"/> Pressurized vessels, piping & equipment removed from service, isolated & vented
<b>Fire watch/hot work and monitoring</b>
<input type="checkbox"/> Fire watch will be provided <u>during</u> and for <u>1 hour</u> after work including break
<input type="checkbox"/> Fire watch is trained and supplied with suitable extinguishers
<input type="checkbox"/> Fire watch is trained in the use of sounding fire alarm
<input type="checkbox"/> Fire watch conducted in adjoining areas, above and below the space where appropriate
<input type="checkbox"/> Monitor hot work area for an additional <u>2 hours</u> after fire watch
<input type="checkbox"/> Other precautions taken (please detail):
_____
_____
_____
_____

Section B Authorization Granted
Board Supervisor/Manager/Proj. Coordinator: _____ Print Name Signature
Permit Valid from / to: (max. 7 days) _____ From This Date To This Date
(Maximum 7 days or until end of hot work whichever is sooner)

Section C Contractor and Location Affected			
Dates: (max 7 days)	Name of Contractor conducting hot work	Name & signature of individual assigned to fire watch	Name & signature of individual assigned to fire monitoring

School: \_\_\_\_\_

Room/Area: \_\_\_\_\_

Nature of Job: \_\_\_\_\_

I verify the above location has been examined each day, the precautions listed in Section A have been taken each day, and permission is authorized for this work.  
I further acknowledge that if activity is during school operational hours, that appropriate notification has been given to school administration.

Hot Works Contractor: \_\_\_\_\_  
Signature

School Administrator notified: \_\_\_\_\_  
Print Name

In Case of Emergency call: 911 - Then call: 519-570-0003 Ext. 4123

Refer to WRDSB Administration Procedure 4200 Hot Works/Fire Watch (Copies Available on Request)

## **SECTION 01 35 23 – HEALTH AND SAFETY**

### **1.0 GENERAL**

#### **1.1. RELATED SECTIONS**

- .1 Section 01 31 00 - Project Managing and Coordination.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 17 – Fire Safety Requirements
- .4 Section 01 35 43 – Hazardous Materials
- .5 Section 01 41 00 – Regulatory Requirements
- .6 Section 01 53 00 – Temporary Construction Facilities
- .7 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.2. REFERENCES**

- .1 Province of Ontario, including requirements for a "Prime Contractor" as defined by the Act.

#### **1.3. SAFETY PLAN**

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to commencing any 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.
- .3 Be governed by pertinent safety requirements of Federal or Provincial Governments and of municipal bodies having authority, particularly the Ontario Construction Safety Act, The Occupational Health and Safety Act for Ontario, and regulations of Ontario Ministry of Labour, and work in conjunction with proper safety associations operating under the authority of Ontario Workers' Compensation Act. Protect Owner, Owner's employees, the public and those employed on the Work from bodily injury and to protect adjacent public and private property and Owner's property from damage. Furnish and maintain protection, such as warning signs, tarpaulins, guard rails, barriers, guard lights, night lights, railings around shafts, pits and stairwells, etc. as required. Remove temporary protective measures when no longer required.

#### **1.4. TEMPORARY WORK**

- .1 Temporary work requiring engineering proficiency for the design, erection, operation maintenance and removal shall be designed and bear stamp of the registered professional Engineer or Architect. Detail drawings will be submitted to the Consultant for review prior to commencing any work.
- .2 Before a temporary structure is used, person responsible for design, or their representative, shall inspect structure and certify it has been constructed according to their design.

### **1.5. RESPONSIBILITY**

- .1 The "Prime Contractor" according applicable local jurisdiction, is 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.
- .3 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, and follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Health and Safety Act having jurisdiction. Advise the Board and the Consultant verbally and in writing.
- .4 The Contractor shall make their own arrangements for emergency treatment of accidents. Any accidents shall be reported immediately to the Board contact.
- .5 The Contractor agrees to hold the Board harmless of any and all liability of every nature and description, which may be suffered through bodily injuries, involving deaths of any persons, by reasons of negligence of the Contractor, his agents, employees, or his sub-Contractors.

### **1.6. SUBMITTALS**

- .1 Make submittals in accordance with Section 01 33 00.
- .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 and Owner.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit Material Safety Data Sheets (MSDS) to Consultant.
- .7 Consultant's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .8 Medical Surveillance: Where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Consultant.
- .9 On-site Contingency and Emergency Response Plan: Address standard operating procedures to be implemented during emergency situations.
- .10 File Notice of Project with the Ministry of Labour prior to commencement of Work.

#### **1.7. SAFETY ACTIVITIES**

- .1 Perform site specific safety hazard assessment related to project.
- .2 Schedule and administer Health and Safety meeting with Consultant prior to commencement of Work.
- .3 Perform Work in accordance with Section 01 41 00 - Regulatory Requirements and this section.

#### **1.8. HEALTH AND SAFETY COORDINATOR**

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:
  - .1 have previous experience as a Health & Safety coordinator,
  - .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, and
  - .5 be on site during execution of Work.

#### **1.9. 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 Health and Safety Act having jurisdiction, and in consultation with Consultant.

#### **1.10. CORRECTION OF NON-COMPLIANCE**

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Consultant or by the Board.
- .2 Provide Consultant and/or Board with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Consultant and or the Board may stop Work if non-compliance of health and safety regulations is not corrected.

#### **1.11. PROJECT/SITE CONDITIONS**

- .1 Work at site will involve contact with:
  - .1 Refer to Section 01 35 43 Hazardous Materials

#### **1.12. HAZARDOUS WORK**

- .1 Blasting or other use of explosives is not permitted at the place of work.

#### **1.13. 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.

#### **1.14. LOCKOUT PROCEDURES**

- .1 All Work to be done on electrical systems or machinery, where the unexpected switching on of the system or machinery could result in personal injury to a student, staff, employee, or the Contractor's employee, must be done in accordance with the Contractor's standard lockout procedure.
- .2 The Contractor shall provide his/her own locks for the above procedure.
- .3 The lock shall include contact information for the person(s) locking out such device.

#### **1.15. OVERHEAD LIFTING**

- .1 Under no circumstances will a crane or lifting device be used over a occupied space.
- .2 When working adjacent to occupied spaces, ensure a clearance of one (empty) classroom, or a minimum of 10m between any occupied space and the furthest possible reach of the crane.

#### **1.16. WARNING SIGNS AND NOTICES**

- .1 Notices shall be posted advising of the hazard but will not be considered a substitute for providing approved protection, separation, and space from the hazard.

#### **1.17. FIRE PROTECTION**

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by the governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on site.
- .3 Maintain placed or installed Fire Protection to protect the portions of the Work during construction.

#### **1.18. SCENT-FREE ENVIRONMENT**

- .1 The Board requires that, where advised, a building may be deemed scent-free and as such, the wearing of scented products is prohibited.
- .2 Any methods or materials that are found to create negative responses in staff or students shall cease and be removed under advisement of the Consultant and or the Board, until alternate methods can be determined.

**END OF SECTION**

**THIS PAGE LEFT INTENTIONALLY BLANK**

## **SECTION 01 35 43 – HAZARDOUS MATERIALS**

### **2.0 GENERAL**

#### **2.1. RELATED SECTIONS**

- .1 Section 01 35 23 – Health and Safety Requirements.
- .2 Section 01 41 00 – Regulatory Requirements.
- .3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **2.2. REFERENCES**

- .1 Province of Ontario, including requirements for a "Prime Contractor" as defined by the Act.

#### **2.3. ASBESTOS and OTHER REGULATED SUBSTANCES**

- .1 An Asbestos Audit, as prepared by MTE Consultants Inc. for this facility, is attached under Appendix 013543 A. A duplicate set is also available in the Facilities Services Departments located in the Education Centre. Unless specifically covered by a Cash Allowance or Contingency Allowance that states otherwise, include in this Contract the required removal of all asbestos containing materials (ACM) to complete the work. No claims for extra costs will be accepted for areas known to contain ACM that are within the scope of this Work.
- .2 Comply with applicable legislation regarding asbestos. Should the Contractor encounter asbestos not noted in the referenced Asbestos Audit that would be disturbed during the course of the Work, they should stop the work in that immediate area and report the same to the Consultant and Board contact.
- .3 In addition, Lead, Mercury, Silica, and Isocyanates are anticipated to be present in existing facilities. New construction, renovations, or alterations require compliance by the Contractor with the applicable legislation.

#### **2.4. PROTOCOL FOR ABATEMENT WORK**

- .1 This Protocol establishes the requirements to be followed by all Asbestos Abatement Contractors involved with the Board. It applies to Type 1, Type 2 and Type 3 Operations as stated in the Regulations and applies to emergency and non-emergency work (directly retained or working as a sub-contractor).
- .2 Asbestos Abatement Contractors must maintain appropriate insurance coverage and WISB certification.



- .3 Contractors retained for asbestos abatement work shall use personnel certified by the Ontario College of Trades and must provide the Consultant and Board with proof of asbestos certification (AAS and AAW) for all supervisors / all staff involved.
- .4 School Access
  - .1 During school hours all asbestos contractors are to report to the school office upon arrival. After school hours, ensure card-in / card-out procedures are followed and building security is maintained.
- .5 Communication
  - .1 Establish communication contact list with email and phone numbers that shall include:
    - .1 Principal / Vice Principal
    - .2 Area Facility Manager
    - .3 Head Custodian
    - .4 Environmental Officer
    - .5 Manager of Mechanical, Electrical and Environmental Services
    - .6 Manager of Health Safety & Security
    - .7 Contractor staff
    - .8 Consultant
  - .2 Contact the School Principal / Vice to set up a firm date for the abatement (removal / repair). Schedule to allow at least 72 hours notice ahead of the work.
  - .3 Confirm the date by notifying via email the following:
    - .1 Principal / Vice-principal,
    - .2 Area Facility Manager, and
    - .3 Environmental Officer.
    - .4 Consultant
  - .4 Indicate the date, the start time, the anticipated completion time for the work and the work areas in the school.
  - .5 Identify personnel managing the project and provide current cell numbers for emergency contacts.
  - .6 For emergency work, as requested by Area Supervisors, Facility Managers or Environmental Officer, no notification to the school is required.
  - .7 Additionally, for Type 3 work also contact:
    - .1 Manager of Health, Safety & Security, and
    - .2 Notify the MOL (also for Type 2) where required by regulation.
    - .3 Consultant

- .8 Discussions with other groups, school staff, media and others is discouraged and shall be directed to the Board Communication Officer where warranted.
- .6 Asbestos Operations
  - .1 Emergency work shall be carried out the same day (evening/night) or under exceptional conditions the following day / evening / night. Contractors shall exercise discretion when working in the school to minimize anxiety of staff/school community. Where warranted, contact Area Supervisor, Facility Manager or Environmental Officer to obtain further direction.
  - .2 For non-emergency work, contractor is to assess the work on site and provide a cost estimate to the Environmental Officer, (daniela\_budure@wrdsb.on.ca) and Consultant. Some work will require discussion with the Facility Manager or Environmental Officer to assess if additional work should be done as to completely remove all ACM material from the area or similar.
  - .3 Where the MTE report shows ACM requiring repair, remove and re-insulate where required.
  - .4 Before beginning any Type 1, Type 2 or Type 3 Operations, the work area must be secured, doors closed, warning signs added to all entrances, caution tape used in open areas and signs used to restrict access to the work area so as to keep persons not involved in the work from entering in the work area.
  - .5 Provide "Construction" warning signs on solid barriers between the Work and public areas. Install a sufficient number of "asbestos abatement" warning signs behind the barriers, posted to warn of the hazard, and that access to the work area is restricted to persons wearing protective clothing and equipment.
  - .6 The contractor is responsible to disable the mechanical ventilation serving the work area and positively prevent operation using Lock-out / Tag-out devices for each air handling unit /fan. Exercise caution during heating season to ensure areas of the building are maintained above freezing and ensure equipment is turned back on after abatement / air clearance completed.
  - .7 Contractor's employees shall put on / take off PPE within work area marked by construction signs. No employee shall leave the work area wearing PPE.

- .8 All dust and waste is to be cleaned up and removed at frequent / regular intervals as the work proceeds and immediately upon completion. No waste bags or similar are to be left behind.

## 2.5. SUBMITTALS

- .1 Once the abatement is completed, forward a Letter of Completion to the Environmental Officer, (daniela\_budure@wrdsb.on.ca). This letter shall be received no later than 72 hours after completion and shall include any sample results.
- .2 For those projects requiring Air Clearance, ensure this info is sent without delay but in all cases no later than 24 hours after sampling. All Type 3 work must take into account that the initial samples may not pass and the contactor must allow one additional day to re-clean and re-sample before school is to resume operations. For those projects not under the direct supervision of a Environmental Consultant, the contactor is to expedite the air clearance sampling with the lab of their choice and carry these costs.
- .3 Forward Air Clearance results to:
  - .1 Principal / Vice-principal,
  - .2 Facility Manager,
  - .3 Environmental Officer,
  - .4 Manager of Mechanical, Electrical and Environmental Services, and
  - .5 Manager of Health, Safety & Security.
  - .6 Consultant

## 2.6. ACKNOWLEDGEMENT

- .1 The protocols for asbestos work must be read and understood by Asbestos Contractor.
- .2 Submit a signed copy of the most current copy of PROTOCOL FOR ABATEMENT WORK (ASBESTOS ABATEMENT CONTRACTORS) to the General Contractor, the Consultant, and the Board's Environmental Officer.

**END OF SECTION**

## SECTION 01 42 00 – REFERENCES

### 1.0 GENERAL

#### 1.1. SECTION INCLUDES

- .1 References and standards.
- .2 Standards producing industry organizations and their addresses.

#### 1.2. RELATED SECTIONS

- .1 Section 01 61 00 – Product Requirements.
- .2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### 1.3. REFERENCES

- .1 For Products or quality specified by association, trade, or other references or consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- .2 Conform to reference standard by Ontario Building Code except where a specific date is established or required by code.
- .3 Obtain copies of standards where required by product specification sections.
- .4 Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Consultant shall be altered from the Contract Documents by mention or inference otherwise, in any reference document.

#### 1.4. STANDARDS

- .1 The following associations and organizations are cited in specification sections. Acronym, name, address, and Internet URL addresses are as follows:
- .2 Canadian Organizations:
  - .1 **ACEC** - Association of Consulting Engineers of Canada, 130 Albert Street, Suite 616, Ottawa, ON K1P 5G4; URL: <http://www.acec.ca>.
  - .2 **AWMAC** - Architectural Woodwork Manufacturers Association of Canada, 516-4 Street West, High River, AB T1V 1B6; URL: <http://www.awmac.com>.
  - .3 **Canada Green Building Council**, 330 - 55 rue Murray Street, Ottawa, ON. K1N5M3; Tel: 613-241-1184, Fax: 613-241-5750; URL: <http://www.cagbc.org>.
  - .4 **CCA** - Canadian Construction Association, 75 Albert St., Suite 400, Ottawa, ON K1P 5E7; URL: <http://www.cca-acc.com>.

- .5 **CCDC** – Canadian Construction Documents Committee, Refer to ACEC, CCA, CSC or RAIC; URL: <http://www.CCDC.org>.
- .6 **CGA** - Canadian Gas Association, 20 Eglinton Avenue West, Suite 1305, Toronto, ON M4R 1K8; URL: <http://www.cga.ca..>
- .7 **CGSB** - Canadian General Standards Board, Place du Portage, Phase III, 6B1, 11 Laurier Street, Hull, QC K1A 0S5; URL: <http://w3.pwgsc.gc.ca/cgsb>.
- .8 **CISC** - Canadian Institute of Steel Construction, 201 Consumers Road, Suite 300, Willowdale, ON M2J 4G8; URL: <http://www.cisc-icca.ca>.
- .9 **CLA** - Canadian Lumbermen's Association, 27 Goulburn Avenue, Ottawa, ON K1N 8C7; URL: <http://www.cla-ca.ca>.
- .10 **CNLA** - Canadian Nursery Landscape Association, RR #4, Stn. Main, 7856 Fifth Street, Milton, ON L9T 2X8; URL: <http://www.canadanursery.com>.
- .11 **CRCA** - Canadian Roofing Contractors Association, 155 Queen Street, Suite 1300, Ottawa, ON K1P 6L1; URL: <http://www.roofingcanada.com>.
- .12 **CSA** - Canadian Standards Association International, 178 Rexdale Blvd., Toronto, ON M9W 1R3; URL: <http://www.csa-international.org>.
- .13 **CSC** - Construction Specifications Canada, 120 Carlton Street, Suite 312, Toronto, ON M5A 4K2; URL: <http://www.csc-dcc.ca>.
- .14 **CSDMA** - Canadian Steel Door Manufacturers Association, One Yonge Street, Suite 1801, Toronto, ON M5E 1W7; URL: <http://www.csdma.org>.
- .15 **CSPI** - Corrugated Steel Pipe Institute, 652 Bishop Street N, Unit 2A, Cambridge, ON N3H 4V6; URL: <http://www.cspi.ca>.
- .16 **CSSBI** - Canadian Sheet Steel Building Institute, 652 Bishop St. N., Unit 2A, Cambridge, ON N3H 4V6; URL: <http://www.cssbi.ca>.
- .17 **CUFCA** - Canadian Urethane Foam Contractor's Association, Box 3214, Winnipeg, MB R3C 4E7; URL: <http://www.cufca.ca>.
- .18 **CWC** - Canadian Wood Council, 1400 Blair Place, Suite 210, Ottawa, ON K1J 9B8; URL: <http://www.cwc.ca>.
- .19 **EC** - Environment Canada, Conservation and Protection, Inquiry Centre, 351 St. Joseph Blvd, Hull, QC KIA 0H3; URL: <http://www.ec.gc.ca>.
- .20 **EFC** - Electro Federation of Canada, 5800 Explorer Drive, Suite 200, Mississauga, ON L4W 5K9; URL: <http://www.electrofed.com>.
- .21 **MPI** - The Master Painters Institute, 4090 Graveley Street, Burnaby, BC V5C 3T6; URL: <http://www.paintinfo.com>.

- .22 **NABA** - National Air Barrier Association, PO Box 2747, Winnipeg, MB R3C 4E7; URL: <http://www.naba.ca>.
- .23 **NLGA** - National Lumber Grades Authority, 406-First Capital Place, 960 Quayside Drive, New Westminster, BC V3M 6G2; URL: <http://www.nlga.org>.
- .24 **NRC** - National Research Council, Building M-58, 1200 Montreal Road, Ottawa, ON K1A 0R6; URL: <http://www.nrc.gc.ca>.
- .25 **QPL** - Qualification Program List, c/o Canadian General Standards Board, Place du Portage, Phase III, 6B1, 11 Laurier Street, Hull, QC K1A 1G6; URL: <http://www.pwgsc.gc.ca/cgsb>.
- .26 **RAIC** - Royal Architectural Institute of Canada, 55 Murray Street, Suite 330, Ottawa, ON K1N 5M3; URL: <http://www.raic.org>.
- .27 **SCC** - Standards Council of Canada, 270 Albert Street, Suite 2000, Ottawa, ON K1P 6N7; URL: <http://www.scc.ca>.
- .28 **TTMAC** - Terrazzo, Tile and Marble Association of Canada, 30 Capston Gate, Unit 5 Concord, ON L4K 3E8; URL: <http://www.ttmac.com>.
- .29 **ULC** - Underwriters' Laboratories of Canada, 7 Crouse Road, Toronto, ON M1R 3A9; URL: <http://www.ulc.ca>.
- .3 USA Organizations:
  - .1 **AA** - Aluminum Association, 900 19th Street N.W., Washington, DC 20006; URL: <http://www.aluminum.org>.
  - .2 **AASHTO** - American Association of State Highway and Transportation Officials, 444 N Capitol Street N.W., Suite 249, Washington, DC 20001; URL: <http://www.aashto.org>.
  - .3 **AHA** - American Hardboard Association, 1210W Northwest Hwy, Palatine, IL 60067; URL: <http://www.hardboard.org>.
  - .4 **AITC** - American Institute of Timber Construction, 7012 S. Revere Parkway, Suite 140, Englewood, CO 80112; URL: <http://www.aitc-glulam.org>.
  - .5 **AMCA** - Air Movement and Control Association Inc., 30 West University Drive, Arlington Heights, IL 60004-1893; URL: <http://www.amca.org>.
  - .6 **ANSI** - American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036; URL: <http://www.ansi.org>.
  - .7 **APA** - The Engineered Wood Association, P.O. Box 11700, Tacoma, WA 98411-0700; URL: <http://www.apawood.org>.
  - .8 **API** - American Petroleum Institute, 1220 L St. Northwest, Washington, DC 20005-4070; URL: <http://www.api.org>.
  - .9 **ARI** - Air Conditioning and Refrigeration Institute, 4100 N Fairfax Drive, Suite 200, Arlington, VA 22203; URL: <http://www.ari.org>.

- .10 **ASHRAE** - American Society of Heating, Refrigeration and Air-Conditioning Engineers, 1791 Tullie Circle NE, Atlanta, GA 30329; URL: <http://www.ashrae.org>.
- .11 **ASME** - American Society of Mechanical Engineers, ASME Headquarters, 3 Park Avenue, New York, NY 10016-5990; URL: <http://www.asme.org>.
- .12 **ASTM International**, 100 Barr Harbor Drive West, Conshohocken, PA 19428-2959; URL: <http://www.astm.org>.
- .13 **AWCI** - Association of the Wall and Ceiling Industries International, 803 West Broad Street, Suite 600 , Falls Church, VA 22046; URL: <http://www.awci.org>.
- .14 **AWPA** - American Wire Producer's Association, 801 N Fairfax Street, Suite 211, Alexandria, VA 22314-1757; URL: <http://www.awpa.org>.
- .15 **AWPA** - American Wood Preservers' Association, P.O. Box 5690, Granbury TX 76049-0690; URL: <http://www.awpa.com>
- .16 **AWS** - American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126; URL: <http://www.amweld.org>.
- .17 **AWWA** - American Water Works Association, 6666 W. Quincy Avenue, Denver, CO 80235; URL: <http://www.awwa.org>.
- .18 **EIMA** - EIFS Industry Manufacturer's Association, 3000 Corporate Center Drive, Suite 270, Morrow, GA 30260; URL: <http://www.eima.com>.
- .19 **ISAP** - International Society for Asphalt Paving, 400 Selby Avenue, Suite 1, St. Paul, MN 55102; URL: <http://www.asphalt.org>.
- .20 **IEEE** - Institute of Electrical and Electronics Engineers, IEE Corporate Office, 3 Park Avenue, 17th Floor, New York, NY 10016-5997; URL: <http://www.ieee.org>
- .21 **MSS** - Manufacturers Standardization Society of the Valve and Fittings Industry, 127 Park Street, N.E., Vienna, VA 22180-4602; URL: <http://www.mss-hq.com>.
- .22 **NAAMM** - National Association of Architectural Metal Manufacturers, 8 South Michigan Avenue, Suite 1000, Chicago, IL 60603; URL: <http://www.naamm.org>.
- .23 **NEMA** - National Electrical Manufacturers Association, 1300 N 17th Street, Suite 1847, Rosslyn, VA 22209; URL: <http://www.nema.org>.
- .24 **NFPA** - National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101 Quincy, MA 02269-9101; URL: <http://www.nfpa.org>.
- .25 **NFSA** - National Fire Sprinkler Association, P.O. Box 1000, Patterson, NY 12563; URL: <http://www.nfsa.org>.

- .26 **NHLA** - National Hardwood Lumber Association, 6830 Raleigh-La Grange Road, Memphis, TN 38184-0518; URL: <http://www.natlhardwood.org>.
- .27 **NSPE** - National Society of Professional Engineers, 1420 King Street, Alexandria, VA 22314-2794; URL: <http://www.nspe.org>.
- .28 **PCI** - Prestressed Concrete Institute, 209 W. Jackson Blvd., Suite 500, Chicago, IL 60606-6938; URL: <http://www.pci.org>.
- .29 **PEI** - Porcelain Enamel Institute, PO Box 920220, Norcross, GA 30010; URL: <http://www.porecelainenamel.com>.
- .30 **SSPC** - The Society for Protective Coatings, 40 24th Street, 6th Floor, Pittsburgh, PA 15222-4656; URL: <http://www.sspc.org>.
- .31 **TPI** - Truss Plate Institute, 583 D'Onofrio Drive, Suite 200, Madison, WI 53719; URL: <http://www.tpinst.org>.
- .32 **UL** - Underwriters' Laboratories, 333 Pfingsten Road, Northbrook, IL 60062-2096; URL: <http://www.ul.com>.

**END OF SECTION**



**THIS PAGE LEFT INTENTIONALLY BLANK**

## **SECTION 01 45 00 – QUALITY CONTROL**

### **1.0 GENERAL**

#### **1.1. RELATED SECTIONS**

- .1 Section 01 21 00 - Allowances.
- .2 Section 01 78 10 – Closeout Submittals and Requirements
- .3 Section 01 79 00 – Demonstration and Training
- .4 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.2. REFERENCES**

- .1 **ISO/IEC 17025-2005** - General Requirements for the Competence of Testing and Calibration Laboratories.
- .2 **SCC** (Standards Council of Canada).

#### **1.3. INSPECTION BY AUTHORITY**

- .1 Allow Authorities Having Jurisdiction 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 whenever portions of the Work are designated for special tests, inspections or approvals, either when described in the Contract Documents or when required by law in the Place of the 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.

#### **1.4. REVIEW BY CONSULTANT**

- .1 Consultant may order any part of the Work to be reviewed or inspected if Work is suspected to be not in accordance with Contract Documents.
- .2 If, upon review such work is found not in accordance with Contract Documents, correct such Work and pay cost of additional review and correction.
- .3 If such Work is found in accordance with Contract Documents, The owner will pay cost of review and replacement.

#### **1.5. INDEPENDENT INSPECTION AGENCIES**

- .1 Independent Inspection and Testing Agencies will be engaged by Contractor for purpose of inspecting and testing portions of Work.
- .2 The Board may, at their discretion, request that the Consultant direct the Contractor to engage independent inspecting and or testing agencies to review or test the Work.
- .3 Allocate Costs for inspections and testing to Section 01 21 00.
- .4 Provide equipment required for executing inspection and testing by appointed agencies.
- .5 Employment of inspection and testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .6 If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Owner. Contractor shall pay costs directly to the inspection agency for retesting and re-inspection.

#### **1.6. ACCESS TO WORK**

- .1 Allow inspection and testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Cooperate to provide reasonable access and facilities for such access.

#### **1.7. CONTRACTOR RESPONSIBILITIES**

- .1 Notify appropriate agency minimum 48 hours in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

#### **1.8. DUTIES & AUTHORITY OF TESTING AGENCY**

- .1 Testing agency is expected to do the following:
  - .1 Act in a professional and unprejudiced basis and carry out inspection and testing functions to establish compliance with requirements of Contract Documents.
  - .2 Check work as it progresses and prepare reports stating results of tests and conditions of work and state in each report whether specimens

tested conform to requirements of Contract Documents, specifically noting deviations.

- .3 Distribute reports as follows
  - .1 Consultant
  - .2 Owner
  - .3 Contractor
- .2 Testing agency is not authorized to amend or release any requirements of Contract Documents, nor to approve or accept any portion of work.

### **1.9. REJECTED WORK**

- .1 The Contractor shall remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If, it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, the Owner may choose to accept the condition. The difference in value between Work performed and that called for by Contract Documents shall be deducted from the Contract value via Change Order. The amount of this change shall be determined by Consultant. The Contractor shall warrant the work performed for the time period specified as if it were performed in accordance with the Contract Documents.

### **1.10. TESTING OF EXCAVATION & BACK FILL**

- .1 The Consultant must approve all Sample and fill tests prior to purchase.
- .2 In coordination with the Consultant and Contractor, inspect and test backfill and fill to ensure the degree of compaction specified has been obtained.
- .3 Inspect excavation at required levels in regard to bearing values for footings, foundations and floor slabs.
- .4 Authorization and calculation of extra excavation work, if required, due to unsatisfactory bearing shall be adjusted by Unit Price.

### **1.11. CONCRETE STRENGTH TESTS**

- .1 Review the proposed concrete mix design and check test if considered necessary.
- .2 Obtain representative samples of fresh concrete for each mix design of concrete placed in any one day as directed by the Consultant.

- .3 Make standard slump tests.
- .4 Mould three (3) standard 150mm diameter cylindrical test specimens from each sampling of fresh concrete. Store specimens as per best practice while they are on the site. Cure all cylinders in the laboratory under standard moisture and temperature conditions. Compression test one of the cylinders at 7 days and the remaining two at 28 days after sampling. Each concrete cylinder test report shall contain the specific location of concrete represented by sample, design strength, aggregate size, admixtures used, date, hour and temperature at time of sampling, percentage air content, unit weight and test strength of cylinder.
- .5 When concrete is placed under the conditions of "Cold Weather Requirements" make one additional cylinder; store it in a heated enclosure for 24 hours and then store it on the job site in a place protected from disturbance and off the ground. Compressive test this cylinder 7 days after sampling.
- .6 Determine the air content of air entrained standard weight concrete.
- .7 Determine the air content and unit weight of light weight concrete by the volumetric method.
- .8 Additional testing required because of changes in materials or proportions of the mix requested by the Contractor as well as any extra testing of concrete or materials occasioned by their failure to meet specification requirements or testing of the structure or performance of the structure, including load testing, shall be carried out at the Contractor's expense.

#### **1.12. INSPECTION OF STRUCTURAL STEEL**

- .1 Ensure all steel has mill test reports that comply with the Specification prior to purchase.
- .2 Inspect fabrication of steel in plant.
- .3 Inspect erection work at site including fit-up, placing, plumbing, levelling, temporary bracing, field cutting and alterations.
- .4 Shop and field inspect welded and bolted connections and painting.
- .5 High strength bolts - the installation and testing of bolts shall conform to the requirements of CSA S16-1969. Check one representative connection in ten by torque testing every bolt, and check each bolt in every connection with a tap of hammer for soundness. Enforce requirements of connection type.
- .6 Examine visually all welded joints for inclusions, porosity, lack of fusion penetration or even contour, undercuts and cracks. Root passes shall be checked for penetration and cracks from the back of the joint. Any suspect welds shall be checked ultrasonically.

### **1.13. INSPECTION OF METAL DECK**

- .1 Check deck for gauge, type and protective coating thickness to ensure compliance with Specification.
- .2 Inspect erection work at the site including anchorage.

### **1.14. INSPECTION AND TESTING OF PAVING**

- .1 Testing shall be carried out in three stages as described below by means of sufficient site visits to ensure satisfactory results but in no case less three site visits.
- .2 Test within 16 hours from time called to do so by Contractor, since paving is a critical item at the end of the project.
- .3 Stage One:
  - .1 Visual inspection and compaction tests of subsoil.
- .4 Stage Two:
  - .1 Inspection of granular sub-base (after each layer is placed or after the last layer is placed and compacted).
  - .2 On site density tests.
  - .3 Verify thickness of various levels. (Minimum of 4 checks shall be done on thickness in a paved area of 250m<sup>2</sup> or less, and 1 additional check for each additional 250m<sup>2</sup> or part thereof).
  - .4 Laboratory tests: moisture content and grading of materials.
- .5 Stage Three:
  - .1 Inspection of asphalt installation.
  - .2 Checking of thickness and density of material and checking suitability of equipment used.
- .6 Standard Proctor Test shall be carried out for all projects.
- .7 Further, grain size analysis and Marshall test shall be carried out if visual inspection is not satisfactory or, if there is reason to suspect materials supplied are not acceptable.
- .8 All laboratory tests shall be performed according to A.S.T.M. methods, latest revisions
- .9 Paving Contractor shall obtain from their supplier grading tables of materials used and submit them to the testing laboratory for approval. The paving contractor shall ensure material delivered complies with grading tables.
- .10 Be responsible for all approvals given to Paving Contractor. At completion of paving project, inform Consultant all tests were performed according to the Specifications and the Contractor's performance has been approved.

- .11 The Consultant will not entertain any credits for work either not performed or incorrectly performed by the contractor. If thicknesses or consistencies of sub-base are not as specified, or if asphaltic material is not as specified, then the Contractor shall remove same at their expense and provide proper specified materials.

#### **1.15. BUILDING THERMOGRAPHIC SCAN**

- .1 Upon completion of the Work, the Consultant and/or Owner may arrange for an independent agency to carry out a thermographic scan of the building to determine acceptability of thermal performance of the building envelope.
- .2 Consultant, prior to start of construction work, will designate a sample area of the building to include a portion of exterior wall and roof.
- .3 Consultant will implement a special inspection program for this sample area to be carried out as construction progresses. Contractor shall not cover any completed work until notifying Consultant and receiving acceptance of completed work. Contractor shall remove and replace any work which is installed in contravention of this requirement.
- .4 Results of thermographic scan of entire building will be evaluated and compared to those of the sample area to determine acceptance or rejection of any part of the building envelope.
- .5 Contractor shall carry out remedial work as required to bring quality of any rejected portion of the building envelope to that of the sample area. Contractor shall pay for costs of any follow-up thermographic scans required to determine acceptability of remedial work. This procedure shall be repeated until all parts of the building envelope have been accepted.

#### **1.16. TESTS AND MIX DESIGNS**

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

#### **1.17. MOCK-UP**

- .1 Prepare mock-up for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.
- .2 Prepare mock-ups for Consultants review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

- .3 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .4 If requested, Consultant will assist in preparing a schedule fixing dates for preparation.
- .5 Remove mock-up at conclusion of Work or when acceptable to Consultant. Repair any damage and clean-up at place of mock-up.
- .6 Approved mock-up may remain as part of Work.

**1.18. EQUIPMENT AND SYSTEMS**

- .1 Submit adjustment and balancing reports for mechanical and electrical systems to the consultant.
- .2 Refer to Sections 01.78.10 and 01.79.00 for definitive requirements.

**END OF SECTION**



**THIS PAGE LEFT INTENTIONALLY BLANK**

## **SECTION 01 51 00 – TEMPORARY UTILITIES**

### **1.0 GENERAL**

#### **1.1. RELATED SECTIONS**

- .1 Section 01 52 00 - Construction Facilities.
- .2 Section 01 53 00 - Temporary Construction.
- .3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.2. INSTALLATION AND REMOVAL**

- .1 Provide temporary utilities controls in order to execute work expeditiously.
- .2 Location of temporary facilities shall be subject to Consultant's approval.
- .3 Salvage and assist in recycling products for potential reuse wherever possible.
- .4 Remove temporary facilities from site when directed by consultant.

#### **1.3. DEWATERING**

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water. Provide necessary pumps (including spare pumps) and temporary drainage for keeping the Work free of water throughout construction period. Locate sumps away from foundation elements. Control grading around excavation to prevent surface water from draining into excavation and from damaging adjoining property.

#### **1.4. WATER SUPPLY**

- .1 Provide continuous supply of potable water for construction use until such time as permanent municipal water supply is available.
- .2 Hose extensions to be provided by subcontractors requiring them.
- .3 For New Builds arrange for connection with appropriate utility company and pay all costs for installation, maintenance, removal and usage costs until occupancy has been achieved.
- .4 For Additions and renovations the contractor can use existing Board service unless noted otherwise.

#### **1.5. TEMPORARY HEATING AND VENTILATION**

- .1 Provide temporary heating required during construction period, including unit rental costs, maintenance.

- .2 Provide temporary heating fuel, if not already available on site, until such time as a permanent natural gas line is installed, and thereafter fuel costs shall be borne by the Board. The Contractor shall provide all connections and piping between the permanent fuel source and the heating appliance(s).
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
  - .1 Facilitate progress of Work.
  - .2 Protect Work and products against dampness and cold.
  - .3 Prevent moisture condensation on surfaces.
  - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
  - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures of minimum:
  - .1 10 degrees C in areas where construction is in progress, until takeover by Board. Contractor to ensure temporary enclosures remain sealed and penetrations are repaired or closed in a timely fashion.
  - .2 16 degrees C in areas where finishes are in progress.
  - .3 16 degrees C in building once it is enclosed.
  - .4 Refer to other Sections for intermittent heating requirements up to 21 degrees C. Provide insulated tarp enclosures for openings as required to enclose the building after completion of main building shell components and roof.
  - .5 If the Contractor fails to ensure the temporary enclosures remained sealed (including temp doors when not in use) the Consultant and or the Board shall require the contractor to pay 40% of that months usage charge
- .5 Use forced hot air heaters. Open-flame type heaters or salamanders are not permitted. Ventilate direct fired heating units to the outside.
- .6 Uniformly distribute heat to avoid hot and cold areas and to prevent excessive drying.
- .7 Early heating of the building shell will be required to expedite interior finishing to meet the project schedule.
- .8 Ventilating:
  - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
  - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
  - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.

- .4 Ventilate storage spaces containing hazardous or volatile materials.
- .5 Ventilate temporary sanitary facilities.
- .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .7 Provide minimum 1 air change per hour for enclosed areas receiving architectural finishes.
- .8 Do not allow excessive build-up of moisture inside building.
- .9 The permanent mechanical systems for the new building, when installed in safe operating conditions, may be used for temporary heating or cooling if approved in writing by the Consultant, without penalty to the warranty.
- .10 Follow the requirements of "Temporary Use of New Permanent Services and Equipment" if the permanent heating system installed under the contract is intended to be used for temporary heating during the construction.
- .11 Provide competent persons to operate and maintain permanent systems for duration of temporary use period.
- .12 Perform required repairs and maintenance immediately after each inspection. Pay for operating costs. Upon termination of temporary use period, services and equipment shall be inspected, tested, adjusted, fitters replaced, balanced, cleaned and lubricated.
- .13 Permanent services and equipment shall be turned over to Owner in new and perfect operating condition.
- .14 Use of permanent systems and equipment as temporary facilities shall not affect the guarantee conditions and guarantee period for such systems and equipment. Make due allowance to ensure Owner will receive full benefits of equipment manufacturer's warranty from the date of Substantial Performance.
- .15 Ensure date of Substantial Performance of the Work and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Consultant.
- .16 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
  - .1 Conform with applicable codes and standards.
  - .2 Enforce safe practices.
  - .3 Prevent abuse of services.
  - .4 Prevent damage to finishes.
  - .5 Vent direct-fired combustion units to outside.
- .17 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

## **1.6. TEMPORARY POWER AND LIGHT**

- .1 Provide temporary electrical service and system including lighting and power system for use by all Sections.
- .2 Contractor will provide a source for, and pay the costs of temporary power during construction for temporary lighting and operating of power tools until such time as permanent source is available.
- .3 Contractor to ensure that the use of power from a source provided by the Board shall not exceed the capacity of the current use required for the operation of any existing facility.
- .4 Install and maintain temporary electrical service and systems in accordance with Construction Safety Association's "Temporary Wiring Standards on Construction Sites", the Ontario Electrical Code and other authorities having jurisdiction.
- .5 Provide at least one temporary panel on each floor with service capacity suitable for construction requirements and to authorities and utilities approval.
- .6 Provide temporary wiring with lighting to all areas of each floor to provide adequate lighting.
  - .1 Lighting levels must be maintained at a minimum of 10 foot candles, or to suit the particular location or operation, whichever is greater.
  - .2 Do not use materials of the temporary service in permanent installation.
  - .3 Increase lighting levels equivalent to the final requirements when finishing operations are underway.
- .7 Extension cords, lights, etc., required by various subcontractors and run from above outlet positions will be supplied and maintained by the party or parties requiring same.
- .8 Follow requirements of "Temporary Use of New Permanent Services and Equipment" if electrical power and lighting systems installed under the contract are intended to be used for temporary electricity and lighting during the construction.
- .9 Electrical power and lighting systems installed under this contract can be used for construction provided damages are made good and all lamps that have been used for more than two months are replaced with new lamps.
- .10 For New Builds arrange for connection with appropriate utility company and pay all costs for installation, maintenance, removal and usage costs until occupancy has been achieved.
- .11 For Additions and renovations the contractor can use existing Board service unless noted otherwise.
- .12 Provide and pay for temporary power for electric cranes and other equipment requiring temporary power in excess of above noted requirements.

**1.7. TEMPORARY COMMUNICATION FACILITIES**

- .1 Contractor to provide and pay for temporary Phone, e-mail and printer hook up, for the duration of contract until completion for use by the contractor.
- .2 The site superintendent is to have e-mail access and a printer on site.

**END OF SECTION**

**THIS PAGE LEFT INTENTIONALLY BLANK**

## **SECTION 01 53 00 – TEMPORARY CONSTRUCTION FACILITIES**

### **1.0 GENERAL**

#### **1.1. RELATED SECTIONS**

- .1 Section 01 51 00 - Temporary Utilities.
- .2 Section 01 35 23 – Health and Safety
- .3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.2. INSTALLATION AND REMOVAL**

- .1 Provide temporary construction facilities in order to execute work expeditiously.
- .2 Remove temporary facilities from site when directed by Consultant.

#### **1.3. PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY**

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

#### **1.4. PROTECTION OF SURROUNDING WORK**

- .1 Provide protection for finished and partially finished Work from damage.
- .2 Provide necessary cover and protection.
- .3 Be responsible for damage incurred due to lack of or improper or inappropriate protection.

#### **1.5. ROOF AND STRUCTURE PROTECTION**

- .1 Ensure no part of Work or existing structures are subjected to a load, which will endanger its safety or will cause permanent deformation.
- .2 The Contractor when indicated by the Board Contact or Consultant shall provide roof protection. Ensure all precautions are taken to avoid liability for roof damage.
- .3 Typical roof protection shall consist of a layer of 1 inch rigid foam insulation set directly on the roof surface and a layer of 19 mm (3/4 inch) plywood in all places under scaffold legs, ladder legs and in areas of foot traffic or falling debris.

#### **1.6. WORK SITE ENCLOSURE & SAFETY BARRIERS**

- .1 Erect and maintain for the duration of the work:



- .1 a minimum 1800 mm high chain link fence or self-supporting, heavy duty, interconnected fence panels (commonly referred to as Insta-fence) for a temporary site enclosure (hoarding) completely around perimeter of work site,
- .2 any temporary posts shall be completely removed by the contractor prior to occupancy,
- .3 under no circumstance shall t-bar posts be used on board property
- .4 any additional safety devices including full hoarding as required and noted on the drawings, to protect the students, staff, public and private property from injury and damage,
- .5 any additional requirements as regulated by authorities having jurisdiction, local by-laws and zoning.
- .2 The Contractor is to assume full responsibility for any injury or damage caused due to failure to comply with Paragraph 1 above.
- .3 Any hazardous conditions identified outside of the main fenced area will be barricaded with a fence complying to the above.
- .4 Provide lockable truck entrance gate/gates and at least one (1) pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys with restricted availability, in the project office.
- .5 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
- .6 Provide barriers around trees and plants designated to remain.
- .7 Protect from damage by equipment and construction procedures.

#### **1.7. TREE PROTECTION**

- .1 Protect all existing trees to remain from damage during construction period. Make good, at Contractor's expense, trees damaged during construction.
- .2 Confine movement of heavy equipment, storage of same, and storage of materials to a predetermined area. Do not store materials or place equipment over root systems of any existing trees to remain.
- .3 Install fencing or approved equal at limits of drip line of existing trees to remain unless directed otherwise. Where this case is not practical, and only if approved by the Consultant, the trunks shall be protected with an approved tree guard.
- .4 No rigging cables shall be wrapped around or installed in trees. Do not flush concrete trucks or cement mixing machines over root systems or near trees. Flush concrete trucks or cement mixing machines in areas approved by Consultant.

- .5 Areas where root systems of trees are exposed directly adjacent to a structure will be backfilled with good loam only.
- .6 Whenever excavating is required within branch spread of trees that are to remain, the contractor shall contact the consultant for direction prior to the start of work.
- .7 If any existing tree to remain is injured and does not survive the following year, it will, as determined by the Board, be removed in its entirety and be replaced with a tree of similar size and value, as directed by the Consultant.
- .8 Should the destroyed tree be of such a size or shape that it cannot be feasibly replaced, the Contractor shall compensate the Owner for the minimum sum of five thousand dollars (\$5,000.00) per destroyed tree.

#### **1.8. GUARD RAILS AND BARRIERS**

- .1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.
- .2 Erect and maintain for the duration of the Work, safety devices and barricades including hoarding, as required, to protect the staff, students, public and private property, from injury and damage.
- .3 The Contractor is to ensure that all requirements from authorities having jurisdiction and all requirements from the Owner are met.
- .4 The Contractor is to assume full responsibility for any damage caused due to his failure to comply with paragraph 2 above.
- .5 Hazardous conditions on the exterior shall be fenced.

#### **1.9. WEATHER ENCLOSURES**

- .1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.
- .2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.
- .3 Design enclosures to withstand wind pressure.

#### **1.10. DUST TIGHT BARRIERS**

- .1 Provide dust tight barriers and 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.
- .3 Where required adjust air handling units to eliminate migration of dust.

#### **1.11. SCAFFOLDING**

- .1 Erect scaffolding independent of walls and use in such a manner limiting interference with other work. When not in use, move scaffolding as necessary to permit installation of other work. Construct and maintain scaffolding in a rigid, secure and safe manner. Remove it promptly when no longer required. Protect surface on which scaffolding is bearing.

#### **1.12. SHORING, BRACING, PILING**

- .1 Provide shoring, bracing, piling, sheeting and sheet piling and underpinning required to support soil banks, existing work and property in accordance with Construction Safety Act and other applicable regulations. Maintain shoring until building is strong enough and sufficiently braced to withstand pressure of backfilling. Make construction aids free of permanent work so they may be removed entirely when no longer required, without damaging the Work. Locate construction aids so adequate room is left for damp-proofing foundation walls, laying substructure drainage and other work.
- .2 Shoring and false work over one tier in height shall be designed and shall bear the stamp of a registered professional engineer, having experience in this field.

#### **1.13. HOISTING**

- .1 Provide, operate and maintain services required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
- .2 Machinery shall be operated by qualified operator.

#### **1.14. OVERHEAD LIFTING**

- .1 Any condition requiring the use of a crane or lifting device over a Board structure must follow the requirements of Health and Safety Section 01 35 23, Paragraph 1.15 Overhead Lifting.

#### **1.15. ELEVATORS/LIFTS**

- .1 When elevators/lifts are to be used by construction personnel, provide protective coverings for finish surfaces of elevator cabs and entrances.
- .2 Co-ordinate use of elevator cabs with Consultant and the Board.

#### **1.16. USE OF THE WORK**

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with Products.

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

#### **1.17. CONSTRUCTION PARKING**

- .1 Construction personnel vehicle parking, to be confined to the work site enclosure, or.
- .2 Parking will be permitted on site only where and if it does not disrupt the employees of the place of work as directed by the Board
- .3 Permission to park vehicles on site does not imply any liability or responsibility for safe keeping of vehicles and contents thereof by the School Board.

#### **1.18. ACCESS TO SITE**

- .1 Provide and maintain adequate access to project site.
- .2 Build and maintain temporary roads where necessary and provide snow removal within the area of work, and access to the work, during period of Work. The area shall be restored to the satisfaction of the Board at the completion of the project.
- .3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.
- .4 Clean roadways and taxi areas where used by Contractor's equipment.

#### **1.19. SECURITY**

- .1 The Contractor shall ensure the security of the work site, contents, and built structures for the duration of the project.
- .2 The Contractor shall be responsible to provide and pay for security personnel to guard site and contents of site after working hours and during holidays as required.
- .3 Notify the Board of the use of security guards or systems.
- .4 The Board shall not be responsible for the loss, theft, or vandalism.

#### **1.20. OFFICES**

- .1 Provide and maintain, until completion of Contract, for Contractor's use, a temporary office, large enough to accommodate site administrative activities and site meetings, complete with light, heat, air conditioning, ventilation, table and chairs. Do not store materials in office area; keep clean and tidy.
- .2 Provide a clearly marked and fully stocked first-aid case in a readily available location.

- .3 Subcontractors may provide their own offices as necessary. Direct location of these offices.

#### **1.21. EQUIPMENT, TOOL AND MATERIALS STORAGE**

- .1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds and platforms for storage of tools, equipment and materials.
- .2 Review storage areas on site with the Consultant. Store materials and equipment to ensure preservation of quality of product and fitness for the Work. Store materials and equipment on wooden platforms or other hard, clean surfaces, raised above the ground or in water tight storage sheds of sufficient size for storage of materials and equipment which might be damaged by storage in open. Locate stored materials and equipment to facilitate prompt inspection.
- .3 Store packaged materials and equipment undamaged, in their original wrappings or containers, with manufacture's labels and seals intact.
- .4 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.
- .5 Storage sheds required by subcontractors shall be provided by them.

#### **1.22. SANITARY FACILITIES**

- .1 Provide weatherproof temporary toilet/sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Service temporary toilet/sanitary facilities as required by authorities but not less than weekly.
- .3 Post notices and take such precautions as required by local health authorities.
- .4 The use of existing washroom facilities is not allowed unless specifically approved by the Board. The Contractor will be required to clean and maintain the existing washrooms to Board standards.
- .5 Except where connected to municipal sewer system, periodically remove wastes from Site.
- .6 Keep toilet/sanitary facilities clean and sanitary and protect from freezing.
- .7 Keep sanitary facilities clean and fully stocked with the necessary supplies at all times.

**END OF SECTION**

## **SECTION 01 61 00 – PRODUCT REQUIREMENTS**

### **1.0 GENERAL**

#### **1.1. RELATED SECTIONS**

- .1 This section describes requirements applicable to all Sections within Divisions 02 to 49.
- .2 Section 01 31 00 – Project Managing and Coordination

#### **1.2. TERMINOLOGY**

- .1 New: Produced from new materials.
- .2 Renewed: Produced or rejuvenated from an existing material to like-new condition to serve a new or existing service.
- .3 Defective: A condition determined exclusively by the Consultant.

#### **1.3. PRODUCT QUALITY**

- .1 The term 'new' in the following paragraph does not exclude re-manufactured products that have some or all of the materials recycled from other sources. Preference in recycling is for post-consumer recycled materials.
- .2 Products, materials, equipment, parts or assemblies (referred to as Products) incorporated in Work:
- .3 New Product, not damaged or defective, of best quality (compatible with specification requirements) for purpose intended. If requested, provide evidence as to type, source and quality of Products provided.
- .4 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.
- .5 Should any dispute arise as to quality or fitness of Products, decision rests strictly with Consultant.
- .6 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

#### **1.4. AVAILABILITY**

- .1 Immediately upon receipt of Boards Purchase Order, review Product delivery requirements and anticipate foreseeable supply delays for any items.
- .2 Immediately upon receipt of Boards Purchase Order the Contractor shall issue Purchase Orders and or Contracts to all Sub-trades. Provide proof to

the Consultant and the Board within 3 days. The Sub-Contractors shall identify in writing any delivery issues within 14 days of receiving the Contractors purchase order or contract. The Schedule noted in 01-31 00 1.7.1 shall incorporate all deliveries and installation.

- .3 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.
- .4 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. STORAGE AND PROTECTION**

- .1 Store and protect Products in accordance with manufacturers' written instructions.
- .2 Store with seals and labels intact and legible.
- .3 Store sensitive Products in weather tight, climate controlled, enclosures in an environment favourable to Product.
- .4 For exterior storage of fabricated Products, place on sloped supports above ground.
- .5 Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of Products.
- .6 Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- .7 Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- .8 Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

#### **1.6. TRANSPORTATION AND HANDLING**

- .1 Transport and handle Products in accordance with manufacturer's written instructions.
- .2 Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.
- .3 Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.
- .4 Suitably pack, crate and protect products during transportation to site to preserve their quality and fitness for the purpose intended.

- .5 Store products in original, undamaged condition with manufacturer's labels and seals intact until they are being incorporated into completed work.
- .6 Protect materials from damage by extreme temperatures or exposure to the weather.

### **1.7. 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 the owner.
- .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.

### **1.8. MANUFACTURER'S WRITTEN INSTRUCTIONS**

- .1 Unless otherwise indicated in specifications, install or erect Products to manufacturer's written instructions. Do not rely on labels or enclosures provided with Products. Obtain written instructions directly from manufacturers.
- .2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant may establish course of action.
- .3 Improper installation or erection of Products, due to failure in complying with these requirements, authorizes Consultant to require removal and re-installation at no increase in Contract Price or Contract Time.

### **1.9. QUALITY OF WORK**

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Consultant and or Board reserves right to require dismissal from site any workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.
- .4 Products, materials, systems and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the applicable manufacturer's printed directions.



- .5 Where specified requirements are in conflict with manufacturer's written directions, follow manufacturer's directions. Where specified requirements are more stringent than manufacturer's directions, comply with specified requirements.

#### **1.10. COORDINATION**

- .1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.
- .3 Contractor is responsible to ensure suppliers or distributors of materials specified or alternatives accepted, which he intends to use, have materials with original schedule, and similarly it shall be the responsibility of all subcontractors and suppliers to so inform the Contractor.
- .4 Contractor shall contact Consultant immediately upon receipt of information indicating materials or items, will not be available on time, in accordance with the latest approved schedule, and similarly it shall be the responsibility of all subcontractors and suppliers to so inform the Contractor.
- .5 The above, in no way releases the Contractor, or their subcontractors and suppliers of their responsibility for ensuring timely ordering of materials and items required, including the necessary expediting, to complete the Work as scheduled in accordance with the Contract Documents including temp accommodations and or materials to ensure occupancy date is achieved.

#### **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 at no additional cost to the Board.

#### **1.12. REMEDIAL WORK**

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate 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 Inform Consultant of conflicting installation. Install as directed.

**1.14. FASTENINGS - EQUIPMENT**

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use Type 304 or 316 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

**1.15. PROTECTION OF WORK IN PROGRESS**

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

**END OF SECTION**

**THIS PAGE LEFT INTENTIONALLY BLANK**

## **SECTION 01 70 00 – EXAMINATION AND PREPARATION**

### **1.0 GENERAL**

#### **1.1. RELATED SECTIONS**

- .1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.2. REFERENCES**

- .1 Owner's identification of existing survey control points and property limits.

#### **1.3. SUBMITTALS**

- .1 Submit name and address of Surveyor to Consultant.
- .2 On request of Consultant, submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by surveyor certifying that elevations and locations of completed Work conforms with Contract Documents.

#### **1.4. QUALIFICATIONS OF SURVEYOR**

- .1 Qualified registered land surveyor, licensed to practise in the Place of the Work.

#### **1.5. SURVEY REFERENCE POINTS**

- .1 Existing base horizontal and vertical control points are designated on Drawings.
- .2 Locate, confirm and protect control points prior to starting site Work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Consultant.
- .4 Report to Consultant when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

#### **1.6. SURVEY REQUIREMENTS**

- .1 Establish existing and new permanent bench marks on site, referenced to established bench marks by survey control points.
- .2 Record locations, with horizontal and vertical data in Project Record Documents.
- .3 Establish lines and levels, locate and lay out, by instrumentation.

- .4 Establish pipe invert elevations.
- .5 Stake batter boards
- .6 Establish foundation and floor elevations.
- .7 Establish lines and levels for mechanical and electrical work.

#### **1.7. SUBSURFACE CONDITIONS**

- .1 Promptly notify Consultant in writing if discovered surface or subsurface conditions at Place of Work differ materially from those indicated in Contract Documents.
- .2 Advise the Consultant of a reasonable assumption of probable conditions when determined.
- .3 After prompt investigation, should Consultant determine that conditions do differ materially, instructions will be issued for changes in Work.

#### **1.8. EXAMINATION**

- .1 The Contractor is expected to be totally familiar with site conditions and shall assume full responsibility for the cost involved in repairing any damage to the building, site and services, city property, adjacent buildings, etc., during general construction, regardless of the extent of the damage.
- .2 Inspect existing conditions, including elements or adjacent Work subject to irregularities, damage, movement, including Work during cutting and patching.
- .3 The Contractor shall provide all equipment necessary to make a full and detailed site evaluation. This shall include but not be limited to ladders, flashlights and hand tools.
- .4 The Contractor expressly agrees that conditions above existing suspended acoustic ceilings, but below fixed structure, unless obscured by an additional ceiling above, shall be considered exposed conditions for the purposes of making findings under the provisions of the Contract. There shall be no claims for extra costs for extra Work in these areas.
- .5 After uncovering, inspect conditions affecting performance of the Work.
- .6 Beginning of cutting or patching means acceptance of existing conditions.

#### **1.9. PREPARATION**

- .1 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .2 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

**1.10. EXISTING SERVICES**

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings.
- .2 Remove abandoned service lines running through within existing and new structures. Cap or seal lines at cut-off points as directed by Consultant.

**1.11. LOCATION OF EQUIPMENT AND FIXTURES**

- .1 Inform Consultant of conflicting installations, install as directed.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Consultant of impending installation and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Consultant.

**1.12. SURVEY RECORD**

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
- .3 Record locations of maintained, re-routed and abandoned service lines.

**END OF SECTION**

**THIS PAGE LEFT INTENTIONALLY BLANK**

## SECTION 01 73 30 – EXECUTION AND CUTTING AND PATCHING

### 2.0 GENERAL

#### 2.1. RELATED SECTIONS

- .1 Section 01 32 00 - Construction Progress Documentation: Submittals and scheduling.
- .2 Section 01 61 00 - Product Requirements.
- .3 Section 01 70 00 – Examination and Preparation
- .4 Individual Product Specification Sections:
  - .1 Cutting and patching incidental to work of the section.
  - .2 Advance notification to other sections of openings required in Work of those sections.

#### 2.2. SUBMITTALS

- .1 Submit written request in advance of cutting or alteration which affects:
  - .1 Structural integrity of any element of Project.
  - .2 Integrity of weather exposed or moisture resistant element.
  - .3 Efficiency, maintenance, or safety of any operational element.
  - .4 Visual qualities of sight exposed elements.
  - .5 Work of Owner or separate contractor.
- .2 Include in request:
  - .1 Identification of Project.
  - .2 Location and description of affected Work.
  - .3 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.

#### 2.3. TOLERANCES

- .1 Monitor fabrication and installation tolerance control of Products to produce acceptable Work.
- .2 Do not permit tolerances to accumulate beyond effective or practical limits.
- .3 Comply with manufacturers' tolerances. In case of conflict between manufacturers' tolerances and Contract Documents, request clarification from Consultant before proceeding.



- .4 Adjust Products to appropriate dimensions; position and confirm tolerance acceptability, before permanently securing Products in place.

### **3.0 PRODUCTS**

#### **3.1. MATERIALS**

- .1 Primary Products: Those required for original installation.
- .2 Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 33 00.

### **4.0 EXECUTION**

#### **4.1. EXAMINATION**

- .1 Examine existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering existing Work, assess conditions affecting performance of work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.

#### **4.2. PREPARATION**

- .1 Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.
- .2 Provide protection from elements for areas which may be exposed by uncovering work.
- .3 Maintain excavations free of water.

#### **4.3. CUTTING**

- .1 Execute cutting and fitting as needed to complete the Work. Prior to any cutting and or coring of concrete floors the contractor shall confirm the area is free of services or rebar. Notify the Consultant of any interferences.
- .2 Uncover work to install improperly sequenced work.
- .3 Remove and replace defective or non-conforming work.
- .4 Remove samples of installed work for testing for Hazardous materials.
- .5 Provide openings in the Work for penetration of mechanical and electrical work.
- .6 Employ experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- .7 Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

- .8 Do all cutting, patching and making good, to leave a finished condition and to make the several parts of the work come together properly. Coordinate work to keep cutting and patching to a minimum.
- .9 Make cuts with clean, true, smooth edges. Fit unit to tolerance established by test standard practice for applicable work. Make patches invisible in final assembly.
- .10 Cutting shall be done in a manner to keep patching to minimum. Obtain Consultant's approval of method to be used to conceal new mechanical and electrical services before beginning cutting. Chasing of concrete surfaces is not permitted.
- .11 Cutting or coring of any structural concrete is to be reviewed and approved by the Consultant.
- .12 Do not endanger any work by cutting, digging or otherwise altering, and do not cut nor alter any load bearing element without written authorization by Consultant. Provide bracing, shoring and temporary supports as required to keep construction safely supported at all times
- .13 Any cost caused by omission or ill-timed work shall be borne by party responsible therefore.
- .14 Regardless of which Section of work is responsible for any portion of cutting and patching, in each case tradesmen qualified in work being cut and patched shall be employed to ensure it is correctly done.

#### **4.4. PATCHING**

- .1 Execute patching to complement adjacent Work.
- .2 Fit Products together to integrate with other Work.
- .3 Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
- .4 Employ original installer to perform patching for weather exposed and moisture resistant elements, and sight-exposed surfaces.
- .5 Restore work with new Products in accordance with requirements of Contract Documents.
- .6 Fit work with adequate support to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .7 At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with firestop material.
- .8 Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- .9 Complete and tightly fit all construction to pipes, ducts and conduits which pass through construction to completely prevent the passage of air.

- .10 Patching and making good shall be done by trade specialists in material to be treated, and shall be made undetectable in finished work when viewed from distance of 1.5m under normal lighting.

**END OF SECTION**

## **SECTION 01 74 00 – CLEANING AND WASTE MANAGEMENT**

### **1.0 GENERAL**

#### **1.1. RELATED SECTIONS**

- .1 Common Work by All Trades
- .2 This section describes requirements applicable to all Sections within Divisions 02 to 49.
- .3 Conduct cleaning and disposal operations to comply with local ordinances and environmental protection legislation.
- .4 Store volatile wastes in covered metal containers, and remove from premises at end of each working day.
- .5 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

### **2.0 PRODUCTS**

#### **2.1. CLEANING PRODUCTS**

- .1 Cleaning Agents and Materials: Low VOC content wherever possible. The Consultant and the Board shall be notified prior to use of any exception.

### **3.0 EXECUTION**

#### **3.1. CLEANING DURING CONSTRUCTION**

- .1 Maintain the Work in tidy condition, free from accumulation of waste products and debris, other than that caused by the Owner or other Contractors.
- .2 Remove waste material and debris from the work areas and deposit in waste container at the end of each working day.
- .3 Vacuum clean interior areas prior to start of finishing work. Maintain areas free of dust and other contaminants during finishing operations.
- .4 Individual Subcontractors are responsible for the daily clean-up and removal of debris related to, or generated by, their own work. The overall responsibility for project cleanliness rests with the Contractor.
- .5 The Contractor shall be responsible for snow removal within the construction area.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Wherever possible recycle materials
- .8 Containers:

- .1 Provide adequate number and sizes of on-site garbage and recycling containers within designated work site as required for collection of waste materials and debris on a daily basis.
- .2 Provide additional waste containers when extent of work warrants.
- .3 Provide and use clearly marked, separate bins for recycling.
- .9 Dispose of waste materials and debris at registered waste disposal and recycling facility.
- .10 Remove oily rags, waste and other hazardous substances from premises at close of each day, or more often when required.
- .11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

### **3.2. WASTE MANAGEMENT**

- .1 Audit, separate and dispose of construction waste generated by new construction or by demolition of existing structures in whole or in part, in accordance with Ontario Regulations 102/94 and 103/94 made under the Environmental Protection Act.
- .2 Containers:
  - .1 Provide adequate number and sizes of on-site garbage and recycling containers within designated work site as required for collection of waste materials and debris on a daily basis.
  - .2 Provide additional waste containers when extent of work warrants.
  - .3 Provide and use clearly marked, separate bins for recycling.
- .3 Fires, and burning of rubbish or waste on site is strictly prohibited.
- .4 Burying of rubbish or waste materials on site is strictly prohibited.
- .5 Disposal of waste or volatile materials such as mineral spirits, oil, gasoline or paint thinner into ground, waterways, or sewer systems is prohibited.
- .6 Empty waste containers on a regular basis to prevent contamination of site and adjacent properties by wind-blown dust or debris

### **3.3. PREPARATION FOR FINAL CLEANING**

- .1 Prior to final cleaning the General Contractor shall:
  - .1 remove all surplus products, tools, construction machinery and equipment not required for the performance of remaining work, and thereafter remove any remaining materials, equipment, waste and debris,
  - .2 replace all filters installed on any equipment in operation in the area of work,

- .3 remove all paint spots or overspray from all affected surfaces, and

### **3.4. FINAL CLEANING PRIOR TO ACCEPTANCE: INTERIOR**

- .1 Prior to applying for Substantial Performance of the Work, or, prior to Owner occupancy of the building or portion of the building affected by the Work, whichever comes first, conduct full and complete final cleaning operations for the areas to be occupied.
- .2 Final cleaning operations shall be performed by an experienced professional cleaning company, possessing equipment and personnel sufficient to perform full building cleaning operations. Contractors "broom cleaning" is not acceptable as a "Final Clean". The cleaning contractor shall:
  - .1 clean interiors of all millwork and surfaces of any furniture and equipment present,
  - .2 use only cleaning materials recommended by the manufacturer of the surface to be cleaned,
  - .3 remove all stains, spots, scuff marks, dirt, dust, remaining labels, adhesives or other surface imperfections,
  - .4 clean and polish all glass and mirrors and remove remaining manufacturer's and safety "X" labels,
  - .5 clean and polish all finished metal surfaces such as enamelled or stainless steel, chrome, aluminum, brass, and bronze,
  - .6 clean and polish all vitreous surfaces such as plumbing fixtures, ceramic tile, porcelain enamel, or other such materials,
  - .7 clean all ceramic tile surfaces in accordance with the manufacturer's instructions,
  - .8 vacuum, clean and dust behind grilles, louvres and screens,
  - .9 steam clean all unprotected carpets immediately prior occupancy by Owner, and
  - .10 clean all equipment and fixtures to a sanitary condition.
- .3 For any areas to be occupied after the owner's initial occupancy, provide full cleaning operations as outlined above prior to turning over to owner,
- .4 The Board's supplies and equipment must not be used for any cleaning operations including, but not limited to: garbage cans, mops, brooms, rags, ladders, chemicals etc.

### **3.5. FINAL CLEANING PRIOR TO ACCEPTANCE: EXTERIOR**

- .1 For areas effected by construction final exterior cleaning operations shall be performed by the General Contractor or competent sub-contractor. Contractor's "broom cleaning" only is not acceptable.

- .2 Final exterior cleaning shall include:
  - .1 broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds,
  - .2 remove dirt and other disfiguration from exterior surfaces,
  - .3 sweep and wash clean paved areas,
  - .4 replace filters of mechanical equipment for all equipment that was in use during construction,
  - .5 clean all roofs, gutters, downspouts, areaways, drywells, and drainage systems,
  - .6 remove debris and surplus materials from crawl areas and other accessible concealed spaces.
  - .7 remove overspray

**END OF SECTION**

## **SECTION 01 78 10 – CLOSEOUT SUBMITTALS AND REQUIREMENTS**

### **1.0 GENERAL**

#### **1.1. RELATED SECTIONS**

- .1 Section 01 78 10 – Appendix 1 and 2 – WRDSB Warranty Card

#### **1.2. TAKE-OVER PROCEDURES**

- .1 Take over procedures will be in strict accordance with the requirements as set out in this Section.

#### **1.3. SUBSTANTIAL PERFORMANCE**

- .1 Prior to requesting a Substantial Performance deficiency inspection submit 2 hard copies, 1 digital copy of the Operating and Maintenance Manuals for Consultants approval.
- .2 Application for Substantial Performance must include.
  - .1 One (1) electronic copy of inspection and acceptance certificates required from regulatory agencies, including but not limited to.
    - .1 Certificates of Approval of the Work by the local Building Department.
    - .2 Electrical Inspection Certificate of Inspection.
    - .3 Fire Alarm Verification Certificate.
  - .3 Advise Consultant in writing, when project has been substantially completed. If Consultant agrees this stage has been reached, the Consultant shall prepare a complete list of deficiencies and submit copies of this list to Contractor and the Board.

#### **1.4. COMMENCEMENT OF LIEN PERIODS**

- .1 The date of publication of the Certificate of Substantial Performance of the Work, provided to the contractor by the Consultant, shall be the date for commencement of the lien period.

#### **1.5. TOTAL PERFORMANCE**

- .1 Prior to requesting a final inspection submit written certificate that the following have been performed:
  - .1 Work has been completed and inspected for compliance with Contract Documents and is ready for final inspection
  - .2 Defects have been corrected and deficiencies have been completed.



- .3 Equipment and systems have been tested and are fully operational.  
Submit two copies of the balancing reports
- .4 Certificates required by the contractor have been submitted.
- .5 Operation of systems have been demonstrated to Owner's personnel.
- .6 Submit Record drawings.
- .7 Submit maintenance materials.
- .8 Provide certified site survey
- .2 When items noted above are completed, request final inspection of Work by consultant, and building inspector. If Work is deemed incomplete by Consultant, complete outstanding items and request re-inspection.

#### **1.6. PAYMENT OF SUBSTANTIAL PERFORMANCE HOLDBACK**

- .1 Prior to the release of lien holdback provide one copy of the following by the Contractor and each subcontractor:
  - .1 Statutory Declaration or Declaration of Last supply
  - .2 Workplace Safety and Insurance Board "Certificate of Clearance".
- .2 The Contractor shall submit an application for payment of the holdback amount.
- .3 After the receipt of an application for payment which will include a Statutory Declaration and WSIB Clearance from the, the Consultant will issue a certificate for payment of the holdback amount.

#### **1.7. FINAL PAYMENT**

- .1 When the Contractor considers final deficiencies and defects have been corrected and it appears requirements of Contract have been completed, make application for final payment.
- .2 When the Consultant finds the Contractor's application for final payment valid, the Consultant will issue a final certificate of payment
- .3 The Board reserves the right to charge the Contractor for school access card(s) that have not been returned.
- .4 The cost to reprogram or replace the card(s) access system is estimated at \$50.00 (fifty dollars) for each card issued, \$30.00 (thirty dollars) for each keybox key, plus \$35.00 (thirty five dollars) administration fee.

#### **1.8. CLOSEOUT SUBMITTALS**

- .1 Prepare instructions and data using personnel experienced in maintenance and operation of described products and submit to Consultant for review.
- .2 Copy will be returned to contractor with Consultant's comments.
- .3 Revise content of documents as required prior to final submittal.

- .4 Two (2) weeks prior to Substantial Performance of the Work, submit to the Consultant, the final copies of operating and maintenance manuals.
- .5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
- .6 If requested, furnish evidence as to type, source and quality of products provided.
- .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .8 Pay costs of transportation.

### **1.9. OPERATION AND MAINTENANCE MANUAL FORMAT**

- .1 Provide two copies of operating and maintenance data, prepared on 215 X 280mm sheets in printed or typewritten form, contained in 3-ring binders with soft vinyl covers for materials and equipment which require special maintenance or operating procedures.
- .2 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder at the front of each volume.
- .3 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .4 Arrange content by the divisions of the specifications under Section numbers and sequence of Table of Contents.
- .5 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .6 Include the following in each manual:
  - .1 Complete list of subcontractors and suppliers, their addresses and telephone numbers. Provide 24 hour emergency telephone number for such subcontractors as Plumbing, Electrical, Sprinklers, Fire System, Heating, etc.
  - .2 Specified warranties for contractor, each subcontractor and supplier.
  - .3 WRDSB Warranty Card
  - .4 Copy of finish hardware list, complete with all amendments and revisions and lock manufacturer's descriptive and service literature.
  - .5 Schedule of paints and coatings. Include sufficient explanation to fully identify each surface with the applicable paint or coating used. Enclose copy of colour schedule.
  - .6 Maintenance instructions for finished surfaces.
  - .7 Brochures, cuts of equipment and fixtures.
  - .8 Operating and maintenance instructions for equipment.

- .9 Submit copies of letters from manufacturers of equipment and systems indicating their technical representatives have inspected and tested systems and are satisfied with methods of installation, connection and operations. These letters shall state names of persons present at testing, methods used and list of functions performed.
- .10 Submit one complete set of reviewed shop drawings of architectural, structural, mechanical and electrical items, folded to 215 x 280mm size, contained in heavy duty manila envelopes, numbered and labelled. Follow specification format with no more than one Section per envelope, hard copy and PDF.
- .11 Relevant certificates issued by authorities having jurisdiction
- .12 Computer disc or flash drive with all the above documentation in PDF format

#### **1.10. RECORDING ACTUAL SITE CONDITIONS**

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

### **1.11. RECORD (AS-BUILT) DOCUMENTS AND SAMPLES**

- .1 Store AS-BUILT documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .2 Label AS-BUILT documents and file in accordance with section number listings in List of Contents of the Project Manual. Label each document AS-BUILT DOCUMENTS in neat, large, printed letters.
- .3 Maintain AS-BUILT documents in clean, dry and legible condition. Do not use as-built documents for construction purposes.
- .4 Keep as-built documents and samples available for inspection by Consultant.

### **1.12. RECORD DRAWINGS**

- .1 Prior to Substantial Performance of the Work, update the marked up information from the AS-BUILT documents to a master set of drawing.
- .2 Submit one set of completed AS-BUILT documents to the Consultant for review.
- .3 Documents will be returned to contractor with Consultant's comments.
- .4 Revise content of documents as required prior to final submittal.
- .5 After the review is completed resubmit to the Consultant for Consultant to produce electronic record drawings for the owner to use.

### **1.13. 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 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .4 Obtain receipt for delivered products and submit prior to final payment.

### **1.14. REPLACEMENT (MAINTENANCE) MATERIALS**

- .1 Deliver to site, unload and store where directed, replacement (maintenance) materials as required elsewhere in these Specifications. Obtain signed receipt from Owner's Representative for delivered materials and include copy of receipt in Operation and Maintenance manuals.
- .2 Package materials so they are protected from damage and loss of essential properties.
- .3 Label packaged materials for proper identification of contents.

### **1.15. SPECIAL TOOLS**

- .1 Provide special tools, in quantities specified in individual specification section.

- .2 Provide items with tags identifying their associated function and equipment.
- .3 Receive and catalogue all items. Submit inventory listing to Consultant.  
Include approved listings in Maintenance Manual

#### **1.16. FINAL SITE SURVEY**

- .1 Submit final site survey certificate in accordance with Section 01 70 00, certifying that elevations and locations of completed Work are in conformance Contract Documents.

#### **1.17. WARRANTIES AND BONDS**

- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
- .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- .3 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined. The date of Substantial Performance of the Work shall be the date for commencement of the warranty period.
- .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 submittals.

**END OF SECTION**

## **SECTION 01 78 40 – MAINTENANCE REQUIREMENTS**

### **1.0 GENERAL**

#### **1.1. SECTION INCLUDES**

- .1 Equipment and systems.
- .2 Materials and finishes.
- .3 Spare parts
- .4 Maintenance manuals.
- .5 Special tools.
- .6 Storage, handling and protection.
- .7 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.2. RELATED SECTIONS**

- .1 Section 01 45 00 - Quality Control.
- .2 Section 01 78 40 – Maintenance Requirements.
- .3 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.3. EQUIPMENT AND SYSTEMS**

- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for troubleshooting; 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 coordination Drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test and balancing reports as specified in Section 01 45 00.
- .15 Additional requirements: As specified in individual specification sections.

## **2.0 PRODUCTS**

### **2.1. MATERIALS AND FINISH**

- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
- .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 Building Envelope: include copies of drawings of building envelope components, illustrating the interface with similar or dissimilar items to provide an effective air, vapour and thermal barrier between indoor and outdoor environments. Include an outline of requirements for regular inspections and for regular maintenance to ensure that on-going performance of the building envelope will meet the initial building envelope criteria.
- .5 Additional Requirements: as specified in individual specifications sections.

### **2.2. 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 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .4 Obtain receipt for delivered products and submit prior to final payment.

### **2.3. MAINTENANCE MATERIALS**

- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .4 Obtain receipt for delivered products and submit prior to final payment.

#### **2.4. SPECIAL TOOLS**

- .1 Provide special tools, in quantities specified in individual specification section.
- .2 Provide items with tags identifying their associated function and equipment.
- .3 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

### **3.0 EXECUTION**

#### **3.1. DELIVERY TO SITE**

- .1 Deliver to place of work and store.
- .2 General Contractor to receive and acknowledge delivery from contractors and sub-contractors of all parts and materials assembled for maintenance requirements. Provide a summary inventory list to the Consultant and/or the Board after all materials are gathered and verification of location. Signatures of receipt will not be accepted from anyone except the General Contractor's representative.

#### **3.2. STORAGE, HANDLING AND PROTECTION**

- .1 Consult with the Board to determine location for storage.
- .2 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .3 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .4 Store components subject to damage from weather in weatherproof enclosures.
- .5 Store paints and freezable materials in a heated and ventilated room.
- .6 Remove and replace damaged products at own expense and to satisfaction of Consultant.

**END OF SECTION**



**THIS PAGE LEFT INTENTIONALLY BLANK**

## **SECTION 01 79 00 – DEMONSTRATION AND TRAINING**

### **1.0 GENERAL**

#### **1.1. SECTION INCLUDES**

- .1 Procedures for demonstration and instruction of Products, equipment and systems to Owner's personnel.
- .2 Seminars and demonstrations.

#### **1.2. RELATED SECTIONS**

- .1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### **1.3. DESCRIPTION**

- .1 At Substantial Performance, at a time acceptable to Owner and Consultant, but not before operations and maintenance manual have been reviewed and accepted by the consultant; contractor shall give a complete demonstration in the presence of consultant; Sub-consultants, Owner and Owner's personnel of operation and maintenance of systems and equipment once they are 100% complete.
- .2 Owner will provide list of personnel to receive instructions and will coordinate their attendance at agreed-upon times.

#### **1.4. COMPONENT DEMONSTRATION**

- .1 Manufacturer to provide authorized representative to demonstrate operation of equipment and systems.
- .2 Instruct Owner's personnel, and provide written report that demonstration and instructions have been completed.

#### **1.5. SUBMITTALS**

- .1 Submit schedule of time and date for demonstration of each item of equipment and each system one (1) week prior to designated dates, for Consultant's approval.
- .2 Submit reports within forty eight (48) after completion of demonstration, that demonstration and instructions have been satisfactorily completed.
- .3 Give time and date of each demonstration, with list of persons present.

#### **1.6. CONDITIONS FOR DEMONSTRATIONS**

- .1 Equipment has been inspected and put into operation in accordance with manufacturer's instructions and contract requirements.
- .2 Testing, adjusting, and balancing have been performed in accordance with manufacturer's instructions and contract requirements, and equipment and systems are fully operational.
- .3 Provide information packages as required for use in demonstrations and instructions.

## **2.0 PRODUCTS**

### **2.1. NOT USED**

- .1 Not used.

## **3.0 EXECUTION**

### **3.1. PREPARATION**

- .1 Verify that suitable conditions for demonstration and instructions are available.
- .2 Verify that designated personnel are present.
- .3 Prepare agendas and outlines.
- .4 Establish seminar organization.
- .5 Explain component design and operational philosophy and strategy.
- .6 Develop equipment presentations.
- .7 Present system demonstrations.
- .8 Accept and respond to seminar and demonstration questions with appropriate answers.

### **3.2. PREPARATION OF AGENDAS AND OUTLINES**

- .1 Prepare agendas and outlines including the following:
  - .1 Equipment and systems to be included in seminar presentations.
  - .2 Name of companies and representatives presenting at seminars.
  - .3 Outline of each seminar's content.
  - .4 Time and date allocated to each system and item of equipment.
  - .5 Provide separate agenda for each system.

### **3.3. SEMINAR ORGANIZATION**

- .1 Coordinate content and presentations for seminars.
- .2 Coordinate individual presentations and ensure representatives scheduled to present at seminars are in attendance.

- .3 Arrange for presentation leaders familiar with the design, operation, maintenance and troubleshooting of the equipment and systems. Where a single person is not familiar with all aspects of the equipment or system, arrange for specialists familiar with each aspect.
- .4 Coordinate proposed dates for seminars with Owner and select mutually agreeable dates.

### **3.4. EXPLANATION OF DESIGN STRATEGY**

- .1 Explain design philosophy of each system. Include following information:
  - .1 An overview of how system is intended to operate.
  - .2 Description of design parameters, constraints and operational requirements.
  - .3 Description of system operation strategies.
  - .4 Information to help in identifying and troubleshooting system problems.

### **3.5. DEMONSTRATION AND INSTRUCTIONS**

- .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment.
- .2 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.
- .3 Instruct personnel on control and maintenance of sensory equipment and operational equipment associated with maintaining energy efficiency and longevity of service.
- .4 Review contents of manual in detail to explain all aspects of operation and maintenance.
- .5 Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.

**END OF SECTION**

**THIS PAGE LEFT INTENTIONALLY BLANK**

**ART 1 - GENERAL**

- |     |   |    |  |             |
|-----|---|----|--|-------------|
| 1.1 | <b><u>General Requirements</u></b>        | .1 | Comply with requirements of Division 1.  |             |
| 1.2 | <b><u>Related Sections</u></b>            | .1 | Scheduling of work:  | Division 1. |
|     |   | .2 | Submittals:  | Division 1. |
|     |   | .3 | Temporary facilities:  | Division 1. |
| 1.3 | <b><u>Qualifications</u></b>              | .1 | CSA S350-M1980 (R1998), Code of Practice for Safety in Demolition of Structures.   |             |
| 1.4 | <b><u>Submittals</u></b>                  | .1 | Where required by authorities having jurisdiction and by other sections of this specification, submit for approval, drawings, diagrams, details and supporting data clearly showing sequence of demolition & removal work of building designed by a registered professional structural engineer licensed to practice in Ontario. |             |
| 1.5 | <b><u>Protection</u></b>                  | .1 | Prevent movement or settlement of adjacent work. Provide and place bracing or shoring and be responsible for safety and support of such work. Be liable for any such movement or settlement, and any damage or injury caused.  |             |
|     |   | .2 | Cease operations and notify Project Manager if safety of any adjacent work or structure appears to be endangered. Take all precautions to support the structure. Do not resume operations until reviewed with Project manager.   |             |
|     |   | .3 | Cease operations and notify the Project Manager immediately for special protective and disposal instructions when asbestos materials or other hazardous materials [, other than those identified,] are uncovered during the work of this project.  |             |
|     |   | .4 | NA   |             |
|     |   | .5 | Prevent debris from blocking surface drainage inlets and mechanical and electrical systems which remain in operation.  |             |
|     |   | .6 | Temporarily suspended work that is without continuous supervision, shall be closed to prevent entrance of unauthorized persons.  |             |
| 1.6 | <b><u>Examination</u></b>                 | .1 | Visit the site and the existing building so as to fully understand all existing conditions and extent of work required. No increase in cost or extension of performance time will be considered for failure to know conditions.  |             |
| 1.7 | <b><u>Components Removed by Owner</u></b> | .1 | All components not removed by the Owner shall become the property of the Contractor and shall be removed from the site by the Contractor.  |             |
|     |   | .2 | Existing millwork and countertops noted to be removed are to be turned over to school.   |             |

**PART 2 - PRODUCTS**

- 2.1 **Materials & Equipment** .1 Provide materials and equipment as required to perform work of this section.

**PART 3 - EXECUTION**

- 3.1 **Preparation** .1 Ensure that affected building areas are unoccupied and discontinued in use prior to start of demolition work.
- .2 Verify that existing services in areas affected by demolition work are disconnected, capped or removed, prior to start of work.
- 3.2 **Existing Services** .1 Disconnect all electrical and telephone service lines in the areas to be demolished in accordance with rules and regulations of authorities having jurisdiction. Post warning signs on all electrical lines and equipment that must remain energized to serve other areas during period of demolition.
- .2 Disconnect and cap mechanical services in accordance with requirements of local authority having jurisdiction.
- .1 Natural gas supply lines to be removed by qualified tradesman in accordance with gas company instructions.
- .2 Remove sewer and water lines and cap to prevent leakage.
- .3 Remove and cap other underground services.
- .4 In each case notify the affected utility company in advance and obtain approval where required, before commencing with the work on main services.
- .3 Do not disrupt active or energized utilities designated to remain undisturbed.
- 3.3 **Demolition** .1 Carry out demolition work in accordance with CSA S350, unless otherwise specified.
- .2 Remove from the site all materials indicated to be removed.
- .3 Carry out demolition in a manner to minimize inconvenience to adjacent occupied space.
- .4 Demolish work in a safe and systematic manner, from top to bottom.
- .5 Sprinkle exterior debris with water to prevent dust. Do not cause flooding, contaminated runoff or icing. Do not allow waste material, rubbish, and windblown debris to reach and contaminate adjacent properties.
- .6 Lower waste materials in a controlled manner; do not drop or throw materials from heights. Use chutes, conveyors, or hoisting equipment to lower materials.

- 3.3 **Demolition** (Cont'd)
- .7 Burning of materials on site is not permitted.
  - .8 Demolish masonry and concrete elements in small sections. Carefully remove and lower structural framing and other heavy and large objects.
  - .9 At end of each work period, leave work in a safe condition, so that no part is in danger of toppling or falling.
- 3.4 **Clean-Up**
- .1 For clean-up during demolition and for final cleaning, comply with requirements of Division 1.
- 3.5 **Disposal**
- .1 Dispose of all demolished and surplus materials off site at a dump site authorized and licensed to receive specific materials.

**End of Section**



### PART 1 - GENERAL

- 1.1 **General Requirements** .1 Comply with requirements of Division 1.
- 1.2 **Related Sections** .1 Site Clearing: Section 02110  
.2 Excavation, Trenching & Backfilling: Section 02200
- 1.3 **Source Quality Control** .1 Comply with applicable codes, ordinances, rules and regulations, and of local, municipal, authorities having jurisdiction.

### PART 2 - PRODUCTS

- 2.1 **Materials** .1 Slope Drains:  
Temporary slope drains not detailed on the drawings may be constructed of pipe, fibre mats, rubble, portland cement concrete, bituminous concrete, or plastic sheets.
- .2 Filter Fabric:  
Pervious sheet of synthetic polymer filaments forming a stable network so fibres retain their relative positions. The fabric shall meet the following minimum requirements.
- .1 Water Permeability:  
5.0 x 10<sup>-3</sup> cm/s
- .2 Equivalent opening size:  
No larger than 45um nor smaller than 300um.
- .3 Grab Tensile Strength:  
485N in either direction when wet, by CAN 2-4M77.
- .4 Grab Elongation:  
16% by CAN 2-4.2M77.
- .5 Bursting Strength:  
2.0 MPa, by CAN. 2-4.2M77 - Mulch Burst Test No. 11.1.
- .6 Minimum Weight:  
125 g/m<sup>2</sup>

### PART 3 - EXECUTION

- 3.1 **General** .1 Provide temporary erosion control directed toward and having the purpose of controlling soil erosion at its potential source. Employ downstream sediment entrapment measures only as a back-up to primary control at the source.
- .2 Employ a continuous program of installation and maintenance of sediment control during the construction period.

- 3.2 **Temporary Erosion During Construction**
- .1 Provide temporary erosion control during construction until such time as permanent paving, planting and restoration of natural areas is effective in control of erosion from the site.
  - .2 Sediment Barriers:
    - .1 Locate temporary sediment barriers at all points where surface water flows from a construction area. This includes the entire perimeter of the construction area where the slope is outward and at inlets to all drainage structures.
    - .2 Construct sediment barriers to remove sediments from flowing water through filtration and sedimentation. Primary filter media may consist of silt fences utilizing anchored filter cloth or straw bales and/or crushed stone staked or otherwise securely held in place.
    - .3 Arrange sediment barriers to create ponding behind them. Make provisions for removing accumulated sediments and maintaining ponding capacity.
  - .3 Grading Operations:
    - .1 Schedule grading operations so that the ground surface will be disturbed for the shortest possible time before permanent construction is installed. Maintain large areas as flat as practicable to minimize soil transport through surface flow.
    - .2 Construct whenever steeper slopes or abrupt changes in grade are required, diversion or berm at the top of the slope to cause the surface water to flow along the diversion to a control point to be transported downslope in a slope drain. In no case shall surface water be allowed to flow uncontrolled down slopes.
  - .4 Slope Drains:
    - .1 Install temporary drains to convey surface water down slopes. Provide slope drains with an apron at their tops to anchor them and properly direct water into them. Place stone or rubble at slope drain outlets to prevent scour at these points.
  - .5 Storm Drainage System:
    - .1 Maintain temporary sediment barriers around drainage structures until final subgrade preparation has begun.
- 3.3 **Clean-Up & Removal**
- .1 Remove temporary sediment and erosion controls and restore the burrowing areas to same standard specified for new construction, once permanent erosion control is effective.
  - .2 Remove any accumulations of silt occurring in detention basin, as a result of the construction.

End of Section

**PART 1 - GENERAL**

1.1	<b><u>General Requirements</u></b>	.1	Comply with requirements of Division 1.	
1.2	<b><u>Related Sections</u></b>	.1	Excavation, Trenching and Backfill	Section 02200
		.2	Concrete Curbs and Paving	Section 02525
1.3	<b><u>Reference Standards</u></b>	.1	<b><u>Bituminous Concrete Paving</u></b>	
		.1	Conform to Ontario Provincial Standard Specifications (O.P.SS) as specified herein.	
		.2	<b><u>Paint</u></b>	
		.1	CGSB 1-GP-74M, Alkyd Traffic Paint	
		.2	CGSB 1-GP-12C-68, Standard Paint Colours	
		.3	CAN/CGSB-1.5-M91, Low Flash Petroleum Spirits Thinner	
		.4	MTO Manual of Uniform Traffic Control Devices. (Metric Edition) - latest edition	
1.4	<b><u>Qualifications</u></b>	.1	The work of this section is to be done by a paving contractor of recognized standing who has personnel experienced in this type of work and who has the necessary equipment to complete the work.	
1.5	<b><u>Guarantee</u></b>	.1	Provide the following Guarantee in accordance with the General Conditions of the Contract, notwithstanding the time provisions therein.	
		.1	<b>Two years on materials and labour</b>	
1.6	<b><u>Inspection &amp; Testing</u></b>	.1	Comply with the requirements of Section 01400 Quality Control.	
		.2	The Owner may appoint and will pay for, out of the Allowances specified in Division 1 an independent inspection agency to conduct any or all of the following as directed by the Consultant.	
		.1	Carry out grain size analysis.	
		.2	Determine minimum and maximum moisture content of densities of granular fill.	
		.3	Determine on-site density, thickness and moisture content of compacted fills.	
		.4	Check properties of asphalt mixes, including aggregate gradation of asphalt content.	
		.5	Check suitability of equipment used.	
1.7	<b><u>Environmental Requirements</u></b>	.1	Lay granular base courses and asphalt paving courses when weather is dry and only on dry bases.	
		.2	Place granular bases courses only when ambient temperature is above 0°C. Do not place granular materials while either material or subgrade is frozen.	
		.3	Place asphalt paving courses only when ambient temperature is 7°C or above.	

- 1.8 **Protection**
- .1 Prevent damage to buildings, landscaping, curbs, sidewalks, trees, and adjacent property.
  - .2 Provide access to building at all times. Arrange paving schedule so as not to interfere with normal use of premises.
  - .3 Make special provisions to minimize deterioration of subgrade, particularly when operating during unfavourable weather conditions or when working in wet soil. Use special designated traffic lanes, build temporary roads, reduce traffic to half-loads or take other suitable measures.
  - .4 Do not permit vehicular traffic on finished asphalt pavement until it has cooled and hardened and in no case sooner than 12 hours after completion.
  - .5 Provide barricades and warning devices to protect pavement.

**PART 2 - PRODUCTS**

- 2.1 **Materials**
- .1 **Granular Base:** Conforming to Class 'A' granular material OPSS 1010 clean, angular crusher run natural stone, free from silt, clay, friable materials, roots and vegetable matter and graded within following limits.

Sieve Size (MTC)	Per Cent Passing
37.5 mm	100
16 mm	62 - 100
9.5 mm	48 - 73
4.75 mm	33 - 55
1.18 mm	15 - 45
0.3 mm	5 - 22
0.075 mm	0 - 8

- .2 **Granular Subbase:** Conforming to Class 'B' granular material OPSS 1010 clean, natural sand and gravel material free from silt, clay, loan friable or soluble materials and vegetable matter and graded within following limits.

Sieve Size (MTC)	Per Cent Passing
106 mm	100
22.4 mm	57 - 100
4.75 mm	25 - 100
1.18 mm	10 - 85
0.300 mm	5 - 40
0.075 mm	0 - 8

- .3 **Asphalt:**
  - .1 Asphalt cement shall be penetration grade 85-100 and conform with OP.SS Specification Form 1101 and aggregates shall conform with OP.SS Form 1003.
  - .2 Asphalt base and surface course, as shown on the drawings shall conform to OP.SS Specification Form 310.

- .3 Asphalt emulsions shall conform with OP.SS Specifications Form 1102.
- .4 Tack coat between base and wearing course shall be SS-1 asphalt emulsion diluted with an equal volume of water.
- .4 **Paint:**
  - .1 **Traffic Marking Paint:**
    - .1 **Paint:** to CGSB 1-GP-74M, alkyd traffic paint  
Colour: to CGSB 1 GP-12C
      - .1 White 513-301
      - .2 Yellow 33538
    - .2 **Thinner:** to CAN/CGSB-1.5
    - .3 All paint to conform to OPSS #1712

### **PART 3 - EXECUTION**

- 3.1 **Ex. Asphalt Paving Removal**
  - .1 Remove existing asphalt paving, including 150 mm depth of existing granular base (for full depth) where shown and noted on drawings for existing asphalt paving to be removed and replaced.
  - .2 Dispose of all surplus materials off site at an approved and authorized registered dumpsite licensed to receive these materials
  - .3 Proof roll and compact existing sub-base to remain and proceed with replacement of granular base and asphalt paving as specified in this section for new asphalt paving.
- 3.2 **Preparation of Subgrade**
  - .1 Examine rough graded subgrade over which asphalt paving system is to be installed to ensure it is suitable for installation. Start of work shall imply acceptance of conditions.
  - .2 Fine grade subgrade as required to bring it to required levels and slopes. Meet compaction densities and fill material requirements specified in Section 02200. Slope fine graded subgrade to permit drainage.
  - .3 Thoroughly compact subgrade to minimum 98% Standard Proctor Density for at least the uppermost 300 mm. Sub-excavate soft spots that develop during compaction and bring to proper grade by the addition of fill material and then thoroughly compact until satisfactory, adding more fill material as required.
  - .4 In the event subgrade cannot be made stable or be compacted with a roller the Consultant will decide if local soft spots are to be excavated and backfilled with 50 mm crusher limestone.
- 3.3 **Granular Base & Subbase**
  - .1 Over compacted subgrade place granular base and subbase in layers not exceeding 150 mm thickness. Compact each layer to 100% Standard Proctor Density unless otherwise indicated.

- 
- .2 Compact granular base and subbase by rolling with power rollers capable of reversing without backlash. Use hand tamping or mechanical hand compaction equipment in areas inaccessible to rollers.
- .3 Add water as required to obtain optimum density and to control dust.
- 3.4 **Paving**
- .1 Obtain approval of granular base and subbase, by Consultant, prior to installing asphalt paving. Lay asphalt as soon as base is approved.
- .2 The Contractor shall inform the Consultant at least 48 hours prior to commencing asphalt operations or resuming same after a delay of more than one week, in order that the Consultant may inspect the base before asphalt is applied.
- .3 No asphalt shall be laid on a surface which is wet, or covered by snow or ice, or if the temperature of the air is below 7°C, or if the ground is frozen.
- .4 Slope paving away from building minimum 1%. Slope paving minimum 1% for drainage in all locations unless specifically indicated otherwise on Drawings. Bumps or "bird baths" will not be accepted.
- .5 Finish surface true to grade and free from deviations exceeding 1:1000 when measured with a 3m straight edge.
- .6 In all cases where asphalt base course layer has been in place for a period of two or more months, tack coat shall be placed prior to the placing of asphalt top course layer or at the discretion of the Consultant.
- .7 Minimum asphalt mixture temperature when spread, 118°C.
- .8 Maximum asphalt mixture temperature at anytime, 149°C.
- .9 Compact each course layer with roller when it can support roller mass without undue cracking or displacement, until all roller marks are eliminated.
- .10 Compact each asphalt paving course to 97% Marshall density to ASTM D1559-76.
- .11 Keep roller speed slow enough to avoid mixture displacement.
- .12 Moisten roller wheels to prevent mixture adhesion.
- .13 Compact mixture with hot tampers in areas inaccessible to roller and all exposed edges.
- 3.5 **Joints**
- .1 Transverse and longitudinal joints in successive courses shall be offset at least 300 mm from each other.
- .2 All joints shall be coated with tack coat prior to placement of adjacent asphalt if the previous section has been in place for more than two hours.
- .3 Transverse joints shall be cut back at least 300 mm and painted with tack coat before paving proceeds.

- .4 Where tack coat has been applied, it shall be allowed to dry to a tacky texture before new asphalt is laid against it.
- 3.6 **Repairs**
- .1 Where repairs are required, include repairs under warranty, cut asphalt to its full depth making straight neat cuts.
- .2 Compact granular base and subbase in accordance with requirements for new asphalt.
- .3 Coat exposed cut edges with a tack coat. Place hot asphalt mixture and compact to thickness required in accordance with requirements for new asphalt.
- 3.7 **Pavement Marking**
- .1 Provide all painted pavement markings shown on drawings including, but not limited to parking stalls, barrier free symbol, painted medians, cross walks, games lines.
- .2 Premark lines in an approved manner and as indicated on drawings.
- .3 Apply paint with an approved pressure type distributor that will ensure uniform application and a positive means to shut-off.
- .4 Evenly apply paint at the rate of 4.5L/10m<sup>2</sup>.
- .5 Barrier free symbol shall be painted in stalls as indicated on drawings.
- .6 **Schedule:**
- .1 **Parking Stalls:** 100 mm wide painted lines  
Colour: white
- .2 **Painted Medians:** 100mm wide angular painted lines  
spaced 300 mm apart  
Colour: yellow
- .3 **Barrier Free Symbols:** to MTO Manual of Uniform Traffic Devices
- 3.8 **Pavement Schedule**
- .1 Provide heavy duty asphalt paving at driveways and where indicated.
- .1 **Heavy Duty Asphalt Pavement and Base Construction:**
- |    |                      |                                    |
|----|----------------------|------------------------------------|
| .1 | Granular Sub-base:   | 450 mm Granular 'B'                |
| .2 | Granular Base:       | 150 mm Granular 'A'                |
| .3 | Asphalt Base Course: | 85 mm of HL-8 base course asphalt. |
| .4 | Asphalt Top Course:  | 35 mm of HL-3a top course asphalt. |
- .2 Provide heavy duty asphalt paving where indicated for existing asphalt paving to be removed and replaced.
- .1 **Heavy Duty Asphalt Pavement and Base Construction:**
- |    |                      |                                    |
|----|----------------------|------------------------------------|
| .1 | Granular Sub-base:   | Existing Granular 'B' to remain.   |
| .2 | Granular Base:       | 150 mm Granular 'A'                |
| .3 | Asphalt Base Course: | 85 mm of HL-8 base course asphalt. |
| .4 | Asphalt Top Course:  | 35 mm of HL-3a top course asphalt. |

.3 Provide light duty asphalt paving for pedestrian walkways.

.1 **Light Duty Asphalt Paving and Base Construction:**

.1	Granular Subbase:	200 mm of Granular 'B'
.2	Granular Base:	150 mm of Granular 'A'
.3	Asphalt Base Course	40 mm of HL-8 Base Course Asphalt
.4	Asphalt Top Course	35 mm of HL3A Top Course Asphalt

**End of Section**



**PART 1 - GENERAL**

- 1.1 **General Requirements** .1 Comply with requirements of Division 1.
- 1.2 **Related Sections** .1 Excavating, Trenching and Backfilling Section 02200  
 .2 Asphalt Paving Section 02510  
 .3 Cast-In-Place Concrete Section 03300
- 1.3 **Reference Standards** .1 Do concrete work in accordance with requirements of Division 3 except where otherwise specified herein.
- 1.4 **Inspection & Testing** .1 Comply with the requirements of Section 01400 Quality Control.

**PART 2 - PRODUCTS**

- 2.1 **Materials** .1 Concrete Materials: CAN3-A23-M77, 25MPa at 28 days with 6% ∇ 1% air entrainment and not less than 325 kg/m<sup>3</sup> of cement. Maximum slump to be 50mm.
- .2 Reinforcing Steel:
- 1) Bars: CSA G30.12-M1977, Grade 400.  
 2) Mesh: CSA G30.5-M1983, 150 x 150mm
- .3 Forms: Either steel or wood, capable of producing smooth flat surfaces. Use flexible spring-steel forms or laminated boards to form radius bends as required.
- .4 Expansion Joints: 12mm thick asphalt impregnated fibre board, unless indicated otherwise.
- .5 Granular Base: Granular 'A' material OPSS 1010 clean, angular crusher run natural stone, free from silt, clay, friable materials, roots and vegetable matter and graded within following limits.
- | Sieve Size (MTC) | Percent Passing |
|------------------|-----------------|
| 37.5 mm          | 100             |
| 16 mm            | 62 - 100        |
| 9.5 mm           | 48 - 73         |
| 4.75 mm          | 33 - 55         |
| 1.18 mm          | 15 - 45         |
| 0.3 mm           | 5 - 22          |
| 0.075 mm         | 0 - 8           |
- .6 Non Shrink Grout: Pre-mixed non metallic 30 Mpa compressive strength.

**PART 3 - EXECUTION**

- 3.1 **Preparation Subgrade**
- .1 Examine rough graded subgrade over which curbs and paving are to be installed to ensure it is suitable for installation. Start of work shall imply acceptance of conditions.
  - .2 Fine grade subgrade as required to bring it to required levels and slopes.
  - .3 Compact subgrade to the requirements of Section 02200.
  - .4 Stake out curb and paving areas and obtain Consultants review prior to proceeding.
- 3.2 **Granular Base**
- .1 Over compacted subgrade place compacted granular base to underside of paving.
  - .2 Compact base courses to 100% Standard Proctor Density.
  - .3 Install granular base within a tolerance of 12mm within 3 metres.
- 3.3 **Installation Cast-In-Place Curbs**
- .1 Obtain approval of granular base, by Consultant, prior to placement of paving.
  - .2 Erect formwork to obtain the required curb section.
  - .3 Install sufficient quantity of forms to allow continuous progress of work so forms can remain in place at least 24 hours after concrete placement.
  - .4 Obtain approval of forms from Consultant before pouring concrete.
  - .5 Install side forms free of warp. Provide proper support to maintain alignment and grade to the following tolerances.
    - 1) Top of Form  
Not more than 3mm in 3.0 metres.
    - 2) Vertical Face  
Longitudinal axis not more than 6mm in 3.0 metres.
  - .6 Treat all form lumber with a non-staining mineral oil prior to concrete placement.
  - .7 Unless otherwise detailed, place three continuous 10M reinforcing bars, one near the bottom, one near the top and one in the middle of the curb. Cut reinforcing at expansion joints.
  - .8 Install transverse expansion joints at returns and at 5.5 metres O.C. Install longitudinal expansion joint where curbs and paved areas abut each other, buildings, other concrete slabs or pads or vertical restraints, unless indicated otherwise.

- 
- .9 Fill joints with specified expansion joint filler cut to the full cross sectional shape of the curb.
- 3.3 **Installation  
Cast-in-Place  
Curbs (Cont'd)**
- .10 Moisten subgrade to reduce suction at the time concrete is placed. Do not place concrete around structures until they have been brought to the required grade and alignment.
- .11 Deposit and spread concrete in a continuous operation between transverse joints. If interrupted for more than 1/2 hour, place a construction joint. Sections less than 5.5 metres in length between transverse joints will not be permitted.
- .12 After screeding and compacting, finish uniformed surfaces with a wood float to produce a uniform texture and finish throughout.
- .13 Do not place concrete on fill that is frozen or which contains frozen material. Concrete, when deposited in forms, shall have a temperature of not less than 10°C, nor more than 32°C. Provided means to maintain these limits for 72 hours after placing.
- .14 Inspect formed surfaces immediately after stripping forms, grind down fins and repair sand runs and honeycombs with the same mix used for the curbs and gutters minus the coarse aggregates.
- .15 After stripping the forms and finishing, treat curb surfaces with approved curing compound, or use other curing method acceptable to Consultant.
- .16 Protect concrete from harmful effects of sunshine, drying winds, cold temperatures, and running surface water for a minimum period of five days.
- 3.4 **Installation of  
Concrete Paving**
- .1 Construct wood forms for all unsupported concrete edges to provide straight, clean lines, and smooth radius curved lines.
- .2 Place wire reinforcing mesh on top of compacted base. Before pouring concrete raise mesh 25mm above base. Cut mesh at expansion joints.
- .3 Obtain Consultants approval of granular base and reinforcing steel/mesh installation prior to placing concrete.
- .4 Install expansion joints around manholes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structures or services. Install expansion joints at approximately 6m O.C. in both directions.
- .5 Divide paving sections between expansion joints into the pattern indicated on the Drawings. Unless otherwise indicated, provide tooled joints during finishing stage at maximum 1500mm O.C. in each direction or saw cut, if directed by Consultant after completion of finishing.
- .6 Round edges, including edges of joints, with 10mm radius edging tool.

- .7 Finish surfaces to within 3mm in 3.0 metres from line, level or grade as measured with a straight edge placed on surface.
- 3.4 **Installation** .8 Finish concrete with wooden float to produce an even gritty surface and in  
**Concrete Paving** accordance with Municipal requirements.  
**(Cont'd)**
- .9 Treat exposed surfaces with curing, compound in accordance with manufacturers instructions, or moist cure in accordance with CAN3 A23.1-M77.
- .10 Immediately after stripping forms, treat expose edges with curing compound.
- 3.5 **Schedule** .1 Provide heavy duty granular base at driveways and parking lots.
1. Granular Subbase: 400 mm Granular 'B'
2. Granular Base: 200 mm Granular 'A'
- .2 Provide light duty granular base at pedestrian walkways.
1. Granular Base: 200 mm Granular 'A'

**End of Section**

## PART 1 - GENERAL

- 1.1 **Related Sections** .1 Division 2
- 1.2 **Definitions** .1 COMPOST: A mixture of soil and decomposing organic matter used as a fertilizer, mulch, or soil conditioner. Compost is processed organic matter containing 40% or more organic matter as determined by the Walkley-Black or LOI test. Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below (25) (50)), and contain no toxic or growth inhibiting contaminants. Composted bio-solids must meet the requirements of the Guidelines for Compost Quality, Category (A) produced by the Canadian Council of the Ministers of the Environment (CCME).

## PART 2 - PRODUCTS

- 2.1 **Topsoil** .1 Topsoil for sodded and seeded areas and ground-level planting beds: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.
- .1 Soil texture based on The Canadian System of Soil Classification, to consist of 45 % sand, 15 % clay, 40% silt, and contain 4 to 10 % organic matter by weight.
- .2 Contain no toxic elements or growth inhibiting materials.
- .3 Finished surface free from:
- .1 Debris and stones over 50 mm diameter.
- .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
- .4 Consistence: friable when moist.
- .5 Fertility: major soil nutrients present in following amounts:
- .6 Nitrogen (N): 20 to 40micrograms of available N per gram of topsoil.
- .7 Phosphorus (P): 40 to 50micrograms of phosphate per gram of topsoil.
- .8 Potassium (K): 75 to 110micrograms of potassium per gram of topsoil.
- .9 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
- .10 Ph value: 6.5 to 8.0.

- 2.2 **Soil Amendments**
- .1 Peatmoss:
    - .1 Derived from partially decomposed species of Sphagnum Mosses.
    - .2 Elastic and homogeneous, brown in colour.
    - .3 Free of wood and deleterious material which could prohibit growth.
    - .4 Shredded particle minimum size: 5 mm.
  - .2 Sand: washed coarse silica sand, medium to coarse textured.
  - .3 Organic matter: compost Category A, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.
  - .4 Limestone:
    - .1 Ground agricultural limestone.
    - .2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
  - .5 Fertilizer: organic, industry accepted standard medium containing nitrogen, phosphorous, potassium and any other micro-nutrients suitable to the specific plant species or application or defined by the soil test.
- 2.3 **Source Quality Control**
- .1 Advise Consultant of sources of topsoil to be utilized with sufficient lead time for testing.
  - .2 Contractor is responsible for amendments to supply topsoil as specified.
  - .3 Soil testing by recognized testing facility for pH, N, P and K, and organic matter and other test components as designated by Consultant. Coordinate with Consultant prior to arranging for testing.
  - .4 Testing of topsoil will be carried out by testing laboratory designated by Consultant. Soil sampling, testing and analysis to be in accordance with Provincial standards. Cost of tests will be paid by cash allowance.

### **PART 3 - EXECUTION**

- 3.1 **Stripping of Topsoil**
- .1 Commence topsoil stripping of areas as directed by Consultant after area has been cleared of weeds and grasses and removed from site.
  - .2 Strip topsoil to depths as indicated. Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.
  - .3 Stockpile in locations as directed by Consultant. Stockpile height not to exceed 2 m.

- |     |  |    |   |
|-----|--|----|---|
| 3.1 | <b><u>Stripping of Topsoil (Cont'd)</u></b>                  | .4 | Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill.  |
|     |  | .5 | Protect stockpiles from contamination and compaction.   |
| 3.2 | <b><u>Preparation of Existing Grade</u></b>                  | .1 | Verify that grades are correct. If discrepancies occur, notify Consultant and do not commence work until instructed by Consultant.  |
|     |  | .2 | Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.   |
|     |  | .3 | Remove debris, roots, branches, stones in excess of 50mm diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris which protrudes more than 50 mm above surface. Dispose of removed material off site. |
|     |  | .4 | Cultivate entire area which is to receive topsoil to minimum depth of 100 mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.  |
| 3.3 | <b><u>Placing and Spreading of Topsoil/Planting Soil</u></b> | .1 | Place topsoil after Consultant has accepted subgrade.   |
|     |  | .2 | Spread topsoil in uniform layers not exceeding 150 mm.  |
|     |  | .3 | For sodded areas keep topsoil 15 mm below finished grade.   |
|     |  | .4 | Spread topsoil as indicated to following minimum depths after settlement.   |
|     |  | .1 | 150 mm for seeded areas.  |
|     |  | .2 | 135 mm for sodded areas.  |
|     |  | .3 | 600 mm for shrub and perennial beds.  |
|     |  | .5 | Manually spread topsoil/planting soil around trees, shrubs and obstacles.   |
| 3.4 | <b><u>Soil Amendments</u></b>                                | .1 | For planting beds and turf: apply and thoroughly mix soil amendments into full specified depth of topsoil.  |
| 3.5 | <b><u>Finish Grading</u></b>                                 | .1 | Grade to eliminate rough spots and low areas and ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking.   |
|     |  | .2 | Consolidate topsoil to required bulk density. Leave surfaces smooth, uniform and firm against deep footprinting.  |
| 3.6 | <b><u>Acceptance</u></b>                                     | .1 | Consultant will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.  |
| 3.7 | <b><u>Surplus Material</u></b>                               | .1 | Dispose of materials except topsoil not required off site.  |

End of Section

**PART 1 - GENERAL**

- 1.1 **Related Sections** .1 Section 02911 Topsoil and Finish Grading
- 1.2 **Samples** .1 Submit samples in accordance with Section 01300 – Submittals.  
.2 Submit:  
.1 Sod for each type specified.  
.1 Install approved samples in one square metre mock-ups and maintain in accordance with maintenance requirements during establishment period.  
.3 Obtain approval of samples by Consultant.
- 1.3 **Scheduling** .1 Schedule sod laying to coincide with preparation of soil surface.  
.2 Schedule sod installation when frost is not present in ground.
- 1.4 **Maintenance Period** .1 Maintain sod from date of installation until Substantial Performance, or a 90 day period after sodding, whichever is longer. If Substantial Performance, or the 90 day period after sodding, ends after end of growing season, extend maintenance period until June 30 of the following growing season. Maintain sod layed at end of growing season until August 31 of following season.

**PART 2 - PRODUCTS**

- 2.1 **Materials** .1 Number One Turfgrass Nursery Sod: Sod that has been especially sown and cultivated in nursery fields as turfgrass crop.  
.1 Turfgrass Nursery Sod types:  
.1 Turf-Type Perennial Ryegrass Sod – containing mixture of 70% perennial Ryegrass and 30% Kentucky Bluegrass.  
.2 Fine-Leafed Fescue Sod – containing mixture of 70% Fine-Leafed Fescue and 30% Kentucky Bluegrass.  
.2 Turfgrass Nursery Sod quality:  
.1 Not more than 2 broadleaf weeds or 10 other weeds per 40 square metres.  
.2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.  
.3 Mowing height limit: 35 to 65 mm.  
.4 Soil portion of sod: 6 to 15 mm in thickness.



- 2.1 **Materials** .2 Sod establishment support:  
**(Cont'd)**
- .1 Wooden pegs: 17 x 8 x 200 mm.
  - .2 Biodegradable starch pegs: 17 x 8 x 200 mm.
  - .3 Water:
    - .1 Supplied by Owner at designated source.
  - .4 Fertilizer:
    - .1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
    - .2 Complete, natural, organic, slow release with 65 % of nitrogen content in water-insoluble form.
- 2.2 **Source Quality** .1 Obtain approval from Consultant of sod at source.  
**Control** .2 When proposed source of sod is approved, use no other source without written authorization.

### **PART 3 - EXECUTION**

- 3.1 **Preparation** .1 Verify that grades are correct and prepared in accordance with Section 02911 - Topsoil and Finish Grading. If discrepancies occur, notify Consultant and do not commence work until instructed by Consultant.
- .2 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.
  - .3 Fine grade surface free of humps and hollows to smooth, even grade, to contours and elevations indicated, to tolerance of plus or minus 8mm, for Turfgrass Nursery Sod, surface to drain naturally.
  - .4 Remove and dispose of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site.
- 3.2 **Sod Placement** .1 Lay sod within 24 hours of being lifted if air temperature exceeds 20°C.
- .2 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.
  - .3 Roll sod as directed by Consultant. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

- 3.3 **Sod Placement on Slopes and Pegging**
- .1 Start laying sod at bottom of slopes.
  - .2 Peg sod on slopes steeper than 3 horizontal to 1 vertical, within 1 m of catch basins and within 1 m of drainage channels and ditches to following pattern:
    - .1 100 mm below top edge at 200 mm on centre for first sod sections along contours of slopes.
    - .2 Not less than 3-6 pegs per square metre.
    - .3 Not less than 6-9 pegs per square metre in drainage structures. Adjust pattern as directed by Consultant.
    - .4 Drive pegs to 20 mm above soil surface of sod sections.
- 3.4 **Fertilizing Program**
- .1 Fertilize during establishment and warranty periods to following program:
 

Date	Rate
May 1 to May 31 (first application)	12 kg / 100 cu.m
July 1 to July 31 (second application)	6 kg / 100 cu.m
September 1 to September 15 (third application)	12 kg / 100 cu.m
  - .2 The fertilizer requirements noted above have been included for tendering purposes only. Adjust requirements and rates to conform to soil testing report and subsequent recommendations. Make such adjustments at no extra cost to the contract.
- 3.5 **Maintenance During Establishment Period**
- .1 Perform following operations from time of installation until acceptance at end of maintenance period.
  - .2 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100 mm.
  - .3 Cut grass to 50 mm when or prior to it reaching height of 75 mm. Remove clippings which will smother grassed areas as directed by Consultant.
  - .4 Maintain sodded areas weed free 95%.
  - .5 Fertilize areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.
- 3.6 **Acceptance**
- .1 Turfgrass Nursery Sod areas will be accepted by Consultant provided that:
    - .1 Sodded areas are properly established.
    - .2 Sod is free of bare and dead spots.
    - .3 No surface soil is visible from height of 1500 mm when grass has been cut to height of 50 mm.
    - .4 Sodded areas have been cut minimum 2 times prior to acceptance.

- |     |   |    |   |
|-----|---|----|---|
| 3.6 | <b>Acceptance<br/>(Cont'd)</b>                        | .5 | Fertilizing in accordance with fertilizer program has been carried out at least once.   |
|     |   | .2 | Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled. |
| 3.7 | <b>Maintenance<br/>During<br/>Warranty<br/>Period</b> | .1 | Maintenance during Warranty Period will be the responsibility of the Owner.   |

End of Section

**PART 1 - GENERAL**

- 1.1 **Related Work** .1 Cast-in-Place Concrete: Section 03300
- 1.2 **References** .1 ANSI/ACI 117-81, Tolerances for Concrete Construction and Materials.  
.2 ASTM C 309-94, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.  
.3 ASTM C 494-92, Specification for Chemical Admixtures for Concrete.  
.4 ASTM E1155M-87, Test Method for Determining Floor Flatness and Levelness Using the F-Number System.  
.5 CAN/CSA-A5-03, Portland Cement.  
.6 CSA-A23.1-00, Concrete Materials and Methods of Concrete Construction.  
.7 CAN/CSA-A23.5-03, Supplementary Cementing Materials.
- 1.3 **Certificates** .1 Submit certificates in accordance with Section 01300 - Submittals.  
.2 Submit to Consultant manufacturer's test data and certification by qualified independent inspection and testing laboratory that materials will meet specified requirements.  
.3 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1.

**PART 2 - PRODUCTS**

- 2.1 **Materials** .1 Portland cement: to CAN/CSA-A5.  
.2 Supplementary cementing materials: to CAN/CSA-A23.5.  
.3 **Water:** to CSA-A23.1.  
.4 **Aggregates:** to CSA-A23.1. Coarse aggregates to be normal density.  
.5 **Sand :** colour, size and type to match existing concrete.  
.6 **Patching Mortar:** Premixed cementitious concrete patching mix.  
**Product:** Sika Repair -223CA with Sika LATEX R additive  
**Manufacturer:** Sika Canada.  
.8 **Bonding Agent:** as recommended by patching mortar manufacturer.  
.9 **Corrosion Inhibitor:** as recommended by patching mortar manufacturer.

- 2.2 **Mixing**
- .1 Mix using a heavy duty low speed electric drill/mixer (300 - 450 rpm) and mixing paddle (Jiffy or Exomixer®/spiral type) or a mortar mixer.
  - .2 In a clean mixer or pail pour 1 jug of Sika® Latex R per 17 kg (37.5 lb) bag of depending on consistency desired. Add SikaRepair®-223CA slowly while continuing to mix. Mix to a uniform consistency for a maximum of three (3) minutes. Add additional liquid if a more fluid consistency is desired. Do not overwater. Excessive water/cement ratios may cause severe bleeding and retardation and will reduce the strength and performance of the mortar.

### PART 3 - EXECUTION

- 3.1 **Preparation**
- .1 Clean surfaces to be repaired, remove loose and foreign matter which could interfere with application.
  - .2 Remove all unsound concrete, using lightweight demolition hammers, not to exceed 18 pounds in weight.. Following demolition, test surfaces for alkalinity/carbonation with a 1-2% solution of phenolphthaline. Surfaces which do not indicate alkalinity (solution turns pink) shall require further demolition.
  - .3 Pressure wash all indicated surfaces using 3000-4000 psi water blast, as required to remove all dust and dirt. Abrasive shall be used in combination with water when cleaning repair cavities, as required to eliminate micro-cracked surface materials resulting from demolition. No water with concrete dust shall be allowed to remain on any surface following washing, and must be immediately removed, prior to drying and rehardening.
  - .4 The result of this preparation shall render a surface clean, meaning having complete exposure of sound original material without any deposits of contaminants, foreign matter or loose material, which could affect the bond or long-term durability of the surface and the patching compound.
- 3.2 **Crack Repair**
- .1 Patching compounds are not to be used to bridge working cracks or joints. Prior to crack repair, contractor shall engage the services of the crack sealant manufacturer's technical representative to assist in the selection of the appropriate grades of crack sealants for each area.
- 3.3 **Priming of Reinforcing Steel**
- .1 Any steel reinforcement exposed in the course of removing unsound materials shall be cleaned and prepared in accordance with the above specifications.
  - .2 Following cleaning and prior to patching, apply cementitious corrosion inhibitive primer and bonding agent to all steel surfaces in accordance with manufacturer's instructions. Care must be taken to create a continuous coating on the full surface, including the underside of the undercut reinforcement. Observe manufacturer's guidelines with regard to minimum and maximum timing "windows" for patching after application of primer.

**3.4**     **Repair of  
Damaged  
Concrete**

- .1     Following preparation, as specified above, contractor shall maintain work area in a clean condition, including materials, equipment and workers' footwear, to avoid tracking in of contaminants, dirt, dust, mud or other materials which may interfere with adhesion and durability of repairs.
2.     Prior to patching, all repair areas to be patched shall be kept continuously wet for at least 20 minutes prior to application of patching compound. Before placing patch, excess water shall be blown, vacuumed or otherwise removed from the surface, leaving the surface damp or saturated/surface dry.
3.     Vigorously brush apply a thin primer coat of acrylic latex bonding agent with added 10% neat Type 1 portland cement into all cavity surfaces.
4.     Within 4 hours of primer application, mix and place patching compound in accordance with manufacturer's instructions.
5.     Mix the precisely measured quantity of water specified by the manufacturer with full bags of patching compound only. Do not whip air into the mix. Do not overmix.
6.     When placing the patching compound, care shall be taken to assure that all corners and gaps under reinforcing steel and entire cavity profile is completely filled and properly compacted to prevent formation of voids or unbonded areas. "Work" the material into corners and gaps, and onto cavity sidewalls using pressure on the trowel to assure good contact between patch and substrates.
7.     Patches deeper than 25 mm may be extended by coarse aggregate addition of clean, washed, pea stone suitable in composition and surface profile for use as a concrete aggregate as recommended by manufacturer.
8.     Do not retemper material which has begun to set. Discard any unused material after 20 minutes. Do not excessively wet patch surfaces after placement or as an aid to trowelling. Limit surface water addition to light misting and do not wet or rework repeatedly.
9.     Observe the curing requirements for each day's working conditions, as specified herein. Do not extend wet curing beyond the maximum specified. Do not open to traffic or expose to weather until adequate strength has been reached, as affected by working and curing conditions.

**3.5**     **Curing**

- .1     To achieve performance consistent with the technical data, curing is required and must be provided as per ACI 308 recommendations for cement concrete. Execute curing by recognized methods such as wet burlap covered with white polyethylene film, misting with water, or approved water-based curing compound as recommended by manufacturer. The use of wet curing blankets is strongly recommended.
- .2     Curing must commence immediately after placing and finishing. It must be maintained for the first 24 hours only. Protect freshly applied product from direct sunlight, strong winds, rain and freezing.

3.6 Clean Up .1 Clean all tools and equipment after use with water. Once hardened, the product can only be removed mechanically. Wash soiled hands and skin thoroughly in hot soapy water or use manufacturer's Hand Cleaner towels.

3.7 Appendix 'A'  
Photographs



**Column 1** – Remove spalled concrete, repair and paint to match existing,



**Column 2 - Remove spalled concrete, repair and paint to match existing.**





**Column 3** - Remove spalled concrete, repair and paint to match existing

**End of Section**

**PART 1 - GENERAL**

- 1.1 **Related Work** .1 Concrete Floor Finishing: Section 03345
- 1.2 **References** .1 ANSI/ACI 117-81, Tolerances for Concrete Construction and Materials.  
.2 ASTM C 309-94, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.  
.3 ASTM C 494-92, Specification for Chemical Admixtures for Concrete.  
.4 ASTM E1155M-87, Test Method for Determining Floor Flatness and Levelness Using the F-Number System.  
.5 CAN/CSA-A5-03, Portland Cement.  
.6 CSA-A23.1-00, Concrete Materials and Methods of Concrete Construction.  
.7 CAN/CSA-A23.5-03, Supplementary Cementing Materials.
- 1.3 **Certificates** .1 Submit certificates in accordance with Section 01300 - Submittals.  
.2 Submit to Consultant manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:  
.1 Portland cement.  
.2 Supplementary cementing materials.  
.3 Grout.  
.4 Admixtures.  
.5 Aggregates.  
.3 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1.

**PART 2 - PRODUCTS**

- 2.1 **Materials** .1 Portland cement: to CAN/CSA-A5.  
.2 Supplementary cementing materials: to CAN/CSA-A23.5.  
.3 Water: to CSA-A23.1.  
.4 Aggregates: to CSA-A23.1. Coarse aggregates to be normal density.  
.5 Water reducing admixture: to CAN3-A266.2-M78 and ASTM C494, Type A, Prokrete N by Conchem Lafarge, WR75 by Euclid Chemical Canada Ltd. or Pozzolith 322N by Master Builders Technologies Limited.  
.6 Non premixed dry pack grout: composition of non metallic aggregate Portland cement with sufficient water for the mixture to retain its shape when made into a ball by hand and capable of developing compression strength of 40 MPa at 7 days. M-Bed Standard by Sternson, V-3 Non-

2.1 **Materials**  
(Cont'd)

- metallic Grout by W.R. Meadows of Canada Ltd., In-Pakt by C.C. Chemicals Canada Ltd. or Progrout by Conchem Lafarge.
- .7 Liquid Curing/Sealing Compound: to CAN/CSA-A23.1 and to ASTM C 309 Type 1-chlorinated rubber, Class B water based acrylic curing/sealing compound, Acryseal WB by Conchem Lafarge, Masterseal W by Master Builders Technologies Limited, Florseal W.B. by Sternson or Sealtight Intex by W.R. Meadows of Canada Ltd.
- .8 Premoulded joint fillers:
  - .1 Bituminous impregnated fiber board: to ASTM D1751, 12.7mm thick x depth of slab.
- 9 Shrinkage control fibres: Fibre Mesh fibrillated polypropylene fibres by Fibermesh Canada Ltd. or equal, 19 mm in length.

2.2 **Mixes**

- .1 Ready-mixed concrete and concrete proportions shall be in accordance with CSA-A23.1, Clause 14, and as follows.
- .2 Concrete shall be proportioned by the water-cement ratio and to provide a plastic and workable mix without the formation of free water on the surface.
- .3 Mix shall be designed for both strength and durability. Submit to Consultant the mix design for the different classes of concrete indicated in the General Construction Notes provided on the structural drawings and listed below.
- .4 The amount of free moisture in the aggregate shall be deducted from the amount of mixing water being added.
- .5 Specified slumps shall be maintained and checked periodically with slump tests.
- .6 Mix shrinkage control fibres into slab mix at rate of 0.9 kg/cu.m of concrete, unless otherwise indicated on drawings. Add admixture as required.
- .7 Class of exposure: refer to Clause 15 and Tables 7, 8 and 9 of CSA-A23.1, and Class of Concrete Table herein.
- .8 Air content: to Table 10 of CSA-A23.1, according to category of exposure and Class of Concrete table provided on structural drawings.
- .9 Concrete mix shall be designed and proportioned to yield the specified ultimate and compressive strength at 28 days as determined by laboratory testing standard 150 mm x 300 mm or 100 mm x 200 mm cylinders moist cured in the laboratory.

.10 Classes of concrete:

CLASS OF CONCRETE	LOCATION	EXPOSURE CLASS	STRENGTH (MPa)	SLUMP (mm)	AIR (percent)
A	Slab on Grade Inside Building,	-	25	80	up to 3

2.2	<b>Mixes (Cont'd)</b>	B	Concrete Fill	-	5	20-80
-----	---------------------------	---	---------------	---	---	-------

\*concrete must utilize plasticizer to facilitate placement.

### PART 3 - EXECUTION

- 3.1 **Preparation**
- .1 Obtain Consultant's approval before placing concrete. Provide 24 hour notice prior to placing of concrete.
  - .2 Pumping of concrete is permitted only after approval of equipment and mix.
  - .3 Ensure reinforcement and inserts are not disturbed during concrete placement.
  - .4 Prior to placing of concrete obtain Consultant's approval of proposed method for protection of concrete during placing and curing.
  - .6 In locations where new concrete is dowelled into existing work, drill holes in existing concrete. Place steel dowels and pack solidly with epoxy grout to anchor and hold dowels in positions as indicated.
- 3.2 **Construction**
- .1 Do cast-in-place concrete work in accordance with CSA-A23.1.
  - .2 Place concrete to prevent layering and segregation, and vibrate sufficiently to ensure thorough compaction, maximum density, and according to CSA-A23.1 Clause 19.
  - .3 Grout under base plates using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.
  - .4 Surface Finishing
    - .1 Finish concrete in accordance with CSA-A23.1.
    - .2 Use procedures acceptable to CAN/CSA-A23.1 to remove excess bleed water. Ensure surface is not damaged.
    - .3 Honeycomb: In locations where the repair of honeycomb is acceptable to Consultant, cut out defective areas and fill the space with a cement mortar of the same materials as the surrounding concrete. Incorporate a liquid latex bonding agent into the mix. Apply in layers not exceeding 25 mm in thickness.
  - .5 Joint Fillers
    - .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Consultant. When more than one piece is required for a joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
    - .2 Locate and form isolation and construction joints as indicated. Install joint filler.

- 3.2 **Construction**  
**(Cont'd)**
- .3 Use 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces, except where perimeter insulation is installed in its place. Extend joint filler from bottom of slab to within 12 mm of finished slab surface unless indicated otherwise.
- .6 Patching
- .1 Make good temporary openings left in concrete work for pipes, conduits, ducts, shoring and other such work during construction using mix of same proportions as surrounding work. Reinforce as required and finish to match surrounding work. Carry out patching as specified in standards contained herein.
- 3.3 **Site Tolerance** .1 Concrete tolerance in accordance with CSA-A23.1.

**End of Section**

**PART 1 - GENERAL**

- 1.1 **General Requirements** .1 Comply with requirements of Division 1.
- 1.2 **Related Sections** .1 Cast-in-Place Concrete: Section 03300.
- 1.3 **Reference Standards** .1 Do concrete floor finish in accordance with CAN3-A23.1-M77 except where specified otherwise.
- .2 Conform to Concrete Floor Finish Specifications of Concrete Floor Contractor's Association of Toronto.
- .3 Surface tolerances 1:350 from plane, maximum 13 mm from floor level at any point, free from trowel marks and "Washboard" chatters.
- 1.4 **Qualifications** .1 The work of this section is to be done by a concrete floor finish contractor of recognized standing having personnel with experience in this type of work and who has the necessary equipment to carry out the work.
- 1.5 **Guarantee** .1 Provide the following guarantee in accordance with the General Conditions, notwithstanding the time provisions therein.

**Three year guarantee against defects in workmanship and materials.**

**PART 2 - PRODUCTS**

- 2.1 **Materials** .1 Concrete materials and reinforcement: in accordance with Section 03300.
- .2 Additive: "Albitol" distributed by Albert Chemical Sales of Canada Limited.
- .3 Curing compound: Mats 3.5.1.
- .4 Sheet: polyethylene film, 0.1 mm thick, CGSB 51-GP-51M; or waterproof paper, Type 2, ASTM C171.
- .5 Cement: Mats 3.2.1, normal, false set final penetration minimum 50% when tested in accordance with ASTM C 359.
- .6 Additives, admixtures and hardeners: to be compatible.
- .7 Chemical Hardener: Sealhard 400 by Sternson Ltd. or Saniseal 100 by Master Builders.

**PART 3 - EXECUTION**

- 3.1 **Inspection** .1 Check that drains and other insets and inserts are set at correct heights.
- 3.2 **Preliminary Finishing** .1 After concrete has been placed to screeds under Section 03300, strike off concrete level and flush with screeds with true, wooden, strike-off bar.

- 
- 3.2 **Preliminary Finishing (Cont'd)**
- .2 Immediately after striking off concrete, level it and consolidate it with wooden bull float, or in limited access areas, with wooden darby. Complete levelling and consolidation before free moisture rises to surface (bleeding).
  - .3 Use suitable techniques to finish abutting pours at joints to eliminate "humping". If humping occurs, grind joint down level to surrounding surface.
- 3.3 **Float Finish**
- .1 After preliminary finishing wait until concrete stiffens sufficiently to sustain foot pressure with only about 6 mm indentation.
  - .2 Float concrete with hand float or with disc type power float or power trowel with float shoes attached.
  - .3 Do not bring water and fines to surface by over floating. Where longer floating is required, floating operation shall be repeated after sheen has disappeared and concrete has further hardened.
- 3.4 **Light Steel Trowel Finish**
- .1 After float finish, trowel surface with steel hand trowel or power trowel keeping blade relatively flat at first and raising blade angle a little more on subsequent passes. Do not bring water and fines to surface by over trowelling.
  - .2 Slope surface to drains not less than 1:50, unless different slope is indicated or no slope to drain is required. Surface shall be level where no drainage requirements exist.
  - .3 Trowel surface as required to leave surface even and straight, free of high or low spots, pits, ridges or other surface irregularities and blemishes.
  - .4 Surface shall have firm and even textured finish.
- 3.5 **Steel Trowel Finish**
- .1 After float or shake finish, trowel surface with steel hand trowel or power trowel keeping blade relatively flat at first and raising blade angle a little more on subsequent passes.
  - .2 Trowel surface at least twice and as many times as necessary to produce smooth, dense surface with close surface tolerances. Do not bring fines to the surface by over trowelling.
  - .3 Surface shall have a smooth, level, extremely fine textured but not burnished finish.
- 3.6 **Chemical Hardened Finish**
- .1 Not sooner than 14 days after steel trowel apply chemical hardener.
  - .2 Make sure surface is thoroughly cured, dry and free from dust. Remove dust with heavy duty, commercial vacuum cleaner.
  - .3 Floors which are to receive chemical surface treatment must not be cured using membrane forming liquid curing compound. Use other means of curing.

- .4 Remove oil, grease or other foreign substances on surface using suitable floor cleaner. Allow floor to dry thoroughly after cleaning.
- .5 Apply chemical treatment as direct by manufacturer.
- 3.7 **Curing**
- .1 Cure surfaces which are to receive chemical surface treatment. Begin curing immediately after trowelling.
- .2 Other finishes may be cured by any method specified in CAN3-A23. Do not use curing compound without first determining whether subsequent finishes are to be applied. If subsequent finishes are to be applied do not use curing compounds, unless it can be warranted not to affect bond of applied finishes.
- 3.8 **Finishes Schedule**
- .1 Finish top horizontal concrete surfaces in accordance with intended use and any intended applied finish. Conform to room finish schedule and following table of finishes.
- .2
- | <u>Intended Use of Surface or Intended Applied Finish</u>   | <u>Integral Finish</u>                                      |
|---|---|
| - surface to receive cementitious beds for subsequent applied hard finishes, e.g. ceramic tile, quarry tile, portland cement bonded terrazzo. | float finish  |
| - seamless, liquid applied flooring; liquid applied waterproof membranes.   | light steel trowel  |
| - resilient flooring, exposed surfaces not indicated to receive other or applied finishes, glued down carpet.                                 | steel trowel finish   |
| - exposed surfaces indicated to be chemically hardened, other surfaces.   | steel trowel finish, followed by chemical surface treatment |

**End of Section**



## **PART 1 - GENERAL**

- 1.1 **General Requirements** .1 Comply with requirements of Division 1.
- 1.2 **Related Sections** .1 Concrete fill for block lintels: Section 03300  
.2 Block Masonry: Section 04200  
.3 Brick Replacement Section 04210
- 1.3 **Reference Standards** .1 Quality Standards: meet requirements of CSA A179-94, Mortar and Grout for Unit Masonry.
- 1.4 **Source** .1 Source of Materials: for mortar to remain exposed in finished project, brands  
**Quality Control** of cementitious materials and source of supply of sand, shall remain the same for duration of work.
- 1.5 **Delivery & Storage** .1 Store cementitious materials so as to prevent moisture absorption from any source. Do not use material affected by moisture.  
.2 Store mortar and aggregate materials to prevent contamination. Do not use contaminated materials.

## **PART 2 - PRODUCTS**

- 2.1 **Materials** .1 Water: potable and non-staining.  
.2 Aggregate - Sand: CSA A82.56M  
.3 Portland cement: CAN/CSA-A5-93, Type 10.  
.4 Masonry cement: CAN/CSA-A8-93, Type H.  
.5 Waterproofer: Master Builders "Omicron"  
.6 Lime: Hydrated lime 'S' Type to ASTM C207.

## **PART 3 - EXECUTION**

- 3.1 **Proportioning & Mixing** .1 Mix mortar in accordance with table 2 of CSA A179-94 and the recommended procedures of the Brick Institute of America Manual MI except as specified herein.  
.2 Mix mortar to proportions indicated in Mortar Schedule.  
.3 An experienced competent tradesman must supervise mortar mixing.  
.4 Mix mortar in watertight mechanical mixers. Measure ingredients accurately by volume. Bring mortar to required elasticity. Continue mixing mortar until materials are blended to uniform colour, but not less than 3 minutes, or more than 5 minutes. Do not mix longer than 10 minutes.

- 3.1 **Proportioning & Mixing (Cont'd)**
- .5 Do not use admixtures of any kind in mixes except where specified otherwise.
  - .6 Prehydrate pointing mortar by mixing ingredients dry then mix again adding just enough water to provide a damp workable mix that will retain its form when pressed into a ball. Allow to stand for not less than two hours then remix with sufficient water to produce mortar of the proper consistency for pointing.
- 3.2 **Time Limits & Retempering**
- .1 Use and place mortar in final position within the following time limits after mixing:
    - .1 Air Temp. above 25 degrees C - 12 hours.
    - .2 Air Temp. below 25 degrees C - 2.5 hours.
  - .2 Standard mortar that has stiffened within above time limits because of evaporation of water may be retempered by adding water as frequently as needed to restore required consistency. Discard mortar not used within above time limits.
- 3.3 **Mortar Schedule**
- .1 Bearing walls: Type S mortar.
  - .2 Non bearing walls: Type N mortar consisting of 1 part Masonry Cement, 3 parts aggregate.

**End of Section**

**PART 1 - GENERAL**

- |     |   |    |  |                  |
|-----|---|----|--|------------------|
| 1.1 | <b><u>General Requirements</u></b>                  | .1 | Comply with requirements of Division 1.  |                  |
| 1.2 | <b><u>Related Sections</u></b>                      | .1 | Supply of reinforcing steel and concrete for block lintels:  | Section 03300    |
|     |   | .2 | Mortar   | Section 04100    |
|     |   | .3 | Brick Replacement  | Section 04210    |
|     |   | .4 | Supply of loose steel lintels  | Section 05500    |
|     |   | .5 | Caulking:  | Section 07900    |
|     |   | .6 | Supply of steel door frames  | Section 08100    |
|     |   | .7 | Supply of access doors for mechanical and electrical Work.   | Division 15 & 16 |
| 1.3 | <b><u>Work Installed But Supplied By Others</u></b> | .1 | Build into masonry elements inserts, anchors, bolts, sleeves and other items supplied by other Sections and which are required for installation and performance of work of other Sections.             |                  |
|     |   | .2 | Install loose steel lintels.   |                  |
|     |   | .3 | Coordinate installation of lateral supports required for final support of masonry partitions with Section 05500.   |                  |
|     |   | .4 | Install steel door frames and access doors occurring in masonry elements.  |                  |
|     |   | .5 | Install reinforcing steel and concrete fill into block lintels.  |                  |
| 1.4 | <b><u>Reference Standards</u></b>                   | .1 | Confirm to requirements of CSA A370.94, CSA A371.94 and CSA S304.1.94.   |                  |
| 1.5 | <b><u>Qualifications</u></b>                        | .1 | The work of this section is to be done by a masonry contractor of recognized standing having personnel with experience in this type of work and who has the necessary equipment to carry out the work. |                  |
| 1.6 | <b><u>Inspection &amp; Testing</u></b>              | .1 | The Consultant may at his discretion call for tests of mortar or other masonry materials to be made by an independent inspection company.  |                  |
|     |   | .2 | A Cash Allowance for these tests will be carried by the General Contractor in accordance with the General Conditions.  |                  |
| 1.7 | <b><u>Source Quality Control</u></b>                | .1 | Submit laboratory test reports certifying compliance of masonry units and mortar ingredients with Specification requirements.  |                  |
| 1.8 | <b><u>Product Handling &amp; Storage</u></b>        | .1 | Handle masonry units so as to prevent soiling and chipping and deliver to the job site in dry condition.   |                  |
|     |   | .2 | Store masonry units above and off ground on level platforms which permit air circulation under stacks.   |                  |
|     |   | .3 | During storage, protect masonry units against moisture absorption, damage, staining and freezing.  |                  |
|     |   | .4 | Keep materials dry until use.  |                  |

- 1.12 **Protection**
- .1 Protect face work from splashing or marking. Protect interior block walls which are to be painted or left unfinished from staining and other damage.
  - .2 Protect all work installed by other trades from splashing and marking and other damage.
  - .3 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

## **PART 2 - PRODUCTS**

- 2.1 **Materials**
- .1 **Concrete Block:** Metric size and autoclaved.
    - .1 Lightweight block: Ultra Lite to CSA Standard A-165.1M
    - .2 Standard weight block: to CAN3-A165.1M85.
    - .3 Units must be cured for at least 28 days before delivery and shall have a moisture content of not more than 30% of total absorption.
    - .4 Size: unless indicated otherwise 190 x 390 mm x thickness as shown on drawings.
    - .5 Exposed block units shall be uniform in size, free of perceptible warp or twist, without chipped, ragged or broken edges; have a uniform surface texture, free of cracks, blemishes or defects detrimental to appearance or performance.
    - .6 Where indicated on Drawings and/or Specifications, provide solid or semi-solid units.
    - .7 Provide manufacturer's catalogued special units such as bullnose corner, lintel block and 45° corner blocks.
  - ..2 **Metal Reinforcement and Anchors**
    - .1 Material: high tensile strength steel wire meeting ASTM A82, by Bloklok or Durowall.
    - .2 Finish: hot dip galvanized after fabrication to ASTM A153, Class B.
    - .3 Provide prefabricated assemblies for corners and intersections.
    - .4 **Horizontal Reinforcement:**
      - .1 Single wythe and solid walls: truss type with minimum 3.66 mm thick side and cross rods unless otherwise indicated; width 50 mm less than wall thickness: BLOK-TRUS BL30.
    - .5 **Anchors and Ties:**
      - .1 Non-bearing walls and partitions to bearing walls: corrugated wall ties minimum 0.7 mm thick, 21 x 175 mm BLOK-LOK BLT7A.

- 2.1 **Materials**  
**(Cont'd)**
- .2 Masonry walls, partitions and veneer to concrete elements:  
Flexible wire tie, 4.76 mm thick, length to suit wall condition, and dovetail anchor slot: BLOK-LOK BLT8, or POS-1-TIE NWTC-TAPCON screw anchors by National Wire Products Industries Inc.
  - .3 Masonry wall to structural wood wall: BLOK-LOC 362-C Gripstay Channel bolted directly to wood stud
  - .3 **Premoulded Joint Filler** - Closed cell vinyl foam, compressed 25% when in joint, one of the following:
    - .1 Unifoam R 1009 - Flexible by Goodco Ltd
    - .2 Rodofoam PR by Sternson Ltd.
  - .4 **Fire stop:** ULC labelled, firebarrier mineral wool by Double A/D Distributors Ltd., Fire-Bloc by M.W. McGill and Associates. Use Bakelite 910-10 Adhesive.
  - .5 **Dovetail anchor slots:** 26 ga. galvanized steel, glass fibre filled. Supply to Section 03300 for installation.
  - .6 **Preformed Control Joint Key:** Titewall BL.A Rubber Preformed Joint Key by BLOK-LOK.
  - .7 **Bond Break:** 0.1 mm thick polyethylene.
  - .8 **Compressible Filler:** Rockwool Insulation
  - .9 **Asphalt Impregnated Board:** 12 mm thick asphalt impregnated fibre boards.

### **PART 3 - EXECUTION**

- 3.1 **Erection**  
**General**
- .1 Build masonry work true to line, plumb, square and level, with vertical joints in proper alignment.
  - .2 Assume complete responsibility for dimensions, plumbness and levels of this work and constantly check same with graduated rod.
  - .3 Masonry courses to be of uniform height, and both vertical and horizontal joints to be of equal and uniform thickness.
  - .4 Extend all non-bearing partitions to within 25 mm of underside of floor or roof construction above and pack joint with a compressible filler of fire stop mineral wool, leave no voids.
  - .5 Carry wall up in uniform manner, no one portion being raised more than 750 mm above another at any time. Build no more than 1500 mm of wall measured vertically in any one day.
  - .6 Buttering corners of units, throwing mortar into joints, deep or excessive furrowing of bed joints not permitted. Do not shift or tap units after mortar has taken initial set. Where adjustments must be made after mortar has started to set, remove mortar and replace with fresh supply.

- 
- .7 Isolate masonry from vertical structural framing in exterior walls using 12 mm thick asphalt impregnated rigid board cemented to columns.
  - .8 Cut exposed masonry units with power driven masonry saw only. Ragged or chipped edges will not be permitted.
  - .9 Consult with other sections to avoid cutting and patching. Co-operate in setting and aligning built-in items. Build in conduit and piping so that they are not exposed. Do not break masonry bond to accommodate concealed built-in items.
  - .10 Install access doors occurring in masonry elements, required by Division 15 and 16. Install access doors, level, plumb properly aligned and securely anchored, in locations directed by Division 15 and 16.
  - .11 Grout solid with mortar all spaces around built-in items.
  - .12 Build in metal nailing plugs, grounds, inserts, anchor bolts, bearing plates, loose and miscellaneous items of steel and iron, isolated beams, lintels and shelf angles, sleeves, blocking and items furnished by other Sections.
- 3.2 **Blockwork**
- .1 Lay all block in running bond with thicker end of face shell upward. Coursing to be modular 200 mm for one block and one joint.
  - .2 Do not wet blocks before laying.
  - .3 Lay units with webs aligning one over the other in full bed of mortar over entire laying surface including webs. Vertical joints shall be fully filled with mortar on both faces and squeezed tight.
  - .4 Exposed faces shall be full units laid out to minimize cutting with not less than 100 mm at any vertical edge or corner.
  - .5 Use solid block for at least two courses under all point bearing loads.
  - .6 Use special shaped units where indicated, specified or required. Use bull nosed units for exposed external corners, window jambs, door jambs and as detailed. Exposed open cells not permitted.
  - .7 Use square cornered block for first course at floor at locations with exposed external bullnose corners. Grind square corner above top of base to match bullnose of blocks above as detailed.
  - .8 Where resilient base is indicated, tool the joints to within 100 mm of the floor. Cut joints flush behind the base.
  - .9 Provide minimum 400 mm solid or grouted block for jambs of openings and at ends of walls.
  - .10 Cope or cut with power saw exposed units to accommodate flush mounted electrical outlets, grilles and other components. Leave maximum 5 mm clearance. Cover plates and flanges must cover cut edges.

- 
- |     |  |     |  |
|-----|--|-----|--|
| 3.2 | <b><u>Blockwork<br/>(Cont'd)</u></b>                         | .11 | Take special care to prevent mortar or other substances from staining exposed block faces. Replace stained blocks as directed by the Consultant at no extra cost to Contract.  |
|     |  | .12 | Tie intersecting non-bearing walls together with masonry reinforcing every second course.  |
|     |  | .13 | Provide continuous 0.1 mm thick polyethylene bond breaker at base of partitions and walls which bear on concrete slabs.  |
|     |  | .14 | Use lightweight blocks for all interior block walls and partitions.  |
| 3.3 | <b><u>Mortar &amp;<br/>Pointing</u></b>                      | .1  | Make all joints uniform in thickness, straight, in line, with mortar compressed to form concave joints.  |
|     |  | .2  | After joints have been tooled rub walls with burlap.   |
|     |  | .3  | Strike joints flush where walls are to receive insulation, ceramic tile or similar finishes.   |
| 3.4 | <b><u>Building-In</u></b>                                    | .1  | Build in door and window frames, steel lintels, sleeves, anchor bolts, anchors, nailing strips and other items to be built into masonry.   |
|     |  | .2  | Do not distort metal frames. Bed anchors of frames in mortar and fill frame voids with mortar or grout as wall is erected.   |
| 3.5 | <b><u>Bearings</u></b>                                       | .1  | Fill concrete block solid with 20 mPa concrete for two courses below bearing points of structural members, and where indicated.  |
|     |  | .2  | Install building paper and wire mesh reinforcing in the bed below second block course from top.  |
|     |  | .3  | Use 100% solid concrete blocks where indicated.  |
|     |  | .4  | Build masonry neatly around beam and lintel bearings.  |
|     |  | .5  | Complete fill voids beneath steel bases bearing on masonry with an approved non-shrink grout having a compressive strength at 28 days of at least 35MPa. Where grout is exposed to view or weather, use no-ferrous expansion agents. |
| 3.6 | <b><u>Anchoring,<br/>Bonding &amp;<br/>Reinforcement</u></b> | .1  | Anchor or bond walls and partitions at points where they intersect.  |
|     |  | .2  | Anchor masonry walls and partitions to concrete elements with anchors spaces at 400 mm vertically.   |
|     |  | .3  | Unless otherwise indicated reinforce all walls and partitions with continuous horizontal metal reinforcement, installed at 400 mm o.c. vertically.   |
|     |  | .4  | At all wall openings place continuous reinforcement in first and second mortar joints above and below openings. Additional reinforcement at openings shall extend 610 mm beyond both sides of openings.                              |
|     |  | .5  | Install prefabricated corner assemblies at outside corners.  |
|     |  | .6  | Lap continuous reinforcement 150 mm at splices. Cut reinforcement at control joints.   |

- 3.7 **Cutting Masonry**
- .1 Cutting of masonry units exposed in finished work shall be done with approved type power saw. Where electrical conduit outlet or switch boxes occur, grind and cut units before services installed.
  - .2 Patching of masonry not permitted.
- 3.8 **Reinforced Lintels**
- .1 Install reinforced concrete block lintels at openings where steel lintels are not indicated.
  - .2 Support masonry units of reinforced block lintels built in place. Provide a level platform, true to the proper elevation and of sufficient strength to support the load without visible deflection. Maintain supports in place for a minimum of 7 days and for a period sufficient to permit the concrete to cure and gain sufficient strength to safely support all loads.
  - .3 Cast and cure lintels on a plank. Set special channel lintel blocks using specified mortar. Place wood stops at each end of lintel to prevent movement.
  - .4 Place 25 mm of 20 mPa concrete in voids, lay in reinforcing bars as indicated on drawings and place concrete to level of block sides. Rod and tamp concrete well without disturbing reinforcing. Allow lintels to cure 7 days before moving.
  - .5 Minimum bearing shall be 200 mm each side.
  - .6 Provide building paper in joint at bearings and at vertical joint at ends of block lintels to break bond.
- 3.9 **Steel Door Frames**
- .1 Install steel frames in masonry walls. Build in frames rigid, true and plumb. Fill voids between frames and masonry with mortar grout.
  - .2 Brace frames solidly in position while being built in. Provide temporary horizontal wood spreader at mid-height of frames to ensure maintenance of required frame width until masonry work is completed.
  - .3 Comply with installation requirements specified under Section 08100.
- 3.10 **Patching & Cleaning**
- .1 At completion of work, holes and other defects in masonry joints shall be repaired, and masonry surfaces shall be thoroughly cleaned.
  - .2 Holes in masonry joints shall be filled with mortar and suitably tooled. Cut out and repoint defective joints.
  - .3 Dry brush masonry surfaces at end of each day's work and after all final pointing. When mortar joints are dry and hard, clean masonry surfaces by rubbing down with abrasive blocks and stiff fibre brushes.

**End of Section**



**PART 1 - GENERAL**

- |     |   |    |   |               |
|-----|---|----|---|---------------|
| 1.1 | <b><u>General Requirements</u></b>                  | .1 | Comply with requirements of Division 1.   |               |
| 1.2 | <b><u>Related Sections</u></b>                      | .1 | Mortar  | Section 04100 |
|     |   | .2 | Air Barrier   | Section 07196 |
|     |   | .3 | Foamed Cavity Wall Insulation   | Section 07219 |
|     |   | .4 | Caulking:   | Section 07900 |
| 1.3 | <b><u>Work Installed But Supplied By Others</u></b> | .1 | Build into masonry elements inserts, anchors, bolts, sleeves and other items supplied by other Sections and which are required for installation and performance of work of other Sections.  |               |
|     |   | .2 | Install loose steel lintels.  |               |
| 1.4 | <b><u>Reference Standards</u></b>                   | .1 | Confirm to requirements of CSA A370.94, CSA A371.94 and CSA S304.1.94.  |               |
| 1.5 | <b><u>Qualifications</u></b>                        | .1 | The work of this section is to be done by a masonry contractor of recognized standing having personnel with experience in this type of work and who has the necessary equipment to carry out the work.  |               |
|     |   | .2 | Ensure that work is executed under the continuous supervision and direction of a competent foreman.   |               |
| 1.6 | <b><u>Submittals</u></b>                            | .1 | Before ordering any materials submit two samples of all materials for approval.   |               |
|     |   | .2 | Submit additional materials as required for testing to a Testing Company approved by the Consultant and provide results of standard tests on the actual production run of exterior brick including compression, absorption and saturation coefficient and 50 cycle freeze thaw resistance test.   |               |
|     |   | .3 | Submit shop drawings in accordance with the General Conditions of all special masonry units.  |               |
| 1.7 | <b><u>Inspection &amp; Testing</u></b>              | .1 | The Consultant may at his discretion call for tests of mortar or other masonry materials to be made by an independent inspection company.   |               |
|     |   | .2 | A Cash Allowance for these tests will be carried by the General Contractor in accordance with the General Conditions.   |               |
| 1.8 | <b><u>Site Mock-Up</u></b>                          | .1 | Construct sample panel of an exterior cavity wall including: masonry veneer, block, reinforcement, insulation, flashings and weep and vent holes, minimum 1.6 m x 2.5 m in size. Build sample panel in stepped-back fashion to expose each material used (brick, insulation, air barrier, block) to a minimum height of 400 mm each. Locate panel where directed by consultant. Panel may be located to allow incorporation into finished work if approved by the Consultant. |               |

- 
- |      |  |    |   |
|------|--|----|---|
|      |  | .3 | Construct panels to meet project requirements. Select masonry units to represent maximum texture and colour variations. Employ specified mortar, bond, reinforcement, ties, jointing, coursing and workmanship. |
|      |  | .4 | Obtain Consultant's approval of mock-up panels prior to starting masonry work.  |
|      |  | .5 | Approved sample shall remain in place for comparison until completion of masonry work and the Consultant has reviewed the work.   |
| 1.9  | <b><u>Source Quality Control</u></b>         | .1 | Submit laboratory test reports certifying compliance of masonry units and mortar ingredients with Specification requirements.   |
|      |  | .2 | For clay units, in addition to requirements set out in referenced Standards include data indicating initial rate of absorption for units proposed for use.  |
| 1.10 | <b><u>Product Handling &amp; Storage</u></b> | .1 | Handle masonry units so as to prevent soiling and chipping and deliver to the job site in dry condition.  |
|      |  | .2 | Store masonry units above and off ground on level platforms which permit air circulation under stacks.  |
|      |  | .3 | During storage, protect masonry units against moisture absorption, damage, staining and freezing.   |
|      |  | .4 | Keep materials dry until use.   |
| 1.11 | <b><u>Environmental Conditions</u></b>       | .1 | In cold weather, construct and protect masonry elements in accordance with Clause 5.15.2 and 5.15.3 of CAN3-A71-M84. Maintain temperature of mortar between 5 degrees C and 50 degrees C until used.            |
| 1.12 | <b><u>Protection</u></b>                     | .1 | Keep masonry dry using waterproof non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain. Anchor securely in position.                                  |
|      |  | .2 | In hot weather, protect freshly laid masonry from drying too rapidly by means of waterproof, non-staining coverings.  |
|      |  | .3 | Protect sills, projections and exposed edges so that finished work will not be damaged or defaced.  |
|      |  | .4 | Protect face work from splashing or marking. Protect interior block walls which are to be painted or left unfinished from staining and other damage.  |
|      |  | .5 | Protect all work installed by other trades from splashing and marking and other damage.   |
|      |  | .6 | Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.  |

**PART 2 - PRODUCTS**

- 2.1 **Materials** .1 **Face Brick**
- .1 Hard burned clay brick to CSA A82.1-M.
- Size: Metric Modular - 90 x 57 x 190  
Series: Ballycroy Matt.  
Distributor: Forterra (Hanson) Brick
- .2 **Metal Reinforcement and Anchors**
- .1 Material: high tensile strength steel wire meeting ASTM A82, by Bloklok or Durowall.
- .2 Finish: hot dip galvanized after fabrication to ASTM A153, Class B.
- .3 Provide prefabricated assemblies for corners and intersections.
- .4 **Horizontal Reinforcement:**
- .1 Single wythe and solid walls: truss type with minimum 3.66 mm thick side and cross rods. Width to suit wall thickness: BLOK-TRUS BL30.
- .5 **Face Brick Veneer Wall Ties:**
- .1 Cavity wall tie with concrete block back-up designed to transfer lateral load from new brick veneer to existing structural backup block masonry and provide composite action between the masonry veneer and the structural backing:
- .1 Heavy duty FERRO RAP-TIE consisting of 1.6 mm thick steel slotted connector L-Plate of length to suit insulation, anchored to existing block masonry back-up with predrilled anchors
- .2 V-Tie: 4.8 mm diameter hot dipped galvanized steel wire to ASTM A82 placing tie legs at centre of face brick veneer.
- .3 Provide face brick veneer wall ties spaced no greater than 400 mm o/c both horizontally and vertically
- .3 **Cavity Wall Insulation:**
- .1 Insulation: Foamed in place insulation by Section 07219.
- .4 **Membrane Flashing/Dampproof Course:** Minimum 0.5 mm thick flexible membrane: Bakor Blueskin TWF (self adhering SBS Modified Flashing Membrane) or F20 by Lexsucu or Rodoply (20 mils) by Sternson.

- 2.1 **Materials**  
**(Cont'd)**
- .5 **Membrane Flashing Back-up:** minimum 0.9 mm thick hot dipped galvanized sheet steel meeting Z275 zinc coating designation
  - .6 **Weep Holes, Vent Holes:** Weep Hole Ventilator by BLOK-LOK Ltd. or Goodco Plastic Brick Vent.
  - .7 **Nailing Inserts:** 0.6 mm purpose made galvanized steel inserts for setting in mortar joints.
  - .8 **Premoulded Joint Filler** - Closed cell vinyl foam, compressed 25% when in joint, one of the following:
    - .1 Unifoam R 1009 - Flexible by Goodco Ltd
    - .2 Rodofoam PR by Sternson Ltd.
  - .9 **Bond Break:** 0.1 mm thick polyethylene.
  - .10 **Compressible Filler:** Rockwool Insulation
  - .11 **Asphalt Impregnated Board:** 12 mm thick asphalt impregnated fibre boards.
  - .12 **Mortar Drainage System**
    - .1 **Products:** "Mortar Net" manufactured by Mortar Net USA Ltd., supplied by JV Building Supply, 905-851-3744.

### **PART 3 - EXECUTION**

- 3.1 **Erection**  
**General**
- .1 Build masonry work true to line, plumb, square and level, with vertical joints in proper alignment.
  - .2 Assume complete responsibility for dimensions, plumbness and levels of this work and constantly check same with graduated rod.
  - .3 Masonry courses to be of uniform height, and both vertical and horizontal joints to be of equal and uniform thickness.
  - .4 Buttering corners of units, throwing mortar into joints, deep or excessive furrowing of bed joints not permitted. Do not shift or tap units after mortar has taken initial set. Where adjustments must be made after mortar has started to set, remove mortar and replace with fresh supply.
  - .5 Isolate masonry from vertical structural framing in exterior walls using 12 mm thick asphalt impregnated rigid board cemented to columns.
  - .6 Cut exposed masonry units with power driven masonry saw only. Ragged or chipped edges will not be permitted.
- 3.2 **Temporary**  
**Shoring**
- .1 Provide temporary engineered bracing to existing 150 mm backup concrete masonry walls.
  - .2 Brace walls to resist lateral wind loads and other lateral loads expected during the full course of the construction work.

- .3 Before work begins, submit for review fully engineered design details complete with professional engineer's signed stamp and seal.
- 3.3 **Face Brick**
- .1 Lay face brick in common running bond except where specifically shown otherwise. Course brick to match existing.
- .2 Completed brickwork shall appear uniform and well blended, free of contrasting areas. Replace at no cost to contract, brickwork which does not meet this requirement.
- .3 Brick with an absorption rate of over 1g/min./100 sq.mm when tested in accordance with ASTM C67 shall be dampened before laying.
- .4 Tops of walls which have been left exposed for any period of time shall be dampened before work is commenced again, if required.
- .5 Brickwork at different levels shall be stepped in regular proportions between levels.
- .6 Brickwork shall be laid up with the shave joint method in full bed of mortar with vertical and horizontal joints filled flush. Slushing mortar into joints after brick is laid, is not permitted.
- .7 All joints in brickwork, including bed and collar joints, shall be filled full as each course is laid. Pull down and rebuild walls/partitions which do not meet this requirement as directed by consultant and at no extra cost to Contract.
- .8 Variations in size of brick shall be evenly distributed in wall so that mortar joints are uniform throughout.
- .9 At first brick course over steel lintels place brick directly on membrane flashing without mortar.
- 3.4 **Cavity Walls**
- .1 Discuss all aspects of cavity wall construction with Consultant before proceeding to ensure that the cavity wall is constructed in accordance with the best masonry practice and recommendations of the Ontario Masons' Relations Council (O.M.R.C.).
- .2 Keep the cavity completely clean and free from mortar droppings or projection. Bevel the "cavity" edge of the mortar bed immediately after "stringing" the mortar. Following the setting of the masonry unit, spread any mortar which protrudes into the cavity over the back of the unit using the back of the trowel.
- .3 Bond face brick veneer to existing block masonry back up wall with Veneer Wall Tie system at 400 mm vertically and horizontally. Provide additional reinforcement at openings as specified hereinafter.
- .4 Ensure that sheet air barrier and foamed insulation is complete and has been inspected and accepted by Consultant prior to installation of face brick
- .5 Provide continuous mortar drainage system at bottom of cavity and at all areas where cavity is interrupted with thru wall flashings.
- .6 Provide weep/vent hole ventilators at both top and bottom of cavity spaced 600 mm o/c

- 
- |     |  |    |   |
|-----|--|----|---|
| 3.5 | <b><u>Mortar &amp; Pointing</u></b>                | .1 | Make all joints uniform in thickness, straight, in line, with mortar compressed to form concave joints.   |
|     |  | .2 | After joints have been tooled rub walls with burlap.  |
|     |  | .3 | Strike joints flush where walls are to receive insulation, ceramic tile or similar finishes.  |
| 3.6 | <b><u>Membrane Flashings/ Dampproof Course</u></b> | .1 | Install dampproof course on top of foundation walls above grade.  |
|     |  | .2 | Install membrane flashing at bottom of cavity walls, at door and window heads, immediately above horizontal interruptions with exterior walls and elsewhere where shown on drawings.                    |
|     |  | .3 | Lap membrane flashing minimum 100 mm at joints./ Seal lap with adhesive.  |
|     |  | .4 | Extend membrane flashing 13 mm beyond face of wall or outside edge of steel lintels. Trim as required to Consultants later instructions.  |
|     |  | .5 | Carry membrane flashing up behind exterior wythe masonry minimum 300 mm and coordinate with Sections 07196 and 07219.   |
|     |  | .6 | At wall/ low roof junctions coordinate with Section 07513. DO NOT INSTALL VENEER UNTIL COMPLETED MEMBRANE FLASHING INSTALLATION HAS BEEN WATER TESTED AND INSPECTED BY CONSULTANT.                      |
| 3.7 | <b><u>Construction Joints</u></b>                  | .1 | Where fresh masonry joins partially or totally set masonry, clean exposed surfaces of set masonry and remove loose mortar and foreign material prior to laying fresh masonry.                           |
|     |  | .2 | If necessary to stop off a horizontal run of masonry, rack back one-half masonry length in each course. Tothing will not be permitted unless approved by the Consultant.                                |
| 3.8 | <b><u>Chases, Openings &amp; Holes</u></b>         | .1 | Chases and openings shall be built in during erection of masonry work, and purpose-made chased units shall be built into proper position.   |
|     |  | .2 | Openings in masonry work exceeding 200 mm opening width shall be provided with lintels in accordance with lintel schedule.  |
|     |  | .3 | No horizontal or diagonal chasing of completed walls or formation of holes shall only be carried out with Consultant's prior approval, and then only with a tool designed to cleanly cut masonry units. |
|     |  | .4 | Chases shall be plumb and shall be minimum of one unit length from jambs of openings.   |
| 3.9 | <b><u>Cutting Masonry</u></b>                      | .1 | Cutting of masonry units exposed in finished work shall be done with approved type power saw. Where electrical conduit outlet or switch boxes occur, grind and cut units before services installed.     |
|     |  | .2 | Obtain Consultant's approval before cutting any part or area which may impair appearance or strength of work.   |

- 
- .3 Patching of masonry not permitted.
- 3.10 **Reglets & Recesses** .1 Form continuous reglets and recesses in masonry elements as shown on Drawings and as required to accommodate work of other Sections.
- .2 Rake out mortar joints and make sawcuts in masonry elements as shown on Drawings and as required to accommodate work of other Sections.
- .3 Make reglets 25 mm deep, unless otherwise shown.
- 3.11 **Weep & Vent Holes** .1 Form weep holes by inserting weep hole inserts into brick mortar joint immediately above all membrane flashings and where shown on Drawings; space weep holes at 600 mm o.c. horizontally.
- .2 Form vent holes by placing inserts near top of cavity compartments and where indicated on drawings. Space inserts at 600 mm o.c.
- .3 Keep face of inserts back from face of brick minimum 6 mm. Keep weep/vent holes free of mortar.
- 3.12 **Patching & Cleaning** .1 At completion of work, holes and other defects in masonry joints shall be repaired, and masonry surfaces shall be thoroughly cleaned.
- .2 Holes in masonry joints shall be filled with mortar and suitably tooled. Cut out and repoint defective joints.
- .3 Dry brush masonry surfaces at end of each day's work and after all final pointing.
- .4 Remove mortar smears and droppings from concrete block masonry surfaces after such smears and droppings have dried. When mortar joints are dry and hard, clean masonry surfaces by rubbing down with abrasive blocks and stiff fibre brushes.
- .5 Remove large particles from brickwork and with wood paddles without damaging surface. Do not use wire brushes. Saturate masonry with clean water and flush off loose mortar and dirt. Scrub with solution of 25 mL trisodium phosphate and 25 mL household detergent dissolved in 1 L of clean water using stiff fibre brushes, then clean off immediately with clean water using hose. Alternatively, use proprietary compound recommended by brick masonry manufacturer in accordance with manufacturer's directions. Repeat cleaning process as often as necessary to remove mortar and other stains.
- .6 Remove efflorescence from masonry surfaces by wet cleaning in accordance with manufacturer's recommendations.

**End of Section**

**PART 1 - GENERAL**

- 1.1 **General Requirements** .1 Comply with requirements of Division 1.
- 1.2 **Related Section** .1 Cabinet Work: Section 06400  
.2 Block Masonry Section 04200  
.3 Metal Doors and Frames Section 08100  
.4 Painting: Section 09900
- 1.3 **Reference Standards** .1 Do welding work to C.S.A. W59-1984 unless specified otherwise.  
.2 Comply with the Ontario Building Code latest edition.
- 1.4 **Submittals** .1 Submit shop drawings in accordance with the General Conditions. Clearly indicate such items as design calculations, materials, thickness, construction, connections, joints, anchorage, supports, reinforcements, and other relevant details.  
.2 Shop drawings for ladders and pit covers shall bear stamp of a professional engineer registered in Ontario.
- 1.5 **Work Supplied To Other Trades** .1 Supply the following items for installation under other Sections of work: Anchor bolts, bearing plates, sleeves and other inserts to be built into concrete and masonry elements and required for anchorage and support of work of this section.  
.2 Supply other Sections with instructions, and if required, templates, necessary for accurate setting of inserts and components.
- 1.6 **Product Delivery & Storage** .1 Deliver, handle and store fabricated components to prevent permanent distortion, corrosion and damage.

**PART 2 - PRODUCTS**

- 2.1 **Materials** .1 Material to be free from defects impairing strength durability or appearance and be of best commercial quality for purposes specified.  
.2 Steel sections and plates: To C.S.A. GRO.21-M1978. Type (300W).  
.3 Steel Pipe: To CSA B63-1966 (R1971) standard weight, extra strong, double extra strong, black, galvanized finish.  
.4 Square steel tube: CAN3-G40.21-M81, Grade 350W, Class H.  
.5 Sheet steel: Hot dip galvanized, cold rolled, with stretcher level degree of flatness to ASTM A526; zinc coating designation Z275.  
.6 Stainless steel: To C.S.A. G110.6-1968 Type 302, exposed surfaces to have No. 4 polished finish.



- 2.1 **Materials** (Cont'd)
- .7 Welding materials: To C.S.A. W59-1984.
  - .8 Bolts and anchor bolts: To ASTM A307-76B.
  - .9 Galvanizing: Hot dipped galvanizing with minimum zinc coating of 600 g/m<sup>2</sup> to CSA G164-1965 (1972).
  - .10 Chromium plating: Chrome on steel with plating sequence of 9 micrometres thickness of copper, 10 micrometres thickness of nickel and 2.5 micrometres thickness of chromium.
  - .11 Galvanized primer: Zinc rich, ready mix to CGSB 1-GP-181M.
  - .12 Cast Iron: Soft grey iron.
  - .13 Wrought Iron: Best quality, strong homogeneous, ductile forged iron to CSA standards latest edition for wrought iron.
  - .14 Shop primer: CGSB 1-GP-40M.
  - .15 Zinc rich paint: CGSB 1-GP-181M.
  - .16 Bituminous enamel: Alkali resistant asphaltic coating.
  - .17 Non-shrink grout: Por-Rok by Hallemite Products Ltd., or SET 15 Minute Anchoring Cement by SET Products Ltd.
- 2.2 **Fabrication**
- .1 Fabricate components in the shop in largest size practicable to minimize field jointing.
  - .2 Fabricate components square, straight, true, free from warpage and other defects. Accurately cut, machine file and fit joints, corners, copes and mitres.
  - .3 Fabricate items from steel unless otherwise noted.
  - .4 Reinforce fabricated components to safely withstand expected loads.
  - .5 Make joints in built-up sections with hairline joints in least conspicuous locations and manner.
  - .6 Make allowance for thermal expansion and contraction when fabricating exterior work.
  - .7 Joints shall be welded unless otherwise indicated and unless details of construction do not permit welding. Exposed welds shall be continuous and shall be ground smooth.
  - .8 Close exposed open ends of tubular members with welded on steel plugs.
  - .9 Curved work to be made true radii.

- 2.2 **Fabrication (Cont'd)**
- .10 Use self-tapping shake-proof countersunk flat headed screws on items required to be assembled by screws or as indicated.
  - .11 Where work of other Sections is to be attached to work of this Section, prepare work by drilling and tapping holes, as required to facilitate installation of such other work.
  - .12 Work of this Section, supplied for installation under other Sections, shall be prepared as required ready for installation by drilling, countersinking and tapping holes, forming shapes and cutting to required sizes.
  - .13 Grind off mill stampings and fill recessed markings on steel components left exposed to view.
- 2.3 **Connections**
- .1 All exposed fastenings to be of same material, colour and finish as the metal to which it is applied.
  - .2 Connections and accessories must be adequate to sustain safely and withstand stresses and strains to which normally subjected.
  - .3 Shop and field connections to be riveted or welded and where indicated or required, blind riveted. Rivets, screws and fastenings to be countersunk into exposed work and finished flush.
  - .4 Connect all members to form a homogeneous structure. Connections to develop the full strength in the member connected before failure.
- 2.4 **Finishes**
- .1 Thoroughly clean steel of loose scale, rust, oil, dirt and other foreign matter. Suitably prepare steel surfaces by power tool cleaning to receive specified finishes.
  - .2 Grind smooth sharp projections.
  - .3 Remove oil and grease by solvent cleaning.
  - .4 Apply coatings in the shop and before assembly. Where size permits, galvanize components after assembly.
  - .5 Shop apply coat of primer to interior components after fabrication except where galvanized or zinc rich paint finish is required.
  - .6 Do not paint surface to be field welded.
  - .7 Dip bolts that are to remain permanently in the structure, in oxide paint before placing in position.
  - .8 Hot dip galvanize all exterior components and, where so indicated, interior components, after fabrication.
  - .9 Apply coat of bituminous enamel to surfaces of metal components in contact with cementitious materials and dissimilar metals.

**PART 3 - EXECUTION**

- 
- 3.1 **Installation** .1 Erect metal work square, plumb, straight and true, accurately fitted, with tight joints and intersections. Drill, cut and fit as necessary to attach this work to adjoining work.
- 3.1 **Installation (Cont'd)** .2 Provide suitable and acceptable means of anchorage such as dowels anchor clips, bar anchors, expansion bolts and shields, toggles.
- .3 Make field connections with high tensile bolts, or weld to CSA S16-1969 and CSA S16S1-1975.
- .4 Provide temporary supports and bracing required to position components until they are permanently anchored in place.
- .5 Securely anchor components in place; unless otherwise indicated, anchor components as follows:
- .1 To concrete and solid masonry with expansion type anchor bolts.
- .2 To hollow construction with toggle bolts.
- .3 To thin metal with screws or bolts.
- .4 To thick metal with bolts or by welding.
- .5 To wood with bolts or lag screws.
- .6 Fill space between railing members and sleeves with non-shrink grout.
- .6 Hand items to be cast into concrete or built into masonry over to appropriate trades together with setting templates.
- .7 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection.
- .8 Touch-up galvanized surfaces with zinc primer where burned by field welding.
- .9 Dissimilar metals and metals in contact with cementitious elements shall have contact surfaces coated with bituminous paint or be isolated by other means as approved by Consultant.
- 3.2 **Schedule of Components** .1 **Millwork Accessories**  
Examine millwork detail drawings and Section 06400 and supply welded tubular frames, angle and channel supports and other miscellaneous metal items required for but not specified as part of Section 06400.
- .2 **Stainless Steel Wall Plates**  
.1 Provide 10 mm thick stainless steel wall plates as detailed.  
.2 Secure wall plates to ends of block masonry walls with countersunk stainless steel fasteners. Face of fasteners to finish flush with face of plate.
- .3 **Miscellaneous Steel Items**  
.1 Miscellaneous steel angles, plates and lintels indicated on Architectural Drawings.

- .2 Other metal fabrications shown on Drawings and not specifically covered in other Sections.

**End of Section**

**PART 1 - GENERAL**

- |     |  |          |   |                                |
|-----|--|----------|---|--------------------------------|
| 1.1 | <b><u>General Requirements</u></b>           | .1       | Comply with requirements of Division 1.   |                                |
| 1.2 | <b><u>Related Sections</u></b>               | .1<br>.2 | Concrete Floor Finishing:<br>Cabinetwork:   | Section 03345<br>Section 06400 |
| 1.3 | <b><u>Work Supplied to Other Trades</u></b>  | .1<br>.2 | Supply following items for installation under other Sections of work: Anchor bolts, bearing plates, sleeves and other inserts to be built into concrete and masonry elements and required for anchorage and support the work of this section.<br>Supply other Sections with instructions, and if required, templates, necessary for accurate setting of inserts and components. |                                |
| 1.4 | <b><u>Source Quality Control</u></b>         | .1<br>.2 | Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.<br>Plywood identification: by grade mark in accordance with applicable CSA standards.  |                                |
| 1.5 | <b><u>Product Delivery &amp; Storage</u></b> | .1<br>.2 | Store material on site on skids off the ground and covered for protection from rain.<br>Take adequate measures to prevent moisture gain of kiln dried materials.  |                                |

**PART 2 - PRODUCTS**

- | 2.1         | <b><u>Lumber Material</u></b> | .1             | Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:   |            |                |              |          |        |   |       |        |   |        |        |   |       |        |   |       |             |   |             |             |   |  |
|-------------|-------------------------------|----------------|---|------------|----------------|--------------|----------|--------|---|-------|--------|---|--------|--------|---|-------|--------|---|-------|-------------|---|-------------|-------------|---|--|
|             |                               | .1<br>.2<br>.3 | CAN 3-086-M84<br>CSA 0141-1970<br>NLGA Standard Grading Rules for Canadian Lumber, 1980 edition revised according to Supplement No. 1, 1981.  |            |                |              |          |        |   |       |        |   |        |        |   |       |        |   |       |             |   |             |             |   |  |
|             |                               | .2             | Furring, blocking, railing strips, grounds, rough bucks, curbs.   |            |                |              |          |        |   |       |        |   |        |        |   |       |        |   |       |             |   |             |             |   |  |
|             |                               |                | <table border="0" style="margin-left: 40px;"> <thead> <tr> <th><u>USE</u></th> <th><u>SPECIES</u></th> <th><u>GRADE</u></th> </tr> </thead> <tbody> <tr> <td>Blocking</td> <td>Spruce</td> <td>2</td> </tr> <tr> <td>Studs</td> <td>Spruce</td> <td>1</td> </tr> <tr> <td>Plates</td> <td>Spruce</td> <td>1</td> </tr> <tr> <td>Other</td> <td>Spruce</td> <td>1</td> </tr> <tr> <td>Cants</td> <td>Douglas Fir</td> <td>2</td> </tr> <tr> <td>Wood Fascia</td> <td>Douglas Fir</td> <td>1</td> </tr> </tbody> </table> | <u>USE</u> | <u>SPECIES</u> | <u>GRADE</u> | Blocking | Spruce | 2 | Studs | Spruce | 1 | Plates | Spruce | 1 | Other | Spruce | 1 | Cants | Douglas Fir | 2 | Wood Fascia | Douglas Fir | 1 |  |
| <u>USE</u>  | <u>SPECIES</u>                | <u>GRADE</u>   |   |            |                |              |          |        |   |       |        |   |        |        |   |       |        |   |       |             |   |             |             |   |  |
| Blocking    | Spruce                        | 2              |   |            |                |              |          |        |   |       |        |   |        |        |   |       |        |   |       |             |   |             |             |   |  |
| Studs       | Spruce                        | 1              |   |            |                |              |          |        |   |       |        |   |        |        |   |       |        |   |       |             |   |             |             |   |  |
| Plates      | Spruce                        | 1              |   |            |                |              |          |        |   |       |        |   |        |        |   |       |        |   |       |             |   |             |             |   |  |
| Other       | Spruce                        | 1              |   |            |                |              |          |        |   |       |        |   |        |        |   |       |        |   |       |             |   |             |             |   |  |
| Cants       | Douglas Fir                   | 2              |   |            |                |              |          |        |   |       |        |   |        |        |   |       |        |   |       |             |   |             |             |   |  |
| Wood Fascia | Douglas Fir                   | 1              |   |            |                |              |          |        |   |       |        |   |        |        |   |       |        |   |       |             |   |             |             |   |  |
| 2.2         | <b><u>Plywood</u></b>         | .1             | Douglas Fir to CSA 0121-08 Unsanded Sheathing Grade.  |            |                |              |          |        |   |       |        |   |        |        |   |       |        |   |       |             |   |             |             |   |  |

- 2.3 **Fasteners**
- .1 Nails: to CSA B111-1974, hot dip galvanized steel for exterior work including components located in exterior walls and roofs; bright finish steel in all other locations. Unless otherwise indicated use common spiral flathead nails.
  - .2 Bolts, nuts, washers: ASTM A307, hot dip galvanized steel.
  - .3 Connectors, anchors, brackets, spikes: hot dip galvanized structural quality steel.
  - .4 Plugs for masonry walls: 4.5 mm galvanized sheet steel wall plugs by Drummond & Reeves, approx. 75 mm deep and 57 mm wide.
  - .5 Screws: to CSA B35.4-1972 zinc, cadmium or chrome plated.
  - .6 Nailing discs: flat caps, minimum 1" diameter, maximum 16 ga thick sheet metal, formed to prevent dishing. Bell or cup shapes not acceptable.
- 2.4 **Wood Treatment**
- .1 Preservative pressure treated components: to CSA, using alkaline copper quaternary (ACQ).
  - .2 Surface, cut, bore and trim components to sizes required as much as possible prior to pressure treatment.

### **PART 3 - EXECUTION**

- 3.1 **General**
- .1 Erect work plumb, level, square and to required lines, Ensure that materials are rigidly and securely attached to each other and to adjacent building elements and will not be loosened by work of other trades.
  - .2 Where other materials and components are to be applied directly over wood members recess heads of fastening devices below wood surfaces.
  - .3 Where work remains exposed to view, fasteners shall be uniformly and evenly spaced and neatly installed.
- 3.2 **Nailers, Blocking Copings Grounds**
- .1 Provide wood nailers, blocking, copings, strapping, bucks, grounds and other rough carpentry components to sizes and in locations required for satisfactory supply of fabricated items and other work.
  - .2 Unless otherwise indicated, provide minimum 38 mm thick material. Grounds may be 21 mm thick material unless otherwise indicated.
  - .3 Install wood members plumb, level, straight, true to line and solidly anchored to adjacent building elements.
  - .4 Provide rough bucks where indicated or required for windows, doors lockers and other elements.

- 3.3 **Anchors & Fasteners**
- .1 Provide rough hardware including nails, screws, bolts, washers, brackets, hangers, and fastening devices of all types.
  - .2 Unless otherwise indicated, attach wood members at maximum 600 mm. o.c. as follows:
    - .1 To concrete and solid masonry with expansion type anchor bolts.
    - .2 To hollow masonry with toggle bolts.
    - .3 To heavy gauge metal with bolts.
    - .4 To light gauge metal with screws or bolts.
    - .5 To wood with nails, screws or bolts as required to ensure stability.
  - .3 Bucks and plates shall be anchored to masonry walls with 13 mm galvanized steel bolts 450 mm long.
  - .4 Fasten wood copings to supporting masonry elements with 13 mm galvanized steel bolts min. 450 mm long spaced max. 600 mm o.c. Where width of coping plate exceeds 100 mm, stagger bolts off centre.
- 3.4 **Pressure Treated Components**
- .1 Use preservative pressure treated lumber and Treated plywood within exterior wall and roof systems and other locations indicated on drawings.
  - .2 Where it is necessary to cut, bore or otherwise alter pressure treated components in the field, treat cut surfaces with heavy coat of wood preservative.

**End of Section**

**PART 1 - GENERAL**

- |     |  |    |   |               |
|-----|--|----|---|---------------|
| 1.1 | <b><u>General Requirements</u></b>           | .1 | Comply with requirements of Division 1.   |               |
| 1.2 | <b><u>Related Sections</u></b>               | .1 | Carpentry   | Section 06100 |
|     |  | .2 | Finished Hardware:  | Section 08710 |
| 1.3 | <b><u>Reference Standards</u></b>            | .1 | Standards referred to herein are based on the published standards of the Architectural Woodwork Manufacturer's Association of Canada (AWMAC).   |               |
|     |  | .2 | Subcontractors shall make themselves thoroughly familiar with these standards prior to submitting their tender.   |               |
| 1.4 | <b><u>Qualifications</u></b>                 | .1 | The work of this section is to be done by a Millwork Contractor of recognized standing having personnel with five years experience in this type of work and who has the necessary equipment to carry out the work.  |               |
| 1.5 | <b><u>Guarantee</u></b>                      | .1 | Provide the following guarantee in accordance with the General Conditions, notwithstanding the time provisions therein.<br><b>Five (5) year guarantee against defects in workmanship and materials including warp and delamination.</b>   |               |
|     |  | .2 | Make good or replace work showing defect in this period at no expense to the Owner  |               |
| 1.6 | <b><u>Submittals</u></b>                     | .1 | Submit shop drawings in accordance with the General Conditions of the contract. Clearly indicate methods of construction, profiles, jointing, fastening and other related details. Make shop drawings complete with details and sections drawn to scale no smaller than 1:10. Draw plans and elevations no smaller than 1:20. |               |
|     |  | .3 | Submit samples of each type of countertop and splashback showing construction and finishes.   |               |
|     |  | .4 | Submit samples of melamine, plastic laminate, edging and all types of hardware including drawer glides, hinges, locks, pilasters, etc. for review by the Consultant.  |               |
| 1.7 | <b><u>Product Delivery &amp; Storage</u></b> | .1 | Do not deliver materials until suitable heated dry storage space is available and portion of building in which it is to be installed is completely ready. Deliver materials with protective coverings and maintain in undamaged condition.  |               |
|     |  | .2 | Store materials on site in such a way as to prevent deterioration or loss or impairment of essential properties. Do not store or install materials in areas where relative humidity is less than 25% or greater than 60% at 22oC.   |               |
|     |  | .3 | Cover finished plastic laminate surfaces with heavy kraft paper or put in cartons during shipment. Protect installed plastic laminate surfaces by approved means. Do not remove until immediately before final inspection.  |               |



## PART 2 - PRODUCTS

### 2.1 Materials

#### .1 Cabinet Hardware:

- .1 Hinges:  
19 mm cupboard door      Blum Model 170BL91-653 with Blum mounting plate BL175.810. or Hafela Aximat hinges, self-closing 270 degree where noted on drawings.
- .2 Locks  
19 mm cupboard door      National C8053-5  
19 mm drawer              National C8053-5  
All cupboard doors and drawers to be keyed the same.  
Each room to be keyed differently.  
Provide 6 master keys.
- .3 Pulls:  
Cupboard door      Canadian Building Hardware CBH 255 xC26D  
or drawer
- .4 Catches:  
19 mm cupboard door      Elbow Catch Richelieu #BP3675-2G
- .5 Door Bumper              Richelieu AMP 5312-11
- .6 Surface Bolts:              Gallery Hardware No. 73
- .7 Shelf Supports: Richelieu #5834-180 for 32mm spaced holes.
- .8 Drawer Slide:              Blum Metabox 320M integrated runner system using epoxy steel carcasses, adjustable front fixing brackets and 12mm Melamine with 3mm PVC on all exposed edges for bottoms and back panels. Install screws to all pre-drilled holes. Use deepest Metabox possible for space available or approved equal. See drawings for other slides called for specific locations.
- .9 Wall Mounted Shelf Brackets and Standards:  
Standards:      Knape & Vogt 185 Series length as shown on drawings to suit shelf width.  
Brackets:      Knape & Vogt Series 85c/w shelf rest.
- .10 Computer Grommets: Standard recessed 3" (75mm) diameter.  
Colour as selected by Architect.
- .11 Slide Bolts: Gallery 73 - 3" (75 mm) or approved equal.
- .12 Coat Hooks: Henkel Hook from Henkel Diversified Inc (519-641-5872). Colour to be either HD001-Graphite or HD006-Light Grey. Architect to make final colour decision.

- 2.1 **Materials**  
**(Cont'd)**
- .2 **Solid Wood**
- .1 **Hardwood Lumber:** to National Hardwood Lumber Association (NHLA) requirements, moisture content of maximum 7%, maple species to AWMAC premium grade.
- .2 **Softwood Lumber:** to CSA 0141-1970, dressed all sides used in concealed locations.
- .3 All wood materials shall be new, straight and clean, free of sap, knots, pitch, and other defects, except as permitted by applicable grading rules.
- .3 **Casework Plywood:**
- .1 **Hardwood Plywood:** Multicore plywood to CSA 0115 - M1982 of thickness indicated, rotary cut face, maple species veneer, good two sides grade where exposed or semi-exposed, good one side sound one side grade where one side is permanently concealed. Veneer to be select maple with book match face.
- .2 **Poplar Plywood:** to CSA 0153-1976 sanded grade in thickness indicated.
- .4 **Casework Particleboard**
- .1 **Particleboard:** to CAN 3-0188, 1-M78 Grade 'R', minimum density of 720 kg/m<sup>3</sup>, of thickness indicated, rotary cut face veneer, good two sides. Veneer to be select maple, book match face.
- .5 **Hardboard:**
- .1 Hardboard: to CGSB 11-GP-3M, Type 2, tempered hardboard 6 mm thick.
- .2 Perforated Hardboard: to CGSB 11-GP-3M Type 2, 6 mm thick with 6 mm holes at 25 mm o.c.
- .6 **Melamine:**
- .1 **Melamine Faced Particleboard:** to CAN3-0.188.1-M78, grade "H" particleboard sanded faces, 19 mm thickness, faced with laminated plastic melamine resin impregnated cover sheet with coloured and/or patterned paper inner layer. Melamine shall be thermally fused to rigid particle board substrate. Melamine faces shall be 120 Gram Weight Paper.  
**Colour: Refer to Section 00865 Colour schedule**  
**Acceptable Material:** Flakeboard, Uniboard or approved equal.
- .2 **Edge Banding:** solid polyvinylchloride (PVC), 3 mm thickness x full width of board, wood grain, colour through type to match melamine face by Canada Wood tape or approved equal.

2.1 **Materials**  
**(Cont'd)**

**Edging:** rigid PVC with a measured degree of hardness of " 95 shore D" and thickness of "3mm (+0.15mm, -0.2mm)" with the primer side having a concave measuring 0.10 to 0.25mm.

Edging adhesive: Ethylene vinyl acetate thermalset adhesive with a temperature resistance of not less than 100 degrees C; A Processing range of 190 degrees - 200 degrees C and natural in colour.

Edging is to be applied using only equipment designed for the application of thick PVC in strict accordance with the specifications of both the thick PVC and hot-melt adhesive manufactures.

.7 **Plastic Laminate Components:**

.1 Plastic Laminate: From full range of products at Nevamar, Formica, Arborite, Wilsonart, Pionite. Colour, gloss and texture to later selection by the Consultant.

.2 Plastic Laminate for Flat Work: to CAN3-A172-M79, Grade 10, General Purpose Grade.

.3 Plastic Laminate Backing Sheet: supplied by same manufacturer as facing sheet and same thickness and colour as face laminate.

.4 Laminated Plastic for Post Forming Work: to CSA A172 1974 Grade 52 General Purpose Forming Grade.

.5 Plywood Core: Douglas Fir to CSA 0121-M1978 solid two sides 19 mm thick.

.6 Particleboard Core: CAN 3-0188.1-M78, Sanded Grade good two sides Grade 'R'.

.7 Plastic Laminate Adhesive: to CSA Standards as recommended by cabinet work manufacturer.

.8 Sealer: Water resistant sealer or glue acceptable to laminate manufacturer.

.9 Sealant: Proglaze by Tremco Silicone Construction sealant.

.10 Draw Bolts and Splines: as recommended by fabricator.

.8 **Fasteners & Adhesives:**

.1 Nails and Staples: to CSA B111-1974 galvanized for exterior work, interior highly humid areas and for treated lumber, plain finish elsewhere.

.2 Screws: zinc cadmium or chrome plated steel. Stainless steel for high moisture areas.

.3 Wire: stainless steel 16 gauge.

.4 Adhesives: Resorcinol resin adhesive to CSA 0112.7-M1977.

- 2.1 **Materials**  
**(Cont'd)**
- .9 **Solid Core Doors:**
- .1 Solid Core Doors: to CSA 0132.2-M1977, flush doors, 35 mm thick, plastic laminate face matching adjacent cabinetwork.
- .10 **Miscellaneous Materials:**
- .1 Rigid Backer Board: 13 mm foilback sheet rock as distributed by Canadian Gypsum. Install on back of cabinets set in front of convectors or for facing convector enclosures.
- .11 **Stainless Steel:** Stainless steel designated by the abbreviation S.S. must be analysis 18-8 type 304, No. 4 finish, 180 grit, free from pits and imperfections. All finish lines to run vertically.
- 2.2 **Fabrication**
- .1 **General Requirements**
- .1 Fabricate all casework to AWMAC premium grade standards.
- .2 Unless noted otherwise casework construction shall be flush overlay.
- .3 Shop install all cabinet hardware.
- .4 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures to accommodate work of other sections.
- .5 Use poplar plywood only in locations where wood is concealed.
- .6 Inconspicuously locate mechanical fasteners. Wherever possible concealed fastenings.
- .7 Countersink nail heads, apply stained wood filler, and smooth to receive finish.
- .8 Where exposed to view, countersink screw and bolt heads and fill holes with matching wood plugs.
- .2 **Fabrication of Casework:**
- .1 All cabinet work is to be constructed with Melamine Faced Particleboard with solid polyvinylchloride (PVC) edging. Fabricate casework components as follows
- .1 **Gables:** 19 mm melamine faced particleboard complete with douglas fir plywood kick.
- .2 **Case bottoms:** 19 mm melamine faced particleboard
- .3 **Case backs:** 13 mm melamine particleboard
- .4 **Backs on Freestanding cabinets:** 19 mm melamine particleboard
- .5 **Base:** 19 mm Fir plywood where covered with rubber base
- .6 **Shelving:**  
Under 915 mm long: 19 mm melamine faced particleboard

2.2 **Fabrication  
(Cont'd)**

- Over 915 mm long: 19 mm melamine faced particleboard with front edge return of 50 mm.
- .7 Valance strips: 19 mm melamine particleboard
  - .8 Cabinet doors up to 1200 mm high: 19 mm melamine particleboard.
  - .9 Door over 1200 mm high: 35 mm solid core doors complete with three butt hinges per door or as detailed.
  - .10 Glazed doors under 1200 mm high: 19 mm x 64 mm melamine faced particleboard
  - .11 Drawer fronts: 19 mm melamine faced particleboard
  - .12 Drawer backs and sides: 13 mm melamine faced particleboard
  - .13 Drawer bottoms: 6 mm hardwood plywood
- .2 Shelving in cabinetwork to be adjustable, with recessed pilasters, supported by four shelf clips, unless noted otherwise. All sides of adjustable shelving to be edge banded with 5mm hardwood.
  - .3 Hanging strips shall be 9 mm x 56 mm hardwood plywood.
  - .4 All doors in full height storage units, regardless of size, shall be 35 mm solid core doors.
  - .5 Backs of cabinets to receive coat hooks or other hardware shall be 19 mm hardwood plywood.
  - .6 Make backs of cabinets easily removable where access to pipes and services is required.
  - .7 Provide removable hardwood stops for all glazed doors.
  - .8 Tongue drawer sides, front and back to receive bottom. Plywood top edge for sides and back may be exposed.
  - .9 Provide all finishing hardware unless noted otherwise.
  - .10 Install hardware in accordance with the hardware manufactures printed instructions.
  - .11 Edge band all exposed edges with 3mm PVC edge banding
- .3 **Fabrication of Plastic Laminate Tops**
- .1 Comply with CAN3-A172-M79, Appendix 'A'.
  - .2 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
  - .3 Ensure adjacent parts of continuous laminate work match in colour and pattern.
  - .4 Veneer laminated plastic to core material in accordance with

2.2 **Fabrication**  
**(Cont'd)**

adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 3000 mm. Keep joints 600 mm from sink cutouts.

- .5 Use straight self edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly. Do not mitre laminate edges.
- .6 Apply laminate backing sheet to reverse side of core of plastic laminate work.
- .7 Form shaped profiles and bends as indicated using post forming grade laminate to laminate manufacturer's instructions. Layout sheets of plastic laminate to minimize joints.
- .8 Fabricate tops using particleboard core.
- .9 Unless noted otherwise form all countertops using post forming grade laminate to laminate manufacturer's instructions. Provide radiused corners on edge and at integral splashback.
- .10 Provide full height plastic laminate splashback where noted on drawings using post forming grade laminate.

**.4 Fabrication of Stainless Steel Tops**

- .1 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .2 Fabricate according to final drawings reflecting dimensions and details of field conditions.
- .3 Fabricate up to 3600 mm long in one piece, including nosing, backs and ends. When counter tops exceed 3600 mm in length accurately fitted, hair line, field joints are acceptable. Grind welds smooth and finished on exposed surfaces to match finish specified.
- .4 Tops to consist of 16 gauge worksurface, in type 304 with #4 finish stainless steel, supported by a marine grade plywood backer.
- .5 All horizontal and vertical corners on countertops to be provided with seamless sanitary cove or radius.
- .6 Standard front edges: 32 mm Box Marine. Reinforces edge with concealed hardwood.
- .7 Provide 100 mm tall x 25 mm deep stainless steel backsplashes at all stainless steel tops:  
splash backs and splash ends to be turned down at least 13 mm at wall. Where faucets are located in splash backs, fabricate depth of splash backs 50 mm with provision made to receive required fixture.

.5 **Finishing of Wood Surfaces**

- .1 Polymerizing two component catalytic conversion varnish factory finish system especially formulated for chemical reagent resistance. The individual components of the system used must be chemically compatible to assure perfect adhesion and top quality, durable final finish.
- .2 All surfaces shall be carefully prepared and sanded free of machine marks before and between finish coats.

**PART 3 -- EXECUTION**

- 3.1 **Workmanship**
  - .1 All work to be performed by skilled mechanics. Tool marks on finished work will not be acceptable. Set nails on all finished work.
  - .2 Do as much handwork as is required for first quality results.
  - .3 Obtain accurate dimensions on the job for all work of this Section. No extra will be allowed for making good pre-cut material which does not fit the job condition.
  - .4 This subcontractor must machine assemble and completely finish all materials in his plant before shipment. Units and countertops, etc. are to be shipped prefinished for assembly and installation by his own forces.
  - .5 Assembled units shall be of such size as will not present difficulties of entry into the building and rooms where required.
- 3.2 **Co-ordination**
  - .1 Carefully examine Mechanical and Electrical drawings and specifications for water, gas, drainage and air piping, faucets, traps, ventilation ducts, sinks, electric receptacles fixtures and wiring specified under the Mechanical and Electrical Sections. Co-ordinate the work with these trades and make provision in the construction of the fitments to accommodate this work. Cut tops for sinks and provide wood or steel bearers for support. Methods of construction shall be such as to permit Mechanical and Electrical work being concealed in the fitments, cut and frame accordingly, provide removable access panels in the units to provide proper access for installation and repairs.
  - .2 Coordinate keying of locks installed in 35 mm doors with Division 08710.
- 3.3 **Measurement**
  - .1 This Contractor shall take, at the site, all measurements of space and conditions to which his work must conform. Measurements shall be taken prior to the fabrication of his work and in ample time to avoid delays in the work.
- 3.4 **Owner's Equipment**
  - .1 Throughout the job, spaces have been provided for Owner's equipment. Obtain the exact size of these units and modify, if necessary, all millwork to suit this equipment.
- 3.5 **Installation**
  - .1 Provide rough hardware, nails, expansion shields, screws, brackets, furring and strapping and incidentals required to assemble and install the fitments in their proper location. Units to be adequately fastened and secured in place with concealed fixings wherever possible.

- 3.5 **Installation**  
**(Cont)**
- .2 Do all framing in accordance with best standard practice.
  - .3 Fitments shall be installed level, plumb and true and complete in all respects.
  - .4 Where permitted, nail with small headed finishing nails. Countersink nail heads with nail setter. Where components are fastened with screws or bolts countersink screw and bolt heads and provide wood plugs matching surrounding wood.
  - .5 Install plastic laminate components using concealed fastening devices.
  - .6 Where cabinetwork abuts other building elements provide wood trim matching cabinetwork except where otherwise detailed.
  - .7 Protect the work from damage during storage, handling, installation and until the building is turned over to the Owners. Make good all damages and loss without expense to the Owner.
  - .8 Touch up all marks, joints, set all nails, sand and make good finish after installation.
  - .9 Check operation of all movable parts and, if necessary, adjust to ensure proper and smooth functioning.
  - .10 Coordinate installation work with other finishing trades.
  - .11 Sink installation:
    - .1 Cut hole and clean the countertop with alcohol.
    - .2 Apply Tremco, Tremsil #200 silicone sealant to cuts.
    - .3 Apply a bead of Tremsil on the top before installing sink.Millwork Contractor and General Contractor to ensure Division 15 installs as specified.
  - .12 Upon completion of installation inspect work of this Section and touch up, where required, minor or damaged surface finish to restore it to original condition. Replace damaged components which in the opinion of the Consultant, cannot be satisfactorily repaired.
- 3.6 **Hardware**  
**Installation**
- .1 Locate concealed European style hinges in accordance with manufacturer of hinge and with best standard practice. Set knobs, locks, and cylinders square with doors and escutcheons plumb. Apply accurately and neatly, to operate quietly and smoothly. Knobs shall turn easily, bolts slide freely and smoothly.
  - .2 All cupboard doors and drawer locks except as noted below, shall be keyed alike in each room unless otherwise stated. All such keys shall be labelled as to their lock location and shall be turned over to the Owner. All locks, slide bolts, etc. shall be supplied with the appropriate strikes and screws. Provide slide bolts at all locked pair of doors on interior side of door leaf without lock.

**NOTE: Provide locks on all cupboard doors and drawers unless noted otherwise. No locks to be provided on doors below sink units.**



- .3 All pilaster strips, where specified, shall be recess mounted and installed with the numbers on the pilaster at equal heights.
- .4 At completion of the work, moving parts shall be gone over, made to work easily, smoothly and efficiently. Work carefully cleaned down and left in complete and finished condition satisfactory to Architect.

**End of Section**

**PART 1 - GENERAL**

- 1.1 **General Requirements** .1 Comply with requirements of Division 1.
- 1.2 **Related Sections** .1 Masonry: Section 04200  
.2 Brick Replacement Section 04210  
.3 Aluminum Windows Section 08900
- 1.3 **Qualifications** .1 All air barrier materials shall be applied by an independent company that specializes in the installation of air barriers and currently approved by W.R. Grace & Co. of Canada. Installation by the mason will not be accepted. Provide written evidence of approval from manufacturer prior to commencement of the work.
- 1.4 **Guarantee** .1 Provide the following guarantee in accordance with the General Conditions notwithstanding the time provision therein.  
.1 **Five (5) years against all air tightness defects.**  
.2 **Ten (10) years manufacturers warranty.**
- 1.5 **Submittals** .1 Submit duplicate 200 mm x 300 mm samples of air barrier material to the Consultant for approval prior to ordering materials.  
.2 Submit original copy of test data from certified independent testing laboratory confirming performance requirements of air barrier membrane as specified.
- 1.6 **Inspection and Testing** .1 Owner will appoint and pay, out of allowance carried in Division I, for independent inspection agency to inspect work of this Section as directed by the Consultant.  
.2 Scaffolding must be provided by this contractor for the use of the Inspection Company, Consultant and School Board.
- 1.7 **Description of System** .1 The air barrier system specified herein is based on Perma Barrier Membrane system by W.R. Grace & Co. The following manufacturers will also be acceptable, subject to the Consultant's detailed review and acceptance:  
.1 Soprema Waterproofing Inc.  
.2 Bakelite Thermosets Ltd.  
.3 Henry Co.
- 1.8 **Product Delivery & Storage** .1 Deliver materials in original unopened containers.  
.2 Containers are to be labelled with manufacturer's name, brand name, installation instructions and identification of various items.  
.3 All materials must be stored between 10°C and 26°C. If exposed to lower temperature, restore materials to 15°C minimum temperature before using.

- 1.8 **Product Delivery & Storage (Cont'd)**
- .4 All materials must be stored in a dry area and protected from water and direct sunlight. Replace damaged materials at no extra cost.
  - .5 Store membrane rolls off ground, flat, protected from moisture and well ventilated.
  - .6 Store solvent base liquids away from excessive heat and open flame.
- 1.9 **Job Conditions**
- .1 Prior to the use of any product consult the manufacturer's safety data bulletin for applicable cautions and warnings.
  - .2 Substrates which are to receive air barrier materials shall be sound and dry.
  - .3 Apply materials only within application limitations specified by respective product manufacturers.
- 1.10 **Protection**
- .1 Make good damage to building and to work of Other Contractors and Subcontractors arising from this Section of Work to the satisfaction of the of the Consultant.
- 1.11 **Compatibility**
- .1 Assure that all components are compatible with each other.

**PART 2 - PRODUCTS**

- 2.1 **Materials**
- .1 **Membrane:** Perm-A Barrier Membrane minimum 1.02mm composite sheet, dark grey, supplied in widths to suit reinforcing. Membrane shall incorporate 6mm edge bead of rubberized asphalt on all side laps.

**Properties**

<u>Property</u>	<u>Value</u>	<u>Test Method</u>
Colour	Dark Grey	N/A
Pliability 180° bendover 25mm mandril at 32°C.	Unaffected	ASTM D146
Tensile Strength - membrane	1.7 MPa min.	ASTM D412 (Die C) modified
Elongation Ultimate failure of rubberized asphalt (%)	300 min.	ASTM D412
Cycling over crack at - 26°C	No effect 100 cycles	
Cycling over 25mm joint at	No effect 1000 cycles	
Peel adhesion (N/mm width) 28 days wet (submerged aging)	0.822 min.	

2.1	<b>Materials</b> <b><u>(Cont'd)</u></b>	Puncture resistance (N) (stretched by blunt object)	178 min.	ASTM E154
		Puncture resistance polyethylene film (mm N tear) (compact from sharp object)	1,746.23 min.	ASTM D781
		Air Permeance of "In Place" System (Pressure difference of 75 Pa)	less than .01 litre sq.m.	ASTM E283-83
		Resistance to 2 kPa Air Pressure Difference	No increase	ASTM E283-83 in equivalent
		Permeance	0.517 metric perms	ASTM E96
		Water Absorption 72 hours (% weight)	0.25 max.	ASTM D1228
	.2	<b>Mastic:</b> Bituthene EM3000 Mastic - Rubber based mastic.		
	.3	<b>Liquid Membrane:</b> Liquid Membrane LM3000 - two component liquid membrane with 100% solids content.		
	.4	<b>Primer:</b> <u>Bituthene Primer</u> - P3100 - rubber based solvent used to condition all substrates.		
	.5	<b>Insulation Attachments</b>		
	.1	Type "N" sticklip and type "S" adhesive as manufactured by ECKEL Industries Ltd., or an approved alternative.		
	.2	Wedge fasteners type "WEDGE-LOK", as manufactured by BLOK-LOK, or an approved alternative for board insulation.		
	.6	<b>Flexible Flashings</b> - Perm-A-Barrier wall flashing, thickness 1mm.		

**PART 3 - EXECUTION**

3.1	<b><u>Preparation</u></b>	.1	Examine all surfaces to receive air barrier for conformance to recommended surface conditions.	
		.2	Do not proceed with air barrier installation until all defects are repaired.	
		.3	Acceptable surfaces include cast-in-place concrete, masonry gypsum board, and plywood.	
		.4	All surfaces to receive air barrier must be smooth, clean, dry and in good condition. All moisture, grease, machine oil or other foreign material shall be removed.	
		.5	Concrete must be smooth, monolithic, free from voids, spalled areas, loose aggregates or sharp protrusions.	

- 
- 3.1 **Preparation (Cont'd)**
- .6 Concrete must be cured minimum (7) days and dry before air barrier is applied. Cure concrete with clear resin-based curing compounds containing no oil, wax or pigment.
  - .7 Allow concrete to dry following rain.
  - .8 Repair defects such as spalled or poorly consolidated areas. Remove sharp protrusions and form match lines.
  - .9 If walls are rough use a well adhered parge coat to achieve a smooth finish.
  - .10 **Concrete Blocks:**
    - .1 Unevenness between blocks shall not exceed 2mm.
    - .2 Holes and openings must be patched.
    - .3 Excess mortar shall be removed.
  - .11 **Cast-In-Place Concrete:**
    - .1 Reliefs at framework joints shall not exceed 5mm.
    - .2 Concrete lumps shall be removed.
    - .3 Tie holes shall be filled.
    - .4 All surfaces shall be clean, dry, free from oil, etc.
- 3.2 **Primer Application**
- .1 Apply primer with lambs wool roller 6 to 8 sq. metres per litre and allow 30 minutes for drying to a tacky surface. Prime only the area to be covered in a working day. Areas not covered with membrane in 24 hours must be reprimed.
- 3.3 **Membrane Installation**
- .1 Apply Perm-A Barrier to primed structured substrates, in accordance with the manufacturer's recommendations.
  - .2 All side laps shall be 64mm minimum and all end laps shall be 150mm.
  - .3 At top and bottom terminations heavy pressure should be applied to membrane with the back of utility knife to assure positive adhesive at the edge.
  - .4 The membrane shall be rolled, firmly and completely immediately after each sheet is applied. An extrusion handled counter top roller shall be used.
  - .5 Apply a trowelled bead of EM3000 Mastic to all terminations of membrane at the end of the day's work.
  - .6 Inspect membrane thoroughly before covering and make any corrections immediately.
  - .7 Misaligned or inadequately lapped seams, punctures or other damage shall be repaired with a patch of Perm-A-Barrier extending 150mm in all directions from the edge of the damaged area. Seal all edges of patch with EM3000 Mastic.

- 
- 3.3 **Membrane Installation (Cont'd)**
- .8 Perm-A-Barrier shall be covered immediately to protect the air barrier from other trades.
  - .9 Fit membrane tightly around all penetrations through it and seal using EM 3000 Mastic.
  - .10 At all detail areas take extra care to ensure continuity of the air barrier.
  - .11 Provide flexible flashings around the perimeter of all openings including window and door frames. Mechanically secure flashings to frames. Reinforce all inside and outside corners.
  - .12 All gaps or joints wider than 6mm shall be filled with LM3000 or a foam backer rod and reinforced with a 300mm piece of membrane prior to application of field membrane.
  - .13 Liquid Membrane LM3000 shall be used at all protrusions which do not allow for easy installation of sheet membrane. LM3000 shall be placed over or under Perm-A-Barrier with at least a 64mm overlap required.
  - .14 Provide flexible flashings at the base of the cavity wall, at the head of windows and doors, at horizontal interruptions in exterior walls, and where shown on drawings.
  - .15 In all cases extend flexible flashings 13mm beyond outside face of wall or outside edge of steel lintel. Trim as required to Consultants later instruction.
  - .16 Unless otherwise indicated carry flexible flashing up behind brick masonry units minimum 200mm and adhere to air barrier membrane with adhesive in accordance with manufacturers recommendations.
- 3.4 **Roof/Wall Junctions**
- .1 Coordinate proper construction of roof/wall junction with roofing contractor so as to maintain continuity of air barrier from wall to roof.
  - .2 Ensure compatibility of air barrier with roofing membrane and flashing.
- 3.5 **Inspection**
- .1 Inspect completed air barrier for punctures, tears and discontinuous seams. Apply additional layer of membrane over punctures and tears, extending min. 50 mm (2 in.) beyond damaged area in all directions.
- 3.6 **Clean-Up**
- .1 Promptly as the work proceeds and on completion, clean up and remove from the premises all rubbish and surplus materials.

**End of Section**

**PART 1 - GENERAL**

- |     |  |    |   |               |
|-----|--|----|---|---------------|
| 1.1 | <b><u>General Requirements</u></b>           | .1 | Comply with requirements of Division 1.   |               |
| 1.2 | <b><u>Related Sections</u></b>               | .1 | Air Barrier System  | Section 07196 |
|     |  | .2 | Masonry   | Section 04200 |
|     |  | .3 | Built-up Roofing  | Section 07513 |
|     |  | .4 | Aluminum Windows  | Section 08900 |
|     |  | .5 | Gypsum Board  | Section 09250 |
|     |  | .6 | Duct and pipe insulation  | Division 15   |
| 1.3 | <b><u>Product Delivery &amp; Storage</u></b> | .1 | Deliver insulation to site in sealed Storage and wrappings bearing manufacturer's name, product name and RSI or KSI value.      |               |
|     |  | .2 | Store materials in a dry area protected from the elements.  |               |
| 1.4 | <b><u>Protection</u></b>                     | .1 | Temporarily protect installed insulation from damage and action of the elements until it is permanently concealed or protected. |               |
|     |  | .2 | Protect polystyrene insulation from sunlight.   |               |

**PART 2 - PRODUCTS**

- |     |   |    |   |  |
|-----|---|----|---|--|
| 2.1 | <b><u>Insulation</u></b>                | .1 | <u>Fibrous batt insulation</u> : mineral fibre, batt or roll type: CSA A101-M1983, friction fit for steel studs.        |  |
|     |   | .2 | <u>Rigid fibrous insulation</u> : thermosetting resin bonded boards, AF530 by Fiberglas Canada Inc.                     |  |
|     |   | .3 | <u>Foam Sealant</u> : One component polyurethane foam sealant "Insta Seal" by Insta-Foam.                               |  |
| 2.2 | <b><u>Fasteners &amp; Adhesives</u></b> | .1 | <u>Insulation adhesive</u> : as recommended by insulation manufacturer.   |  |
|     |   | .2 | <u>Impaling clips</u> : zinc coated Stic-Klip type N and cadmium plated speed washer by Eckle Industries of Canada Ltd. |  |
|     |   | .3 | <u>Impaling clip adhesive</u> : as recommended by impaling clip manufacturer.   |  |

**PART 3 - EXECUTION**

- |     |                           |    |  |  |
|-----|---------------------------|----|--|--|
| 3.1 | <b><u>Preparation</u></b> | .1 | Substrate to receive rigid board insulation shall be sound, dry and free of dirt, oil grease and other foreign substances. |  |
|     |                           | .2 | Clean substrate as required. Remove concrete surface ridges and deposits.  |  |

- 3.2 **Installation General** .1 Provide under this Section all thermal insulation required except where it is specified to be part of other Sections.
- .2 Where insulation is interrupted by construction elements, neatly fit insulation around such elements and pack spaces around elements with same insulation.
- .3 Moderately butt insulation boards against each other so that there are no gaps.
- .4 Stagger joints at multiple layer installations.
- 3.3 **Foamed Sealant** .1 Provide foamed sealant where indicated on the Drawings.
- .2 Coordinate the installation of this work with the work of other sections.
- 3.4 **Fibrous Batt Insulation** .1 Provide fibrous batt insulation where indicated on Drawings.
- .2 Completely fill spaces between furring and framing members with insulation, leaving no gaps or voids. Do not pack insulation tighter than manufactured density of materials.

**End of Section**



**PART 1 - GENERAL**

- |     |  |    |   |               |
|-----|--|----|---|---------------|
| 1.1 | <b><u>General Requirements</u></b>     | .1 | Comply with requirements of Division 1.   |               |
| 1.2 | <b><u>Related Sections</u></b>         | .1 | Block Masonry   | Section 04200 |
|     |  | .2 | Brick Replacement   | Section 04210 |
|     |  | .2 | Air Barrier   | Section 07196 |
| 1.3 | <b><u>Qualifications</u></b>           | .1 | The work of this section is to be performed by applicators certified and licensed for the specific application of closed cell spray foam insulation. Spray foam insulation products and application shall comply with the requirements of CAN/ULC S705.1-15 and in accordance with the Montreal Protocol employing <b>non HFC</b> blowing agents. |               |
| 1.4 | <b><u>Submittals</u></b>               | .1 | Provide data on material characteristics, performance characteristics, limitations and independent R value, recycled content and water vapour transmission test data.   |               |
| 1.5 | <b><u>Mock up</u></b>                  | .1 | Provide mock-up of materials.   |               |
|     |  | .2 | Construct typical exterior wall sample panel. Locate where directed by consultant.  |               |
|     |  | .3 | Mock-up may remain as part of the work.   |               |
|     |  | .4 | Allow [24] hr for inspection of mock-up by Consultant before proceeding with work of this section.  |               |
| 1.6 | <b><u>Pre-Installation Meeting</u></b> | .1 | Prior to commencing work of this section convene a pre-installation meeting to review conditions of installation, installation procedures, and coordination with related work. Establish manufacturer's requirements for approval of substrate.   |               |
|     |  | .2 | Ensure attendance of representatives from inspection company, manufacturer and applicator, and parties directly affecting the work of this section.   |               |

**PART 2 - PRODUCTS**

- |     |   |    |  |  |
|-----|---|----|--|--|
| 2.1 | <b><u>Insulation Air Barrier System</u></b> | .1 | Closed cell, spray applied polyurethane foam, medium density, ccSPF meeting the requirements of CAN / ULC-S705.1-15 and using only HFO blowing agents. Certified by EcoLogo as containing a minimum of 5% recycled content by mass of finished product. ULE/GREENGUARD Indoor Air Quality Certified® by the ULE/GREENGUARD Environmental Institute under the GREENGUARD for Children & Schools <sup>SM</sup> . Having an R value of R5.25/ inch @ 2 inches, R5.53/inch @ 4 inches. |  |
|     |   | .1 | <b>WALLTITE</b> CM01 or XL01 by BASF as represented by Building Resource Inc. installed at a Minimum Field Density (Core) (ASTM D1622): 29 kg/m <sup>3</sup> (1.8lb/ft <sup>3</sup> )  |  |
|     |   | .2 | <b>Heatlock Soya HFO</b> two component closed cell spray applied rigid polyurethane foam system standard by Huntsman. installed at a Minimum Field Density (Core) (ASTM D1622): 35.49 kg/m <sup>3</sup> (2.21lb/ft <sup>3</sup> ).   |  |

- 2.1 **Insulation Air Barrier System (Cont'd)**
- .2 Transition Membrane Self Adhering: SBS modified bitumen, self adhering sheet membrane complete with a cross-laminated polyethylene film. Acceptable material: Tremco ExoAir 110, Blueskin SA as manufactured by Bakor or other material as accepted by BASF.
  - .3 Through-wall flashing membrane (Self-Adhering): SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film. Acceptable material: Tremco TWF, Bakor Blueskin TWF or other material as accepted by BASF.
  - .4 Through-wall flashing and dampproof coursing mastic: Synthetic rubber base compound. Compatible with air/vapour barrier membrane, substrate and insulation materials, Acceptable material: Air-Bloc 21 or 230-21 Adhesive as manufactured by Bakor.
  - .5 Primer for self-adhering membranes: Synthetic rubber based adhesive type, quick setting. Acceptable material: Blueskin® Primer as manufactured by Bakor.

### **PART 3 - EXECUTION**

- 3.1 **Examination**
- .1 Verify that surfaces and condition are suitable prior to commencing work of this section.
  - .2 Ensure that:
    - .1 Surfaces are sound, dry, even and free of oil, grease, dirt, excess mortar or other contaminants.
    - .2 Concrete surfaces are cured and dry, smooth and without large voids, spalled areas or sharp protrusions.
    - .3 Masonry joints are flush and completely filled with mortar.
    - .4 Verify that all penetrations, sleeves, etc. are properly placed and secure.
- 3.2 **Preparation**
- .1 Substrate to receive foamed in place insulation shall be sound, dry and free of dirt, oil grease and other foreign substances.
  - .2 Clean substrate as required. Remove concrete surface ridges and deposits.
  - .3 All excessively wide joints should be covered or filled before applying the polyurethane foam.
  - .4 Install transition membranes in all places recommended in section 3 of BASF's technical product documentation including at the intersection of dissimilar materials, at connection to roof membranes, at all openings (doors and windows), at moving joints (control, construction and expansion), and around through wall penetrations as required.
  - .5 Install though wall flashings at all shelf angles and as shown on the drawings.

- 3.2 **Preparation** .6 Polyurethane foam should be sprayed with a tolerance of  $\pm 6\text{mm}$  ( $\pm 1/4"$ ) in relation to the specified thickness.
- (Cont'd)**
- .7 Avoid the formation of sub-layer air pockets when applying.
- .8 Avoid spraying the foam on any surfaces other than those indicated. Use drop sheets or masking tape to protect other surfaces.
- .9 Once the foam has hardened, remove all overspray from non-prescribed surfaces .
- .10 Do not allow polyurethane foam, once applied, to be damaged during work by the other trades.
- .11 Spray the polyurethane foam in overlapping layers, so as to obtain a smooth, uniform surface.
- .12 Do not spray polyurethane foam any closer than 75 mm (3") from chimneys, heating vents, steam pipes, recessed lighting fixtures, and other heat sources. Do not spray the insides of any exit openings or electrical junction boxes (refer to the BASF manual).
- .13 In temperatures below  $+10^{\circ}\text{C}$  ( $+50^{\circ}\text{F}$ ) use transition membranes specifically formulated for low temperature application. If required mechanically fasten transition membranes to achieve the required pull strength.
- 3.3 **Installation** .1 Apply insulation in accordance with manufacturer's instructions. Ensure full bond of insulation to substrate.
- .2 Apply insulation within recommended application temperature ranges. Consult manufacturer when insulation cannot be applied within these temperature ranges.
- .3 Using airless spray equipment having a minimum pressure of 20 684 kPa (3000 psi), apply insulation in multiple, uniform passes to provide seamless, monolithic cured thickness as indicated on drawings.
- .4 Ensure water tight seal at items penetrating insulation and ensure continuity of building envelope air barrier.
- 3.4 **Field Quality** .1 An independent inspection and testing company appointed and paid for by the owner under Cash Allowance specified in Section 01020 will carry out inspection and testing in accordance with the General Conditions.
- Control**
- 3.5 **Cleaning** .1 Clean work in accordance with Section 01710.
- .2 Clean to the Consultant's approval, soiled surfaces, spatters, and damage caused by work of this Section.

**End of Section**

**PART 1 - GENERAL**

- 1.1 **Related Work** .1 Fire stopping and smoke seals within mechanical assemblies (i.e. inside ducts, dampers) and electrical assemblies (i.e. inside cable trays) and at mechanical and electrical penetrations specified in Division 15 and 16 respectively.
- .2 Coordinate work of this section with other sections as required to properly execute the work and as necessary maintain satisfactory progress of the work of other sections.
- 1.2 **Related Sections** .1 Section 01300 – Submittals
- .2 Section 01400 – Quality Control.
- .3 Divisions 15 and 16
- 1.3 **Reference** .1 Underwriter's Laboratories of Canada (ULC)
- .1 CAN-S115, Fire Tests of Firestop Systems.
- 1.4 **Submittals** .1 Submit duplicate 300 x 300 mm samples showing actual firestop material proposed for project.
- .2 Submit shop drawings to show proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.
- .3 Submit manufacturer's engineering judgement identification number and drawing details when no ULC or UL system is available. Engineering judgement must include both project name and contractor's name who will install firestop system as described in drawing.
- .4 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation. Include manufacturer's specifications, training letter, and technical data for each material including the composition and limitations, documentation of ULC or CUL firestop systems to be used.
- .5 Submit material safety data sheets provided with product delivered to job site.

**PART 2 – PRODUCTS**

- 2.1 **Materials** .1 Use only firestop products that have been ULC or UL tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements and fire-rating involved for each separate instance.
- .2 Fire stopping and smoke seal systems: in accordance with CAN-S115.
- .1 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN-S115 and not to exceed opening sizes for which they are intended.

- .2 Firestop system rating: as indicated on drawings.
- .3 Service penetration assemblies: certified and tested by ULC or UL in accordance with CAN-S115.
- .4 Service penetration firestop components: certified and tested by ULC or UL in accordance with CAN-S115.
- .5 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.
- .6 Non-curing, re-penetrable intumescent sealants, caulking or putty material for use with flexible cables or cable bundles.
- .7 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal. Consult with Consultant and damper manufacturer prior to installation ULC or UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
- .8 Intumescent sealants or caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe. No silicone based firestop are allowed to be applied on plastic pipes.
- .9 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .10 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .11 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.
- .12 Sealants for vertical joints: non-sagging.

### **PART 3 – EXECUTION**

- 3.1 **Preparation**
- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.
  - .2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.
  - .3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.
  - .4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

- 3.2 **Installation**
- .1 Install fire stopping and smoke seal material and components in accordance with ULC certification or UL Products Certified for Canada (CUL) and manufacturer's instructions.
  - .2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
  - .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
  - .4 Tool or trowel exposed surfaces to a neat finish.
  - .5 Remove excess compound promptly as work progresses and upon completion.
- 3.3 **Inspection**
- .1 Notify Consultant when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.
- 3.4 **Schedule**
- .1 Firestop and smoke seal at:
    - .1 Penetrations through all fire-resistance rated masonry, concrete, and gypsum board partitions and walls including walls required to provide a fire separation but having no required fire resistive rating.
    - .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.
    - .9 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.
- 3.5 **Clean Up**
- .1 Remove excess materials and debris and clean adjacent surfaces immediately after application.
  - .2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

**End of Section**

**PART 1 - GENERAL**

- |     |  |    |   |               |
|-----|--|----|---|---------------|
| 1.1 | <b><u>General Requirements</u></b>                       | .1 | Comply with requirements of Division 1.   |               |
| 1.2 | <b><u>Related Sections</u></b>                           | .1 | Painting  | Section 09900 |
| 1.3 | <b><u>Definition</u></b>                                 | .1 | Caulking = Sealant.   |               |
| 1.4 | <b><u>Qualifications</u></b>                             | .1 | Work of this section is to be done by Contractors of recognized standing having personnel with experience in this type of work and who have the necessary equipment to carry out the work.  |               |
|     |  | .2 | Use only sealants which are proven to be compatible with materials they are in contact with. Notify Consultant prior to start of work should any sealant specified be considered unsuitable for the purpose intended.   |               |
| 1.5 | <b><u>Guarantee</u></b>                                  | .1 | Provide the following guarantee in accordance with the General Conditions, notwithstanding the time provisions therein, that the caulking work will not leak, crack, crumble, melt, shrink, run, loose adhesive or colour or stain adjacent materials for the following period. |               |
|     |  | .1 | <b>Two years on material and labour for interior work.</b>  |               |
|     |  | .2 | Examine drawings, details and specifications prior to tendering to ensure that the materials and the joint details will satisfy the conditions of the guarantee. Submission of tender and commencement of work shall imply an unqualified guarantee.                            |               |
| 1.6 | <b><u>Product Delivery, Storage &amp; Submittals</u></b> | .1 | Deliver sealants in sealed containers bearing manufacturer's name, brand reference standard to which sealant complies.  |               |
|     |  | .2 | Store materials in a dry area having an ambient temperature within limitations recommended by material manufacturer.  |               |
|     |  | .3 | Submit product cut sheets.  |               |
| 1.7 | <b><u>Job Conditions</u></b>                             | .1 | Unless otherwise specified, apply sealants when air temperature is between 10 degrees C and 25 degrees C. when air temperature is above 25 degrees C or below 10 degrees C follow sealant manufacturer's recommendations regarding application.                                 |               |
|     |  | 2. | Coordinate work of this Section with that of Section 09900. Prior to start of work review installation procedures with Consultant, where caulking is located adjacent to painted surfaces.  |               |

## **PART 2 - PRODUCTS**

- 2.1 **Materials**
- .1 **Sealants**
- .1 Class A Sealant: Dymeric by Tremco Meeting CGSB 19.24
- .2 Class C Sealant: Acrylic Latex by Tremco Meeting CGSB 19-GP-17M
- .3 Class E Sealant: Proglaze by Tremco Meeting CGSB 19-GP-9Ma
- .4 Materials shall be standard colours as selected by the Consultant, free from ingredients which will stain masonry.
- .2 **Primers, thinners, cleaners:** As recommended by sealant manufacturer, non-staining type.
- .3 **Premoulded backup for sealant:** Round, closed cell polyethylene of size to suit joint, causing 30% compression of backing when in place. Dow Ethafoam or approved equal.
- .4 **Bond breaker:** Closed cell polyethylene or vinyl foam tape, self-adhering one side.
- .5 Materials must comply with 'low emitting' LEED requirements.

## **PART 3 - EXECUTION**

- 3.1 **Examination**
- .1 Before any caulking is done, a representative of the sealant manufacturer and the caulking contractor must inspect all joints or rebates to receive sealant. The work of others must be examined insofar as it affects the work of this section.
- .2 Ensure that joints and rebates are of sufficient width and depth for sealant installation.
- .3 Do not commence installation of sealants until conditions are acceptable.
- .4 Commencement of the work implies that the contractor accepts full responsibility that the caulking will perform without failure for the full period of the guarantee.
- 3.2 **Inspection**
- .1 The sealant manufacturers' representative must carry out periodic inspections during application and submit a written report to the Consultant immediately after each inspection.
- .2 The caulking contractor shall notify the Consultant when the work is completed for inspection. Do not cover work until approved. Take out and recaulk all defective work.
- 3.3 **Preparation**
- .1 Clean and prepare joints to be caulked to produce clean sound surfaces for sealant adhesion.
- .2 Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.



- 3.3 **Preparation (Cont'd)**
- .3 Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.
  - .4 Remove oil, grease and other coatings from non-ferrous metals with joint cleaner.
  - .5 Prepare concrete, masonry, glazed and vitreous surfaces to sealant manufacturer's instructions.
  - .6 Examine joint sizes and correct to achieve depth ratio one half of joint width with minimum width and depth of 6 mm maximum width 25 mm.
  - .7 Install joint filler to achieve correct joint depth.
  - .8 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
  - .9 Apply bond breaker tape where required to manufacturer's instruction.
  - .10 Prime side of joints to sealant manufacturer's instructions immediately prior to caulking.
  - .11 Seal joints in surfaces to be painted before surfaces are painted. Where surfaces to be sealed are primed in shop before sealing, check to make sure prime paint and sealant are compatible. If they are incompatible inform Consultant and change sealant to compatible type approved by Consultant.
  - .12 Check form release agent used on cast in place concrete for compatibility with sealant and primer. If they are incompatible inform Consultant and change sealant to compatible type approved by Consultant or clean concrete to Consultant's approval.
  - .13 Install bond breaker tape and back up joint where joint backing is not required or cannot be installed (so that sealant will adhere only to sides of joint).
- 3.4 **Application**
- .1 Apply sealant using gun fitted with suitable nozzle. Use sufficient pressure to fill voids and joint solid. Superficial pointing with skin bead is not acceptable.
  - .2 Tool surface of sealant smooth, concave, free from ridges, wrinkles, sags, air pockets and embedded foreign matter.
  - .3 Apply sealants in accordance with following table:

<u>Joint Width</u>	<u>Sealant Depth</u>
5 mm	5 mm
10 mm	7 mm
15 mm	10 mm
20 mm	12 mm
25 mm	15 mm
  - .4 Where recommended by sealant manufacturer, vent exterior joints in accordance with such recommendation.

- 3.5 **Cleaning** .1 As work progresses, remove sealant smears and stains from adjacent surfaces. Use cleaning method recommended by sealant manufacturer.
- .2 Leave adjacent surfaces in neat and clean condition.
- 3.6 **Schedule** .1 Apply sealant at the following interior locations:
- .1 Between dissimilar materials in exposed locations except where specifically indicated otherwise with Class A sealant.
- .2 Concealed air/vapour barrier joints except those sealed under work of other Sections with sealant compatible with surfaces being caulked.
- .3 Perimeter of door, window, louvre and screen frames with Class C sealant.
- .4 Control joints in masonry elements with Class A sealant.
- .5 Perimeter of fire extinguisher cabinets, access panels, and control panels with Class A sealant.
- .6 Between counter tops and wall with Class E sealant.
- .7 Where shown on Drawings.

**End of Section**

**PART 1 - GENERAL**

- |     |   |    |  |               |
|-----|---|----|--|---------------|
| 1.1 | <b><u>General Requirements</u></b>                      | .1 | Comply with requirements of Division 1.  |               |
| 1.2 | <b><u>Related Sections</u></b>                          | .1 | Caulking at frame perimeters:  | Section 07900 |
|     |   | .2 | Finish Hardware:   | Section 08710 |
|     |   | .3 | Glazing:   | Section 08800 |
|     |   | .4 | Painting:  | Section 09900 |
| 1.3 | <b><u>Qualifications</u></b>                            | .1 | Acceptable manufacturers: Member of The Canadian Steel Door & Frame Manufacturers' Association.  |               |
|     |   | .2 | Reference standards: Unless otherwise specified, meet requirements of "Canadian Manufacturing Specification for Steel Doors and Frames" published by the Canadian Steel Door & Frame Manufacturers' Association. |               |
|     |   | .3 | Fire protection requirements: fire rated doors, frames and screens shall bear ULC labels.  |               |
|     |   | .4 | One manufacturer is to provide doors and frames unless specified otherwise.  |               |
| 1.4 | <b><u>Guarantee</u></b>                                 | .1 | Provide the following guarantee in accordance with the General Conditions, notwithstanding the time provision therein.   |               |
|     |   | .1 | <b>Three years on materials and labour.</b>  |               |
| 1.5 | <b><u>Submittals</u></b>                                | .1 | Submit shop drawings in accordance with Section 01300.   |               |
|     |   | .2 | Clearly indicate each type of frame, door, material, core thickness reinforcements, glazing stops, location of anchors, exposed fastenings and finishes.   |               |
| 1.6 | <b><u>Work Supplied to Other Trades</u></b>             | .1 | Supply frames and anchors to other Sections where it is necessary to build frames into work of other Sections.   |               |
|     |   | .2 | Supply instructions required for accurate positioning and proper installation of components supplied to other Sections.  |               |
| 1.7 | <b><u>Design Requirements of Doors &amp; Frames</u></b> | .1 | Exclusion of water.  |               |
|     |   | .2 | Prevent air infiltration in excess of 0.5 cubic feet/minute/linear foot.   |               |
|     |   | .3 | U factor of 0.56 or less   |               |
|     |   | .4 | S.T.C. 20.   |               |

**PART 2 - PRODUCTS**

- 2.1 **Materials**
- .1 **Sheet Steel:** Cold rolled steel with stretcher level degree of flatness, meeting requirements of ASTM A366 Class 1.  
  
**Finish:**
    - .1 W25 wipe coated zinc finish to ASTM A526.
    - .2 Hot dipped galvanized zinc to ASTM A526M for all doors and frames where indicated.
  - .2 **Core Material:**
    - .1 **Fire rated doors:** in accordance with fire test requirements.
    - .2 **Exterior doors:** semi-rigid glass fibre insulation minimum density of 24 kg/m<sup>2</sup>.
    - .3 Interior doors, except fire rated doors: honeycomb core of rigid pre-expanded resin impregnated Kraft paper having maximum 20mm hexagonal shaped cells.
  - .3 **Finishing Materials:**
    - .1 **Touch up paint:** zinc rich paint CGSB 1-GP-181M.
    - .2 **Metal filler:** two component epoxy type.
    - .3 **Shop primer:** zinc or lead chromate type.
  - .4 **Door Bumpers:** Gray neoprene double stud.
- 2.2 **Reinforcement & Hardware Preparation**
- .1 **Templated hardware:** prepare work in accordance with templates supplied by Section 08710. ANSI Standards will not necessarily be used. Drill and tap doors for templated hardware. Provide door latch guide.
  - .2 Blank, reinforce, drill and tap doors and frames for concealed, mortised and surface mounted hardware and concealed magnetic contacts. Provide door closer reinforcement at all steel doors and frames whether closer is required by hardware list or not.
  - .3 Hardware reinforcements shall be minimum 3.4mm thick.
  - .4 Guard boxes: 0.9 mm (20 ga.) steel welded to back of frame at hardware cutouts where mortar or other materials could obstruct hardware operation.
  - .5 Provide steel angle high frequency top hinge reinforcing in doors and frames. Weld both legs of angle to adjoining surfaces.

- 2.3 **Doors**
- .1 Construct fire rated doors in accordance with fire test requirements.
  - .2 Provide all doors of seamless construction with no visible seams or joints on faces and vertical edges. Render joints invisible by grinding, filling and dressing smooth.
  - .3 Exterior doors: : 1.6 mm (16 ga.) thick base sheet steel of urethane core construction. Fully weld vertical seams for full height of door and grind smooth.
  - .4 Interior doors: 1.2 mm (18 ga.) thick base sheet steel of honeycomb core construction. Mechanically interlock, with adhesive, face sheets at vertical edge to form a tight straight joint. Tack weld every 150 mm for full height of door. Fill all seams with epoxy and grind smooth.
  - .5 Provide condensation weep holes at bottom edge of exterior doors.
  - .6 Provide flush end steel closures at top edge of all exterior doors and where required for attachment of hardware, weather stripping and concealed magnetic switches.
  - .7 Prepare doors as required for louvres, glazing and between glass blinds where indicated. Surround openings in flush doors with minimum 1.2mm thick steel edge channels, welded to both face sheets. Where prepared openings in doors exceed 35% of the total door area, face sheets at vertical edges must be continuously welded.
  - .8 Provide 0.9 mm thick removable glazing stops of zinc coated steel channels mitred at corners, accurately fitted into position and fastened with countersunk Phillips, flathead sheet metal screws.
  - .9 Glazing stops at outside of exterior doors shall be rendered non-removable.
  - .10 Doors to be square and true. Maximum twist 3mm measured on the diagonal of the door.
  - .11 Construct rail and stile doors in same manner as flush doors.
  - .12 Undercut doors where shown or required to suit floor finish.
- 2.4 **Frames**
- .1 Provide welded frames of 1.6 mm thick sheet steel to profiles shown on Drawings.
  - .2 Shop assemble components with accurately cut joints. Mitre outside corner joints of frames. Weld joints on inside of profile; grind welds, flush and sand to smooth uniform surface.
  - .3 Glazing stops shall be minimum 0.9 mm thick steel, drilled and secured with oval headed screws.

- 2.4 **Frames**  
**(Cont'd)**
- .4 Drill interior door frames for double stud rubber bumpers. Drill strike jamb of each single frame for 3 bumpers. Drill head member of double door frames for 2 bumpers.
  - .5 Provide full height 3.4 mm thick steel reinforcement at hinge side of all frames.
  - .6 Provide steel channel head reinforcement for door frames wider than 915 mm.
  - .7 Tack weld two removable 1.2 mm thick steel spreader channels to inside faces of door frames at base.
  - .8 Provide adjustable base clips for anchorage to floor at bottom of each door jamb.
  - .9 Provide 0.9 mm guard boxes at all strike and hinge reinforcements.
  - .10 Provide welded on drip at head of exterior door frames.
  - .11 For screens with between the glass blinds, prepare frame to accept tilt control knob assembly.
  - .12 Prepare frames as required to accommodate wiring to electrical hardware devices.
  - .13 Provide removable mullions where indicated.
  - .14 Provide 1.2 mm thick continuous steel closer panels at all exposed backs of head and jamb frame conditions.
  - .15 Prepare frames as required to accommodate supplementary steel supports provided by Section 05500.
  - .16 Provide 1.6 mm thick anchors for frames.
- 2.5 **Transom**  
**Panels**
- .1 Provide insulated metal transom panels at head of doors where shown on drawings.
  - .2 Construct panels in manner specified for hollow metal doors.
  - .3 Secure panels to frame with concealed fastenings.

**PART 3 - EXECUTION**

- 3.1 **Frame &**  
**Screen**  
**Installation**
- .1 Set frames plumb, square, level and at correct elevation.
  - .2 Allowable limit of distortion shall be 1.5mm out of plumb at each jamb, measured on face of frame, resulting in maximum twist of frame of 3mm measured from upper corner to lower diagonal corner.

- 3.1 **Frame & Screen Installation (Cont'd)**
- .3 Generally anchorage of frames shall be by means of standard anchors. Where standard anchors cannot be used, provide special anchors to ensure proper installation. Method of anchorage shall not be visible when frames are installed.
  - .4 Provide minimum 3 anchors at each jamb. At frames exceeding 2150 mm in height provide one additional anchor for each additional 610mm or part thereof.
  - .5 Anchor intermediate vertical frame members to structure above as required to ensure stability. Where required, provide steel frame extensions. Provide flexible connection at structure to allow for deflection.
  - .6 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 950mm wide. Remove temporary spreaders after frames are built-in.
  - .7 Remove spreader channels only after frames are securely anchored in place.
- 3.2 **Doors**
- .1 Install doors after wet finishes are completed.
  - .2 Doors must be square and true within frame. Maintain approximately 3mm between perimeter outside edge of sides and head of door and inside edge of frame.
  - .3 Exterior doors and fire doors must seal tight against weatherstrip and smoke gaskets.
  - .4 Install transom panels where indicated on drawings.
  - .5 Install hardware in accordance with hardware supplier's instructions.
  - .6 Adjust operable parts to ensure proper operation.
- 3.3 **Touch-up**
- .1 Patch damaged shop primer. Remove rust, sand damaged and abraded surfaces and touch-up with prime paint matching original finish.
  - .2 Touch-up damaged zinc coating with zinc rich paint prior to application of shop primer.

**End of Section**

**PART 1 - GENERAL**

- |     |  |                                  |  |  |
|-----|--|----------------------------------|--|--|
| 1.1 | <b><u>General Requirements</u></b>           | .1                               | Comply with requirements of Division 1.  |  |
| 1.2 | <b><u>Related Sections</u></b>               | .1<br>.2                         | Installation of finish hardware<br>Hardware for cabinetwork:   | Sections 06200, 08100<br>Section 06400 |
| 1.3 | <b><u>Scope of Work</u></b>                  | .1                               | Supply only of<br><br>.1 Finishing Hardware  |  |
| 1.4 | <b><u>Quality Assurance</u></b>              | .1<br>.2<br>.3<br>.4             | The products listed in the finishing hardware schedule establish the minimum quality standards for this project. Deviations are not permitted.<br>Companies tendering this project shall retain a qualified Architectural Hardware Consultant (A.H.C.) who will assume responsibility relative to their profession.<br>Finishing Hardware companies tendering on this project shall BID only those products specified, or for the purpose of tendering products listed here in as equivalents. Alternates will be allowed only as outlined in Section 2.1.<br>The Architect's Consultant will be provided with a copy of the approved hardware schedule and all approved change notices to complete a quality assurance inspection at completion of the project. It will be the hardware supplier's responsibility to correct any hardware found to be improperly supplied, including installation, painting and reworking of doors and/or frames. |  |
| 1.5 | <b><u>Handling, Delivery and Storage</u></b> | .1<br>.2<br>.3<br>.4<br>.5<br>.6 | Package finishing hardware for each opening, identified shall correspond with hardware schedule.<br>Copy of finishing hardware schedule shall accompany hardware shipments.<br>Deliver all hardware to job site and obtain signed receipt.<br>The general contractor shall provide on site an adequate, enclosed, lockable, clean and dry storage area. Access to locked storage area will be the responsibility of the general contractor.<br>All hardware shall be checked in jointly by representatives of the general contractor and hardware supplier to avoid discrepancies.<br>The general contractor shall protect the finish and function of the installed hardware from the other trades (paint, plaster, cleaners, etc.) during the construction period.  |  |



- 1.6 **Warranty** .1 Submit a written warranty covering finish hardware against defects in materials and workmanship. The warranty period shall be two years generally and five years for closers. Warranty commences on date of Substantial Completion.
- .2 Hardware products found defective within warranty period shall be removed by the general contractor or owner and returned to the distributor for evaluation.
- 1.7 **Submittals** .1 Submit templates when requested to contractor for use by installers and fabricators as required for proper location and installation of hardware.
- .2 Submit 4 (four) copies of the hardware schedule complete with a list and legend of abbreviations used. It is the Suppliers responsibility to thoroughly check the Hardware Schedule and working drawings to ensure, all handlings are correct, product will function as listed and that there are no errors or omissions before submitting for approval.
- .3 Upon request submit physical samples of each type of hardware for the project. Samples which may be required shall be tagged for their intended use and shall be incorporated into the supply of finishing hardware.
- .4 Supply wiring schematics and product information for all electronic hardware supplied under this section.
- 1.8 **Codes and Regulations** .1 All hardware listed or furnished shall meet requirements of Federal, Provincial and Local Codes having jurisdiction over this installation.

**PART 2 - PRODUCTS**

- 2.1 **Manufacturers** .1 The following is a list of acceptable manufacturers for work under this contract. The listed acceptable alternative manufacturers must provide products which are of equal quality of better than the specified manufacturers products.

	<b>Manufacturer As Specified</b>	<b>Acceptable Alternative Manufacturer</b>
Hinges	Stanley	Hager
Locks	Schlage	No substitution
Exit Devices	Sargent	Von Duprin (Full stainless steel)
Closers	LCN4041 Cush	Sargent 351 PS
Kickplates	Gallery	Hager/CBH
Push/Pulls	Gallery	Hager/CBH
Overhead Stops	Sargent Glynn Johnson	
Weatherstrip	Hager	KN Crowder National Guard

**PART 3 - EXECUTION**

- 3.1 **Execution** .1 The contractor installing the hardware shall carefully follow manufacturer's instructions for installation of all finish hardware.
- .2 The finish hardware installer shall be experienced in the installation of architectural hardware and have general knowledge of the functions of the various types of hardware.
- .3 Thru bolts for door pulls are to be counter sunk and concealed by push plates where push plates are listed.
- .4 Manufacturer's fasteners supplied are to be used. It is the installers responsibility to ensure fasteners are not over tightened or stripped by use of screw guns, etc.
- .5 Provide finished hardware for all display cases. Refer to Architectural drawings for locations.
- 3.2 **Keying** .1 All locks shall be interchangeable core and to be keyed to a factory registered master key system.
- .2 Furnish the following quantities of keys:
- 2 Grand master keys
  - 3 Master keys
  - 2 Change keys per lock
  - 3 Construction keys
- .3 All permanent Cores and Keys are to be delivered to the end user.
- 3.3 **Adjusting** .1 It is the hardware installer's responsibility to adjust the hardware as per the manufacturer's specifications. Final adjustments to closers shall be made at final completion of products.
- 3.4 **Documentation** .1 The finish hardware supplier shall include copies of the as-built finishing hardware schedule, and maintenance manuals to the owner on completion of this project.
- 3.5 **Schedule** .1 Supply the following finishing hardware.

**HEADING # 1**

- 1 SGL Door Ex. Storage 6-24 to Ex. Corridor 6 – Door No. 6-24.
- 1 SGL Door Ex Corridor to Ex. Office 3.2a – Door 3.2a

Door 6-24 - 1150 x 2150 x 45 HM Door/ HM Frame – 45 MIN FRR  
 Door 3.2a – 950 X2150 x 45 HM Door/HM Frame

6	HW HINGE	MPB99 114MM X 114MM	32D	MCK
2	STOREROOM LEVER	ND80PD X SPA X 13-247 X 10-025 X KD X F		626
2	KEYING	MASTERKEY CYLINDER (MASTERKEYING CYLINDER BY G & A)		G&A
4	CUT KEY	CHANGE KEY CUT (CUT KEY BY G & A)		G&A
2	DOOR CLOSER	4040XP X RW/PA X SRT	AL	LCN
1	WALL STOP	GSH 240B	C32D	GA

**HEADING # 2**

1 SGL Door Ex. Classroom 6-22 to Ex. Corridor 6 – Door No. 6-22A  
 1 SGL Door Ex. Classroom 6-20 to Ex. Corridor 6– Door No. 6-22B

950 x 2150 x 45 HM Door/ HM Frame – 45 MIN FRR

6	HW HINGE	MPB99 114MM X 114MM	32D	MCK
2	CLASSROOM LEVER	ND75PD X SPA X 13-247 X 10-025 X KD X F		626
2	KEYING	MASTERKEY CYLINDER (MASTERKEYING CYLINDER BY G & A)		G&A
2	CUT KEY	CHANGE KEY CUT (CUT KEY BY G & A)		G&A
2	DOOR CLOSER	4040XP X RW/PA X SRT	AL	LCN
2	WALL STOP	GSH 240B	C32D	GA

**HEADING # 3**

1 SGL Door Ex. Corridor to New Universal WR 3.2 – Door No. 3.2.

950 x 2150 x 45 HMD Door/ HMF Frame                      NON-RTD Door/ Frame

3	HW HINGE	MPB99 114MM X 114MM	32D	MCK
1	STOREROOM LEVER	ND80PD X SPA X 13-247 X 10-025 X KD X F		626
1	KEYING	MASTERKEY CYLINDER (MASTERKEYING CYLINDER BY G & A)		G&A
1	CUT KEY	CHANGE KEY CUT (CUT KEY BY G & A)		G&A
1	ELECTRIC STRIKE	5000C-12/24D-630	630	ESH
1	AUTO OPERATOR	6100 KIT #9801 BARRIER FREE WR. (REG OPERATOR INDICATOR, EMERG CALL, 1 WIRED BUTTON)	AL	G&A
2	KICK PLATE	GSH 80A X 2-SIDED TAPE X 200MM X912MM	C32D	GAL
1	WALL STOP	GSH 240B	C32D	GAL
1	SIGN	AKLP-58 6 X 6 SIL/BLK HANDICAP PICTO (HANDICAP PICTO DOOR SIGN)		

**BARRIER FREE OPERATION:**

1. PUSH OUTSIDE ACTUATOR TO POWER OPERATOR AND DOOR WILL OPEN WITH PRE-SET DELAY.
2. ONCE DOOR IS CLOSED PUSH LOCKING ACTUATOR - POWER TO ELECTRIC STRIKE TO CEASE.
3. OUTSIDE OCCUPIED INDICATOR WILL LIGHT UP INDICATING "OCCUPIED".
4. PUSH INSIDE ACTUATOR TO POWER OPERATOR, OCCUPANCY INDICATOR WILL INDICATE "UN-OCCUPIED".
5. DOOR WILL OPEN WITH PRE-SET TIME DELAY AND THEN CLOSE WHEN DELAY HAS TIMED OUT.

**End of Section**

**PART 1 - GENERAL**

- 1.1 **General Requirements** .1 Comply with requirements of Division 1.
- 1.2 **Related Sections** .1 Metal Doors and Frames Section 08100  
.2 Finishing Hardware Section 08710
- 1.3 **Qualification** .1 Work of this Section is to be done by Contractors of recognized standing having personnel with a minimum of five years experience in this type of work and who have the necessary equipment to carry out the work. Manufacturers and Contractors are to comply to the Standards of the "Insulated Glass Manufacturers of Canada Ltd." latest edition.  
.2 Approved Manufacturers of Sealants, Glazing Tapes, Splines etc. are as follows:  
.1 Tremco Canada Ltd.
- 1.4 **Guarantee** .1 Provide the following guarantee in accordance with the General Conditions, notwithstanding the time provision therein, as follows.  
.1 **Five years material and labour should defects in factory sealed insulating units such as, but not limited to, obstruction of vision due to dust or film forming on inner glass surfaces occur.**
- 1.5 **Product Delivery & Storage** .1 Deliver materials to site only as required.  
.2 All units are to be crated and stored upright, covered, ventilated in a dry and safe location.  
.3 Leave all materials in their original cartons or wrapping until required.  
.4 Identify all glass delivered to job with Manufacturer's labels which are to remain in place until final cleaning.
- 1.6 **Protection** .1 Protect work of other trades from damage resulting from work of this Section.  
.2 Identify glazed openings immediately following glass installation. Do not apply tapes directly to glass.

**PART 2 - PRODUCTS**

- 2.1 **Materials** .1 **Setting Blocks:** neoprene, Shore 'A' duro-meter hardness of 70 to 90 points; spacer shims, 40 to 50 points, as recommended by glass manufacturer.  
.2 **Glazing Compound:** non-hardening modified oil type meeting requirements to CGSB 19-GP-2M.

- 2.1 **Materials** (Cont'd)
- .3 **Glazing Sealant:** one part polysulphide to CAN2-19.13-M82 or one part silicone to CGSB 19-GP-18M.
  - .4 **Glazing Tape:** Polyshim 2 Tape by Tremco
  - .5 **Glazing Gasket:** E.P.D.M. Glazing Gasket by Tremco
  - .6 **Tempered Safety Glass (TG):** 6 mm and 10 mm thick fully tempered float glass to CAN2-12.1. Tempered glass identification must be sandblasted into glass and shall be visible after installation.
  - .7 **Fire Rated Glass (FRG):** 8 mm thick polished, clear ceramic laminated glass. Each lite shall bear permanent non-removable label certifying it for use in tested fire rate assemblies in accordance with ASTM E2074-00, ULC standards, CAN4 S-104 and CAN4 S-106. Impact safety resistance to ANSI Z97.1 and CPSC 16CFR1201.
  - .8 **Insulating Glass:** 6 mm thick PPG Industries Inc. Solarban 60 Low-E high performance glass, clear shading coefficient 0.44
  - .9 **Exterior Glass:** 6mm thick PPG Industries Solexia, tint to match existing.
  - .10 **Safety Film:** 100 microns thick, clear polyester film with pressure sensitive adhesive; Scotchtint Shatter Resistant Window Film by 3M.
  - .11 **Low-E Coating:** PPG Comfort-ES low-emissivity coating.
- 2.2 **Fabrication**
- .1 **Double Glazed Exterior Insulated Glass Units:**
    - .1 Outer Light - Tinted Tempered Exterior Glass
    - Air Gap - 13 mm Argon gas filled air space
    - Inner Light - Insulating Glass, tempered, with Low-E coating.
  - .2 Provide tempered safety glass (TG) in all lights and sidelights of doors, both on exterior and interior except where noted otherwise..

### **PART 3 - EXECUTION**

- 3.1 **Glass Installation** **General**
- .1 Do not glaze when ambient or surface temperature is less than 5° C. Ensure that glazing rabbets, stops and glass are dry, free of frost, grease, oil, dust, rust and other substances detrimental to adhesion of compounds and sealants.
  - .2 Carefully remove glazing stops and reinstall after glazing.
  - .3 Provide clearance at perimeter edge of glass on all four sides, minimum equal to glass thickness. Accurately size glass to fit openings, allowing for expansion in accord with glass manufacturer's recommendations.
  - .4 Site cutting of glass is prohibited unless approved by the Consultant.
  - .5 Provide sealer space between face of glass and glazing stops of minimum 3 mm.

- 
- 3.1 **Glass Installation General (Cont'd)**
- .6 Clean sealing surfaces at perimeter of glass and sealing surfaces of rabbets and stop beads before applying glazing tapes, gaskets and compounds. Use solvents and cleaning agents recommended by manufacturer of sealing materials.
  - .7 Install glazing tapes uniformly with accurately formed corners and bevels. Ensure that proper contact is made with glass and rabbet interfaces.
  - .8 Set glass on setting blocks, spaced as recommended by glass manufacturer. Provide at least one setting block at quarter points from each corner.
  - .9 Centre glass in glazing rabbet to maintain specified clearances at perimeter on all four sides. Maintain centred position of glass in rabbet and provide the required sealer thickness on both sides of glass.
  - .10 Use spacers and shims in accordance with glass manufacturer's recommendations.
  - .11 Mark each pane of glass with approved means to indicate presence of glass.
- 3.2 **Interior Glazing**
- .1 Unless otherwise indicated glaze interior openings as follows:
    - .1 Apply glazing tape to permanent stop; centre glass in opening and set glass on setting blocks, align edges and press home.
    - .2 Apply glazing tape to removable stops and install stops. Trim tape for neat appearance.
- 3.3 **Exterior Glazing**
- .1 Unless otherwise indicated glaze exterior openings as follows:
    - .1 Apply glazing tape to permanent stop; butt tape joints and weld together; do not overlap joints; daub tape corners with sealant.
    - .2 Set glass on setting blocks, align edges and press home to ensure adhesion at all points.
    - .3 Apply heel bead of sealant around perimeter of glass, maintaining 5 mm bite to glass and positive bond to frame. Completely seal void around glass edges. Sealant shall partially fill channel between glass and removable stop.
    - .4 Install removable stops; insert spacer shims between glass and stops at approximately 610 mm o.c. not less than 6 mm below sight lines. Fill remaining void with glazing compound or sealant to sight line and trim to clean line leaving no voids or depressions.
    - .5 Glazing gaskets may be installed in lieu of backfilling with sealant or glazing compound after setting removable stops.

- 3.4 **Completion**
- .1 Tighten all stops and ensure they are properly secured.
  - .2 Remove dirt, scum, plaster, paint spatter, and other harmful and deleterious matter from glass promptly and completely, before they establish tight adhesion.
  - .3 Avoid using abrasive, steel wool, razor blades, solvents, alkaline or other harsh cleaning agents.
  - .4 Remove excess sealant using solvents as recommended by sealant manufacturer.
  - .5 Remove glazing compound droppings promptly from all surfaces as the work progresses.
  - .6 Replace scratched or otherwise damaged glass.
  - .7 After inspection by Consultant remove all labels and polish glass.
  - .8 Wash down exposed surfaces with a mild solution of tri-sodium phosphate in warm water and dry with soft clean wiping cloths, polish all glass.
- 3.6 **Schedule**
- .1 Provide glazing for the following elements and components:
    - .1 Exterior aluminum windows and vents
    - .2 Metal Doors, Frames, Screens, and Transoms.
    - .3 Other glazing shown on Drawings and not covered in other Sections.
  - .2 Provide the following glass Types:
    - .1 **Double Glazed Insulating Units**: all exterior glazed elements and where indicated on documents.
    - .2 **Tempered Glass (TG)**: doors, sidelights, and transoms at entrances and exits, and other location where indicated on drawings.
    - .3 **Fire Rated Glass (FRG)**: doors, sidelights, screens and transoms requiring a fire resistive rating and other location where indicated on drawings.

End of Section

**PART 1 GENERAL**

1.1	<b><u>General Requirements</u></b>	.1	Comply with requirements of Division 1	
1.2	<b><u>Related Sections</u></b>	.1	Cast in Place Concrete	Section 03300
		.2	Masonry	Section 04200
		.3	Wood Blocking	Section 06100
		.4	Air Barrier	Section 07196
		.5	Insulation	Section 07200
		.6	Sealant	Section 07900
		.7	Metal Doors & Frames	Section 08100
		.8	Finishing Hardware	Section 08710
		.9	Glazing	Section 08800
1.3	<b><u>Reference Standard</u></b>	.1	Do sealant work in accordance with Section 07900, unless otherwise specified herein.	
		.2	Do glazing work in accordance with Section 08800, unless otherwise specified herein.	
1.4	<b><u>Qualifications</u></b>	.1	Work of this section is to be done by Manufacturers of recognized standing, having personnel with minimum five years experience in this type of work and who have the necessary equipment to carry out the work.	
1.5	<b><u>Guarantee</u></b>	.1	Provide the following Guarantee in accordance with the General Conditions of the Contract, notwithstanding the time provisions therein. <b>Ten years material and labour to cover the following:</b>	
		.1	Replace any window unit whose finish shows any defects such as but not limited to delamination, blistering or excessive fading.	
		.2	Replace or repair any window unit with air and water leakage, defects and malfunctions under normal usage.	
1.6	<b><u>Submittals</u></b>	.1	<b><u>Shop Drawings</u></b>	
		.1	Submit shop drawings in accordance with the General Conditions.	
		.2	Clearly indicate materials and large scale details for head, jamb and sill, profiles of components, elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes and fasteners.	
		.3	All shop drawings for curtain wall systems must bear the stamp of a professional engineer.	
		3	<b><u>Maintenance Data</u></b>	
		.1	Submit maintenance data for cleaning and maintenance of aluminum windows for incorporation into maintenance manual.	
1.7	<b><u>Inspection &amp; Testing</u></b>	.1	The Owner may appoint and pay, out of the allowances carried in Section 01020, for an independent inspection agency to inspect and test the work of this section as directed by the Consultant.	
1.8	<b><u>Work Supplied to Other Trades</u></b>	.1	Supply to other Sections anchors, inserts and items required to be built into work of other Sections.	
		.2	Ensure accurate setting of built-in items; where necessary provide	



- 1.9 **Acceptable Manufacturer** .1 templates, diagrams or other suitable means of instruction.  
Product
- .1 Product Qualifications: The Specification and drawings are based on products as manufactured by Kawneer Company Inc.

Acceptable Alternate Manufacturers:  
Alumicor Ltd. or Aerloc Industries Ltd. with similar profiles, materials performance specifications and finishes that meet the standards established by this Specification. The manufacturer will be responsible for the supply, installation, and guarantee of this Section.

## **PART 2 - PRODUCTS**

- 2.1 **Materials** .1 Window Systems:
- .1 Window Systems: Kawneer Trifab 451 UT (thermal) Storefront System complete with Kawneer DUAL IsoLock® Thermal Break with two (2) 1/4" (6.4 mm) separations consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections.
- .1 Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.
- .2 Aluminum Window Extrusions: Extruded alloy AA 6063-T54 mechanically straightened and free of marks and be of size and shape as specified and detailed. Minimum extrusion wall thickness of 2.5 mm.
- .3 Aluminum Plate and Sheet: AA 1100 alloy.
- .4 Steel Sections and Plates: to CSA GRO 21-M1978 Type 300W. Hot dip galvanized with minimum zinc coating of 600 g/M<sup>2</sup>.
- .5 Bolts and Anchor Bolts: to ASTM A307-7613, hot dip galvanized with minimum zinc coating of 600 g/M<sup>2</sup> to CSA G16a-1972.
- .6 Steel Reinforcing: For screens to CSA G40.2, Class H.
- .7 Flashings: 2 mm aluminum finished to match windows and entrances.
- .8 Glass and Glazing Materials: Conform to the requirements of Section 08800 Glazing.
- .9 Caulking Materials
- .1 Sealant: two part polyurethane terpolymer to CAN/CGSB-19.24-M80; acceptable product: Tremco Dymeric; Colour selected by Consultant.
- .2 Primer: As recommended by sealant manufacturer.
- .3 Joint backing: foamed, closed cell polyethylene rope, minimum 12 mm wider than joint, compressed when installed.
- .10 Foam Sealant: One component polyurethane foam sealant "Insta Seal" by

- 2.1 **Materials**  
**(Cont'd)**
- .11 Insta-Foam.  
Sills: 3 mm formed or extruded aluminum shapes of proper size and fastening type to suit wall conditions and as detailed, complete with joint covers and drip deflectors.
- .12 Operable Venting Hardware: Top hinged open-out vents to have extruded aluminum hinges with stainless steel pins, clear anodized aluminum under screen roto operators with rotating disk handle.
- .13 Vent Screens  
.1 Standard top hinge open out bug screen configuration.
- .14 Miscellaneous Materials  
.1 Flexible Flashings: 1 mm thick Perm-A-Barrier flexible flashing by W.R. Grace & Co. of Canada.  
.2 Bituminous paint: alkali resistant asphaltic enamel.  
.3 Bedding compound: non-hardening and non-skinning.  
.4 Assembly Screws: Stainless steel.  
.5 Anchor Screws and Bolts: Stainless steel.  
.6 Gaskets: E.P.D.M.  
.7 Thermal Break: 13mm extruded, rigid polyvinyl chloride keyed into aluminum members.
- .15 Miscellaneous Materials (Cont')  
.8 Aluminum Closures: Closures, caps, flashings and panels as detailed fabricated from 14 gauge aluminum laminated to 19 mm fir plywood backing. Finish to match frame.
- 2.2 **Fabrication**  
**General**
- .1 Aluminum components shall be extruded Section and shapes unless otherwise specified.
- .2 Framing shall consist of closed tubular aluminum sections reinforced if necessary, thermally broken.
- .3 Open channel profiles are not acceptable.
- .4 Make allowances for deflection of structure. Ensure that structured loads are not transmitted to windows.
- .5 Design work so that it will not be distorted nor fasteners overstressed from expansion and contraction of metal.
- .6 Internally reinforce framing members where fastening for work of other sections is required and to withstand loads and deflection within allowable limits.
- .7 Fastenings shall be concealed where possible. Where concealed fasteners cannot be used, use countersunk flathead screws with finish to match base metal on which they occur.
- .8 Manufacturer's name plates on windows and doors are not permitted.

- 2.2 **Fabrication** .9 Insure any moisture entering or forming inside systems drains to the exterior.  
**General**  
**(Cont.)** .10 Fabricate aluminum sills to profiles indicated to suit wall conditions. Provide drip deflectors at sill ends and at abutting vertical surfaces. Open ends of sills shall be fitted with neatly applied closure plates. Unless otherwise detailed provide flush slip joint at intermediate sill joints.  
.11 Stools, cap flashings, closures, covers and trim shall be extruded or formed to profiles shown and unless otherwise shown, minimum 3 mm thick.
- 2.3 **Ventilator** .1 Ventilator frames shall consist of inner and outer aluminum frame sections joined by means of an interlocking thermal barrier. Thermal barrier shall completely prevent metal to metal contact in any form. Vent corner shall be cut at 45 degrees, swaged with 3 heavy-duty reinforcing angles per corner.  
**Units** **Screwed corners on vents will not be permitted.**
- 2.4 **Finishes** .1 Aluminum windows and vents: clear anodized finish matching existing.

### **PART 3 - EXECUTION**

- 3.1 **Framing** .1 Erect and secure framing systems and window units plumb, square and level, free from warp, twist and superimposed loads.  
.2 Anchor framing systems to supporting building elements; provide brackets, anchors and clips as required. All devices for anchoring shall have sufficient adjustment to permit correct and accurate alignment. After alignment rivet, weld or otherwise positively lock anchoring devices to prevent movement other than that required to accommodate expansion, contraction and deflection.  
.3 Anchor immediate vertical frame members to structure above as required. Where support for intermediate vertical frame members is not available directly above head, provide frame extensions to structure above. Provide flexible connection at structure to allow for movement.  
.4 Anchor window jamb members to adjacent building elements near top and bottom and at maximum 600 mm in between.  
.5 Provide necessary inserts to be built into work of other Sections as required for anchorage of framing.  
.6 Set frame members in bedding compound to ensure watertight assembly.  
.7 Metal to metal joints between abutting components shall be sealed weathertight.  
.8 Use concealed fastenings where possible; where not possible, use flathead screws in countersunk holes. Match exposed fastenings with base metal on which they occur.

- 3.2 **Glazing** .1 Glaze openings in accordance with window and glass manufacturer's recommendation and Glazing Section 08800 so as to achieve weathertight installation.
- 3.3 **Sealants** .1 Seal joints in accordance with window and sealant manufacturer's recommendations and in accordance with Sealants Section 07900.
- .2 Provide caulking between framing members and adjoining work and where required to render work of this Section weathertight.
- .3 Provide for continuity of air and vapour barrier in all locations; join up with air/vapour barrier components of adjacent systems.
- .4 Install polyurethane foam sealant in all voids between framing and surrounding building elements.
- .5 Where indicated provide membrane flashing located within or abutting framing systems. Secure membrane flashings to frames and to adjacent work mechanically or with adhesive lap membrane flashings at joints minimum 100 mm and seal.
- .6 Where indicated, and where required to maintain continuity of air barrier, install galvanized sheet metal closures at terminations of framing systems and effectively seal to adjacent building elements.
- 3.4 **Sill Installation** .1 Install metal sills with uniform wash to exterior level in overall length, straight in alignment with plumb upstands and faces. Use maximum lengths possible allowing for expansion.
- .2 Secure sills in place with anchoring devices locate at ends and at 600 mm o.c. in between.
- .3 Fasten drip deflectors with self tapping stainless steel screws.
- 3.5 **Covers, Closures & Trim** .1 Provide stools, covers, closures and trim as indicated and as required to provide complete and finished installation.
- 3.6 **Final Cleaning and Adjustment** .1 When instructed by Consultant and after the Substantial Completion of the project, perform the following work:
- .1 Remove any protective coatings or tapes from windows.
- .2 Wash all interior and exterior work installed under this section with a mild solution of tri-sodium phosphate and water.
- .3 Rinse all surfaces and polish with a soft dry cloth.
- .4 Reset and tighten all glazing studs.
- .5 Adjust all operating vents.
- .6 Touch up any scratches and abrasions on frames.

End of Section

**PART 1 - GENERAL**

1.1	<b><u>General Requirements</u></b>	.1	Comply with requirements of Division 1.	
1.2	<b><u>Related Sections</u></b>	.1	Rough Carpentry:	Section 06100
		.2	Sealants:	Section 07900
		.3	Metal Doors and Frames:	Section 08100
		.4	Painting:	Section 09900
		.5	Mechanical Access Panels:	Division 15
		.6	Electrical Access Panels	Division 16
1.3	<b><u>References Standards</u></b>	.1	CAN/CSA-A82.27-M91 - Gypsum Board.	
		.2	CGSB 19-GP-21M - Sealant.	
		.3	CAN/CSA-S102-Latest Edition - Building materials and assemblies, standard method of test for surface burning characteristics.	
		.4	CAN/CSA-A82.30-Latest Edition - Metal framing and furring (Substitute words "Lath and Plaster" in standard with "Gypsum Board").	
1.4	<b><u>Qualifications</u></b>	.1	Work to be performed by a qualified contractor of recognized standing, who has personnel with 5 years experience of successful work on similar projects and who has the necessary equipment to complete the work.	
		.2	This specification is based on materials manufactured by C.G.C. Donn Canada. Alternate materials are acceptable provided they meet the specifications.	
1.5	<b><u>Submittals</u></b>	.1	<b><u>Samples</u></b>	
		.1	Prior to ordering materials submit, for Consultants' review, duplicate 150x150mm sample of each board material and 300mm long sample of each corner bead, casing, trim and moulding.	
1.6	<b><u>Site Mock-up</u></b>	.1	Prior to commencing work, review all details and provide mock-ups for Consultants' review.	
1.7	<b><u>Definitions</u></b>	.1	Drywall - Gypsum Board.	
1.8	<b><u>Source Quality Control</u></b>	.1	Give complete cooperation to trades erecting framing and furring over which this work is applied. Coordinate finished joint location with framing. Notify carpentry trades when framing, blocking and furring are inadequate by CSA Standards.	
1.9	<b><u>Product Delivery &amp; Storage</u></b>	.1	Do not deliver or install materials on site until building has been enclosed and heated.	
		.2	Deliver materials to site in original unopened containers, store safely in dry protected area free of moisture. Take precautions so no foreign matter contaminates materials.	

- 1.9 **Product Delivery & Storage (Cont'd)**
- .3 Corner beads, casing beads, mouldings and trim to be shipped in rigid packages. Bent, rusted or deformed material will not be accepted.
  - .4 Allow materials to come to room temperature (18°C - 22°C) for 24 hours prior to installing.
- 1.10 **Environmental Conditions**
- .1 Install and finish gypsum board when ambient temperature is between 14°C and 22°C. Maintain this temperature range in areas to receive gypsum board for 24 hours prior to and during application, and until joint cement and adhesives are fully cured.
  - .2 Do not start work in an area until bucks, anchors, blocking, electrical and mechanical work and other work which is to be installed in or concealed by this work, has been installed, tested and approved.
- 1.11 **Protection**
- .1 Provide adequate protection of materials and work from damage by weather and other causes. Protect work of other trades from damage resulting from work of this trade.

## **PART 2 - PRODUCTS**

- 2.1 **Framing, Furring & Trim**
- .1 Unless otherwise specified provide framing, and frame members of minimum 0.91 mm (20 ga.) core thickness, hot dip galvanized to ASTM A525.
  - .2 Studs: channel shaped screw-on type: 41mm, 67mm, 92mm , 152mm depth to suit conditions; with knurled supporting flanges at least 34mm wide; with service pass-through holes in web at 610mm o.c.
  - .3 Top and bottom runners: channel sections, depth to suit studs, with 35mm legs and service pass-through holes at 610mm o.c.
  - .4 Rough furring members: 13x13x1.2mm and 19x13.1.2mm galvanized steel channels.
  - .5 Furring and strapping members to receive gypsum board: channel shaped, 19mm deep; with outstanding flanges and 35mm wide knurled supporting face.
  - .6 Corner beads: CGC #200B trim "L" shaped.
  - .7 Casing beads: CGS #200-A trim "J" shaped, one piece length per location. Exposed J-mould is unacceptable.
  - .8 Metal control joints: CGC #093.
  - .9 Ceiling and Soffit Furring and Framing
    - .1 Tie Wire: CGC Tie Wire, 1.2mm min., soft annealed galvanized steel wire.
    - .2 Hangers: CGC Wire Rod and Pencil Rod, 3.7mm min., galvanized steel rod.
    - .3 Main Runners: Sheet steel 1.6mm thick; 38mm deep x 13mm wide; linear density 0.7 kg/m min.

- 2.1 **Framing Furring & Trim (Cont'd)**
- .4 Cross Furring: Screwable, 19mm deep (flange to flange), 0.55mm thick or deeper and heavier where required by loads.
  - .5 Furring Clips: Not less than 3.5mm galvanized.
  - .10 Reveal Channel, other Furring and Framing: Sheet metal of sizes and thickness as required.
  - .11 Anchors: Self-drilling tie wire anchors, Red Head T32. Phillips Drill Co. of ITT Ind.
  - .12 Resilient Channels: RSI resilient channels.
- 2.2 **Board Materials**
- .1 Gypsum Board: CSA A82.27-M1977, tapered edge, minimum 16mm thick, 1200mm wide x most practical length. Use backing board in unexposed locations.
  - .2 Abuse Resistant Gypsum Fibre Board: CGC Fiberock Brand Panels Type VHI abuse - resistant 16 mm thickness. **No alternate manufacturers will be accepted.**
  - .3 Fire Rated Gypsum Board: Type 'X' board CSA A82.27-M1977.
  - .4 Cementitious Backer Board: CGC Fiberglass reinforced, light weight concrete board, 13mm thick.
  - .5 Moisture/Abuse Resistant Gypsum Fibre Board: CGC Fiberock AQUA-Tough panels - 16 mm thickness. No alternate manufacturers will be accepted.
  - .6 Shaftwall: In accordance with UL Design No. U415 System A -1 Hr.
  - .7 Exterior Sheathing: Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M, with fiberglass mat laminated to both sides and with manufacturer's standard edges.  
Basis-of-Design Product: 5/8" Type X Georgia-Pacific Gypsum; "DensGlass Sheathing".
- 2.3 **Fastening & Finishing Materials**
- .1 Gypsum Board
    - .1 Screws: to CAN/CAS A82-031, self-drilling, self-tapping, case hardened, as recommended by Gypsum Board Manufacturer.
    - .2 Laminating Adhesive: CGC Durabond 90 compound.
    - .3 Joint Tape: 50mm wide, CGC sheetrock joint tape.
    - .4 Joint Filler: as recommended by Manufacturer.
  - .2 Cementitious Backer Board
    - .1 Fasteners: Self-tapping galvanized or coated bugle head gypsum board screws, length to suit manufacturer's specification for board thickness.

- |     |   |    |   |
|-----|---|----|---|
| 2.3 | <b>Fastening &amp; Finishing Materials (Cont'd)</b> | .2 | <u>Joint Tape</u> : 50 mm wide Durock, Alkali resistant fiberglass open weave, type AP≅ tape.   |
|     |   | .3 | <u>Joint Filler</u> : Thin-set mortar as recommended by manufacturer.   |
|     |   | .4 | <u>Latex Additive</u> : As recommended by manufacturer.   |
|     |   | .3 | <u>Insulation Strip</u> : Rubberized, moisture resistant 3mm cork strip, 12mm wide, with self sticking adhesive on one face, lengths as required. |
| 2.4 | <b>Acoustical Materials</b>                         | .1 | <u>Acoustic Insulation</u> : CGC Therma fiber, sound attenuation fire blanket thickness and width to suit cavity.                                 |
|     |   | .2 | <u>Caulking</u> : CGC Acoustical Sealant.   |

### **PART 3 - EXECUTION**

- |     |                                |    |   |
|-----|--------------------------------|----|---|
| 3.1 | <b><u>General</u></b>          | .1 | Do work in accordance with CAN/CSA A82-31 except where specified otherwise.   |
|     |                                | .2 | Framing and furring indicated on Drawings is schematic and shall not be considered exact or complete. Location and spacing of members, bracing, supports and securement shall be in accord with referenced standards as required to provide complete and finished work. |
|     |                                | .3 | Provide additional framing, supports and stiffeners to support recessed, built-in or surface mounted cases, shelving, fixtures and equipment.   |
|     |                                | .4 | Coordinate with other trades to determine opening and access requirements.  |
| 3.2 | <b><u>Framing Erection</u></b> | .1 | <u>Partitions</u>   |
|     |                                | .1 | Unless specified otherwise extend partitions assembly and individual studs framing each side of openings to underside of structure above. Provide for deflection of structure.  |
|     |                                | .2 | Furr duct shafts, beams, columns, pipe spaces, exposed services and around built in equipment or openings on all sides.   |
|     |                                | .3 | Install runner channels at top and bottom of partitions and secure to supporting building elements at maximum 610mm o.c.  |
|     |                                | .4 | At partition corners extend one runner channel to end of corner and butt other runner channel; allow clearance for gypsum board thickness; do not mitre runner channels.  |
|     |                                | .5 | Install studs vertically; fix studs to runner channels by screwing on both sides.   |
|     |                                | .6 | Install additional studs as detailed and required at partition intersections, openings and terminations at dissimilar materials.  |



3.2 **Framing  
Erection  
(Cont'd)**

- Place studs not more than 50mm from abutting walls, openings and each side of corners.
- .7 Stiffen partitions over 2400mm in height at maximum 1500mm with at least one 19mm horizontal bracing channel extending full length of partition.
- .8 Where studs extend over 3600mm in height, provide continuous girt bracing spaced approximately at mid height and double studs each side of door frames and other openings. In addition, carry studs through to structure above. Use 90mm studs spaced 400mm o.c. unless indicated otherwise. Conform to manufacturer's limiting height restriction. Brace diagonally to structure above, on approximately 45° angle, both sides of partitions, 2400mm o.c. maximum. Carry bracing down as close to ceiling as possible. Where studs have to be joined or spliced to achieve required height, nest one stud completely within other for distance of 600mm minimum.
- .9 Provide for deflection under structure to avoid transfer of structural load to partition.
- .10 In glazed partitions install horizontal runner at top and bottom of rough opening.
- .11 Shim furring members for wall furring to present true, plumb line and plane face for application of wallboard.
- .12 Locate furring members not more than 50mm away from openings, interior corners, intersections, frames, and control joints.
- .13 Install miscellaneous furring using studs or furring runners as best suited for location.
- .14 Install nested stud girts at proper locations to provide fastening anchorage for accessories, and equipment requiring special support. Check Division 10, Specialties and Division 15, Mechanical for anchors supplied by them.
- .15 Install continuous insulating strips to isolate studs from uninsulated surfaces.
- .16 Provide horizontal framing and reinforcing sufficiently strong, stiff and sturdy to take load of wall hung cases, shelving, and equipment. Mark gypsum board to show where supports are located. Coordinate number and height of horizontal elements with drawings and related subcontractors. Screw continuous 150mm wide fastener reinforcement to metal studs before installing gypsum board.
- .2 Ceilings and Soffits
- .1 Erect hangers and runner channels in accordance with CAN/CSA-A82.31 except where specified otherwise.

- 3.2 **Framing  
Erection  
(Cont'd)**
- .2 Erect suspension system to support ceiling assemblies, rigid secure and level to a tolerance of  $\nabla$  3mm over 3000mm with a maximum deflection of L/360 where L represents the unsupported span.
  - .3 Hangers for suspended ceilings will support suspension system independent of walls, columns, pipes and ducts. Space hangers at maximum 1220mm o.c. along rough furring members and not more than 150mm from ends.
  - .4 Cut hangers to required length. Ensure hangers are free from kinks, bends, twist or other deformations, except those required for fastening. Double saddle tie main runners to hangers. If hangers bend around or through runners and buck on themselves they shall be twisted around themselves a minimum of 2 twists.
  - .5 Where hanger is suspended from concrete slab provide self drilling anchor only. Impact driven anchors are not acceptable.
  - .6 Provide additional hangers within 150mm of corners to support weight of lighting fixtures, diffusers, grilles and other built-in items occurring in ceiling. Provide additional hangers of 600mm o.c. around perimeter of items over 1m in length.
  - .7 Where duct work, piping and other elements within ceiling spaces interfere with direct suspensions of ceiling from structure, or where hanger spacing must exceed 1200mm install additional framing securely fastened to main structure to accommodate proper hanging of ceiling.
  - .8 Securely saddle tie main runners to hangers and level. Do not level by crimping hangers. Locate hangers not more than 150mm from ends of main runners and framing channels and not more than 1200mm o.c. both ways to accommodate placement of main runners and framing channels and to support weight of ceiling and superimposed loads such as lighting fixtures, diffusers and grilles.
  - .9 Locate main runners not more than 150mm from walls which are parallel to them or from other ceiling interruptions and not more than 1200mm o.c., and to suit ceiling layouts; and to frame and support superimposed weight of items intersecting ceilings.
  - .10 Space furring channels at right angles to main runners and framing channels at not more than 600mm o.c. Attach furring channels by means of clips or double strand of tie wire.
  - .11 Furr with furring channels, perimeter of openings for access panels, grilles, diffusers and lighting fixtures. Coordinate with other trades for proper location.
  - .12 Screw 300mm wide continuous fastener reinforcement at head of all exterior windows and screens before installing gypsum board. Install fastener reinforcement for full length of window wall.

- 3.2 **Framing Erection (Cont'd)**
- .13 At exterior soffits install furring members at maximum 400mm o.c. Suspend soffit framing with metal studs and brace system to withstand positive and negative wind pressures without detrimental effects. Fasten furring members to surrounding walls.
- .3 Bulkheads, Coves
- .1 Frame to profiles shown, rigid, square, true to line and securely fastened to supporting building elements.
- .2 Space furring members to receive gypsum board at 450mm o.c.
- .3 Provide rough framing and bracing members as required to ensure stability and accuracy of work.
- .4 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .5 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- 3.3 **Installation**
- .1 Gypsum Boards:
- .1 Do not install gypsum board tight to floor surface. Leave a gap of 13 mm minimum between floor surface and underside of panel.
- .2 Apply gypsum board to framing with screw fasteners. Position all edges or ends over supporting members. Use maximum practical sizes and install vertically or horizontally to minimize end joints.
- .3 Fit end and edge joints closely, but not forced together. Stagger joints on opposite sides of partition and locate inconspicuously.
- .4 Where joints cannot terminate on support member terminate between supports, stagger and back block them for joint treatment to minimize irregular joint appearance in side light.
- .5 Apply screw fasteners, for non-rated assemblies, at the following spacings (apply screw fasteners in rated assemblies in accordance with ULC standards).
- .1 For single layer space screws 300mm o.c. in field of panels and along edges or end joints.
- For double layer screw attachment, space screws 400mm o.c. for both layers. Apply both layers of gypsum panels parallel to studs with joints in face layer offset from base layer joints. Use 25mm screws for base layer and 41mm screws for face layer.
- .6 Adhesive bonded gypsum board; apply 13x13mm ribbons of laminating adhesive to back side of board, parallel to long dimension; space adhesive ribbons at maximum 150mm o.c.

3.3 **Installation**  
**(Cont'd)**

temporarily brace boards until complete adhesive bond develops.

- .7 Provide moulding at perimeter of gypsum board ceilings and around window openings as detailed.
- .8 Provide casing beads where gypsum board butts dissimilar materials, against surfaces having no trim concealing junction and at openings.
- .9 Provide corner beads at external corners.
- .10 Provide insulating strips where gypsum board butts frames of exterior doors and windows or exposed masonry and concrete walls. Adhere strips to casing beads and compress 50%.
- .11 In areas requiring gypsum board ceiling, gypsum board shall extend over the whole ceiling area including furred and pipe spaces.
- .12 Where space above ceiling is congested with services, making installation difficult, contractor may use alternate system, with Consultant's approval, provided fire rating of assembly is maintained and no additional cost to Owner is incurred.

.2 **Abuse Resistant Gypsum Fibre Board Installation**

- .1 Provide abuse resistant gypsum fibre board in the following areas.
  - .1 **All interior wall locations shown, detailed or noted to have gypsum board finish surface.**
  - .2 Install abuse resistant gypsum board to height of 2400 above finished floor and where noted or detailed. Install regular gypsum board from 2400 height to U/S of structure.

.3 **Cementitious Board Installation**

- .1 Provide cementitious board in the following areas.
  - .1 All exterior soffits
  - .2 Leave gap of 3mm, at edge, between adjacent panel and or dissimilar materials. Anchor panel with specified fasteners at 150mm o.c. Fill gaps with thin set mortar with latex additive, and finish with fiberglass tape as recommended by manufacturer.

.4 **Moisture/Abuse Resistant Gypsum Fibre Board**

- .1 Provide moisture resistant board in the following areas:
  - Barrier free WR/Shower
  - Washrooms

.5 **Shaftwall**

- .1 Provide Shaftwall where noted on drawings.

- 3.4 **Gypsum Board Finishing**
- .1 Tape and conceal exposed joints, fastener heads, edges and corners to produce a smooth level surface, free of defects, ready to receive finish.
  - .2 Finish panel joints and internal angles using 3 coat joint system consisting of the following:
    - Thin layer of joint compound and embedded joint tape.
    - Skim coat of compound over joint tape and allow to dry.
    - 2 additional coats of compound feathered out onto panel face 200mm.
  - .3 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.
  - .4 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.
  - .5 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- 3.5 **Gypsum and Relief Joints**
- .1 Control Joints
    - .1 Provide control joints where shown on Drawings and as follows:
      - .1 Partitions: maximum 7.5m o.c.
      - .2 Ceilings: maximum 10m o.c.
  - .2 Relief Joints
    - .1 Provide relief joints where shown on Drawings and where gypsum board assemblies abut dissimilar construction.
    - .2 Stop gypsum board 6mm from abutting construction at dissimilar building elements.
    - .3 Where reglet pattern is required in gypsum board panel cut gypsum board and install appropriate trim.
- 3.6 **Expansion Joints**
- .1 Provide expansion joints where indicated and at change of substrate construction and building expansion joint locations.
  - .2 Construct joints of 2 back to back casing beads set in gypsum board and supported independently at both sides. Break continuity of gypsum board and framing at joint.
  - .3 Provide continuous polyethylene dust barrier behind and across joints.
  - .4 Fill joint with sealant.
- 3.7 **Sound Control**
- .1 Acoustical Insulation
    - .1 Provide acoustical insulation in gypsum board partitions and ceilings as indicated on Drawings. Unless otherwise noted provide 50mm thick insulation for full height of all partitions.

- 
- |     |  |    |  |
|-----|--|----|--|
| 3.7 | <b>Sound Control</b><br><b><u>(Cont'd)</u></b>       | .2 | <u>Acoustical Sealant</u>  |
|     |  | .1 | Where sealant is to be installed, keep bottom of panel 13 mm above floor.  |
|     |  | .2 | Provide acoustical sealant around periphery of each partition and ceiling scheduled to receive acoustic insulation, to seal gypsum board/structure junction. Seal full perimeter of cut-outs, services and other penetrations.         |
|     |  | .3 | Provide 2 bead sealant system around horizontal and vertical perimeters of partitions. Apply continuous sealant beads at each side of horizontal runner tracks and vertical end studs, between gypsum board and adjacent construction. |
| 3.8 | <b>Associated Elements</b><br><b><u>Elements</u></b> | .1 | Access doors and plaster rings for access to mechanical and electrical equipment and fixtures to be supplied by Mechanical and Electrical Division for installation by this Section.   |
|     |  | .2 | Build doors and rings into gypsum board elements flush and parallel to walls. Rigidly secure frames to framing or framing systems.   |

**End of Section**

**PART 1 - GENERAL**

- 1.1 **General Requirements** .1 Comply with requirements of Division 1.
- 1.2 **Related Sections** .1 Finishing of Concrete Slabs: Section 03345  
.2 Sealants Section 07900
- 1.3 **Reference Standards** .1 Do tile work in accordance with installation manual 200-1979 (Revised 1989), 'Ceramic Tile', by Terrazzo Tile and Marble Association of Canada and CSC Architectural Specification Study 09300 on Ceramic Tile.  
.2 American National Standards Institute (ANSI) / Ceramic Tile Institute (CTI)  
.1 ANSI A108.1, Specification for the Installation of Ceramic Tile (Includes ANSI A108.1A-C, 108.4-.13, A118.1-.10, ANSI A136.1)  
.3 American Society for Testing and Materials (ASTM)  
.1 ASTM C144, Specification for Aggregate for Masonry Mortar.  
.2 ASTM C207, Specification for Hydrated Lime for Masonry Purposes.  
.4 Canadian General Standards Board (CGSB)  
.1 CGSB 71-GP-22M, Adhesive, Organic, for Installation of Ceramic Wall Tile  
.2 CAN/CGSB-75.1, Tile Ceramic  
.5 Canadian Standards Association (CSA)  
.1 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A5, A8, A23.5, A362, A363, A456.1, A456.2, A456.3)
- 1.4 **Qualifications** .1 Installer: Work to be performed by a qualified Contractor and who has personnel with experience of successful work on similar projects, and who has the necessary equipment to complete the work.
- 1.5 **Guarantee** .1 Provide the following guarantees in accordance with the General Conditions, not withstanding the time provisions therein, including but not limited to such defects as cracks and delamination, except where proven the defect is a direct result of structural failure.  
.2 Provide certificate of quality compliance from tile manufacturer.  
.3 Provide certificate of quality compliance from tile installer upon satisfactory completion of installation.  
.1 **General Tile Work - 2 years**

- 1.6 **Submittals** .1 **Samples:**
- .1 Prior to ordering materials submit, for Consultant's review, duplicate samples of each tile, trim, fitting and base, mounted on panels complete with grout and mortar joints. Also submit samples of mitre cut base (if indicated on Finishes Drawings and Colour Schedule) and field tiles.
- .2 **Maintenance Data:**
- .1 Submit manufacturer's maintenance data for inclusion into the maintenance manuals specified in Division 1. Also submit manufacturer's specification sheets for mortar and grout systems installed.
- .3 **Maintenance Materials:**
- .1 Supply a minimum 2%, but not less than 2 boxes, of each tile specified, for maintenance purposes after all deficiencies have been completed. Store material where directed by Consultant.
- .2 Maintenance materials to be of same run as materials installed.
- 1.7 **Site Mock-Up** .1 Prior to commencing work, review all details and provide mock-up for Consultants review. Mock-up will remain in place throughout installation as a representation of finish work standard and may become part of the finished work if approved by Consultant.
- .2 Review tile patterns and layout with Consultant, on site, prior to commencing work.
- 1.8 **Product Delivery & Storage** 1 Deliver materials to site in original unopened containers. Store in safe dry protected area free of moisture. Take precautions so no foreign matter contaminates materials.
- 1.9 **Environmental Conditions** .1 Do not install tiles when ambient air temperature and substrate temperature is less than 12°C.
- .2 Maintain a temperature of between 12°C to 20°C in areas of work for 24 hours prior to and during installation and for duration of curing time.
- .3 Inspect areas to receive work and certify surfaces are acceptable for installation. Do not commence installation until improper conditions have been corrected.
- 1.10 **Protection** .1 Exclude construction traffic from areas to receive tile, during installation and for duration of curing time.

## **PART 2 - PRODUCTS**

- 2.1 **Tile General** .1 Specifications for tile and supporting accessories is based on materials manufactured and/or distributed by Olympia Tile International Inc., at 1-800-268-1613 or 416-785-6666.
- .2 **Tile:** CAN2-75T-M77, except that no blisters or chips will be allowed; colours and patterns selected by Consultant.



2.2	<b>Ceramic &amp; Porcelain Tile</b>	.1	Colour to be selected by Consultant. Refer to Section 00865 Colour Schedule.
		.2	All tiles to be flush on the wall face. May need to build up substrate of areas where tiles are not as deep as field wall tiles. Refer to Section 00865 Colour Schedule for tiles specifications.
2.3	<b>Mortar/ Adhesives &amp; Grout</b>	.1	All interior wall tile to use Ultra/Mastic 1.
		.2	All floor tiles to use Karalastic/Karabond.
		.3	Colour to be selected by Consultant. Refer to Section 00860 Colour Schedule for material selections.
		.4	Provide “Grout Boost” Stain resistant grout additive by Specialty Construction Brands Inc, to grout for all porcelain floor tile applications.
		.5	Unless otherwise indicated all grout lines on walls to line up with grout lines on floors in all directions.
2.4	<b>Transition Strips</b>	.1	Provide Schluter Schiene or Quadec transition strips in satin anodized aluminum at the top edge and exposed side edges of porcelain tiles (where indicated on the finishes drawings and interior elevations).
		.2	Transitions strips are required to clean up edge of tiles where different thicknesses of tiles are specified and vertical edges. Refer to interior elevations for notes regarding location of transition strips.
		.3	Provide Schluter Quadec in brushed stainless steel for at outside corners where tile meets tile. Refer to interior elevations and detail sheets for notes.
		.4	Grind all sharp edges smooth. Careful attention to corner conditions to ensure smooth finish to touch.
		.5	Use full length strips where possible. All connecting transition strips to have a seamless appearance and smooth to the touch.
2.5	<b>General Materials</b>	.1	<u>Water</u> : Potable and non-staining
		.2	<u>Portland Cement</u> : CAN3-A5-M83.
		.3	<u>Sand</u> : CSA A82.56-M1976.
		.4	<u>Control Joint Sealant</u> : Urethane sealant equal to Vulkem 245 self leveling sealant manufactured by Mameco Canada Ltd. Colour to match grout. Architect to make final colour selection.
		.5	<u>Tile Sealer</u> : Polished tiles are recommended to be sealed prior to grouting. Use MORE™ Grout, Ceramic & Porcelain Sealer, Ready to use, reapply 1-3 years for commercial applications.
		.6	<u>Grout Haze Remover</u> : Grout Haze-Epoxy/ Urethane, MORE™ Coating Striper. Test in an inconspicuous area to make sur the product is achieving the desired results and is not damaging the finish of the surface, Ready to use as needed.
		.7	<u>Grout Haze Cementitious Remover</u> : MORE™ Acidic Cleaner, 1:4 ratio dilution with water, as needed.

**PART 3 - EXECUTION**

- 3.1 **Inspection**
- .1 Examine floors for defects that are detrimental to installation and bonding of tile.
  - .2 Examine drywall surfaces for adequate fixing, plumb, joint filling and freedom from waves.
  - .3 Examine masonry and concrete surfaces for soundness, excessive moisture, efflorescence and variation tolerance.
- 3.2 **Preparation**
- .1 Substrates to be clean and free of foreign matter and minimum 10° C.
  - .2 Clean substrates as required to produce acceptable surface.
  - .3 Where substrate conditions require it, apply leveling coat and allow to cure.
- 3.3 **Tile / Stone General**
- .1 Finished work shall be level, plumb, or sloped as shown, true, square and free of defective, chipped, broken, discoloured or blemished tiles. Maximum allowable finished surface variation is 3 mm in 3 m when measured, in any direction, with a 3 m straightedge.
  - .2 Lay out tile patterns symmetrically within each area using full tiles where possible, and to patterns shown. Unless otherwise indicated provide stacked pattern. Review with architect/interior designer on site prior to installation of any and all tiles.
  - .3 Joints shall be parallel, uniform, neat, straight, square and completely filled.
  - .4 Fit tile or stone accurately against and around interruptions, penetrations and abutting dissimilar surfaces. Wherever possible, drill holes for penetrating elements to ensure neat fitting.
  - .5 After setting, sound tiles and replace hollow backed tiles.
  - .6 Provide tile manufacturer's standard trim pieces at changes in direction and at terminations. Unless otherwise indicated provide the following corner and edge conditions.
    - .1 Internal horizontal corners: coved.
    - .2 External vertical and horizontal corners and edges: bullnose.
    - .3 Internal vertical corners and unexposed edges: square butt joint.
    - .4 Top of base: curved surface cap.
- 3.4 **Floor Tile Installation**
- .1 At floors shown to be sloped install setting bed to slopes indicated screed and tamp firmly, minimum 20 mm thick, with reinforcing mesh embedded approximately in centre of setting bed. Lap mesh 50 mm at joints.
  - .2 Over setting bed trowel or brush on bond coat approximately 1.5 mm thick, or apply evenly over back of tiles. Set tiles onto setting bed and beat firmly and evenly in place so as to achieve true, uniform and properly bonded installation but without causing damage to tiles.
  - .3 Provide minimum 1% slope to floor drains.

- 3.4 **Floor Tile Installation (Cont'd)**
- .4 Floor tiles at floors without slopes, and base tiles may be installed with the thin set method using dry set mortar.
  - .5 Unless otherwise indicated provide 3 mm wide joints.
  - .6 Provided caulked control joints at 6 m on centres.
- 3.5 **Wall Tile Installation**
- .1 Install tile on dry wall surfaces with organic adhesive or thin set bond coat (TTMAC 200-5 & -5A). Install wall tile on masonry or concrete with organic adhesive or dryset mortar (TTMAC 200-3, -3A).
  - .2 Use presanded dry set mortar or latex Portland Cement mortar for setting tile on glass fiber reinforced concrete backer board base as follows:
    - .1 Fill space between edge of board & tub or shower receptor with mortar.
    - .2 Fill backer board joints and joints between backer board and other materials solid with mortar. Apply skim coat of mortar and embed fiberglass tape over joints.
    - .3 Apply mortar setting bed in one coat to 2.4 mm minimum thickness after tiles are beat in. Initially apply mortar coat smoothly, then notch.
  - .3 Set wall tile in adhesive with 2 mm joint maximum both vertically and horizontally. Carry tile to ceiling unless otherwise indicated.
  - .4 At internal corners where tile abuts tile, tile and grout one plane before commencing work on intersecting plane to ensure proper filling of void at corners. Grout corner joint with sealant, same colour as mortar grout.
  - .5 Do tile work before ceilings are begun. Provide level and straight termination 50 mm above ceiling heights.
  - .6 On cast-in-place concrete wall, use bonding agent before applying adhesive.
  - .7 Install joint filler and seal behind escutcheon plates at every pipe penetrating tile work.
  - .8 Consult and review tile patterns with architect/interior designer on site prior to installation.
- 3.6 **Grouting**
- .1 Remove mortar and adhesive from tile face as work progresses with CLEAN water.
  - .2 Commence grouting not earlier than 24 hours after setting tiles unless otherwise directed by grout manufacturer.
  - .3 Force maximum grout into joint so as to fill them flush, leaving no voids.
  - .4 Promptly as work progresses remove excess grout from adjacent tile surfaces with CLEAN water before grout establishes tight permanent adhesion.
  - .5 Cure grout in accordance with manufacturer's directions, minimum of 10 days.
  - .6 Use MORE™ Surface Acidic Cleaner - to remove grout haze from the surface. Product supplied by Olympia Tile & Stone.

- 
- |     |  |    |   |
|-----|--|----|---|
| 3.6 | <b><u>Grouting</u></b><br><b><u>(Cont'd)</u></b> | .7 | Seal all polished tiles with manufacturer's recommended sealer prior to grouting. Review and consult architect prior to tile installation and grouting. |
| 3.7 | <b><u>Control</u></b><br><b><u>Joints</u></b>    | .1 | Provide control joints at substrate control joint locations, at abutting dissimilar materials.  |
|     |  | .2 | Unless otherwise detailed provide control joints 10 mm wide and fill with control joint sealant.  |
| 3.8 | <b><u>Cleaning</u></b>                           | .1 | Thoroughly clean tiles in accordance with manufacturers' instructions rinse with clean water and polish with clean dry cloths.                          |
|     |  | .2 | <u>Deep Cleaning:</u> MORE™ Alkaline Cleaner, 1:4 ratio dilution with water, as needed.   |
|     |  | .3 | Remove all grout haze from all tiles.   |

**End of Section**

**PART 1 - GENERAL**

- 1.1 **General Requirements** .1 Comply with requirements of Division 1.
- 1.2 **Related Sections** .1 Cast-in-place Concrete: Section 03302  
.2 Masonry: Section 04200  
.3 Sealants: Section 07900
- 1.3 **Submittals** .1 Samples:  
.1 Colours and Patterns, unless otherwise specified herein or shown on Drawings, shall match terrazzo in existing building.  
.2 Submit two samples, 300 mm x 300 mm x 20 mm of each type of finish to be used on the work. Make changes in mix and prepare new samples of changed mix if required by Consultant, until samples are approved.
- 1.4 **Product Handling** .1 Deliver products to site and store packaged materials in original unopened containers with manufacturer's labels and seals intact.
- 1.5 **Protection** .1 Prohibit all traffic on terrazzo floors during installation, for 48 hours after installation, for 48 hours after initial grinding and application of curing compound, and 48 hours after final grinding, polishing and until final sealing.  
.2 Cover finished surfaces with stout fibre reinforced "Kraft" paper. Secure in place with gummed tape. Remove cover when requested by Architect.

**PART 2 - PRODUCTS**

- 2.1 **Materials** .1 Cement: To CAN/CSA-A5, type 10 grey for under bed and white for topping.  
.2 Sand: Fine and coarse aggregates to CAN/CSA-A23.1.  
.3 Water: Potable.  
.4 Marble Chips: Soundness and abrasion resistance. Grade chips in accordance with TTMAC standard.  
.5 Pigments: Non-fading mineral pigments in colours to match existing.  
.6 Divider Strips: 3 mm thick white alloy zinc with depth of 32 mm.  
.7 Accessories: Base caps and base divider strips, separator strips, purpose made and of same material to match divider strips.

- 2.1 **Materials** .8 Expansion Strips: 3mm thick white alloy zinc laminated both sides 3mm  
**(Cont'd)** black neoprene with depth of 32mm.
- .9 Curing Compound: To manufacturer's standard.
- .10 Cleaning Compound: To TTMAC standard 1001.
- .11 Sealing Compound: To TTMAC standard 2001.
- .12 Finishing Compound: To TTMAC standard 3001.
- .13 Reinforcing Mesh: 50mm x 50mm No. 16 x No. 16 steel mesh, welded,  
galvanized after fabrication conforming to CSA G30.5.
- .14 Slip Sheet: 2 mil polyethylene film to CGSB 70-GP-1, type 1.

### **PART 3 - EXECUTION**

- 3.1 **Workmanship** .1 Do terrazzo work in accordance with CSC Architectural Specification Study  
on Portland Cement Terrazzo, produced in cooperation with Terrazzo, Tile  
and Marble Association of Canada (TTMAC).
- 3.2 **Installation** .1 Install terrazzo after concrete slabs have cured 28 days.
- .2 Install divider strips true and level to detailed pattern.
- .3 Slope finished terrazzo floors to drains.
- .4 Produce terrazzo finished surfaces to match samples.
- .5 Floors: Floating terrazzo: broom clean base slab. Fill all voids with loose  
sand. Apply 1 ply polyethylene slip sheet over sand lapping joints  
minimum 100 mm.
- .6 Bases:
- .1 Terrazzo bases to TTMAC detail to match existing.
- .7 Clean, seal and finish terrazzo surfaces to TTMAC recommendations.
- 3.3 **Preparation** .1 Saturate base slab with water. Remove free water. Apply slurry  
**of Substrate** consisting  
of a thick paste of cement and water immediately preceding application of  
underbed.
- 3.4 **Underbed** .1 Provide underbed of thickness such that the finished thickness of  
terrazzo and underbed combined is not less than 64 mm.
- .2 Carefully place underbed to exact level, minimum 16 mm below finished  
floor level.
- .3 Build up underbed as may be required, to form any platforms, curbs and  
the like where indicated.
- .4 Cover underbed with 4 mil polyethylene film and allow to cure for a

- minimum of 24 hours before removing polyethylene film and placing terrazzo topping.
- 3.5 **Divider Strips**
- .1 Install divider strips in underbed while it is still in a plastic state. Locate divider strips as shown. If locations not shown, locate divider strips to form regular panels maximum 900 m x 900 m to Architect's approval.
  - .2 Where floor finish changes from terrazzo to other type of flooring at door openings and the like, extend terrazzo into opening and terminate against divider strip.
- 3.6 **Terrazzo Topping**
- .1 Soak underbed, remove excess water and place a slurry consisting of cement and colour using same proportions as used for topping.
  - .2 Use stainless cement, coloured if required to match approved sample and marble chips.
  - .3 Wet topping mixture, mix thoroughly and apply to underbed while slurry is still wet.
  - .4 Sprinkler topping with wetted marble chips using same formula used in topping mix to ensure finished surface will consist of marble chips to match approved samples.
  - .5 Roll topping with heavy rollers to compact topping and remove excess water and cement.
  - .6 Hand trowel to level terrazzo topping flush with top of divider strips and cure.
- 3.7 **Surfacing of Terrazzo**
- .1 Surface and grout terrazzo when it has set sufficiently hard. Surface by machine rubbing with #24 grit or finer abrasive blocks. Use plenty of water during grinding.
  - .2 Immediately following initial grinding, flush terrazzo surfaces thoroughly using water only and apply a grout to fill voids. Mix grout in same proportions of cement and colour as used for topping. Allow grouted surface to cure for at least 48 hours and then resurface by machine rubbing using #120 grit abrasive blocks and plenty of water.
  - .3 Following removal of grout, scrub thoroughly using machine scrubbers and Type 1001 cleaner. Rinse with clean water and then dry thoroughly. Dry clean with industrial vacuum cleaning machine, removing all traces of dust.
  - .4 Apply first coat of Type 2001 sealers, as soon after cleaning as possible. Apply sealer in accordance with manufacturer's written directions, and wipe off excess sealer before it dries.
  - .5 Apply second coat of Type 2001 sealer in same manner as first, but not until all other work is complete and terrazzo has been cleaned again as previously specified above.

- .6 Apply two coats of surface finish Type 3001.
  
- 3.8 **Repair to Existing Terrazzo**
  - .1 Repair existing terrazzo floors and coved bases as indicated. Remove existing topping in complete squares to the nearest divider strip.
  - .2 Reinstated work shall match adjacent existing terrazzo in all respects including chip and matrix proportion and colour and divider strip type and pattern.
  - .3 Where replacement is necessary, finish patched areas as specified for new work.

**End of Section**



**PART 1 - GENERAL**

- |     |                                    |    |  |               |
|-----|------------------------------------|----|--|---------------|
| 1.1 | <b><u>General Requirements</u></b> | .1 | Comply with requirements of Division 1.  |               |
| 1.2 | <b><u>Related Sections</u></b>     | .1 | Gypsum Board:  | Section 09250 |
|     |                                    | .2 | Painting:  | Section 09900 |
|     |                                    | .3 | Mechanical Fixtures:   | Division 15   |
|     |                                    | .4 | Electrical Fixtures:   | Division 16   |
| 1.3 | <b><u>Reference Standards</u></b>  | .1 | CAN/CGSB -92.1-M89, Sound Absorptive Prefabricated Acoustical Units.   |               |
|     |                                    | .2 | CAN/ULC-S102-M88, Surface Burning Characteristics of Building Materials.   |               |
| 1.4 | <b><u>Qualifications</u></b>       | .1 | Work to be performed by a qualified Contractor of recognized standing, who has personnel with experience of successful work on similar projects, and who has the necessary equipment to complete the work.   |               |
| 1.5 | <b><u>Submittals</u></b>           | .1 | <b><u>Samples</u></b>  |               |
|     |                                    | .1 | Prior to ordering materials submit, for Consultants' review, duplicate 300x300mm tile samples and duplicate samples of suspension system components.   |               |
|     |                                    | .2 | <b><u>Maintenance Data</u></b>   |               |
|     |                                    | .1 | Submit manufacturer's maintenance data for inclusion into the maintenance manuals specified in Division 1.   |               |
|     |                                    | .3 | <b><u>Maintenance Materials</u></b>  |               |
|     |                                    | .1 | Supply three boxes of each tile specified, for maintenance use. Comply with the requirements of Section 01700.   |               |
|     |                                    | .2 | Maintenance materials to be of same run as materials installed.  |               |
|     |                                    | .4 | <b><u>Certificates</u></b>   |               |
|     |                                    | .1 | Submit certificate, attested by professional engineer registered in Province of Ontario, signed and sealed by attesting engineer, affirming ceiling system has been designed, fabricated and installed to safely support light fixtures installed in it, to satisfy requirements of electrical inspection department of Ontario. |               |
|     |                                    | .2 | Have representative of tile manufacturer inspect the site and certify moisture levels are at an acceptable level for installation of tile.   |               |
| 1.6 | <b><u>Site Mock-up</u></b>         | .1 | Prior to commencing work, review all details and provide a mock-up for Consultants' review. Mock-up will remain in place throughout installation as a representation of finish work standard and may become part of finished work if approved by the Consultant.   |               |

- |     |  |    |   |
|-----|--|----|---|
| 1.7 | <b><u>Design Criteria</u></b>                | .1 | Maximum deflection: 1/360th of span to ASTM C635-76 deflection test.  |
|     |  | .2 | <u>Level:</u> suspension system to be erected to a maximum tolerance of 3mm over 3m length.   |
| 1.8 | <b><u>Product Delivery &amp; Storage</u></b> | .1 | Deliver materials to site in original sealed wrapping and containers. Store material in dry area free from dampness. Take precautions so no foreign matter contaminate materials.           |
|     |  | .2 | Store materials in work area 48 hours prior to commencing work.   |
| 1.9 | <b><u>Environmental Conditions</u></b>       | .1 | Install ceiling systems after building is completely enclosed and before cementitious building elements are complete and cured and humidity levels are acceptable to the tile manufacturer. |
|     |  | .2 | Maintain uniform minimum temperature of 15°C and humidity of 20-40% before and during installation.   |
|     |  | .3 | Ensure work to be concealed by ceiling systems has been installed, tested, inspected and approved before starting work.   |
|     |  | .4 | Coordinate with Division 15 and 16 for work to be built into work of this Section.  |

**PART 2 - MATERIALS**

- |     |                                    |    |  |
|-----|------------------------------------|----|--|
| 2.1 | <b><u>General Requirements</u></b> | .1 | Fabricate and install ceiling systems to ASTM C636-76.   |
| 2.2 | <b><u>Suspension System</u></b>    | .1 | All components formed from commercial quality cold-rolled zinc coated steel. Exposed finish: baked enamel, low gloss, white.                                 |
|     |                                    | .2 | <u>Suspension System:</u> Donn CE by CGC by Donn Canada Ltd. Or Equivalent by Bailey Metal Products or Armstrong.  |
|     |                                    |    | <b><u>Type ACT.1 &amp; ACT.2</u></b>   |
|     |                                    |    | Exposed Tee System with override cross tee to main tee connection.   |
|     |                                    |    | Main Tee                      38 x 38 mm Bulb Section  |
|     |                                    |    | Length                         3600 x 38   |
|     |                                    |    | Cross Tee                     38 mm wide   |
|     |                                    |    | Length                         1220 mm   |
|     |                                    | .3 | <u>Hanger Wire:</u> Galvanized, soft annealed steel 3.6mm thick.   |
|     |                                    | .4 | <u>Tie Wire:</u> 1.5mm soft annealed galvanized steel, double strand.  |
|     |                                    | .5 | <u>Anchors:</u> Self drilling tie wire anchor, Red Head T32, Phillips Drill Co. of ITT Ltd.  |
|     |                                    | .6 | <u>Carrying Channels:</u> Minimum 1.2mm thick cold rolled galvanized steel channels 38x13mm.   |
|     |                                    | .7 | <u>Accessories:</u> Splicers, fasteners, clips, outside corners, retainers as required to provide complete and finished work: manufacturer's standard types. |
|     |                                    | .8 | <u>Border Trim:</u> Armstrong Shadow Mould #7878 by Armstrong Ceiling Systems or equal.  |

- 2.3 **Acoustical Boards**
- .1 Mineral Fibre: **Type ACT.1**  
Size: 610mmx1220mm  
Thickness: 16mm  
Flame Spread: Fire Resistive  
NRC: 0.50  
STC: 35-39  
Manufacturer: Armstrong  
Type: Dune  
Pattern: Dune, square edge, lay-in No. 1851  
Finish: Factory applied vinyl latex – white
  - .2 Mineral Fibre: **Type ACT.2**  
Size: 610mmx1220mm  
Thickness: 16mm  
Flame Spread: Class 'A' Fire Resistive  
NRC: NA  
STC: NA  
Manufacturer: Armstrong  
Type: Kitchen Zone  
Pattern: Smooth, square edge, lay-in No. 672  
Finish: Factory applied – white  
Washable surface meeting USDA/FSIS guidelines for use in food processing areas.

### **PART 3 - EXECUTION**

- 3.1 **General Requirements**
- .1 Cooperate with other ceiling installers where acoustic ceilings and other ceiling types or bulkheads are installed as part of same ceiling system.
  - .2 Lay out ceilings in accordance with reflected ceiling plans and symmetrical within each area to obtain uniform borders at perimeter of room. Where layout is not shown, install ceilings as directed by Consultant.
  - .3 Finished work shall be plumb, level, and square with adjoining work.
  - .4 Cooperate with mechanical and electrical subcontractors and other trades. Assist in preparation of interference Drawings so services, fixtures and other penetrations are properly located in relation to the ceiling. Cut, fit and trim around services, fixtures and other penetrations.
  - .5 Where recessed light fixtures are covered with canopies, ventilate canopies.
- 3.2 **Preparation**
- .1 Locate hangers in accordance with specification careful not to interfere with services cast in concrete slabs.
  - .2 Percussion activated type anchors are not permitted.
- 3.3 **Suspension System Installation**
- .1 Install hangers to required length. Hangers shall be free from kinks, bends, twists and crimps, except those required for fastening. Saddle tie main runners to bent hangers. If hangers bend around or through runners and back on themselves, they shall be twisted around themselves at least twice.

- 3.3 **Suspension System Installation (Cont'd)**
- .2 Suspend ceilings directly from structural members or from carrying supported from structural members. Do not fasten hangers to steel deck.
  - .3 Hangers shall support grillage independently of walls, columns, pipes and ducts. Space hangers at maximum 1220mm o.c. along supporting grillage and not more than 150mm from ends.
  - .4 Make provisions for carrying fixtures occurring on and in suspended ceilings. Install additional hangers and reinforcing to ensure loads being carried do not compromise integrity of system. Frame around fixtures openings and changes in elevation as required.
  - .5 At light fixtures occurring on and in suspended ceilings, provide suspension hanger at each corner of fixture.
  - .6 Where ductwork, piping and other elements interfere with direct suspension of ceiling from structure, install additional framing securely fastened to main structure to accommodate proper hanging of ceiling.
  - .7 Install main tees in accordance with module size.
  - .8 Install cross tees perpendicular to main tees in accordance with module size. Interlock with main tees.
  - .9 Exposed members to be longest length possible to minimize joints. Distribute joints to prevent clustering in one area. Joints to be square, tight and flush so exposed faces of intersecting members are on same plane.
  - .10 Use no stabilizer bars. Securely, positively and mechanically interlock cross member to main runner so grid is adequately and stiffly braced and stabilized, yet members can be removed easily and adequate provision is made for expansion and contraction.
  - .11 Mechanically fasten border trim to suspension system or walls. Do not adhere with glue or adhesive. Maximum spacing of fasteners not to exceed 450mm o.c.
  - .12 Install border trim at junction of ceiling and walls and other materials around entire length of joint. Secure to construction. Butt joints neatly, square and true in alignment.
- 3.4 **Acoustical Board Installation**
- .1 Commence installation when all anchors, blocking, sound or fire barriers and mechanical and electrical work above ceiling has been inspected and approved by Consultant.
  - .2 Install acoustic units in true, level plane, on surface, recessed or concealed grid as indicated and scheduled.
  - .3 Install acoustic units with directional pattern running in same direction.
  - .4 Scribe acoustic units to suit ceiling layout, services, fixture and to fit adjacent work. Butt joints tight, terminate edges with moulding or trim as required.

- .6 Install services and fixtures on center of panels unless otherwise indicated.
  - .7 Identify panels below valves, controls and equipment requiring servicing, in ceiling space, with coloured upholstery tacks acceptable to Consultant.
- 3.5 **Cleaning**
- .1 Touch up scratches and abrasion. Replace damaged or improperly installed acoustic units or suspended grid.

**End of Section**

**PART 1 - GENERAL**

- |     |  |    |   |
|-----|--|----|---|
| 1.1 | <b><u>Reference</u></b>                  | .1 | Comply with requirements of Division 1.   |
| 1.2 | <b><u>Related Sections</u></b>           | .1 | Not Applicable.   |
| 1.3 | <b><u>Qualifications</u></b>             | .1 | Work of this Section to be performed by established Contractors of recognized standing having personnel experienced in this type of work and having the necessary equipment to complete the work. |
|     |  | .2 | All products listed in this Section are to be installed by an installer trained and approved by the listed product manufacturers or representatives.  |
| 1.4 | <b><u>Submittals</u></b>                 | .1 | <b><u>Samples:</u></b>  |
|     |  | .1 | Submit duplicate tiles/planks/sample pieces of each colour specified for approval.  |
|     |  | .2 | Direction of veining or marbleization in the floor tile will be in accordance with instructions issued by the Consultant when colour selection is made.   |
|     |  | .2 | <b><u>Maintenance Data:</u></b>   |
|     |  | .1 | Furnish the Owner with three copies of manufacturers printed maintenance instruction for inclusion in the maintenance manuals.  |
|     |  | .3 | <b><u>Maintenance Materials:</u></b>  |
|     |  | .1 | Deliver 25 tiles and/or planks of each colour pattern and type flooring material required for this project for maintenance use. Store where directed. Clearly identify each box.                  |
|     |  | .2 | Furnish to the Owner additional materials containing a total of at least 1% of each different colour or design of the indoor resilient athletic surface used on the project.                      |
|     |  | .3 | Delivery 10 m length rubber base. Store where directed.   |
|     |  | .4 | Maintenance materials to be same production run as installed materials.   |
| 1.5 | <b><u>Delivery and Storage</u></b>       | .1 | Deliver materials to the job in sealed, original, labeled containers.   |
|     |  | .2 | Store flooring materials in areas of application for at least 48 hours prior to installation.   |
| 1.6 | <b><u>Environmental Requirements</u></b> | .1 | Maintain minimum 20°C air temperature at flooring installation area for 3 days before, during and for 48 hours after installation.  |

**PART 2 - PRODUCTS**

- 2.1 **Materials**
- .1 Mastic Fill (latex underlayment): Bakelite Co. latex underlayment power/liquid or other approved manufacturer.
  - .2 RUB – Rubber Base: to meet the performance requirements of ASTM F-1861, Type TP and TV, Group 1 (Solid), Standard Specification for Resilient Wall Base.
    - .1 Tightlock Resilient Topset wall base is specifically designed for resilient installations where there is a transition from resilient flooring to carpet.
    - .2 6.35mm (1/4") thick – wedge design, ± 100mm (4") high, complete with inside/outside corners.
    - .3 Should not crack, break, or show any signs of fatigue when bent around a (6.4mm (1/4") diameter cylinder.
    - .4 Product Performance and Technical Data
      - ASTM F 1515 (Resistance to Light)..... ΔE<8
      - ASTM F 925 (Chemical Resistance)..... Pass
        - 5% acetic acid
        - 70% isopropyl alcohol, mineral oil
        - 5% sodium hydroxide solution
        - 5% hydrochloric acid solution
        - 5% sulfuric acid solution
        - 5% household ammonia solution
        - 5.25% household bleach solution
  - Rubber Wall Base:
    - ASTM E 84/ NFPA 255 (Flame/Smoke)..... Class A,  
<450
    - ASTM E 648/ NFPA 253 (Critical Radiant Flux)..... Class I
  - Acceptable rubber base manufacturers: Johnsonite, Nora, Roppe, Mannington.
  - Refer to Section 00865 Colour Schedule for colour selection(s).
  - .3 Metal Edge Strips: aluminum extruded, smooth mill finish with lip to extend under floor finish, shoulder flush with adjacent floor finish.
  - .4 Vinyl Reducing Strips: Minimum 25 mm wide x thickness of flooring on one side, tapered on the other side, minimum 915 mm long.

- 2.1 **Materials** .5 **VSF – Vinyl Sheet Flooring:** Tarkett by Johnsonite  
**(Cont'd)**
- a. Complies with requirements for ASTM F 1913 Standard Specification for Vinyl Sheet Floor Covering Without Backing.
  - b. iQ construction: no wax, no finish for life of product.
  - c. Roll/Sheet Width: 6' 6" (2 m)
  - d. Wear layer/Overall thickness: .080" (2.0 mm).
  - e. ASTM D 2047, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring of 0.6 or greater.
  - f. ASTM F 970, Standard Test Method for Static Load Limit – 250 PSI.
  - g. ASTM E 648, Standard Test method for Critical Radiant Flux of 0.45 watts/cm<sup>2</sup> or greater, Class I
  - h. Johnsonite offers a RESTART reclamation program for returning jobsite scrap
  - i. Contains 25% pre-consumer recycled content
  - j. 100% Recyclable
  - k. NSF-332 Platinum Certified
  - l. Phthalate-free (except for recycled material)
  - m. iQ Natural contains 16% rapidly renewable content (Castor Oil) and 75% Natural Materials
  - n. SCS FloorScore® Certified and meets California Specifications Section 01350
  - o. LEED contributions for Homogeneous Vinyl Sheet Flooring includes MR2; MR4; MR6 (iQ Natural) and EQ4.3
  - p. Johnsonite facilities are ISO 9001 and ISO 14001 Certified

Refer to Section 00865 Colour Schedule for colour selection(s).

Weld rods to match colour of product selected as per Colour Schedule.

### **PART 3 - EXECUTION**

- 3.1 **Inspection** .1 Ensure concrete floors are dry by using test methods recommended by tile resilient flooring manufacturers, and exhibit negative alkalinity, carbonization for dusting. Follow current ASTM F710 guidelines for the preparation of concrete slabs to receive resilient flooring.
- 3.2 **Subfloor Treatment** .1 Remove subfloor rides and bumps. Fill low spots, cracks, joints, holes and other defects with subfloor filler.
- .2 Prepare concrete substrates in accordance with ASTM F 710.
- 1. Concrete floors must be free of dust, solvent, paint, wax, oil, grease, residual adhesive, adhesive removers, film-forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds, alkaline salts, excessive carbonation or laitence, mold, mildew, and other foreign materials that may affect dissipation rate of moisture from the concrete, discoloration or adhesive bonding.
  - 2. Mechanically remove contamination on the substrate that may cause damage to the resilient flooring material. Permanent and non-



- 3.2 **Subfloor Treatment (Cont'd)**
- permanent markers, pens, crayons, paint, etc., must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.
3. Perform moisture testing as recommended by manufacturer. Proceed with installation only after substrates have been tested and meet the minimum requirements from the manufacturer in accordance with ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride or ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
  4. A pH test for alkalinity must be conducted on the concrete floor prior to installation with results between 7 and 9. If the test results are not within the acceptable range, then installation must not proceed until the problem has been corrected.
  - .3 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured.
  - .4 Apply filler as necessary where resilient flooring terminates at adjacent thicker flooring materials to insure top of finished flooring materials are flush Feather filler sufficiently to eliminate abrupt changes in elevation.
  - .5 Prime concrete to floor manufacturer's recommendations.
- 3.3 **General Application**
- .1 All flooring materials are to be installed wall to wall over entire floor areas prior to the installation of any cabinet work.
- 3.4 **Resilient Flooring Application**
- .1 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.
  - .2 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern.
  - .3 Install rolls in sequential order following roll numbers on the labels.
  - .4 Reverse non-pattern sheets as referenced in the Tarkett Installation Instructions.
  - .5 Roll the flooring in both directions using a 100 pound three-section roller.
  - .6 Install flooring to square grid pattern with all joints aligned.
  - .7 Cut tile or sheets and fit neatly around fixed objects.
  - .8 Install flooring in pan type floor access covers. Maintain floor pattern.

- .9 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.
- 3.4 **Resilient Flooring Application (Cont'd)**
- .10 Provide reducer strip fully bonded to floor where floor covering terminates exposing edge of floor.
- .11 For best results of resilient flooring:
- .1 When performing wet maintenance always use proper signage and prohibit traffic until the floor is completely dry.
- .2 Do not use excessive amounts of liquid during maintenance.
- .3 Do not use brown or black pads, equivalent brushes or stiff-bristled, highly abrasive brushes on resilient flooring.
- .4 The flooring should be protected with 1.4" or thicker plywood, hardboard or other underlayment panels if moving heavy objects over the flooring.
- 3.5 **Resilient Base Application**
- .1 Set base in adhesive tightly against wall and floor surfaces. Use lengths as long as practicable and not less than 600 mm long.
- .2 Install straight and level to variation of 1:1000.
- .3 Scribe and fit to door frames and other obstructions.
- .4 Wrap base around exterior corners as recommended by base manufacturer. Miter internal corners.
- .5 Apply base to all millwork surfaces in contract with the floor unless otherwise detailed.
- 3.6 **Protection and Cleaning**
- .1 Protect all adjacent surfaces from damage resulting from the work of this scope. Make good all damage.
- .2 Prior to final completion, inspect the work and do all necessary replacement or repair. Replace or repair floor covering which has not seated in a level plane with surrounding material. Replace all tile showing broken corners or fracture lines or imperfections of sub floor or adhesive. Replace all damaged rubber base.
- .3 Promptly as the work proceeds and on completion, clean-up and remove from the premises all rubbish and surplus material resulting from the work of this Section.
- .4 Promptly remove adhesive from surface of resilient materials as work progresses.
- .5 Leave resilient floors broom clean, free of building materials, rubbish, paint, adhesives, stains and spills.

**End of Section**

**PART 1 - GENERAL**

**1.01 General Requirements**

- .1 Conform with requirements of all Sections of Division 1, General Requirements, as it applies to the work of this Section.

**1.02 Related Sections**

- .1 Section 06100: Rough Carpentry.
- .2 Division 7 : Thermal and Moisture Protection.
- .3 Division 15: Mechanical.
- .4 Division 16: Electrical

**1.03 References**

- .1 General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- .2 **American Society for Testing & Materials (ASTM):**
  - .1 AST ASTM E 84-05 Standard Test Method for Surface Burning Characteristics of Building Materials. CLASS A
  - .2 ASTM D5420 Gardner Impact Exceeds 160 inch pounds
- .3 **Underwriters Laboratories of Canada (ULC)**
  - .1 CAN/ULC-S102, Surface Burning Characteristics

**1.04 System Description**

- .1 **Performance Requirements:** Provide hygienic wall covering manufactured and installed to maintain performance criteria stated by manufacturer without defects damage or failure.

**1.05 Submittals**

- .1 **Product Data:** Submit manufacturer's current printed product literature, specifications, installation instructions, and field reports in accordance with Section 01330 - Submittal Procedures.
- .2 **Shop Drawings:** Submit shop drawings to indicate materials, details, and accessories in accordance with Section 01330 - Submittal Procedures including but limited to the following:
  - .1 Submit a layout diagram indicating the location of each panel and joining method.
- .3 **Samples:** Submit duplicate sample pieces of material, as well as accessory pieces in accordance with Section 01300 - Submittal Procedures.
- .4 **Quality Assurance Submittals:** Submit the following:
  - .1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
  - .2 Manufacturer's Instructions: Current published manufacturer's installation and maintenance instructions.
  - .3 Manufacturer's Field Reports: Specified herein.

- .5 **Closeout Submittals:** Submit the following:
  - .1 **Operation and Maintenance Data:** Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.

1.06 **Quality Assurance**

- .1 **Installer Qualifications:** Installer experienced in performing work of this section who has specialized training in installation of work similar to that required for this project.
- .2 **Mock-ups:** Install at project site a job mock-up using acceptable products and manufacturer approved installation methods. Obtain Owner's and Consultant's acceptance of finish colour, texture and pattern, and workmanship standards.
  - .1 **Mock-Up Size:** 1200 mm x 2400mm.
  - .2 **Maintenance:** Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.
  - .3 **Incorporation:** Mock-up may be incorporated into final construction upon Owner's approval.
- 3. **Pre-installation Meeting:** Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

1.07 **Delivery, Storage & Handling**

- .1 **Ordering:** Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- .2 Deliver, store and handle wall panels in accordance with Section 01610 - Basic Material Requirements.
- .3 Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- .4 Store materials protected from exposure to harmful weather conditions, at temperature and humidity conditions recommended by manufacturer.
- .5 Store panels in temperature controlled environments. Leave protective blue film on panel until ready to use.

1.08 **Waste Management & Disposal**

- .1 Deposit all packaging materials in appropriate container on site for recycling or reuse.
- .2 Avoid using landfill waste disposal procedures when recycling facilities are available.

1.09 **Project Conditions**

- .1 **Temperature Requirements:** If storage temperature is below 65F (18C), the wall panel must be moved to a warmer place and allowed to reach this temperature before installation.

- .2 Maintain air temperature and structural base temperature at installation area between 65F (18C) and 80F (26C) for 48 hours before, during and 24 hours after installation.

#### 1.10 **Warranty**

- .1 **Manufacturer's Warranty:** Submit manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
- .2 Warranty Period shall be 20 years commencing on Date of Substantial Completion.

#### 1.11 **Maintenance Materials**

- .1 Provide extra materials of product and adhesives in accordance with Section 01700 - Closeout Submittals.
- .2 Provide 3.0 M<sup>2</sup> of each colour, pattern and type material required for project for maintenance use. Materials to be from same production run as installed materials.

### **PART 2 PRODUCTS**

#### 2.01 **Manufacturer**

- .1 This specification is based on products manufactured by:
  - .1 Altro CANADA: 6221 Kennedy Road, Unit 1, Mississauga, ON L5T 2S8  
Toll-free: 800.565.4658 Tel: 905.564.1330 Fax: 905.564.0750  
E-mail: [support@altrofloors.com](mailto:support@altrofloors.com) Web Site: [www.altrofloors.com](http://www.altrofloors.com).
  - .2 **Contact:** Chris Johnson 416-428-3964

#### 2.02 **Hygienic Wall Cladding (WP-1)**

- .1 **Acceptable material:** Altro Whiterock Satins Wall Cladding - 100% pure vinyl, extruded, semi-rigid PVCu sheet containing no plasticizers or fillers.
  1. **Thickness:** 0.10" (2.5 mm)
  2. **Panel Width:** 4' (1.22m)
  3. **Panel Height:** 8.2' (2.5m);
  4. **Weight:** 4'x8' Panel: 24 lbs (10.4 kg)
  5. **Colour:** Refer to Section 00865 Colour Schedule

#### 2.03 **Accessories**

- .1 **Vinyl welding rod:** Altro weld rod - WSR/\*\* colour
- .2 **Joint Strips:**
  - 1-Part Joint Strip – [G831/25/\*\* colour] Length 98.5"
  - 2-Part Joint Strip – [A831/25/\*\* colour] Length 98.5"
- .3 **Cut-Tile Transition Strips:**
  - 1-Part Transition Strip – [G832/25/\*\* colour] Length 98.5"
  - 2-Part Joint Strip – [A832/25/\*\* colour] [G831/30/\*\* colour] Length 98.5"
- .4 **Start and Edge Trim:**
  - 1-Part Start and Edge Trim – [G833/25/\*\* colour] Length 98.5"
  - 2-Part Start and Edge Trim – [A833/25/\*\* colour] Length 98.5"

- .5 **Stainless Steel Accessories:**
  - .1 Stainless Steel Corner Protector – [A861/12 Brushed Steel] Dimensions:  
4' x 2 ½" x 2 ½"
  - .2 1-Part Stainless Steel Joint Strip – [A855 Brushed Steel] Length 7'
  - .3 Stainless Steel Capping – [A865 Brushed Steel] Length 8'
- .6 **Polyurethane Adhesive:** The default adhesive for most installations, suitable for wet area, non-climate controlled areas, and non-absorbent surfaces: AltroFix W39, a two-part resin-based polyurethane adhesive as recommended by manufacturer.
- .7 **Caulking and Sanitary Sealant Compounds and Tools:**
  - .1 FlexiJoint Coil – [FJ\*\* colour] Length 164 linear feet
  - .2 FlexiJoint Steel Spacers (engineered steel)
  - .3 Parabond Adhesive Sealant - [AP600] 10 oz Tube
  - .4 Altro Sanitary Sealant – [A803 Clear, A806/\*\* colour] 10.5 oz Tube

#### 2.04 **Source Quality**

- .1 **Source Quality:** Obtain wall products from a single manufacturer.

### **PART 3 EXECUTION**

#### 3.01 **Manufacturer's Instructions**

- .1 **Compliance:** Comply with manufacturer's product data, including product technical bulletins, product catalog, installation instructions and product label instructions for installation.

#### 3.02 **Examination**

- .1 **Site Verification of Conditions:** Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

#### 3.03 **Substrate Preparation**

- .1 Walls must be smooth and level. High points must be removed and low points filled with filler intended for the substrate and environmental conditions.
- .2 Surfaces must be permanently dry and free from all substances that may contribute to adhesive bond failure.
- .3 Remove loose paint and conduct an adhesive bond test with paint.
- .4 Dry wall substrates should be paint ready.

#### 3.04 **Preparation**

- .1 All surfaces must be free from dust and cleaned prior to wall cladding installation. The working environment must also be dust free. Failure to comply with these conditions will reduce the bond strength between the adhesive and substrate, and may cause the panels to debond.
- .2 Very absorbent / porous substrates (particularly plaster finishes and unprimed sheetrock) must have a proprietary sealer e.g. PVA primer or similar, applied to the surface a minimum of 12 hours prior to the installation.

- .3 All electrical switches, power points etc., should be in a first fix / installation state.
- .4 All pipes, fixing bolts, etc. extending through the panels should have a minimum 1/8" (3mm) expansion gap and be sealed using Altro Sanitary Sealant.
- .5 The panels must be stored on a level flat surface off the ground (risk of condensation on the panels if stored on damp surfaces). Storage on uneven surfaces could cause the panels to distort prior to installation.

3.05 **Installation**

- .1 **Wall Installation:** Install panels in accordance with the current Manufacturers Installation Guide. All joints should be joined by approved methods as detailed in the installation guide.

3.06 **Cleaning**

- .1 Once all panels and joints are installed, remove protective film and clean all surfaces down with antistatic solution or antistatic wipes. This is required as the panel may have static build up and any dust in the atmosphere will adhere to the surface of the panel.
- .2 Panels can be cleaned with a diluted soap/detergent solution, such as Altro 44 Cleaner.
- .3 When cleaning the panel surface, the temperature of water must not exceed 140° F (60° C).
- .4 Remove construction debris from project site and legally dispose of debris.

**End of Section**

## PART 1 – GENERAL

### 1.1 This Section Includes:

1. All painting work, as per contract documents.
2. Surface preparation.
3. Finish coats.

### 1.2 References:

1. C.P.C.A. Canadian Painting Contractors Association - Painting Manual.
2. C.G.S.B. Standards for paint.
3. All surfaces shall be prepared in accordance with **Chapter 2 for Interior Work** of the Master Painters and Decorators Association Painting Manual, latest edition.
4. All metal surfaces to receive coatings shall be cleaned to SSPC-SP1 (Solvent Washing) prior to painting as herein specified.
5. All metal surfaces exposed during repairs and/or exhibiting rust shall be cleaned to SSPC-SP2 or SSPC-SP3 standards and primed with an approved rust inhibitive primer prior to recoating as specified.
6. While the method of application shall be as by the generally accepted trade method, both coats (prime coat and finish coat) must receive mechanical action such as roller or brush application. Spray and backroll.

### 1.3 Environmental Requirements:

1. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 7<sup>o</sup>C for 24 hours before and during and 48 hours after application.

### 1.4 Scope of Work:

1. Clean and degrease all masonry walls, vents, grills, stair railings, ladders; interior of doors and frames, including the overhead shop doors in these two shops.
2. Repair, spot prime and repaint all previously painted walls, vents, grills, stair railings, ladders, interior of doors and frames, including the overhead shop doors as required.

## PART 2 - PRODUCTS

### 2.1 Acceptable Manufacturers and Product:

1. Paints, stains and varnish:
  - a) General Paint
  - b) Benjamin Moore
  - c) Sherwin Williams
  - d) Zinsser
  - e) Glidden
  - f) Sikkens Canada
  - g) PPG



2. Latex Semi-Gloss all light colours only,( SG)
  - General Paint 59-Line Z-Coat
  - Benjamin Moore #224, Moore ECO-SPEC
  - Sherwin Williams-Harmony #6403-36178, B10 W 951
3. Latex Water Based Epoxy – (LEP)
  - Sherwin Williams B70W00211-Waterbased catalyzed epoxy extra white / Tint base A / B60V00025 – Water based Catalyzed epoxy Semi Gloss Hardener Part B.
  - Glidden – 4420 –True Glaze Water born epoxy / 4426 True Glaze semi gloss converter.
4. High Gloss Epoxy - (HGEP)
  - PPG, HPC High Gloss Epoxy 95-501 – two component, high solids,low VOC epoxy topcoat
5. Latex Super Adherent Primer,
  - General Paint 51-050 Premium Latex Plastic Primer
  - Benjamin Moore # 23-00 Freshstart Acrylic Primer Sealer
  - Zinser 1-2-3 Acrylic Primer Sealer
  - Sherwin-Williams –B51WQ8850-Adhesion Primer White
  - Glidden Latex super undercoat 94280
6. Interior Latex Block Filler, C.G.S.B. Standard #-GP-188M
  - General Paint 70-224 Premium Latex Block Filler
  - Benjamin Moore # 595-01 Latex Block filler
  - Glidden # 36250 Concrete Block Filler
  - Sherwin Williams B42W00046 Heavy Duty Block Filler
7. Stain Suppresent Sealer/Primer Hi-Hide, C.G.S.B. # 1-GP-119M (Prior approval Required)
  - General Paint 60-200 X-Terminator 2 Latex Sealer
  - Zinsser BIN Primer, hi-hide (spot prime only)
  - Zinsser Bulls-eye Odourless
  - Sherwin-Williams –B49WQ8820 Multipur LTX Pr Wh
  - Glidden / Jammer 200

## 2.2 **Materials:**

1. Colours shall be those of the Consultants Colour Schedule. All primers and undercoats may be tinted to no more than 25% of the intensity of the finish colour. Where deep/intense colours are specified, only colours from the nearest factory premixed colour selection shall be altered to match those specified. The application of Clear Base Deep Tints in either Primer or Finish is not acceptable.
2. All primer and paint must be delivered to the job site in manufacturer's original containers.
3. All materials used in this painting contract are to be applied according to product label directions and in accordance with information stated on the Products Data Specification sheet.
4. Unless otherwise indicated two coats of the specified finish paint are required.
5. Any work not conforming to the specification, or not meeting with the approval of the Consultant or Owner's representative, shall be removed or corrected and or/repainted.
6. Manufacturer's sales representatives shall perform inspections on the owner's behalf. In order to ensure compliance with product specifications.
7. Primer and subsequent top coats are to be products from **same** manufacturer

### PART 3 - EXECUTION

#### 3.1 Inspection:

1. Verify that all surfaces and substrate conditions are ready to receive work, as per the instructions of the product manufacturer.
2. Minimum application temperatures for latex paints:  
- interior 7<sup>o</sup>C; exterior 10<sup>o</sup>C.
3. Beginning of installation means acceptance of site conditions.

#### 3.2 Preparation:

1. The painting contractor shall be wholly responsible for the quality of his work, and is not to commence any part of it until surface is in proper condition.
2. If the painting contractor considers any surface unsuitable for proper finishing, he is to notify the Architect or the Owner's representative of this fact in writing. He is not to apply any material until corrective measures have been taken or they have instructed him to proceed.
3. All surfaces are to be clean, dry, and free from contaminates such as, but not limited to oil, grease, or dust. If for any reason the surface cannot be cleaned, this condition shall be reported to the Architect or the Owner's representative promptly.
4. If the painting contractor has been instructed by the Architect or the Owner's representative to begin painting under conditions and circumstances he believes could result in poor performance and early failure of the coatings, he shall request an order to proceed in writing. The first coat of primer or finish should be applied soon after surface has been cleaned properly to prevent contamination of the substrate.
5. All manufacturers' directions must be followed regarding surface and product preparation. Product failure due to non-compliance and any indicated corrective measures, shall be the contractor's responsibility. Surface irregularities and blemishes shall be repaired with materials which match strength, and texture of surrounding surfaces.
6. **Walls and Ceilings:** Preparation shall consist of a strong solution of tri-sodium phosphate and water, followed by a clear water rinse. Thoroughly scrub entire surface with solvent. Replace cleaning rags frequently to avoid spreading the surface contaminants around. Repeat process at least once. Use clean rags for final cleaning.
7. **Metal surfaces:** Such as but not limited to; hollow metal doors and frames, ducts, metal roof decks. Use TSP to remove protective oil films consistent with SSPC -SP1. All surfaces must be free of grease, oil, mildew, dirt and shall be cleaned in accordance with SSPC-SP1 Solvent cleaning. This method employs the use of emulsifiers or solvents to remove surface contaminants such as oil, grease, soil, cutting compounds, etc. Thoroughly scrub entire surface with solvent. Replace cleaning rags frequently to avoid spreading the surface contaminants around. Repeat process at least once. Use clean rags for final cleaning. Use this cleaning standard as a first step prior to any abrasive blasting standards.
8. **Wooden surfaces:** All surfaces must be free of grease, oil, wax, and dust. Use TSP to remove surface contaminants. Thoroughly scrub entire surface with solvent using steel wool or scotch brite pads. Replace cleaning rags frequently to avoid spreading the surface contaminants around. Repeat the process at least once. Use clean rags for final cleaning.

9. **Existing Walls and Ceilings:** Loose or flaking paint must be removed, and feather edge sanded to produce a smooth uniform surface. Any defects should be filled with an appropriate patching compound. Bare surfaces or patch compound must be primed with specified primer. High gloss painted surfaces must be dulled with sandpaper especially those that are high gloss alkyd, urethane or epoxy.
10. **Existing Metal Surfaces :** Such as, but not limited to previously painted hollow metal doors and frames, ducts, metal roof decks. Remove loose mill scale, non-adherent rust, scaling paint, and other foreign matter consistent with SSPC-SP2 by employing the use of scrapers, sandpaper, wire brushes, or hand impact tools. Bare surfaces must be primed with specified primer. High gloss painted surfaces must be dulled with sandpaper especially those that are high gloss alkyd , urethane or epoxy.
11. **Existing Wooden Surfaces:** All surfaces shall be free of loose or failing paint or clear coatings. Sand using 100 grit sand paper with the grain or employ a paint scraper in a manner consistent with removing the coating only so as to not damage the surface of the wood. Paint stripper may be employed taking care not to contact and damage adjacent surfaces. Sand surface to a final smoothness with the grain using 220 grit sandpaper wipe surface with a clean tack cloth to remove sanding dust. Spot prime any bare wood areas with the appropriate primer or clear coating.
12. Prepare surfaces in accordance with covering manufacturer's instructions.

### 3.3 **Applications:**

1. Perform mandatory surface cleaning and preparation prior to commencing this section.
2. Application of primers and finishes shall be by brush, roller, spray, or a combination of those methods.
3. On each designated substrate, apply in compliance with this specification, only the approved products or product combinations.
4. **Concrete Block - New (Approved primer and finish combinations):**
  - Latex block filler / 1 coat
  - Latex water based epoxy 2 coats or latex water based Semi gloss/ 2 coats where noted on Room Finish Schedule
5. **Drywall Board**
  - Latex super adherent primer 1 coat
  - Latex water based Semi Gloss or Egg Shell/ 2 coats where noted on Room Finish Schedule.
  - HGEP high gloss epoxy - where noted on drawings and Room finish schedule
6. **Hollow Metal Doors/Frames and Metal Ductwork**
  - Latex super adherent primer 1 coat
  - Latex water based epoxy 2 coats.
7. **Metal Roof Decks New (Approved primer and finish combinations):**
  - General Paint 10900 Alkyd Dryfall. Apply one coat: spread rate, 250 square feet per 3.78 litre container on smooth surfaces and 75 square feet on corrugated steel. Each coat wet thickness: 4.6 mils. Each coat dry thickness: 2.0 mils.

- Benjamin Moore and Co. Ltd. #597-01 Sweep-Up Spray Latex Flat. Apply one coat: spread rate, 255 square feet per 3.79 liter container. Each coat wet thickness: 6.3 mils. Each coat dry thickness: 2.5 mils.
  - Glidden #10120 Spraymaster Latex Eggshell. Apply one coat: spread rate, 264 square feet per 3.78 liter container. Each coat wet thickness: 6.0 mils. Each coat dry thickness: 2.0 mils.
9. Apply products in accordance with manufacturer's instructions.
  10. Sand lightly between coats to achieve required finish.
  11. Do not apply finishes to surfaces that are not dry.
  12. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surfaces.

3.4 **Protection:**

1. Protection (drop sheets, tarps, plywood decking and masking) for surfaces not being painted under this specification, shall be supplied and kept in place during the project. It will be the contractor's responsibility to repair any and or all damaged surfaces.
2. Wall mounted electrical fixture face plates, such as but not limited to; receptacles, switch boxes, cover plates etc., are to be removed before painting and are to be replaced at completion of painting.
3. Upon completion of a room or area, it shall be left in a clean and orderly condition, and all paint splatters, contaminated rags and trash shall be removed.
4. Upon completion of the job, the painting contractor is to remove all surplus materials, scaffolds, that relate to his trade, from the premises.
5. It will be the contractor's responsibility to ensure the rooms being painted have adequate fresh air for safe occupancy by workers.

3.5 **Cleaning:**

1. As work proceeds, promptly remove paint where spilled, splashed or spattered.

**End of Section**

**PART 1 - GENERAL**

- 1.1 **General Requirements** .1 Comply with requirements of Division 1.
- 1.2 **Qualifications** .1 The following manufacturers are acceptable:
- .1 Architectural School Products - Mississauga
  - .2 CVET1 Products Ltd.
  - .3 Martack Specialties Ltd.
  - .4 Forbo
  - .5 Global School Products
- 1.3 **Guarantee** .1 Provide the following guarantee in accordance with the General Conditions, notwithstanding the time provisions therein to replace whiteboards showing any manufacturing defects which impair proper use of board.
- Ten years material and labour.**
- 1.4 **Submittals** .1 **Shop Drawings**
- .1 Provide shop drawings in accordance with the General Conditions. Show dimensional layouts together with fabrication and installation details based on site conditions.
  - .2 **Samples**
    - .1 Submit samples to the Consultant, if requested, for perusal and approval of all materials to be utilized in this installation.
- 1.5 **Inspecting** .1 Inspect all surfaces for irregularities, trueness, and rigidity and projections and notify the General Contractor for correction.
- .2 On completion of the installation all materials and workmanship to be inspected for proper operation, rigidity and appearance, and any defective materials to be replaced with the materials prior to final inspection.
- 1.6 **Product Delivery & Storage** .1 Deliver whiteboards and tackboards to site in properly packed crates. Store material in dry area within building held off floor on 50 mm x 100 mm blocking.
- 1.7 **Protection** .1 During installation utmost care is to be taken by workmen to ensure the protection of the work from damage by other trades until the building is ready for occupation and handed over to the owner.
- .2 Protection of all materials during the painting operation shall be carried out by the use of polyethylene covering which shall be the responsibility of the painting contractor.

**PART 2 - PRODUCTS**

- 2.1 **Whiteboard** .1 12.7 mm thick porcelain enamelled board with minimum 0.75 mm thick steel writing surface laminated to 11 mm impregnated fibreboard core and 0.48 mm thick stretcher levelled zinc coated steel back sheet.

- 2.2 **Tackboards** .2 Porcelain enamel finish shall meet requirements of the Porcelain Enamel Institute Standard S104. Acceptable finish: Duracite.  
.1 6 mm thick natural cork, fine grain, factory laminated to 6 mm thick particleboard, to maximum size of 1.22 x 2.44 m. Tackboards to meet all requirements of O.B.C. for flame spread ratings.
- 2.3 **Trim** .1 Whiteboard and Tackboards:  
.1 Material: Extruded aluminum sections, 6063-T5 alloy.  
.2 Design: Series 200 by Architectural School Products (A.S.P.).  
.3 Perimeter trim: A.S.P. #207 and #207 divider  
.4 Maprail above each whiteboard and tackboard: Kwickgrip display rail.  
.5 Rail below each whiteboard: A.S.P. #212.
- 2.4 **Finishes** .1 Whiteboards: White.  
.2 Trim: Clear etched and anodized.
- 2.5 **Fabrication** .1 Pre-assemble, as far as possible, whiteboards and tackboards in factory.  
.2 Trim joints shall be hairline type, neat and tight, mitre corners.  
.3 Affix a label to upper right-hand corner of each whiteboard unit, stating manufacturer's recommended care and maintenance instructions.

### **PART 3 - EXECUTION**

- 3.1 **Installation** .1 Erection of materials to be carried out by competent craftsmen supervised by a foreman with at least two years experience in this specialized field.  
.2 Overhead work such as ceiling girds, plumbing, electrical services, communications systems, painting, etc., to be in an advanced stage of completion in order not to impede this sub-contractor. Millwork units forming integral part of the whiteboard/tackboard installation to be located and affixed to the walls before commencing whiteboard/tackboard installation.  
.3 Install Whiteboards and tackboards in accordance with manufacturer's printed instructions.  
.4 Install whiteboards and tackboards plumb, square, in true plane and fasten securely to substrate.  
.5 All fastenings shall be concealed.  
.6 Ensure that where boards are joined the joint is uniform, neat and tight, and the boards are properly aligned.  
.7 Field measure masonry recess for gymnasium whiteboard. Custom fit to allow a maximum of 12 mm space between trim and block.

- 3.1 **Installation** .8 Tackboards to be adhered to wall surface by the use of an adhesive as recommended by the supplier applied in egg-size blobs at approximately 200 mm centres. Tackboards to be pressed firmly into this adhesive to ensure proper adhesion.
- (Cont'd)** .9 Whiteboards to be joined together by the use of a 14-gauge x 25.4 mm wide steel spline and an extruded polyvinyl slotted insert to ensure a flush butt joint with a hairline appearance.
- .10 All writing boards are to be whiteboards.
- 3.2 **Cleaning** .1 Upon completion of all work clean down, remove all stains, loose dirt and excessive adhesive, and leave all elements in a first-class condition at the point of handing over to the owner.

**End of Section**

**PART 1 - GENERAL**

- 1.1 **General Requirements** .1 Comply with requirements of Division 1.
- 1.2 **Related Sections** .1 Concrete bases: Section 03300  
.2 Wood grounds & blocking: Section 06100
- 1.3 **Qualifications** .1 Installation of lockers shall be by locker manufacturer.  
.2 This Specification is based on "Emperor" lockers manufactured by Hadrian Manufacturing Inc. The following Manufacturers will also be acceptable provided they conform with requirements specified herein:  
.1 "Shanahan" Deluxe 16 distributed by W.G. Wood Sales Ltd.  
.2 "Elite" by General Storage Systems (GSS)
- 1.4 **Submittals** .1 **Shop Drawings**  
.1 Submit detailed shop drawings showing locker layout, sizes, thicknesses of materials, construction, trim pieces, finishes, numbering and installation details.  
.2 **Samples**  
.1 Submit duplicate sets of manufacturer's standard colour samples.

**PART 2 - PRODUCTS**

- 2.1 **Locker Materials** .1 **Sheet steel**: cold rolled, stretcher levelled, plain commercial galvanized or wipe coated conforming to ASTM A526.  
.2 **Baked enamel**: synthetic type, providing good flexibility, adhesion, hardness and resistance to marring.  
.3 **Frames**: 16 ga steel welded box section.  
.4 **Doors**: 16 ga. outer panel, and 24 ga steel inner panel welded together to form a rigid box construction. Doors shall be flush, proud doors will not be accepted. Doors shall have honeycomb core bonded to inner surfaces. Lighter gauge doors will not be acceptable.  
.5 **Body**: 24 ga steel, formed edges to provide rigid assembly.  
.6 **Metal Hasp**: Single point locking shall be by means of a padlock and 11 ga metal hasp (Padlock N.I.C.), which fit into a recessed steel chrome plated pocket. Plastic or vinyl hasps will not be accepted.  
.7 **Shelf and bottom**: 22 ga steel.  
.8 **Sloped Tops**: 16 ga. steel.  
.9 **Base**: Individual galvanized box base



- 2.2 **Existing Relocated Lockers**
- .1 Remove and relocate/reinstall existing lockers as shown on drawings.
  - .2 Reinstall lockers in same manner as for new lockers. Any damage to the locker bodies and locker finish resulting from the work of this section is to be repaired to match existing.
  - .3 **Exterior trim**
    - .1 Provide new continuous trim around all edges of complete relocated locker banks. Colour of trim to match existing.
    - .2 Provide filler panels where obstructions or if the width does not permit the use of a standard locker. Colour of filler panels to match existing.
    - .3 Grind all welds smooth, hem all exposed or sharp edges of sheet metal.
- 2.3 **Locker Finish**
- .1 Clean and degrease all metal.
  - .2 Chemically pre-treat galvanized surfaces, apply two coats of enamel and bake on under controlled temperature conditions.
  - .3 Produce uniform, smooth, lustrous and hard furniture finish.

### **PART 3 - EXECUTION**

- 3.1 **Installation**
- .1 Securely anchor lockers and associated trim to supporting building elements. Use concealed fasteners.
  - .2 Install locker batteries and trim sections in true alignment, plumb and level.
  - .3 Rigidly bolt lockers back to back and side to side in banks.
  - .4 Provide dummy panels where required or where indicated on Drawings.
  - .5 Recessed lockers shall be trimmed at each battery end and top with recessed trim as detailed.
  - .6 Install closures, fillers and trim where shown and where required to provide finished appearance. Provide trim, fillers and closures of profile acceptable to Consultant. Install in longest possible lengths.
  - .7 Upon completion, test doors, and adjust, if required for proper functions. Touch up minor surface scratches. Replace damaged components as directed by the Consultant.

**End of Section**

**PART 1 - GENERAL**

- 1.1 **General Requirements** .1 Comply with requirements of Division 1.
- 1.2 **Related Work** .1 Structural support framing Section 05120
- 1.3 **System Description** .1 Manually operated, end stacking, centred on track, top supported series of sliding glass panels.
- 1.4 **Quality Assurance** .1 This specification is based on the following system:
- .1 Modernfold Glass Wall Model COMPACTLINE as manufactured by Modernfold Inc. and distributed by Bravura [estimating@bravuradesign.com](mailto:estimating@bravuradesign.com)
- .2 Preparation of the opening shall conform to the criteria set forth per ASTM E557 Standard Practice for Architectural Application and Installation of Operable Partitions.
- .3 Floor Conditions: ensure that the variation in floor levels, along the centerline of the partition will not exceed +/- 6mm per 3000mm, on a non-cumulative basis, and for 760mm on each side of the partition center line. The maximum allowable variation from one end of the opening to the other will not exceed 12mm.
- 1.5 **Submittals** .1 **Shop Drawings:** Submit detailed shop drawings. Indicate dimensions, weights, conditions at openings and at storage areas, and required installation, storage, and operating clearances. Indicate location and installation requirements for hardware and track including floor tolerances required and direction of travel. Indicate blocking to be provided by others.
- .2 **Setting Drawings:** Show imbedded items and cutouts required in other work, including support beam punching template.
- .3 **Samples:** Color samples demonstrating full range of finishes available for selection by architect. Verification samples will be available in same thickness and material indicated for the work.
- .4 Submit operating and maintenance instructions for inclusion into maintenance manual specified in Section 01700.
- 1.6 **Warranty** .1 Partition Panels shall be guaranteed for a period of two (2) years with track system guaranteed for a period of five (5) years. This guarantee is against defects in material or workmanship of manufacturer's product.

## **PART 2 - PRODUCTS**

- 2.1 **Materials & Fabrication**
- .1 **Partition Panels:**
- .1 **Aluminum:** Alloy and temper recommended by aluminum producer and finisher for type of use, corrosion resistance, and finish indicated; ASTM B221 (ASTM B221M) for extrusions; manufacturer's standard strengths and thicknesses for type of use.
- .2 **Glass Type:** Tempered, 13mm (1/2-inch) complying with safety standards specified in ANSI Z97.1 CPSC16, CFR1201, ASTM C1036 and ASTM C1048.
- .3 **Glass Finish:** Clear tempered
- .4 **Top and Bottom Rails:** 124mm clear satin aluminum contoured top and bottom rails.
- .2 **Operation:**
- .1 Manually operated and top-supported series of individual glass panels. Panels use two-piece, clamp-on top and bottom rail that fastens together from alternating sides.
- .2 **Final Closure:**
- .1 New Family Studies 6-20: Pivot panel.
- .2 New Family Studies 6-22: Pivot panel.
- .3 **Suspension System:** G-330 Suspension System "Smart Track"
1. **Suspension Tracks:** Extruded aluminum with a minimum wall thickness of 0.235 inches (6 mm). Incorporate cast aluminum or mitered intersections, switches, and curves in stacking area. Provide alignment pins for track, intersections, switches and curves insuring both fit and roller surface integrity.
2. **Carriers:** Two stainless steel trolleys with vinyl roller surfaces. Trolley design incorporates eight (8) wheels of varying dimensions. Automatic indexing of panels into stack area is provided by pre-programmed switches and trolleys without electrical, pneumatic, or mechanical activation.
- .3 **Exposed Track Soffit:** Factory-finished aluminum with white powder coat.
- .4 **Pass Doors:**
- .1 **Sliding Swing Doors:** Top hung operating swing door, rails heights to match partition rails providing uniform appearance. One pass door to be provided for each sliding glass partition.

- |     |   |    |  |
|-----|---|----|--|
| 2.1 | <b>Materials &amp;<br/>Fabrication<br/>(Cont'd)</b> | .2 | <b>Hardware:</b>                       |
|     |   | .1 | Automatic Door Closer: overhead closer |
|     |   | .2 | Push/Pull Bars:                        |
|     |   | .3 | Mortise Cylinder Floor Locks           |
|     |   | .3 | Door pulls back-to-back - Pivot Panel. |
|     |   | .1 | Not required                           |

### **PART 3 - EXECUTION**

- |     |   |    |  |
|-----|---|----|--|
| 3.1 | <b><u>Installation</u></b>                  | .1 | Comply with ASTM E557, operable glass partition manufacturer's written installation instructions, Drawings, and approved Shop Drawings.  |
|     |   | .2 | Install operable glass partitions and accessories after other finishing operations, including painting, have been completed.   |
|     |   | .3 | Match operable glass partitions by installing panels from marked packages in numbered sequence indicated on Shop Drawings.   |
|     |   | .4 | Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.  |
|     |   | .5 | The complete installation of the partition system shall be by an authorized factory trained installer.   |
|     |   | .6 | Include all accessories and installation of complete assembly. Any damage to walls or floor must be made good.   |
| 3.2 | <b><u>Schedule</u></b>                      | .1 | Provide operable glass partitions and accessories complete with pass doors in the following rooms:   |
|     |   | .1 | New Family Studies 6-20  |
|     |   | .2 | New Family Studies 6-22  |
| 3.3 | <b><u>Cleaning &amp;<br/>Protection</u></b> | .1 | Clean metal and glass surfaces upon completing installation of operable glass partitions to remove dust, loose fibers, fingerprints, adhesives, and other foreign materials according to manufacturer's written instructions.  |
|     |   | .2 | Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer that ensure operable glass partitions are without damage or deterioration at time of Substantial Completion.   |
| 3.4 | <b><u>Adjusting</u></b>                     | .1 | Adjust operable glass partition to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and other moving parts. |

- 3.5     Demonstration .1     Demonstrate proper operation and maintenance procedures to Owner's representative.

**End of Section**

**PART 1 - GENERAL**

- 1.1 **General Requirements** .1 Comply with requirements of Division 1.
- 1.2 **Related** .1 Glazing: Section 08800.
- 1.3 **Guarantee** .1 Provide the following guarantee in accordance with the General Conditions, notwithstanding the time provisions therein, to replace mirrors should defects in silvering occur.
- Ten years material and labour**
- 1.4 **Submittals** .1 Shop Drawings
- .1 Submit detailed shop drawings of each component required.

**PART 2 - PRODUCTS**

- 2.1 **Fabrication General** .1 Fabricate work true to dimension, square and plumb.
- .2 Thickness of metals shall be adequate for the various conditions and intended uses.
- .3 Finished work shall be free from warping, open seams, weld marks, rattles, and other defects. Drilling shall be reamed, and exposed edges finished smooth. There shall be no sharp edges.
- .4 Fastenings shall be concealed or theftproof type where possible. Exposed fastenings shall be neatly executed and shall be of the same material and finish as the base metal on which they occur.
- .5 Washroom accessories of the same materials, construction and finishes, similar in function, design, appearance and conforming to the standards of those specified, manufactured by the following are considered equal subject to the approval of the Consultant:
- .1 Bobrick Washroom Equipment of Canada Ltd.
- .2 Bradley Washfountain Co.
- .3 Frost Metal Products Ltd.
- .4 ASI Group Canada (Watrous)
- 2.2 **List of Components** .1 Model numbers are for washroom accessories manufactured by ASI Watrous and/or Bobrick Washroom Equipment Ltd. Other manufacturers shall certify that materials meet all requirements of this section and submit samples and detail product drawings for the Consultant's approval.
- .2 Keyed (tumbler locks) accessories shall be keyed alike with the exception of coin receiving boxes in vending equipment.

- 2.2 **List of Components (Cont'd)** .3 Accessories: The following is a complete list of accessories which may or may not apply to this project. Provide accessories according to Schedule 3.3 within this specification.
- .1 Type A - Hand Dryer: By Division 16.
- .2 Type B - Paper Towel Dispenser: Supplied by Owner. Installed by this section.
- .3 Type C - Toilet Tissue Dispenser: Supplied by Owner. Installed by this section.
- .4 Type D - Sanitary Napkin Vendor: Supplied by Owner. Installed by this section.
- .5 Type E - Soap Tank and Dispenser: Supplied by Owner. Installed by this section.
- .6 Type F - Framed Mirror: ASI Watrous No. 6220-1836 vandal resistant 6mm tempered glass mirror with satin stainless steel frame and heavy gauge galvanized steel back. Size to be 460 mm x 915 mm..
- .7 Type F1 - Framed Tilted Mirror Barrier Free: ASI Watrous No. 0535-1830 vandal resistant mirror, fixed tilt mirror with welded stainless steel angle frame, polished to #4 satin finish. Size to be 460 mm x 762 mm.
- .8 Type F2 - Framed Mirror: ASI Watrous No. 6220-1824 vandal resistant 6mm tempered glass mirror with #304 stainless steel channel frame and heavy guage galvanized steel back. Size to be 460 mm x 610 mm.
- .9 Type G1 - Paper Cup Dispenser: Not used.
- .10 Type H - Grab Bars:
- .1 Equip toilet compartments for the handicapped with grab bars in conformance with the Ontario Building Code, Section 3.8 - Barrier Free Design, Bobrick B-6206 series, One L-shaped bar with each leg 760 mm in length and one 610 mm length bar as detailed.
- .2 Grab bars shall be stainless steel, with welded concealed flanges and peened surfaces.
- .3 Provide all required reinforcement for installed grab bars to be capable of supporting a 250 kg downward pull.
- .11 Type J - Grab Bars:
- .1 Bobrick B-6206 series, stainless steel with welded concealed flanges and peened surfaces.

- 2.2 **List of Components (Cont'd)**
- .2 L-shaped bar, one leg 900mm + one leg 750mm.
- .12 Type J1 – Swing Up Grab Bar C/W Toilet Paper Holder:  
Frost #1055 Type-304 stainless steel satin finish with peened gripping surface.
- .13 Type J2 – Grab Bar – Frost #10001 NP 24. Stainless steel 610 mm length.
- .14 Type J3 –Grab Bar with Backrest : - Frost #1028
- .15 Type K - Sanitary Napkin Disposal: Supplied by Owner. Installed by this section.
- .16 Type L - Shower Curtain Rod: Bobrick B-6047 heavy duty 32 mm O.D. stainless steel rod with end flanges in lengths and configuration to suit conditions and as detailed.
- .17 Type M - Shower Curtain: Bobrick 204 white vinyl shower curtain 1980 high with length to suit opening.
- .18 Type N - Coat Hook: Frost 1150 safety release coat hook.
- .19 Type O - Soap Dish: Bobrick B973 extra heavy cast bronze.
- .20 Type P - Grab Bar :Bobrick B-6206 series, 32 mm O.D. stainless steel 760 mm long. Lighter gauge not acceptable.
- .21 Type Q - Mop Rack: Watrous 8215-5 with 5 mop holders on a 1170 mm strip.
- .22 Type R - Shelf: ASI Watrous 20692-648 stainless steel shelf 1220 mm long x 200 mm depth.
- .23 Type R1 - Shelf: ASI Watrous 20692-612 stainless steel shelf 306 mm long x 150 mm depth.
- .24 Type S- Shower Seat: - Bobrick B-5191.
- .25 Type T– Baby Change Station: – Foundations Worldwide Inc supplied by GSR Storage Systems (Canada) -416 234-2822. Fold down, surface mounted, horizontal orientation, fully stainless steel (#304 brushed), C/W replaceable ABS tray, and safety strap  
Dimensions: 35.75" L x23.5" W x 4" H
- .26 Type U – Special Needs Change Station: - Foundations Worldwide Inc supplied by GSR Storage Systems (Canada) -416 234-2822. Fold down, surface mounted, fully stainless steel (#304 brushed), extended length. C/W dual pneumatic gas springs, replaceable ABS tray, and safety strap  
Dimensions: 64.75" L x23.5" W x 4" H

### **PART 3 - EXECUTION**

- 3.1 **Installation** .1 Install components at locations shown on drawings. Where location is not given, install as directed by Consultant. Install all components noted to be supplied by Owner.



- .2 Fastenings shall be non-corrosive type.
- 3.1 **Installation (Cont'd)**
- .3 Provide mounting and anchorage devices to be built in to walls and other construction elements as required to securely anchor components in place.
- .4 Securely anchor components in place. Method of fastening shall ensure that components will be capable of withstanding expected loads without movement.
- .5 Install framed mirrors with concealed wall hinges and lock in place with theft proof screws.
- .6 Insulate accessory surfaces to prevent electrolysis due to contact with dissimilar metal surfaces. Use bituminous paint or other approved means.
- .7 Coordinate mounting heights of electrical devices prior to roughing-in.
- 3.2 **Cleaning & Adjustment**
- .1 Upon completion of work or when directed, remove all traces of protective coatings or paper.
- .2 Test mechanisms, hinges, locks and latches and where necessary, adjust and lubricate and ensure that accessories are in perfect working order.
- .3 Remove all sharp edges.
- 3.3 **Schedules**
- .1 Provide the following accessories in the rooms listed as follows:
- .1 **New Universal Washroom – 3.2**
- One Item A – Hand Dryer
  - One Item C – Toilet Tissue Dispenser
  - One Item E – Soap Tank & Dispenser
  - One Item F – Framed Mirror
  - One Item J2 - BF Grab Bar
  - One Item J3 –BF Backrest
  - Two Item J1- Swing up Grab Bar
  - One Item K - Sanitary Napkin Disposal
  - One Item N – Safety Release Coat Hook
  - One Item R1- Shelf

End of Section

## **1. GENERAL**

### 1.1 General Requirements

- .1 This general division, Division 20 – Mechanical, applies to the following detailed divisions:
  - a. Division 22 – Plumbing
  - b. Division 23 – Heating, Ventilating and Air Conditioning
  - c. Division 25 – Integrated Automation
- .2 Comply with the conditions of Division 0 and Division 1.
- .3 Specifications and drawings form an integral part of the contract documents. Any item omitted from one but which is mentioned or reasonably implied in the other, shall be considered as properly and sufficiently specified and shall be included as part of the work.

### 1.2 Liability and Property Insurance

- .1 Comply with the requirements of Division 0, Division 1 and Section GC 11.1 of CCDC 2 - 2008.

### 1.3 Indemnification Claims

- .1 This Trade shall indemnify and save harmless the Owner and its respective officers and agents from all claims relating to labour and material furnished or supplied in executing the contract, and from and against all claims, demands, losses, costs, damages, actions, suits or proceedings by whomsoever made, brought or prosecuted in any manner based upon, arising out of, relating to, occasioned by or attributable to the activities or omissions of this Trade or those for whom this Trade is at law responsible in performing the contract.
- .2 Comply also with Section GC 12.1 of CCDC 2 - 2008.

### 1.4 Workplace Safety and Insurance Board

- .1 This Trade shall produce a Workplace Safety and Insurance Board Certificate of Clearance Form at each monthly progress draw and prior to final payment under the contract.

### 1.5 Schedule

- .1 Where specified in Division 0 or Division 1, all work shall be scheduled to meet the required project milestones.
- .2 All work in existing facilities shall be performed at times to suit the Owner.
- .3 This Trade shall include all allowances for overtime rates in the bid price.

### 1.6 Payment Certification

- .1 Submit a sample progress draw to the Consultant within one week of award of contract for review and approval.
- .2 Submit monthly progress draws to the Consultant for review and certification. Monthly progress draws shall resemble approved sample progress draw.

### 1.7 Extras and Credits

- .1 All extras and credits must be submitted to and approved by the Consultant prior to such work commencing. They shall be priced individually with a complete breakdown clearly indicating all labour and material costs, overhead and profit mark-up and tax.
- .2 Labour rates for extras and credits shall be identical. They shall be valued at payroll cost plus a percentage mark-up for burden as stipulated in Division 0.
- .3 Only the net difference between an extra and a credit will be subject to overhead and profit mark-up.

### 1.8 Scope of Work

- .1 Supply and install all equipment and materials as specified and / or shown on the drawings and required to provide complete, properly functioning, mechanical systems fit to the intended use. Provide all labour for the satisfactory completion of the work. Supply any miscellaneous equipment and materials not herein listed necessary for the proper installation and operation of the systems.
- .2 All of the equipment and materials required for the work shall be new, the best of their respective kinds and installed in a first-class manner. Similar equipment shall be of the same manufacturer unless noted otherwise.
- .3 All deposits, levies or similar fees, if any, required for completion of the mechanical work shall be paid as follows:
  - a. Fees for approval and inspection of any portion of mechanical system by any government agency, department or authority shall be included in the bid price.
  - b. Acquiring a building permit and paying all associated fees shall be by the Owner.
- .4 Unless noted otherwise, the bid price may be based on the use of products equal to those specified herein. Where 'approved equals' are listed, only products from these manufacturers may be used in the bid price. Where approved equals are not listed, any manufacturer may be used in the bid price.
- .5 Unless specifically stated otherwise, this project has been designed based on the first named manufacturer of each section or that specifically listed in the schedules. If this Trade chooses to use a manufacturer other than the first named manufacturer, it will be their responsibility to ensure that all equal and alternative equipment meets the mechanical specification, is similar in dimensions, stability, quality, weight, ease of maintenance, performance, etc. and that the equipment will fit into the space allocated. This Trade shall be responsible for preparing revised design drawings (if directed by the Consultant) and shall carry all costs required to accommodate the equal / alternative equipment INCLUDING ALL COSTS INCURRED BY OTHER TRADES. The Consultant reserves the right to approve or reject any alternate based upon his evaluation of the equipment proposed. If only one manufacturer is listed, then only that manufacturer shall be acceptable.
- .6 'Provide' means to supply and install the products specified. The 'work' means the total construction required by the Contract Documents and includes all labour and 'products'.

'Products' means all materials and equipment forming the completed work as required by the Contract Documents.

- .7 All mechanical work shall be in accordance with the regulations of the Ontario Building Code (OBC), Canadian Gas Association (CGA), Technical Standards and Safety Authority (TSSA), Natural Gas and Propane Installation Code, National Fire Protection Association (NFPA), Canadian Standards Association (CSA), Ontario Fire Code, Ontario Electrical Safety Code (OESC), all Municipal regulations and any authorities having jurisdiction.

#### 1.9 Examination of Site and Contract Documents

- .1 It is the responsibility of this Trade to carefully review the drawings, specifications and other instructions and notify the Owner in writing of any errors, omissions and discrepancies prior to closing of tenders. This Trade shall abide by the decision given in writing. The work as shown is intended to be completed in all respects and that failure to notify the Owner of any discrepancies will not relieve this Trade of responsibility for completing the work as intended. In no case shall this Trade proceed in uncertainty.
- .2 Examine all mechanical specification divisions and sections and all other related contract documents. The mechanical specification is to be read in conjunction with all other divisions and sections of the specification. In the event of conflict between documents, this specification shall govern.
- .3 Mechanical drawings are not to be scaled. Refer to architectural drawings for all dimensions.

#### 1.10 Intent

- .1 Provide all products specified or shown in the contract documents complete with incidentals necessary for a complete operating installation. Provide all tools, instruments, equipment and labour required to do the work.
- .2 The contract documents are not intended to enumerate each and every detail which may be necessary to furnish and install the complete system ready for operation. The bid price shall include all such details, and all associated labour and materials, to provide a complete and working system. The omission of any details in the contract documents shall not be a warrant for poor workmanship or the omission of such details.
- .3 Where the drawings or specifications assign work to a particular Trade, this is intended to be used as a guide only to assist this Trade with the preparation of the bid price. The final decision as to which Trade provides required labour or materials rests solely with this Trade. Extra payments will not be considered based on a difference in interpretation of the contract documents as to which Trade involved provides labour or materials for specific items of work. The Consultant will not enter into such discussions.
- .4 Wherever differences occur in the contract documents, the maximum conditions will govern and shall be allowed for in the bid price. The items to be incorporated will be at the option of the Consultant.
- .5 All Work shall be carried out by qualified Trades and Sub-trades with established reputations for the type of work involved and performed to good industry standards.

### 1.11 Shop Drawings

- .1 Shop drawings shall be submitted as PDF files via email. All shop drawings shall bear a signed and dated stamp indicating this Trade has reviewed and approved the submission.
- .2 Shop drawings shall be submitted for all products (including all associated accessories, controls, etc.), including but not limited to:
  - a. Fire extinguishers.
  - b. Plumbing fixtures including trim.
  - c. Plumbing specialties.
  - d. Grease interceptors.
  - e. Water treatment including cleaning / treatment chemicals and dosage rates.
  - f. Grilles / diffusers.
  - g. Motorized dampers including actuators.
  - h. Louvres.
  - i. Combination fire and smoke dampers.
  - j. Access doors.
  - k. Kitchen hoods including fire suppression systems.
  - l. Range hoods.
  - m. Fans.
  - n. Unit ventilators.
  - o. Condensing units.
  - p. Building automation system including all components, wiring diagrams, sequences and points lists.
  - q. Miscellaneous controls and accessories for all of the above.
  - r. Firestopping systems.
- .3 For firestopping systems, shop drawings shall show construction conditions, relationships to adjoining construction, dimensions, description of materials and finishes, component connections, anchorage methods, hardware and installation procedures, plus the following:
  - a. Firestop design designation of testing and inspecting agency acceptable to the authorities having jurisdiction.
  - b. Documentation, including illustrations, from a qualified testing and inspection agency that is applicable to each firestop system configuration for construction and penetrating items. Factory or manufacturer furnished installation details are not acceptable in lieu of published documents by approved testing agencies.
  - c. Where conditions require modification of a qualified testing and inspecting agency's illustration to suit a particular firestop condition, submit illustration, with modifications marked, approved by the firestop system manufacturer's fire-protection Engineer.
- .4 For additional shop drawing requirements, refer to other divisions and sections of this specification.
- .5 Allow maximum two weeks for Consultant's review.

### 1.12 Questions

- .1 Questions pertaining to the work shall be submitted to the Consultant in writing in the form of a Request for Information (RFI).
- .2 Allow for up to two weeks for RFI response from the Consultant. Claims for delay within this period will not be accepted.

#### 1.13 As-built Drawings

- .1 Obtain an extra set of prints, for the job use only, on which to generate as-built drawings including the accurate recording of all deviations from the contract drawings.
- .2 Take special care to indicate buried drains, inverts (shown at main reference points) and dimensioned distances from visible reference points such as walls or columns.
- .3 Submit to the Consultant for approval one complete set of as-built drawings (hard copy) at project completion. The approved as-built drawings shall then be submitted to the Owner in both hard copy (one copy) and electronic (scanned) format.
- .4 Prior to Substantial Performance, this Trade shall edit the electronic files to provide AutoCAD as-built drawings that incorporate all redline information. Associated costs shall be carried in the bid.
- .5 The Consultant shall provide, at no cost, AutoCAD drawing files incorporating Changes and Instructions.

#### 1.14 Identification

- .1 Identification plates shall be engraved two-ply plastic, 0.125" (3 mm) thick, 1.0" (25 mm) high with 3/4" (19 mm) white characters on black background and length as required. Locate in a conspicuous location and secure with self-tapping sheet metal screws to equipment. All screws used outside shall be stainless steel. Nameplates which are not exposed to outdoor conditions may be secured with double sided adhesive tape. All starters shall be identified by the Electrical Trade.
- .2 Where noted below, identify pipe mains by means of pressure sensitive adhesive labels. Markers and flow arrows shall be in accordance with ANSI/ASME A13.1 latest edition. Identify medium by lettered legend and direction of flow by arrows. Provide labels as follows:
  - a. At intervals not greater than 50 ft (15 m), changes of direction, upstream of major manually / automatically operated control valves, at all branch pipe connections, behind all access doors and on both sides where pipes pass through walls. Use approximate spacing intervals of 25 ft (7.6 m) for all piping running through suspended ceiling spaces.
  - b. Labels shall be sized as follows (pipe diameter includes insulation where applicable):
    - i. 0.75" (19 mm) to 1.25" (32 mm) piping:
      - 1) Minimum 8" (200 mm) long label with minimum 0.5" (13 mm) letter height.
    - ii. 1.5" (38 mm) to 2" (50 mm) piping:
      - 1) Minimum 8" (200 mm) long label with minimum 0.75" (19 mm) letter height.
    - iii. 2.5" (63 mm) to 6" (150 mm) piping:

- 1) Minimum 12" (300 mm) long label with minimum 1.25" (32 mm) letter height.
  - c. All identification labels shall be easily and accurately readable from usual operating areas, plane of legend to be approximately at right angles to most convenient line of sight.
  - d. Wording of all labels shall be approved by the Consultant prior to manufacture.
- .3 Valve / pipe identification is not required for this project except for the following:
- a. Identify the following new piping systems:
    - i. Domestic cold water
    - ii. Domestic hot water
    - iii. Domestic hot water recirculating
    - iv. Above ground sanitary
    - v. Hot water heating supply
    - vi. Hot water heating return
  - b. Piping running exposed through rooms other than mechanical, electrical, storage and custodial rooms shall not be identified.
- .4 Identification of equipment / systems shall be as follows:
- a. All equipment with symbols included in drawing schedules or plans shall be identified to match symbols indicated.
  - b. All components of building automation systems shall be tagged at installed location and keyed to a control wiring diagram. Diagram shall be included in the Operation and Maintenance Manual.
  - c. Identify hood fire suppression system manual release as 'HOOD FIRE SUPPRESSION SYSTEM MANUAL RELEASE'.
  - d. Identify the filter in the dryer exhaust ductwork as 'CLEAN AFTER EACH DRYING CYCLE'.
  - e. Identify access doors in kitchen hood exhaust ductwork as 'ACCESS PANEL - DO NOT OBSTRUCT'.
  - f. For additional requirements regarding refrigeration system identification, refer to Division 23 - Heating, Ventilating and Air Conditioning.
  - g. Provide additional miscellaneous identification labels as described on the drawings or in other divisions and sections of the specification.
  - h. Identification of all equipment / systems not listed above or on the drawings is not required for this project.
  - i. All equipment, valves, motorized dampers, major components of the building automation system, miscellaneous controls / transformers, etc. located above suspended ceilings shall be identified with 0.25" (6 mm) diameter coloured markers with adhesive backing. Colour of markers shall be red.
- .5 Verify all identification labels / tags on site with the maintenance staff prior to installation and adjust as required to be consistent with the existing identification system.

#### 1.15 Close-out Documentation – Operation and Maintenance Manual

- .1 Upon project completion, this Trade shall submit an Operation and Maintenance Manual as well as as-built drawings. Submit one paper hard copy in a three-ring binder, and one .PDF electronic copy on a suitably sized USB thumb drive. Each manual shall contain the following:

- a. Warranty.
  - b. Extended warranties.
  - c. Contact list (Sub-trades, suppliers, manufacturers, etc.).
  - d. Sign-back of latest Site Review Report (confirmation of completion).
  - e. Permits and approvals.
  - f. Certificates.
  - g. Test reports (water analysis/treatment, maximum temperature setting at fixtures, etc.).
  - h. Firestop manufacturer sign-off.
  - i. Shop drawings (revised as reviewed by the Consultant).
  - j. Equipment start-up reports (including hood smoke test, etc.).
  - k. Equipment operation and maintenance manuals.
  - l. On-site instruction documents (CD as applicable).
  - m. TAB (air and water testing, adjusting and balancing) reports.
- .2 This Trade shall instruct the Owner on site to the full satisfaction of the Consultant on the operation and maintenance of all mechanical systems.

#### 1.16 Cutting, Patching and Refinishing

- .1 This Trade shall allow for cutting and patching of building assemblies to support own project work. Cutting and patching shall be performed by workers specialized in this type of work and capable of performing to good commercial standards. All work shall be to the approval of the Architect / General Contractor.
- .2 No cutting of the building envelope or structural elements (including precast concrete floors / roofs (including core slab)) shall be done without permission of the Architect.
- .3 This Trade shall patch new openings in building assemblies and openings caused by the removal of existing work. Patching shall be done to maintain existing fire separations, sound transmission class ratings, vapour retarder performance, insulation values, etc. Patching of exterior wall openings shall include filling voids and annular spaces with Roxul (not pink) batt insulation and providing a watertight seal on both sides.
- .4 Finishes damaged by cutting and patching by this Trade shall be made good by this Trade with materials and colours to match existing unless noted on the architectural drawings to be refinished by the General Contractor.
- .5 This Trade shall cut and patch slab-on-grade floor. The General Contractor shall refinish flooring.
- .6 This Trade shall provide openings in drywall walls and ceilings.
- .7 This Trade shall provide openings in masonry walls where lintels are not required. The General Contractor shall provide openings where lintels are required.
- .8 The General Contractor shall provide structural supports or lintels for applicable openings.
- .9 The General Contractor shall provide framing for openings in floors, walls (including metal and wood studs) and roofs.



- .10 The General Contractor shall provide cutting, patching and refinishing of existing roof assembly.
- .11 Protect the existing roofing system from damage at all times. Provide plywood work platforms / walkways as required.
- .12 Where wall openings caused by the removal of thermostats, sensors, etc. are not covered by new wall finishes (refer to architectural drawings) or new thermostats, sensors, etc., provide stainless steel coverplates.

#### 1.17 Concrete

- .1 Patching of concrete floors shall utilize 25 MPa concrete having a smooth trowel finish. Thickness shall match that of the existing floor.

#### 1.18 Cleaning

- .1 New or affected equipment, fixtures, ductwork, piping, building finishes, building contents, etc. soiled by this Trade's work shall be cleaned to the satisfaction of the Consultant at job completion.
- .2 At the completion of each day's work and at project completion, remove from the area of work all dirt, rubbish, surplus material and equipment associated with this Trade's systems installation and not required in the finished work.
- .3 At project completion, replace all new / existing air filters which have been soiled by the work.

#### 1.19 Existing Construction

- .1 This Trade shall provide adequate protection to existing systems (all disciplines), pavement, curbs, walkways, sodding, shrubs, building construction, building contents, etc. throughout the project. This Trade shall be responsible for restoring to its original condition or replacing any removed or damaged item in connection with the work unless otherwise directed by the Consultant.
- .2 Undertake all necessary measures required by this Trade's work to maintain adequate security of the existing building at all times.
- .3 Any interruption of this Trades services to any part of the existing buildings shall come at a time agreeable to the Owner and Consultant.

#### 1.20 Protection

- .1 Where foreseeable damage of any description could result from this Trade's work, this Trade shall provide adequate protection of work previously completed, including work of others. This Trade will be responsible for restoring any damaged materials.

#### 1.21 Demolition

- .1 This Trade shall be responsible for revisions to and for the complete removal of this Trade's systems to permit the new work, all as shown on the drawings or described in the

specification. This includes removal of materials from the site. All disposal costs shall be included in the bid price.

- .2 Materials being removed shall become the property of the Owner unless shown otherwise, and if the Owner has no use for it, it shall be disposed of by this Trade. This Trade shall include in the bid price for the disposal of all materials. Note that the Owner shall have the first right of refusal for all demolished equipment.
- .3 Demolished materials shall not be reused unless noted otherwise.

#### 1.22 Asbestos

- .1 Where asbestos will be disturbed in the execution of this contract, comply with the regulation respecting asbestos on construction projects and in buildings and repair operations made under the Occupational Health and Safety Act, Ontario Regulation 654/85 and local requirements pertaining to asbestos.
- .2 The removal of all asbestos insulation which must be disturbed by the execution of this contract shall be by the General Contractor. The Mechanical Trade shall provide new fiberglass piping insulation to replace the removed asbestos insulation.
- .3 Include the cost of retaining an Owner-approved Sub-trade for the abatement of all asbestos containing materials (ACM) within 24" (600mm) radius of any mechanical work. Refer to the Owner's Hazardous Materials Building Survey.

#### 1.23 Sleeves

- .1 Provide sleeves for piping and ductwork as follows:
  - a. For all copper pipe penetrations of masonry structures where required to prevent direct contact of the structure with the copper piping. Sleeves are not required provided that direct contact of the structure is prevented and provided the openings comply with the firestop manufacturer's requirements (where applicable).
  - b. Where required for proper installation of pipe firestop systems.
  - c. Where required for proper installation of fire dampers.
- .2 Pipe sleeves shall be as follows (Trade to choose desired type):
  - a. Schedule 40 steel.
- .3 Ductwork sleeves shall be manufactured of galvanized sheet steel of at least the same gauge as ductwork penetrating wall and shall be reinforced so as not to be deformed by the placement of the concrete.
- .4 Floor sleeves shall have a minimum 0.5" (13mm) lip on the upper side. All other sleeves shall be flush with adjacent surfaces.
- .5 Unless otherwise directed, all sleeves and openings shall provide minimum 0.25" (6 mm) clear space to ductwork, pipe or insulation. Provide space for application of firestopping for all sleeves and openings according to the fire stop manufacturer's detailed installation drawings.

For sleeves used with fire dampers, comply also with the fire damper manufacturer's requirements.

#### 1.24 Firestopping

- .1 Firestopping shall be 3M or approved equal fire stop sealant / devices, listed in the UL fire Resistance Directory under categories XHCR (firestop devices) and XHEZ (firestop systems) and of a type to suit construction type, penetrant type, annular space requirements and fire rating involved in each separate instance. Systems shall be symmetrical for wall applications and shall be asbestos free. Install according to manufacturer's detailed installation instructions.
- .2 All firestop materials shall be of the same manufacturer as that used by the General Contractor. Co-ordinate on site.
- .3 Firestop systems shall comply with the required F, T and L ratings, as determined per ASTM E814 / ASTM E119 (as applicable). F ratings shall meet or exceed the fire-resistance ratings of the construction assembly. Firestop systems shall have the required flame spread and smoke developed ratings to suit the point of application and to comply with Code requirements.
- .4 Provide components that are needed for fill materials and to comply with the manufacturer's detailed installation instructions. Use components specified by the manufacturer and approved by the qualified testing and inspection agency, including slag / rock-wool-fiber insulation, forming / damming / backing materials, fillers for sealants, substrate primers, collars / steel sleeves, etc.
- .5 For firestop systems exposed to view, traffic, moisture and physical damage, provide products that after curing do not deteriorate when exposed to these conditions.
- .6 Firestop systems shall be installed by an experienced installer who
  - a. Is qualified by having the necessary experience, staff and training to install the manufacturer's products.
  - b. Is acceptable to or licensed by the manufacturer or local authority.
  - c. Has established a record of successful in-service experience with firestop systems or completed a manufacturer's certified product installation training course.
- .7 Deliver firestop system products to site in original, unopened containers or packages with intact and legible manufacturer's labels identifying product and manufacturer, date of manufacture, lot number, shelf life, qualified testing and inspection agency's classification marking, curing time and mixing instructions. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants or other causes. Follow manufacturer's instructions.
- .8 Verify the condition of the substrates and correct unsatisfactory conditions before installing firestop system products. Follow manufacturer's detailed installation instructions and comply with requirements for temperature and humidity conditions. Coordinate construction and sizing of sleeves, openings and penetrating items to ensure compliance with installation instructions.

- .9 Upon project completion, the firestop manufacturer shall provide a letter certifying that all fire stop systems throughout the project have been installed according to their detailed installation instructions and Code requirements.

#### 1.25 Sound Packing

- .1 Where pipes and ductwork pass through non-rated walls, pack around ductwork or pipe with mineral wool filler to reduce noise transmission.

#### 1.26 Cements and Primers

- .1 All cements, primers, etc. shall be low volatile organic compound type, tested to meet the requirements of SCAQMD rule 1168, Test Method #316A (South Coast Air Quality Management District).

#### 1.27 Pipe Escutcheons

- .1 Provide proper chrome plated steel escutcheon plates for exposed uninsulated piping penetrating walls / floors / ceilings except where openings around piping have been filled to the approval of the Consultant.
- .2 Pipe escutcheons shall be one-piece type with set screws for installation at plumbing fixtures.
- .3 Unless noted otherwise, use chrome plated slit type with substantial hinges, positive latches and set screws. Size plates so that they are tight against the wall, floor or ceiling surface concerned; outside diameter to cover opening or sleeve and inside size to fit around finished pipe.

#### 1.28 Access Doors for Walls and Ceilings

- .1 Provide to the General Contractor for installation access doors for concealed mechanical equipment requiring accessibility for service and maintenance. These items should be grouped wherever possible in order to reduce the number of panels required. Doors shall be a minimum size of 8"x8" (200x200 mm) and a minimum size of 24"x18" (600x450 mm) where head and shoulders access is required unless otherwise noted. Doors shall be complete with positive locking self-opening screwdriver lock. The exact size of access doors shall be as recommended by the manufacturer to suit the application.
- .2 Doors shall be manufactured by Acudor or approved equal and shall be of the following types (Trade to choose applicable type):
  - a. Drywall / Block Walls or Ceilings: Model UF-5000 having the following features:
    - i. Uninsulated steel construction.
    - ii. Doors up to 16"x16" (400x400 mm) shall have 16 gauge doors and 18 gauge mounting frame.
    - iii. Doors over 16"x16" (400x400 mm) shall have 14 gauge doors and 16 gauge mounting frame.
    - iv. Door shall be flush to frame with rounded safety corners.
    - v. A one-piece outer flange shall be welded to the mounting frame.
    - vi. Continuous concealed hinge.
    - vii. Stainless steel screwdriver operated cam latch.

- viii. Prime coat of white alkyd baked enamel.
- b. Tile Walls: Model UF-5000-SS having the following features:
  - i. Uninsulated type 304 stainless steel construction complete with a #4 satin polish finish.
  - ii. Doors up to 16"x16" (400x400 mm) shall have 16 gauge doors and 18 gauge mounting frame.
  - iii. Doors over 16"x16" (400x400 mm) shall have 14 gauge doors and 16 gauge mounting frame.
  - iv. Door shall be flush to frame with rounded safety corners.
  - v. A one-piece outer flange shall be welded to the mounting frame.
  - vi. Continuous concealed hinge.
  - vii. Stainless steel screwdriver operated cam latch.
  - viii. The General Contractor shall install with stainless steel fasteners.
- c. Fire Rated Drywall / Block Walls: Model FB-5050 having the following features:
  - i. Insulated steel construction.
  - ii. ULC 2.0 hour B label.
  - iii. Doors shall be 20 gauge and mounting frames shall be 16 gauge.
  - iv. Doors shall be filled with 2" (50 mm) thick fire rated insulation.
  - v. Door shall be flush to frame with reinforced edges, flange to be 1" (25 mm) wide.
  - vi. Self-closing and self-latching.
  - vii. Inside latch release.
  - viii. Concealed hinge.
  - ix. Universal self-latching bolt latch, operated by a flush key.
  - x. Prime coat of white alkyd baked enamel.
- d. Fire Rated Tile Walls: Model FB-5050-SS having the following features:
  - i. Insulated stainless steel construction complete with a #4 satin polish finish.
  - ii. ULC 2.0 hour B label.
  - iii. Doors shall be 20 gauge and mounting frames shall be 16 gauge.
  - iv. Doors shall be filled with 2" (50 mm) thick fire rated insulation.
  - v. Door shall be flush to frame with reinforced edges, flange to be 1" (25 mm) wide.
  - vi. Self-closing and self-latching.
  - vii. Inside latch release.
  - viii. Concealed hinge.
  - ix. Universal self-latching bolt latch, operated by a flush key.

### 1.29 Dissimilar Metals

- .1 Separate dissimilar metals by means of gaskets or shims of approved material in order to prevent electrolytic action. Where piping of dissimilar metals is connected, use approved dielectric unions or flanges. A brass fitting or brass valve may also be used in making connections between copper and steel piping.
- .2 Where supporting copper pipe, isolate pipe from hanger with electrolytic action tape or equivalent or use copper / plastic coated supports. Direct contact between copper piping and concrete, masonry or precast construction will not be permitted.

### 1.30 Installation Requirements

- .1 Install equipment and services as follows:

- a. Neatly following building lines and in such a manner as to permit free use of space and maximum headroom.
- b. To allow free access for maintenance, adjustment and eventual replacement.
- c. In accordance with the manufacturer's requirements.
- d. Provide all supports, hangers and fasteners except as otherwise noted.
- e. Do not support piping or ductwork from equipment.
- f. Secure all products and services so as not to impose undue stresses on the structure or systems.
- g. Cap off and seal all open ends of new / affected ductwork, venting, piping and conduits to prevent entrance of foreign matter.
- h. Do not install piping in a location or manner which might result in freezing.
- i. Layout and install piping, valves, fittings, cleanouts, etc. in conveniently accessible spaces to facilitate easy maintenance.
- j. All exposed ductwork and piping shall present a neat appearance and located parallel to and centered between building structure, lights, etc.
- k. Support of ductwork, piping, equipment, etc. from the metal roof / floor deck will not be permitted except as otherwise noted.

#### 1.31 Packaged Equipment Installation and Start-up

- .1 Handle equipment carefully to prevent damage, breaking, denting and scoring. Damaged units or damaged components shall not be installed. Replace damaged parts with new supplied by the manufacturer.
- .2 If equipment is to be stored prior to installation, store in a clean, dry place. Protect from weather, dirt, fumes, water, physical damage, etc.
- .3 Comply with the manufacturer's rigging and installation instructions for unloading and moving into final location.
- .4 Level equipment according to manufacturer's requirements, and to permit proper condensate drainage where applicable.
- .5 Assemble, install and start-up equipment according to manufacturer's requirements. Complete all manufacturer start-up literature (where applicable) and include in the Operation and Maintenance Manual.
- .6 Provide adequate / manufacturer's required / Code required clearances to permit servicing and maintenance of equipment.

#### 1.32 Flashings

- .1 Unless noted below, all flashings and counter flashings required for this Trade's work shall be supplied and installed by the General Contractor.
- .2 If piping and wiring is not indicated on drawings to penetrate roof assembly through a doghouse, it shall penetrate through the following roof flashing system:
  - a. Portals Plus extra tall Aluma-Flash complete with 0.60" aluminum base, 13" high and 14" diameter. 8" collar opening shall have two sealing rings to suit EPDM cap of type to suit services. All services to be secured to cap with stainless steel clamps.

- b. Roof flashing system to be supplied by this Trade and installed by the General Contractor.

### 1.33 Excavating and Backfilling

- .1 Necessary excavation, removal, disposal, backfill and compaction of materials pertaining to this Trade's work shall be provided by this Trade. Before commencing with work, investigate locations, arrangements and conditions of all previously installed / existing underground services.
- .2 Granular material shall be compacted to 98% Standard Proctor Density and all native material shall be compacted to 95% Standard Proctor Density unless otherwise directed by the General Contractor. Grade bottom of trenches to maintain design slopes.
- .3 In competent undisturbed soil, lay pipes directly on the soil and shape soil to fit the lower one-third segment of all pipes and pipe bells. Ensure even bearing along the barrels. Backfill trenches 6" (150 mm) on sides and 12" (300 mm) on top with machine compacted bedding sand or limestone screening. Backfill remainder of trench with granular 'B' material machine compacted in 12" (300 mm) layers. Keep sides of trenches vertical to a minimum depth of 20" (500 mm) over pipe to maintain load within pipe design limits. Minimum width of trench shall be pipe diameter plus 18" to 24" (450 to 600 mm). For trenches excavated too deep, where rock, shale or other materials may cause damage to piping or have diameters larger than 1" (25 mm) and where required by manufacturer's installation requirements to prevent damage to piping, excavate to 6" (150 mm) below pipe and backfill with machine compacted bedding sand or limestone screening.
- .4 For installation of ductwork, refer also to the detail on drawings.
- .5 Provide timber sheeting, bracing, shoring, guard rails, etc. as required to protect all persons having access to the site from excavations. All excavation work shall comply with the latest edition of the Occupational Health and Safety Act of Ontario. Keep all excavations free of water.

### 1.34 Work Performed by the General Contractor

- .1 The following work shall be performed by the General Contractor:
  - a. Furred in ductwork / pipe spaces.
  - b. Structural supports for roof-mounted equipment.
  - c. Unless noted otherwise, all painting associated with this Trade's systems installations except that refinishing of surfaces damaged by this Trade's work shall be by this Trade.
  - d. Roof flashings for mechanical systems.
  - e. Work outlined in Cutting, Patching and Refinishing section.

### 1.35 Paint

- .1 Paint for patching of existing / damaged finishes shall be good quality commercial grade of a type to suit the application. Apply according to manufacturer's requirements. All painted surfaces shall have a minimum of one primer coat and two finish coats.

### 1.36 Inspection Certification and Review

- .1 Arrange for inspection of all work by the authorities having jurisdiction. Obtain unconditional certificates of approval, acceptance and compliance with rules and regulations for authorities having jurisdiction. The work will not be considered complete until such certificates have been delivered to the Owner.
- .2 Attend promptly to any deficiencies reported. Request final review when the completed installation has been checked and all deficiencies have been rectified.

### 1.37 Testing, Adjusting and Balancing

- .1 Retain the services of an independent Balancing Trade to test, adjust and balance the systems and include for the provision of a balancing report. All work shall be performed in compliance to the requirements of the National Environmental Balancing Bureau (NEBB) or Associated Air Balance Council (AABC) and the Balancing Trade shall be certified with one of these agencies.
- .2 The following is a list of the approved Balancing Trades whom may quote on the balancing of the systems:
  - a. Air Audit Inc., 183 Samuelson, Cambridge, Ontario, N1R 1K2, (519) 740-0871
  - b. Clark Balancing Ltd., 8094 Esquesing Line, Milton, Ontario, L9T 2X9, (905) 693-1518
  - c. Airwaso Canada Inc., 124-4096 Meadowbrook Drive, London, Ontario, N6L 1G4, (519) 652-4040
  - d. Dynamic Flow Balancing Ltd., 1200 Speers Road, Unit 36, Oakville, Ontario, L6L 2X4, (905) 338-0808
  - e. Air Velocities, 100 Premium Way, Mississauga, Ontario, L5B 1A2, (905) 279-4433
  - f. Flowset Balancing Ltd., 431 Willis Drive, Oakville, Ontario, L6L 4V6, (416) 410-9793
- .3 Provide all necessary precision instruments, pressure gauges, manometers, thermometers, etc. for measuring and adjusting. Use instruments which are of correct scale and accurately calibrated.
- .4 All balancing shall be done in a manner to minimize throttling losses and using speed adjustment to meet design flowrates. Final flowrates shall be within ten percent (10%) of specified value.
- .5 Start balancing only when the work is essentially completed, including: installation of ceilings, doors, windows and other construction affecting testing and balancing; application of sealing, caulking and weatherstripping; normal operation of mechanical / electrical / control systems affecting testing and balancing; thermal overload protection in place for electrical equipment; air filters clean and in place; ductwork systems clean of debris; correct fan rotation; fire and volume dampers in place and open; coil fins cleaned; all ductwork outlets installed and connected; access doors closed; ductwork installation complete; water systems flushed, filled and vented; correct pump rotation; proper strainer baskets clean and in place; service and balancing valves fully open; liquid treatment system operable.
- .6 The Balancing Trade shall perform the following work in regards to air systems:
  - a. Test and adjust system / equipment for design air flows.
  - b. Equipment requiring air balancing shall be as follows:



- i. The existing affected rooftop unit, including outdoor air adjustment.
    - ii. All new exhaust fans.
    - iii. The new unit ventilator.
  - c. Locations of systems measurements / adjustments shall include but not be limited to the following as appropriate:
    - i. Each duct run-out (or grille / diffuser) having an indicated airflow on the drawings.
    - ii. Make pitot tube traverse of main supply / return / exhaust duct to verify design airflows at equipment.
  - d. Measurements shall include but not be limited to the following as appropriate for systems / equipment / controls:
    - i. Air velocity, flow rate, static pressures (including suction and discharge), ductwork cross-sectional area, RPM, electrical power (including full load amperes), voltage, sheave diameter / setting, belt quantity / size.
  - e. Test and adjust blower RPM to design requirements. All required pulleys shall be supplied / installed / adjusted by the Balancing Trade.
  - f. Adjust grilles and diffusers to obtain optimum air distribution patterns. Also adjust to suit the Consultant.
  - g. Verify control system operation and report on any installation problems observed. Physical changes in the control system, such as relocating sensors or calibrating controllers, are the responsibility of the Mechanical Trade. The Balancing Trade shall work closely with Mechanical Trade to identify and correct problems.
- .7 The Balancing Trade shall perform the following work in regards to water systems:
  - a. Test and adjust system / equipment for design water flows.
  - b. Equipment requiring water balancing shall be as follows:
    - i. The heating coil in the new unit ventilator.
  - c. Locations of systems measurements / adjustments shall include but not be limited to the following as appropriate:
    - i. Each circuit balancing valve.
  - d. Measurements to include but not limited to the following as appropriate for systems, equipment, components, controls:
    - i. Flow rate.
  - e. Fluid flow quantities shall be measured using the installed devices provided by Others.
- .8 Upon balancing completion, the Balancing Trade shall submit the final system balancing report (TAB Report) to the Mechanical Trade for inclusion in the Operation and Maintenance Manual. One paper hard copy and one .PDF electronic copy is required. Report shall include index page, index tabs and shall be certified by the Balancing Trade. Handwritten data will not be accepted. Include types, size, manufacturer, serial numbers and dates of calibration of all instruments used. The format shall be in accordance with the Canadian AABC or NEBB Report Form and approved by the Consultant. In addition, the report shall include:
  - a. Project record drawings.
  - b. System schematics.
  - c. All measured / adjusted values (include initial and final readings).
  - d. All pertinent information regarding balanced equipment shall be listed, such as:
    - i. Designation of equipment.
    - ii. Manufacturer.

- iii. Type.
- iv. Size.
- v. Motor nameplate characteristics.

- .9 During the system testing, adjusting and balancing, the Mechanical Trade shall fully demonstrate the operation of all controls. The Mechanical Trade shall be present during the testing, adjusting and balancing and make modifications as often as necessary to satisfy the Balancing Trade.

#### 1.38 Commissioning

- .1 At or near the completion of the project, this Trade shall provide acceptance tests to demonstrate that the equipment and systems actually meet the specified requirements. Tests may be conducted as soon as conditions permit.
- .2 Concurrently, written approvals or acceptances by local authorities shall be presented. In testing, vary loads to illustrate start-up, operating sequences, normal shut down and simulate emergency conditions. Final tests shall be conducted in the presence of the Consultant where directed.

#### 1.39 Trial Usage

- .1 The Owner has the right to use the systems or parts thereof for the purpose of testing and learning operational procedures.
- .2 Continue trial usage over a period of time as deemed reasonable by the Consultant.
- .3 This Trade shall supervise and maintain responsibility for the systems during the period of trial usage.
- .4 Trial usage shall not be construed as acceptance by the Owner.
- .5 No claims for damage shall be made by this Trade for the injury to or breaking of any parts of such work which may be so used whether caused by weakness or inaccuracy of structural parts; or by defective material or workmanship of any kind whatsoever. All equipment used on a temporary basis must be brought back to new condition by the Trade's service department and new full guarantee period to begin on the date of Substantial Performance.

#### 1.40 Discount Pricing

- .1 The Waterloo Region District School Board receives discount pricing from Noble Trade. This Trade is encouraged to contact Noble Trade for pricing on this project.

#### 1.41 Guarantees and Warranties

- .1 This Trade shall issue a written guarantee of his equipment and systems for a period of two years from date of issue of the Substantial Performance certificate. Include the extended warranties as outlined in the various sections of this specification. Guarantee shall include all costs including material and labour and any necessary cutting, patching and making good including finishes, necessitated by these operations.

- .2 Where a Manufacturer two year warranty is not available, this Trade or equipment Supplier shall extend the Manufacturer warranty ensuring a full two year coverage.

## **2. THERMAL INSULATION**

### **2.1 General Requirements**

- .1 All insulation shall be applied in general accordance with TIAC National Insulation Standards Manual, manufacturer's published instructions and requirements, and these specifications.
- .2 Apply covering in a neat workmanlike manner so that finished job is uniform and smooth in finish.
- .3 All insulation and components shall have maximum flame and smoke spread ratings of 25 and 50, respectively.
- .4 Ensure that all piping (including valves and fittings), ductwork and equipment are dry and clean before applying covering.
- .5 Do not apply insulation until the items to be covered have been tested against leakage.
- .6 Butt joints firmly together. Stagger joints in multiple layer construction. All joints shall be taped unless noted otherwise.
- .7 Locate longitudinal seams so as to be invisible.
- .8 Cover all joints with self-sealing 3" (75mm) wide butt strips provided by the insulation manufacturer or vapour barrier tape.
- .9 Install pipe insulation continuous through barriers (walls, ceilings, floors, etc.).
- .10 Install duct insulation continuous through barriers (walls, ceilings, floors, etc.) except at fire dampers.
- .11 For cold water piping as well as for all duct thermal insulation, maintain integrity of vapour barrier jacket over all insulation, taking special precaution at fittings, valves, strainers, etc. For these systems:
  - a. Install insulation directly over pipes and not over hangers, supports, etc.
  - b. Ensure duct and pipe insulation is not broken at supports, hangers and standing duct seams. Where required, provide vapour barrier tape to maintain the integrity of the vapour barrier jacket at these locations.
  - c. Finish insulation ends with self-sealing 3" (75mm) wide butt strips provided by the insulation manufacturer or vapour barrier tape.
- .12 Protect insulation passing through floors, walls and similar barriers to prevent damage.
- .13 Install insulation over equipment which may require service or replacement by maintenance staff (valves, unions, flanges, etc.) to be easily removable or replaceable without damage to adjacent insulation (use only pre-fabricated type insulation).

- .14 Valves, strainers, unions, flanges, etc. which are 1" (25mm) and smaller in domestic hot and heating water systems are not required to be insulated.
- .15 Existing pipe and duct insulation shall remain unchanged except that all existing insulation damaged during installation of new work shall be repaired.
- .16 Where asbestos insulation has been removed by the General Trade to permit new connections, new fiberglass insulation shall be installed by this Trade.

## 2.2 Pipe Insulation

- .1 Rigid Piping: Johns Manville Micro-Lok or approved equal, pre-moulded, glass fibre, rigid, sectional sleeve insulation with a K factor of 0.23 Btu-in/hr-ft<sup>2</sup>-°F (0.033 W/m-°C) at a mean temperature of 75°F (24°C) and jacketed with a factory applied reinforced vapour retarder facing having a longitudinal acrylic adhesive closure system. Thickness and application shall be as specified below.
- .2 Valves and Fittings: Pre-formed fittings or mitred segments to match adjacent pipe insulation. Where insulation is to be provided with PVC covers, insulation may be revised to Johns Manville Microlite Standard Type 150 or approved equal formaldehyde-free, flexible glass fibre, blanket insulation with a K factor of 0.24 Btu-in/hr-ft<sup>2</sup>-°F (0.035 W/m-°C) at a mean temperature of 75°F (24°C) and a factory applied FSK vapour barrier facing having a 2" (50mm) stapling tab.
- .3 Install rigid fiberglass type insulation according to manufacturer's requirements and as follows:
  - a. Apply the SSL II Positive Closure System smoothly and securely as per the manufacturer's requirements, ensuring all contacting surfaces are kept clean.
  - b. Apply insulation on valves, backflow preventers, strainers, unions, flanges, fittings, etc. prior to straight run insulation.
  - c. Insulation on fittings shall be cut in proper segments to provide a tight fit or pre-formed fittings shall be used. Insulation on valves, backflow preventers, strainers, unions, flanges, etc. shall be pre-formed type only.
  - d. All insulation for fittings shall be cut to suit the length of the body plus 2" (50mm) at each end.
  - e. Any void between the insulation on fittings, valves, backflow preventers, strainers, unions, flanges, etc. and the straight run insulation shall be filled with insulation segments cut to fit the gap.
  - f. If a continuous vapour barrier is specified, finish insulation ends with self-sealing 3" (75mm) wide butt strips provided by the insulation manufacturer or vapour barrier tape.
- .4 Finish Covering for Insulation (Interior of Building):
  - a. Leave as All Service Jacket (ASJ) or FRK finish except as otherwise noted below.
  - b. All interior exposed pipe insulation shall be provided with PVC jacketing, Proto or approved equal as follows:
    - i. Insulation located within suspended ceiling spaces, cabinet spaces and walls will not be considered exposed.

- ii. System shall consist of one piece and two piece pre-moulded high impact LoSMOKE PVC pipe and fitting covers with all required accessories, which include elbows, tees, valves, end caps, mechanical line couplings, specialty fittings, tank end panels, tack fasteners, tapes and specialty items. Jacket shall be bright high-gloss white colour.
  - iii. Jacket shall have flame spread rating and smoke developed classification of 25 and 50, respectively.
  - iv. Jacket shall not promote the growth of fungi or bacteria.
  - v. Where desired by Trade, fibreglass inserts which comply with the insulation specifications may be provided.
  - vi. Jacket shall be 0.02" (0.5mm) thick with standard one piece fitting cover.
  - vii. Apply according to manufacturer's requirements and as follows:
    - 1) Apply on clean, dry surfaces.
    - 2) Do not apply jacket too tightly. Install slide joints and jacket to prevent cracks and puckering.
    - 3) Jacket shall be cut and rolled to fit the circumference of pipe plus a 2" (50mm) overlap.
    - 4) Apply PVC adhesive bead (Red Devil Inc. Celulon or approved equal, water based, clear) along longitudinal edge, approximately 1" (25mm) in from edge, and apply jacket over adhesive using firm pressure for attachment. Temporarily hold PVC jacket in place using masking tape until firmly attached.
    - 5) Provide PVC end caps at all insulation endpoints (caulked joints will not be permitted).
    - 6) Any corners or cracks shall be neatly finished with a white silicone caulking bead.
    - 7) Secure throats of fitting, valve, etc. covers by either tack fastening or taping (do not use tacks where a vapour barrier insulation system is specified). For insulation systems required to have a vapour barrier insulation, use Proto PVC tape with a minimum 2" (50mm) downward overlap.
- .5 Pipe insulation thicknesses shall be as follows:
- a. Copper Cold Water: 0.5" (13mm).
  - b. Copper Hot Water: 1" (25mm).
  - c. Metal Heating Water (Supply and Return): 1.5" (38mm).

### 2.3 Duct Insulation

- .1 Johns Manville Microlite XG Type 75 or approved equal formaldehyde-free, flexible glass fibre, blanket insulation with a K factor of 0.27 Btu-in/hr-ft<sup>2</sup>-°F (0.039 W/m-°C) at a mean temperature of 75°F (24°C) and a factory applied FSK vapour barrier facing having a 2" (50mm) stapling tab. Provide as follows:
  - a. In concealed locations, where insulation is required on rectangular ductwork as indicated on drawings and as per below. Concealed locations include ceiling spaces (including suspended), bulkheads, cabinet spaces, walls, attics, etc.
  - b. In exposed locations, where insulation is required on round ductwork as indicated on drawings and as per below. Concealed locations include ceiling spaces (including suspended), bulkheads, cabinet spaces, walls, attics, etc.

- c. Ductwork below attic insulation shall be provided with 1.5" (38mm) insulation unless otherwise noted.
  - d. Supply ductwork within or above attic insulation shall be provided with 3" (75mm) insulation. Thermal insulation will be required in addition to any acoustic insulation indicated on drawings.
  - e. Return, intake (outdoor air) and exhaust ductwork within or above attic insulation shall be provided with 1.5" (38mm) insulation. Thermal insulation will be required in addition to any acoustic insulation indicated on drawings.
- .2 Insulation fasteners shall be 12 gauge (2mm) zinc coated steel pins at 16" (400mm) to 18" (450mm) on center complete with minimum 1.5" (38mm) square plastic or zinc plated steel self-locking washers. Alternatively, use Continental spindle anchors held in place with Tac Two or approved equal adhesive at 16" (400mm) to 18" (450mm) on center.
- .3 Insulation self-adhesive tape shall be MacTac Canada Ltd. or Venture Tape, ULC listed.
- .4 Flexible insulation shall be applied as follows:
- a. Cut to have a 3" (75mm) minimum overlap.
  - b. On round ductwork, provide one row of welded or glued on spindle anchored pins on top or side section at 12" (300mm) centers (length of pins shall suit ductwork). Proper washers shall be pressed on the pins and the ends of the pins cut before sealing with a piece of 4" (100mm) tape. On round ductwork 14" (350mm) and smaller, 0.5" (13mm) wide 20 gauge stainless steel banding may be used as an alternate to the anchoring pins (install bands at 12" (300mm) on center).
  - c. On rectangular ductwork, apply as specified for round ductwork where dimensions do not exceed 16" (400mm) in total on the four sides. On larger ductwork, the sides and bottom shall have stud welded pins or spindle anchored pins glued on at 16" (400mm) to 18" (450mm) on center.
  - d. All pin penetrations or punctures and all circumferential and longitudinal joints in jacket shall be sealed with a 4" (100mm) vapour barrier tape.
  - e. Refer also to manufacturer's requirements.
- .5 Insulation shall be provided as indicated on drawings and as per the following:
- a. Supply ductwork in unconditioned spaces (not air-conditioned) including ceiling spaces (not used as a return air plenum), bulkheads, cabinet spaces, walls, etc.
  - b. First 8'-0" (2.4m) of exhaust ductwork on interior side of exterior wall, roof, etc. penetrations.

#### 2.4 Duct Insulation for Kitchen (NFPA 96)

- .1 Insulation shall be CL4FIRE or approved equal fire rated thermal insulation, consisting of a blend of calcium, magnesium and silica with enhanced body solubility characteristics, all totally encapsulated in a reinforced foil wrapper and supplied in roll form. The insulation system shall have the following approvals:
- a. Commercial Kitchen Grease Ductwork Testing Standards:
    - i. Internal - ULC Grease Duct Testing Protocol rated for 0" clearance to combustible materials.
    - ii. External - ISO 6944 Duct A Standard.

- iii. Tested per NFPA-96 to meet all applicable Codes as a gypsum shaft alternative.
- iv. Warnock Hersey Listed.
- b. Ventilation Air Ductwork Testing Standards for Emergency Air Supply:
  - i. ISO 6944 Duct A Standard.
  - ii. Warnock Hersey Listed.
- .2 Provide two layers of 1.5" (38mm) thickness.
- .3 Insulation shall be applied directly to the ductwork in strict accordance with the listed system and manufacturers installation instructions.
- .4 All banding and weld-pins shall be installed strictly according to listing requirements.
- .5 Support rods and anchors shall be properly sized and spaced to suit the duct size according to listing requirements.
- .6 All banding, anchors and support rods not matching the system requirements will be removed and replaced.
- .7 The installation shall be reviewed with the manufacturers designated CL4FIRE representative prior to installation and at intervals during the installation. Upon project completion, provide a letter of review and acceptance by the CL4FIRE representative.
- .8 Provide fire stopping at all penetrations of fire rated building construction according to manufacturer's installation requirements.
- .9 The insulation shall run continuously from the Kitchen suspended ceiling space through to the top of the roof curb so as to maintain the integrity of the building fire separations and to protect all combustibles located within 18" (450mm) of the exhaust duct.

#### 2.5 Alternate Manufacturers List:

- .1 Pipe and Duct Thermal Insulation
  - a. Johns Manville
  - b. Owens-Corning Fiberglas
  - c. Manson
  - d. Knauf
  - e. CL4FIRE
  - f. Firemaster

### **3. ELECTRICAL**

#### 3.1 Electrical Wiring

- .1 Unless noted otherwise, power wiring for mechanical equipment shall be provided by the Electrical Trade and this Trade shall provide all controls complete with all low voltage wiring (less than 50V).

- .2 The Electrical Trade shall provide starters, overload protection and disconnects for equipment supplied by this Trade unless noted otherwise. Refer to Wiring for Equipment Schedule on electrical drawings for detailed requirements.
- .3 Line and low voltage electrical work provided by this Trade shall be done in accordance with and to the standards outlined in the electrical specification.
- .4 Control wiring and transformers shall be class 1 or 2 as required by the Ontario Electrical Safety Code (OESC) to suit system operating voltages and currents.
- .5 Control wiring shall be the shielded type and of a type as recommended by the manufacturer. Wiring running concealed shall not run in conduit unless otherwise required by the OESC. Take all necessary precautions to ensure electromagnetic interference from other wiring systems within the building does not affect the operation of the mechanical control systems.
- .6 Where control wiring is installed in return air plenums, use wiring having maximum flame and smoke ratings of 25 and 50 respectively.
- .7 Wiring sizes and transformer capacities shall be suitable to service all control equipment and to accommodate voltage drops in wiring systems.
- .8 Control wiring shall run concealed except as follows:
  - a. In the following locations, wiring may run exposed on surface in conduit. All conduit shall be supplied and installed by this Trade.
    - i. Wiring running on walls or ceilings in Mechanical / Electrical Rooms.
    - ii. Wiring running on ceilings in spaces having no suspended ceilings.
  - b. Exposed control wiring will not be permitted (run in conduit as described above).
  - c. Where not possible to run concealed in spaces other than listed above, surface mount in wiremold. All wiremold shall be supplied and installed by this Trade and shall be of a type approved by the Consultant.
- .9 For all thermostats mounted on concrete block walls, this Trade shall be responsible for installing conduit in walls for control wiring.
- .10 Additional details regarding the electrical wiring are as follows:
  - a. Control transformers for the Building Automation System / motorized dampers shall be supplied and wired by the Mechanical Contractor from power sources provided by the Electrical Contractor where indicated on the drawings. All low voltage wiring to the Building Automation System / motorized dampers shall be by the Mechanical Contractor.
  - b. 24V motorized dampers shall be wired by the Mechanical Contractor.
  - c. All power and control wiring for exhaust fans shall be by the Electrical Contractor.
  - d. The Electrical Contractor shall provide a split receptacle within 3'-0"(0.91m) of the dryer booster fan as a power source for the fan and associated controls.
  - e. All power and control wiring for the kitchen hood exhaust fan and the kitchen hood lights by Electrical Contractor. All interlock wiring from the hood fire suppression system to the building fire alarm system by the Electrical Contractor.
  - f. Interlocks between duct type smoke detectors and the fire alarm system shall be by the Electrical Contractor. All interlock wiring from the detector to the associated air



- handler shall be by the Mechanical Contractor. Note that this interlock shall be hard wire type (do not interlock through the BAS).
- g. For the building automation systems, refer to BUILDING AUTOMATION SYSTEM.
  - h. All 120V power wiring to transformers serving sensor-operated water closet flush valve control boxes shall be by the Electrical Contractor (transformers shall be located in the suspended ceiling space above each associated water closet). The Mechanical Contractor shall supply and installed all transformers (they are provided as an accessory to the flush valve) and provide all control wiring as follows:
    - i. Provide 24V wiring from the transformer to the hardwire converter located in the flush valve sensor box.
    - ii. Provide all 6 VDC wiring running between the flush valve sensor box, the flush valve junction box and the flush valve.
    - iii. All 24V and 6 VDC control wiring running within the wall shall run in conduit which shall be supplied and installed by the Mechanical Contractor.
  - i. Removal of all power / control wiring for demolished mechanical equipment / systems shall be as noted on the drawings.

**END OF SECTION**

## **1. GENERAL**

### 1.1 General Requirements

- .1 Refer to Division 20 – Mechanical.

## **2. PLUMBING AND DRAINAGE**

### 2.1 Supports

- .1 Provide all of the required pipe hangers and supports.
- .2 Pipe and equipment supports shall be Grinnell or approved equal of spacing and type as recommended by manufacturer, in accordance with Code requirements and in accordance with good commercial standards.
- .3 Provide supports to secure pipes, prevent pipe vibration, maintain required grading, allow for expansion and contraction and produce a neat appearance. Design for strength and rigidity to suit loading and services, prevent undue stress to structural members and with provision for vertical adjustment after piping is erected.
- .4 Anchor / support risers so that weight is not transferred to the underground piping / connected horizontal piping.
- .5 Offset hanger pipe and structural attachments in such a manner that rod is vertical when piping is hot and is subject to tensile loading only.
- .6 Adjust hanger rods to equalize load.
- .7 For all piping systems specified to have insulation with a continuous vapour barrier (refer to 'Insulation'), oversize pipe hangers and supports to accommodate insulation.
- .8 Provide supplementary structural steelwork where structural bearings do not exist or where concrete inserts are not in correct locations.
- .9 Where supporting from open web steel joists, attach supports to the approval of the structural engineer and comply with the following:
  - a. For all piping, attach supports to the top angle iron section of joists only.
  - b. Support from panel points only.
  - c. Hanger spacing shall not exceed 10'-0" (3.0m).
- .10 Special care shall be taken to ensure all plastic piping is supported according to the recommendations of the pipe manufacturer and as follows:
  - a. Concentrated loads (valves, flanges, etc.) in water filled piping shall be supported directly or immediately adjacent to the load.
  - b. Piping shall be supported as close as practical to the change-of-direction fittings to eliminate torsional stress.
  - c. Sharp support or sharp edges shall not be used.
  - d. All valves shall be braced against operating torque.

## 2.2 Domestic Water Piping

- .1 Above Ground:
  - a. 3" (75mm) and under: type "L" hard copper tubing with sweat wrought copper pressure type solder joint fittings.
- .2 Below Slab-on-Grade Floors:
  - a. Uponor Aquapex non barrier tubing or approved equal cross-linked polyethylene rated at 180 deg. F. (82.2 deg. C.) maximum working temperature at 100 Psig (690 Kpa) working pressure. The tubing shall be manufactured and listed to CSA B137.5, ASTM F876 and F877, and shall be certified to NSF Standards 14 and 61. Tubing shall be manufactured by the Engel Method.
- .3 Connections
  - a. Lead-free solder for Type L copper.
  - b. For PEX piping, provide mechanical connections according to manufacturer's recommendations. TUBE FITTINGS WILL NOT BE PERMITTED BELOW THE FLOOR SLAB WITHIN THE BUILDING.

## 2.3 Sanitary Drain and Vent Piping

- .1 Below Ground (Contractor to choose desired type):
  - a. 2" and under: type "L" hard copper with cast brass or wrought copper fittings.
  - b. Over 2": Cast iron with "MJ" fittings.
  - c. All sizes inside the building: ABS DWV or PVC-SDR-35 pipe with injection-molded socket fittings.
- .2 Above Ground (Contractor to choose desired type):
  - a. 2" and under: type DWV hard drawn copper tube with cast brass alloy drainage fittings.
  - b. Over 2": Cast iron pipe with "MJ" fittings or DWV copper tubing with cast alloy drainage fittings.
  - c. All sizes: PVC DWV pipe with injection-molded socket fittings. Pipe shall be suitable for use in non-combustible building construction (IPEX System 15 or approved equal). For piping running through return air ceiling plenums, piping shall have a maximum smoke developed rating of 50 (IPEX System XFR 15-50 or approved equal).
- .3 Connections:
  - a. 50-50 lead-tin solder for DWV copper.
  - b. Stainless steel screw clamps and elastomer sleeve for mechanical joint cast iron soil pipe, Bibby-Ste-Croix series 2000 or approved equal.
  - c. Solvent weld all socket fittings according to manufacturer's recommendations.
- .4 All piping shall conform to or be certified by the appropriate CSA standard according to OBC requirements.

- .5 Exposed piping will not be permitted at fixture connections (piping within cabinet spaces is not considered exposed). Use only fixture trim components as specified in the Equipment Schedule or, if not specified, copper piping.
- .6 Un-insulated plastic piping will not be permitted to run exposed in any location. Use only copper or cast iron piping in these locations.
- .7 Plastic piping will not be permitted to run exposed less than 8'-0" (2400mm) above the finished floor in any location (unless approved by Owner or where protected by equipment, block enclosure, etc.) to prevent pipe from being damaged. Use only cast iron piping in these locations including where piping runs within Mechanical / Electrical / Storage / Custodial Rooms.
- .8 Plastic piping will not be permitted for individual piping branches to floor drains which could receive discharge from commercial dishwasher outlets (to prevent pipe damage from extreme temperatures of waste discharge). Use only copper or cast iron piping for these applications for a minimum distance of 15'-0" (4.5m) from the drain outlet.

#### 2.4 Condensate Drain Piping

- .1 Condensate drain piping shall be type M copper, hard drawn with sweat wrought copper pressure type solder joint fittings. Connections shall be made using lead-free solder. Pipe to discharge outdoors as detailed on the drawings.

#### 2.5 Plastic Piping

- .1 Prior to installation of any plastic piping:
  - a. Obtain ULC approved installation instructions from the firestop manufacturer for all firestops throughout the complete project. Where ULC approved products cannot be obtained to suit all pipe configurations and building constructions, use copper or cast iron piping only.
  - b. Verify that the proposed types and locations of plastic piping are acceptable to the local authority and modify work as required without extra cost.
- .2 Do not store plastic piping in direct sunlight.

#### 2.6 Sanitary Cleanouts

- .1 Zurn or approved equal of the following types (Contractor to choose applicable type):
  - a. In ceramic tile and vinyl floor areas, provide ZN-1602 complete with dura coated cast iron body, neoprene body sleeve, polished nickel bronze adjustable head and round top.
  - b. In sheet flooring or equivalent areas, provide ZN-415-R6-ST complete with dura coated cast iron body, combination invertible membrane clamp and adjustable collar with 6" (150mm) diameter polished nickel solid top.
  - c. In piping systems not terminating through building finishes, provide compatible cleanout fittings as manufactured by the pipe manufacturer. Access doors shall be provided as specified elsewhere in the specification.

- .2 Install floor cleanouts where shown on the drawings and where required with top edge flush or maximum 0.125" (3.1mm) below finished floor elevation.

### 2.7 Floor Drains

- .1 Zurn or approved equal of the following types (Contractor to choose applicable type):
  - a. In vinyl tiled and ceramic floor areas, provide ZN-211-B5-P complete with dura coated cast iron body, bottom outlet, adjustable 5" (125mm) diameter polished nickel bronze round strainer and trap primer connection.
  - b. In sheet flooring or equivalent areas, provide ZN-415-R6-P complete with dura coated cast iron body, combination invertible membrane clamp and adjustable collar with 6" (150mm) diameter polished nickel bronze strainer (surface ring and grate) and trap primer connection.
- .2 Install floor drains where shown on the drawings with top edge flush or maximum 0.125" (3.1mm) below finished floor elevation. Co-ordinate the exact location of all floor drains on site and adjust to suit the floor slopes as directed by the General Contractor.

### 2.8 Valves

- .1 General
  - a. All valves shall have a pressure rating suitable for the system operating pressure.
  - b. Similar valves shall be of the same manufacturer.
  - c. All valves supplied for this project shall have a current and valid Canadian Registration Number for the Province of Ontario with TSSA. Suppliers shall provide a copy of the Statutory Declaration for valves, stamped, signed and dated by TSSA as validation of the CRN registration. This shall be provided along with the shop drawing submittal package.
  - d. Provide stem extensions / extended necks as required to suit insulation thickness.
- .2 Fixtures:
  - a. Each fixture supply shall have a shut-off valve. Exposed valves and piping to be chrome plated.
- .3 Isolation Valves (Domestic Hot and Cold Water):
  - a. Sizes 0.5" (13mm) to 2" (50mm): Ball valve complete with 2 piece forged brass body, stainless steel trim, blowout proof stem, PTFE seats, maintenance free double o-ring stem seals and full port design. Valves shall be pressure rated to 150 WSP / 600 WOG and conform to MSS-SP 110 and certified to CSA.
    - 1) Threaded valves: Kitz 68AMLL or approved equal.
    - 2) Soldered valves: Kitz 69AMLL or approved equal
- .4 Balancing Valves (Domestic Hot Water):
  - a. Combination isolation / balancing valves shall be Tour and Andersson 786 / 787 or approved equal complete with soldered / threaded connections to suit application. Note that valves manufactured by Armstrong will not be permitted. The valve size

shall be selected by the manufacturer to suit the flowrate indicated on the drawings.  
The valve shall be complete with the following features:

- i. The valves shall be provided with provision for connecting a portable differential pressure meter.
- ii. The balancing valves shall be Y-pattern globe style design with all metal parts of nonferrous, pressure die cast, nonporous metal.
- iii. Each valve shall be provided with four functions:
  - 1) Precise flow measurement.
  - 2) Precision flow balancing.
  - 3) Positive shut-off with no drip seat, eliminating the need of an additional isolation valve.
  - 4) Drain connection using 0.75" (19mm) NPT hose end thread.
- iv. The valves shall have four 360 degree adjustment turns of the handwheel for precise setting with hidden memory to provide a tamper-proof balancing setting. The handwheel shall have a digital readout and it can be installed in any position without affecting performance.
- v. Valves shall be installed as follows:
  - 1) With flow in the direction of the arrow on the valve body.
  - 2) At least five pipe diameters downstream from any fitting.
  - 3) At least 10 pipe diameters downstream from any pump.
  - 4) Two pipe diameters upstream of any fitting.
  - 5) With easy and unobstructed access to the valve handwheel and metering ports.
  - 6) To prevent sediment build-up in the metering ports.

.5 Pressure Reducing Valves:

- a. Watts Model U5B-S-Z3-GG or approved equal complete with bronze body, thermal expansion by-pass feature, pressure gauge with tapping, adjustable reduced pressure setting, standard pressure range (25-75 Psig (172-517 Kpa)), integral stainless steel strainer, sweat union inlet connection, NPT female outlet and renewable stainless steel seat. The disc holder shall be removable for replacement of disc without dismantling the valve. Suitable for a maximum inlet pressure of 300 PSI (2068kPa) and for maximum temperatures of 160 deg. F. (71 deg. C.).

.6 Drain Valves:

- a. Two piece forged brass body, chrome plated ball, blowout proof stem, PTFE seats / seals, PP or brass cap and chain, full port design. Valves shall be pressure rated to 150 WSP / 600 WOG.
  - i. Threaded valves: Kitz 68C or approved equal.
  - ii. Soldered valves: Kitz 69C or approved equal.
- b. Where required by the local authority, provide tamper proof vacuum breaker.

## 2.9 Shock Absorbers

- .1 Shock absorbers shall be located and sized in accordance with Plumbing and Drainage Institute standard no. WH201-PD-1. Absorbers shall be Zurn Wilkins or approved equal, 1250XL series.

## 2.10 Trap Seal Primers

- .1 Traps and trap seal primers shall be provided for all floor drains / standing wastes according to OBC requirements (traps and primers not shown on drawings).
- .2 Trap seal primer valves and distribution units shall be Precision Plumbing Products Inc. or approved equal. Provide model P-2 primer valve for one or two drains, Model P-1 primer valve for one to four drains. Primer valves to be installed with Precision Plumbing Products model DU-4 or DU-U distribution units or suitable fabricated header.
- .3 Install units according to manufacturer's recommendations and as follows:
  - a. On an active domestic cold water main (1.5" (38mm) or smaller) where pressure fluctuations will ensure proper operation of the primer. The branch piping running to the primer shall connect to the top of the cold water main only (to prevent debris from entering the primer).
  - b. With a minimum elevation above the floor drain as directed by the manufacturer.
  - c. With an isolation valve immediately upstream of each primer.
- .4 All under floor trap seal primer piping shall be polybutylene tubing having an SDR of 11 or less and all above ground piping shall be copper tubing. The minimum size of all trap seal piping shall be 0.5" (13mm).

#### 2.11 Piping Installation Requirements

- .1 Piping shall be installed according to good commercial standards and approximately as follows:
  - a. All piping running vertically shall run concealed in wall construction / furred enclosures unless noted otherwise on the drawings.
  - b. Use compression joints or unions joints in sufficient quantities to facilitate removal of equipment, fixtures, etc. without removal of long lengths of pipe.
  - c. Install eccentric reducers in horizontal piping to permit drainage and eliminate air pockets.
  - d. Where pipe sizes differ from connection sizes of equipment, install reducing fittings close to equipment. Reducing bushings are not permitted.
  - e. All valves and other pipe accessories shall match the associated pipe size unless noted otherwise.
  - f. Cut ends of pipes square, ream, clean scale and dirt and assemble without binding.
  - g. Install copper tubing so that it is not in contact with dissimilar metal and will not be kinked or collapsed.
  - h. Plug or cap pipe and fittings to keep out debris during construction.
  - i. Run buried drains minimum 8" (200 mm) clear below bottom of concrete slab unless not permitted by invert of building drain.
  - j. All piping shall be laid straight and in true alignment to the slopes of the pipe, as indicated on the drawings and / or as directed.
  - k. Install piping free from strains and with proper allowance and off-sets for thermal expansion and contraction.
- .2 Piping shall be graded as follows:
  - a. Water Piping: Minimum 1/20" per foot (0.43mm/100mm) length. Insure all piping can be drained and provide drain valves at all low points.

- b. Sanitary Drains: Minimum slopes as required by Code or as otherwise noted on the drawings.
  - c. Condensate Drains: Minimum 2%.
- .3 Keep all sanitary and water piping clear of outside wall. It is the responsibility of this Contractor to ensure that plumbing piping is installed so that freezing conditions within the pipe do not occur.
- .4 Install a minimum of 24" (600mm) straight run piping between pipe elbows, valves or other fittings in recirculating water systems.
- .5 All drainage piping exposed in accessible pipe chases, utility and similar rooms shall be cast iron or copper only.
- .6 Install plastic piping in accordance with manufacturers product data, including product technical bulletins, installation instructions and product carton instructions for installation.
- .7 Additional installation requirements for PEX piping are as follows:
- a. Do not install PEX tubing within 6" (150mm) of gas appliance vents except that for type 'B' gas vents the minimum clearance shall be 1" (25mm).
  - b. Do not install PEX tubing within within 12" (300mm) of any recessed light fixture.
  - c. Do not install PEX tubing within 5'-0" (1500mm) of direct view from fluorescent lighting without sleeving the pipe with UV-blocking material.
  - d. Do not solder within 18" (450mm) of PEX tubing in the same waterline. Make sweat connections prior to making PEX connections.
  - e. Do not apply open flame to PEX tubing.
  - f. Maintain required separation between adjacent runs of PEX piping to maintain a maximum 25 / 50 flame and smoke developed rating.
  - g. All manifolds shall be provided with supply water isolation valves.
  - h. Ensure that no glues, solvents, sealants or chemicals come in contact with the tubing without prior permission from the tube manufacturer. In particular:
    - i. Do not allow organic chemicals, strong acids or strong bases to come in contact with the tubing.
    - ii. Do not allow petroleum or solvent based paints, greases or sealants to come in contract with the tubing.
  - i. Use only approved and appropriate firestop materials with PEX tubing.
  - j. PEX tubing passing through structural concrete slabs shall be sleeved with utility grade polyethylene tubing one (1) pipe diameter larger than the PEX tubing.
  - k. PEX tubing passing through metal studs shall be use grommets or sleeves having a flame spread rating less than 25 at the penetration.
  - l. Protect PEX tubing with sleeves having a flame spread rating less than 25 where abrasion may occur.
  - m. Use strike protectors where PEX tubing has the potential for being struck with a screw or nail.
  - n. Manufacturer's bend supports shall be used where bends are less than 6 times outside pipe diameter.
  - o. Do not use PEX tubing between the tub / shower valve and the tub spout.
  - p. Horizontal piping shall be supported using hangers and supports designed for use with plastic piping and approved by the PEX tubing manufacturer. Install at maximum



32" (800mm) centers in accordance with Code and manufacturers recommendations except that:

- i. Support spacing may be extended where support channels are utilized. Comply with Code requirements and manufacturers recommendations.
- ii. Space supports relative to valves according to manufacturers recommendations.
- iii. Space supports relative to support channels according to manufacturers recommendations.
- q. All horizontal straight type tubing shall be supported by PEX-a galvanized support channels. Provide 50 pound tensile rated straps to secure the tubing to the channels, spaced according to manufacturers recommendations.
- r. All fitting connections to the PEX tubing shall be made to the requirements of ASTM F1960.
- s. PEX risers shall be provided with epoxy coated riser clamps according to manufacturer's recommendations for proper support and expansion control. Manufacturers concrete tube support bracket shall be used in structural concrete applications at all fixture and manifold locations.
- t. Manufacturers wall penetration brackets shall be used at all wall membrane penetrations.
- u. PEX tubing shall extend through walls at fixtures connections and all exposed tubing shall be covered with a manufactured supplied chrome sleeve.
- v. Conditioning and Testing:
  - i. Condition all new tubing to 1.5 times the required test pressure for 30 minutes.
  - ii. Pressurize PEX potable water distribution system for testing purposes with air or potable water in accordance with applicable codes or, in the absence of applicable codes, to a pressure of 25 psi (173 kPa) above normal working pressure of the system.
  - iii. Comply with safety precautions when pressure testing. Water shall not be used to pressurize the system if ambient air temperature has the possibility of dropping below 32 degrees F (0 degrees C).
  - iv. Comply also with manufacturers recommendations in regards to pipe conditioning and testing requirements.
- w. Install underground PEX piping with the following additional requirements:
  - i. Install in the granular A fill and protect piping as required to ensure no damage occurs prior to or during pouring of the floor slab.
  - ii. Underground joints within the building will not be permitted.
  - iii. The pipe and fittings shall be pressure tested in accordance with manufacturers recommendations, applicable codes and industry standards after installation and before the tubing is covered. The test shall be approximately as follows:
    - 1) Charge the installed but not yet concealed pipe with air. Check the system for leaks.
    - 2) Perform a preliminary pressure test to a pressure of 60 psi (415 Kpa). Stabilize the pressure over 30 minutes.
    - 3) Pressure test the system for a minimum of 1 hour. During this time the pressure shall not fall more than 2 psi (14 Kpa). No leakage shall be detected.
    - 4) Reduce the pressure to 40 psi (275 kPa) and maintain the pressure test throughout the concrete pour and a minimum of 24 hours after the concrete emplacement.

- 5) The pressure test must be performed a minimum of 24 hours prior to the concrete pour.
- 6) The system shall be thoroughly checked for possible piping punctures and shall be repaired by the Contractor prior to and during the concrete application.
- x. Provide manufacturers field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturers instructions. The Contractor shall include in the tender price for a minimum of 3 manufacturers site visits.

### 2.12 Fire Extinguishers

- .1 Fire extinguishers indicated on the drawings shall be of the following types:
  - a. Type FE: Wet Chemical solution, Wilson and Cousins model 141-1000-360, 1.59 USG (6.0 L) capacity having a 2-A:1A:C:K rating complete with stainless steel cylinder. Provide wall mounting bracket.
- .2 Verify all locations on site with the local authority prior to installation and adjust as directed. Mount the handle of the extinguisher at 3'-11" (1175mm) above finished floor.

### 2.13 Plumbing Fixtures

- .1 Plumbing fixtures complete with trim shall be of the manufacturer's listed in the Schedule on the drawings or approved equal. Colour of fixtures (except stainless steel fixtures) shall be white.
- .2 Connect plumbing fixtures and equipment to the water supplies, wastes, traps and vents in accordance with the Ontario Building Code. Traps and vents are not shown on the drawings. All fixtures shall be served from wall unless noted otherwise on the drawings.
- .3 Set fixtures level, square and centered with relation to floors, walls, and partitions, a standard height from floor to rim unless otherwise shown on drawings and / or directed by the Consultant.
- .4 Attach plumbing fixtures in an approved manner complete with all required flanges, gaskets, bolts, nuts, etc. Seal around all fixtures.
- .5 Branch piping to individual plumbing fixtures shall be sized as shown in the Plumbing Branch Piping Schedule on the drawings.
- .6 Approximate mounting heights of fixtures, as measured from finished floor/grade level shall be as follows unless noted otherwise on the drawings:
  - a. Countertop sink: Countertop level.
  - b. Washer supply fitting: Minimum height above washer.
  - c. Wall-hung barrier-free lavatory: 34" (865 mm) to overflow rim.
  - d. Barrier-free water closet: 17" (430 mm) to 19" (485 mm) to top of seat.

### 2.14 Grease Interceptor

- .1 Unit shall be acid-resistant coated (inside and outside) fabricated steel interceptor complete with internal air relief by-pass, bronze cleanout plug, removable pressure equalizing / flow diffusing inlet baffle, fixed bottom outlet baffle, visible double wall trap seal, gasketed non-skid secured cover having center tie down assembly and integral flow control. Provide top to center line inlet dimension to suit installation. Fully recess in floor. For units suspended above grade provide anchoring flange. In waterproof areas provide membrane clamp.
- .2 Interceptors shall be Zurn or approved equal. For model, accessories and performance requirements, refer to Equipment Schedule on the drawings.

#### 2.15 Draining Water Systems

- .1 Drain and refill as applicable all existing water systems as required to permit revisions as indicated on the drawings.

#### 2.16 Testing and Inspection

- .1 Test drainage, vent and domestic water piping to Plumbing Code requirements. Repair all leaks to the inspection authority and / or the Consultant's approval.
- .2 All leaks shall be repaired by remaking the joint. After piping systems have been tested and repaired, repeat tests.
- .3 All equipment / devices which may be damaged by test pressures shall be isolated during testing procedures.

#### 2.17 Cleaning and Flushing

- .1 Flush and clean all new and existing affected piping in the following sequence:
  - a. Flush with potable water for a minimum time period of 30 minutes. During flushing and cleaning maintain all isolating valves in the open position. Remove faucet strainers during flushing and replace once flushing is complete.
  - b. Disinfect all new piping for three hours using a 200 ppm chlorine solution.
  - c. After disinfection, flush all new and affected existing piping with potable water for a minimum time period of 30 minutes.
  - d. Perform a water quality / bacteria analysis prepared by an independent lab to verify that the domestic water system downstream of each Tenant water meter is clean and suitable for consumption. Take each sample at the most downstream end of each piping system.
- .2 During flushing and cleaning maintain all isolating valves in the open position.

#### 2.18 Alternate Manufacturers List:

- .1 Plumbing Fixtures
  - a. American Standard
  - b. Kohler
  - c. Mansfield

- .2 Plumbing Trim
  - a. Delta Commercial
  - b. Moen Commercial
  - c. Sloan
  - d. Chicago
  
- .3 Electronic Flush Valves
  - a. Delta Commercial
  - b. Sloan
  - c. Toto
  
- .4 Stainless Steel Sinks
  - a. Franke
  - b. Novanni
  - c. Elkay
  - d. Architectural Metal Industries
  
- .5 Plumbing Specialties
  - a. Zurn
  - b. Ancon
  - c. Mifab
  - d. Jay R. Smith
  - e. Precision Plumbing Products
  
- .6 Valves and Strainers
  - a. Armstrong
  - b. Watts
  - c. Toyo
  - d. M.A. Stewart
  - e. Neo
  - f. Kitz
  - g. Apollo
  
- .7 Pipe Hangers
  - a. Grinnell
  - b. Crane
  - c. Unistrut
  - d. Myatt
  - e. L.E. Taylor

- .8 Fire Extinguishers
  - a. Wilson and Cousins
  - b. National Fire Equipment
  - c. Flag
  - d. Reliable

**END OF SECTION**

## **1. GENERAL**

### 1.1 General Requirements

- .1 Refer to Division 20 – Mechanical.

## **2. HOT WATER HEATING**

### 2.1 Supports

- .1 Provide all of the required pipe hangers and supports.
- .2 Pipe and equipment supports shall be Grinnell or approved equal of spacing and type as recommended by manufacturer, in accordance with Code requirements and in accordance with good commercial standards.
- .3 Provide supports to secure pipes, prevent pipe vibration, maintain required grading, allow for expansion and contraction and produce a neat appearance. Design for strength and rigidity to suit loading and services, prevent undue stress to structural members and with provision for vertical adjustment after piping is erected.

### 2.2 Hot Water Heating Piping

- .1 Above Ground Metal Piping (Contractor to choose desired type):
  - a. Piping to NPS 6" (150mm) shall be ERW or seamless schedule 40, Grade B black steel complying with ASTM A53 / A53M.
  - b. Piping to NPS 3" (75mm) may be type L hard copper complying with ASTM B88.
  - c. Fittings shall be to the following as applicable:
    - i. Malleable iron screwed fittings, Class 150 to ASME B16.3.
    - ii. Malleable iron unions, Class 150 to ASME B16.3. Unions 2.5" (63mm) and larger shall be made with flanges.
    - iii. Sweat wrought copper or cast brass soldered fittings for Type 'L' copper piping.
    - iv. All fittings shall be long radius type.
  - d. Connections shall be to the following as applicable:
    - i. Piping NPS 2" (50mm) and under: screwed or soldered.
      - 1) For screwed piping connections, use teflon tape (pipe thread taper to ASME B2.1).
      - 2) Where copper piping is used joints shall be 95-5 hard solder.

### 2.3 Valves

- .1 General
  - a. All valves shall have a pressure rating suitable for the system operating pressure.
  - b. Similar valves shall be of the same manufacturer.
  - c. All valves supplied for this project shall have a current and valid Canadian Registration Number for the Province of Ontario with TSSA. Suppliers shall provide a copy of the Statutory Declaration for valves, stamped, signed and dated by TSSA as

- validation of the CRN registration. This shall be provided along with the shop drawing submittal package.
- d. Provide stem extensions / extended necks as required to suit insulation thickness.
- .2 All valves shall be to the following or approved equal:
- a. Up to and including NPS 2" (50 mm), bronze valves as follows:
- i. Isolation:
- 1) Ball valve complete with 2 piece forged brass body, stainless steel trim, blowout proof stem, PTFE seats, maintenance free double o-ring stem seals and full port design. Valves shall be pressure rated to 150 WSP / 600 WOG and conform to MSS-SP 110 and certified to CSA.
  - 2) Threaded valves: Kitz 68AMLL or approved equal.
  - 3) Soldered valves: Kitz 69AMLL or approved equal.
- b. Combination isolation / balancing valves shall be Armstrong CBV Series or approved equal complete with threaded or flanged connections to suit piping. The valve size shall be selected by the manufacturer to suit the flowrate indicated on the drawings. The valve shall be constructed / installed as follows:
- i. Two 0.25" (6mm) NPT brass metering ports with Nordel check valves and gasketed caps shall be located on both sides of the valve seat.
  - ii. Two additional 0.25" (6mm) connections with brass plugs shall be provided on the opposite side of the metering ports for use as drain connections.
  - iii. Drain connections and metering ports shall be interchangeable to allow for measurement flexibility when valves are installed in tight locations.
  - iv. Y pattern, modified, equal percentage globe style, providing the following functions:
    - 1) Flow measurement.
    - 2) Flow balancing.
    - 3) Positive drip tight shut off.
  - v. Multi-turn, 360 deg. Adjustment with a micrometer type indicator located on the valve handwheel.
  - vi. Hidden memory feature on handwheel which will provide a means for locking the valve position after the system is balanced.
  - vii. Sizes 2" (50mm) and under shall have bronze body with ultra-high strength engineered resin plug, bronze stem and high strength resin handwheel and sleeve. The plug shall have precision-contoured channels to distribute flow uniformly across the valve seat. Valves shall have a minimum of four full 360 deg. handwheel turns.
  - viii. Valves shall be installed as follows:
    - 1) With flow in the direction fo the arrow on the valve body.
    - 2) At least five pipe diameters downstream from any fitting.
    - 3) At least 10 pipe diameters downstream from any pump.
    - 4) Two pipe diameters upstream of any fitting.
    - 5) With easy and unobstructed access to the valve handwheel and metering ports.
    - 6) To prevent sediment build-up in the metering ports.

## 2.4 Air Vents

- .1 Automatic air vents shall be Taco model 400 Hy-Vent or approved equal. Install air vents and collecting chambers at high points of heating system, where indicated on the drawings and in all locations where air can be trapped including unit heaters and heating coils. Provide stop cock to facilitate removal of vent without draining the heating system.

### 2.5 Piping Installation Requirements

- .1 Piping shall be installed according to good commercial standards and approximately as follows:
  - a. Use unions in sufficient quantities to facilitate removal of equipment without removal of long lengths of pipe.
  - b. Install eccentric reducers in horizontal piping to permit drainage and eliminate air pockets.
  - c. Where pipe sizes differ from connection sizes of equipment, install reducing fittings close to equipment. Reducing bushings are not permitted.
  - d. All valves and other pipe accessories shall match the associated pipe size unless noted otherwise.
  - e. Cut ends of pipes square, ream, clean scale / dirt and assemble without binding.
  - f. Install copper tubing so that it is not in contact with dissimilar metal and will not be kinked or collapsed.
  - g. Plug or cap pipe and fittings to keep out debris during construction.
  - h. All piping shall be laid straight and in true alignment to the slopes of the pipe, as indicated on the drawings and / or as directed.
  - i. Install piping free from strains and with proper allowance and off-sets for thermal expansion and contraction.
  - j. Slope piping up in direction of flow at a minimum rate of 1/20" per foot (0.43mm/100mm) length and provide drain at low points. The entire hot water heating system shall be capable of being drained.
  - k. Provide all piping connections to all mechanical equipment with valves and unions located so that removal of equipment is possible without disconnecting more than a minimum amount of pipework, shutting down other pieces of equipment or draining the entire system.
  - l. Install a minimum of 14" (350mm) straight run piping between pipe elbows, valves or other fittings unless noted otherwise on the drawings.
  - m. Maintain minimum five pipe diameters of straight pipe on the inlet and outlet sides of pressure independent control / balancing valves.
  - n. Provide clearance for maintenance of equipment and valves.

### 2.6 Draining and Refilling the Hot Water Heating System

- .1 This Contractor shall be responsible for draining and refilling the heating system to permit revisions as noted on the drawings.
- .2 All new and affected existing piping system (mains and branch piping) shall be flushed and cleaned as follows, in the specified order:
  - a. Flush using raw water to ensure removal of heavy debris and excessive oil or dirt.
  - b. During flushing, maintain all isolating and control valves in the open position.
  - c. Do not flush piping through equipment which could be damaged by pipe debris (coils, etc.). Provide necessary bypass piping.



- d. Clean with Quatic Chemicals Series 6002 neutral pH cleaner or approved equal. The cleaner shall be introduced into system at a dosage of 2 gallons per 100 gallons (9.0 litres per 455 litres) of water in the system and circulated for 24 hours at ambient temperature.
  - e. The complete system shall then be drained as quickly as possible using all available drain valves.
  - f. Immediately refilled with fresh water and circulate for a minimum of 60 minutes.
  - g. The complete system shall then be drained and refilled. If any foaming or discoloration is still present, the system will require repeated draining and refilling. Ensure that all residual cleaner has been removed to the approval of the chemical treatment manufacturer.
  - h. Following cleaning / flushing procedures, clean strainers and immediately fill system.
  - i. Make all necessary provisions in the piping system for the introduction of the cleaning chemicals.
- .3 Chemically treat the heating water according to the existing chemical treatment manufacturer's recommendations. All chemicals shall be supplied and installed by This Contractor.

### 2.7 Testing and Inspection

- .1 Test hot water heating piping at 1.5 times the system operating pressure or 125 Psig (860 Kpa), whichever is greater for a minimum 4 hour period or as may be necessary to determine if there is leakage. Repair all leaks to the Consultants approval.
- .2 All leaks shall be repaired by remaking the joint. After piping systems have been tested and repaired, repeat tests.
- .3 All equipment / devices which may be damaged by test pressures shall be isolated during testing procedures.

## **3. HEATING, VENTILATING AND AIR CONDITIONING**

### 3.1 Ductwork

- .1 All ductwork shall be G-60 galvanized steel unless noted otherwise, in accordance with ASTM A-653 and A-924. Thickness and fabrication shall be to ASHRAE and SMACNA standards.
- .2 Fittings and joints shall be fabricated and installed to ASHRAE and SMACNA standards.
- .3 Non-metallic flexible ductwork shall be Thermaflex S-LP or approved equal, non-collapsible woven and coated fibre glass fabric permanently bonded to a coated spring steel wire helix. Where flexible ductwork is connected to thermally insulated rigid ductwork, flexible ductwork shall be thermally insulated type, Thermaflex G-KM or approved equal. Flame and smoke developed ratings not to exceed 25 and 50 respectively. Ducts shall comply with ULC, NFPA and SMACNA standards.
- .4 All duct runnouts shall have a diameter the same size as the diffuser neck size unless noted otherwise.

- .5 All supply / return / exhaust elbow fittings shall have a centreline radius equal to 1.5 times the duct width for rectangular ducts or 1.5 times the diameter for round ducts.
- .6 All ductwork serving dryer exhaust systems shall be aluminum and shall be assembled without screws or other fasteners which extend into the vent.
- .7 All supply, exhaust and return air ductwork shall be complete with sealed joints as follows:
  - a. Supply and exhaust ductwork located in conditioned spaces within the building shall be Seal Class C as defined in SMACNA standards (transverse joints / connections made airtight with sealing compound, longitudinal seams unsealed).
  - b. Dryer venting shall be Seal Class A as defined in SMACNA standards (transverse joints / connections, longitudinal seams and duct wall penetrations made airtight with sealing compound plus aluminum tape).
  - c. Unconditioned spaces are those which are not heated or cooled.
  - d. Return air ductwork is not required to be sealed.

### 3.2 Kitchen Hood Exhaust Ductwork

- .1 Ducts shall be constructed of and supported by carbon steel of not less than 16 gauge. Unless otherwise noted or permitted by NFPA 96, all seams, joints, penetrations and duct-to-hood collar connections shall have a liquidtight continuous external weld. All duct elbows and offsets shall be radius type constructed to SMACNA standards (turning vanes within ductwork will not be permitted).
- .2 All ducts shall be installed without forming dips and traps that may collect residues.
- .3 Duct-to-duct connections shall be:
  - a. Telescoping, bell-type, flange with edge weld or flange with filled weld as described in NFPA 96.
  - b. For telescoping and bell-type connections, the inside duct section shall always be uphill of the outside duct section, the difference between inside dimensions of overlapping sections shall not exceed 0.25" (6.4mm) and the overlap shall not exceed 2" (50mm).
  - c. Butt welded connections will not be permitted.
- .4 Provide access openings for the cleaning and inspection of the interior surfaces of all exhaust ducts and provide access openings at all changes in direction unless otherwise permitted by NFPA 96 . All access openings shall comply with NFPA 96 requirements and shall be approximately as follows:
  - a. Openings shall be located on the sides or at the top of the duct. The edge of openings shall be not less than 1.5" (38mm) from all outside edges of the duct or welded seams.
  - b. On horizontal ducts:
    - i. At least one 20"x20" (500x500mm) opening shall be provided for personnel entry. Where this is not possible, smaller openings shall be provided at 12'-0" (3.6m) intervals.
  - c. On vertical ducts:
    - i. Adequate access for cleaning shall be provided on each floor.

- d. At the hood connection(s) having dampers in the collar, provide an access panel for cleaning / inspection unless dampers are accessible through the hood.
  - e. Access panels shall be of the same material and thickness as the duct.
  - f. Access panels covering the openings shall have a gasket or sealant that is rated for 1500 deg. F. (815 deg. C.) and is greasetight. Fasteners used to secure the access panel to the grease duct shall not pierce the duct wall. Instead, weld a flanged collar to the opening, and attach access panel to collar with fasteners.
  - g. Panels shall be labelled ACCESS PANEL - DO NOT OBSTRUCT.
- .5 All duct connections to the hood and exhaust fan shall comply with NFPA 96 requirements to provide a liquid tight seal.
- .6 All roof exhaust fans shall be mounted with their outlets minimum 40" (1000mm) above the roof and with 10'-0" (3.05m) clearance to adjacent buildings, property lines and air intakes unless otherwise permitted by NFPA 96. All clearances from fans to combustible and limited combustible surfaces shall be as specified below for ductwork.
- .7 The hood and ducts shall have a clearance of at least 18" (450mm) to combustible materials, 3" (75mm) to limited combustible materials and zero clearance to noncombustible materials unless otherwise specified in NFPA 96. Reduced clearances will be permitted when materials are protected as specified in NFPA 96 or as noted on the drawings. Refer also to NFPA 96 Materials Classification Schedule on the drawings.
- .8 For exact requirements regarding the installation of the kitchen hood exhaust system, refer to NFPA 96.
- .9 The complete kitchen hood exhaust system shall be field tested to the approval of the Consultant, Owner, and local authority. Perform a smoke test of the exhaust ductwork and any other test requested by the local authority without extra cost.

### 3.3 Supports

- .1 All ducts shall be adequately supported. Maximum size to be supported by a strap hanger shall be 36" (900mm) wide. All other ducts shall be supported by steel angles complete with threaded rods, locking nuts and washers. Threaded rods shall be sized according to the recommendations of Grinnell to suit the application. Hanger spacing shall comply with SMACNA standards.
- .2 Ducts cannot in any location be supported from the furring or ceiling construction. Also, ducts having areas greater than 1.0 sq. ft. (0.1 sq. m.) cannot in any location be supported from the metal floor / roof deck. Smaller ducts which are permitted to be supported from the metal floor / roof deck shall be fastened to the sides (not bottom) of the flutes and shall be attached with a minimum #10 size screw.
- .3 Supports for roof mounted mechanical equipment shall be by the General Contractor.
- .4 All supports for the kitchen hood exhaust ductwork shall be in compliance with the requirements of the fire rated thermal insulation manufacturer.

### 3.4 Roof Curbs

- .1 All curbs for roof mounted exhaust fans shall be supplied and installed by the Mechanical Contractor.
- .2 Roof curbs shall be galvanized steel with wood nailer strip, turndown flange and shall be capable of supporting the entire unit weight. Curbs may be bolted together on site where required for ease of transporting to site.
- .3 Provide a closed cell curb gasket with adhesive on one side to seal between the ductwork / roof mounted equipment and the top of curb.
- .4 Suitably secure curbs to the roof deck and level according to manufacturer's recommendations.

### 3.5 Duct Access Doors

- .1 Provide duct mounted access doors to service all mechanical equipment requiring maintenance access (including fire dampers, motorized dampers, etc.). Provide doors on one or both sides of device as required to permit full service / cleaning. Doors shall be Nailor-Hart series 0800 or approved equal, insulated sandwich construction complete with sheet metal angle frame, 1" (25mm) thick insulation, gaskets and camlocks. Sizing to manufacturer's recommendations to suit application.

### 3.6 Duct Sealant

- .1 Interior duct sealant shall be Bakor Duck-Seal or approved equal having a maximum flame and smoke rating of 25 and 50 respectively.

### 3.7 Refrigeration Piping

- .1 The design, construction, testing and stamping of every pressure vessel and associated piping and the registration of fittings shall conform to all requirements of CSA B52. All applicable requirements relating to welding / brazing procedures, quality control procedures and other related requirements must be followed. All pressure retaining components within the scope of CSA Standard B51 shall be constructed to a design that is registered as a pressure vessel, a fitting or a piping system.
- .2 For this project, the refrigeration system(s) will not require system registration with TSSA.
- .3 Refrigerant piping and fittings shall be registered in accordance with CSA Standard B51. If applicable, they shall be listed either individually or as part of refrigeration equipment by an approved testing laboratory or shall comply with ANSI / ASME B31.5. Piping shall also comply with the following:
  - a. Unprotected hard-drawn copper tubing shall conform to ASTM B88, type L.
  - b. Unprotected, soft, annealed copper tubing shall not be used in sizes larger than 1-3/8" (34mm) OD. It shall conform to ASTM Standard B280. The minimum nominal wall thickness shall be in accordance with CSA Standard B52.
  - c. Soft copper tubing will not be permitted:
    - i. In exposed locations within the building.
    - ii. For exposed piping running on the roof.

- .4 All piping shall be supplied clean and dehydrated.
- .5 Connections:
  - a. Use manufacturer's flared connections (where applicable) in accordance with manufacturer's installation instructions.
  - b. Do not use flux when brazing refrigeration piping. Use phosphor copper brazing filler metal (B-Cu93P-710/795: ISO 3677) which does not require flux.
  - c. A pure dry nitrogen flow of 1-3 cubic feet / minute (0.5-1.5 l/s) shall be introduced into the pipe during brazing to displace air. Control the flow using a suitable metering device.
- .6 All refrigerant lines shall be sized, pitched and installed according to manufacturer's recommendations and as indicated on the drawings. Ensure that oil is properly returned to the compressor. All pipe sizes indicated on the drawings shall be verified and adjusted on site according to manufacturer's recommendations and to suit the final installed pipe lengths.
- .7 Systems shall be complete with refrigerant metering device / expansion valve, filter drier, sight glass, isolation valves, purge valves, etc. as required for the proper operation and maintenance of the system. All accessories shall be of adequate capacity and of suitable type for the service required.
- .8 Pitch horizontal hot gas piping at a minimum rate of 0.5" per 10'-0" (42mm per 10.0m) so that gravity will aid in moving oil in the direction of refrigerant / oil flow.
- .9 Systems containing more than 6.6 lb. (3.0 Kg) but less than 110 lb. (50.0 Kg) of refrigerant shall have stop valves installed on each suction inlet and discharge outlet of each condensing unit. This is not required for systems having a refrigerant pumpout function capable of storing the entire refrigerant charge, are equipped with provisions for pumpout of the refrigerant or are self-contained.
- .10 Stop valves used with soft, annealed copper tubing or hard-drawn copper tubing 7/8" (22mm)OD or smaller shall be securely mounted, independent of tubing fastenings or supports.
- .11 All required refrigerant in excess of the charge shipped with the mechanical equipment shall be supplied and installed by the Contractor.
- .12 Do not open valves isolating equipment until all piping is pressure tested and evacuated.
- .13 The high and low sides of all refrigeration piping shall be tested and proven tight at not less than the lower of the design pressure given in CSA B51 or the setting of the pressure-relief device protecting the high and low sides of the system respectively. In testing systems using non-positive displacement compressors, the entire system shall be considered at the low-side pressure for test purposes. Repair all leaks by remaking the connection and re-test.
- .14 The system shall be pressure tested to the following minimum standards:
  - a. Pressurize the complete system using Nitrogen to 45 Psig (310 Kpa) and hold for a minimum of 3 minutes.

- b. Pressurize the complete system using Nitrogen to 220 Psig (1515 Kpa) and hold for a minimum of 3 minutes.
  - c. Pressurize the complete system using Nitrogen to 450 Psig (3100 Kpa) and hold for a minimum of 24 hours.
- .15 Evacuate all system components as follows:
- a. Evacuate the line set and indoor unit to an absolute pressure of 23,000 microns.
  - b. Break the vacuum with dry nitrogen set for a discharge pressure of 150 Psig (1035 Kpa).
  - c. Release the dry nitrogen from the line set and the indoor unit.
  - d. Evacuate the line set and indoor unit until the absolute pressure does not rise above 1000 microns within a 7 minute period after shutting off the vacuum pump and closing the test manifold gauge valves.
  - e. When the absolute pressure requirement has been met, break the vacuum with refrigerant and charge the system to manufacturer's recommendations.
  - f. Use a vacuum gauge with is capable of accurately measuring down to 50 microns.
- .16 Insulation for all suction and hot gas piping shall be 0.5" (13mm) Armacell AP Armaflex Tube unslit flexible elastomeric cellular pipe insulation or approved equal with a "K" factor of 0.27 Btu-in/hr.-sq.ft.-deg.F (0.039 W/m.-deg.C) at a mean temperature of 75 deg. F. (24 deg. C.). All insulation and associated components shall have maximum flame spread and smoke developed ratings of 25 and 50 respectively. Apply according to manufacturer's recommendations and approximately as follows:
- a. All butt joints shall be sealed using Armaflex 520 adhesive. Both surfaces to be joined shall be completely coated with adhesive and butted firmly together.
  - b. All outside insulation shall be protected with 2 coats of Armstrong Armaflex WB finish.
  - c. Apply using slip-on method unless not possible due to site conditions. Where required to use slit type insulation, seal all joints using Armaflex 520 adhesive.
  - d. Insulation shall be neatly cut to fit snugly around obstacles. Seal all joints using Armaflex 520 adhesive.
  - e. Comply with manufacturer's recommendations regarding required ambient temperatures.
- .17 Each refrigeration system shall be provided with a permanent sign securely attached, readily accessible and legible indicating the following:
- a. Name and address of the installer
  - b. Refrigerant identification
  - c. Lubricant identity and amount
  - d. Total weight of refrigerant required for normal operations
  - e. Field test pressures applied
  - f. Refrigeration capacity at design or nominal condition
  - g. Prime movers rating in HP (KW) or full load current and voltage.
- .18 Refrigeration pipe supports shall be resilient type, Unistrut Cush-A-Clamp or approved equal.
- .19 Do not allow refrigeration piping to be in direct contact with the building structure.

- .20 Provide two year full guarantee on the complete refrigeration system including all components, refrigerants and oils. Provide 5 year warranty on compressor.

### 3.8 Combination Fire / Smoke Dampers

- .1 Combination fire/smoke dampers shall be Nailor series 1270 series or approved equal constructed as follows:
- a. Frame shall be constructed of 16 gauge galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength.
  - b. Blades shall be of triple-vee design, 16 gauge galvanized steel, on 5.5" (138mm) centers and shall be parallel configuration.
  - c. Blade axles shall be 0.5" (13mm) diameter plated steel, double bolted at each end of blade to ensure positive locking connection. Hex or square friction-fit or press-fit axles are not acceptable.
  - d. Bearings shall be self-lubricating oilite bronze type.
  - e. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream.
  - f. Jamb seals shall be compression type stainless steel. Blade seals shall be stainless steel.
- .2 Dampers shall meet the requirements of NFPA 90A, 92A and 92B and shall be classified by UL and labeled as a 1.5 hour fire damper under UL 555 and as a Class II Leakage Rated smoke damper under UL555S at an elevated temperature of 350 deg. F. (177 deg. C.).
- .3 Dampers shall be qualified for use in dynamic or static Smoke Control Systems.
- .4 Dampers shall be supplied with factory installed sleeves (optional field supplied sleeves may be supplied where desired by the Contractor) of minimum 16" (400mm) length, to be field verified by Contractor to suit the wall thickness. Sleeves shall be caulked to UL requirements and shall be 20 gauge through 84" (2100mm) wide, and 18 gauge above 84" (2100mm) wide. Provide type A, B or C sleeve to suit installation.
- .5 A Honeywell or approved equal model ML4115, 120 volt actuator (power open, spring close) shall be installed by the damper manufacturer in the factory and shall have been tested and classified under UL555S with the damper at an elevated temperature of 350 deg. F. (177 deg. C.). Actuators shall incorporate an OEM internal spring return mechanism. External after-market spring mechanisms are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of three times to ensure correct operation.
- .6 Each damper shall be equipped with a UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center / knee lock linkage, when the duct temperature reaches the maximum degradation temperature of the damper / actuator assembly as required by UL555S. Closure devices that cause instantaneous closure are not acceptable.

### 3.9 Manual Dampers

- .1 For spin-in collars, single blade butterfly dampers shall be of same material as duct. Metal construction and damper configuration to recommendations of SMACNA. Balancing dampers shall have handle and locking device.

### 3.10 Grilles and Diffusers

- .1 Krueger or approved equal. Refer to Diffuser and Grille Schedule on drawings for model and type.
- .2 All aluminum grilles shall be fastened with stainless steel screws.

### 3.11 Duct Acoustic Insulation

- .1 Johns Manville Linacoustic RC or approved equal flexible duct liner made with glass fibers bonded with a thermosetting resin. The airstream surface shall be protected with a Permacote acrylic coating with a flexible glass cloth reinforcement. A factory applied coating shall be applied to the edges of the liner core.
- .2 Unless noted otherwise on the drawings, provide 0.5" (13mm) thickness having an R value of 2.2 hr.-sq.ft.-deg.F / Btu (0.38 sq.m.-deg.C/W) for all ductwork where indicated on the drawings. NOTE: WHERE ACOUSTIC LINING IS INSTALLED, SIZE OF DUCTWORK IS ACTUAL OUTSIDE DIMENSION OF DUCT.
- .3 All portions of duct designated to receive duct liner shall be completely covered with liner. Transverse joints shall be neatly butted and there shall be no interruptions or gaps. The liner surface designed to be exposed shall face the air stream. Duct liner shall be adhered to the sheet metal with 100% coverage of adhesive and all exposed leading edges and all transverse joints coated with adhesive. The liner shall be additionally secured with weld-on pins which shall compress the duct liner sufficiently to hold it firmly in place.
- .4 Duct liner shall be cut to assure overlapped and compressed longitudinal corner joints. For velocities to 2,500 ft./min. (762 m/min.) the weld-on pins shall start within 3" (75 mm) of the transverse edges of the liner. Space with a maximum separation of 12" (300 mm) around the perimeter of the duct except that pins shall be a maximum of 4" (100mm) from a corner break. Elsewhere they shall be a maximum of 18" (450 mm) o.c.. All transverse edges shall be coated with adhesive.
- .5 All insulation shall be applied according to manufacturer's recommendations.
- .6 All insulation and components shall have maximum flame and smoke spread ratings of 25 and 50 respectively.

### 3.12 Kitchen Range Hoods

- .1 Hoods shall be Broan or approved equal complete with centrifugal blower, 3-speed controller, permanent aluminum mesh grease filter, LED light complete with lens, thermally protected motor, prewired junction box with plug in motor, top or back wiring entrance, keyhole mounting slots, backdraft damper and stainless steel finish. Width of unit shall be as listed in the Equipment Schedule (verify on site and adjust as required to suit installation).
- .2 For model, accessories and performance requirements, refer to Equipment Schedule on the drawings.

### 3.13 Centrifugal Upblast Roof Mounted Exhaust Fans

- .1 Fans shall be Penn Fumex or approved equal, upblast arrangement, having the following features:



- a. The fan housing shall be weatherproof, utilize heavy-gauge spun aluminum construction with a large rolled bead for strength.
  - b. Galvanized base and rigid galvanized steel internal support structures. The housing shall not provide any of the internal structural support.
  - c. Oversized electrical conduit chase through the curb cap and into the motor compartment
  - d. Pre-wired to a junction box mounted in the motor compartment and equipped with an electrical disconnect device.
  - e. Statically and dynamically balanced backwardly inclined, centrifugal wheels shall be aluminum, spark resistant, non-overloading, and matched to deeply spun venturis.
  - f. Motors shall be mounted out of the main airstream.
  - g. Belt drive fan assemblies shall be as follows:
    - i. Large diameter cooling tube causing ambient air to flow over the motor.
    - ii. Motor shall be continuous duty, ball bearing design, permanently lubricated type.
    - iii. Shafts shall be turned, ground, polished and rust protected.
    - iv. Heavy duty ball bearings shall be rated for a minimum L50 life exceeding 200,000 hours.
    - v. Pulleys shall be adjustable, cast iron, machined, keyed, securely attached and sized for 150% of the horsepower at its rated maximum speed.
  - h. The fans shall be AMCA certified for both sound and air performance, and shall be UL and CSA listed.
- .2 For fans serving the kitchen exhaust hoods, provide the following:
- a. Drain connection leading into a grease collector / separator box.
  - b. Construction in accordance with NFPA-96 requirements ("fat trap" design).
  - c. Provide UL 762 Listing rated at 400 deg. F. (204 deg. C.).
  - d. Motor pre-wired to a weather-proof junction box.
  - e. Shop fabricated roof curb complying with NFPA-96 requirements and having a height to maintain the minimum clearances indicated on the drawings. The curb shall also be constructed to enable the duct transition within the curb as noted on the drawings and to permit the fire rated thermal insulation to extend up within the curb to a minimum height above the roof of 1'-6" (450mm).
- .3 For model, accessories and performance requirements, refer to Equipment Schedule on the drawings.

### 3.14 Condensing Units

- .1 Units shall be factory assembled, single piece, air cooled condenser complete with hermetic compressor, air cooled coil, propeller type condenser fan, internal wiring / piping / controls and refrigerant charge (R-410A).
- .2 Units shall have the following approvals / ratings:
  - a. Rated in accordance with the latest edition of AHRI Standard 210.
  - b. Certified for capacity and efficiency, and listed in the latest AHRI directory.
  - c. Unit construction shall comply with the latest edition of ANSI / ASHRAE and with NEC.
  - d. Unit shall be constructed in accordance with UL standards and will carry the UL label of approval.

- e. Units shall have c-UL-us approval.
- .3 The unit cabinet shall be constructed of galvanized steel, bonderized and coated with a powder coat paint.
- .4 The condenser fan shall be direct drive propeller type discharging air upward. The condenser fan motor shall be totally enclosed, 1-phase type with class B insulation and permanently lubricated bearings. Shafts shall be corrosion resistant. The fan blades shall be statically and dynamically balanced and the fan openings shall be equipped with coated steel wire safety guards.
- .5 The compressor shall be hermetically sealed and shall be mounted on rubber vibration isolators.
- .6 The condenser coil shall be air cooled and shall be constructed of aluminum fins mechanically bonded to copper tubes which are then cleaned, dehydrated and sealed. Factory leak test at 150 PSIG (1035 Kpa) and pressure test at minimum 450 PSIG (3100 Kpa).
- .7 Refrigeration circuit components shall include liquid line shut-off valve with sweat connections, vapor line shut-off valve with sweat connections, internal pressure relief valve, filter drier for R-410A refrigerant and system charge of R-410A refrigerant and compressor oil.
- .8 Provide internal thermal overload.
- .9 Unit electrical power shall have a single point connection. The control circuit shall be 24 volts.
- .10 Units shall be Carrier. For model, accessories and performance requirements, refer to Equipment Schedule on the drawings.

### 3.15 Blower Type Kitchen Hood (NFPA Rated)

- .1 The filter hood shall be a Spring Air Systems model FD-BR-MJ-3.50/3.92-OD1 (or approved equal) box canopy, high efficiency, filter hood with type 'MJ' perimeter defence system.
- .2 Hood to include factory-installed UL listed 1" (25mm) wall on all sides to allow for zero clearance to combustible materials.
- .3 Hood shall be approximately 3'-6" by 3'-11" (1050x1175mm). Prior to the purchase of the hood, the size shall be confirmed on site to ensure that it overhangs the present plus future cooking equipment by a minimum of 6" (150mm) on all sides. Notify the Consultant immediately of any concerns. Refer to drawings for additional information.
- .4 Hoods shall be built to / comply with the following standards:
  - a. cULus / ULC listed.
  - b. Built in accordance with Underwriters Laboratories UL710 Standard under 'Exhaust hoods with exhaust fire damper'.
  - c. Built in accordance with Underwriters Laboratories of Canada Standard S646-98 'Hoods for commercial and institutional kitchens'.
  - d. Built in accordance with the current edition of NFPA-96.

- e. Built in accordance with the International Mechanical Code under file numbers MH26919 and MH45396.
  - f. Comply with NSF / ANSI 2. Hood shall appear in NSF official listing.
  - g. Comply with all other applicable requirements.
- .5 The unit casing shall be constructed of minimum 18 gauge stainless steel, with No. 4 finish on all exposed surfaces.
- .6 Provide UL / ULC listed baffle grease filters mounted in an integral stainless steel rack inclined at 45 degrees. The filter rack shall include a full length stainless steel grease gutter and removable grease cup.
- .7 Provide a stainless steel fire damper in the exhaust duct collar, arrangement D, butterfly type with metal blade and edge seals. The damper shall be activated by a fusible link and dead weight arrangement.
- .8 The hood shall have vapour-proof cULus approved LED lights evenly spaced along the length of the hood (number as recommended by the hood manufacturer) and factory wired to a J-box on the top of the hood.
- .9 The hood shall be complete with stainless steel enclosure panels extending from the top of the hood to the underside of the ceiling (exact size of panels shall suit ceiling / hood elevations - determine on site). The enclosure panels shall be completely supported by the hood, with no requirement to be tied into the ceiling structure. All panels shall have a No. 4 stainless steel finish to match the hood.
- .10 Supply air shall be introduced along the front and back of the hood as follows:
- a. Multiple blowers (quantity as recommended by the manufacturer) shall be mounted on the top of the hood and at the front of the hood.
  - b. The blowers shall take air from the return air ceiling plenum through washable aluminum mesh filters and discharge this air to a stainless steel plenum mounted to the front of the hood.
  - c. The air shall discharge out the bottom of the plenum through a stainless steel two way adjustable perforated grille which runs along the complete length of the plenum. This air may then be proportioned between the appliances and the chef area by adjusting the comfort tuning dial.
  - d. The blowers shall be mounted complete with adjustable Triacs, washable filters and factory wired to a J-box on the top of the hood.
  - e. A fusible link fire damper shall be located below each damper.
  - f. Each blower shall have rheostat control.
- .11 Fire Suppression System:
- a. The hood manufacturer shall provide a factory installed, pre-engineered type wet chemical surface fire suppression system with a fixed nozzle agent distribution network.
  - b. The hood manufacturer or their authorized representative shall be responsible for a complete and operational system, including but not limited to the following:
    - i. All field hook-ups, including installation of fire suppression nozzles, cabling running to the manual release pull station / gas valves and installation of the

- manual release pull station where indicated on the drawings. Note that the gas valves shall be installed into the piping system by the Plumbing Contractor.
- ii. All cabling shall run in conduit which is supplied and installed by the hood manufacturer or their authorized representative.
  - iii. All required tests and permits to comply with Code and local authorities requirements.
  - iv. Supply and installation of all wet chemical fire suppression agent.
- c. The system shall be capable of automatic detection and actuation with local or remote manual actuation (provide local manual actuation for this project).
  - d. The extinguishing agent shall be a potassium carbonate, potassium acetate based formulation designed for flame knockdown and securement of grease related fires.
  - e. The regulated release mechanism shall be compatible with a fusible link detection system. The fusible link shall be selected and installed according to the operating temperature in the ventilating system. The fusible link shall be supported by a detector bracket / linkage assembly.
  - f. The system shall be ULC Listed and supplied and installed in accordance with the NFPA-96, NFPA-17A, ULC 300, all applicable provincial and local code requirements, and the manufacturer's detailed installation instructions, to suit the hood and duct arrangement indicated on the drawings.
  - g. The nozzles and fusible links shall be located to protect the appliances, hood plenum, duct collar and all ductwork immediately downstream of the hood.
  - h. The system shall be complete with:
    - i. Two DPDT electric micro switch for interlock with the building fire alarm and any electric appliances under the hood (normally open).
    - ii. Two mechanical gas valves to shut off gas to all gas fired equipment under both hoods. The gas valves shall be installed by the Plumbing Contractor and all associated cables shall be installed by the Hood Manufacturer or their authorized representative.
    - iii. Wet chemical cylinder (factory mounted on the hood prior to shipment).
    - iv. All necessary black steel piping (factory install in the hood prior to shipment where possible). Keep quantity of piping running within the hood to an absolute minimum (run horizontal piping above the hood). All pipe penetrations of the exhaust hood casing shall be made using a UL / ULC hood penetration fitting.
    - v. All necessary nozzles complete with swivel fittings.
    - vi. All necessary detectors.
    - vii. All necessary stainless steel cable for system actuation complete with corner pulleys having stainless steel bearings, conduit for all cables and manual release. The release shall be mounted maximum 3'-11" (1175mm) above finished floor. All cables serving the manual release and mechanical gas valve shall run exposed on the wall in conduit and concealed through the suspended ceiling space.
  - i. The fire suppression agent tank, release / bracket assembly and required electrical devices shall be located in a stainless steel cabinet which is mounted to the side of the blower type hood. This cabinet shall have an appearance matching the hood and it shall be equipped with a removable stainless steel service door.
- .12 The Electrical Contractor shall interlock the hood fire suppression system with the building fire alarm system and all cooking equipment located under the hoods (all cooking equipment shall be de-energized on an alarm condition).

- .13 Provide wall-mounted, remote control panel, ULC listed, with stainless steel enclosure and brushed finish. Panel includes an on / off switch, exhaust fan on pilot light and canopy lights on / off switch. Panel includes Thermal-Start option per requirements of IMC 2006; duct-mounted J-couple assembly including mini-clips, J-box and ULC ductwork penetration fitting (supplied by hood manufacturer and installed by Mech Trade in main ductwork leading to exhaust fan), 30 feet of J-couple wire including male and female mini-clip connectors, RPD panel-mounted temperature processor set to auto activate exhaust fan at 90F (32C). All low voltage wiring for exhaust fan, kitchen hood, fire suppression and associated controls to be by Mech Trade. All line voltage wiring to be by Elec Trade.

### 3.16 Louvres

- .1 Ventex or approved equal model 2220 / 2225, 2" (50mm) deep, 45 degree storm proof blades at 3.125" (79mm) centers.
- .2 Provide channel or flange frame to suit application.
- .3 Frame and blades shall be constructed of extruded aluminum 6063-T5. Minimum thickness of frame and blades shall be .062" (1.5mm). Blades shall have a weather stop.
- .4 Louvre shall be assembled with cadmium plated steel screws.
- .5 Provide Polyester baked enamel finish of colour to suit Architect selected from standard colours.
- .6 Provide 0.5" x 0.5" (13x13mm) 19 gauge galvanized birdscreen mounted to inside face in removable frame, extended sill for channel frames and extended sleeve where required by ductwork configuration

### 3.17 Unit Ventilators:

- .1 General
- a. The contractor shall furnish and install packaged unit ventilator systems, of the capacities, performance, and configuration, as indicated in the unit schedule. Each unit shall be complete with factory furnished components and accessories as shown in the plans and as specified herein.
- b. Electrical work required as an integral part of the temperature control work is indicated on the mechanical drawings, and is the responsibility of the HVAC contractor to hire the services of a temperature control contractor and/or system integrator contractor to provide a complete system to perform the sequence of operation shown, or as described in this specification. The full sequence of operation must be provided and installed by this contractor for all trades.
- c. Unit ventilator shall be Daikin. Alternates shall be Engineered Air and Change Air.
- d. Refer to Division 20 Mechanical, 1.1 General Requirements for delivery expectations.
- .2 Quality Assurance
- a. Unit ventilators shall be listed by Underwriters Laboratories Inc. (U.L.) for the United States and Canada.

- b. Motors shall conform to the latest applicable requirements of NEMA, IEEE, ANSI, and NEC standards.
- c. Unit ventilation rate to be certified and tested per Air Conditioning and Refrigeration Institute (ARI) standard 840.
- d. Unit to be certified and labeled compliant with the seismic design provisions of the International Building Code (IBC) Chapter 16 and independent test agency requirements of Chapter 17.

.3 Cabinet and Chassis:

- a. Unit frames shall be of unitized, welded construction, with structural elements aligned in an assembly jig prior to welding, to insure proper dimensions, rigidity, and squareness. Frames assembled with mechanical fasteners shall not be acceptable.
- b. Internal sheet metal parts shall be constructed of galvanized steel to inhibit corrosion.
- c. Exterior cabinet panels shall be fabricated from furniture grade steel of not less than 16 gauge steel with no sharp edges and no unsightly screw heads and shall receive an electro-statically applied powder paint, and be oven baked with environmentally friendly thermosetting urethane powder finish to provide a high quality appearance. Finish color shall be as selected by Architect from manufacturer's standard colors.
- d. The interior areas of the unit ventilator shall be insulated for sound attenuation and to provide protection against condensation of moisture on or within the unit. The unit shall be provided with an ultra-quiet sound package consisting of acoustically matched low speed fans to fan housing, sound barrier insulation material (non-fiberglass) adhered to the bottom underside of the unit top panel, sides of the fan section and sound absorbing insulation (non-fiberglass) material applied to the unit front panel.
- e. Units shall be constructed so that testing and troubleshooting can be accomplished in the end pockets of operating units, without affecting the normal air flow patterns through the unit.
- f. Each unit shall be provided with a non-fused power interrupt switch that disconnects the main power to the unit for servicing or when the unit is to be shut down for an extended period of time. The fan motor and controls shall have the hot line(s) protected by factory installed cartridge type fuse(s).
- g. The manufacturer shall have published cataloged sound data available for the engineer's review. Sound data shall have been conducted using a qualified reverberant room per ANSI S1.31 and ANSI S12.32. Sound test data shall be based on standard cfm at standard air (fixed density of air at 70F) in accordance with ARI procedures based upon ARI 350. The engineer shall have the right to reject equipment not conforming to the specified manufacturer's sound data, as a minimum.

.4 Floor Units:

- a. Floor mounted units shall have an integral pipe tunnel for convenient crossover of piping and a built-in metal wire raceway from right end compartment to left end compartment to contain any line voltage electrical wiring separate from the air stream. Line voltage wiring shall not be touchable in the air stream of the unit during normal maintenance procedures of oiling bearings or motors. Unit shall come standard with a factory installed and wired disconnect switch.
- b. Unit top surface shall be supplied with a charcoal bronze textured finish, to resist scuffing, reduce glare and help hide fingerprints. Unit top shall have two access

doors, one at each end (for access to motor and bearings for easy servicing). The front and ends shall be available in a selection of architecturally pleasing colors by the manufacturer, for selection by the Architect.

- c. Unit discharge grille shall be constructed of continuous rounded edge steel bars to provide 10 degree vertical deflection. A 1/4" painted, galvanized mesh screen shall be provided beneath the discharge grille to protect against objects being dropped through the discharge grille.
- d. The unit top and grille shall be of a modular construction so that it is removable for service and maintenance.
- e. The unit front surface shall be comprised of three separate removable panels. The controls and piping shall be accessible without removing the entire front panel. Panels shall be secured to the unit with recessed, tamper resistant, Allen head fasteners. Slots for flat head screwdrivers shall not be acceptable as tamper resistant.
- f. An extended cabinet depth unit, 21 7/8" deep, shall incorporate a full adapter back with closed pipe tunnel with the same features of the standard cabinet depth units with the additional capability of bringing in fresh air from 1" to 28" from the floor. The unit top, back and vertical adapter back partitions shall be insulated and sealed to form a thermal barrier. The vertical and horizontal insulated metal extensions shall have a 1" wide compressible gasket to form an airtight seal between the wall and the unit. A field removable horizontal support plate between the unit bottom and top to achieve the 1" to 28" fresh air access shall not be acceptable.

.5 Coils:

- a. Coil assembly shall be of a modular construction so that it is removeable from the front of the unit.
- b. All coils shall be installed in a draw through position to assure uniform air distribution over the full-face area of the coil, and an even unit discharge temperature.
- c. All heating and cooling coils shall be constructed with copper tubes and mechanically bonded aluminum corrugated plate type fins. All coils shall have aluminum individual unshared fin surfaces. An air break shall exist between coils.
- d. Water heating and cooling coils shall be furnished with a threaded drain plug at the lowest point and a manual air vent at the high point of the coil. A factory installed low temperature freezestat shall be provided on the leaving edge of the water heating coil in a wave-like configuration to sense multiple locations and shall react to possible freezing conditions. The unit-mounted controls shall incorporate this device.

.6 Drain Pan

- a. All units shall come furnished with an insulated drain pan constructed of galvanized steel. A drain outlet shall be provided on both ends of the drain pan with one outlet capped. The drain hand of connection shall be easily field-reversed by relocating the cap to the opposite end without disassembly of the unit or movement of the unit drain pan.
- b. The drain pan shall be able to be sloped in either direction for proper condensate removal.
- c. Drain shall be provided with a secondary, overflow drain connection on both ends of the pan.

.7 Fans and Motor:

- a. The fan and motor assembly shall be of a low speed design to assure maximum quietness and efficiency.
  - b. Fans shall be double-inlet, forward-curved, centrifugal type with offset aerodynamic blades. Fans and shaft shall be statically and dynamically balanced as an assembly in the unit before shipment.
  - c. Fan housings shall be constructed of galvanized steel incorporating logarithmic expansion for quiet operation. Fan and motor assembly shall be of the direct drive type. Belt drive fans shall not be allowed.
  - d. ECM Motor speed shall be factory programmed for three (3) speeds, HIGH-MEDIUM-LOW-OFF. Fan motor shall have hot leg protected by a factory installed cartridge fuse. Motors shall be located out of the conditioned air stream.
  - e. All components of the fan/motor assembly shall be removable from the top of floor-mounted units.
  - f. Units shall have sleeve type motor and fan shaft bearings, and shall not require oiling more than annually. All bearings shall be located out of the airstream. Bearings in the air stream are not acceptable.
- .8 Face & Bypass Damper:
- a. Each unit shall be provided with a factory-installed face and by-pass damper, constructed of aluminum. The long sealing surfaces of the damper shall seal positively against stops fitted with extruded EPDM rubber seals. Face and bypass dampers without sealing edges to prevent air bypass shall not be acceptable. The damper ends shall have blended mohair seals along the ends glued to the damper end for a positive seal. Plastic clip-on brush end seals shall not be acceptable as an end seal. The unit design shall incorporate the face and bypass damper to prevent coil surface wiping and be before the fan in a draw-thru configuration. The face and by-pass damper shall be arranged to have a dead air space to minimize heat pick-up in the by-pass position.
- .9 Outdoor & Room Dampers:
- a. Each unit shall be provided with separate room air and outdoor air dampers.
  - b. The room air damper shall be two-piece, double-wall construction fabricated from aluminum, and be counterbalanced against backpressure to close by gusts of wind pressure, thereby preventing outdoor air from blowing directly into the room.
  - c. The outdoor air damper shall be two piece, double wall construction fabricated from galvanized steel, with ½" thick, 1½ lb. density glassfiber insulation encapsulated between the welded blade halves for rigidity and to inhibit corrosion. The outdoor air damper shall have additional foam insulation on the exterior surface damper blade and on the ends of the outdoor air chamber. A single blade damper, which can be twisted and will leak air, will not be considered.
  - d. Dampers shall be fitted with blended mohair seals along all sealing edges. Pressure adhesive sponge neoprene or plastic clip-on brush type sealers for damper seals are not acceptable. Rubber type gasket using pressure adhesive for fastening to metal and exposed to the outside air is not acceptable.
  - e. Dampers shall use the turned-metal principle on long closing ends with no metal-to-metal contact for proper sealing.
  - f. The damper shaft shall be mechanically fastened to the blade, and shall operate in bearings made of nylon or other material which does not require lubrication.



.10 Filter:

- a. Each unit ventilator shall be equipped with a one-piece filter located to provide filtration of the return air/outdoor air mixture, in lieu of separate filters for each air stream. The entire filter surface must be useable for filtration of 100% room air or 100% of outdoor air. The filter shall be easily accessible from the front, and removable in one piece without removal of the unit return air damper stop. The unit shall ship with a factory installed 1" thick fiberglass, single-use type.
- b. Spare filters shall be 1" thick fiberglass, single-use type.

.11 Control Components:

- a. The hot water heating coil shall use a factory furnished, field installed, two position End Of Cycle (EOC) control valve to shut off the heating medium at the end of the heating cycle. Upon a power failure, the heating EOC valve shall spring return to the normally open position for flow of water. End of cycle valves without spring return to the normal position upon a power failure shall not be acceptable. The EOC shall be of the 2-way or 3-way configuration as specified in the valve specifications.
- b. A room humidity sensor shall be factory located in a sampling chamber (front, center panel) where room air is continuously drawn through for fast response to humidity changes in the room for units capable of passive dehumidification or for units using indoor/outdoor enthalpy type economizer.
- c. The unit ventilator shall come with a factory installed pre-wired control package of Direct Digital Control (DDC) control components which facilitates field hook up of DDC Unit Ventilator Controllers (UVC) by others which are compatible with the factory installed sensors and actuators and capable of providing standard ASHRAE II cycle control sequence. Electrical wiring shall be isolated from the airstream. It shall be the entire responsibility of the Automatic Temperature Control (ATC) supplier to ensure the controls operate correctly and protect the unit. DigitalReady shall consist of the following components which are factory wired and powered:
  - i. 75 VA 24-volt NEC Class 2 transformer (50 VA or less is not acceptable) for 24-volt power supply with a complete 24-volt power wiring harness terminating in the left-hand end compartment at three 10-pole Europa type 16 awg terminal blocks rated for 10 amps at 300 volts;
  - ii. Terminal strips hooked up with the fan motor start/stop relay;
  - iii. A factory installed Low Air Temperature Limit (Freezestat);
  - iv. Unit mounted 10K NTC (negative temperature coefficient) and 1K PTC (positive temperature coefficient) Discharge Air Temperature Sensors;
  - v. Unit mounted 10K NTC and 1K PTC Outdoor Air Temperature Sensors;
  - vi. 24 VAC power wired to the damper actuators;
  - vii. Direct coupled, proportional control (0 to 10 Vdc, or 4 to 20 mA), 35 inch-pounds of torque Outdoor Air/Return Air Damper Actuator that spring-returns the outdoor air damper shut upon a loss of power;
  - viii. Direct coupled proportional control (0 to 10 Vdc, or 4 to 20 mA) Face and Bypass Damper Actuator, non-spring returned;
  - ix. Terminal locations for 24-volt power to one or two End of Cycle valves (by ATC control contractor);
  - x. Direct coupled floating point (tri-state) Modulating Valve Actuator, non-spring returned;
  - xi. Terminal connectors for interface with a DDC UVC Controller (by ATC control contractor).

- d. A normally-closed Low Temperature Thermostat (Freezestat) shall be factory provided to detect low leaving air temperature conditions on the unit indoor air hot water coil. This thermostat shall be mounted on the discharge airside of the units hot water coil. The low temperature thermostat cutout shall be 38°F (38°C) +/-2 and the cut-in shall be 45°F (38°C) +/-2.

.12 Installation

- a. Install all equipment in strict accordance with manufacturer's instructions and so as to be compatible with the intent of the respective system performance requirement.
- b. The System Integrator/Controls contractor shall be responsible for the integration of all factory provided unit mounted controls and unit communications as required/specified for unit integration into the Building Automation System and proper unit operation.
- c. Contractor shall clean each unit and accessory section of construction dust and debris, prior to turning systems over to the owner.
- d. Contractor shall install clean filters in each unit at time of system commissioning, and shall deliver to the owner one complete set of spare filters, and one spare motor of each type used in the project.
- e. System Integrator/Controls contractor shall be responsible for the integration of all factory provided unit mounted controls and unit communications as required/specified for unit integration into the Building Automation System and proper unit operation.
- f. Installer shall engage the services of manufacturer's factory trained service technician to provide check, test, and start-up of each unit ventilator system.
- g. Contractor shall provide one-year warranty for furnishing parts and labor for replacing any part of the unit ventilator or accessory sections, which becomes defective in operation. Unit ventilator manufacturer's representative shall maintain a local stock of replacement parts to support the systems specified herein.
- h. Contractor shall submit a completed "Check Test and Start Sheet" for each Unit Ventilator installed for verification of proper installation and start up.

3.18 Alternate Manufacturers List

.1 Roof Mounted Exhaust Fans

- a. Penn
- b. Cook
- c. Greenheck

.2 Residential Style Range Hoods

- a. Broan
- b. Panasonic
- c. NuTone
- d. Venmar

.3 NFPA Rated Exhaust Hoods

- a. Spring Air
- b. Gaylord

- c. Halton
- d. Caddy
  
- .4 Unit Ventilators
  - a. Daikin
  - b. Engineered Air
  - c. Trane
  
- .5 Condensing Units
  - a. Carrier
  - b. Daikin
  - c. Trane
  - d. Lennox
  
- .6 Diffusers and Grilles
  - a. Krueger
  - b. E.H. Price
  - c. Nailor
  - d. Titus
  - e. Metalaire
  
- .7 Fire and Smoke Dampers
  - a. Nailor
  - b. Alumavent
  - c. Controlled Air
  - d. Ruskin
  
- .8 Access Doors
  - a. Nailor
  - b. Controlled Air
  - c. Ruskin
  
- .9 Flexible Ductwork
  - a. Thermaflex
  - b. Flexmaster
  - c. Wiremold

**END OF SECTION**

## **1. GENERAL**

### 1.1 General Requirements

- .1 Refer to Division 20 – Mechanical.

## **2. BUILDING AUTOMATION SYSTEM**

### 2.1 Description of System

- .1 Furnish and install all components, devices and control wiring for a fully integrated energy management and building control system incorporating Direct Digital Control (DDC), and equipment monitoring. The system shall control/monitor HVAC and plumbing equipment and systems as specified in this section. The work shall include but is not limited to the following:
  - a. All necessary hardware, software, control panels, web access modules, control wiring, field devices, installation, documentation and owner training as specified.
  - b. The installed system shall incorporate electronic and digital control devices to perform the control sequences and monitoring outlined herein. Specific control sequence requirements are as detailed elsewhere in this section of the specification.
  - c. Motorized dampers shall be installed in the duct system by the Mechanical Trade complete with necessary duct transitions, access doors, etc. The Controls Trade shall be responsible for coordination with the Mechanical Trade and the installation of the actuators.
  - d. Control valves shall be installed in the piping system by the Mechanical Trade complete with transitions and unions as required.
  - e. Testing, debugging, calibrating, adjustment, programming and confirmation of total system operation.
- .2 Manufacturer and Installing Trade
  - a. The control manufacturer shall be TAC Xenta – local representative 519-893-2638.
  - b. Any new building must be a seamless extension of the current energy management and building control system.
  - c. The existing TAC Vista software is, and shall continue to be, the only head-end BAS server for the entire school board.
  - d. The head-end server contains the secure energy management settings (i.e. master setpoints and schedules) that are sent to all schools in real-time. The control system must be an extension of the head-end server and be able to be managed exclusively through the Vista head-end server.
  - e. Monitoring of all school board control systems are done in real-time and must be presented at the exclusive Vista head-end server as first-priority data.
  - f. The Vista head-end server has all the required controller databases and software to be able to centrally maintain and modify network configuration and controller software for the entire school board. The Vista head-end server is the only system that can access the LacNet programming variables inside the controllers for real-time configuration of setpoint and time scheduling parameters.
  - g. The graphics and controller database must be presented inside the Vista head-end server in its native format in order to preserve the real-time speed, integrity and multi-site administration of the entire system.

- h. The controls company shall have a service office and maintenance facility within six kilometers of the Waterloo Region District School Board main office. The controls company shall be able to provide service to any school within four hours during normal working hours.

.3 Quality Assurance

- a. The system components shall be listed by Underwriters Laboratories Inc. and Canadian Standards Association.
- b. The system control products shall be stored and handled according to manufacturer's recommendations.
- c. The work shall be performed by skilled technicians all of whom shall be properly trained and qualified for this work.

2.2 Products

- .1 The system shall integrate the operation of intelligent building management controllers distributed into the network.
- .2 The DDC system shall be generally comprised of the following devices to achieve the control functions described in this section:
  - a. Distech 200, 300, 400 and 600 series programmable controllers.
  - b. Distech input/output programmable controllers.
  - c. Distech EC-BOS web server with graphical user interface for this project.
  - d. Network repeaters as required by network lengths.
  - e. Control relays.
  - f. Control dampers and valves.
  - g. Sensors, actuators and other input/output devices.
- .3 Controllers shall execute the application programs, calculations, and commands to provide the control function specified for that unit. Each controller shall include its own micro-computer controller, power supply, input/output modules, termination modules and real time clock.
- .4 Controllers shall be capable of full control functionality and alarm reporting independently or as a part of the DDC network.
- .5 The system shall be stored in flash ram so no batteries are required.
- .6 Each control device shall be modular and expandable to provide additional inputs and outputs and control functionality for that device.
- .7 Each controller shall be able to transfer and receive data via the network for performance of control functions.
- .8 The system shall be modular, permitting expansion by adding hardware and software without changes in communication or processing equipment.
- .9 The complete system shall be capable of communication over a LonWorks network.

- .10 The controllers shall monitor the status of all overrides and include this information in logs and summaries to inform the operator that automatic control has been inhibited.
- .11 Controllers shall continuously perform self-diagnostics, communication diagnosis and diagnosis of all subsidiary equipment and provide both local and remote annunciation of any component failures.
- .12 Controllers shall activate an orderly shutdown of their operation in the event of loss of normal electrical power. Non-volatile memory shall be incorporated for all controller configuration data. The controllers shall automatically resume full operation without manual intervention.
- .13 The controllers shall have sufficient memory to support their own operating system and data bases including:
  - a. Control processes.
  - b. Energy management applications.
  - c. Alarm management.
  - d. Trend data.
  - e. Operator input/output.
  - f. Remote communications.
  - g. Manual override monitoring.
- .14 Controllers shall incorporate the following software features:
  - a. Energy management:
    - i. Time of day scheduling.
    - ii. Calendar based scheduling.
    - iii. Holiday scheduling.
    - iv. Optimal start and stop.
    - v. Demand limiting.
    - vi. Heating/cooling interlock.
  - b. Alarm management:
    - i. Alarm management shall be provided to monitor, buffer and direct alarm reports to operator devices and memory files. The controllers shall perform alarm analysis and filtering to minimize operator interruptions due to non-critical alarms, minimize network traffic and prevent alarms from being lost.
    - ii. All alarm or point change reports shall include the points' English language description and the time and date of occurrence.
    - iii. The user shall be able to define the specific reaction for each point, the priority level (three in total) and ability to inhibit alarm reporting for each point.
    - iv. The user shall be able to define conditions under which point changes need to be acknowledged by an operator and logged for analysis at a later date.
    - v. The user shall be able to print, display or store a unique sixty character alarm message to more fully describe the alarm condition or direct operator response. The message shall be customizable to describe each individual alarm.
    - vi. In web access applications, only critical alarms shall initiate a call to a remote operator device, otherwise call activity shall be minimized by time stamping and saving reports until a manual request is received or until the buffer space (minimum fifty alarms) is full.

- c. Trend logs:
    - i. Controllers shall provide an automatic roll-over trend log, which stores records up to an operator-selected number at an operator-selected sampling rate and then overwrites the oldest record with each new record.
    - ii. Sample intervals shall be from one minute to twenty-four hours.
    - iii. Provide graphical and tabular displays.
  - d. Runtime totalization:
    - i. The controllers shall automatically accumulate and store runtime hours for binary points with a sampling resolution of one minute. The user shall have the ability to define a warning limit to trigger maintenance or user-defined messages.
  - e. Event totalization:
    - i. Controllers shall have the ability to count events (such as on/off) and store up to ten million events before reset with a user-defined limit used to trigger a user-defined message.
  - f. Custom programming:
    - i. The controllers shall permit user defined custom control processes based on:
      - 1) Any system measured data or status.
      - 2) Any calculated data.
      - 3) Any results from other processes.
      - 4) Boolean logic.
  - g. The custom processes may be triggered by:
    - i. Time-of-day.
    - ii. Calendar date.
    - iii. Events (point, alarm, etc.).
- .15 The control strategy for each control loop shall be performed by software within the controller. The sequence of events required for each control loop is described for each system in the control sequence.
- .16 Outdoor air temperature indication shall be available at each controller as an integral part of the control strategies for that controller. Should the network transmission of the common outdoor air temperature (or any other common value) fail, then each controller shall use the last good value received.
- .17 Network Architecture
- a. The controllers on the local network shall communicate via a two wire LonTalk TP/FT-10 network.
  - b. The control network shall be able to expand to match the requirements of the facility, including any future building additions.
  - c. The control network shall be able to support a total developed length of 305 meters without using a network repeater.
- .18 Control Panels
- a. Control panels shall be fully enclosed cabinets with all steel construction. Cabinets shall have a hinged door with locking latch or bolt-on cover plate. All cabinet locks shall be common keyed. Cabinets shall be finished with two coats of paint.
- .19 Temperature Sensors

- a. Provide thermistor temperature sensors, not requiring transmitters, to measure temperature.
- b. Accuracy shall be +/-0.2°C from 0 to 70°C.
- c. Space sensors in occupied areas shall be Greystone TE200 series, type AE or equal having an integral push button for unoccupied override and an integral slider to adjust set point (LED display not required).

.20 Motorized Dampers and Operators

- a. Rectangular dampers shall be Nailor 1010 or equal, parallel blade type complete with blade and edge seals. Use low profile dampers for heights less than 12". Dampers with heights less than 10" shall be single blade.
- b. Actuators shall be Belimo LMB24-SR-T or equal, proportional control, non-spring return, direct coupled, 24 V for 2-10 VDC or 4-20 mA, 45 in-lb torque, suitable for a maximum damper size of six square feet.

.21 Water Control Valves

- a. Heating control valves shall be Belimo CCV series characterized ball valves, complete with chrome plated brass trim and NPT female pipe connections. Radiation valves shall be complete with non-spring return modulating actuators. Control valves for coils heating a portion of outdoor air shall have spring return modulating actuators.
- b. Control valves shall be sized to provide approximately one half the circuit branch pressure drop to obtain good modulation control but they shall be no smaller than two pipe sizes less than the pipe they are installed in.

## 2.3 Execution

.1 Installation

- a. All controllers and components in the system and on the network shall be installed according to manufacturer recommendations, general installation standards for digital controls and in accordance with the approved shop drawings.
- b. Locate room sensors in the locations shown on the mechanical drawings. All sensors shall be mounted at barrier free height (3'-11" above finished floor).
- c. All programmable controllers, web access components, relays and other control components shall be located within control panels. Control panels shall be wall mounted and shall be located within suspended ceiling spaces or other locations approved by the Consultant.
- d. The Electrical Trade will provide hand-off-auto switches in all starters controlled by the BAS.
- e. The Electrical Trade will provide dedicated 120 VAC, 15 ampere power circuits wired to junction boxes on each floor for controls transformers.
- f. The supply of all motorized temperature control dampers complete with actuators shall be by this section, except for dampers and actuators supplied with packaged air handlers. All dampers shall be installed into the duct system by the Mechanical Trade complete with necessary duct transitions, access doors, etc. The Controls Trade shall be responsible for the actuators and all coordination with the Mechanical Trade.
- g. The supply of all automatic control valves shall be by This Section. All valves shall be installed into the piping system by Mechanical Trade complete with necessary fittings,



etc. The Controls Trade shall be responsible for all coordination with the Mechanical Trade.

.2 System Start-up and Acceptance

- a. Upon completion of installation, test, adjust and calibrate controls provided under this Section.
- b. On system completion, a demonstration of complete system operation shall be made to the Owner's authorized representative and Consultant.
- c. The Consultant shall verify through the Owner's representatives that the entire system is complete and operating to the satisfaction of the Owner before final acceptance is approved.

.3 Training

- a. The Controls Trade shall provide competent instructors to give full instruction to designated personnel in the adjustment, operation and maintenance of the system installed rather than a general training course. Instructors shall be thoroughly familiar with all aspects of the subject matter they are to teach. All training shall be held during normal work hours of 8:00 a.m. to 4:30 p.m. weekdays as follows:
- b. Provide 4 hours of training for Owner's operating personnel. Training shall include:
  - i. Explanation of drawings, operations and maintenance manuals.
  - ii. Explanation of web access program.
  - iii. Explanation of adjustment procedures.
  - iv. Trend analysis.

.4 Identification

- a. Provide system identification and provide nameplates identifying the following (nameplates shall be keyed to the wiring diagrams):
  - i. Duct mounted sensors.
  - ii. Control panels (identify as to equipment / systems controlled). Each panel shall include an as-built drawing showing all the connected control points.

.5 Testing and Balancing

- a. During the system testing and balancing by the Balancing Trade, demonstrate the operation of all controls. During balancing procedures, set controls to a fixed mode (bypass damper locked fully closed and all zone dampers locked fully open) to prevent any changes during the balancing procedure.

.6 Electrical Wiring

- a. Control transformers for the building automation systems shall be supplied and wired by the Controls Trade from 120 V power sources in junction boxes provided by the Electrical Trade (at least one at each end of each floor accessible above ceiling tile in a corridor). All low voltage wiring (below 50 V) to the building automation systems shall be by the Controls Trade.
- b. The Electrical Trade will rough-in thermostats in new concrete block walls.
- c. All wiring shall be installed to the standards specified in the Electrical Division.
- d. Use Echelon recommended orange jacket cable for all network wiring.

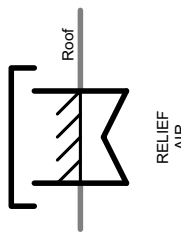
- e. Run all wiring in EMT conduit where exposed, where running within concrete block walls and where required by the Ontario Electrical Code (conduit supplied and installed by the Controls Trade). Plenum rated cable shall be used in return air ceiling plenums.
- f. Where wiring runs through corridor suspended ceiling spaces, run in wall hooks where possible. The wall hooks shall be provided by the Electrical Trade where indicated on the electrical drawings.
- g. Control relays necessary for BAS operation shall be provided by the Controls Trade but all contactors and their power supplies handling power wiring to the equipment shall be by the Electrical Trade.

#### 2.4 Sequence of Operation

- .1 See the graphical sequences at the end of this specification.

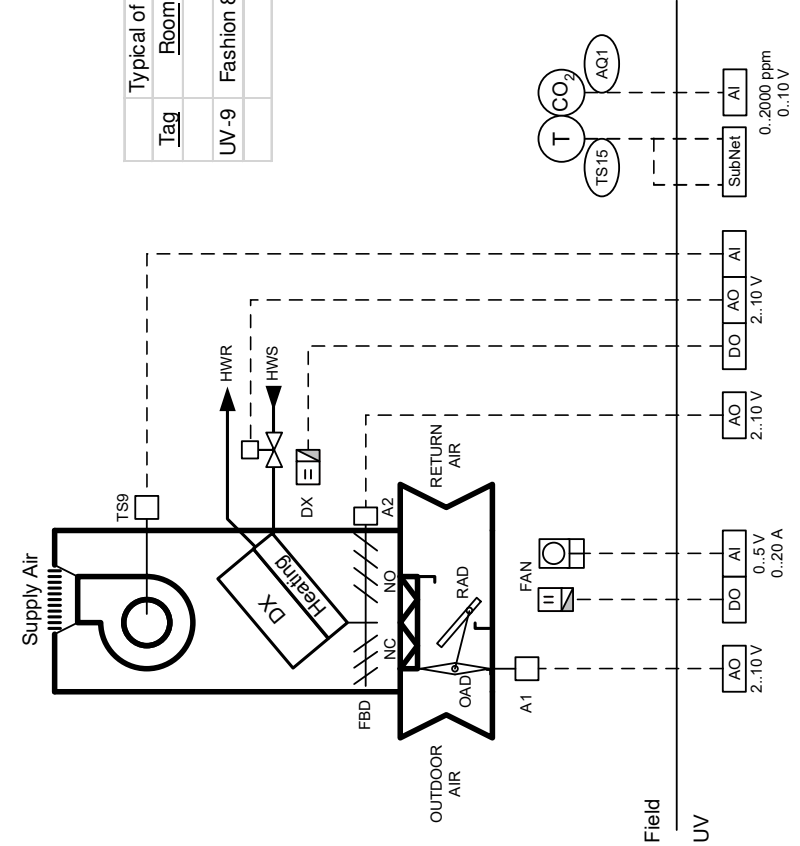
**END OF SECTION**

- Notes:
- 1) T6: Freezestat is factory wired to shut down fan and close outside air damper.
  - 2) A1: Belimo actuator (SR), 2 V = OA closed
  - 3) A2: Belimo actuator (NSR), 2 V = bypass, 10 V = open to coil.
  - 4) TS9: Supply air sensor (10 k, Type II).
  - 5) 75 VA transformer
  - 6) Fan relay, R4
  - 7) Local high/med/low/off switch



**Note: Wiring between indoor unit and outdoor condensing unit by refrigeration contractor.**

Daikin UAAV9H10



Typical of 1						
Tag	Room	Supply (cfm)	DX (tons)	Htg Water (MBh)	Rad (MBh)	Notes
UV-9	Fashion 8-6	1090	3.5	79	None	

Job #: XX  
Job Name: Forest Heights C.I. Family Studies

Owner: Waterloo Region District School Board

Drawn By: XX  
Revision Date: May 4, 2021

Title: Unit Ventilator Schematic

SEQUENCE OF OPERATION

Unoccupied Mode

The fan is off, the heating valve is open, the face & bypass damper is in the bypass position, the DX cooling is off and the mixing dampers are in the 0% outside air position. The fan cycles with full heating to maintain the unoccupied heating setpoint (initially 17.5°C). If the pushbutton on the room sensor is pressed, the system will revert to occupied mode for a period of 2 hours.

Occupied Mode

An optimized start routine for heating advances the system start time when morning warm-up is required. The room temperature sensor modulates the mixing dampers in sequence with DX cooling to maintain the cooling setpoint, and modulates the heating valve and face & bypass dampers in sequence to maintain the heating setpoint. The setpoint can be adjusted +/-2°C at the room sensor. Fan status is monitored by a current switch.

Limits and Safeties

- 1) If the outside air temperature exceeds the free cooling setpoint based on outdoor temperature and humidity, the mixing dampers return to minimum position.
- 2) Mixed air damper minimum position control is provided during occupied periods (initially 10% OA).
- 3) Air quality sensor AQ1 increases the amount of minimum outside air as the space CO<sub>2</sub> reading increases from 1000 ppm to 1200 ppm.
- 4) The fan must be running before the mixing dampers and DX cooling will operate.
- 5) The supply air sensor acts as a low limit to ensure temperature does not fall below setpoint (initially 16°C, reset to 13°C on a call for free cooling).
- 6) A software freeze/estat on the supply air temperature shuts the fan down and closes the outdoor air damper when the supply air temperature is below 3°C for 30 seconds (resets at 6°C with 5 minute delay before restart).
- 7) Heating valve V1 opens as the outside air temperature drops from 3°C to -3°C.
- 8) If the hard-wired freeze/estat trips, the fan shuts down, outside air damper closes and heating valve opens.
- 9) DX cooling is disabled when the outside air temperature falls below the global mechanical cooling disable setpoint (initially 14°C).
- 10) DX cooling has a minimum off time of 5 minutes.
- 11) DX cooling has a supply air temperature low limit (6/12°C).
- 12) The face & bypass damper is in the face position when DX cooling is operating.

Alarms

An alarm is indicated at the operator's terminal if any of the following occur:

- 1) Fan status does not match fan start/stop signal.
- 2) Room temperature too high (42/40°C) or too low (14/15°C).
- 3) Supply air temperature too high (65/60°C) or too low (5/7°C).
- 4) Room CO<sub>2</sub> level too high (1700/1600 ppm) or too low (250/300 ppm).
- 5) Software freeze/estat tripped.
- 6) Fan runtime exceeded weekly runtime setpoint.

	Job #: XX	Owner: Waterloo Region District School Board	Drawn By: XX	Title: <b>Reheat Coil Schematic</b>
	Job Name: Forest Heights C.I. Family Studies		Revision Date: May 4, 2021	2

Sequence of Operation

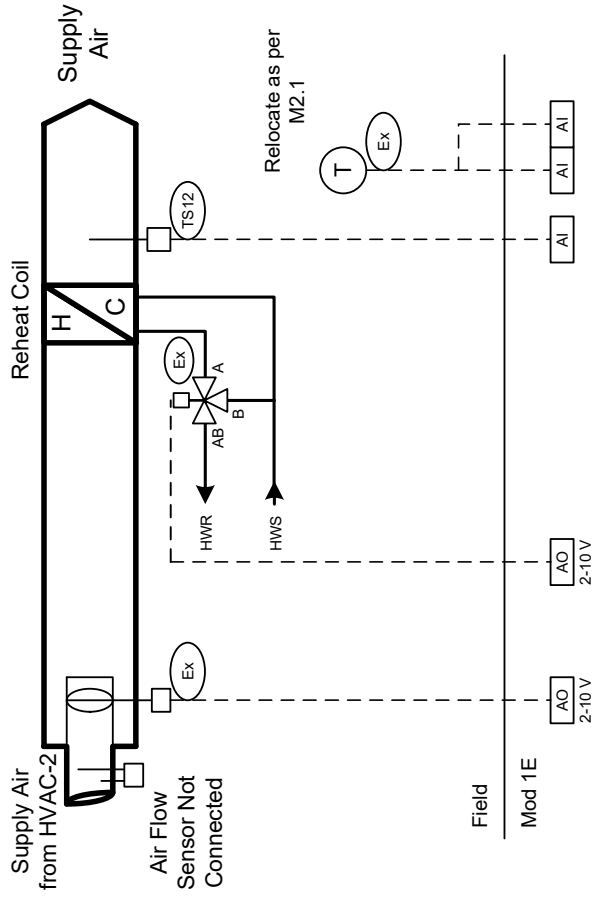
The room sensor modulates the control damper (for cooling) to maintain the occupied cooling setpoint, and modulates the reheat valve (for heating) to maintain the occupied heating setpoint. The action of the control damper is reversed (and operates in unison with the heating valve) if the supply air temperature is higher than the space temperature.

The control damper has a minimum position of 30% for heating and 30% for cooling. There is a minimum deadband of 2°C between heating and cooling setpoints.

When the kitchen hood is on the cooling is limited to the room by keeping the damper at minimum position if the DX cooling is on in HVAC-2.

Indication is provided for supply air temperature.

VAV Box controlled as VVT Zone



Ground Floor VAV/Reheat Coils			
Zone	Room	Controller	Notes
Z2-5	6-22	Mod 1E	Family Studies, Food
Z2-6	6-20	Mod 1E	Family Studies, Food

Job #: XX

Job Name: Forest Heights C.I.  
Family Studies

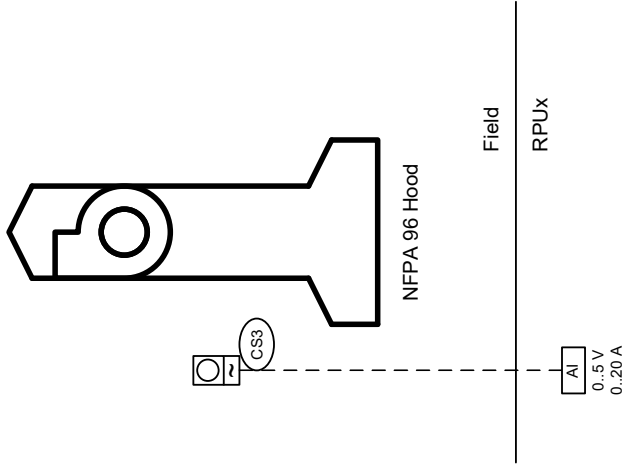
Owner:  
Waterloo Region  
District School Board

Drawn By: XX

Revision Date:  
May 4, 2021

Title: **Reheat Coil Schematic**

**KITCHEN EXHAUST HOOD**



Zone	Room	Controller	Hood
Z2-5	Family Studies 6-22	Mod 1E	EF-1
Z2-6	Family Studies 6-20	Mod 1E	EF-2

**SEQUENCE OF OPERATION**

The exhaust fans are started and stopped manually. When the exhaust fan starts (from the fan status as determined by the current sensor), the room VAV box limits cooling to the room.

Job #: XX	Job Name: Cameron Heights CI Floor 4 Family Studies	Owner: Waterloo Region District School Board	Drawn By: XX	Title: <b>Kitchen Exhaust</b>	4
			Revision Date: May 4, 2021		

## **1. GENERAL**

### 1.1 General Requirements

- .1 The Procurement and Contracting Requirements as outlined under Division 00, and the General Requirements as outlined under Division 01, and all addenda thereto shall apply to and govern all portions of the electrical work.
- .2 Reference Division 27 and Division 28 for additional requirements.
- .3 Points not specifically mentioned shall be in strict accordance with the Ontario Electrical Safety Code (OESC) and regulations of the Electrical Inspection Department from which the permit was obtained. The latest revisions and/or amendments to this Code, with applicable date restrictions, shall also govern work on this contract.
- .4 It is the intent of these specifications to supply and install all materials and equipment as herein specified, and/or shown on the drawings in such a manner as to leave each of the systems of the electrical trades complete and in satisfactory operating condition. Provide all products and methods specified or shown complete with incidentals necessary for a complete operating installation. The contract documents are not intended to enumerate each and every detail which may be necessary to furnish and install the complete system connected up ready for service operation. The bid shall include all such details, and all associated labour and materials, to provide a complete and working system. The omission of any details in the contract documents shall not be a warrant for the installation of poor workmanship or materials, or the omission of such details. The scope of the work to be performed by the Contractor, shall be obtained by a careful examination of these specifications and all electrical drawings.
- .5 These specifications are to be considered as an integral part of the plans which accompany them, neither the plans nor the specifications shall be used alone. Any item or subject omitted from one but which is mentioned or reasonably implied in the other shall be considered as properly and sufficiently specified and must, therefore, be provided by the Contractor. Misinterpretation of either the plans or the specifications shall not relieve the Contractor of responsibility.
- .6 The Electrical Subcontractor shall be held responsible for the satisfactory completion of all work bearing upon their trade.
- .7 The Electrical Subcontractor must make note of any inaccuracies or inconsistencies in the drawings and/or specifications. Prior to bid close, any such items shall be disclosed, following the procedure outlined in the Invitation to Proponents.
- .8 The Waterloo Region District School Board (WRDSB) receives discount pricing from Gerrie Electric Wholesale Limited. The Electrical subcontractor is encouraged to contact Gerrie Electric for pricing on this project.
- .9 Within this design, the term "provide" is defined as "supply and install".

### 1.2 Codes, Permits and Submissions

- .1 All work shall comply with the OESC (current edition, including all bulletins and amendments) and all local and municipal codes and Government agencies having jurisdiction.
- .2 It is understood that the Subcontractor has examined and checked all drawings and specifications with the local authorities and the equipment and materials supplied by the Subcontractor shall have the approval of CSA, ULC, Factory Mutual (FM) and any other authority having jurisdiction.
- .3 The Electrical Subcontractor shall obtain and pay for all necessary permits and inspection fees as may be required by the public administrative authorities having jurisdiction. Any changes or alterations required by an authorized inspector shall be rectified by the Electrical Subcontractor without charge to the Owner.
- .4 Plans have not been submitted to the Electrical Safety Authority (ESA) Plans Approval Department. In accordance with the requirements of 2-010 of the OESC, plan submission is not required for this project.
- .5 All new electrical equipment must conform to the regulations of the Ontario Electrical Safety Code (OESC). Anything necessary to make the equipment comply with these requirements shall be provided without additional cost to the Owners.
- .6 Submit all required documentation to the authorities for their approval and comment before starting any work. Provide all additional drawings, details or information as may be required.

### 1.3 Standards of Workmanship and Materials

- .1 All materials supplied by the Contractor shall be new and of the quality specified. All such materials shall be certified by CSA or other organization approved by the ESA. For any material not so certified, the Electrical Subcontractor shall obtain special approval of the local Inspection Authority and shall bear all inspection charges levied and any modification cost required.

### 1.4 Quality Assurance and Regulatory Agencies

- .1 All materials, installations supplied and performed by the Electrical Subcontractor shall be new and meet the standards of quality as specified herein:
  - a. Canadian Standards Association - CSA.
  - b. Ontario Regulation 332/12 (Ontario Building Code) - OBC with amendments.
  - c. Local Fire Codes.
  - d. Ontario Ministry of Labour.
  - e. Ministry of the Environment.
  - f. Ontario Electrical Safety Code.
  - g. Local Electrical Inspection Department.

### 1.5 Contractor's Shop

- .1 Each Subcontractor shall provide their own office, workshop, tools and materials storage as required, and be responsible for any loss or damage thereto.

### 1.6 Setting Out of the Work



- .1 The electrical trade shall be responsible for correcting all work completed contrary to the intent of the drawings and specifications and shall bear all costs for same. Where the intent of the documents is not clear he shall obtain the clarification of the Engineer before proceeding with the work.
- .2 Where any equipment supplied by the electrical trade must be built-in with work of the other Subcontractors, the Electrical Subcontractor shall be responsible for the supplying of the equipment to be built-in or measurements to allow necessary openings to be left so as not to hold up the work.
- .3 The electrical trade, in setting out of the work, shall reference Architectural, Structural and Mechanical drawings. He shall consult with the respective trades in setting out locations for conduit runs, lighting fixtures, panel assemblies, etc. so that conflicts are avoided and symmetrical even spacing is maintained. Being there first is not a permissible excuse.
- .4 Do not scale drawings for installation purposes. Obtain all dimensions from Architectural plans, manufacturers Shop Drawings and onsite inspections.
- .5 Before submitting bid, carefully examine the site of the proposed work so as to ascertain all existing conditions affecting the work. No extras will be allowed for work necessitated by conditions ordinarily evident on the site.
- .6 Installation of conduits, outlets and equipment in mechanical areas shall not proceed until the installation of mechanical equipment is far enough progressed to avoid conflicts. Position of electrical equipment and outlets shall be adjusted in these areas to coordinate with mechanical equipment.

#### 1.7 Preparation

- .1 The Electrical Subcontractor shall be responsible for all cutting and patching of any building construction made necessary by the installation of the work except in such instances as may be otherwise assigned by the specifications or shown on the drawings. All cutting and patching shall be to the satisfaction of the Consultant.
- .2 Finishing shall be by General trades.
- .3 In areas otherwise unaffected by the work of this contract, trades that are required to disturb existing finishes shall patch the existing surfaces and provide new finishes to the area of the wall or ceiling surface affected. Paint colour shall be selected to match existing. Repainting of entire walls or surfaces is not required unless a reasonable paint match cannot be obtained.
- .4 Existing ceiling tiles and grids shall be removed and replaced as required to permit the work. Ceiling tiles and grids that are damaged, or left with holes shall be replaced with new to match existing.
- .5 All devices required to be removed in existing walls shall have suitable blank cover plates installed.
- .6 Existing concrete structure contains concealed conduits. The Electrical Subcontractor shall retain the services of a qualified concrete imaging company to scan for existing buried services prior to cutting/coring/drilling.

- .7 The Electrical Subcontractor shall provide all sleeves, inserts, hangers, flashings, back boxes, tubs, junction boxes, etc. required for the completion of the work. Locations shall be coordinated with the respective subtrade into whose materials they are being installed.
- .8 Structural members shall not be cut without the consent of the Structural Engineer. For all necessary cutting, channelling, core drilling, sleeving etc., the Electrical Subcontractor shall provide their own forces and necessary equipment required to complete the electrical installation.

#### 1.8 Temporary Construction Service and Construction Lighting

- .1 Secure temporary service from existing building distribution system.
- .2 Provide construction lighting to meet or exceed Occupational Health and Safety Act requirements.

#### 1.9 Continuity of Services

- .1 Service and distribution system power interruptions shall be kept to an absolute minimum. Power interruptions must be coordinated with the Owner and all other trades by the Electrical Subcontractor. Written application for electrical interruptions must be received from the Contractor indicating the date, time and estimated duration of the interruption. Application for approval of the power interruptions must be submitted to the Owner's and Consultants at least two weeks prior to the requested shutdown date.
- .2 Electrical interruption is recommended for mid-to-end of July 2022.
- .3 No Electrical work of any description will be permitted during normal school hours in areas inside the building that are normally accessible to students. Work may be carried out during school hours provided it does not extend into building areas accessible to students.
- .4 All barricades as required shall be by the Contractor.
- .5 Provide portable generator set(s) with a minimum 5kVA capacity at 208/120V in order to maintain life safety and access control services. Provide fuel and all temporary connections.
- .6 All work shall be coordinated so that there is complete and continuous life safety protection throughout the entire facility (fire alarm and detection, emergency and exit lighting). System down times shall be kept to an absolute minimum
- .7 At times when the fire alarm and detection system must be de-energized, the following procedure shall be followed:
  - a. Contact the monitoring company to inform them of the shutdown.
  - b. Contact the local fire department to inform them of the shutdown.
  - c. Establish an alternate source of alarm, i.e., telephone, siren, etc.
  - d. Carefully monitor all high risk fire areas such as kitchens and mechanical rooms.
  - e. Ensure all building occupants are aware of the shutdown, the alternate source of alarm, and the time at which the system will be back on line.

- .8 All necessary system interruptions shall occur at a time suitable to the Owner and may be required to be at times that the building is not occupied or outside of regular business hours.
- .9 If overtime work or temporary wiring provisions are required to maintain services as required herein such work shall be included in the bid.

#### 1.10 Demolition

- .1 Existing lighting shall remain for construction purposes. Provide temporary support for existing fixtures to permit demolition. Ensure that there is adequate lighting for construction throughout the entire process.
- .2 The Electrical Subcontractor shall visit the site to examine the existing conditions and make necessary allowances in the bid for removal, rerouting, relocation, and reconnecting of equipment as may be necessary for the execution and completion of this project.
- .3 Wiring, conduits, etc., located in areas being altered or demolished, but feeding outlets or equipment required to remain in service shall be rerouted as required to maintain the continuity of these services, to the satisfaction of the Engineer.
- .4 In areas requiring installation of new duct risers for roof-mounted mechanical equipment, include for relocating conduits that may interfere with new openings. Confirm exact extent of work on site prior to close of bids.
- .5 Include for strapping existing conduits and cables that are not properly supported and are required to remain above ceilings. Determine exact extent of work on site.
- .6 The Electrical Subcontractor shall provide adequate protection to existing equipment throughout the project and particularly where wiring, piping, equipment, etc., have become exposed to mechanical injury or moisture.
- .7 Existing distribution equipment shall be permitted to be reused only as indicated on the drawings.
- .8 Existing equipment being reused shall be checked for proper operation. Reused equipment shall not have any sign of physical abuse or corrosion. Any knockouts removed in existing equipment being reused shall be plugged.
- .9 All wiring made redundant due to demolition/renovation work shall be disconnected and removed to the nearest distribution point upstream that is not affected by demolition/renovation work. All concealed conduit made redundant due to demolition/renovation work may remain provided it does not adversely affect any new installations, unless it is noted to be removed on the drawings. All exposed conduit in finished areas made redundant due to demolition/renovation work shall be removed and the wall patched.
- .10 Existing wiring devices shall not be permitted to be reused. Existing outlet boxes may be reused if in "as new" condition. Existing branch circuit wiring will only be permitted to be reused in existing non accessible walls/ceilings where the existing wiring is of adequate size, has acceptable bonding conductor and is in as new condition.

- .11 Asbestos Containing Material (ACM) may be disturbed in the execution of this contract. Refer to the Owner's Designated Substances Report.
- .12 Include the cost of retaining a WRDSB-approved subcontractor for the abatement of all ACM within a 600mm radius of any electrical work. Refer to the Owner's Designated Substances Report.
- .13 All existing panel directories, zone legends and distribution equipment identification shall be reworked to reflect any changes made by any demolition/renovation work. All existing wiring device tags shall be replaced to reflect any changes made to the upstream distribution designations.
- .14 The Electrical Subcontractor shall be responsible to ensure that all existing communications systems are undamaged during the course of demolition and renovations.

#### 1.11 Disposal

- .1 The Electrical Subcontractor will be responsible for the complete removal of all electrical equipment and systems to permit alterations, all as shown and noted on the plans. This includes removal of all such equipment from the site.
- .2 All miscellaneous equipment being removed shall become the property of the Owner unless shown otherwise. If the Owner has no use for it, all material shall be responsibly disposed of, in a timely manner, by the subcontractor in accordance with all applicable federal, provincial and municipal acts, bylaws and regulations.
- .3 All appropriate measures to the health and safety of employees and WRDSB personnel shall be observed.

#### 1.12 Shop Drawings

- .1 The Electrical Subcontractor shall submit Shop Drawings to the Project Manager and/or Engineer for review. They shall show in detail the design, construction and performance of all apparatus.
- .2 Shop Drawings shall be submitted electronically in editable Portable Document Format (.PDF). Hard copy (paper) format Shop Drawings shall not be processed and shall be recycled.
- .3 Submissions shall be made in a timely manner after award of the contract.
  - a. Contractor shall submit within one week of purchase order receipt.
  - b. Consultant shall review within one week of receipt.
  - c. The first progress draw request may not be approved unless all Shop Drawings have been received.
- .4 The Engineer's and/or Project Manager's review of Shop Drawings and manufacturer's specifications is general and is not intended to serve as the final check. It shall not relieve the Contractor from responsibility for errors.

- .5 Before submission, the subcontractor shall check all Shop Drawings for accuracy of details, dimensions etc. Do not proceed with work on any item for which shop drawing review has not been performed by the Engineer.
- .6 Any deviations whatsoever from the materials and methods specified herein must be clearly outlined in writing and such an outline must accompany the Shop Drawings of the proposed deviation.
- .7 All Shop Drawings shall be arranged so that all drawings of a particular system are in one file and are in logical order. Shop Drawings that are submitted individually or are not arranged by system shall be rejected. For example, the lighting system Shop Drawings shall be submitted to include each fixture in order as listed in the "LIGHTING FIXTURE SCHEDULE".
- .8 Any materials that require a colour selection shall have colour samples submitted for Owner/Architect review and acceptance. Arbitrary colour selection by the supplier is not acceptable. Any item for which a formal colour selection is not submitted and approved will not be permitted on site.
- .9 Shop Drawings outlining all components shall be submitted for the following:
  - a. Power distribution panels.
  - b. Lighting fixtures.
  - c. Emergency lighting.
  - d. Lighting controls.
  - e. Fire alarm and detection components.
  - f. Integrated Testing Plan for fire protection and life safety systems.
  - g. Wiring devices (refer to Section below).
  - h. Fire stopping systems.
  - i. Assistive listening systems.

#### 1.13 As-Built Drawings

- .1 The Contractor shall provide redline drawings that accurately record the location of all outlets and conduit runs etc., and all circuiting of devices, as installed on site.
- .2 The Consultant shall provide, at no cost, AutoCAD drawing files incorporating Changes and Instructions.
- .3 Prior to Substantial Performance, the Contractor shall edit the electronic files to provide AutoCAD as-built drawings that incorporate all redline information. Associated costs shall be carried in the bid.

#### 1.14 Close-Out Documentation - Maintenance and Instruction Manuals

- .1 Upon project completion, the Contractor shall submit a Maintenance and Instruction Manual as well as as-built drawings. Submit one paper hard copy in a three-ring binder, and one .PDF electronic copy on a suitably sized USB thumb drive. Each manual shall contain one copy of the following:
  - a. Shop Drawings (revised as reviewed by the Engineer).
  - b. Digital photos indicating each labeled distribution panel with the cover off.

- c. Megger Test Results.
  - d. Updated panel directories.
  - e. ESA Final Inspection Certificate.
  - f. Fire Alarm Verification Report(s).
  - g. Integrated Testing Report for fire protection and life safety systems.
  - h. Emergency Lighting Test Report.
  - i. Written Guarantee (Warranty).
  - j. Sign back of the latest Site Review Report to confirm completion.
- .2 Include for updating the Owner's Continuous Safety Services (CSS) ESA log book for all electrical work.

#### 1.15 Testing

- .1 At or near the completion of the project, the Electrical Subcontractor shall provide acceptance tests to demonstrate that the equipment and systems actually meet the specified requirements. Tests may be conducted as soon as conditions permit. These shall include but shall not be limited to the following:
- a. Lighting system control.
  - b. Emergency lighting function.
  - c. 3000VDC Megger tests on all XLPE insulated feeders, 60A and larger, 15s duration.
  - d. 1000VDC Megger tests on all PVC insulated feeders, 60A and larger, 15s duration.
  - e. Fire alarm and detection system function.
  - f. Voltage drop measurements.
  - g. Proper phase rotation.
  - h. Existing communications equipment and associated cabling.
- .2 Concurrently, written approvals or acceptances by local authorities shall be presented. In testing, vary loads to illustrate start-up, sequence, normal shut down and simulate emergency conditions. Final tests may be conducted in the presence of the Consultant.

#### 1.16 Training and Demonstrations

- .1 The Electrical Subcontractor shall arrange for onsite instruction and training to the Owners staff on the operation and maintenance of the following:
- a. Smoke damper interlocks.
  - b. NFPA hood interlocks.
- .2 All such training sessions shall be recorded by the Contractor. Media to be handed over to the Owner upon project completion.
- .3 Provide for a minimum of two training sessions of four hours each with the Owner.
- .4 Demonstration of remaining systems shall be covered under Allowances.

#### 1.17 Commissioning

- .1 The Electrical Subcontractor shall retain the services of an Integrated Testing Coordinator (ITC) for all systems that are designed to operate together to achieve an overall fire protection and life safety objective, in accordance with OBC 3.2.10.
- .2 Refer to Division 01 for additional commissioning details.

#### 1.18 Warranty

- .1 The electrical trade shall furnish a written guarantee stating that all work executed under this contract will be free from defects of workmanship and materials for a period of two (2) years from the date of Substantial Performance. The period shall in no way supplement any other warranty of a longer period.
- .2 The Electrical Subcontractor will at their own expense, repair and replace all such defective work and other work damaged thereby which fails or becomes defective during the term of the warranty provided that such failure is not caused by improper use.
- .3 Refer to the Division 01 specifications for additional warranty details.
- .4 Include for completion of the WRDSB Project Warranty Card prior to Substantial Performance.

#### 1.19 Electrical Equipment Approved Equals

- .1 Unless specifically stated otherwise, this project has been designed based on the first named manufacturer of each section in the "ALTERNATE MANUFACTURERS LIST" or that specifically listed in the schedules. If the Electrical Subcontractor chooses to use a manufacturer other than the first named manufacturer, it will be their responsibility to ensure that the alternate is equal in all respects to that of the first named manufacturer. The Engineer reserves the right to approve or reject any alternate based upon an evaluation of the equipment proposed. If only one manufacturer is listed then only that manufacturer shall be acceptable.

#### 1.20 Alternate Manufacturers List

- .1 Distribution Equipment
  - a. Eaton
  - b. Schneider Electric (Square D)
  - c. Siemens
- .2 Contactors
  - a. Eaton or Klockner Moeller
  - b. Schneider Electric (Square D) or Telemecanique
  - c. Siemens
  - d. Allen Bradley
- .3 Switches, Receptacles and Wiring Devices
  - a. Hubbell
  - b. Eaton Wiring Devices
  - c. Pass and Seymour

- d. Leviton
- .4 Lighting Controls
- a. Acuity
  - b. Lutron
  - c. Hubbell
  - d. Steinel Lighting Controls
  - e. Eaton Wiring Devices
  - f. Wattstopper
  - g. Douglas
- .5 Support Channels, Cable Tray and Hangers
- a. Cooper (B-Line)
  - b. Hubbell
  - c. Unistrut
  - d. Canstrut
  - e. Caddy (Erico)
  - f. T.J. Cope (Tyco)
- .6 Surface Raceway
- a. Hubbell
  - b. Wiremold
  - c. Panduit
- .7 Fire Stopping Systems
- a. 3M
  - b. Hilti
  - c. AD Firebarrier
  - d. STI EZ-Path
- .8 Lighting Fixtures (Luminaires)
- a. Refer to "LIGHTING FIXTURE SCHEDULE"
  - b. Lithonia
  - c. Hubbell
  - d. Signify (Cooper/Eaton/Philips)
  - e. Delviro
- .9 Emergency Lighting
- a. Refer to "LIGHTING FIXTURE SCHEDULE"
  - b. Stanpro
  - c. Beghelli
  - d. AimLite
  - e. Emergi-Lite/Ready-Lite/Lumacell (Thomas & Betts)
  - f. Dual-Lite (Hubbell)



- .10 Fire Alarm and Detection Components
  - a. Chubb Edwards (UTC Fire & Security)
  - b. Troy Life & Fire Safety Ltd.
- .11 Assistive Listening Systems
  - a. Refer to Division 27

#### 1.21 Access Doors

- .1 Supply access doors to the Contractor for installation for all concealed electrical equipment requiring accessibility for service and maintenance such as junction boxes, pull boxes, relay enclosures, controls, etc. All doors shall be a minimum size of 8" x 8" (200mm x 200mm) and a minimum size of 24" x 18" (600mm x 450mm) where human access is required unless otherwise noted and shall be complete with positive locking self-opening screwdriver lock. The exact size of all access doors shall be as recommended by the manufacturer to suit the application.

#### 1.22 Equipment Supplied By Others

- .1 The Electrical Subcontractor is to supply all wiring, disconnect switches, motor starters, etc., for all Owner-supplied and mechanical equipment, unless noted otherwise. Detailed equipment information is given on drawings "WIRING FOR EQUIPMENT SCHEDULE".
- .2 The Electrical Subcontractor shall ensure that all existing equipment is certified by an agency recognized by ESA (CSA, Entela, etc) prior to energization. If such certification is not present, this subcontractor shall arrange for special inspection by ESA, and all costs for this extra work shall be paid by the Owner.
- .3 Coordinate exact electrical requirements for all equipment with Shop Drawings and actual nameplate data. Revise electrical requirements to suit.

#### 1.23 Allowances

- .1 Refer to Section 01 21 00 for allowance details.
- .2 Any ESA inspection charges shall be included in the project cost and shall be paid for by the Contractor.

#### 1.24 Itemized, Alternate and Separate Prices

- .1 Refer to Bid Form for details.

#### 1.25 Substantial Performance Certificate

- .1 Before the Contractor can make application for a Certificate of Substantial Performance the Electrical Subcontractor will be required to provide the following:
  - a. Maintenance and Instruction Manuals as detailed above.
  - b. As-Built drawings as detailed above.

- c. Testing as detailed above.
- d. Commissioning as detailed above.
- e. Training and Demonstrations as detailed above.

#### 1.26 Contractor's Liability Insurance

- .1 The successful bidder is to maintain adequate insurance as specified by the Owner's Standard Form of Contract. This insurance is to firmly protect both himself and the Owners from public liability claims and property damage, and all claims under the Workman's Compensation Act. Evidence of insurance coverage shall be filed and approved.

#### 1.27 Payment Certification

- .1 Submit monthly draws to the consultant for review and certification. Draws shall provide a complete breakdown of project in a manner acceptable to the consultant. Submit sample progress draw and a proper invoice template to the consultant within one week of award of contract for review.

#### 1.28 Extras and Credits

- .1 Only extras and credits approved by the Electrical Engineer or their representative will be allowed and must be submitted for approval before such work commences. They shall be priced individually with a complete breakdown clearly indicating labour costs, material cost, mark-up and taxes. Labour rates and material costs for extras and credits shall be identical. Material shall be valued at current trade prices incorporating all discounts. Only the net difference between an extra and a credit will subject to overhead and profit mark-up.

## **2. EQUIPMENT IDENTIFICATION**

### **2.1 General**

- .1 Provide all nameplates for equipment such as panels, starters, disconnect switches, contactors, etc.
- .2 Nameplates shall indicate Year, Equipment Name, Source and Electrical characteristics (ampacity, voltage, phases, number of conductors), i.e., 2022, Panel "1E" fed from Room B6-12, 150A, 120/208V, 3-phase, 4-wire.
- .3 All equipment/circuits/devices that reference room names or numbers shall be modified as required to reflect the finalized Owner designated room names/numbers. Do not duplicate the room numbers indicated on the drawings.
- .4 Nameplates shall be a stock white lamacoid, with black lettering and with beveled edges. Letters shall have a minimum 0.06", (1.5mm) stroke.
- .5 Nameplate engraving shall be as follows:
  - a. Electrical equipment name: 0.5", (13mm) high.
  - b. Electrical equipment characteristics: 0.25", (6mm) high.
- .6 Equipment nameplates shall be mechanically fastened with tamperproof screws. Equipment nameplates that are fastened with adhesives shall not be acceptable.
- .7 Provide adhesive labeling for wiring devices such as receptacles, switches, speed controllers, etc. Labels shall indicate the circuit(s) that serve the device, i.e., "1E61".
- .8 Provide all warning signs and labels as required by the ESA.
- .9 Provide typed directory cards in all new and revised distribution panels. Hand written directory cards are not acceptable.
- .10 Provide preprinted slip on conductor identification tags for all conductors as they enter electrical enclosures, equipment, and outlet boxes (switches, receptacles, light fixtures, etc). Tags shall be Thomas and Betts "EZCode" SMC series or approved alternate. Cloth or vinyl markers are not acceptable.
- .11 All empty or spare conduit shall be identified with black indelible marker.
- .12 All junction boxes shall be identified with black indelible marker showing the systems with which they are associated, i.e., lighting, receptacles, fire alarm and detection, etc. Where boxes are exposed, identification shall be on the inside of the cover.
- .13 Colour code as specified herein, outlet boxes, pull boxes, and junction boxes by applying a small dab of paint to inside and outside of each item during installation.
- .14 Use the following paint colour code:
  - a. White: 208/120V Power

- b. Red: Fire alarm and any other emergency control systems.
- .15 Repaint or refinish all damaged factory applied finishes.

### **3. CONDUIT, RACEWAY, WIRE AND CABLE**

#### **3.1 General**

- .1 All wiring in noncombustible areas, unless otherwise noted, to be CSA approved soft copper, type T90/TWN75 in conduit, unless otherwise required by the Electrical Code for specific areas or environmental conditions.
- .2 Maximum voltage drop at most remote outlet not to exceed 3% in accordance with OESC #8-102. The minimum wire size shall be #12 AWG.
- .3 All low voltage (0-10V) dimming cabling shall be CSA approved soft copper, type T90 installed in raceway or metal armour. The minimum wire size shall be #16 AWG. Wiring colours to be violet and grey. Insulation rating shall be equivalent to the phase conductors serving the lighting fixtures. A cable that combines power conductors with control conductors under one armour may be used.
- .4 All neutral feeder conductors shall be a minimum of two gauges larger than the respective phase conductor, i.e., 3-#3/0 phase conductors shall include 1-#250 neutral.
- .5 New feeders and branch wiring shall not be run below slab, unless specifically noted on drawings. Include for running feeders above grade, within structure.
- .6 There shall be one neutral conductor for each phase conductor in a branch circuit. Sharing of neutrals shall not be permitted.
- .7 Armored cable (BX) may be used in metal stud partition walls, in concrete block walls, and for final drops to fixtures in accessible ceiling spaces. Cable length shall not exceed 3.1m (120") horizontally in accessible ceilings. BX cable shall under no circumstances be run exposed.
- .8 EMT shall be used in dry concrete slabs and for interior exposed surface applications (where permitted). Surface mounted EMT may be permitted on existing finished walls only in areas where there is existing surface mounted EMT within 24" (600mm).
- .9 Rigid PVC (IPEX Scepter or approved alternate) raceways shall be used in or below concrete slabs, for direct burial, or exposed exterior surface applications. Conduit shall be FT4 rated.
- .10 All conduit and wiring is to be concealed in all finished areas including storage rooms unless otherwise approved. EMT conduit shall be permitted above and below surface mounted panels.
- .11 Exposed or concealed conduits above ceilings shall be run in straight lines parallel to building structure. Diagonal runs will not be permitted.
- .12 Provide 9mm (3/8") polypropylene pull rope and pull tape in all empty conduits 53mm (2") and larger.
- .13 Provide nylon pull tape in all empty conduits smaller than 53mm (2").
- .14 Securely fasten pull rope/tape in empty conduits/raceways at each end.

- .15 Pull tape shall be Neptco WP900P, 0.5" (13mm) wide, 900lb (409kg) pull strength, lubricated, with sequential metric distance markings.
- .16 Conduits and cables shall not enter an exit stair shaft, unless they serve devices/fixtures within the exit stair, i.e., route all conduits and cables around the stair to maintain the integrity of the exit.
- .17 Install flexible conduit section in all locations on either side of an expansion joint where rigid conduit is fastened to structure.
- .18 All wiring serving rotating or vibrating equipment shall be stranded and shall be in a flexible raceway. Raceway length shall not exceed 1.5m (60").
- .19 Connections to equipment shall be flexible and of sufficient length to permit the equipment to be moved for servicing or housekeeping. Connections to kitchen equipment shall have PVC jacket.
- .20 Coordinate with HVAC trades to run feeders to rooftop equipment alongside refrigerant lines. Separate roof penetrations/cones for feeders shall not be permitted.
- .21 Where separate roof penetrations are required, i.e., for EF-1 and EF-2, provide roof sleeves complete with flashing and rain shields. Recommended product is PortalsPlus Alumi-Flash.
- .22 All outlet boxes shall be metal.
  - a. Provide PVC boxes only for the proximity readers.
- .23 Outlet boxes located in areas normally accessible to building occupants shall have no exposed knockouts. Support all boxes independently of connecting conduits.
- .24 In areas where it is not possible to run conduits concealed in existing structures, surface mounted raceways shall be permitted. The Electrical Subcontractor shall verify the proposed locations of all surface mounted conduits with the Engineer prior to installation.
- .25 Where permitted, all surface mounted raceways shall be "Wiremold" series 2000, 500, or 700, as required to match the quantity and size of conductors. Surface mounted raceways shall be complete with all "Wiremold" fittings and accessories (couplings, bushings, clips, straps, elbows, outlet boxes etc.) to form a complete installation.
- .26 All surface mounted raceways shall be painted by the Electrical Subcontractor to match the colour of the surface upon which it is installed.
- .27 All wiring situated in a return air plenum shall be totally enclosed in a non-combustible raceways or shall be FT6-rated (also known as Communications Media Plenum, or CMP).
- .28 All conduits and raceway systems shall be provided complete with plastic bushings on both ends.

### 3.2 Fire stopping

- .1 Provide fire stop sealant / devices of a type to suit piping, building construction, opening size, etc. Supply and install according to manufacturers detailed installation instructions.
- .2 Indicate the fire stopping systems to be used at all conduit and wiring penetrations of fire rated building construction. Include certified drawings prepared by the fire stop manufacturer which are applicable to the application. These drawings shall indicate all certifications, wall / floor construction details, pipe size / material details, SP numbers, F and T ratings, etc. and they shall be keyed to floor plan blue prints which indicate the location of each fire stopping application.
- .3 Communications sleeves through rated penetrations shall be fire stopped by the Communications Subcontractor after cabling installations.
- .4 Coordinate with General Trades to be consistent with the fire stopping manufacturer throughout the project.
- .5 Firestop behind panels, enclosures and outlet boxes greater than 100cm<sup>2</sup> (15.5in<sup>2</sup> or two gang) recessed in fire rated separations using 3M Interam Endothermic Mat E-5A-4.
- .6 Firestop behind enclosures and outlet boxes 100cm<sup>2</sup> (15.5in<sup>2</sup> or two gang) or smaller recessed in fire rated separations in the same stud space and closer than closer than 600mm (24") using Hilti CP617 or CFS-PA Firestop Putty Pads.

### 3.3 Computer Raceway System - PVC

- .1 The raceways shall be Hubbell PB3BCx and shall possess the following features:
  - a. PVC construction, UL listed and CSA approved.
  - b. Office colour, paintable.
  - c. Two piece construction, U channel base with snap on cover.
  - d. Three internal barriered compartments with removable barrier. Middle compartment reserved for communications cabling.
  - e. Provide covers, end caps, elbows, device cover plates, connectors, tees and hardware as necessary for a complete raceway system.
  - f. Provide a PB3FCIB2G full capacity box for each station.
  - g. Power outlets shall feature one duplex receptacle in a IFP126OW face plate.
  - h. Communications outlets shall feature an ISF2OW outlet frame in a IFP126OW face plate. Jacks provided by others.
  - i. Provide a deep box to permit HDMI connections.
- .2 Situate device mounting plates centered on workstations in the configuration indicated on the drawings.
- .3 Mount raceways to desks, benches, and walls in an approved manner and as indicated on the drawings with lengths to suit.
- .4 Provide one 1.0" (27mm) communications conduit for each 144" (3.6m) of linear raceway. Alternate arrangements are acceptable, provided an equal capacity is installed.

#### **4. WIRING DEVICES**

##### 4.1 General

- .1 Provide all wiring devices and their associated fittings as indicated in the "Wiring Device Schedule" in this specification or as specifically noted on the drawings.
- .2 Wiring devices shall be black unless noted otherwise. Verify colour with Owner prior to ordering and adjust if required.
  - a. New receptacles in raceway shall be ivory.
- .3 Wiring devices for general purpose shall be of heavy-duty specification grade.
- .4 Devices shall be manufactured and tested in accordance with CSA and EEMAC standards. Attachment plugs and receptacles to conform to CSA configurations.
- .5 Provide tamper resistant 15A and 20A receptacles (CSA 5-15R and 5-20R) where outlined.

##### 4.2 Wiring Device Schedule

- .1 Hubbell serves as the basis for this specification. If the Contractor chooses to use an Approved Alternate manufacturer, as listed above, it will be their responsibility to ensure that the alternate is equal in all respects to that named herein. The Engineer reserves the right to approve or reject any alternate based upon an evaluation of the equipment/device proposed.
- .2 120V Switches
  - a. Decorator Style - 20A
    - i. DS120, DS320, DS420
- .3 120V Receptacles
  - a. Ground Fault Circuit Interrupter (Weather and Tamper Resistant) - 15A
    - i. GFTWRST15
  - b. Ground Fault Circuit Interrupter (Weather and Tamper Resistant) - 20A
    - i. GFTWRST20
  - c. Decorator Style - 15A
    - i. HBL2152
  - d. Decorator Style - 20A (CSA 5-20R)
    - i. HBL2162
  - e. Decorator Style, Tamper Resistant - 15A
    - i. DR15xTR
  - f. Decorator Style, Tamper Resistant - 20A
    - i. DR20xTR
- .4 250V Devices
  - a. Dryer Receptacles - 30A
    - i. HBL9430
  - b. Range Receptacles - 50A



- i. HBL9450
- .5 Power Distribution Unit (PDU)s
- a. PDUs shall be rated for operation at 60degreeC and shall feature a minimum of twenty-four 5-20R colour-coded outlets.
    - i. Eaton Catalog No. ePBZ90 for 30A circuits.
  - b. Mount vertically adjacent to the new IT rack. Coil and tie-wrap extra cord.
- .6 Lighting Controls for Dimming Environments (0-10V).
- a. Refer to Lighting Control Schedule.
  - b. Large motion occupancy sensor nCM PDT 10.
  - c. Single channel dimmer with on/off and raise/lower nPODMA DX.
  - d. Single channel wallpod with on/off nPODMA.
  - e. Utility power/relay pack nPP16D EFP.
  - f. Provide a non-booted CAT5e connections.
  - g. Provide quantity of bridges, power/relay packs as required.
  - h. All luminaires shall come on automatically via occupancy sensor(s) to 50% illumination. Manual control of light levels by the dimmer after detection of occupancy.
  - i. All luminaires to automatically dim to off 15 minutes after no occupancy is detected.
  - j. Sensors shall be located and adjusted per manufacturer's instructions to provide detection within the defined area.
  - k. Manufacturer shall commission and test the entire system. Provide verification report.
- .7 Cover plates
- a. Plates shall be specification grade type 304 brushed stainless steel.
  - b. Plates serving the ceiling mounted devices shall have a matching white nylon cover plate.
  - c. Surface Exterior While-In-Use Weatherproof Covers:
    - i. Die-cast metal construction, gasketed.
    - ii. Lockable open or closed.
    - iii. Hubbell (Taymac) MX3300.
    - iv. Use only for mechanical equipment or other areas where recessed installation is not possible.

#### 4.3 Execution

- .1 All wiring devices to be flush mounted in all finished areas.
- .2 All switches shall be rated 20A minimum.
- .3 Where GFCI devices are shown on the drawings, an actual GFCI device must be installed. Feed through type arrangements are not acceptable.
- .4 Receptacles connected to 20A branch circuits shall be CSA 5-20R configuration.

- .5 Install boxes so as to be accessible after building is complete, set to be flush with finished lines of building structure, where recessed, and lined and leveled where surface mounted.
- .6 Switch and receptacle mounting heights shall be coordinated with Architectural details and shall be adjusted, if required to the satisfaction of the Architect/Engineer at no additional cost to Owner.
- .7 Where outlets occur in exterior walls, the electrical trade shall ensure that there is insulation and a vapour barrier behind the outlet box to prevent condensation through the boxes.
- .8 Non-combustible outlet boxes recessed in rated assemblies shall be tightly fitted (less than 3mm annular space) and shall not exceed 100cm<sup>2</sup> (15.5in<sup>2</sup>) or two gang. Maximum total of thirteen gangs in any 9.3m<sup>2</sup> (100sqft.) area.
- .9 Outlet boxes located in vertical fire separations shall not be closer than 600mm (24") horizontally or shall be fire blocked to maintain the integrity of the separation. Fire block shall be 13mm gypsum board or 0.38mm sheet steel. Arrange and pay for fire block materials.
- .10 Install switches with handle in the "Up" position when the switch is in the "On" position.
- .11 Outlets located in masonry, textured or otherwise uneven wall/surfaces shall be mounted such that the cover plate is flush with the wall/surface. Grind or modify the face of the material so that the cover plate fits flush. The cover plate shall have an opening no larger than 1/8" (3.0mm) from the surface. Caulking shall not be permitted as a method of filling gaps larger than 1/8" (3.0mm).
- .12 Remove plastic protective film on stainless steel plates only after painting and other work has been completed in that area.
- .13 Do not use cover plates designed for flush outlet boxes on surface mounted boxes. Do not use outlet boxes designed for flush mounting in surface mount applications.
- .14 Install decorator style devices in all areas of the building except unfinished areas and utility rooms where standard devices shall be permitted.
- .15 All low voltage lighting controls shall be provided with an appropriately sized outlet box and a 0.5" (16mm) conduit to the accessible ceiling space. In cases where the ceilings are not accessible, extend conduit to within 6.0" (150mm) of the nearest associated power/relay pack.
- .16 Unless specifically stated otherwise, rooms with ceiling mounted occupancy sensors shall control all lighting in the room. If additional local controls are shown, they shall also be controlled by the occupancy sensor. Provide additional relays as required to perform this function.

#### 4.4 Mounting Heights

- .1 Mounting heights to centre of box above finished floor (AFF), unless noted otherwise:
  - a. 5", (125mm): range outlets, flush mounted.
  - b. 18", (450mm): receptacles, communications outlets.

- c. 30", (750mm): exterior receptacles above finished grade/roof. Where possible, align with foundation lines where grade varies to maintain uniform appearance.
  - d. 36", (900mm): dryer outlet. If stacked, coordinate with manufacturer.
  - e. 41.5", (1050mm): light controls, push buttons, wall-mounted telephones, power door push buttons.
    - i. Minimum height is 36" (900mm), maximum height is 43" (1100mm).
    - ii. Maintain minimum of 150mm horizontally from centre of all wall-mounted telephone outlets to the edge of any adjacent device (light control, thermostat, etc.).
    - iii. At locations with power door operators, mount minimum 24" (600mm) and maximum 60" (1500mm) beyond door swing.
  - f. 92", (2340mm): fire alarm audible devices. Install at least 6", (150mm) below ceiling to the top edge of the device. Visual devices shall not be lower than 78", (2000mm).
  - g. Devices above counter shall be 4" above millwork/back splash. Coordinate with Architectural details.
  - h. Fire alarm device modules shall be recessed in walls at 92" (2.34m) AFF or 6", (150mm) clear below ceiling, whichever is lowest. Clearly indicate location of modules on as-built drawings. Verify locations on site with Architect.
- .2 Controls adjacent to Classroom doors shall be arranged to have thermostat closest to the door, followed by telephone, followed by lighting controls.
- .3 Where devices are to be mounted in block walls, outlet boxes shall be cut into the top or bottom of the nearest block course that is lower than the height specified.
- .4 Where a conflict of device mounting occurs, the Contractor shall contact the Engineer for clarification.

## **5. DISTRIBUTION EQUIPMENT**

### **5.1 General**

- .1 The Electrical subcontractor shall provide the distribution equipment required for the complete installation.
- .2 All distribution equipment shall be complete with drip shields suitable for use in a future sprinklered environment.
- .3 Equipment shall be delivered to the site and shall be protected all around with a plastic covering. Additional onsite protection must be provided to keep the equipment protected from the elements and other trades. If there is any sign of rusting or corrosion or severe physical abuse on the equipment, the affected parts shall be replaced at no cost to the Owner.
- .4 All distribution equipment shall have tested and approved series ratings for fault currents and shall have identifying labels.
- .5 All distribution equipment shall have lugs with termination temperatures rated at 75 deg C minimum.

### **5.2 Service Entrance**

- .1 Provide new labels for breakers within existing board.

### **5.3 Panels**

- .1 Provide surface or recessed panels of type, voltage, ampere capacity, number of poles, branch circuit, capacity, etc., as indicated.
- .2 All panel bus bars shall be tin plated aluminum unless specifically noted otherwise.
- .3 Panels shall have a hinged door with flush lock for access only to the breakers.
- .4 Panel tubs shall be the width outlined. Panel interior shall be centered within the tub.
- .5 Balance all panels to give as near as possible equal current in all phases under full load conditions.
- .6 Provide 200% rated neutral lugs where outlined.
- .7 Provide a minimum of two 1.5", (41mm) spare conduits from each recessed panel to the nearest accessible ceiling space or utility space. Cap conduits and label as "spare."

### **5.4 Load Centers**

- .1 Load centers shall not be permitted for use on this project.

### **5.5 Disconnect Switches**

- .1 Disconnect switches shall have visible blades in the off position, quick make, quick break mechanism and shall have steel reinforced clips.
- .2 Provision for padlocking in on-off switch position by one lock.
- .3 Switch mechanically interlocked door with front accessible defeat to prevent opening when handle in ON position.
- .4 Switches with pull out style contact devices shall not be permitted.
- .5 Coordinate with HVAC equipment to procure a suitably sized disconnect switch for the rooftop condensing units.

#### 5.6 Breakers

- .1 Unless indicated otherwise, breakers shall be moulded case type, thermal-magnetic, ambient temperature compensated, of the frame size and with trip settings as indicated on the drawings. Breakers mounted in panels shall be bolt-on type.
- .2 Unless otherwise noted all breakers shall be rated minimum 22kA symmetrical interrupting capacity at 208V.
- .3 All breakers indicated as "spare" shall be installed in the "OFF" position.
- .4 Breaker supplier shall allow for up to 10% of breakers to be returned and traded for equal breakers of two standard ampacity sizes higher or lower than that originally provided at no additional cost to the project.
- .5 The manufacturer shall arrange breakers in panels as applicable, in the order indicated on the schedules. Rearrangement of breakers on site is not recommended.

#### 5.7 Contactors

- .1 Contactors shall be of the voltage, ampacity and number of poles as indicated on the drawings. Contacts shall have mixed load ratings (lighting and motor) and a withstand rating of 100kA. Contacts shall be electrically held.

#### 5.8 Grounding and Bonding

- .1 Include bonding as required by OESC, ESA Inspection Department.

#### 5.9 Motor Protection and Control

- .1 General:
  - a. Each starter shall include manual reset thermal overload elements, one for each power supply line, i.e., three for three-phase motors. Overloads shall be sized to suit the connected load.
  - b. All starters and disconnects shall be listed as "Suitable as Motor Disconnects".
  - c. Two (2) speed starters shall have two (2) sets of overload relays.

- d. All starters shall be NEMA rated with a minimum Size 0 and be rated at minimum 15A continuous current. IEC design starters shall not be permitted.
  - e. Motor starters shall be rated for minimum 10kA withstand rating and shall not be less than the available fault current.
- .2 Magnetic and combination type starters:
- a. Provide combination starters complete with fused disconnect switch protection suitable for use with Class J fuses.
  - b. Provide two sets of normally open and normally closed extra auxiliary contacts in each starter for connection to the building automation system by the controls subcontractor.
  - c. Integral control voltage transformer with fused secondary, rated for min 50VA. All control wiring and devices shall function on a 24VAC control circuit unless indicated otherwise.
  - d. Thermal overload protection.
  - e. Green pilot lamp indicating starter is energized.
  - f. Door mount overload reset switch.

#### 5.10 Execution

- .1 Distribution equipment shall be mounted in an approved manner. The equipment shall be mounted in a well-organized and planned arrangement.
- .2 Panel boards shall generally be wall mounted. Provide strut standoffs or strut frame where required if wall surface is not uniform, or where wall structural capacity is not adequate to support weight of panel.
- .3 Refer to drawing notes for details on panel replacements.
- .4 Install disconnecting means within sight and less than 9m from motor loads.
- .5 Install disconnecting means within sight and less than 3m from air conditioning and refrigeration equipment.

## **6. LIGHTING**

### **6.1 General**

- .1 Supply and install lighting with all accessories and lamps as shown in "LIGHTING FIXTURE SCHEDULE," and as described.
- .2 Submit Shop Drawings containing the following information:
  - a. Picture of fixture, fixture model number, fixture colour.
  - b. Lens data, mounting details, photometric data.
  - c. Fixture manufacturer (include address and telephone number).
- .3 No allowance or change in fixture type will be permitted for the failure of the Electrical Subcontractor to allow sufficient time for the delivery of the fixtures when required to the site. Should the approved fixtures not arrive on time, this subcontractor shall supply and install temporary fixtures at no cost to the Owner and shall replace same with the approved fixtures when they arrive and make good all surfaces disturbed by this operation.

### **6.2 Solid State (LED) Lighting**

- .1 Quality Assurance
  - a. Luminaires shall be of uniform quality and appearance.
  - b. Manufacturers of LED luminaires shall demonstrate a suitable testing program incorporating high heat, high humidity and thermal shock test regimens to ensure system reliability and to substantiate lifetime claims.
  - c. The LED fixture assembly/manufacturing facility shall be ISO 9001 certified and produce product in compliance to RoHS.
  - d. At time of manufacture, electrical and light technical properties shall be recorded for each luminaire. At a minimum, this should include lumen output, CCT, and CRI. Each luminaire shall utilize a unique serial numbering scheme. Technical properties must be made available for a minimum of 7 years after the date of manufacture.
  - e. Luminaires shall be provided with a 5 year warranty covering, LEDs, drivers, paint and mechanical components.
- .2 Material and specifications for each luminaire are as follows:
  - a. Each Luminaire shall consist of an assembly that utilizes LEDs as the light source. In addition, a complete Luminaire shall consist of a housing, LED array, and electronic driver (power supply).
  - b. Each Luminaire shall be rated for a minimum operational life of 60,000 hours of operations at an average operating time of 10.5 hours.
  - c. The rated operating temperature range shall be -40°C to +40°C.
  - d. Photometry must be compliant with IESNA LM-79-08 and shall be conducted at 25°C ambient temperature.
  - e. Each Luminaire shall meet all parameters of this specification throughout the minimum operational life when operated at the average nighttime temperature.
  - f. The individual LEDs shall be constructed such that a catastrophic loss or the failure of one LED will not result in the loss of the entire Luminaire.

- g. Luminaire shall be constructed such that LED modules may be replaced or repaired without replacement of whole Luminaire.
- h. Each Luminaire shall be listed with CSA or cUL under UL1598 for luminaires.

.3 Electrical Requirements

- a. Maximum power consumption allowed for the Luminaire shall be determined by application. The Luminaire shall not consume power in the off state.
- b. The Luminaire shall operate from a 60 HZ  $\pm$ 3 HZ AC line over a voltage ranging from 108 VAC to 350 VAC. The fluctuations of line voltage shall have no visible effect on the luminous output.
- c. (The Luminaire shall have a power factor of 0.90 or greater.
- d. Total harmonic distortion (current and voltage) induced into an AC power line by a Luminaire shall not exceed 20 percent.
- e. The Luminaire on-board circuitry shall include surge protection devices (SPD) to withstand high repetition noise transients as a result of utility line switching, nearby lightning strikes, and other interference.
- f. The LED circuitry shall prevent visible flicker to the unaided eye over the voltage range specified above.
- g. LED Drivers must meet Class A emission limits referred in Federal Communications Commission (FCC) Title 47, Subpart B, Section 15 regulations concerning the emission of electronic noise.
- h. Drivers shall have a Class A sound rating.

.4 Photometric Requirements

- a. Optical assemblies shall have a minimum efficiency of 85% regardless of distribution type. All optical assemblies will be mounted parallel to the ground, aimed in the same direction and shall provide the same optical pattern such that catastrophic failures of individual LEDs will not constitute a loss in the distribution pattern.
- b. All photometric data will be measured by the IESNA LM-79-08 standard and formatted per IESNA LM-63-02 as an electronic .ies file.
- c. The illuminance shall not decrease by more than 30% over the expected operating life. The measurements shall be calibrated to standard photopic calibrations.
- d. The luminaire shall have a correlated color temperature (CCT) range of 3,000K to 4,500K as indicated in the Lighting Fixture Schedule. The color rendition index (CRI) shall be 80 or greater.
- e. Exterior luminaires shall not allow more than 10 percent of the rated lumens to project above 80 degrees from vertical. The Luminaire shall not allow more than 2.5 percent of the rated lumens to project above 90 degrees from vertical. Backlight and Glare ratings calculated as per IESNA TM-15.

.5 Thermal Management

- a. The thermal management (of the heat generated by the LEDs) shall be of sufficient capacity to assure proper operation of the Luminaire over the expected useful life.
- b. The LED manufacturer's maximum thermal pad temperature for the expected life shall not be exceeded.
- c. Thermal management shall be passive by design. The use of fans or other mechanical devices shall not be allowed.



- d. The Luminaire shall have a minimum heat sink surface such that LED manufacturer's maximum junction temperature is not exceeded at maximum rated ambient temperature of 40 degrees Celsius (supply Heat test).
- e. The heat sink material shall be aluminum.

.6 Physical and Mechanical Requirements

- a. The Luminaire shall be a single, self-contained device, not requiring on-site assembly for installation. The power supply for the Luminaire shall be integral to the unit.
- b. The assembly and manufacturing process for the LED Luminaire shall be designed to assure all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

6.3 Execution

- .1 Provide all fastenings, supports etc. to install in an appropriate and approved manner. Adequately support all ceiling mounted fixtures, from the building structure. Use safety chains for all accessible ceilings. The accessible ceiling shall not solely support the fixture. The requirement for independent support for fixtures may be waived only if the accessible ceiling manufacturer provides written confirmation that the ceiling has been designed to carry the load.
- .2 Fasten fixtures to studs, joists, furring channel or other structural ceiling framing with screws. Drill holes in fixtures if required for alignment to ceiling structure. Coordinate with ceiling installed to ensure sufficient structure is provided for the fixtures. Toggle bolts or drywall anchors alone is insufficient.
- .3 All fixtures installed in/on acoustic tile in T-bar ceilings shall have safety chains. All fixtures recessed into T-bar ceilings shall be provided with grid clips, or fly-out tabs to restrict the fixture from being pushed up during maintenance.
- .4 All fixtures in T-bar ceilings shall be wired with sufficient spare conductor coiled in the ceiling to allow fixtures to be moved 4'-0", (1.2m) in any direction.
- .5 All cabling associated with lighting control system shall be CMP CAT5e green. Performance shall meet or exceed that of Nexans HyperPlus 5e Plenum Part Number 10032232.
- .6 Coordinate position of lighting fixtures in mechanical areas with mechanical duct work and equipment. Modify installation to suit.
- .7 Provide an adjustable hanger system for areas requiring fine adjustment of fixture suspensions. System shall be Gripple, or approved alternate, rated for fixture mass with minimum 5:1 safety factor.
- .8 The location of fixtures as shown on the drawings are approximately correct, but the Consultant reserves the right to alter the location of any number of them up to 120", (3.0m) without incurring extra costs, provided the request is made before the fixture is installed.

## **7. EMERGENCY LIGHTING (UNIT EQUIPMENT)**

### **7.1 General**

- .1 Supply and install an emergency lighting system consisting of the following, to activate and provide egress lighting in the event of a power failure:
  - a. Battery-backed lighting fixtures, conduit, wiring etc.
- .2 Batteries to automatically recharge after normal power is restored.
- .3 Provide complete working system utilizing products as outlined in "LIGHTING FIXTURE SCHEDULE."
- .4 Equipment shall conform to CAN/CSA-C22.2 No. 141-10 (or latest edition).

### **7.2 Products**

- .1 Emergency Lighting Units
  - a. High quality, corrosion, flame and vandal resistant, polycarbonate housing.
  - b. Vandal resistant latch clips.
  - c. Auto-test circuitry. External test switch for momentary test operation.
  - d. Ceiling or wall mounted.
  - e. IP65 rating. Suitable for wet location installations.
  - f. Sealed Ni-MH batteries for minimum 90 minute emergency illumination.
  - g. Nine year pro-rata warranty on the assembly. Ten year battery warranty.

### **7.3 Execution**

- .1 Perform an Emergency Lighting test as soon as the systems are operational. Test shall indicate the following in chart form on Company letterhead:
  - a. Building name and location.
  - b. Physical location of each remote device.
  - c. The device designation, i.e, EA, etc.
  - d. Battery pack designation, manufacturer and name plate data.
  - e. Proper operation under normal AC power.
  - f. Duration of operation under emergency DC power.
  - g. Current load check on each output circuit.
  - h. Location and voltage at most remote fixture.
  - i. Charging current at the end of the test.
  - j. Date of testing.
  - k. Signature and name of testing individual.
- .2 Once system is free of defects, remove all AC and DC power sources at a time suitable to the Owners, so as to schedule subsequent self-diagnostic Auto-Tests for minimal distraction to building occupants.

**END OF SECTION**

## **1. GENERAL**

### 1.1 General Requirements

- .1 The Procurement and Contracting Requirements as outlined under Division 00, and the General Requirements as outlined under Division 01, and all addenda thereto shall apply to and govern all portions of the communications work.
- .2 Reference Division 26 and Division 28 for additional requirements.

### 1.2 Work in Contract

- .1 The Electrical Subcontractor shall be responsible for the supply and installation and/or modification of the following systems, including all equipment, associated cabling, terminations, testing, programming, integration and commissioning:
  - a. Pathways for communications, electronic safety and security.
  - b. Assistive listening.
  - c. Audio/Visual.
- .2 The Electrical Subcontractor shall obtain the services of qualified Communications Subcontractor(s) for the satisfactory completion of the work, and shall carry all such subcontractor costs in the bid.
- .3 All rough-in work shall be performed by Division 26. All final terminations and programming shall be performed by the appropriate Communications Subcontractor.
- .4 The Communications Subcontractor shall warrant any equipment installed under this specification to be free from defects for a period of two years from date of final acceptance.
- .5 The subcontractors shall ensure that all communications cabling in spaces being used as a return air plenum is totally enclosed in non-combustible raceways, or is FT6 rated (also known as Communications Media Plenum, or CMP).
- .6 All systems and components shall be ULC listed.

### 1.3 Work by Others

- .1 All equipment, associated cabling, termination, testing, programming, integration and commissioning of the following systems shall be supplied and installed by others under the specified allowance(s):
  - a. Computer (data).
  - b. Telephone (voice).
  - c. Public address.
- .2 The Electrical Subcontractor shall coordinate with the successful subcontractor(s) to provide the proper infrastructure (rough-in work) for the installations.

## **2. PATHWAYS FOR COMMUNICATIONS, ELECTRONIC SAFETY AND SECURITY SYSTEMS**

### 2.1 General

- .1 This section will generally refer to empty conduits, sleeves, junction boxes, etc. associated with the following systems:
  - a. Communications, i.e., structured cabling, Information Technology (IT), telephone (voice), public address, audio/visual and assistive listening.
  - b. Electronic Safety and Security, i.e., intrusion alarm, access control and video surveillance.
- .2 Provide all material and labour necessary for a complete installation of pathways.

### 2.2 Installation - Interior

- .1 Unless otherwise noted, all outlets shall be single gang deep boxes. Each single gang box shall be provided with 0.75" (21mm) conduits. Outlets that indicate more than two drops shall feature 1.0" (27mm) conduits. Allow for punching holes in metal outlet boxes if available knockouts cannot meet this specification.
- .2 All conduit runs shall originate at the communications room, communications closet, wire way, pull box or splice box.
- .3 All conduit entering into the communications room or closets (unless otherwise stipulated) will protrude into the room from 1.0-2.0" (25-50mm) without a bend.
- .4 All conduit runs shall follow building grid lines and shall be concealed. Conduits installed below the floor slab need not follow building grid lines.
- .5 EMT bushings shall be Arlington AL-EMTx series, size to suit conduit specified.

### 2.3 Specific Rough-ins

- .1 Rough-in for exterior card readers shall be 6x6" (150x150mm), standard depth boxes. Provide smoked, beveled lexan cover. Interior rough-ins may be flush mounted on single gang box with an extended back plate.
- .2 Unless otherwise noted, boxes for audio/video outlets shall be two-gang.

### 2.4 Self-Sealing Conduit Sleeves

- .1 All conduit sleeves through a rated separation shall consist of an enclosed, fire-rated pathway device. The CUL Classified/FM Approved pathway shall contain a built-in fire sealing system sufficient to maintain the hourly fire rating of the wall or floor being penetrated. The self-contained sealing system shall automatically adjust to the installed cable loading and shall permit cables to be installed, removed, or retrofitted without the need to adjust, remove, or reinstall firestop materials. The pathways shall be Specified Technologies Inc. EZ-Path, or approved alternate, in the following configurations:

- a. Series 44 for ganged sleeves through 6.0" (153mm) cored holes. Standard length is 14" (356mm).
- .2 Provide wall plates, gang kits (extensions), conduit attachment kits, and retrofit kits as required.

### 2.5 Cabling Hangers

- .1 Multiple use "J" shaped hanger to provide secure containment of low voltage communications cables.
  - a. Pre-galvanized finish.
  - b. 4" (100mm) size capable of supporting 300 4-pair UTP, CAT5e or 2-strand fibre cable, or 185 CAT6.
  - c. Quick release cable retainer.
- .2 Hangers shall be Cooper B-Line Catalog No. BCH64 series, or approved alternate, complete with Qwik-Latch cable retainers.
- .3 Units shall be wall mounted (-1D) where ever possible. Where not possible, units shall be suspended from the structure (-2D).
- .4 Installation of power wiring in hangers shall not be permitted.
- .5 Hangers shall be spaced at 60" (1.5m) intervals
- .6 Coordinate exact location of hangers onsite with Mechanical Contractor to avoid conflicts with piping, ductwork etc.

### 2.6 Execution

- .1 Provide a conduit from each outlet box to the nearest accessible ceiling space. Conduit shall extend minimum of 6.0" (150mm) above ceiling and shall have smooth 90 degree bends. Do not terminate conduits above non-accessible ceiling systems.
- .2 Conduits for Assistive Listening cabling is recommended to be contained within each room (not stubbed to the corridor). Maximum of 15m cable lengths.
- .3 Provide a blank cover plate on each outlet of the same colour and material as described in the wiring devices section.
- .4 All empty conduits and raceway systems shall be provided complete with nylon pull tapes and plastic bushings.
- .5 Pull tapes shall be suitably fastened to the ends of each conduit to prevent accidental pull outs.

### **3. ASSISTIVE LISTENING**

#### **3.1 Scope of Work**

- .1 The Electrical Subcontractor shall be responsible for the provision of a complete assistive listening system including the supply and installation of all equipment, cabling, and field devices.
- .2 All final terminations and programming shall be performed by the manufacturer's authorized representative.
- .3 The subcontractor is to coordinate with the Owners staff for the start-up of the system.
- .4 The assistive listening systems are to be delivered to the WRDSB Education Centre, 51 Ardel Avenue, Box 58, Kitchener, Ontario, to be tagged and entered into their system. The Electrical Subcontractor is to allow for delivery to and picking up of the system after it has been tagged at the Education Centre. The system shall then be taken back to the site for installation.

#### **3.2 Quality Assurance**

- .1 The subcontractor shall have a factory trained service department on call twenty-four hours a day, 365 days a year, to service the specified product.
- .2 The installing subcontractor may be asked to provide a reference list of five similar sized projects installed by the subcontractor including contacts and telephone numbers.

#### **3.3 Products**

- .1 Each individual room shall consist of the following Lightspeed Topcat components:
  - a. One (1) Model No. TCA ceiling-mounted audio base station. Provide plug-in power adapter and 15.24m plenum rated DC power cable kit.
  - b. Two (2) Model No. FM flexmike pendent-style wireless microphones. Provide AA NiMH rechargeable battery pack and lavalier cord.
  - c. One (1) Model No. FMCC cradle charger for flexmikes. Provide plug-in power adapter.
  - d. One (1) Model No. Media Connector wireless audio transmitter/receiver to integrate with classroom audio sources and send/receive the wireless signal. Provide plug-in power adapter.
  - e. One (1) wall-mounted, black, glass shelf.

#### **3.4 Execution**

- .1 Typical Teaching Space
  - a. Refer to the 'Classroom Audio/Video Rough-in Detail' for installation details.
  - b. Refer to the 'Classroom Audio/Video Cabling Schematic' for cabling details.
  - c. Locate and install the Topcat Access on the ceiling, centrally within the room. Install plug-in power supply and plenum rated DC cabling from the power supply to the Topcat Access.
  - d. Preferred location of the wall-mounted shelf is above millwork shelves to prevent accidental contact.

- .2 Provide custom stainless steel decora strap for the HDMI and 3.5mm audio inputs. Install in a two-gang box with a data drop in the second gang. Locate a minimum 2440mm off center of the projection screen.
- .3 Provide 27mm riser conduits for cable installation. Cables shall only be run exposed above accessible ceilings.
- .4 Outlet boxes serving inputs shall be bonded to ground.
- .5 Provide cable ties to neatly route cabling above accessible ceilings where indicated. Do not lay cables on top of ceiling tiles or lighting fixtures.
- .6 Size and quantity of conductors shall be in accordance with manufacturer's requirement for cabling.
- .7 All cabling shall be Communications Media Plenum (CMP) rated.
- .8 The assistive listening system shall not be integrated into the school public address system.
- .9 Refer to Division 26 for details of training and demonstrations.

### 3.5 Field Quality Control

- .1 The work of this section shall not be considered to be complete until all systems and component parts have been tested and found to be in satisfactory operating condition.

#### **4. AUDIO/VISUAL SYSTEMS**

##### 4.1 Projectors

- .1 Projectors are existing, to be relocated.
- .2 Provide new mounting hardware, cabling, etc.
- .3 Projection screens shall be provided by others.
- .4 Provide the following in a typical teaching space:
  - a. HDMI Decorator Frame. Refer to Assistive Listening specification.
  - b. HDMI cable.
    - i. Plenum rated (CMP).
    - ii. Length to suit, but less than 15m.
    - iii. 10.2 Gbps bandwidth.
    - iv. 24 AWG.
  - c. Adjustable Projector Drop Pole: Chief CMS Series. Provide suitable length pole such that the projector is level with the top of the screen.
  - d. Projector Mount: Chief RPAU-W.
  - e. Mounting Plate: Chief CMA440. Fasten safety cable to structure.
  - f. Plenum Rated Box: Chief CMA470. Secure to top of mounting plate.

##### 4.2 Video Display Screen and Camera

- .1 New video display screen 'C' and camera 'C' in Family Studies are supplied by the Owner for installation by the Contractor.
- .2 Contractor to provide suitable mounting hardware.
- .3 Provide suitable rough-ins including the following:
  - a. Provide Plenum rated HDMI and CAT6 cabling between camera and display.
  - b. Locate AFC receptacle to serve the power supplies of both devices.

##### 4.3 Execution

- .1 Installations instructions shall be obtained from the system manufacturer prior to installation.
- .2 Prior to installation, verify optimal distance from projectors to screen with projector manufacturer's specifications. Based on proposed equipment, maintain 3660mm (12ft) between projector and screen. Projector shall be no more than 100mm (4") off centre of the screen.
- .3 Mount duplex receptacle above finished ceiling to power the projector.
- .4 Provide CMP HDMI cable from the projector to the video outlet. Refer to the floor plans for the location of the video outlet.



- .5 All projectors are subject to ambient light conditions. It is recommended lighting and window coverings be adjusted for optimal projector performance.

**END OF SECTION**

## **1. GENERAL**

### 1.1 General Requirements

- .1 The Procurement and Contracting Requirements as outlined under Division 00, and the General Requirements as outlined under Division 01, and all addenda thereto shall apply to and govern all portions of the electronic safety and security work.
- .2 Reference Division 26 and Division 27 for additional requirements.

### 1.2 Work in Contract

- .1 The Electrical Subcontractor shall be responsible for the supply and installation and/or modification of the following systems, including all equipment, associated cabling, terminations, testing, programming, integration and commissioning:
  - a. Supplemental aid assistance alarm associated with the Universal Washroom.
  - b. Fire alarm and detection.
- .2 All rough-in work shall be performed by Division 26.
- .3 The Security Subcontractor shall warrant any equipment installed under this specification to be free from defects for a period of two years from date of final acceptance.
- .4 The subcontractors shall ensure that all communications cabling in spaces being used as a return air plenum is totally enclosed in non-combustible raceways, or is FT6 rated (also known as Communications Media Plenum, or CMP).
- .5 All systems and components shall be ULC listed.

### 1.3 Work by Others

- .1 All equipment, associated cabling, termination, testing, programming, integration and commissioning of the following systems shall be supplied and installed by others under the specified allowance:
  - a. Access controls.
- .2 The Electrical Subcontractor shall coordinate with the successful subcontractor(s) to provide the proper infrastructure (rough-in work) for the installations.

## **2. SUPPLEMENTAL AID ASSISTANCE FOR UNIVERSAL WASHROOM**

### 2.1 General

- .1 The Universal Washroom Access Controls and Emergency Call system hardware shall be provided by others, complete with all low voltage cabling. Provide power and rough-ins as outlined.

### 2.2 Products

- .1 Provide supplemental aid assistance alarm including the following:
  - a. Viking Model No. E-40-SS. Coordinate exact location and mounting height to suit grab bars, etc.
  - b. Viking Model C-200 Phone Interface and connect to an unused line input (loop start trunk input) on the phone system.
  - c. CAT5e cabling from aid assistance alarm to nearest communications room.
- .2 Adjust speaker and microphone volume as directed by Owners. Programming required to integrate the aid assistance alarm into the phone system shall be provided by others so that a signal initiates a call to the designated telephone handset.

### 2.3 Execution

- .1 Make line voltage connections to all devices as supplied by the hardware subcontractor.

### **3. FIRE ALARM AND DETECTION**

#### 3.1 Scope of Work

- .1 This specification provides the requirements for the modification of the existing addressable, hybrid fire alarm and detection system.

#### 3.2 Quality Assurance

- .1 Edwards is the existing manufacturer and as such, sets the standard of quality and type of equipment to be provided.
- .2 Each and all items of the fire alarm and detection system shall be covered by a one-year parts and labour warranty covering defects resulting from faulty workmanship and materials.
- .3 All equipment shall be new and unused. All components and systems shall be designed for uninterrupted duty. All equipment, materials, accessories, devices, and other facilities covered by this specification or noted on contract drawings and installation specifications shall be the best suited for the intended use and shall be provided by a single manufacturer or if provided by different manufacturers recognized as compatible by both manufacturers and ULC.
- .4 Installing contractor shall be certified by a program or course acceptable to the Office of the Fire Marshal. Evidence of membership in the ECAO Fire Alarm and Protection Certification Program, or proof of registration as a CFAA Fire Alarm Technician may be requested.

#### 3.3 Control Panel (FACP)

- .1 Existing Chubb Edwards model EST3 shall remain. Modify as per floor plans.
- .2 The system program shall meet the requirements of this project, current codes and standards, and satisfy the local authority having jurisdiction.
- .3 Provide optional relay cards as required to support all ancillary devices and equipment as described herein.

#### 3.4 Remote Annunciators

- .1 Existing annunciator shall remain. Modify to reflect the new initiating zone arrangement.

#### 3.5 Passive Graphic

- .1 An updated passive zoning graphic shall be provided by others.

#### 3.6 Addressable Initiating Devices

- .1 Addressable Devices - General
  - a. Each remote device shall have a microprocessor with non-volatile memory to support its functionality and serviceability.

- b. Each device shall be capable of electronic addressing, either automatically or application programmed assigned, to support physical/electrical mapping and supervision by location.

.2 Addressable Detectors

- a. The system addressable detectors shall be capable of full digital communications using both broadcast and polling protocol.
- b. Each detector shall have an integral microprocessor capable of making alarm decisions based on parameter information stored in the detector head.
- c. Each detector shall have a separate means of displaying communication and alarm status.
- d. The detectors shall be suitable for mounting on any Signature Series detector mounting base.
- e. The addressable detectors and devices shall be as follows:
  - i. Heat Rate-of-Rise, SIGA-HRD. (57C)/Rate of Rise (9C per minute).
  - ii. Heat Fixed, SIGA-HFD.
  - iii. Duct Smoke, SIGA-SD. Provide sampling tube and remote alarm LED.
- f. All addressable detectors shall be suitable for use with the following bases:
  - i. Standard, SIGA-SB.

.3 Addressable Modules

- a. It shall be possible to address each Intelligent Signature Series module without the use of DIP or rotary switches.
- b. The personality of multifunction modules shall be programmable at site to suit conditions and may be changed at any time using a personality code downloaded from the Analog Loop Controller.
- c. Input and output circuit wiring shall be supervised for open and ground faults.
- d. The addressable module devices shall be as follows:
  - i. Dual Input, SIGA-CT2.
  - ii. Control Relay, SIGA-CR (form C contacts, 2A @24VDC, 0.5A @120VAC).
  - iii. Control Relay, SIGA-CRH (form C contacts, 6A @24VDC, 7A @120VAC).

3.7 Signaling Devices

- .1 All appliances shall be ULC Listed for Fire Protective Service.
- .2 All appliances shall be of the same manufacturer as the Fire Alarm Control Panel to ensure absolute compatibility between the appliances and the control panels, and to ensure that the application of the appliances is done in accordance with the single manufacturer's instructions.
- .3 Signaling pattern and sound shall be consistent throughout the facility. Mixing of different sounding devices shall not be permitted.
- .4 Bells
  - a. MB6-24 motor driven.
- .5 Strobe

- a. 202-7A-T LKW-1.

### 3.8 Fire Alarm Monitoring Panel (FAMP)

- .1 Existing panel shall remain to allow for offsite monitoring of the fire alarm and detection system.

### 3.9 Sequence of Operation

- .1 The system shall function so that operation of any alarm initiating device shall cause the following:
  - a. Signal devices to operate throughout building.
  - b. Transmit an alarm signal to remote monitoring agency.
  - c. Display an event type, alarm time, and a location message for each active device or zone at control panel and at remote annunciator.
- .2 The system shall function so that operation of any supervisory initiating device shall cause the following:
  - a. Internal signal to sound at the control panel and remote annunciator.
  - b. Display a location message for active device(s) at the control panel and remote annunciators.
  - c. Transmit a supervisory signal to remote monitoring agency.
- .3 Program interlocks with all ancillary equipment as follows:
  - a. Smoke dampers: alarm or any duct smoke detector.
  - b. HVAC equipment: alarm or local duct smoke detector.
  - c. For equipment system interlocks not referenced above, contact consultant for clarification.
- .4 Program initiating devices as follows:
  - a. Alarm:
    - i. heat detectors.
    - ii. Kitchen hood fire suppression.
  - b. For equipment system interlocks not referenced above, contact consultant for clarification.
- .5 Indicate trouble condition at control panel and all remote annunciator for the following conditions:
  - a. Field wiring open circuit.
  - b. Field wiring ground fault.
  - c. Battery disconnect.
  - d. Low battery.
  - e. AC power failure.

- .6 Equipment beneath kitchen hood shall shut down only upon a signal from the local fire suppression system completely independent of the fire alarm system. Do not connect equipment to shut down upon an alarm from the fire alarm system. Kitchen equipment shall continue to run on an alarm condition until such point that the suppression system is activated.
- .7 Duct detectors and smoke detectors associated with adjacent smoke dampers shall be programmed to activate both the initiating zone on the floor where the device is located and the associated air handling equipment.

### 3.10 Installation

- .1 General Installations
  - a. All new components shall be installed in accordance with CAN/ULC-S524-14 and approved manufacturers manuals and wiring diagrams. The Electrical Subcontractor shall furnish all conduit, wiring, outlet boxes, junction boxes, cabinets and similar devices necessary for the complete installation. All wiring shall be of the type recommended by the OESC, approved by local authorities having jurisdiction for the purpose, and shall be installed in dedicated conduit throughout.
  - b. All penetration of floor slabs and fire walls shall be fire stopped in accordance with all local fire codes.
  - c. Provide all programming and labels that reference room names or numbers to reflect the finalized Owner designated room names/numbers. Do not duplicate the room names/numbers indicated on the drawings.
  - d. All wiring shall be minimum #14 AWG copper with 300V insulation rating, unless specifically noted otherwise.
- .2 Initiating Installations
  - a. Locate and install all initiating circuits and detectors and connect to zone wiring.
  - b. Install fire detectors on ceiling unless otherwise specified herein with minimum and maximum distances as required for the respective type of detector. Mount at highest point where variations in ceiling height exist. A clear space of at least 18" (450mm) shall be maintained on the ceiling, below and around the fire detector. Fire detectors shall not be located a direct air flow or within 18" (450mm) from an air supply or exhaust outlet.
  - c. Install duct detector sampling tubes in straight section of duct to manufacturer's recommendation. Install so that the smoke detector and sampling tube are accessible for servicing. Obtain actual duct dimensions onsite prior to ordering air sampling tubes.
- .3 Signaling Installations
  - a. Locate and install new signaling devices and connect to notification circuit. Provide suitable back boxes and back plates for signaling appliances, surface or recessed type to suit the specific application.
  - b. Provide adequate signal circuit wiring so that circuits are not loaded beyond 65%, regardless of the zoning arrangement indicated on the plans.
  - c. Notification devices shall be set for steady pattern at maximum volume unless noted otherwise. Changes to a temporal 3-3-3 pattern will be implemented at a later date.

### 3.11 Addressable System Notes

- .1 New zone isolators are not anticipated.
- .2 Data loop wiring shall be ULC S524 Style C.
- .3 Data loop wiring shall exit/enter the control panel separate raceways and shall be separated 1.2m horizontally and 0.3m vertically thereafter.
- .4 The following OBC zones need not have zone isolators:
  - a. Other devices that are situated completely within a floor area.
- .5 Addressable sensors and modules shall be connected directly to the data loop wiring. T-tapping off the data loop to form a Class "B" (zone wiring) circuit shall not be permitted.
- .6 Zone wiring shall be #14/2 copper in a metallic raceway. AC90 (BX) cable is acceptable where specified. In all cases, the sensors and modules shall be located between the isolators serving the particular zone.
- .7 Ensure data loop device count does not exceed 80%. Provide additional data loops if required. Proposed zone layout shall be prepared by the manufacturer and submitted to the Consultant for review.
- .8 The address of each sensor and module shall be assigned by means of computer polling of the data loop(s) once installations are complete. The Electrical Subcontractor shall ensure that each addressable detector and module is assigned an identifying name in accordance with its installed location upon project completion.
- .9 All signaling devices shall be fed direct from the control panel using Notification Appliance Circuits (NAC)s. NAC wiring shall be #14/2 copper in metallic raceway. AC90 (BX) cable is acceptable where specified.
- .10 Connect addressable relay module outputs to the data loop nearest the module.
- .11 Field measure all loads connected to addressable relay modules where the ratings on contacts is exceeded, provide additional relay suitable for the connected load.

### 3.12 Field Quality Control and Programming

- .1 Perform tests in accordance with CAN/ULC-S537-13 Standard for the Verification of Fire Alarm Systems. Include testing as outlined in CAN/ULC-S536 latest addition.
- .2 Perform audibility tests if required by the local Building officials or if requested by the consultant.
- .3 Check annunciator panels to ensure zones are shown correctly.
- .4 The system shall be installed and fully tested under the supervision of trained manufacturer's representative. The system shall be demonstrated to perform all the functions as specified.



- .5 Verification(s) shall be performed by the manufacturer's representative authorized by the CFAA. Verification by the Contractor shall not be permitted.
- .6 Include for multiple verifications and integrated tests where the construction schedule warrants. Coordinate exact requirements with General trades.
- .7 System installation and operations shall be verified by the manufacturer's representative and a verification certificate presented upon completion. The manufacturer's representative shall be responsible for an on-site demonstration of the system operation and initial staff training as required by the Architect and/or Consulting Engineer.
- .8 Changes made to an existing fire alarm system shall require the following:
  - a. Verification of all new and modified devices.
  - b. Testing of all devices on the data loops affected. Software polling of devices on modified data loops shall not be acceptable.
  - c. Testing of one device on each zone data loop not affected.
- .9 System changes shall be verified by the manufacturer's representative and a verification certificate presented upon completion.

### 3.13 Integrated Systems Testing of Fire Protection and Life Safety Systems

- .1 The Electrical Subcontractor shall retain the services of an Integrated Testing Coordinator (ITC) for all systems that are designed to operate together to achieve an overall fire protection and life safety objective, in accordance with OBC 3.2.10.
- .2 The Contractor shall not act as the ITC. The ITC shall be an independent provider that has been certified by ULC to perform this function and shall provide proof of certification prior to proceeding.
- .3 The Electrical Subcontractor shall cover the costs of the ITC and shall be responsible for coordinating and scheduling all affected parties including owners, operators, occupants, inspectors, consultants, installing subcontractors and verifying parties to participate in the testing.
- .4 The ITC shall be knowledgeable and experienced in the design, installation and operation of fire protection and life safety systems as well as associated building systems. The ITC individual shall be certified by a program or course acceptable to the Office of the Fire Marshal. Provide evidence of membership in the ECAO Fire Alarm and Protection Certification Program, or proof of registration as a CFAA Fire Alarm Technician.
- .5 The ITC shall provide a project-specific, written report outlining the testing procedure and necessary functional results in accordance with CAN/ULC-S1001. A cause and effect matrix may be used to outline the sequence of operation for the systems integration. Specifically, this integrated testing plan shall outline the fire alarm system's integration with the following equipment and systems:
  - a. Cooking Equipment Fire Suppression.
  - b. Smoke dampers.
  - c. Notification.

- .6 Submit the integrated testing plan to the Engineer concurrently with shop drawings. Prior to testing, the Contractor shall provide all occupancy-related documentation to the ITC.
- .7 Unless otherwise outlined, the testing procedure shall consist of the functional operation of the device or system, i.e., testing of relay contacts alone is insufficient. Sample testing is also insufficient.
- .8 Once testing is completed, the ITC shall provide a signed report documenting the implementation of the systems integration. Include the report in the project close out for subsequent periodic systems testing as required.

**END OF SECTION**

1.1 **Architectural**

- A0-0 COVER & OBC MATRIX
- A1-0 OVERALL SITE PLAN
- A1-2 PARTIAL SITE PLAN – PROPOSED PARKING & DEMOLITION PLANS
- A2-0 OVERALL FIRST AND SECOND FLOOR PLANS
- A2-1 PARTIAL FIRST FLOOR PLAN – PROPOSED FAMILY STUDIES & DEMOLITION
- A2-2 PARTIAL FIRST FLOOR PLAN – PROPOSED TECH DESIGN/CE & DEMOLITION SECTION
- A2-3 PARTIAL 2ND FLOOR PLAN & ELEVATIONS – COLUMN REPAIR
- A2-4 PARTIAL FIRST FLOOR PLAN – WINDOW REPLACEMENT
- A3-1 EXTERIOR ELEVATIONS
- A3-2 WALL SECTIONS
- A3-3 WALL SECTIONS
- A4-1 INTERIOR ELEVATIONS, FAMILY STUDIES & TECH DESIGN/CE
- A6-1 PARTIAL FIRST FLOOR REFLECTED CEILING PLAN
- A9-1 PARTIAL FIRST FLOOR FINISHES PLAN

1.2 **Structural**

- S0.0 KEY PLAN, GENERAL NOTES & DETAILS
- S1.0 PARTIAL ROOF FRAMING PLAN & SECTIONS

1.3 **Mechanical**

- M1.1 MECHANICAL LEGEND & DETAIL
- M1.2 MECHANICAL SCHEDULES
- M2.1 PARTIAL MECHANICAL PLANS
- M2.2 PARTIAL MECHANICAL PLANS

1.4 **Electrical**

- E1.1 ELECTRICAL KEY PLANS & LEGEND
- E2.1 PARTIAL EXISTING ELECTRICAL PLAN
- E2.2 PARTIAL EXISTING ELECTRICAL PLAN
- E3.1 PARTIAL REVISED ELECTRICAL PLAN
- E3.2 PARTIAL REVISED ELECTRICAL PLAN
- E4.1 POWER DISTRIBUTION SCHEDULES
- E4.3 DETAILS, SCHEDULES & SCHEMATICS

**End of Section**

## Room Finish Schedule

Room No.	Room Name	Floor		Base		Wall		Ceiling			Remarks
		mat'l	finish	mat'l	finish	mat'l	finish	mat'l	finish	height	
3-2	NEW UNIVERSAL WASHROOM	CONC	POR	-	POR	CONC BLK	POR	ACT	-	2500	REPAIR FLOOR & WALL BASE IN & AROUND ROOMS <b>AND</b> CORRIDOR AT SCOPE OF WORK.
3-2A	EXISTING OFFICE	CONC	EX	-	RUB	EX	SG-PT	EX	EX	EX	PATCH & MAKE GOOD ALL AFFECTED SURFACES. INSTALL NEW RUBBER BASE IN FULL LENGTH STRIPS FROM CORNER TO CORNER.
8-6	TECH DESIGN/ CE	EX	EX	EX	EX	EX	EX	EX	EX	EX	REPLACE AFFECTED CEILING TILES & REPAINT WALL TO MATCH EXISTING WHERE AFFECTED BY SCOPE OF WORK.
6-20	NEW FAMILY STUDIES	CONC	VSF	-	RUB	CONC BLK	EP-PT	ACT	-		ADD GYP BOARD TO WALL AT LIBRARY SIDE
6-21	NEW KITCHEN	CONC	VSF	-	RUB	CONC BLK	EP-PT	ACT	-		ADD GYP BOARD TO WALL AT LIBRARY SIDE
6-22	NEW FAMILY STUDIES	CONC	VSF	-	RUB	CONC BLK	EP-PT	ACT	-		ADD GYP BOARD TO WALL AT LIBRARY SIDE
6-24	NEW STORAGE	CONC	VSF	-	RUB	CONC BLK	SG-PT	EXP	-	-	NEW FINISHES THROUGHOUT - WALLS & FLOORS
6	CORRIDOR	CONC	TER	-	TER	CONC BLK	EP-PT	EX	EX	EX	PATCH & MAKE GOOD ALL SURFACES AFFECTED BY SCOPE OF WORK

**LEGEND:**

ACRYL	INTERIOR ACRYLIC PAINT	EP	EPOXY	P.LAM	PLASTIC LAMINATE	S/S	STAINLESS STEEL
ACT	ACOUSTIC CEILING TILE	EX	EXISTING	POR	PORCELAIN TILE	TER	TERRAZZO
BLK	BLOCK	EXP	EXPOSED	PT	PAINT	RUB	RUBBER BASE
CONC	CONCRETE	GYP	GYPSUM BOARD	SFT	SAFETY FLOORING	VCT	VINYL COMPOSITE TILE
CPT	CARPET	LEP	LATEX EPOXY	SG	SEMI-GLOSS	VSF	VINYL SHEET FLOORING
EG	EGGSHELL	LVT	LUXURY VINYL TILE	SPF	SPORTS FLOORING		

**End of Section**

## Colour Schedule

### PART 1 - GENERAL

#### 1.1 Reference

- .1 Comply with requirements of Division 1. This Colour Schedule is to be read in conjunction with all other contract documents.
- .2 Colour selections are based on specific manufacturers products and that further review and adjustments will be made once successful suppliers and/or manufacturers are known.

### PART 2 - LIST OF FINISHES

1. **Terrazzo:**
  - Manufacturer:** Unknown
  - Colour:** Match Existing
  - Code:** Unknown
  - Application:** Patch existing terrazzo in corridors to match existing
  - Contact:** Unknown
  
2. **Porcelain Tile:**
  1. **(POR-1):**
    - Manufacturer:** Olympia Tile
    - Collection:** Italian Icon
    - Through body, Coloured-Base**
    - Colour:** Beige (Beige/Brown/Cream striated) Looks like Limestone
    - Code:** CI.II.BGE.1224.MT.VC
    - Finish:** Matte
    - Shade Variation:** V-3
    - Size:** 305mm x 610mm (12" x 24")
    - Thickness:** 9 mm (3/8")
    - Application:** Floor – New Universal Washroom 3-2
  
  2. **(POR-2):**
    - Manufacturer:** Olympia Tile
    - Collection:** Italian Icon
    - Through body, Coloured-Base**
    - Colour:** Caldo (complimentary basketweave) Looks like Limestone
    - Code:** CI.II.CDO.1616.BL.MT
    - Finish:** Matte
    - Shade Variation:** V-3
    - Size:** 406mm x 406mm (16" x 16")
    - Thickness:** 9 mm (3/8")
    - Application:** Walls (Field) – New Universal Washroom 3-2
  
  3. **(POR-3):**
    - Manufacturer:** Olympia Tile
    - Collection:** Micro Crystal
    - Colour:** Vetro Bianco **Gloss**
    - Code:** ZY.V.BIA.1224.11,5MM
    - Shade Variation:** V-1
    - Size:** 305mm x 610mm (12" x 24")
    - Thickness:** 9 mm (3/8")
    - Application:** Walls (Accent) – New Universal Washroom 3-2
  
    - Contact:** Peony Seto 416-785-9555 ext.1254

## Colour Schedule

### PART 2 - LIST OF FINISHES (cont'd)

#### 3. Grout:

- |           |  |  |               |              |
|-----------|--|--|---------------|--------------|
| 1. (GT-1) | Manufacturer:<br>Colour:<br>Application:<br>Paired with Tile(s):                     | Mapei<br>38 Avalanche<br>Floor – sanded Karalastic/ Karabond<br>POR-1  |               |              |
| 2. (GT-2) | Manufacturer:<br>Colour:<br>Application:<br><br>Paired with Tile(s):<br><br>Contact: | Mapei<br>38 Avalanche<br>Wall – unsanded Ultra/ Mastic 1<br>with Plastijoint acrylic latex grout additive<br>POR-2, POR-3<br><br>Mapei | Jeff McCoppen | 905-799-6884 |

#### 4. Transition Strip:

- |             |  |   |  |  |
|-------------|--|---|--|--|
| 1. (TRAN-1) | Manufacturer:<br>Style:<br>Finish:<br>Size:<br>Item No.<br><br>Location: | Schluter<br>Schiene<br>Satin Anodized Aluminum (AE)<br>8mm (5/16")<br>AE 80<br><b>Contractor to verify correct item No. required</b><br>VSF to Terrazzo Transition Strips<br>Cap for all POR wall tiles at top of wall & transition between<br>POR tiles (Wall Tiles) |  |  |
| 2. (TRAN-2) | Manufacturer:<br>Style:<br>Finish:<br>Size:<br>Item No.<br><br>Location: | Schluter<br>Quadec<br>Brushed Stainless Steel (EB)<br>8mm (5/16")<br>Q 80 EB<br><b>Contractor to verify correct item No. required</b><br>Outside Corner trim for all wall tiles in washrooms  |  |  |

#### 5. Vinyl Sheet Flooring:

- |            |  |  |  |              |
|------------|--|--|--|--------------|
| 1. (VSF-1) | Manufacturer:<br>Colour:<br>Roll Size:<br>Total Thickness:<br>Application:                 | Johnsonite – Tarkett iQ Optima<br>3077260 Sharktale WG (Marbled brownish colour)<br>L - 25 linear meters (82'-7") x W - 2 meters (6'-6")<br>2.0mm (0.080" Gauge)<br>Floor – Accent in Classrooms/ Field in Kitchen |  |              |
| 2. (VSF-2) | Manufacturer:<br>Colour:<br>Roll Size:<br>Total Thickness:<br>Application:<br><br>Contact: | Johnsonite – Tarkett iQ Optima<br>3242246 Egyptian Scrolls (creamy beige)<br>L - 25 linear meters (82'-7") x W - 2 meters (6'-6")<br>2.0mm (0.080" Gauge)<br>Floor – Field in Classrooms<br><br>Janet Sayer        |  | 647-542-2514 |

## Colour Schedule

### PART 2 - LIST OF FINISHES (cont'd)

#### 6. Wall Protection:

1. (WP-1):	Manufacturer:	Altro	
	Product:	Altro Whiterock Satins Wall Cladding	
	Colour:	Cream/ Linen	(White)
	Size:	4' x 8'-2" W136	
		4' x 9'-10" W137	
	Thickness:	8' 2.5mm	
		10' 3.0mm	
	LRV:	89	
	Application:	Backsplash Wall Protection in Family Studies Kitchen Take backsplash to underside of cabinets and stove hood, plus to floor behind stoves along the walls.	
	Trim:	Use corresponding trim pieces for edges and sheet connections (white)	
	Contact:	Chris Johnson	416-428-3964

#### 7. Rubber Base:

1. (RUB-1)	Manufacturer:	Johnsonite – Tarkett	
	Colour:	40 Black	
	Characteristics:	TightLock for Resilient Topset (Coved) TDCR-XX (Rubber)	
	Profile:	6.35 mm thick – wedge design with a toe (Coved)	
	Height:	111.1 mm (4-3/8")	
	Details:	Coved, complete with preformed inside/outside corners	
	Contact:	Janet Sayer	647-542-2514

#### 8. Plastic Laminate:

1. (PL-1):	Manufacturer:	Wilsonart	
	Colour Name & #:	Kensington Maple 10776-60	
	Finish:	Matte Finish	
	Application:	<b>Millwork Units (Base &amp; Upper Cabinets) In Family Studies and Fashion Arts Classroom</b>	
2. (PL-2):	Manufacturer:	Wilsonart	
	Colour Name & #:	Pewter Mesh 4878-38	
	Finish:	Fine Velvet Finish	
	Application:	<b>Tabletops for Sewing Millwork</b>	
	Contact:	Wilsonart Jan Bibic	416-319-8107

#### 9. Stainless Steel:

1. (S/S-1):	Stainless Steel:	304	
	Gauge:	18	
	Application:	Countertop for Family Studies Kitchen Millwork	
	Contact:	Unknown	

## Colour Schedule

### PART 2 - LIST OF FINISHES (cont'd)

#### 10. Paint:

- |    |               |               |  |                      |
|----|---------------|---------------|--|----------------------|
| 1. | <b>(PT-1)</b> | Manufacturer: | Dulux Paints                                   |                      |
|    |               | Colour:       | Match Existing                                 | (Light Creamy-White) |
|    |               | Code:         | Unknown  |                      |
|    |               | Application:  | General – Corridor Walls / Classroom Walls     |                      |
|    |               |               | General – Gypsum Wall Board (Walls / Ceilings) |                      |
| 2. | <b>(PT-2)</b> | Manufacturer: | Dulux Paints                                   |                      |
|    |               | Colour:       | Match Existing                                 |                      |
|    |               | Code:         | Unknown  |                      |
|    |               | Application:  | Painted Doors                                  |                      |
| 3. | <b>(PT-3)</b> | Manufacturer: | Dulux Paints                                   |                      |
|    |               | Colour:       | Match Existing                                 |                      |
|    |               | Code:         | Unknown  |                      |
|    |               | Application:  | HM Door Frames                                 |                      |
|    |               | Contact:      | Steven Whyte                                   | 416-420-3603         |

**End of Section**



**DIVISION – 1**

1-101	Standard abbreviations
1-102	Standard abbreviations
1-103	Standard symbols

**DIVISION – 2**

2-100	Paving and Curb Details
2-103	Paving Details

**DIVISION 4 – 1**

4-101	Control Joint at Interior Door (Section + Elevation)
4-103	Typical Bullnose Block Corner Detail.
4-107	Typ. Door Jamb at Block Wall

**DIVISION – 6**

6-301	Cabinet Types
-------	---------------

**DIVISION – 7**

7-101	Section at Folding Glass Partition
7-102	Section Detail at New Door

**DIVISION – 8**

8-400	Door Types
8-500	Hollow Metal Frame Details
8-501	Hollow Metal Frame Details

**DIVISION 9 – 1**

9-102	Bulkhead Detail at Glass Partition
-------	------------------------------------

**DIVISION 10 – 1**

10-100	Barrier-Free Washroom Front Elevation
10-101	Barrier-Free Washroom Side Elevation
10-102	Barrier-Free Washroom Accessory Installation

**WRDSB – Details of Architectural Woodwork Standards**

AW001	Elevations / Sections – Materials Legend
AW002	Fillers Details
AW003	Sample Setbacks of Panels and Shelves


**WRDSB – Details of Architectural Woodwork Standards (Continued)**

AW004	Toe Tick Detail
AW106	Lower Cabinet with Sink – Section
AW051	Upper Cabinet – 400 – Elevation
AW053	Upper Cabinet – Section
AW054	Small Upper Cabinet – Elevation
AW055	Small Upper Cabinet – Section
AW056	Small Upper Cabinet – Section
AW102	Lower Cabinet – 800 Wide – Elevation
AW103	Lower Cabinet – Section
AW104	Lower Cabinet with Double Sink – Elevation
AW105	Lower Cabinet with Single Sink – Elevation
AW106	Lower Cabinet with Sink – Section
AW107	Lower Cabinet with Drawers – Elevation
AW108	Lower Cabinet with Drawers – Section
AW125	Lower Counter - Elevation
AW126	Lower Counter – Section
AW201	Lower Cabinet – 800 Wide – Elevation
AW202	Lower Cabinet – 800 Wide – Section
AW305	Teachers Closets – Type 3 – 2 Doors – Elevation
AW306	5 Shelf Storage Cabinet 800 - Section
AW333	Teachers Closets – Type 4 – 2 Doors – Elevation
AW334	Teachers Closets – Type 4 – Cabinet 800 – Section
AW401	Sewing Counter - Elevation
AW402	Sewing Counter – Section


**End of Section**

AC/ACT	ACOUSTIC CEILING TILE	DF	DRINKING FOUNTAIN	GR	GRADE
ACR	ACRYLIC	DG	DOUBLE GLAZE	GSR	GAS SERVICE REGULATOR
AD	AREA DRAIN	DH	DOUBLE HUNG	GRA	GRAVEL
ADJ	ADJUSTABLE	DIA.	DIAMETER	GWG	GEORGIAN WIRE GLASS
AFF	ABOVE FINISHED FLOOR	DIM	DIMENSION	GYP	GYPSUM
AGGR	AGGREGATE	DISP	DISPENSER		
AL	ALUMINUM	DK	DECK	HB	HOSE BIB
AP	ACOUSTIC PANEL	DN	DOWN	HC	HOLLOW CORE
APG	ARMoured PLATE GLASS	DO	DOOR OPENING	HDWD	HARDWOOD
APPROX.	APPROXIMATE	DS	DOWNSPOUT	HD	HAND DRYER
ARCH	ARCHITECTURAL	DW	DISHWASHER	HDWE	HARDWARE
AS SPEC.	AS SPECIFIED	DWG	DRAWING	HGT	HEIGHT
ASPH	ASPHALT	DWR	DRAWER	HM	HOLLOW METAL
ASS'Y	ASSEMBLY			HORIZ.	HORIZONTAL
ATTEN.	ATTENUATION	E	EAST	HP	HYDRO POLE
A/V	AIR VAPOUR	EA.	EACH	HR	HOUR
		EF	EXHAUST FAN	HSS	HOLLOW STEEL SECTION
BAT	BATTENS	EJ	EXPANSION JOINT	HTG	HEATING
BC	BOTTOM CURB	EL	ELEVATION	HW	HOT WATER HEATER
BD	BOARD	ELECT	ELECTRICAL		
BF	BARRIER-FREE	EMER	EMERGENCY	ID	INSIDE DIAMETER
BITUM.	BITUMINOUS	EN	ENAMEL	IFOB	INSIDE FACE OF BLOCK
BKCS	BOOKCASE	ENCL	ENCLOSURE	IMP	INSULATED METAL PANEL
BLDG	BUILDING	EP	EPOXY	INV	INVERT
BLK	BLOCK	EQ	EQUAL	INSUL	INSULATION
BLKHD	BULKHEAD	EQMT	EQUIPMENT	INT	INTERIOR
BM	BEAM	ES	EGG SHELL		
BOT	BOTTOM	EX.	EXISTING	JAN	JANITOR
BRK	BRICK	EXPAN	EXPANSION	JT	JOINT
BUR	BURLAP	EXP	EXPOSED		
		EXT	EXTERIOR	KIT	KITCHEN
C	CHAIR	FA	FIRE ALARM	LAM	LAMINATE
CB	CATCH BASIN	FAAP	FIRE ALARM ANNUNCIATION PANEL	LAV	LAVATORY
CFI	CONCRETE FACED INSULATION	FD	FLOOR DRAIN	LDIG	LIGHT DIFFUSING INSULATED GLASS
CEM	CEMENT	FDC	FIRE DEPARTMENT CONNECTION	LEP	LATEX EPOXY PAINT
CER	CERAMIC TILE	FDN	FOUNDATION	LF	LATERAL FILE
CG	CORNER GUARD	FE	FIRE EXTINGUISHER	LF	LATERAL FILE
CHBD	CHALKBOARD	FEC	FIRE EXTINGUISHER CABINET	LKR	LOCKER
CI	CAST IRON	FF	FORCED FLOW HEATER	LP	LIGHTING PANEL
CJ	CONTROL JOINT	FG	FIXED GLASS	LS	LIGHT STANDARD
CL	CENTRE LINE	FHC	FIRE HOSE CABINET	LT WT	LIGHT WEIGHT
CLB	CENTRE LINE OF BLOCK	FIN	FINISH	LV	LATERAL FILE
CLG	CEILING	FL	FLOOR	LVT	LUXURY VINYL TILE
CLO	CLOSET	FLASH	FLASHING		
CLR	CLEAR	FLEX.	FLEXIBLE	M	METAL
CM	COFFEE MACHINE	FLUOR	FLUORESCENT	MAX.	MAXIMUM
CNTR	COUNTER	FLT	FLOAT	MCT	MARMOLEUM COMPOSITE TILE
CO	CASED OPENING	FOB	FACE OF BLOCK	M.D.F.	MEDIUM DENSITY FIBREBOARD
COL	COLUMN	FOB(EX.)	FACE OF BLOCK (EXISTING)	MECH	MECHANICAL
CONC	CONCRETE	F.PT	FLAT PAINT	MEMB	MEMBRANE
CONN	CONNECTION	FR	FRIDGE	MFR	MANUFACTURER
CONSTR.	CONSTRUCTION	F.RET	FIRE RETARDANT	MGAT	MAKE GOOD ALL TRADES
CONT.	CONTINUOUS	FRR	FIRE-RESISTANCE RATED	MH	MAINTENANCE HOLE
CORR	CORRIDOR	FT	FOOT or FEET	MIN	MINIMUM
CP	CONTROL PANEL	FTG	FOOTING	MIR	MIRROR
CPAN	COMPOSITE PANEL	FURR	FURRING	MISC	MISCELLANEOUS
CPT	CARPET	FUT	FUTURE	MO	MASONRY OPENING
CTG	COATING	F&G	FELT & GRAVEL	MOR	MORTAR
CTR	CENTRE			MR	MOISTURE RESISTANT
CTSK	COUNTER SUNK	GA	GAUGE	MSB	MEDIUM SAND BLAST
C/W	COMPLETE WITH	GALV	GALVANIZED	MTD	MOUNTED
CV	CONVECTOR	GB	GRAB BAR	MUL	MULLION
		GL	GLASS	MW	MICROWAVE
DBL	DOUBLE	GL.BL.	GLAZED BLOCK		
DEPT	DEPARTMENT	GND	GROUND		
DET.	DETAIL				

FOR CONTINUATION SEE DWG. NO. 1-102

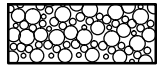
 KINGSLAND + ARCHITECTS INC 219 Dufferin Street, Suite 308b Toronto, Ontario M6K 3J1 ph 416.203.7799 fax 416.203.7763	ISSUED:	DRAWING NAME: <b>STANDARD ABBREVIATIONS</b>	DATE: April 2021	SCALE: N.T.S.
		PROJECT NAME: Forest Heights C.I.	DRAWN: K+	PROJECT NO: A20017
			CHECKED: K+	DWG NO: 1-101

N	NORTH	S	SOUTH	VRT	VINYL REINFORCED TILE
ND	NAPKIN DISPOSAL	SC	SOLID CORE	VSF	VINYL SAFETY FLOOR
NIC	NOT IN CONTRACT	SCHED	SCHEDULE	VWC	VINYL WALLCOVERING
NO. or #	NUMBER	SD	SOAP DISPENSER		
NOM.	NOMINAL	SECT	SECTION		
NS	NON SLIP	SG	SEMI GLOSS	W	WEST
NTS	NOT TO SCALE	SH	SHELF	W/	WITH
		SHR	SHOWER	W.C.	WATER CLOSET
OA	OVER ALL	SHT	SHEET	WD	WOOD
OBS	OBSCURE	SIL	SILICONE	W/O	WITHOUT
O.C.	ON CENTRE	SIM	SIMILAR	WHBD.	WHITEBOARD
OFB	OUTSIDE FACE OF BLOCK	SL.BLK.	SLAG BLOCK	WP	WATERPROOF
OD	OUTSIDE DIAMETER	SP	SPRAYED	WR	WASHROOM
OHD	OVERHEAD DOOR	SPAN	SPANDREL PANEL	WSCT	WAINSCOT
OPNG	OPENING	SPEC.	SPECIFICATION	WT	WEIGHT
OPP	OPPOSITE	SPF	SPORTS FLOORING	WWM	WELDED WIRE MESH
OWSJ	OPEN WEB STEEL JOIST	SPG	SPANDREL GLASS		
		SP.BK.	SPLASHBACK		
P	PLASTIC	SQ	SQUARE		
PARG	PARGING	SS	STAINLESS STEEL		
PART	PARTITION	SSCG	STAINLESS STEEL CORNER GUARD		
PB	PARTICLE BOARD	SSKP	STAINLESS STEEL KICKPLATE		
PC	PRECAST	S.SUR.	SOLID SURFACE		
PERF	PERFORATED	ST	STOVE		
PG	PLATE GLASS	STA	STATION		
PL	PLATE	STD	STANDARD		
P.LAM	PLASTIC LAMINATE	STN	STAIN		
PLAS.	PLASTER	STL	STEEL		
PLY	PLYWOOD	STG	STORAGE		
PNEU	PNEUMATIC	STRUCT	STRUCTURAL		
POL	POLISHED	STY	STYLE		
POR	PORCELAIN TILE	SUP	SUPPORT		
PP	POWER PANEL	SUSP	SUSPENDED		
PPG	POLISHED PLATE GLASS	SVF	SHEET VINYL FLOORING		
PR	PAIR	SYM	SYMMETRICAL		
PREFIN	PREFINISHED				
PT	PAINT	T	TREADS		
PTD	PAPER TOWEL DISPENSER	TB	TOWEL BAR		
QT	QUARRY TILE	TBL	TABLE		
		TC	TOP OF CURB		
R	RISER	TEC	TECTUM		
RAD	RADIUS	TEL	TELEPHONE		
RD	ROOF DRAIN	TER	TERRAZZO		
REF	REFERENCE	T&G	TONGUE & GROOVE		
REFR	REFRIGERATOR	THK	THICK		
REINF	REINFORCED	THRES	THRESHOLD		
RESIL.	RESILIENT	TKBD	TACKBOARD		
REQ.	REQUIRED	T/O	TOP OF		
RFG	ROOFING	TPG	TEMPERED PLATE GLASS		
RGTR	REGISTER	TR	TRIM		
RH	ROOF HOPPER	TRAN	TRANSITION		
RM	ROOM	TTD	TOILET TISSUE DISPENSER		
RO	ROUGH OPENING	TV	TELEVISION		
RTT	RESILIENT TERRAZZO TILE	TW	TOP OF WALL		
RUB	RUBBER	TYP.	TYPICAL		
RWL	RAIN WATER LEADER				
		UNF	UNFINISHED		
		UNGL	UNGLAZED		
		UNIV.	UNIVERSAL		
		U.O.N.	UNLESS OTHERWISE NOTED		
		UR	URINAL		
		U/S	UNDERSIDE		

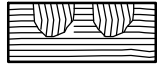
 KINGSLAND + ARCHITECTS INC 219 Dufferin Street, Suite 308b Toronto, Ontario M6K 3J1 ph 416.203.7799 fax 416.203.7763	ISSUED:	DRAWING NAME:	DATE:	SCALE:	
		PROJECT NAME:	DRAWN:	PROJECT NO:	
		Forest Heights C.I.	K+	DWG NO:	REV.
			K+	1-102	0



EARTH



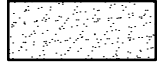
CRUSHED STONE



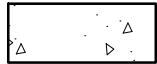
ROCK



CINDER OR  
SLAG FILL



SAND, PLASTER  
& CEMENT



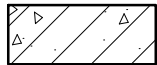
CAST-IN-PLACE  
CONCRETE



PRECAST CONCRETE



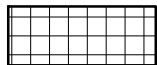
LIGHT WEIGHT CONCRETE



CONCRETE BLOCK



SLAG BLOCK



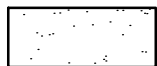
GLAZED SLAG BLOCK



FACE BRICK



FIRE BRICK



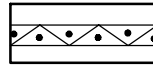
FACING STONE



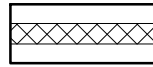
SPRAY FOAM INSULATION



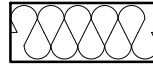
METAL, STEEL



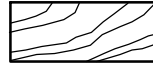
TERRAZZO



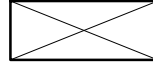
QUARRY TILE



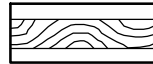
BATT INSULATION



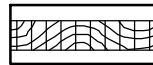
FINISHED WOOD



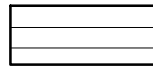
WOOD BLOCKING



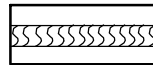
WOOD STUD  
PARTITION



INSULATION WOOD  
STUD PARTITION



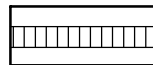
METAL STUD  
PARTITION



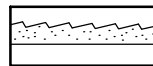
INSULATION METAL  
STUD PARTITION



PLYWOOD/M.D.F./PARTICLE BOARD



ACOUSTIC TILE



METAL LATH  
& PLASTER



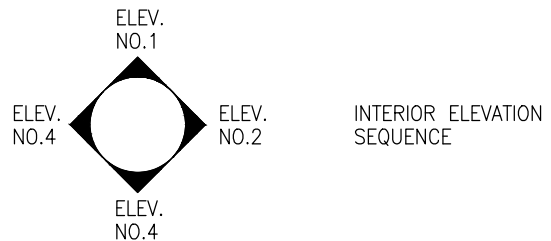
GYPSON BOARD



TECTUM



RIGID INSULATION



**Kingsland** + ARCHITECTS INC.

KINGSLAND + ARCHITECTS INC  
219 Dufferin Street, Suite 308b  
Toronto, Ontario M6K 3J1  
ph 416.203.7799  
fax 416.203.7763

ISSUED:

DRAWING NAME:  
**STANDARD SYMBOLS**

PROJECT NAME:  
Forest Heights C.I.

DATE:  
April 2021

DRAWN:  
K+

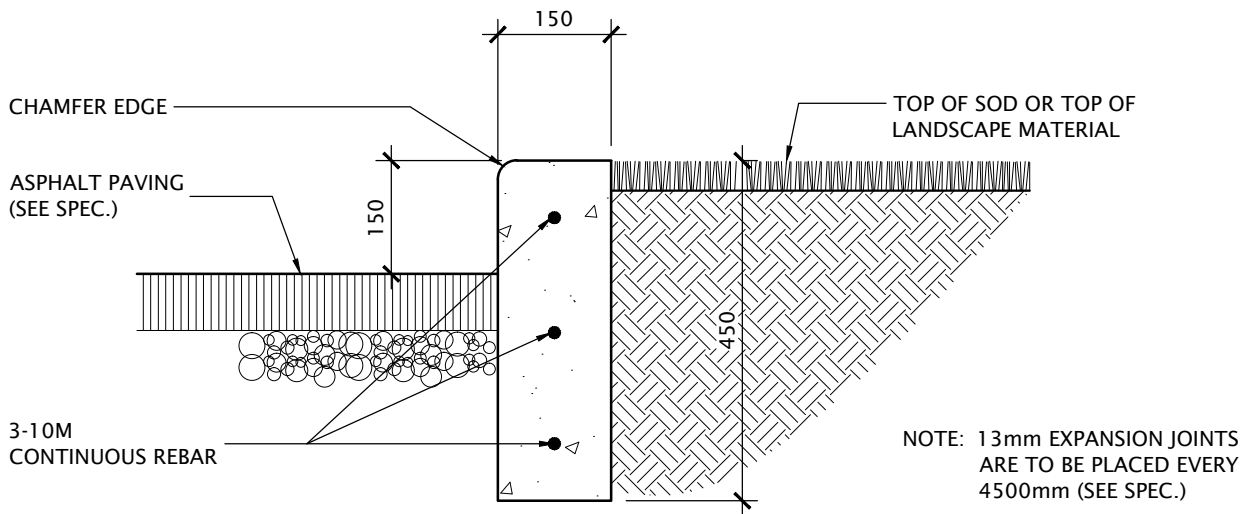
CHECKED:  
K+

SCALE:  
N.T.S.

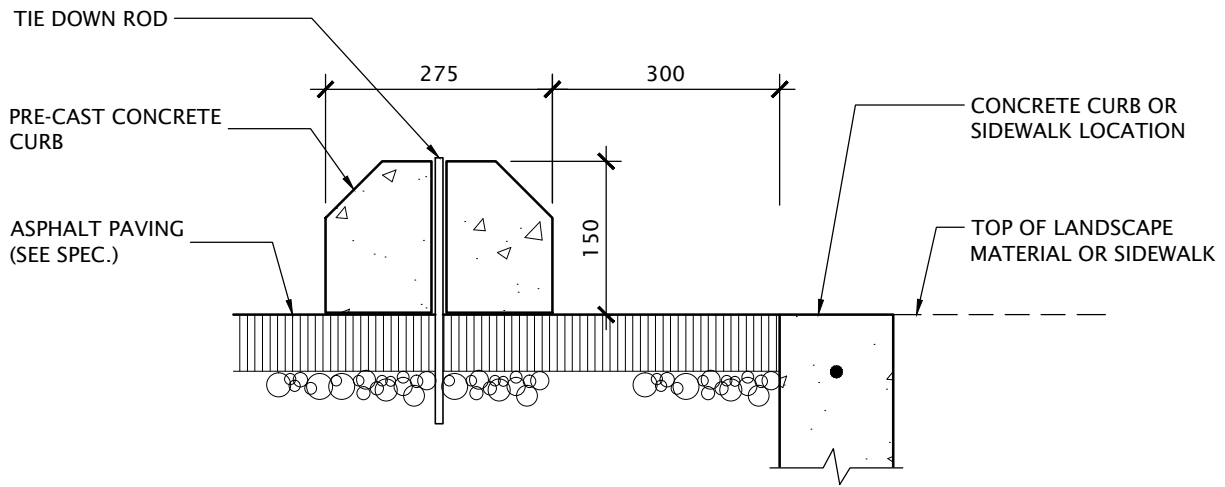
PROJECT NO:  
A20017

DWG NO:  
1-103


REV.  
0

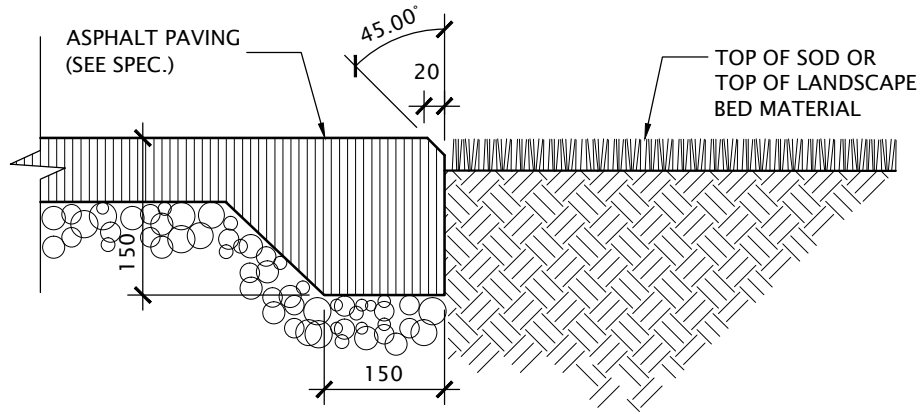


1 CONCRETE CURB DETAIL



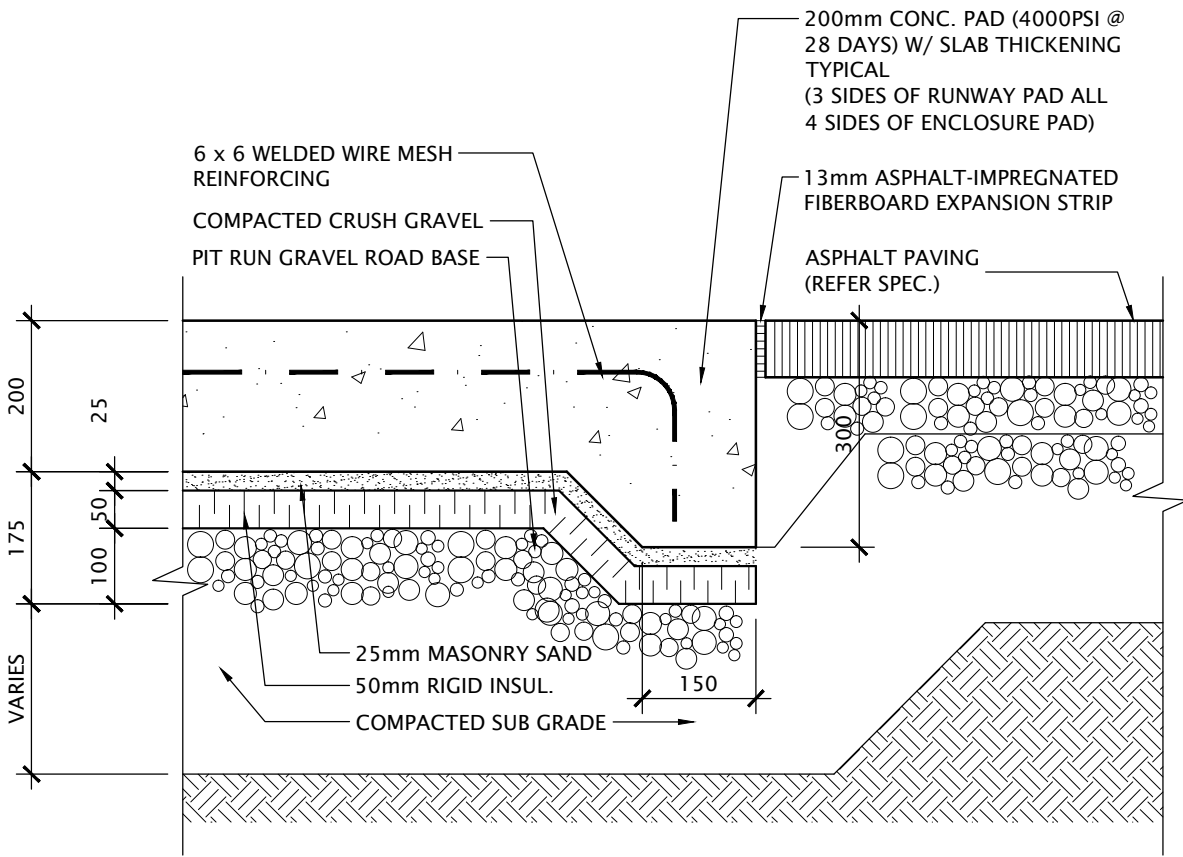
2 PRE-CAST CONCRETE PARKING CURB DETAIL

 <p>KINGSLAND + ARCHITECTS INC 219 Dufferin Street, Suite 308b Toronto, Ontario M6K 3J1 ph 416.203.7799 fax 416.203.7763</p>	ISSUED:	DRAWING NAME:	DATE:	SCALE:
		<p><b>PAVING AND CURB DETAILS</b></p>	April 2021	1:10
<p>PROJECT NAME:</p> <p>Forest Heights C.I.</p>		DRAWN:	PROJECT NO:	
		K+	A20017	
		CHECKED:	DWG NO:	REV.
		K+	2-100	0



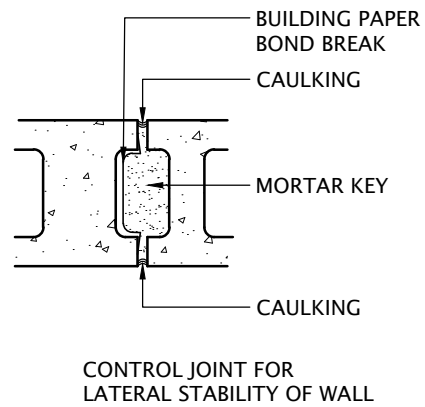
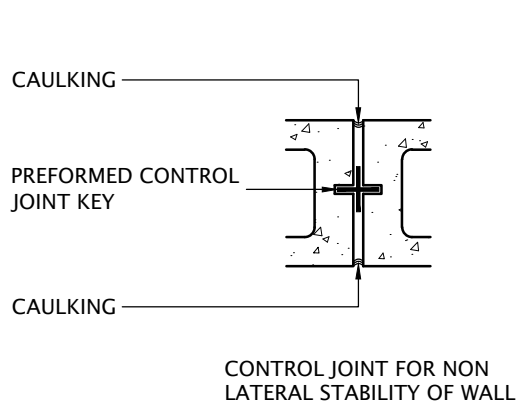
1

ASPHALT PAVING AT SOD DETAIL

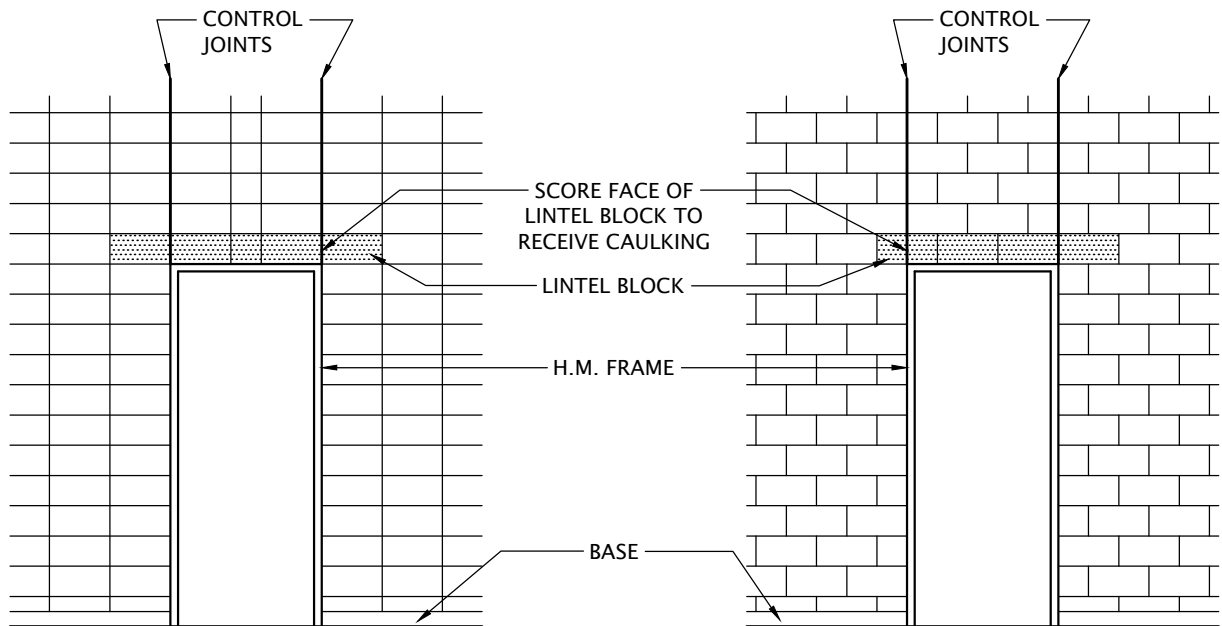


2

CONCRETE PAD AND ASPHALT PAVING DETAIL



**SECTIONS**



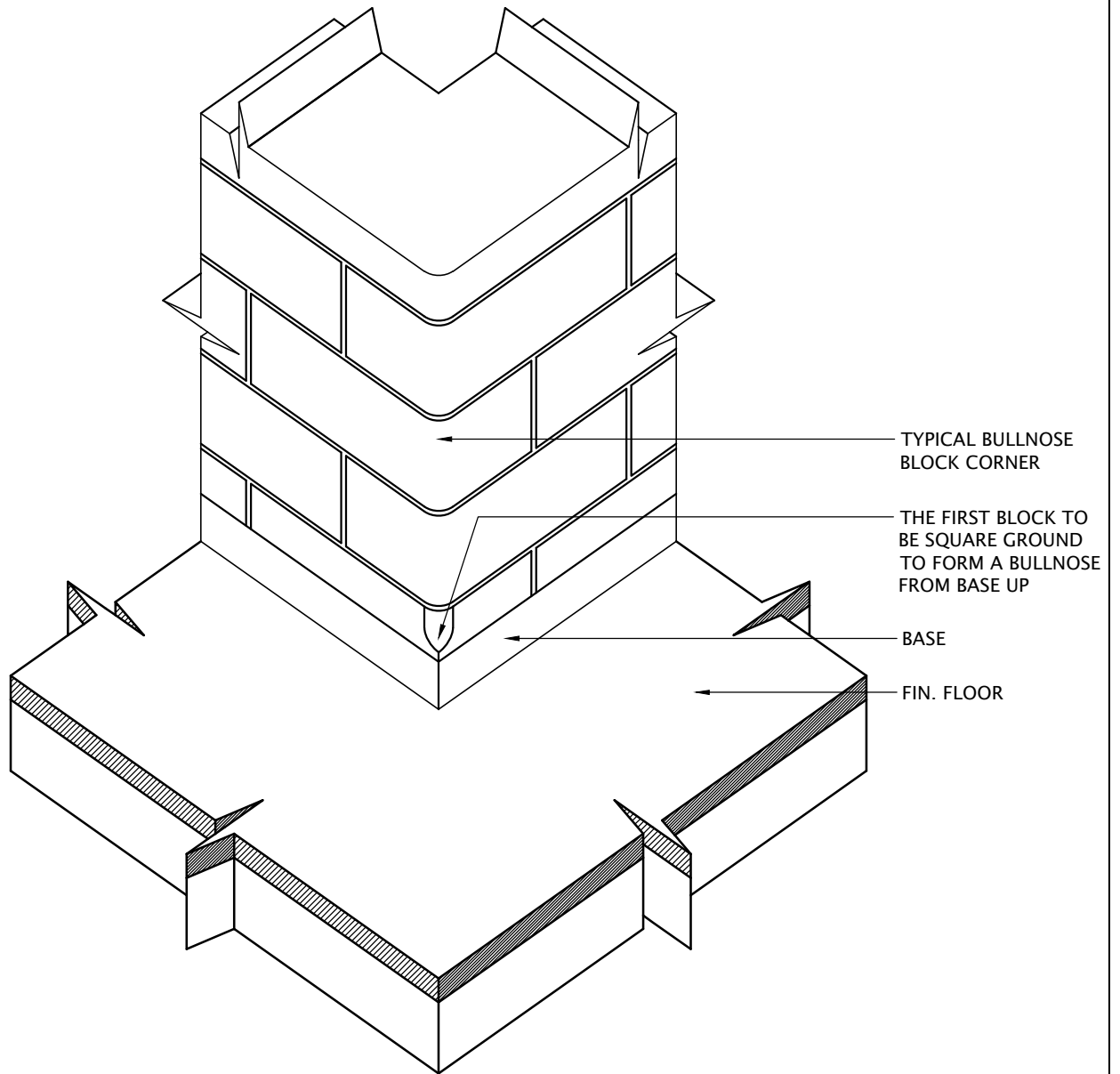
**STACK BOND ELEVATION**

**RUNNING BOND ELEVATION**

NOTE: EXTEND CONTROL JOINT TO U/S OF STRUCTURE ABOVE

<p>KINGSLAND + ARCHITECTS INC 219 Dufferin Street, Suite 308b Toronto, Ontario M6K 3J1 ph 416.203.7799 fax 416.203.7763</p>	ISSUED:	DRAWING NAME:	DATE:	SCALE:	
		<b>CONTROL JOINT AT INTERIOR DOOR</b>	April 2021	N.T.S.	
		PROJECT NAME:	DRAWN:	PROJECT NO:	
		Forest Heights C.I.	K+	A20017	
			CHECKED:	DWG NO:	REV.
			K+	4-101	0





KINGSLAND + ARCHITECTS INC  
 219 Dufferin Street, Suite 308b  
 Toronto, Ontario M6K 3J1  
 ph 416.203.7799  
 fax 416.203.7763

ISSUED:

DRAWING NAME:  
**TYP. BULLNOSE BLOCK  
 CORNER DETAIL**

PROJECT NAME:  
 Forest Heights C.I.

DATE:  
 April 2021

DRAWN:  
 K+

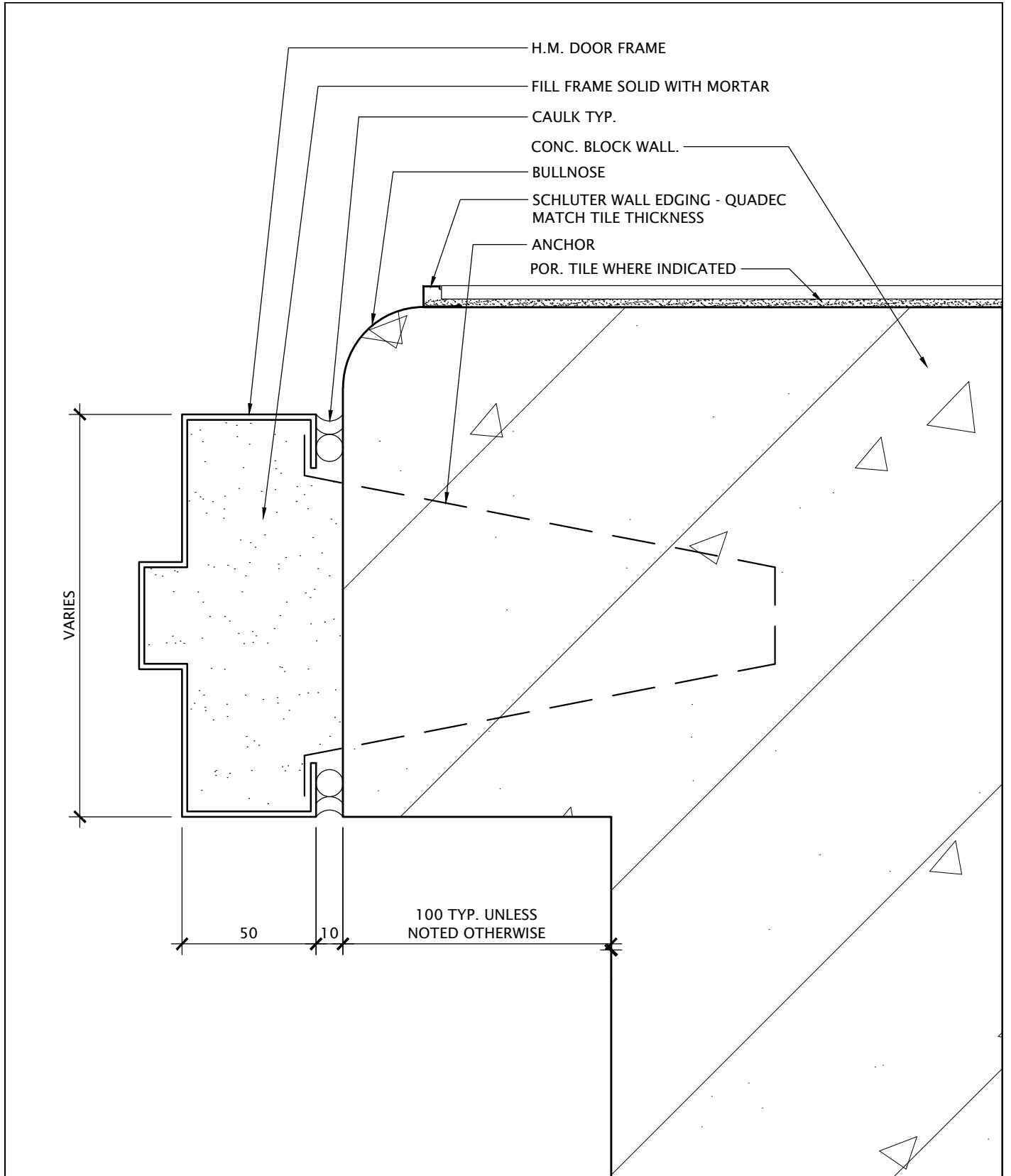
CHECKED:  
 K+


SCALE:  
 1:5

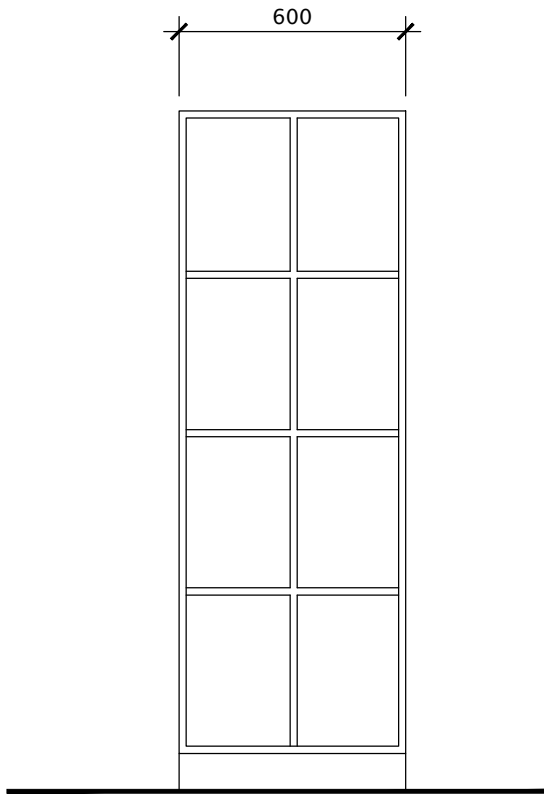
PROJECT NO:  
 A20017

DWG NO:  
 4-103

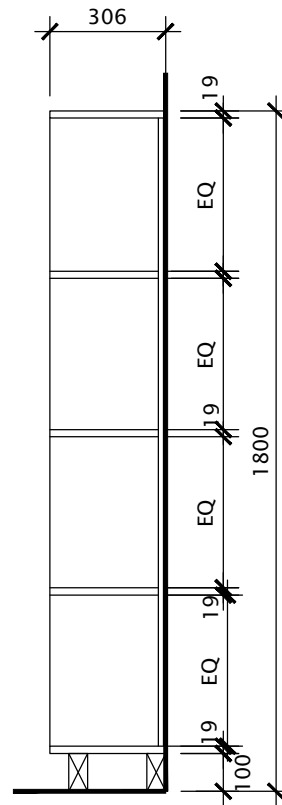
REV.  
 0




 KINGSLAND + ARCHITECTS INC 219 Dufferin Street, Suite 308b Toronto, Ontario M6K 3J1 ph 416.203.7799 fax 416.203.7763	ISSUED:	DRAWING NAME:	DATE:	SCALE:	
		<b>TYP. DOOR JAMB AT BLOCK WALL</b>	April 2021	1:2	
		PROJECT NAME:	DRAWN:	PROJECT NO:	
		Forest Heights C.I.	K+	A20017	
			CHECKED:	DWG NO:	REV.
				4-107	0

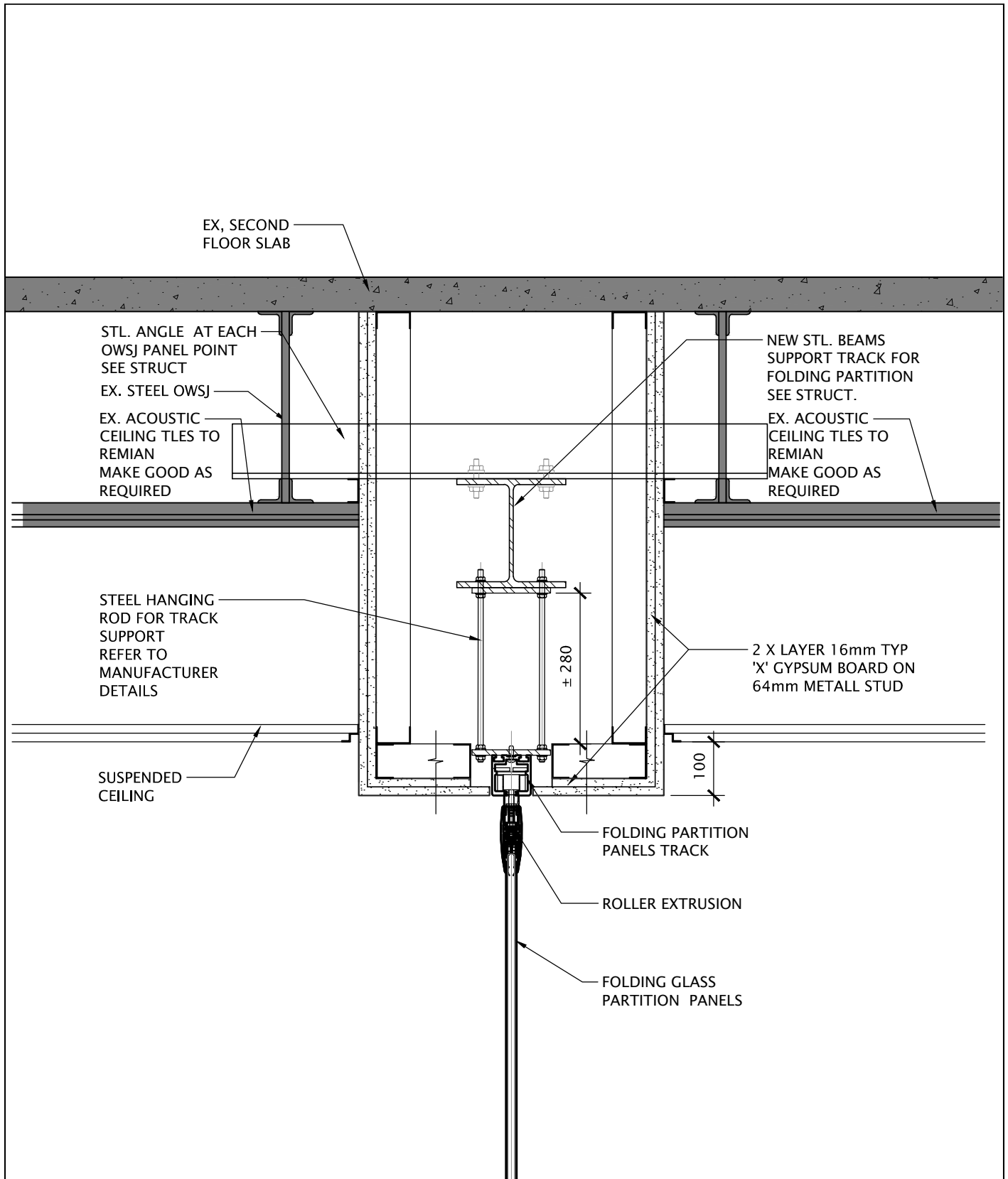



ELEVATION

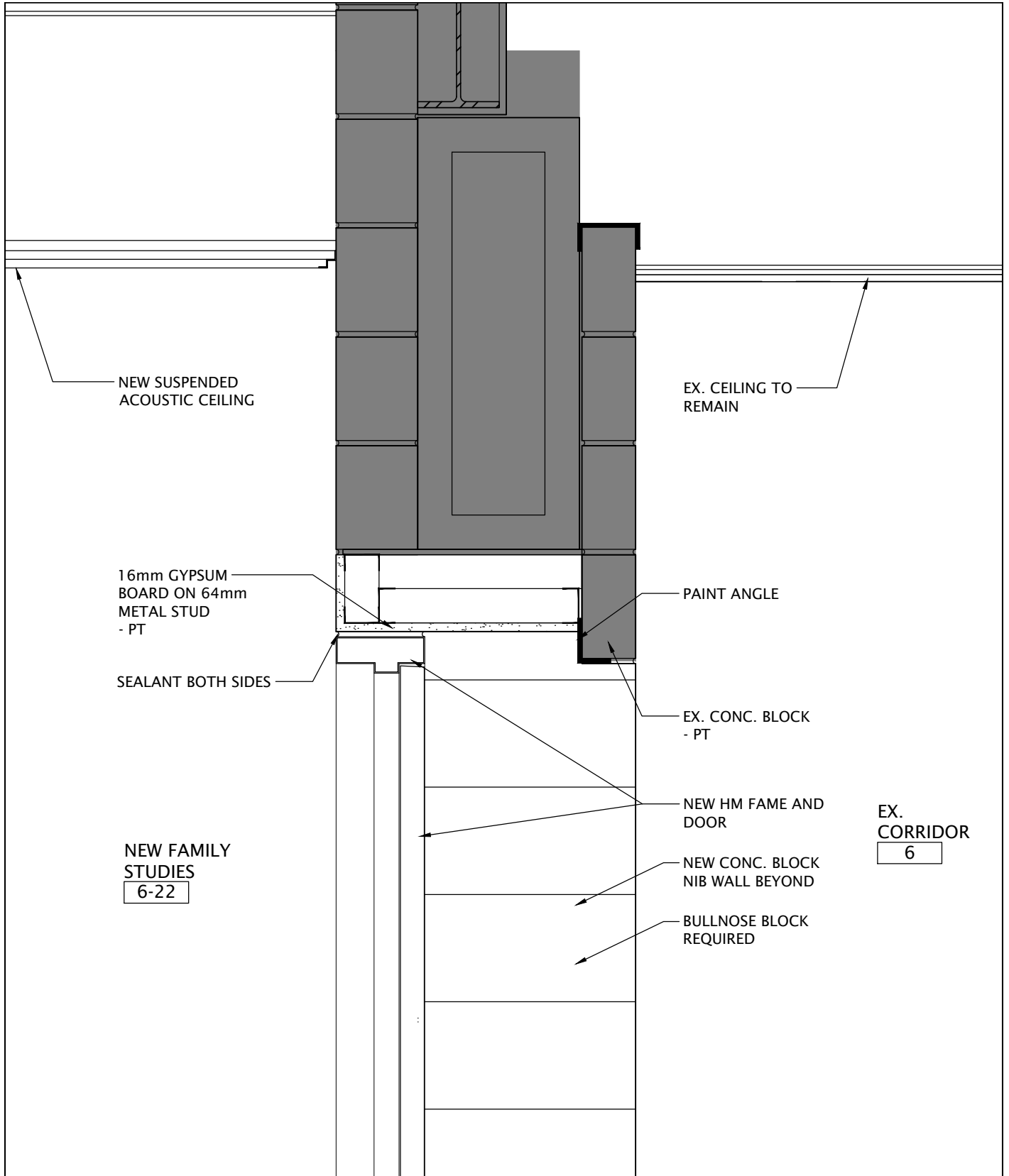



SECTION

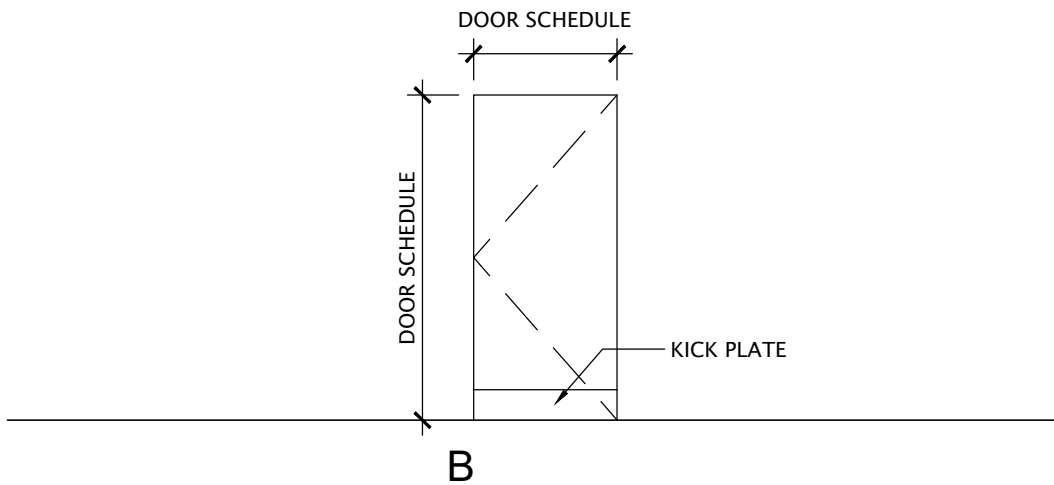
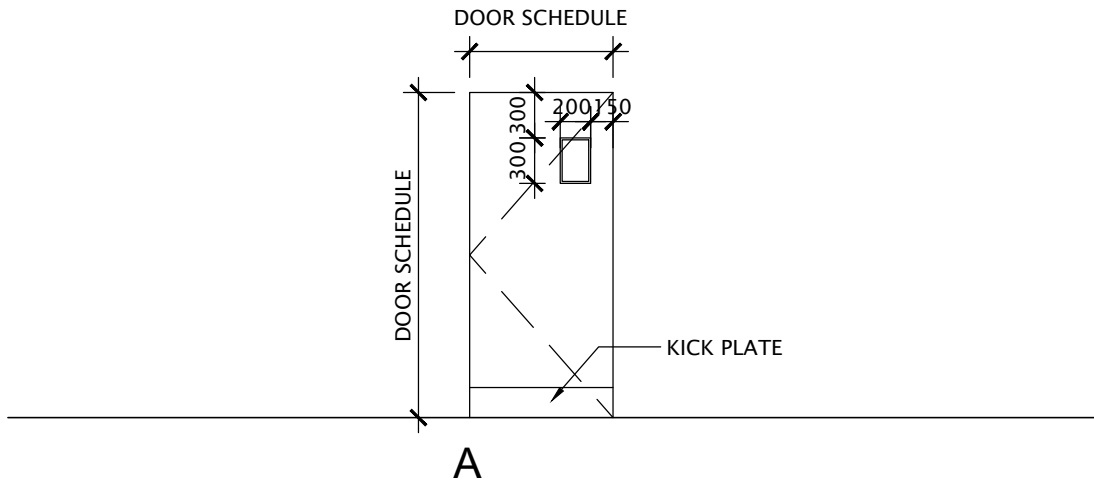
 KINGSLAND + ARCHITECTS INC 219 Dufferin Street, Suite 308b Toronto, Ontario M6K 3J1 ph 416.203.7799 fax 416.203.7763	ISSUED:	DRAWING NAME: <b>CABINET TYPES</b>	DATE: April 2021	SCALE: 1:20	
		PROJECT NAME: Forest Heights C.I.	DRAWN: K+	PROJECT NO: A20017	
			CHECKED: K+	DWG NO: 6-301	REV. 0




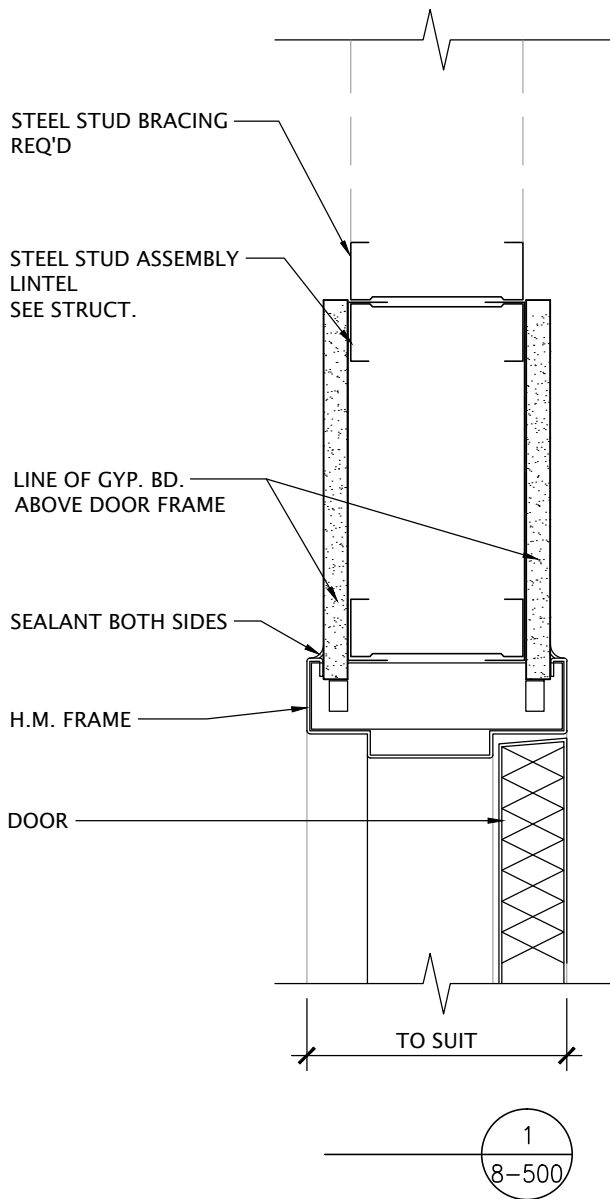
 KINGSLAND + ARCHITECTS INC 219 Dufferin Street, Suite 308b Toronto, Ontario M6K 3J1 ph 416.203.7799 fax 416.203.7763	ISSUED:	DRAWING NAME:	DATE:	SCALE:	
		<b>SECTION AT FOLDING GLASS PARTITION</b>	April 2021	1:5	
		PROJECT NAME:	DRAWN:	PROJECT NO:	
		Forest Heights C.I.	K+	A20017	
			CHECKED:	DWG NO:	REV.
			K+	7-101	



 <p>KINGSLAND + ARCHITECTS INC 219 Dufferin Street, Suite 308b Toronto, Ontario M6K 3J1 ph 416.203.7799 fax 416.203.7763</p>	ISSUED:	DRAWING NAME:	DATE:	SCALE:
		SECTION DETAIL AT NEW DOOR	April 2021	1:5
PROJECT NAME: Forest Heights C.I.		DRAWN:	CHECKED:	PROJECT NO:
		K+	K+	A20017
			DWG NO:	REV.
			7-102	



 KINGSLAND + ARCHITECTS INC 219 Dufferin Street, Suite 308b Toronto, Ontario M6K 3J1 ph 416.203.7799 fax 416.203.7763	ISSUED:	DRAWING NAME: <b>DOOR TYPES</b>	DATE: April 2021	SCALE: 1:50	
		PROJECT NAME: Forest Heights C.I.	DRAWN: K+	PROJECT NO: A20017	
			CHECKED:	DWG NO: 8-400	REV. 0



**Kingsland +**  
ARCHITECTS INC.

KINGSLAND + ARCHITECTS INC  
219 Dufferin Street, Suite 308b  
Toronto, Ontario M6K 3J1  
ph 416.203.7799  
fax 416.203.7763

ISSUED:

DRAWING NAME:  
**HOLLOW METAL  
FRAME DETAILS**

PROJECT NAME:  
Forest Heights C.I.

DATE:  
April 2021

DRAWN:  
K+

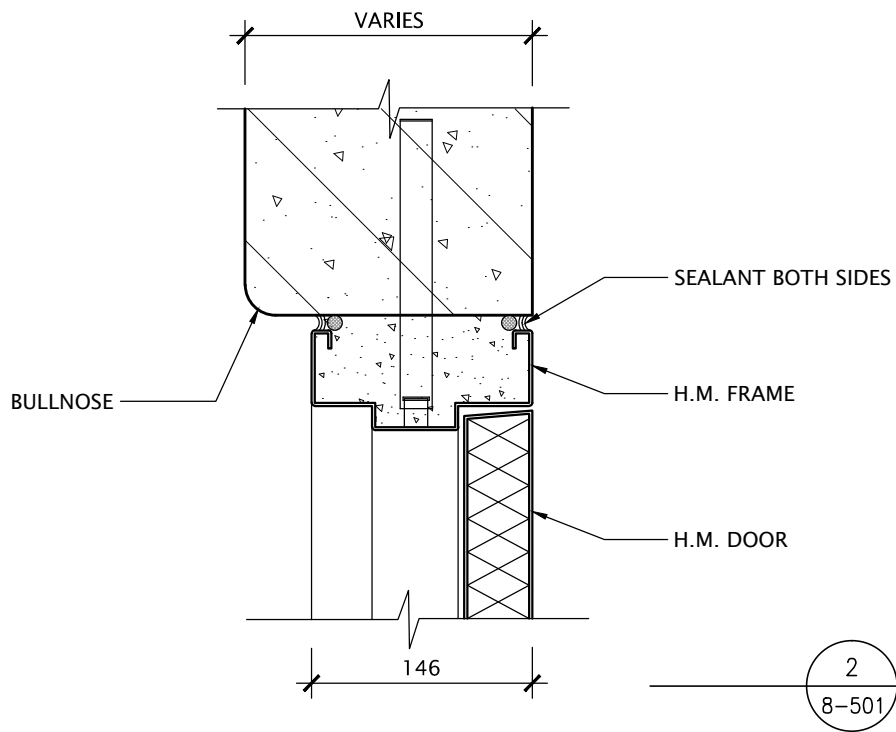
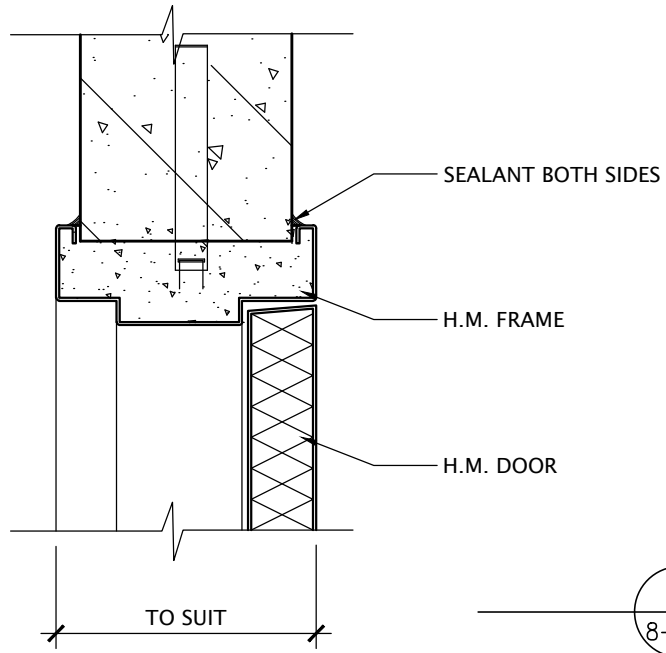
CHECKED:

SCALE:  
1:5

PROJECT NO:  
A20017

DWG NO:  
8-500

REV.



**Kingsland +**  
ARCHITECTS INC.

KINGSLAND + ARCHITECTS INC  
219 Dufferin Street, Suite 308b  
Toronto, Ontario M6K 3J1  
ph 416.203.7799  
fax 416.203.7763

ISSUED:

DRAWING NAME:  
**HOLLOW METAL  
FRAME DETAILS**

PROJECT NAME:  
Forest Heights C.I.

DATE:  
April 2021

DRAWN:  
K+

CHECKED:

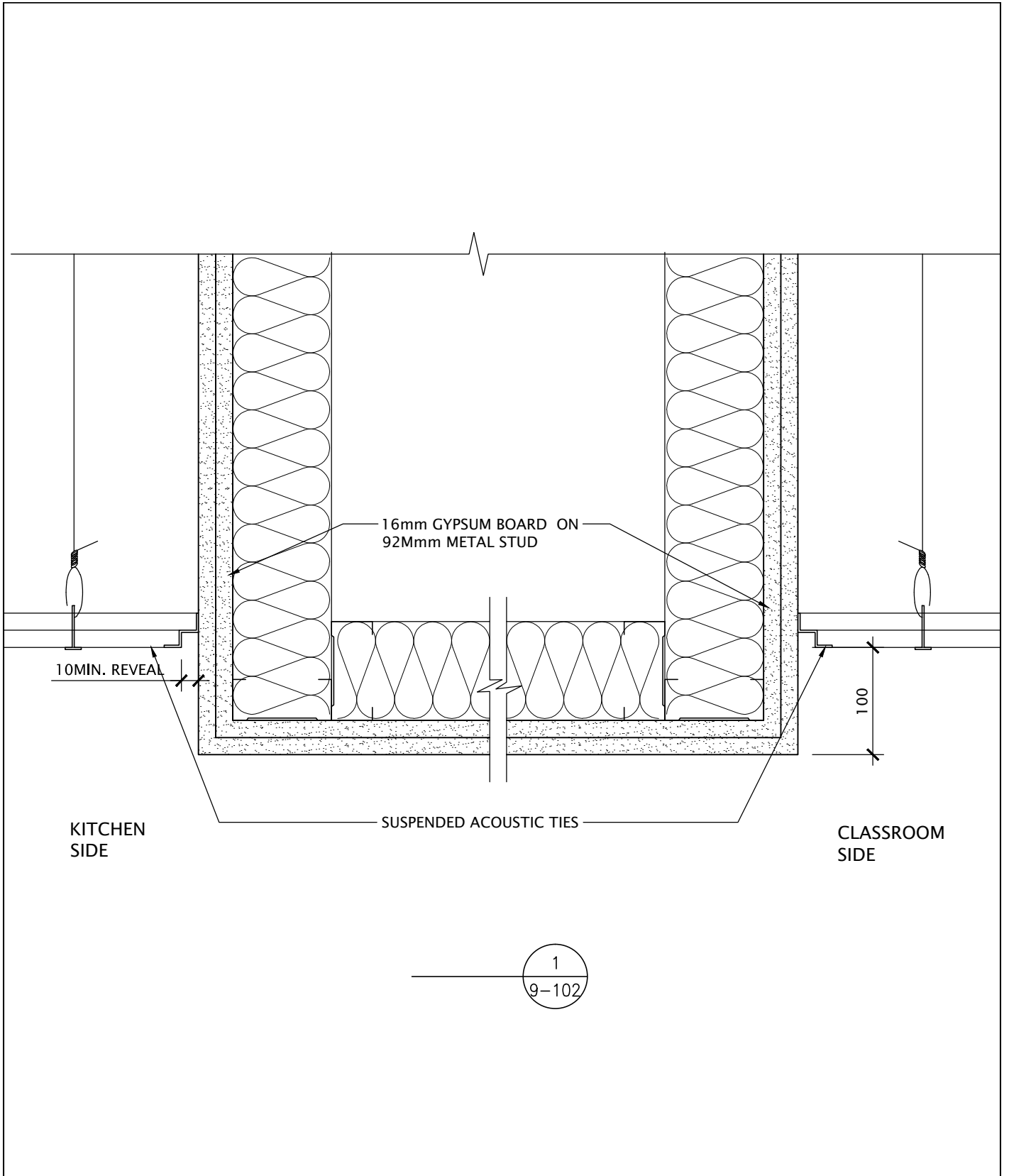
SCALE:  
1:5


PROJECT NO:  
A20017

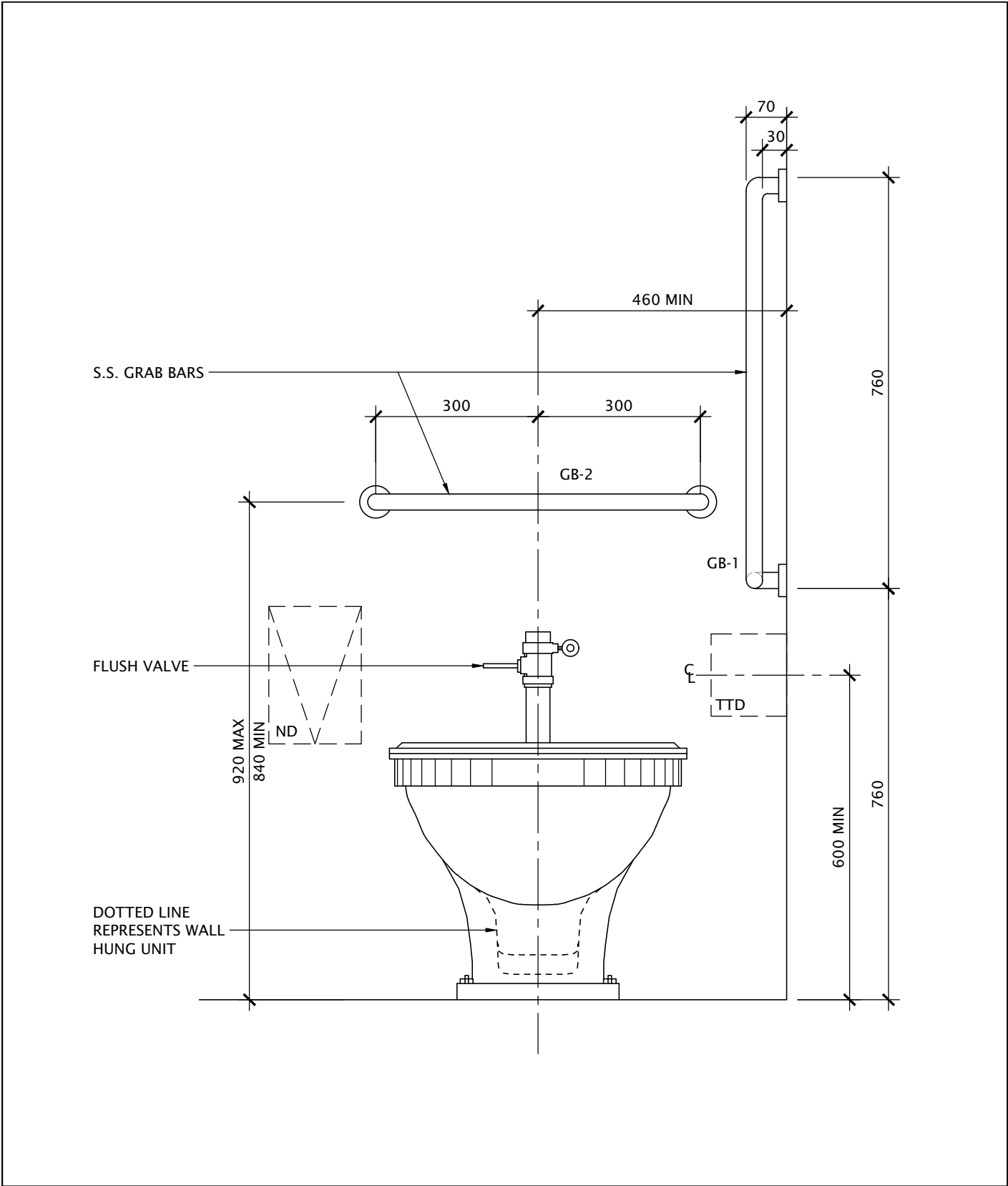
DWG NO:  
8-501


REV.

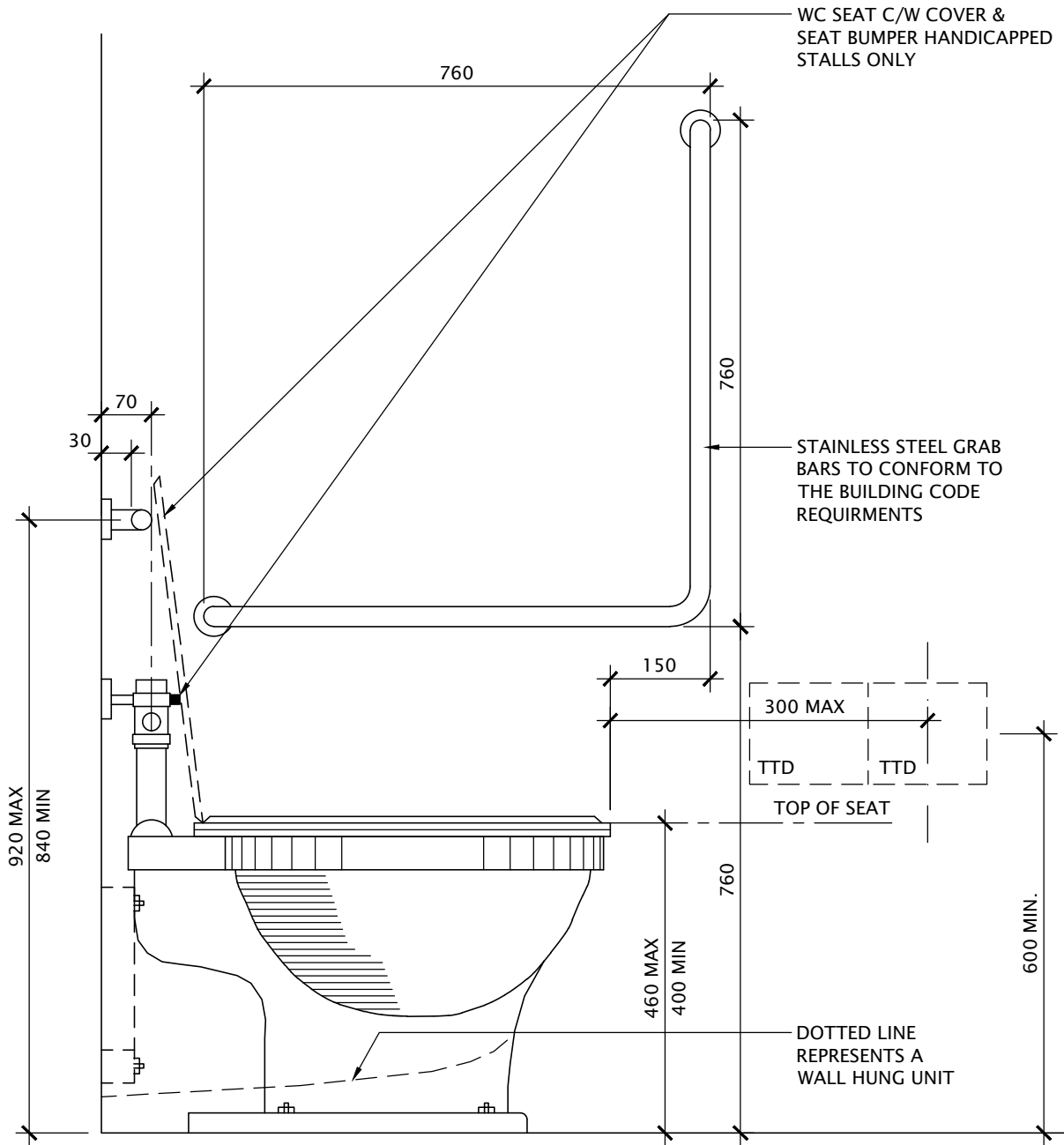




 KINGSLAND + ARCHITECTS INC 219 Dufferin Street, Suite 308b Toronto, Ontario M6K 3J1 ph 416.203.7799 fax 416.203.7763	ISSUED:	DRAWING NAME:	DATE:	SCALE:	
		<b>BULKHEAD DETAIL AT GLASS PARTITION</b>	April 2021	1:5	
		PROJECT NAME:	DRAWN:	PROJECT NO:	
		Forest Heights C.I.	K+	A20017	
			CHECKED:	DWG NO:	REV.
				9-102	

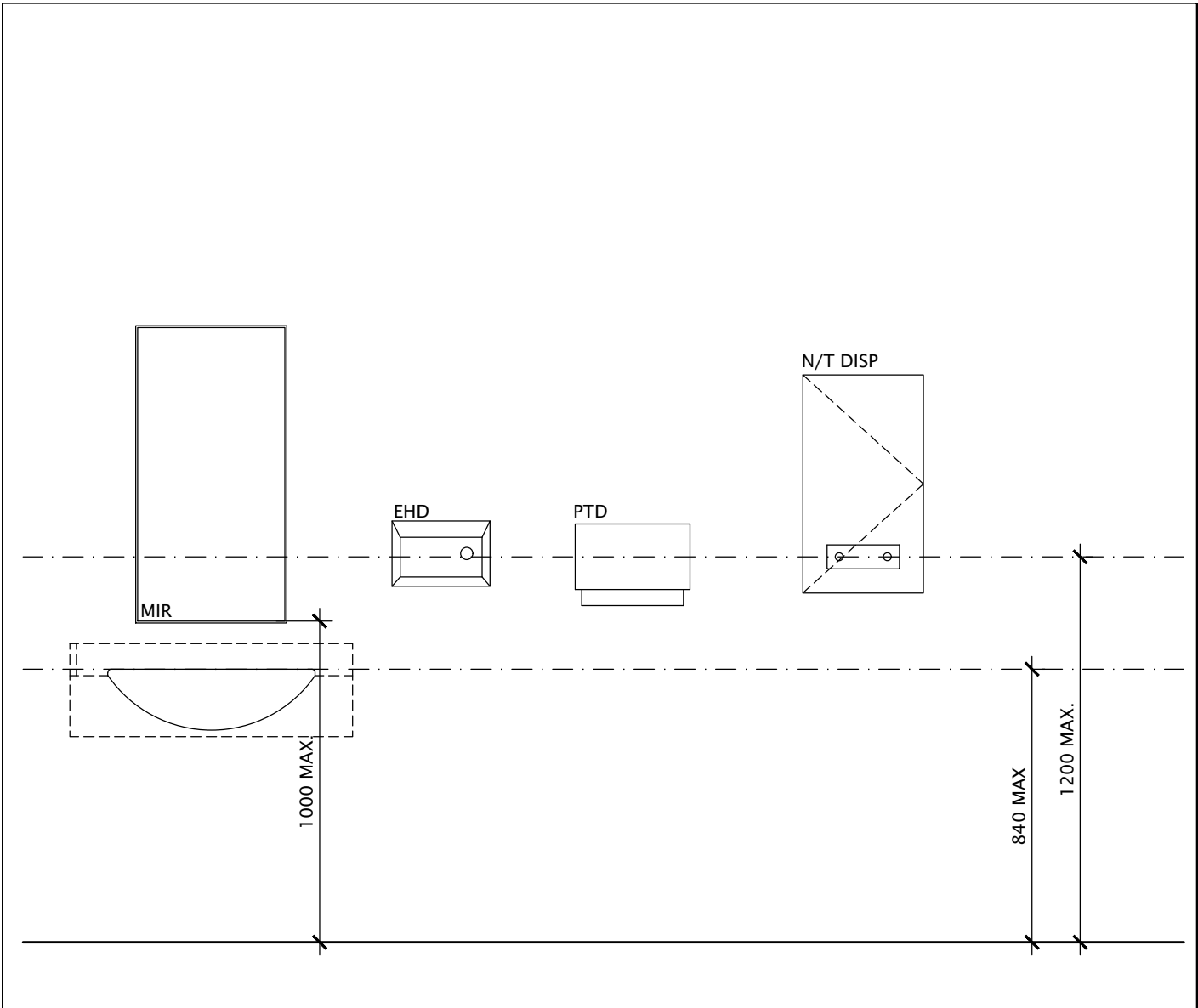


 <p>KINGSLAND + ARCHITECTS INC 219 Dufferin Street, Suite 308b Toronto, Ontario M6K 3J1 ph 416.203.7799 fax 416.203.7763</p>	ISSUED:	DRAWING NAME:	DATE:	SCALE:		
		<p><b>BARRIER-FREE WASHROOM FRONT ELEVATION</b></p>	April 2021	1:10		
<p>PROJECT NAME:</p> <p>Forest Heights C.I.</p>		DRAWN:	CHECKED:	PROJECT NO:	DWG NO:	REV.
		K+	K+	A20017	10-100	0



**NOTE:**  
 INSTALLATION OF GRAB BARS, WASHROOM ACCESSORIES & W.C. TO CONFORM TO BUILDING CODE REQUIREMENTS (FOR ONTARIO - O.B.C. SECTION 3.8 BARRIER FREE DESIGN. SEE FLOOR PLANS FOR LOCATION OF WASHROOM ACCESSORIES.

 KINGSLAND + ARCHITECTS INC 219 Dufferin Street, Suite 308b Toronto, Ontario M6K 3J1 ph 416.203.7799 fax 416.203.7763	ISSUED:	DRAWING NAME:	DATE:	SCALE:	
		<b>BARRIER-FREE WASHROOM SIDE ELEVATION</b>	April 2021	1:10	
		PROJECT NAME:	DRAWN:	PROJECT NO:	
		Forest Heights C.I.	K+	A20017	
			CHECKED:	DWG NO:	REV.
			K+	10-101	0



**NOTES:**  
 INSTALLATION OF WASHROOM ACCESSORIES TO CONFORM TO THE BUILDING CODE REQUIREMENTS FOR BARRIER FREE DESIGN.  
 A COAT HOOK MUST BE MOUNTED WITHIN THE STALL ON THE SIDE WALL NOT MORE THAN 1200 MM ABOVE THE FLOOR AND EXTENDING NOT MORE THAN 50 MM OUT FROM WALL.  
 IN UNIVERSAL TOILET ROOMS PROVIDE A SHELF LOCATED NOT MORE THAN 1200 MM ABOVE THE FLOOR.  
 SEE FLOOR PLANS FOR LOCATION OF WASHROOM ACCESSORIES.  
 REFER TO MANUFACTURES SPECIFICATIONS FOR MOUNTING DETAILS OF SPECIFIED ACCESSORIES.

 KINGSLAND + ARCHITECTS INC 219 Dufferin Street, Suite 308b Toronto, Ontario M6K 3J1 ph 416.203.7799 fax 416.203.7763	ISSUED:	DRAWING NAME:	DATE:	SCALE:	
		<b>BARRIER-FREE ACCESSORY INSTALLATION</b>	April 2021	1:20	
		PROJECT NAME:	DRAWN:	PROJECT NO:	
		Forest Heights C.I.	K+	A20017	
			CHECKED:	DWG NO:	REV.
			K+	10-102	0

THE CONTRACTOR SHALL VERIFY ALL DIMS. AGAINST THE ARCHITECTURAL WOODWORK DIMS. AND MUST REPORT ANY INCONSISTENCIES TO THE WRDGS BEFORE PROCEEDING WITH WORK.

ALL DWGS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDGS. AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWGS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDGS WRITTEN PERMISSION.

**GENERAL NOTES:**

ON ALL DWGS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW003 FOR ADDITIONAL DETAILS.



**ARCHITECTURAL WOODWORK STANDARDS**  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD

**LEGEND**

Status	-
Folder	-
File	-
Drawn By	-
Check By	-
Scale	N.T.S.
Date	May 2021
Last Plot	-
Job No.	-
Sheet No.	-

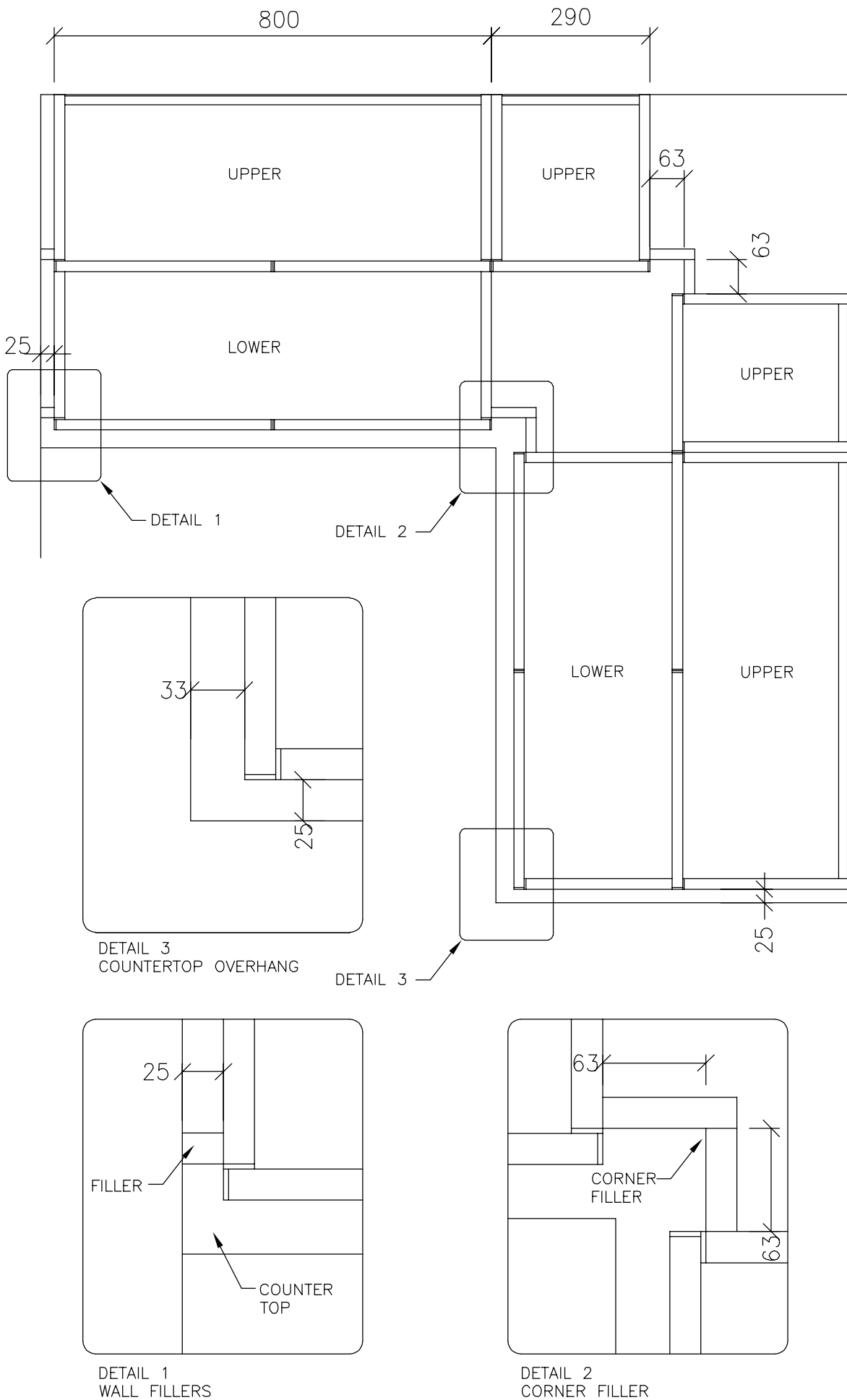
**AW001**

**ELEVATIONS / SECTIONS**

**MATERIAL LEGEND:**

**MATERIALS LEGEND**

- ① DISPLAY CASE
- ② 100 HIGH RUBBER BASE TOE KICK ON 19 VENEER CORE PLYWOOD
- ③ 19mm MELAMINE PANEL OPEN STORAGE c/w 5 ADJUSTABLE SHELVES
- ④ 19mm MELAMINE PANEL DRAWER FRONT c/w 3mm PVC EDGES. REFER TO SPEC FOR DRAWER SLIDERS AND DRAWER CONSTRUCTION (METABOX)
- ⑤ 19mm MELAMINE GABLE PANEL c/w 3mm PVC ON ALL EXPOSED EDGES AND PIN HOLES FOR 19mm ADJUSTABLE SHELVES AS SHOWN
- ⑥ 19mm MELAMINE PANEL BANK OF 4 DRAWERS
- ⑦ POST-FORMED PLASTIC LAMINATE COUNTERTOP c/w 76 HIGH BACKSPLASH ON STOKK STAINLESS STEEL COUNTER TOP, SEE SPEC.
- ⑧ GYPSUM BOARD BULKHEAD
- ⑨ 19mm MELAMINE PANEL UPPER CABINETS c/w FINISHED END GABLES WHERE REQUIRED AND ADJUSTABLE SHELVES AS SHOWN
- ⑩ 80 HIGH MELAMINE PANEL VALANCE x 19mm
- ⑪ STAINLESS STEEL SINGLE SINK
- ⑫ PLASTIC LAMINATE SEPARATE BACKSPLASH ON 19mm PLYWOOD
- ⑬ 19mm MELAMINE COUNTERTOP c/w 3mm PVC ON ALL EXPOSED EDGES AND BETWEEN BUTT JOINT EDGES STAINLESS STEEL COUNTER TOP, SEE SPEC.
- ⑭ DISHWASHER
- ⑮ 19mm MELAMINE ADJUSTABLE SHELF WITH 3mm PVC EDGES
- ⑯ 16mm MELAMINE BACK c/w 3mm PVC EDGE WHERE EXPOSED
- ⑰ 19mm MELAMINE TOP, BOTTOM c/w 3mm PVC EDGE
- ⑱ ENAMELLED STEEL VANITY LAVATORY
- ⑲ LOCKABLE CASTERS REFER TO SPEC.
- ⑳ PLASTIC LAMINATE POST FORMED WORKSURFACE ON MELAMINE PANEL INTERMEDIATE GABLES
- ㉑ PLASTIC LAMINATE POST FORMED COUNTERTOP AND MELAMINE PANEL OPEN STORAGE c/w FINISHED GABLE END WHERE REQUIRED AND ADJUSTABLE SHELVES AS SHOWN
- ㉒ 19mm MELAMINE FIXED SHELF c/w 3mm PVC EDGE
- ㉓ 19mm MELAMINE DOOR c/w 3mm PVC EDGE ON ALL EXPOSED EDGES
- ㉔ 19mm MELAMINE PANEL c/w 3mm PVC EDGE ON ALL EXPOSED EDGES
- ㉕ 16mm MELAMINE PANEL c/w 3mm PVC EDGE ON ALL EXPOSED EDGES FRAME
- ㉖ 16mm FIXED MELAMINE PANEL/SHELF c/w 3mm PVC EDGE ON ALL EXPOSED EDGES
- ㉗ PLASTIC LAMINATE POST FORMED COUNTERTOP AND MELAMINE PANEL GABLES
- ㉘ PLASTIC LAMINATE ON 19mm PLYWOOD
- ㉙ 25mm MELAMINE WITH PVC EDGE AT FRONT FACE AND EACH FACE OF THE JOINTS IN THE COUNTER TOP
- ㉚ 38mm X 89mm SOLID HARDWOOD SUPPORT
- ㉛ SINGLE 19mm MELAMINE GABLE C/W 1/8" PVC EDGE
- ㉜ TRIPLE 19mm MELAMINE GABLE SUPPORT C/W 3mm PVC EDGE ON FRONT AND FLOOR EDGE AT APROX. 910mm O.C. MAX. WAFFER AND SCREW TOGETHER.
- ㉝ ADJUSTABLE FEET SEE SPEC.
- ㉞ 51mm X 102mm OR 19mm PLYWOOD CONTINUOUS BLOCKING ON WALL, PROVIDE WOOD BLOCKING AT ALL EDGE END WAL CONDITIONS.
- ㉟ 19mm HARDWOOD SCREW STRIP BETWEEN MELAMINE GABLES.
- ㊱ PLYWOOD PANEL FILLER 19mm
- ㊲ 19mm VENEER CORE PLYWOOD CONTINUOUS JOINTS TO BE AT GABLE LOCATIONS.

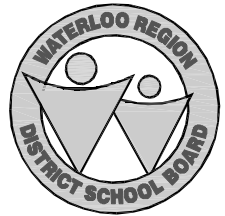


THE CONTRACTOR SHALL VERIFY ALL DIMS. AGAINST THE ARCHITECTURAL WOODWORK DIMS. AND MUST REPORT ANY DISCREPANCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DIMS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS, AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DIMS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS WRITTEN PERMISSION.

**GENERAL NOTE:**  
 ON ALL DIMS. AN REFERS TO ARCHITECTURAL WOODWORK.  
 FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.  
 REFER TO AW002 TO AW004 FOR ADDITIONAL DETAILS.



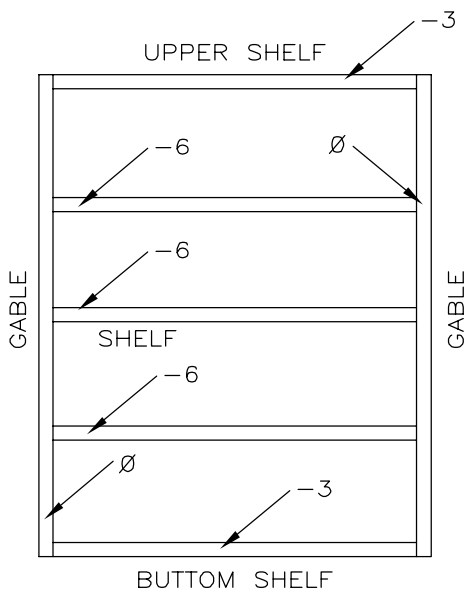
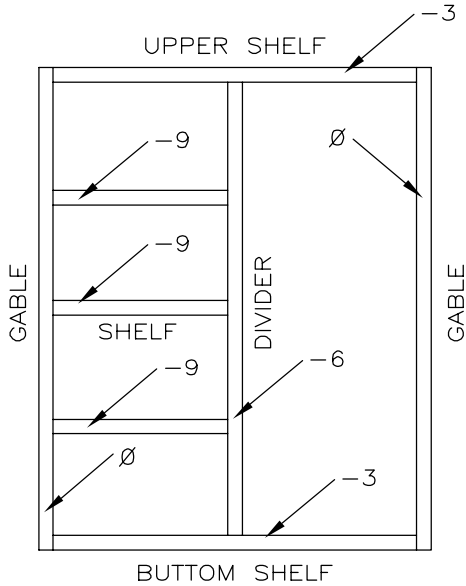
**ARCHITECTURAL WOODWORK STANDARDS  
 FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**FILLERS**

Status	
Folder	AW002\20017 - FOREST HEIGHTS CL. - FAMILY RT
File	AW002.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	February 2015
Last Plot	4/28/2021 12:58 PM
Job No.	
Sheet No.	

**AW002**

SAMPLE SETBACKS OF  
PANELS AND SHELVES  
(STEPPED TO MATCH PVC  
EDGING)



THE CONTRACTOR SHALL VERIFY ALL DWG. AGAINST THE ARCHITECTURAL WOODWORK DWG. AND MUST REPORT ANY DISCREPANCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DWG. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS, AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWG. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES:**

ON ALL DWG. AN REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO ANNOT AND THE SPECIFICATIONS.

REFER TO ANNOT TO ANNOT FOR ADDITIONAL DETAILS.

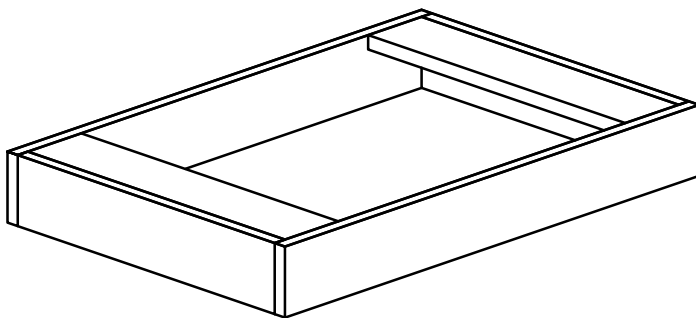
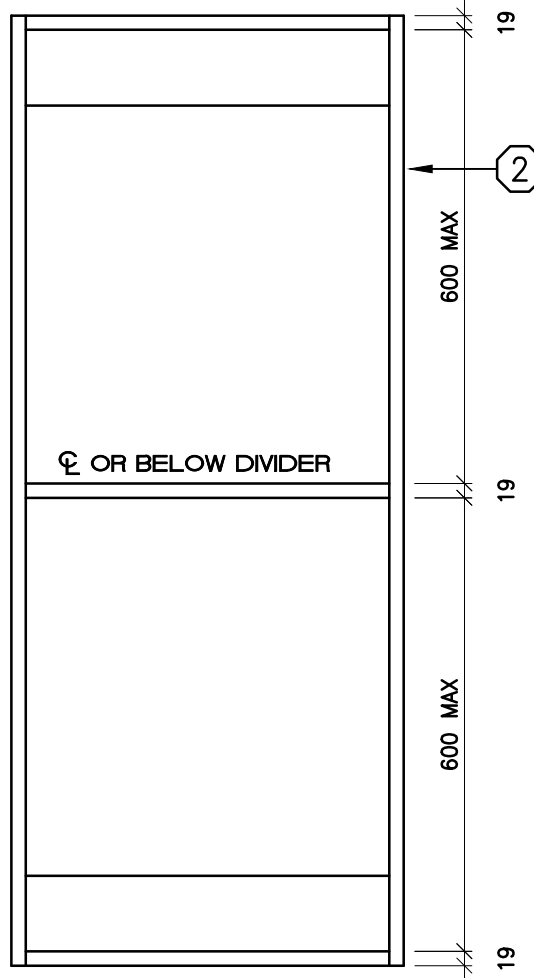
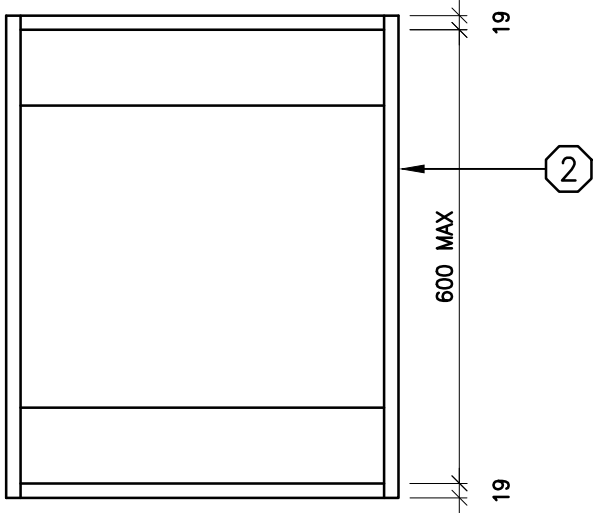


**ARCHITECTURAL WOODWORK STANDARDS  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**SAMPLE SETBACKS OF PANELS AND SHELVES**

Status	
Folder	AW003\20017 - FOREST HEIGHTS CL - FAMILY
File	AW003.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	February 2015
Last Plot	4/28/2021 1:00 PM
Job No.	
Sheet No.	

**AW003**



THE CONTRACTOR SHALL VERIFY ALL DWGS. AGAINST THE ARCHITECTURAL WOODWORK DWGS. AND MUST REPORT ANY INCONSISTENCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DWGS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS, AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWGS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES**

ON ALL DWGS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW003 FOR ADDITIONAL DETAILS.



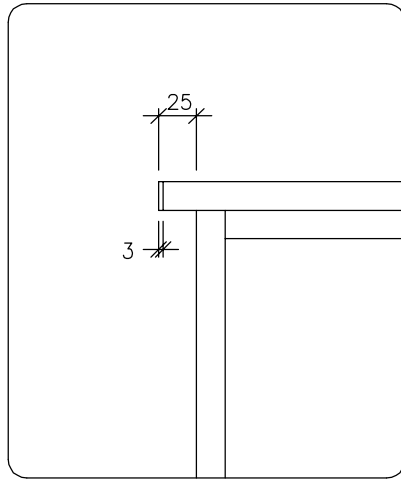
**ARCHITECTURAL WOODWORK STANDARDS  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**TOE KICK DETAIL**

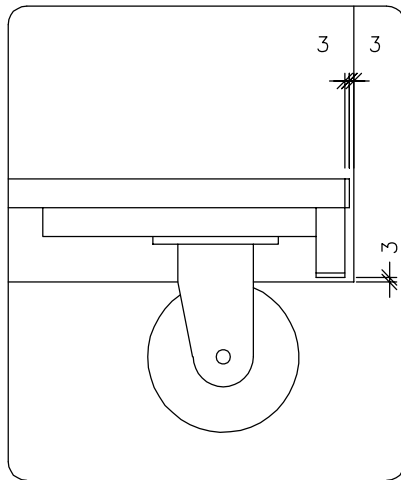
Status	
Folder Path	WDRS\A20002.1 -- BRIDGEPORT PUBLIC SCHOOL
File	AW004.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	April 2021
Last Plot	4/1/2021 8:14 AM
Job No.	
Sheet No.	

**AW004**





DETAIL 1



DETAIL 2

THE CONTRACTOR SHALL VERIFY ALL DWGS. AGAINST THE ARCHITECTURAL WOODWORK DWGS. AND MUST REPORT ANY DISCREPANCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DWGS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS. AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWGS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS' WRITTEN PERMISSION.

**GENERAL NOTES:**

ON ALL DWGS. ALL REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW005 FOR ADDITIONAL DETAILS.



**ARCHITECTURAL WOODWORK STANDARDS  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**CART DETAILS**

Status

Folder: \\AW006\320017 - FOREST HEIGHTS CL. - FAMILY 5

File: AW006.DWG

Drawn By: NST

Check By: SKA

Scale

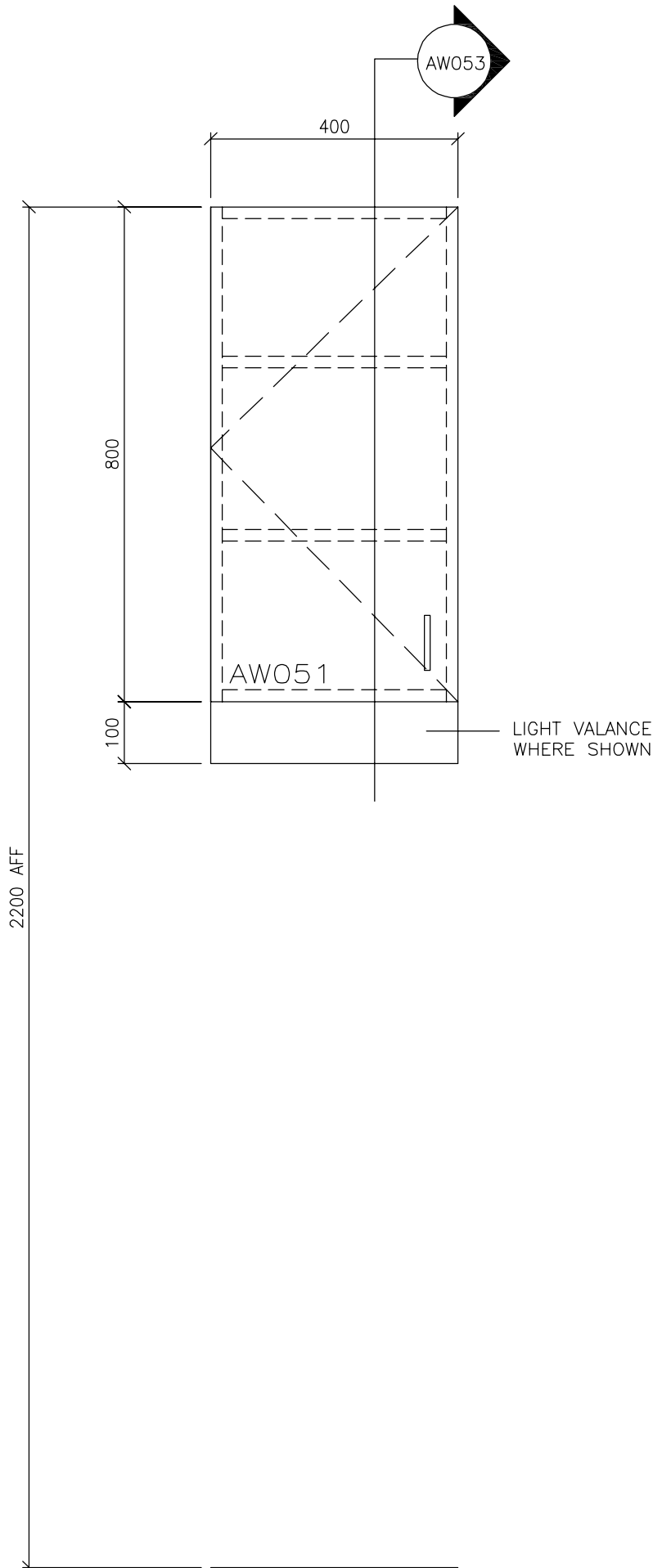
Date: ----

Last Plot: 4/28/2021 12:55 PM

Job No.

Sheet No.

**AW006**



THE CONTRACTOR SHALL VERIFY ALL DIMS. AGAINST THE ARCHITECTURAL WOODWORK DIMS. AND MUST REPORT ANY DISCREPANCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DIMS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS. AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DIMS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES:**  
 ON ALL DIMS. AW REFERS TO ARCHITECTURAL WOODWORK.  
 FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.  
 REFER TO AW002 TO AW004 FOR ADDITIONAL DETAILS.

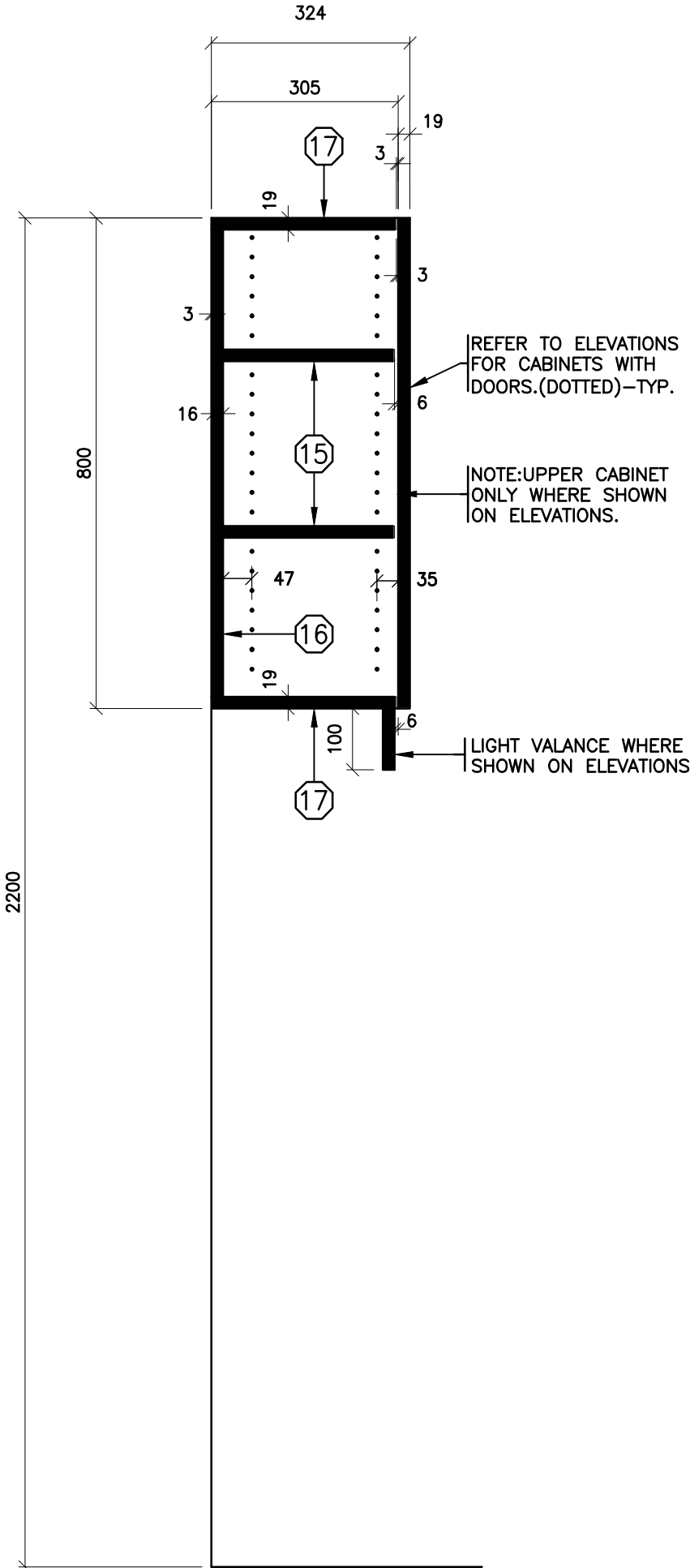


**ARCHITECTURAL WOODWORK STANDARDS**  
**FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**UPPER CABINET - 400 - ELEVATION**

Status	
Folder	AW0051\20017 - FOREST HEIGHTS CL - FAMILY RT
File	AW051.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	April 2021
Last Plot	4/28/2021 1:48 PM
Job No.	
Sheet No.	

**AW051**



THE CONTRACTOR SHALL VERIFY ALL DWGS. AGAINST THE ARCHITECTURAL WOODWORK DWGS. AND MUST REPORT ANY INCONSISTENCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DWGS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS. AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWGS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES**

ON ALL DWGS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW005 FOR ADDITIONAL DETAILS.



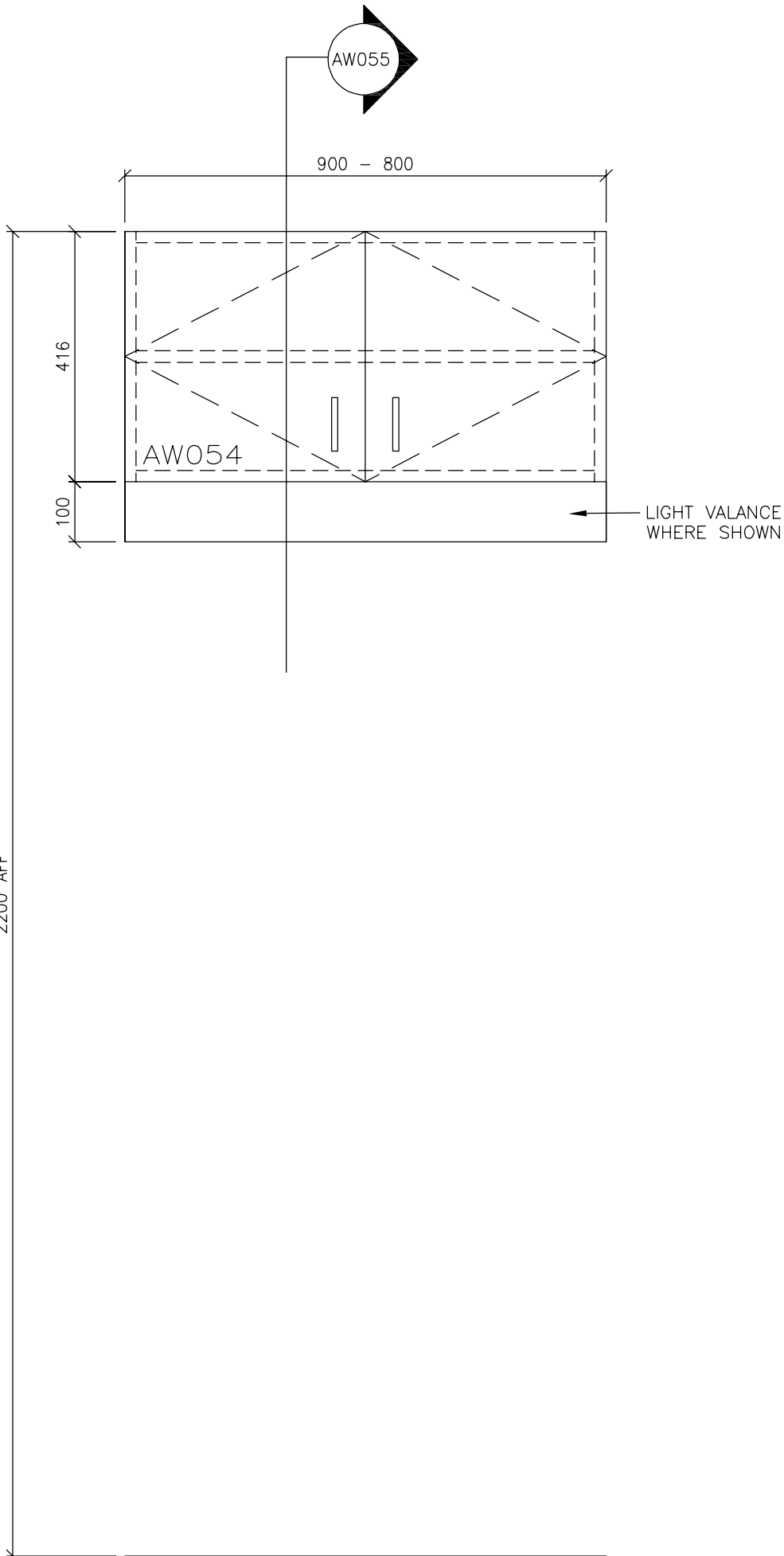
**ARCHITECTURAL WOODWORK STANDARDS**  
**FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**UPPER CABINET - SECTION**

Status	
Folder Path	W053\A20002.7 - SUNNYSIDE PUBLIC SCHOOL
File	AW053.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	April 2021
Last Plot	4/21/2021 10:31 AM
Job No.	
Sheet No.	

**AW053**

2200 AFF



THE CONTRACTOR SHALL VERIFY ALL DIMS. AGAINST THE ARCHITECTURAL WOODWORK DIMS. AND MUST REPORT ANY DISCREPANCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DIMS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS. AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DIMS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES:**  
 ON ALL DIMS. AN REFERS TO ARCHITECTURAL WOODWORK.  
 FOR APPROPRIATE PRODUCTS REFER TO AW051 AND THE SPECIFICATIONS.  
 REFER TO AW052 TO AW054 FOR ADDITIONAL DETAILS.

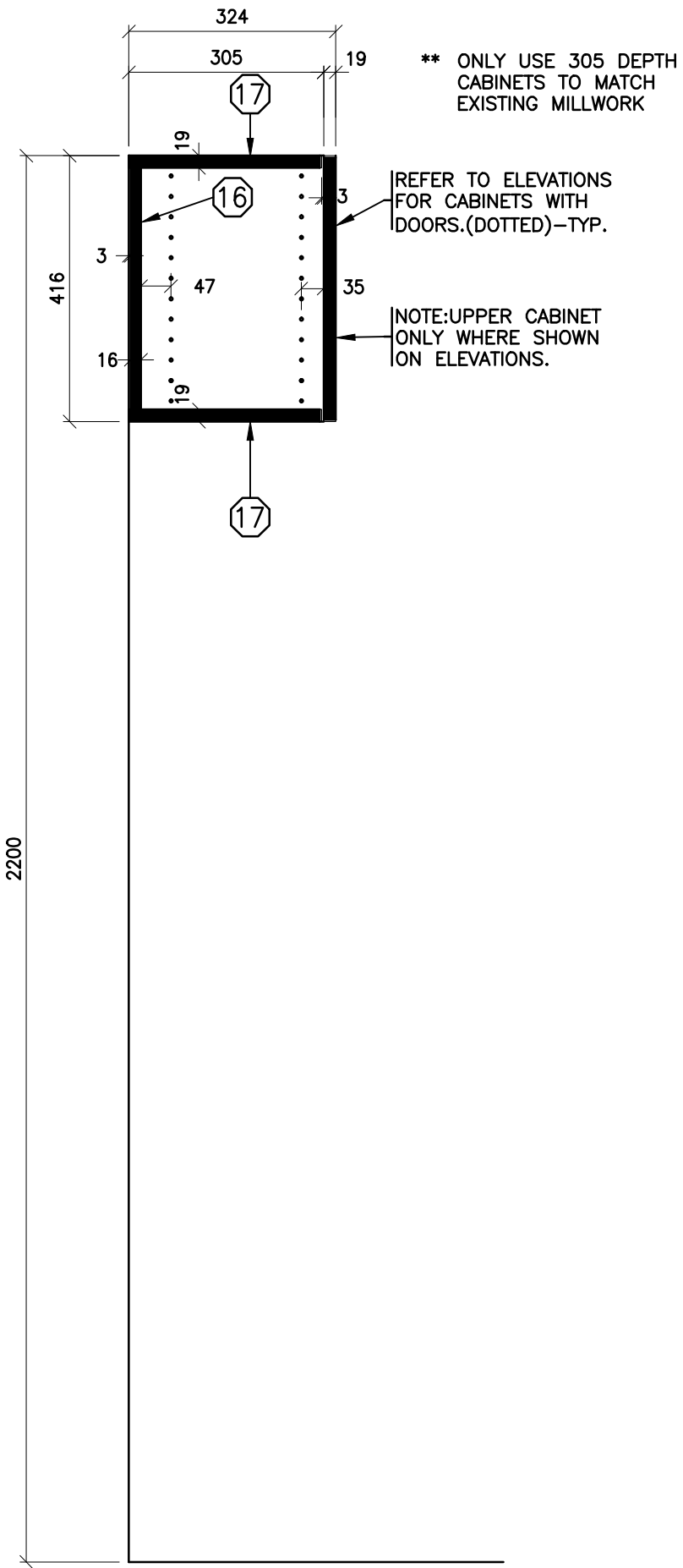


**ARCHITECTURAL WOODWORK STANDARDS  
 FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**SMALL UPPER CABINET - ELEVATION**

Status
Folder S:\WRODS\30017 - FOREST HEIGHTS CL - FAMILY RT
File AW054.DWG
Drawn By NST
Check By SKA
Scale
Date April 2021
Last Plot 4/28/2021 1:52 PM
Job No.
Sheet No.

**AW054**



THE CONTRACTOR SHALL VERIFY ALL DWGS. AGAINST THE ARCHITECTURAL WOODWORK DWGS. AND MUST REPORT ANY INCONSISTENCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DWGS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS. AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWGS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES**

ON ALL DWGS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW005 FOR ADDITIONAL DETAILS.

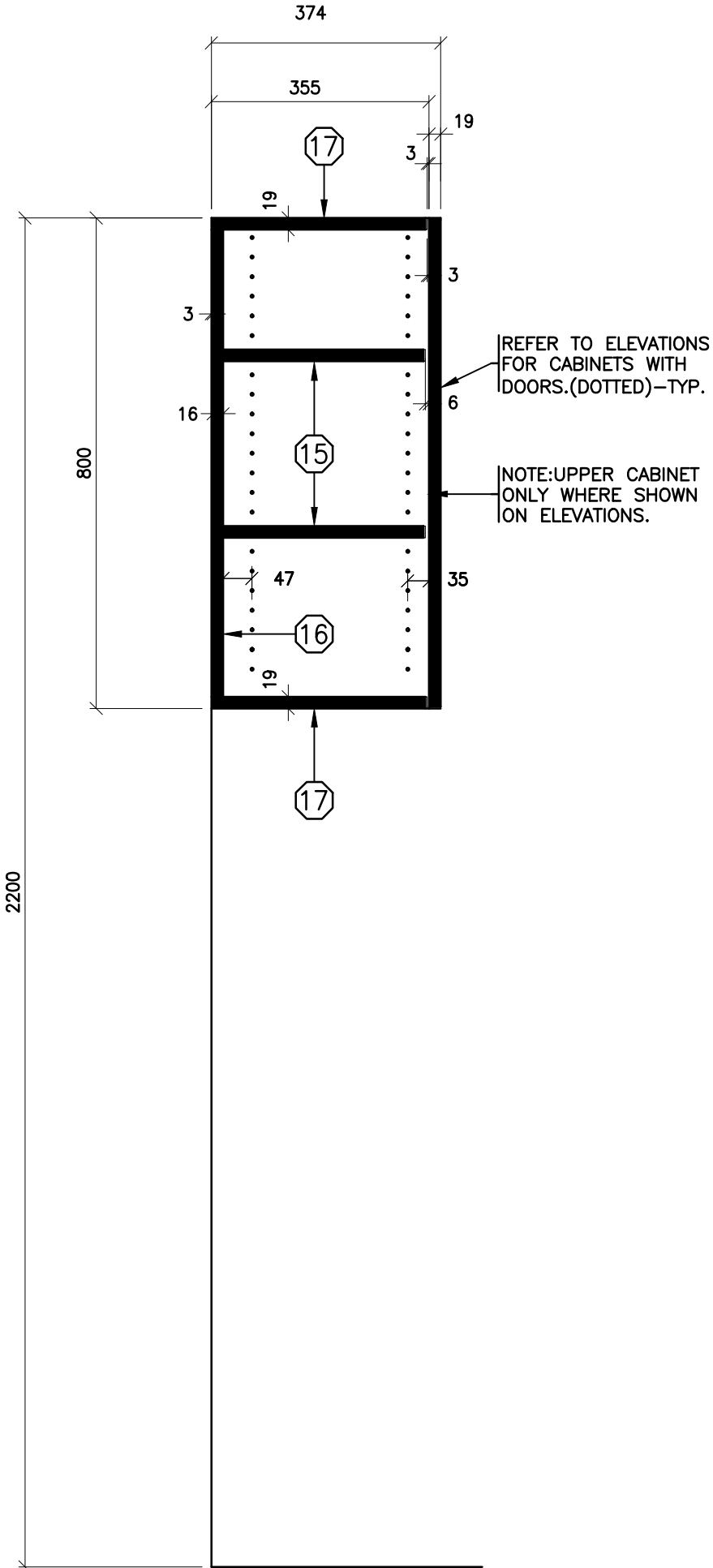


**ARCHITECTURAL WOODWORK STANDARDS  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**SMALL UPPER CABINET - SECTION**

Status	
Folder	H:\WRDSB\A20017 - FOREST HEIGHTS C.L. - FAMILY ST
File	AW055.DWG
Drawn By	NST
Check By	SKA
Scale	1:10
Date	May 21
Last Plot	5/6/2021 11:56 AM
Job No.	
Sheet No.	

**AW055**



THE CONTRACTOR SHALL VERIFY ALL DWGS. AGAINST THE ARCHITECTURAL WOODWORK DWGS. AND MUST REPORT ANY INCONSISTENCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DWGS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS, AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWGS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES**

ON ALL DWGS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW005 FOR ADDITIONAL DETAILS.

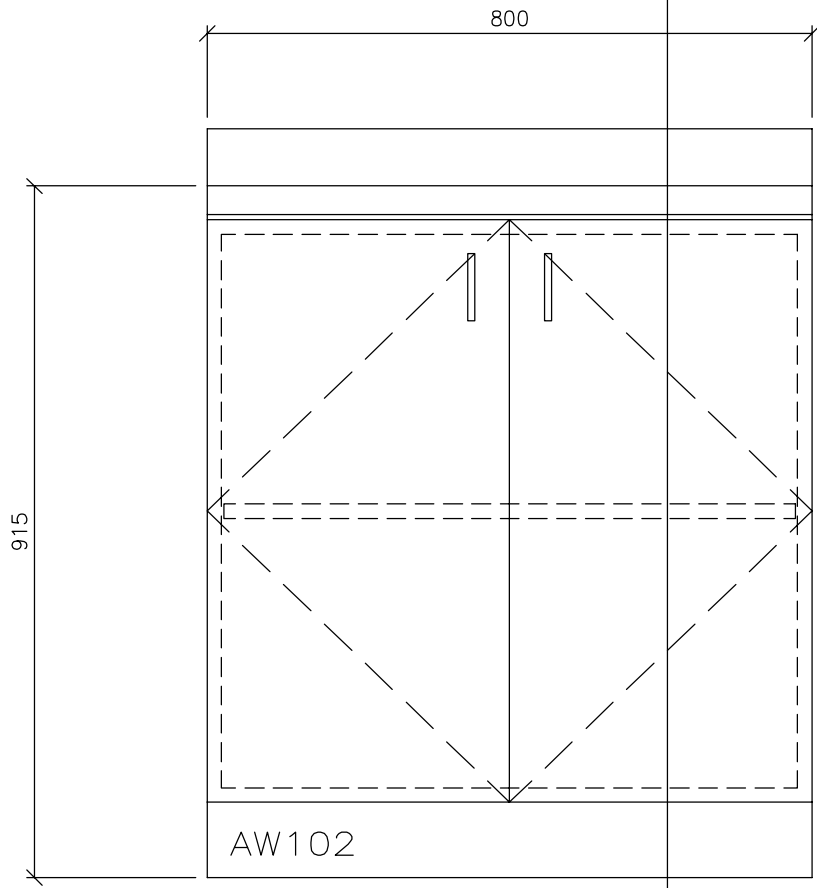


**ARCHITECTURAL WOODWORK STANDARDS**  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD

UPPER CABINET - SECTION - 355 DEEP

Status	
Folder	AW056\A20017 - FOREST HEIGHTS C.L. - FAMILY ST
File	AW056.DWG
Drawn By	NST
Check By	SKA
Scale	1:10
Date	May 21
Last Plot	5/6/2021 12:47 PM
Job No.	
Sheet No.	

**AW056**



AW103

THE CONTRACTOR SHALL VERIFY ALL DIMS. AGAINST THE ARCHITECTURAL WOODWORK DIMS. AND MUST REPORT ANY DISCREPANCIES TO THE WDRS BEFORE PROCEEDING WITH WORK.

ALL DIMS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WDRS. AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DIMS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WDRS'S WRITTEN PERMISSION.

**GENERAL NOTES:**  
 ON ALL DIMS. AW REFERS TO ARCHITECTURAL WOODWORK.  
 FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.  
 REFER TO AW002 TO AW004 FOR ADDITIONAL DETAILS.



**ARCHITECTURAL WOODWORK STANDARDS**  
**FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**LOWER CABINET-800 WIDE - ELEVATION**

Status	
Folder	WDRS\20017 - FOREST HEIGHTS CL - FAMILY RT
File	AW102.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	April 2021
Last Plot	4/28/2021 1:53 PM
Job No.	
Sheet No.	

**AW102**

THE CONTRACTOR SHALL VERIFY ALL DWGS. AGAINST THE ARCHITECTURAL WOODWORK DWGS. AND MUST REPORT ANY INCONSISTENCIES TO THE WRDSB BEFORE PROCEEDING WITH WORK.

ALL DWGS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDSB, AND MUST BE RETURNED UPON REQUEST.

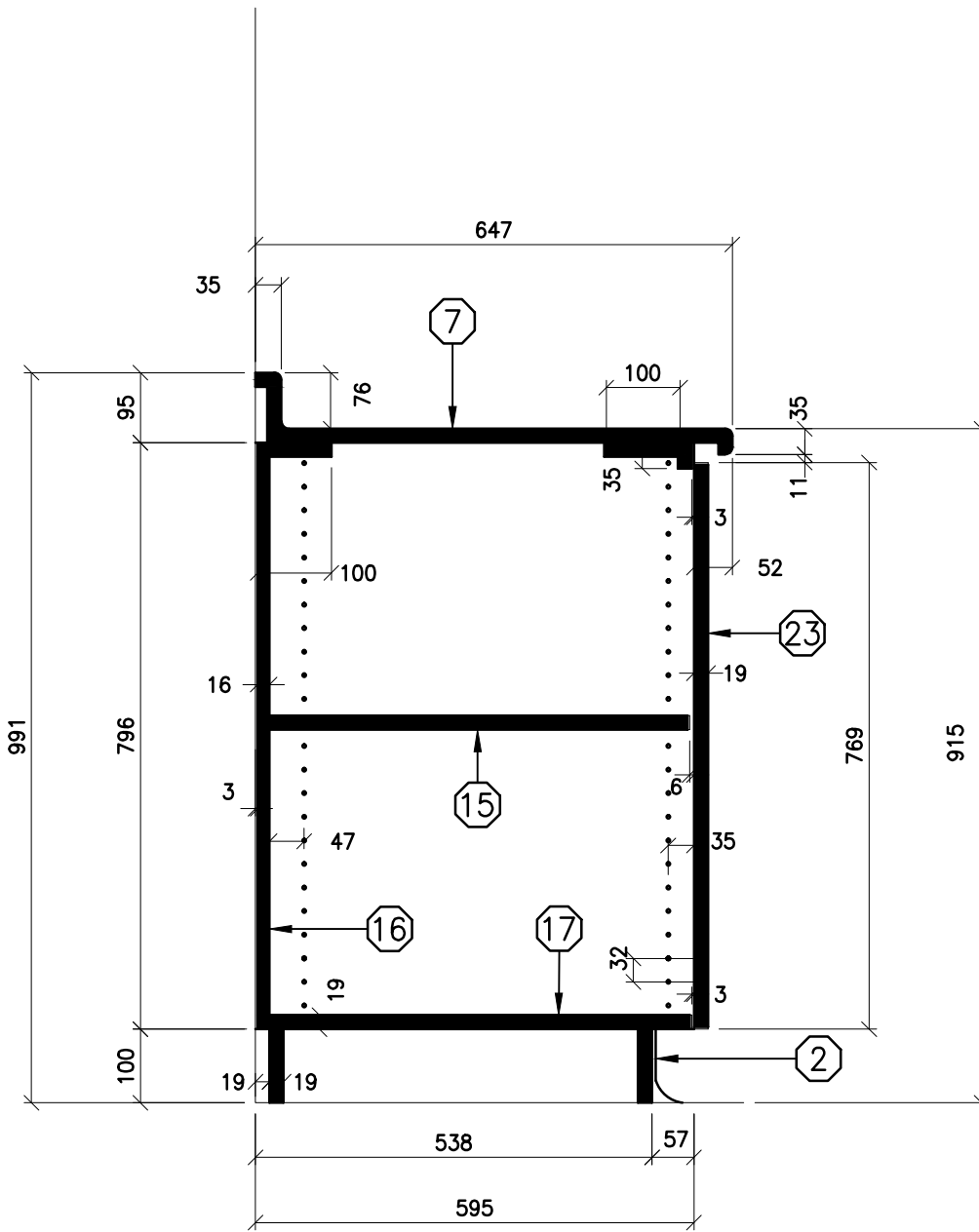
REPRODUCTION OF DWGS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDSB'S WRITTEN PERMISSION.

**GENERAL NOTES**

ON ALL DWGS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW008 FOR ADDITIONAL DETAILS.



**ARCHITECTURAL WOODWORK STANDARDS  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

LOWER CABINET - SECTION

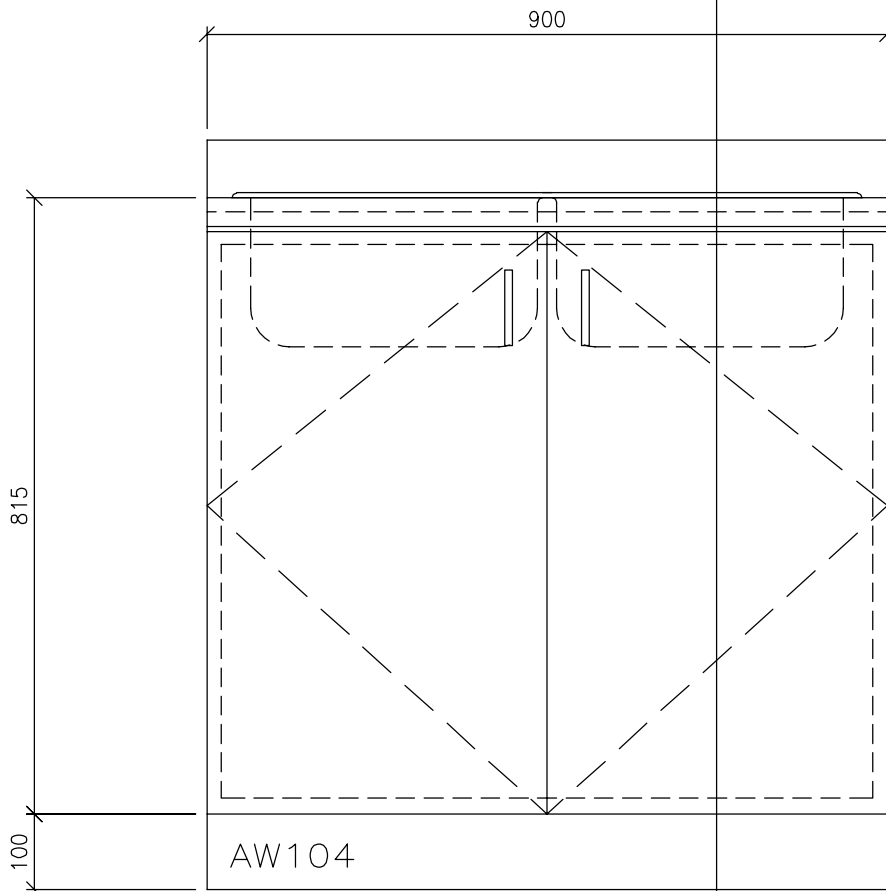
Status	
Folder	\\WRDSB\A20017 - FOREST HEIGHTS C.L. - FAMILY ST
File	AW103.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	May 2021
Last Plot	5/6/2021 12:04 PM
Job No.	
Sheet No.	

**AW103**



- SINGLE SINK: 800 WIDE
- DOUBLE SINK: 863 WIDE MIN USE 900 WIDE
- UPPER CABINET TO HAVE A DIVIDER

AW106



THE CONTRACTOR SHALL VERIFY ALL DIMS. AGAINST THE ARCHITECTURAL WOODWORK DIMS. AND MUST REPORT ANY DISCREPANCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DIMS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS. AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DIMS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES:**

ON ALL DIMS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW004 FOR ADDITIONAL DETAILS.



**ARCHITECTURAL WOODWORK STANDARDS  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**LOWER CABINET WITH DOUBLE SINK - ELEVATION**

Status

Folder #\\WRDS\20017 - FOREST HEIGHTS CL - FAMILY RT

File AW104.DWG

Drawn By NST

Check By SKA

Scale

Date April 2021

Last Plot 4/28/2021 1:55 PM

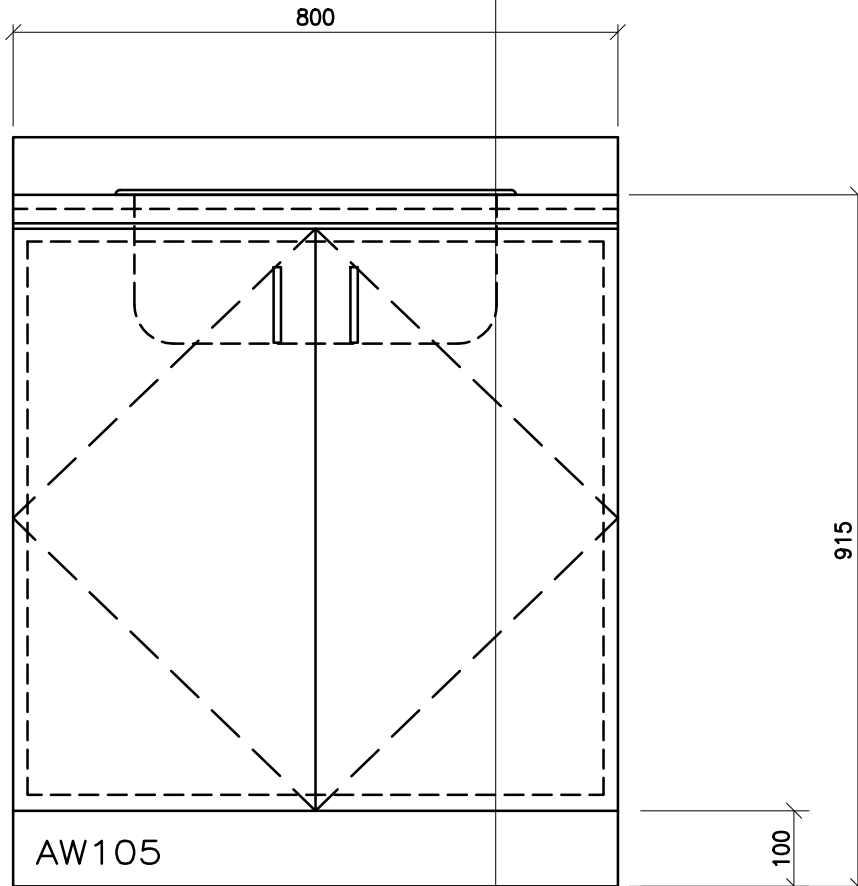
Job No.

Sheet No.

**AW104**

- SINGLE SINK: 800 WIDE
- DOUBLE SINK: 863 WIDE MINIMUM, USE 900 WIDE CABINET
- UPPER CABINET TO HAVE A DIVIDER
- COUNTERTOP TO HAVE CLASSIC NO-DRIP PROFILE

AW106



AW105

100

915

THE CONTRACTOR SHALL VERIFY ALL DWGS AGAINST THE ARCHITECTURAL WOODWORK DWGS AND MUST REPORT ANY INCONSISTENCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DWGS AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWGS AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES**

ON ALL DWGS AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW005 FOR ADDITIONAL DETAILS.



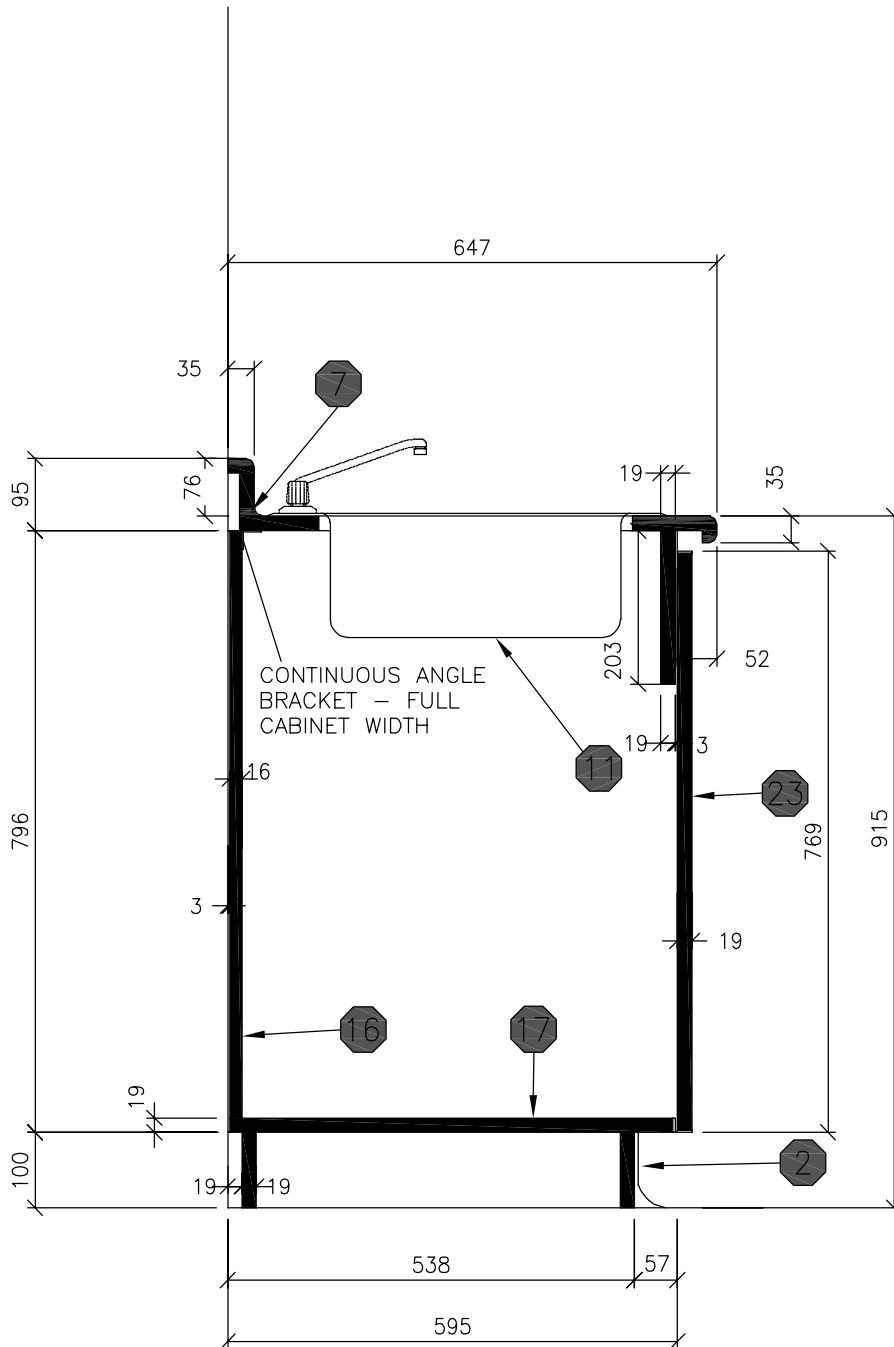
**ARCHITECTURAL WOODWORK STANDARDS**  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD

LOWER CABINET WITH SINGLE SINK - ELEVATION

Status	
Folder	AW001\A20017 - FOREST HEIGHTS C.L. - FAMILY ST
File	AW105.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	May 2021
Last Plot	5/6/2021 10:53 AM
Job No.	
Sheet No.	

**AW105**

- SINGLE SINK: 800 WIDE
- DOUBLE SINK: 863 WIDE MINIMUM,  
USE 900 WIDE CABINET
- UPPER CABINET TO HAVE A DIVIDER
- COUNTERTOP TO HAVE CLASSIC  
NO-DRIP PROFILE



THE CONTRACTOR SHALL VERIFY ALL DIMS. AGAINST THE ARCHITECTURAL WOODWORK DIMS. AND MUST REPORT ANY DISCREPANCIES TO THE WDSB BEFORE PROCEEDING WITH WORK.

ALL DIMS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WDSB, AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DIMS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WDSB'S WRITTEN PERMISSION.

**GENERAL NOTES:**

ON ALL DIMS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW004 FOR ADDITIONAL DETAILS.



**ARCHITECTURAL WOODWORK STANDARDS  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**LOWER CABINET WITH SINK - SECTION**

Status	
Folder	4\WDSB\WDSB_2020 11 22 WDSB MILLWORK STD
File	AW106.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	November 2020
Last Plot	4/28/2021 2:04 PM
Job No.	
Sheet No.	

**AW106**

THE CONTRACTOR SHALL VERIFY ALL DIMS. AGAINST THE ARCHITECTURAL WOODWORK DIMS. AND MUST REPORT ANY DISCREPANCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DIMS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS. AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DIMS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTE:**  
ON ALL DIMS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW004 FOR ADDITIONAL DETAILS.

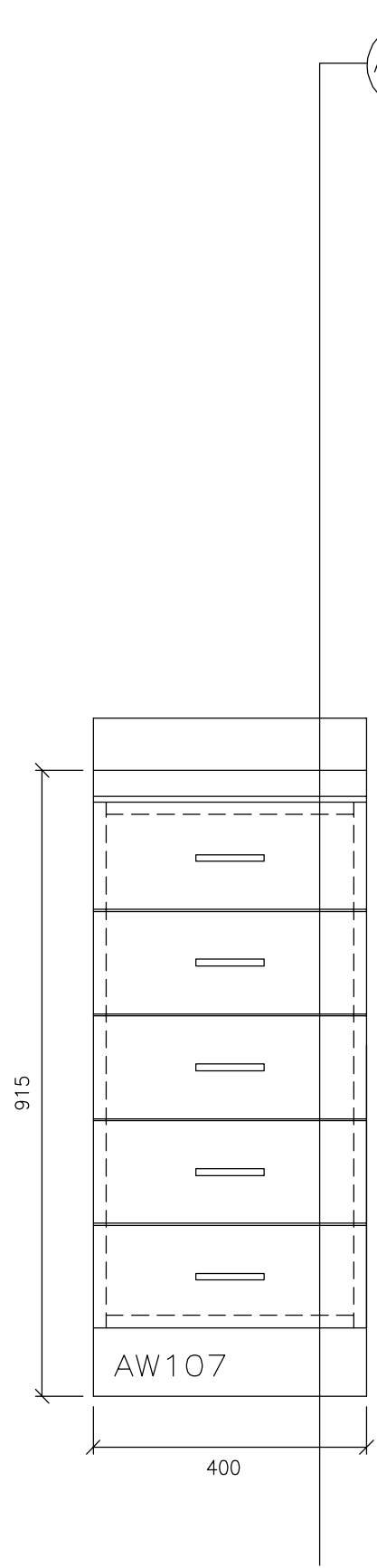


**ARCHITECTURAL WOODWORK STANDARDS**  
**FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**LOWER CABINET WITH DRAWERS - 5D c/w DL - ELEVATION**

Status	
Folder	AW002\20017 - FOREST HEIGHTS CL - FAMILY RT
File	AW107.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	February 2015
Last Plot	4/28/2021 1:56 PM
Job No.	
Sheet No.	

**AW107**



**THE CONTRACTOR SHALL VERIFY ALL DIMS. AGAINST THE ARCHITECTURAL WOODWORK DIMS. AND MUST REPORT ANY DISCREPANCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.**

**ALL DIMS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS, AND MUST BE RETURNED UPON REQUEST.**

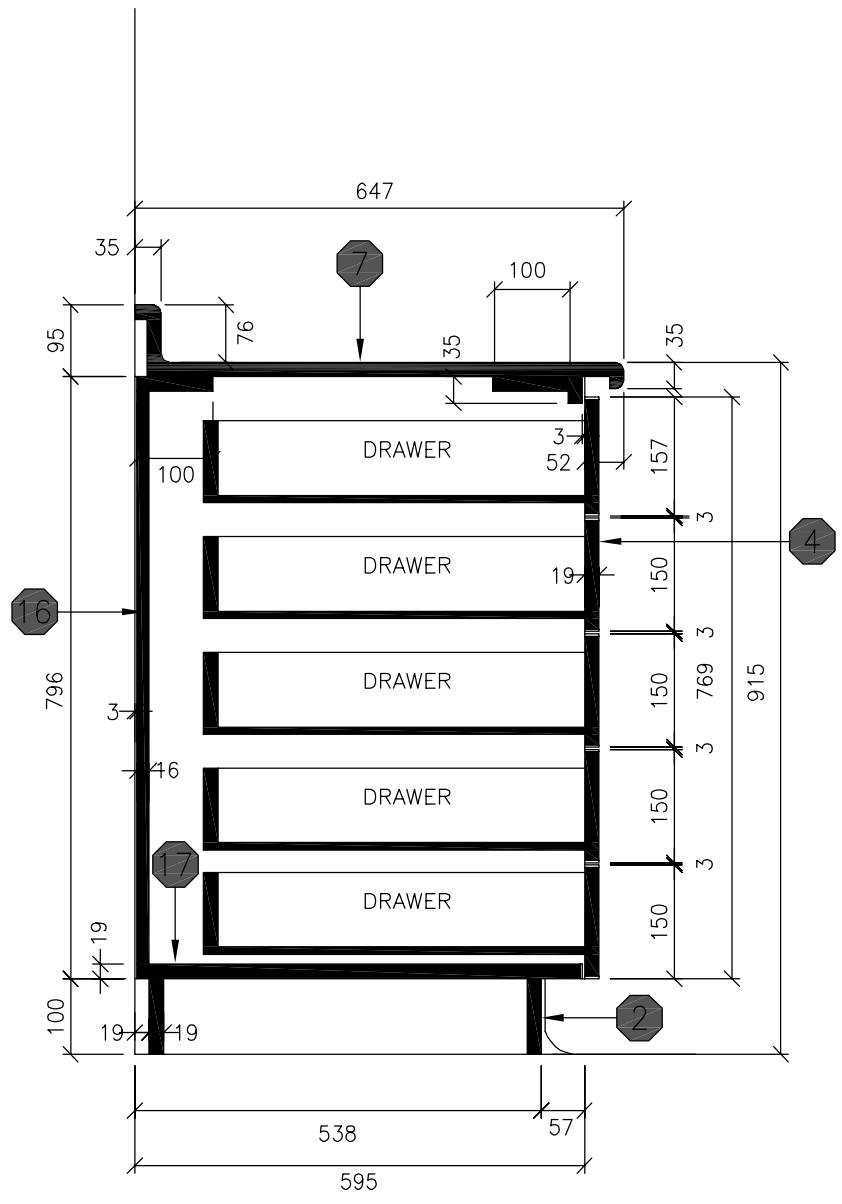
**REPRODUCTION OF DIMS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.**

**GENERAL NOTES:**

**ON ALL DIMS. AW REFERS TO ARCHITECTURAL WOODWORK.**

**FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.**

**REFER TO AW002 TO AW004 FOR ADDITIONAL DETAILS.**



**ARCHITECTURAL WOODWORK STANDARDS**  
**FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**LOWER CABINET WITH DRAWERS - 5D c/w DL - SECTION**

Status	
Folder	AW108/2017 - FOREST HEIGHTS CL - FAMILY RT
File	AW108.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	February 2015
Last Plot	4/28/2021 1:57 PM
Job No.	
Sheet No.	

**AW108**

THE CONTRACTOR SHALL VERIFY ALL DIMS. AGAINST THE ARCHITECTURAL WOODWORK DIMS. AND MUST REPORT ANY DISCREPANCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DIMS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS. AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DIMS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES:**

ON ALL DIMS. AW REFERS TO ARCHITECTURAL WOODWORK.

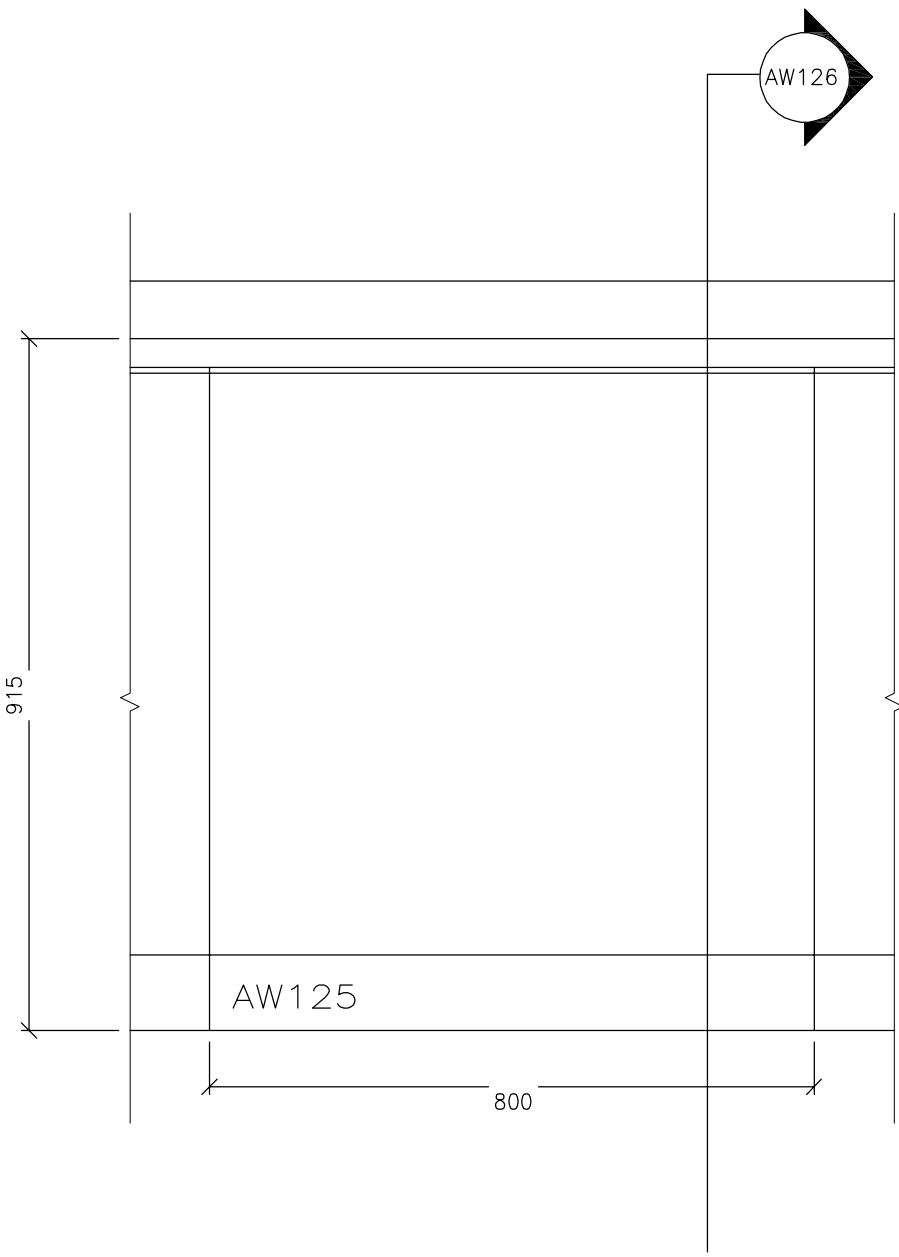
FOR APPROPRIATE PRODUCTS REFER TO AW101 AND THE SPECIFICATIONS.

REFER TO AW102 TO AW104 FOR ADDITIONAL DETAILS.



**ARCHITECTURAL WOODWORK STANDARDS  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**LOWER COUNTER - ELEVATION**



Status	
Folder	\\WRDS\32017 - FOREST HEIGHTS CL - FAMILY RT
File	AW125.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	February 2015
Last Plot	4/28/2021 1:57 PM
Job No.	
Sheet No.	

**AW125**

THE CONTRACTOR SHALL VERIFY ALL DIMS. AGAINST THE ARCHITECTURAL WOODWORK DIMS. AND MUST REPORT ANY DISCREPANCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

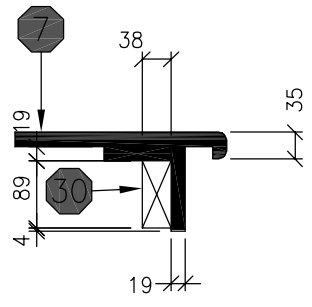
ALL DIMS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS, AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DIMS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

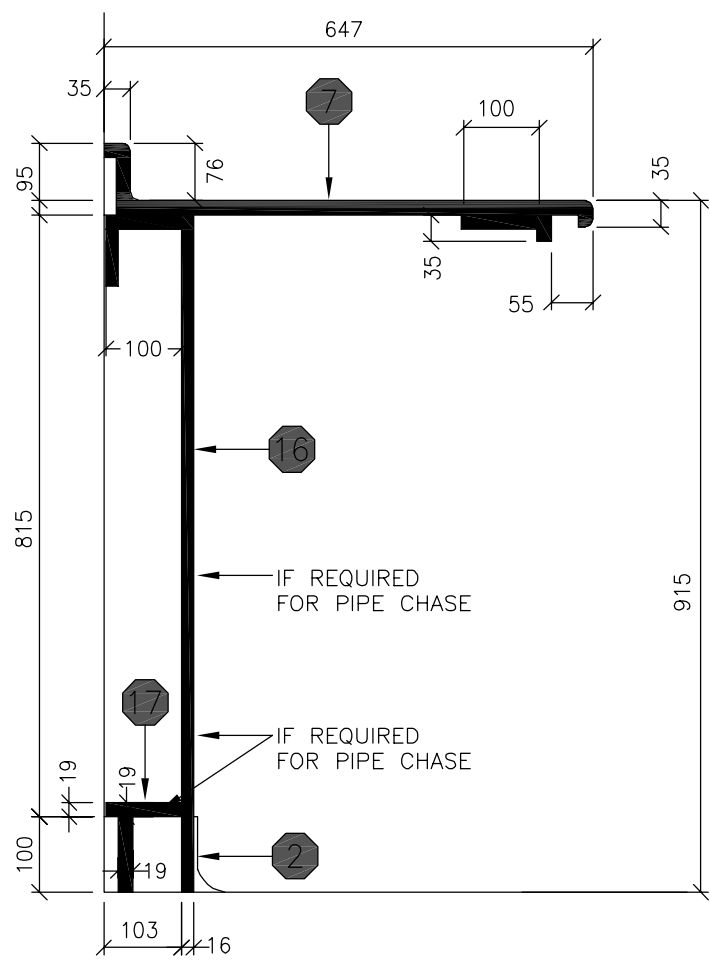
**GENERAL NOTE:**  
 ON ALL DIMS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW004 FOR ADDITIONAL DETAILS.



USE THIS DETAIL WHEN SPAN OVER 800 OR FOR POSSIBLE HEAVY LOAD SITUATIONS

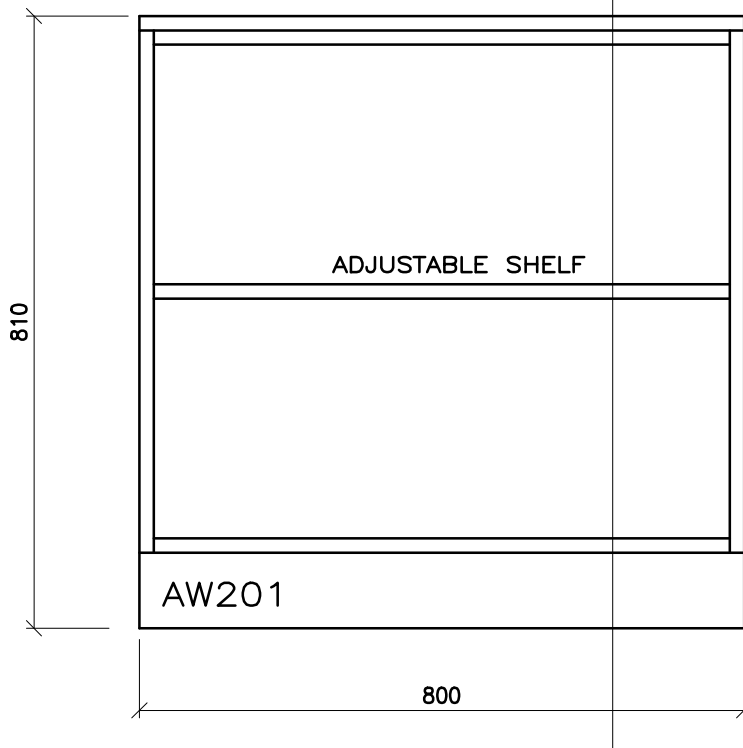


**ARCHITECTURAL WOODWORK STANDARDS**  
**FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**LOWER COUNTER -SECTION**

Status	
Folder	AW002\20017 - FOREST HEIGHTS CL - FAMILY
File	AW126.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	February 2015
Last Plot	4/28/2021 1:58 PM
Job No.	
Sheet No.	

**AW126**



- SEE LIST
- AW202 - 253
  - AW203 - 305
  - AW204 - 405

THE CONTRACTOR SHALL VERIFY ALL DWGS AGAINST THE ARCHITECTURAL WOODWORK DWGS AND MUST REPORT ANY INCONSISTENCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DWGS AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWGS AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES**

ON ALL DWGS AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW008 FOR ADDITIONAL DETAILS.



**ARCHITECTURAL WOODWORK STANDARDS**  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD

LOW BOOKSHELF - 810 - ELEVATION

Status	
Folder Path	WDRS\A20017 - FOREST HEIGHTS C.L. - FAMILY ST
File	AW201.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	May 2021
Last Plot	5/6/2021 2:28 PM
Job No.	
Sheet No.	

**AW201**



THE CONTRACTOR SHALL VERIFY ALL DIMS. AGAINST THE ARCHITECTURAL WOODWORK DIMS. AND MUST REPORT ANY DISCREPANCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DIMS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS. AND MUST BE RETURNED UPON REQUEST.

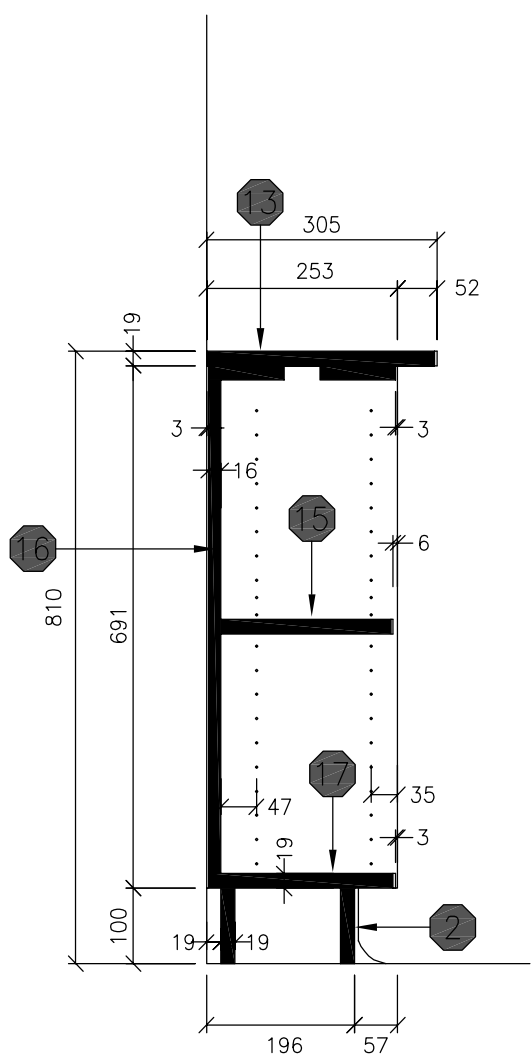
REPRODUCTION OF DIMS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES:**

ON ALL DIMS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW004 FOR ADDITIONAL DETAILS.



**ARCHITECTURAL WOODWORK STANDARDS  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

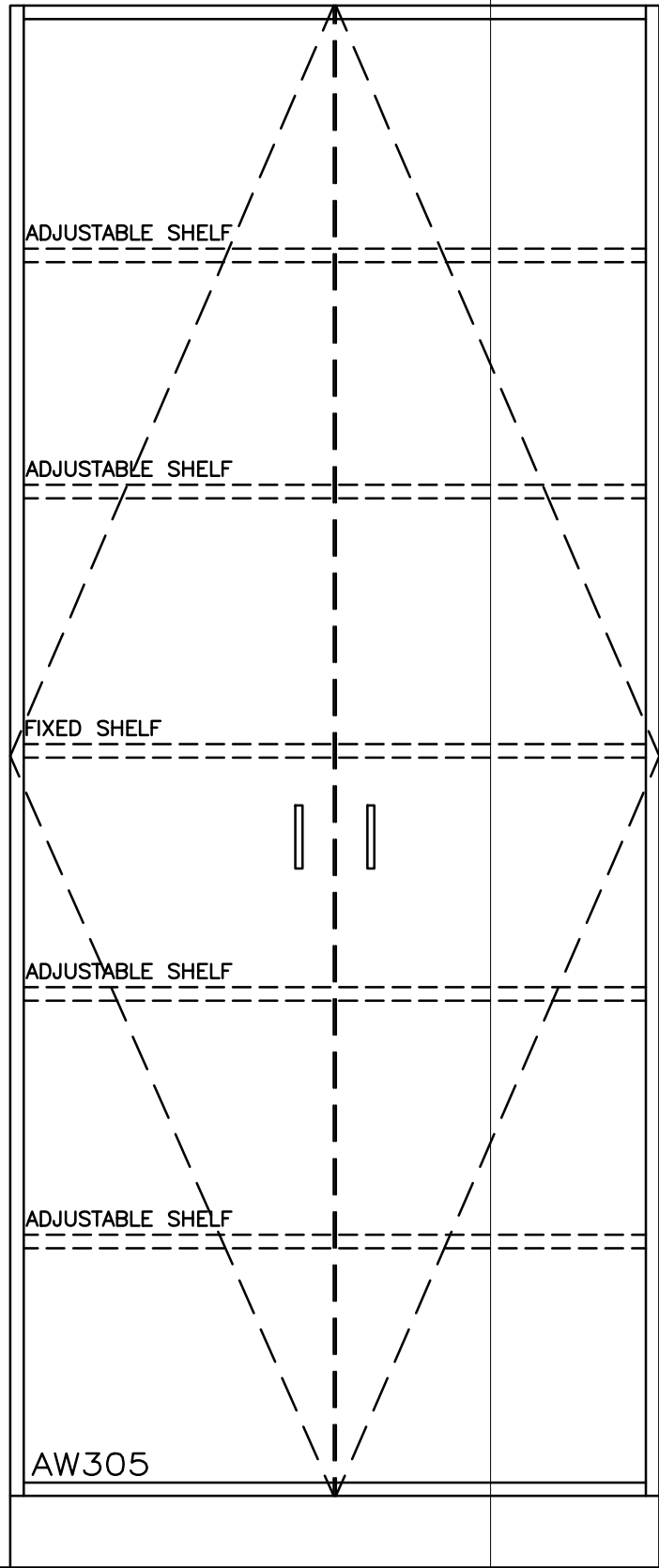
**LOW BOOKSHELF #10 - SECTION**

Status	
Folder	AW002\20017 - FOREST HEIGHTS CL. - FAMILY RT
File	AW202.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	February 2015
Last Plot	4/28/2021 2:02 PM
Job No.	
Sheet No.	

**AW202**

AW306

915



ADJUSTABLE SHELF

ADJUSTABLE SHELF

FIXED SHELF

ADJUSTABLE SHELF

ADJUSTABLE SHELF

AW305

2200

THE CONTRACTOR SHALL VERIFY ALL DWGS AGAINST THE ARCHITECTURAL WOODWORK DWGS AND MUST REPORT ANY INCONSISTENCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DWGS AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWGS AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES**

ON ALL DWGS, AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW008 FOR ADDITIONAL DETAILS.

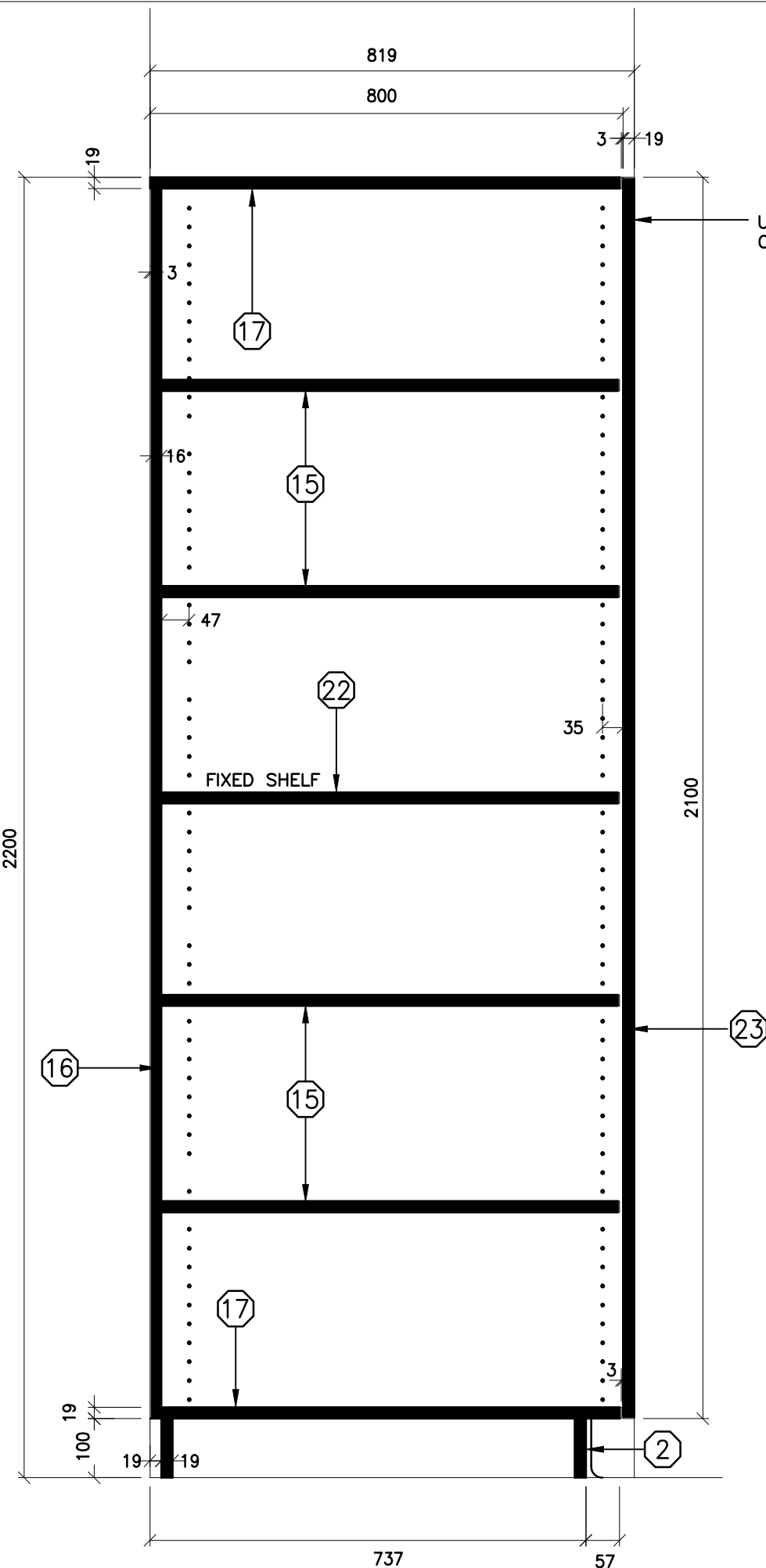


**ARCHITECTURAL WOODWORK STANDARDS**  
 FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD

TEACHERS CLOSETS - TYPE 3 - 2 DOORS - ELEVATION

Status
Folder R:\WRDSB\A20017 - FOREST HEIGHTS C.L. - FAMILY ST
File AW305.DWG
Drawn By NST
Check By SKA
Scale
Date May 2021
Last Plot 5/6/2021 10:47 AM
Job No.
Sheet No.

**AW305**



USE 5 STANDARD CLOSING HINGES

THE CONTRACTOR SHALL VERIFY ALL DWGS. AGAINST THE ARCHITECTURAL WOODWORK DWGS. AND MUST REPORT ANY INCONSISTENCIES TO THE WRDSB BEFORE PROCEEDING WITH WORK.

ALL DWGS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDSB. AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWGS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDSB'S WRITTEN PERMISSION.

**GENERAL NOTES**

ON ALL DWGS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW005 FOR ADDITIONAL DETAILS.

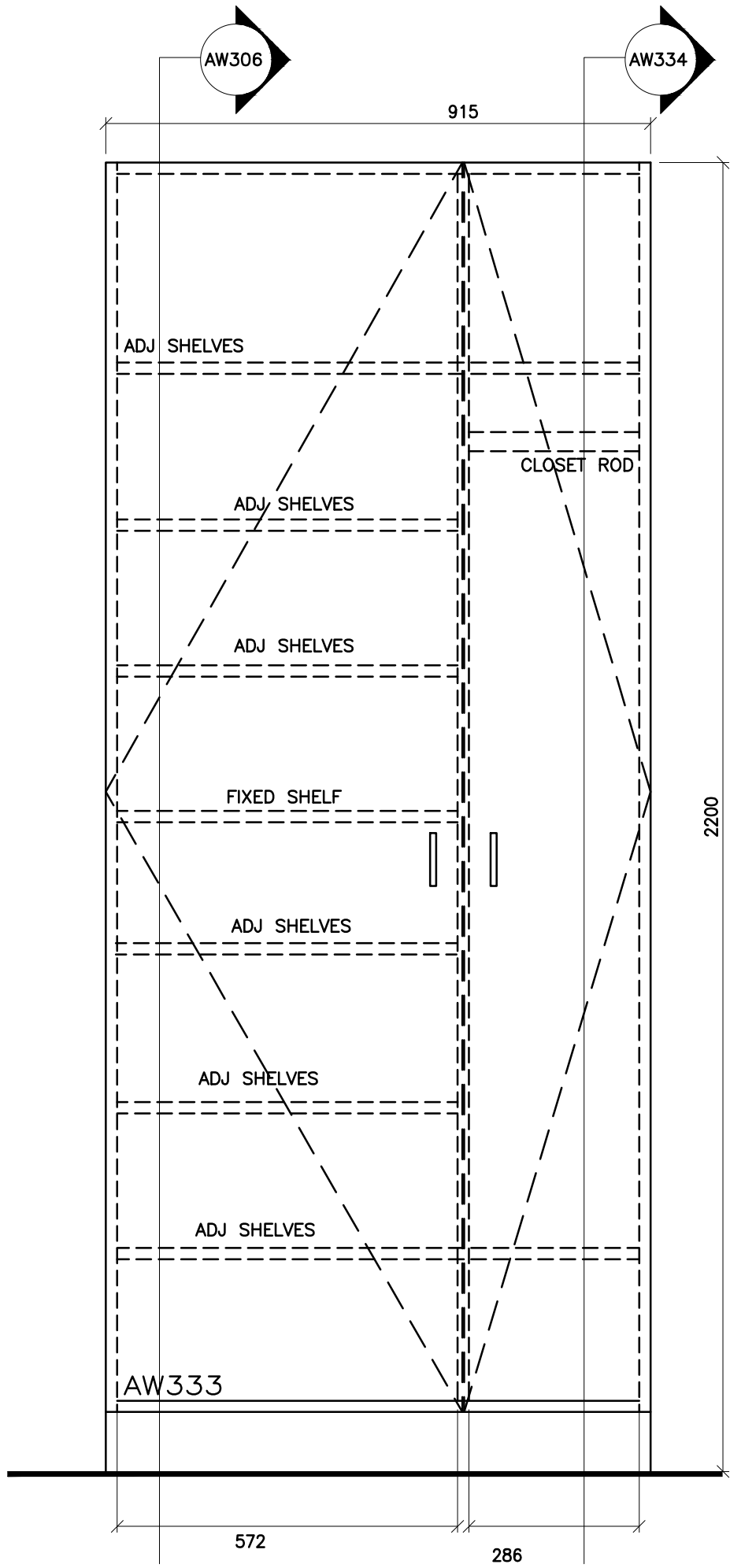


**ARCHITECTURAL WOODWORK STANDARDS**  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD

5 SHELF STORAGE CABINET 800 - SECTION

Status	
Folder	R:\WRDSB\20017 - FOREST HEIGHTS C.L. - FAMILY ST
File	AW306.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	May 2021
Last Plot	5/6/2021 10:48 AM
Job No.	
Sheet No.	

**AW306**



THE CONTRACTOR SHALL VERIFY ALL DWGS AGAINST THE ARCHITECTURAL WOODWORK DWGS AND MUST REPORT ANY INCONSISTENCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DWGS AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWGS AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES**  
 ON ALL DWGS, AW REFERS TO ARCHITECTURAL WOODWORK.  
 FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.  
 REFER TO AW002 TO AW003 FOR ADDITIONAL DETAILS.

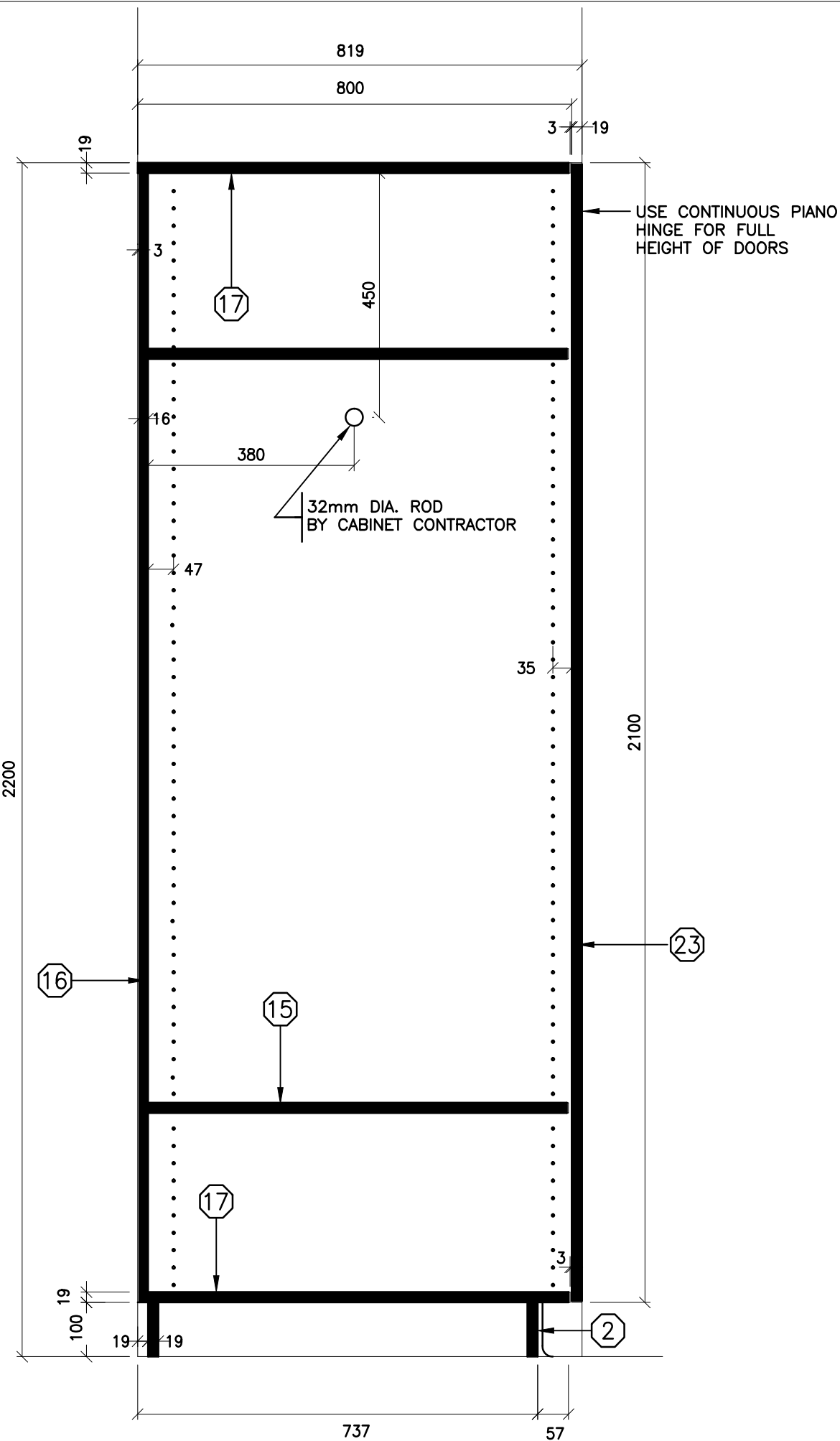


**ARCHITECTURAL WOODWORK STANDARDS**  
 FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD

TEACHERS CLOSETS - TYPE 4 - 2 DOORS - ELEVATION

Status	
Folder	WRODSE\20017 - FOREST HEIGHTS C.L. - FAMILY ST
File	AW333.DWG
Drawn By	NST
Check By	SKA
Scale	1:10
Date	May 21
Last Plot	5/6/2021 10:50 AM
Job No.	
Sheet No.	

**AW333**



THE CONTRACTOR SHALL VERIFY ALL DWGS. AGAINST THE ARCHITECTURAL WOODWORK DWGS. AND MUST REPORT ANY INCONSISTENCIES TO THE WRDSB BEFORE PROCEEDING WITH WORK.

ALL DWGS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDSB, AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWGS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDSB'S WRITTEN PERMISSION.

**GENERAL NOTES**

ON ALL DWGS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW008 FOR ADDITIONAL DETAILS.

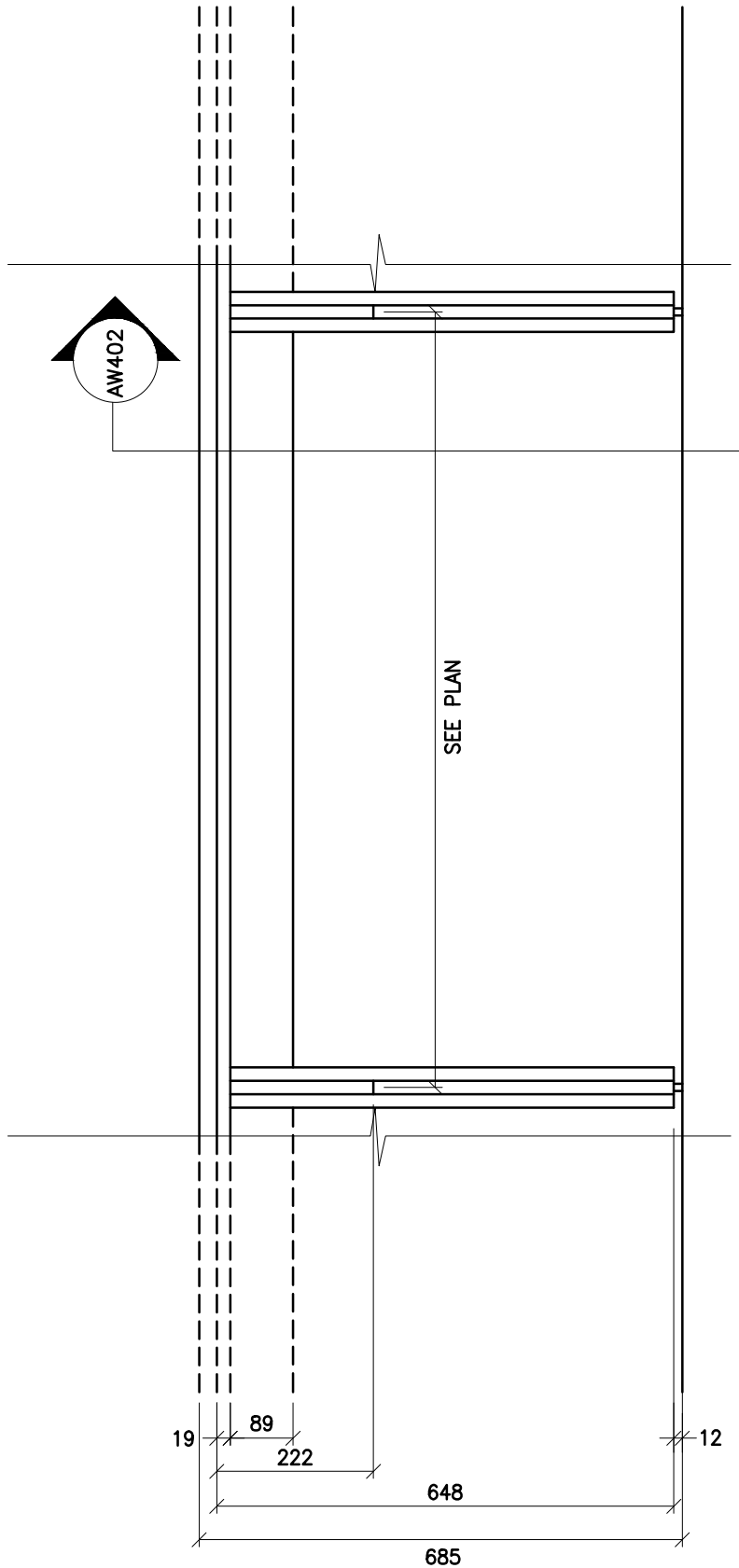


**ARCHITECTURAL WOODWORK STANDARDS**  
**FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

**TEACHERS CLOSET -TYPE 4 - CABINET 800 - SECTION**

Status	
Folder	AW008\A20017 - FOREST HEIGHTS C.L. - FAMILY ST
File	AW334.DWG
Drawn By	NST
Check By	SKA
Scale	1:10
Date	May 21
Last Plot	5/6/2021 10:50 AM
Job No.	
Sheet No.	

**AW334**



THE CONTRACTOR SHALL VERIFY ALL DWGS. AGAINST THE ARCHITECTURAL WOODWORK DWGS. AND MUST REPORT ANY INCONSISTENCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DWGS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS. AND MUST BE RETURNED UPON REQUEST.

REPRODUCTION OF DWGS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES**

ON ALL DWGS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW008 FOR ADDITIONAL DETAILS.



**ARCHITECTURAL WOODWORK STANDARDS**  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD

COMPUTER COUNTER ELEVATION

Status	
Folder	R:\WRDSB\A20017 - FOREST HEIGHTS C.I. - FAMILY ST
File	AW401.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	May 2021
Last Plot	5/6/2021 12:33 PM
Job No.	
Sheet No.	

**AW401**

THE CONTRACTOR SHALL VERIFY ALL DWGS AGAINST THE ARCHITECTURAL WOODWORK DWGS. AND MUST REPORT ANY INCONSISTENCIES TO THE WRDS BEFORE PROCEEDING WITH WORK.

ALL DWGS. AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE WRDS. AND MUST BE RETURNED UPON REQUEST.

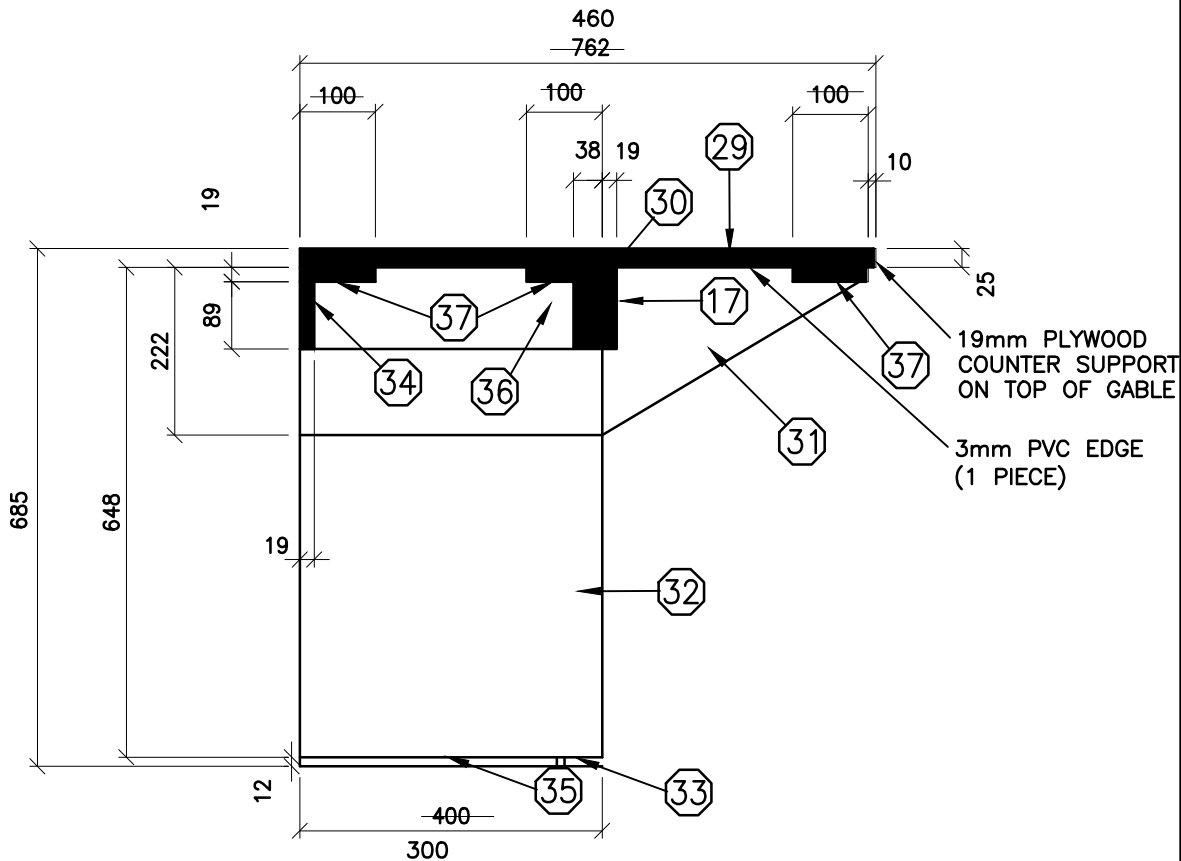
REPRODUCTION OF DWGS. AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRDS'S WRITTEN PERMISSION.

**GENERAL NOTES**

ON ALL DWGS. AW REFERS TO ARCHITECTURAL WOODWORK.

FOR APPROPRIATE PRODUCTS REFER TO AW001 AND THE SPECIFICATIONS.

REFER TO AW002 TO AW008 FOR ADDITIONAL DETAILS.



**ARCHITECTURAL WOODWORK STANDARDS  
FOR THE WATERLOO REGION DISTRICT SCHOOL BOARD**

COMPUTER COUNTER - SECTION

Status	
Folder	AW002\A20017 - FOREST HEIGHTS C.L. - FAMILY ST
File	AW402.DWG
Drawn By	NST
Check By	SKA
Scale	
Date	May 2021
Last Plot	5/6/2021 12:39 PM
Job No.	
Sheet No.	

**AW402**

# **7274-RW-22 - Forest Heights Collegiate Institute – Family Studies Renovation, Partial Window & Brick Replacement, Column Repair, Asphalt Replacement & Barrier Free Washroom**

Opening Date: March 25, 2022 5:00 PM

Closing Date: April 13, 2022 2:00 PM

---



## Schedule of Prices

\* Denotes a "MANDATORY" field

Do not enter \$0.00 dollars unless you are providing the line item at zero dollars to the Board.

## Bid Price Form

**Note: Cash Allowances included in BID PRICE.**

**Blackout Period Protocol is understood and will be adhered to.**

**HST is additional.**

Line Item	Description	Unit of Measure	Quantity	Bid Price *	Total
1	Forest Heights Collegiate Institute – Family Studies Renovation, Partial Window & Brick Replacement, Column Repair, Asphalt Replacement & Barrier Free Washroom	Lump Sum	1		
Subtotal:					

## Summary Table

Bid Form	Amount
Bid Price Form	
HST (13%)	\$ 0.00
Total Contract Amount:	

## Specifications

### Bidder's Contact Information

Provide contact information for the following employees for this project.

If any of the contacts are to change within the duration of the contract the Board must be immediately notified and pre-approve the change(s).

Title	Name *	E-mail *	Cell Phone Number *	
Project Manager				*
Site Supervisor				*

## Documents

It is your responsibility to ensure the uploaded file(s) is/are not defective or corrupted and are able to be opened and viewed by the Owner. If the attached file(s) cannot be opened or viewed, your Bid Submission may be rejected.

### COVID REPSONSE

Submit a work plan that outlines how the company plans to address COVID-19, including implementing workplace strategies that include, but are not limited to, social distancing, personal hygiene recommendations, and other relevant recommendations made by the government of Ontario, the government of Canada, the local municipal government, and their respective ministries, agencies, and departments, in respect of the employees and other personnel of the successful bidder, their subcontractors and suppliers, as well as the employees and other personnel of the Board, the Board's Consultant, and the general public.

- WSIB \* (mandatory)
- Covid Response \* (mandatory)

**BONDING UPLOAD SECTION**

Refer to the Bonding Requirements Section of the Terms and Conditions.

- Bid Deposit Bond \* (mandatory)
- Agreement to Bond \* (mandatory)

## Addenda, Terms and Conditions

I/We have read and understand this Bid Solicitation document, and agree to perform the Work required in accordance with this Bid Solicitation document, including all addenda, at the price(s) detailed in the Bid.

I/We confirm that:

1. The person named in this Bid is authorized to sign and electronically submit this Bid through the Bidding System.
  2. I/We meet all mandatory requirements of the Bid Solicitation document.
  3. The bid will remain open for a specified acceptance period after the Closing Time. The Board may, at any time within this period, accept the Bid whether or not any other Bid has previously been accepted.
  4. All prices provided in the Bid will remain fixed and firm for the duration of the term of the agreement, unless specified otherwise.
  5. All prices provided in my/our Bid are in Canadian funds and include all charges of every kind attributable to the Work. Harmonized Sales Tax will be extra and not shown, unless specified otherwise.
  6. To the best of my/our knowledge and belief:
    - a) the information provided in the Bid is correct; and
    - b) the Bid is made without any comparison of figures or arrangement with any other individual, corporation or person submitting a Bid for the same Work and is in all respects fair and without collusion or fraud.
  7. I/We comply with the all applicable Board policies, provincial, and federal laws, and are aware of the Board's "Principles of Business Conduct" and will comply.
  8. I/We agree and understand that the recommendation to award the Work may be subject to the approval from the Board as well as availability of funds.
  9. I/We agree to be bound by the terms and conditions of the Bid Solicitation document and submit this Bid on behalf of the Bidder.
- I have the authority to bind the Bidder.

The Bidder/Proponent is to declare any actual, potential or perceived conflict of interest that could arise from submitting the Bid/Proposal.

Do you have a potential conflict of interest?

Yes  No

The Bidder acknowledges and agrees that the addendum/addenda below form part of the Bid Solicitation Document.

Please check the box in the column "**I have reviewed this addendum**" below to acknowledge each of the addenda.

File Name	I have reviewed the below addendum and attachments (if applicable)	Pages
There have not been any addenda issued for this bid.		