



REFERENCE NO. 2024-137-P01947

TENDER FOR

**Hess Street Elementary School
Renovation Project**

AT

**107 Hess Street North
Hamilton, ON L8R 2T1**

ARCHITECTURAL SPECIFICATION

Contractors shall carefully examine and study all of the Contract Documents and shall visit the site(s) of proposed work in order to satisfy themselves by examination as to all conditions and dimensions.

ISSUED FOR TENDER
ISSUED FOR CLIENT REVIEW
ISSUED FOR CLIENT REVIEW
ISSUED FOR TENDER

MARCH 2024
MARCH 12, 2024
FEBRUARY 29, 2024
FEBRUARY 20, 2024

PROJECT Hamilton-Wentworth District School Board
Hess Street Elementary School Renovation Project
 107 Hess Street North, Hamilton, ON L8R 2T1

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By: HWDSB
V2024.01

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By: Pinchin Ltd.
Dated: February 22, 2024
Pinchin File: 320572.021

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1 GENERAL

- 1.1 Comply with Division 1 requirements and documents referred to therein.
- 1.2 In addition to the General Conditions of the contract, the Contractors shall familiarize themselves with all Section of the Specifications.
- 1.3 Contractor shall include in contract Price all Contingency Allowances specified therein.

2 CASH ALLOWANCES

- 2.1 Include in the Contract Price, a stipulated sum Cash Allowance in the amount of **\$10,000.00 (Ten Thousand Dollars)**.
- 2.2 Cash Allowances, unless otherwise specified, cover the net cost to the General Contractor of services, products, construction, machinery and equipment, freight, handling, unloading, storage installation and other authorized expenses incurred in performing the Work noted in item 2.6.
- 2.3 The Contract Price, *and not the Cash Allowance*, includes the General Contractor's profit in connection with such cash allowance.
- 2.4 The Contract Price will be adjusted by written order by the Consultant to provide for an excess or deficit to each Cash Allowance. Any unused portions of these allowances shall be returned to the Owner on the conclusion of the Contract.
- 2.5 Expend Cash Allowances as directed by the Consultant in writing. Allowances will be adjusted to actual cost with no adjustment to Contractor's charges. Cash expenditure must identify the H.S.T. separately.
- 2.6 The Contract Price and not the Cash Allowance includes the General Contractor's profit and co-ordination cost in connection with all Cash Allowance expenditures.
- 2.7 The following is a summary of the cash allowances to be included in the contract.
 - Testing and Inspection

Total: \$10,000.00

END OF SECTION

PART 1 – GENERAL

1.1 SETTING OUT THE WORK

- 1.1.1 The Contractor shall be responsible for the construction layout.
- 1.1.2 Verify all elevations, lines, levels, and dimensions and report any errors, discrepancies or conflicts to the Consultant.
- 1.1.3 Establish and maintain benchmarks, location stakes and batter boards as required.
- 1.1.4 Verify and record proposed location and finished elevations relative to existing grades.
- 1.1.5 Determine actual location and elevation of existing underground utilities where connections are required.
- 1.1.6 Call in relevant utility companies where required to locate utilities.
- 1.1.7 Undertake test digging where required.
- 1.1.8 Verify and coordinate finished elevations and dimensions of the work of one Section with respect to a related Section of the Work.
- 1.1.9 Prepare interference drawings of system and equipment components to ensure that all elements can be accommodated within the spaces provided.
- 1.1.10 Ensure that all clearances required by authorities having jurisdiction are maintained in the installed work.

1.2 SURVEYOR'S CERTIFICATE

- 1.2.1 Provide an Ontario Land Surveyor's Certificate with a Surveyor's Plan to verify the location of the building in relation to the existing property lines.
- 1.2.2 Submit to the Consultant four (4) copies of the Surveyor's Certificate and the Surveyor's Plan within seven days of completion of the exterior foundations.
- 1.2.3 On completion of the work submit to the Consultant the same Survey to show the outline of paved areas, final finished grades throughout the site and the location of buried services. Note any deviations from the approved working drawings.

END OF SECTION

PART 1 - GENERAL

1.1 PERMITS, LICENSES AND FEES

1.1.1 The Owner shall obtain and pay for, in a timely manner in order to avoid delays to the construction, the Building Permit and Occupancy Permit.

1.2 BUILDING CODE BY-LAWS AND REGULATIONS

1.2.1 Carry out all work in accordance with the regulations of the Ontario Building Code, latest issue, including all amendments and revisions.

1.2.2 Comply with all requirements, regulations and ordinances of all jurisdictional authorities.

1.2.3 Comply with and pay for requirements of local authorities regarding any necessary work outside the property lines such as curbs and sidewalks.

1.2.4 Inform the Consultant of any known variance of the Contract Documents from the requirements of the Building Code and authorities having jurisdiction and assume responsibility for work known to be contrary to such requirements and performed without notifying the Consultant.

1.3 FIRE PROTECTION

1.3.1 Materials and components required to construct fire rated assemblies and materials requiring fire hazard classification shall be listed and labelled.

1.3.2 Fire rated assemblies shall be constructed in accordance with applicable fire test report information issued by the fire rating authority. Deviation from fire test report will not be allowed.

1.3.3 Construct fire rated assemblies as continuous, uninterrupted elements except for permitted openings. Extend fire rated walls and partitions from top of floor assembly to underside of the fire rated assembly above.

1.4 HAZARDOUS MATERIALS

1.4.1 Comply with requirements of the Occupational Health and Safety Act, as amended to include WHMIS (Workplace Hazardous Materials Information System).

1.4.2 Ensure that a current Material Safety Data Sheets (MSDS) arrives before or with the first delivery of every controlled product.

1.4.3 Check the date to ensure that the MSDS is up-to-date (MSDS are valid for three years from date of production).

1.4.4 Ensure that worksite copies of the MSDS are available to workers wishing to consult them and to the health and safety representative and/or joint health and safety committee.

1.4.5 Ensure that workers are instructed in the purpose and content of MSDS.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

- 1.1.1 This Section outlines the mandatory minimum Health and Safety protocol for all renovation, addition and new construction Project where all or a portion of the existing building remains occupied and in use.
- 1.1.2 These Health and Safety protocols are mandatory minimum requirements, procedures and standards that the Owner insists are fully complied with by all parties involved with the Projects.

1.2 RELATED SECTIONS

- 1.2.1 These specifications apply to all Divisions of this Project specification. It is the responsibility of the Contractor to apply these provisions wherever practical within specification limits to all products and services used on this Project.
- 1.2.2 The requirements of this Section supersede those of all other specification Sections and Drawings. Where conflicts exist in procedures, methods or materials, they shall immediately be brought to the attention of the Consultant and Owner. Where clarification is not immediately available, the Contractor shall assume the specifications contained in this Section are a minimum standard and the more stringent specification shall apply.
- 1.2.3 The Contractor must receive approval from Owner for any deviations from this specification Section.
- 1.2.4 The General Contractor shall recognize that it is they who are the Constructor of the Project. The General Contractor shall also recognize that they are solely responsible for site safety at the Place of the Work and compliance with the requirements of this Section does not limit or remove his total responsibility for site safety as Contractor of the Project.

1.3 REFERENCES

- 1.3.1 Applicable related regulations, standards and laws related to safety include but are not limited to:
 - .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
 - .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
 - .3 Province of Ontario
 - .1 Latest Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O.

1.4 COMPLIANCE SPECIFICATION

- 1.4.1 Notwithstanding the requirements of this Section, the Contractor must comply with all applicable health, safety and environmental regulations and statues.

1.5 BEYOND COMPLIANCE SPECIFICATION

- 1.5.1 These specifications apply in addition to all applicable health, safety and environmental compliance regulations. They are incorporated here to reflect the Owner's intention to develop a specification which provides the safest practical procedures and policies for construction project sites that are occupied and in use by staff, students, and visitors during the execution of the Construction Contract.

- 1.5.2 Beyond compliance specifications recognize that performance well beyond the minimum regulatory standard is often desirable, possible and affordable, often with no cost or low cost options. It also recognizes that application methods or protocols may be as important as the material specified. Therefore, these specifications cover both material and methods.
- 1.5.3 These provisions apply to both indoor and outdoor applications equally.

PART 2 - EXECUTION AND COMPLIANCE REQUIREMENTS

2.1 APPLICATION OF COMPLIANCE REQUIREMENTS

- 2.1.1 The Contractor shall execute all of the procedures and meet all of the requirements set out herein and apply these protocols from the outset of the Construction Phase.
- 2.1.2 These procedures or requirements are to be maintained for the duration of the Construction Phase. The Contractor shall not discontinue any of the individual procedures or requirements without the prior approval of the Owner.

2.2 SITE SUPERVISOR (SITE SUPERINTENDENT)

- 2.2.1 A full-time Site Supervisor (Site Superintendent) is required for each site at any site, regardless of the number of active workers on site.
- 2.2.2 Site Superintendent must carry a cell phone at all times during construction with the ability to be reached directly during all work hours and the ability to have voicemail recorded during all non-work hours including weekends and holidays.
- 2.2.3 Site Superintendent shall not be changed throughout projects unless confirmed and approved by the Owner.

2.3 ONTARIO OCCUPATION HEALTH & SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS

- 2.3.1 General Contractor to comply with the Ontario Occupational Health & Safety Act and Regulations for Construction Projects, latest edition – including all amendments.
- 2.3.2 Beyond compliance in item .1 above, regardless of the number of labourers active on the Project, the General Contractor shall form a contractor's Health and Safety Committee at the outset of construction. This Committee shall then follow the standard requirements for such a Committee as set out in the *Occupational Health & Safety Act and Regulations for Construction Projects*.

2.4 ON-SITE COMMUNICATIONS

- 2.4.1 At the outset of the project the General Contractors shall provide to the Owner all relevant contract information for the Site Superintendent, General Contractor Project Manager and key sub-contractors including names and cell phone numbers.
- 2.4.2 The General Contractor shall provide at least one "emergency contact" telephone number at which the Contractor's representative can be reached directly during all work hours and have the ability to have voicemail recorded during all non-work hours including weekends and holidays. As outlined below, this may be designated to the Site Superintendent's cell phone number.
- 2.4.3 Regardless of compliance method for the emergency contact telephone number stated above, Site Superintendent must carry a cell phone at all times during construction with the ability to be reached directly during all work hours and the ability to have voicemail recorded during all non-work hours including weekends and holidays.

- 2.4.4 The Contractor is to ensure that the Owner and Consultant are immediately apprised of any safety issues as each arise and related request and/or resolution. The Owner and Consultant are responsible for any decisions that have an effect on the contract execution.
- 2.4.5 Notwithstanding the reporting to the Owner and Consultant noted above the Site Superintendent shall liaise with the Owner and Consultant on all safety related matters as required on a daily basis.
- 2.4.6 In the event of a safety issue requiring contractual clarification or action (i.e. Change Notice, etc.), the contractor shall ensure that, where applicable, the action is followed up with appropriate documentation.
- 2.5 SITE SAFETY SIGNAGE
- 2.5.1 Standardized Safety Signage is required at all construction entrances.
- 2.5.2 If not designated on the Contract Documents, the location of the Safety Signage shall be confirmed with the Owner and Consultant at the outset of the Project and before the placement of hoarding and fencing.
- 2.5.3 Safety Signage is to be posted at all street entrances to site and at each entrance to hoarded/ fenced construction area.
- 2.5.4 Total surface area of signage is to avoid exceeding municipal standards that would require a separate signage permit.
- 2.5.5 Access signage texts shall include cell phone contact number for Site Superintendent.
- 2.5.6 Contractor is responsible for co-ordination of all deliveries to the school. Deliveries are to be before of after school hours only. Communication with the Owner and school's caretaker is required before delivery.
- 2.6 ACCESS / EGRESS CONTROLS
- 2.6.1 At the outset of the Contract, the General Contractor shall advise all suppliers and subcontractors of the protocols listed herein and of the requirement to contact the Site Superintendent.
- 2.6.2 The drivers of all construction vehicles entering the site, including delivery vehicle drivers, are to contact Site Superintendent by cell phone prior to entering site; the Site Superintendent.
- 2.7 CONTRACTOR PARKING
- 2.7.1 Contractor parking is allowed on property during the summer, after school hours and on weekends. Contractor parking is not permitted on-site during school hours.
- 2.7.2 Outside of this street parking would be required ensuring to follow City By-Laws.
- 2.8 CONTRACTOR EQUIPMENT
- 2.8.1 Contractor is responsible to lock up all their equipment, materials, etc left on site.
- 2.8.2 Security of any materials, equipment, portable toilets, garbage bins, vehicles etc. are the Contractor's responsibility.
- 2.8.3 Contractor or their subtrades are not to use caretaker's equipment and/or tools.

- 2.8.4 A staging area for portable washroom, bins and container (for materials/equipment) must be approved by the Owner. No other area is to be used to store or house equipment or material. No materials and equipment are permitted to be stored on-site.
- 2.9 CONSTRUCTION FENCING AND HOARDING
- 2.9.1 Construction hoarding requirements shall be a site based decision to be determined by the Architect and Owner Project Manager at the design stage and shown on the Contract Documents.
- 2.9.2 Construction site area cannot impede on fire routes or city garbage removal.
- 2.9.3 Staging area placement and size must be approved by the Owner in writing, prior to erecting fencing and hoarding, and must be within the boundaries of the area noted in the Tender drawings.
- 2.9.4 In portions of the site where chain link is approved, it shall be continuous 1800mm high chain link fencing, wire-tied staked iron 'tees' at 1800mm on centre – OR – leased, modular 'fast fence' if staked down and wire tied together.
- 2.9.5 All fenced and hoarded areas to be gated with lockable vehicular and man gates- minimum construction to be steel rail and chain link construction.
- 2.9.6 The portable washroom must be within a fenced area that is locked and the portable washroom locked each night.
- 2.9.7 Plastic snow fencing is NOT permitted.
- 2.9.8 All hoarding and fencing shall be maintained in a stable condition, for the duration of construction period as part of the base contract price and to include Superintendent's inspection at the beginning and end of each work day.
- 2.9.9 All Fire Routes to be outside all fenced and hoarded areas and maintained clear at all times.
- 2.9.10 Sufficient space must be provided for the City garbage removal.
- 2.9.11 'Covered Way' protection shall be provided when accesses or pathway are proximity to construction, in accordance with Ministry of Labour *Occupational Health & Safety Act* Regulations.

END OF SECTION

PART 1 - GENERAL

1.1 START-UP MEETING

1.1.1 Post Contract Award, upon notification attend at location of Owner's choice, a start up meeting with the Owner and Consultants and Engineers.

1.2 PRE-CONSTRUCTION MEETING

1.2.1 Immediately prior to construction, upon notification attend at location of Owner's choice, a pre construction meeting, along with authoritative representatives of key subcontractors, project superintendent, inspection and testing company representatives, and the consultants.

1.2.2 Purpose of meeting is as follows:

- .1 Review project communications procedures.
- .2 Review Contract administration requirements including submittals, payment and change order procedures.
- .3 Identify all critical points on Construction Schedule for positive action.
- .4 Review Consultant's inspection requirements.
- .5 Review any points which require clarification.

1.3 SITE MEETINGS

1.3.1 Hold regular site meetings every two weeks. Ensure that persons, whose presence is required, Are present and that relative information is available to allow meetings to be conducted efficiently. The Consultant will attend these meetings. The Owner may also choose to attend these meetings, at his discretion.

1.3.2 Schedule additional meetings, if required.

1.3.3 Prepare an agenda for each meeting and distribute a copy to all required participants prior to the meeting.

1.3.4 Prepare and distribute meeting minutes to all within 72 hours.

1.4 SUPERVISION

1.4.1 Employ an experienced and qualified superintendent for the project who shall devote his time exclusively to the work of this Contract and who shall be in complete charge of the work from commencement to completion. A working foreman will not be acceptable. The superintendent shall not be changed after commencement of work without the Consultant's approval.

1.4.2 Supervise, direct, manage and control the work of all forces carrying out the work, including subcontractors and suppliers. Carry out daily inspections to ensure compliance with the working drawings and detailed specifications and the maintenance of quality standards. Ensure that the inspection staff includes personnel competent in supervising the mechanical and electrical trades.

1.5 PROGRESS RECORD

- 1.5.1 The Contractor shall maintain on site, permanent written record of progress of work. Record shall be open to inspection by Owner at all times and copy shall be furnished to Consultants upon the Consultant's request.
- 1.5.2 This record shall show weather conditions, dates of commencement, progress and completion of various trades and items of work. Particulars pertaining to erection and removal of forms, pouring of concrete, installation of roofing and other critical or major components as well as number of employees of various trades and type and quantity of equipment employed daily, shall be noted.
- 1.5.3 Display a copy of the construction schedule in the site office from start of construction to completion. Superimpose actual progress of work on schedule at least once each week.
- 1.6 AS-BUILT DRAWINGS
 - 1.6.1 Maintain an accurate set of As-Built Drawings showing progress of the work and all changes, revisions and additions to the work and deviations from the Contract Documents in red ink.
 - 1.6.2 Include accurate location, depth, position, size and type of concealed and underground services, both inside and outside shall be as part of these As-Built Drawings, as required.
 - 1.6.3 As-Built Drawings shall be available for review at each site meeting by the Consultant.
- 1.7 DOCUMENTS ON SITE
 - 1.7.1 The Contractor at all times will have on-site, a complete set of Contract Documents (Schematic Drawings and Performance Specifications) with all addenda, site instructions, change orders, reviewed shop drawings and samples, colour schedule, paint materials schedules, hardware list, progress reports and meeting minutes.
 - 1.7.2 The Contractor at all times will have on-site, a complete set of all construction documents, as issued for building permit and bearing the stamp of the appropriate municipal authority.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 No work requiring a sample or shop drawing submission shall be commenced until the submission has received the Consultant's final review. All such work shall be in accordance with reviewed samples and shop drawings.

1.1.2 Provide submittals as requested by the Contract Documents, as specified herein, and in accordance with the conditions of the Contract.

1.1.3 In addition to submittals specifically requested by the Contract Documents, provide other submittals as may be reasonably requested by the Consultant, or as are required to coordinate the Work and to provide the Owner with choices available, within the scope of Contract Documents.

1.1.4 Contractor's review of submittals:

- .1 Review submittals for conformity to Contract Documents before submitting to Consultant. Submittals shall bear stamp of Contractor and signature of a responsible official in Contractor's organization indicating in writing that such submittals have been checked and coordinated by Contractor. Contractor's review shall be performed by qualified personnel who have detailed understanding of those elements being reviewed and of the conditions at the Place of the Work proposed for installation.
- .2 Check and sign each submittal and make notations considered necessary before submitting to Consultant for review. Where submittal is substantially and obviously in conflict with requirements of Contract Documents, reject submittal without submitting to Consultant and request resubmission. Note limited number of reviews of each submittal covered under Consultant's services as specified below.
- .3 Contractor shall assume sole responsibility for any conflicts occurring in the Work that result from lack of comparison and coordination of submittals required for the Work.
- .4 Submittals that have not been reviewed, checked, and coordinated by Contractor prior to submission to Consultant, will be rejected.
- .5 Notify Consultant in writing of changes made on submittals from Contract Documents. Consultant's review of submittals shall not relieve Contractor of responsibility for changes made from Contract Documents not covered by written notification to Consultant.

1.1.5 Consultant's review of submittals:

- .1 Review of submittals by Consultant is for the sole purpose of ascertaining conformance with the general design concepts and the general intent of the Contract Documents. This review shall not mean that Consultant approves the detail design inherent in the submittals, responsibility for which shall remain with the Contractor. Such review shall not relieve the Contractor of responsibility for errors or omissions in the submittals, or responsibility for meeting requirements of Contract Documents.
- .2 Contractor shall be responsible for dimensions to be confirmed and correlated at the Place of the Work for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of the Work.
- .3 Consultant's review and markings on submittals do not authorize changes in the Work or the Contract Time.

1.1.6 Make submittals with reasonable promptness and in an orderly sequence so as to cause no delay in the Work. Be responsible for delays, make up time lost and pay added costs, at no additional

cost to the Owner, incurred because of not making submittals in due time to permit proper review by Consultant.

- 1.1.7 Do not proceed with work affected by a submittal, including ordering of Products, until relevant submittal has been reviewed by Consultant.
- 1.1.8 Contractor's responsibility for errors and omissions in submittals is not relieved by Consultant's review of submittals.
- 1.1.9 Contractor's responsibility for deviations in submittal from requirements of Contract Documents is not relieved by Consultant's review of submittal, unless Consultant gives written acceptance of specific deviations.
- 1.1.10 Engineered submittals:
 - .1 Submittals for items required to be sealed by professional engineer (or as otherwise indicated as engineered), shall be prepared under the direct control and supervision of a qualified professional engineer registered in the Place of the Work, and having minimum professional liability insurance required in accordance with the General Conditions, as amended.
 - .2 Design includes life safety, sizing of supports, anchors, framing, connections, spans, and as additionally required to meet or exceed requirements of applicable codes, standards, regulations, and authorities having jurisdiction.
 - .3 Engineered submittals shall include design calculations, complete with references to codes and standards used in such calculations, supporting the proposed design represented by the submittal. Prepare calculations in a clear and comprehensive manner so that they can be easily reviewed. Incomplete or haphazard calculations will be rejected.
 - .4 The professional engineer responsible for the preparation of engineered submittals shall undertake periodic field review, including review of associated mock-ups, at locations wherever the work as described by the engineered submittal is in progress, during fabrication and installation of such work, and shall submit a field review report after each visit. Field review reports shall be submitted to the Consultant, to authorities having jurisdiction as required, and in accordance with the building code.
 - .5 Field reviews shall be at intervals as necessary and appropriate to the progress of the work described by the submittal to allow the engineer to be familiar with the progress and quality of such work and to determine if the work is proceeding in general conformity with the Contract Documents, including reviewed shop drawings and design calculations.
 - .6 Upon completion of the parts of the Work covered by the engineered submittal, the professional engineer responsible for the preparation of the engineered submittal and for undertaking the periodic field reviews described above, shall prepare and submit to the Consultant and authorities having jurisdiction, as required, a letter of general conformity for those parts of the Work, certifying that they have been Provided in accordance with the requirements both of the Contract Documents and of the authorities having jurisdiction over the Place of the Work.
 - .7 Costs for such field reviews and field review reports and letters of general conformity are included in the Contract Price.
- 1.1.11 Keep copies of reviewed submittals at the Place of the Work in a neat, orderly condition. Only submittals that have been reviewed by the Consultant's and are marked with Consultant's review stamp, as applicable, are permitted at the Place of the Work.

- 1.1.12 The Work shall conform to reviewed submittals subject to the requirements of this section. Remove and replace materials or assemblies not matching reviewed submittals at no increase in the Contract Time and at no additional cost to the Owner.

PART 2 - PRODUCTS

- 2.1 MATERIAL LIST
- 2.1.1 Within 10 days of award of Contract, submit a complete list of manufactured materials to Consultant.
- 2.1.2 List is required to enable Consultant to verify that materials meet Specifications prior to submission of shop drawings or installation, and to select colours and/or patterns.
- 2.1.3 Should materials not meeting requirements be included, the Consultant will require re-submission.
- 2.1.4 Only the listed materials shall be used, unless otherwise approved by the Consultant.

PART 3 - EXECUTION

- 3.1 PROJECT MEETING
- 3.1.1 Schedule regular bi-weekly construction progress meetings for duration of the work.
- 3.1.2 Contractor, major Subcontractors currently involved in the Work, Consultant and Owner are to be in attendance of the bi-weekly meetings.
- 3.1.3 Record minutes of each meeting and distribute copies to all participants, and all others requiring information of recorded minutes, within one week of date meeting.
- 3.1.4 Meeting Agenda will include the following:
- .1 Review and approval of minutes from previous meeting.
 - .2 Work progress since previous meeting.
 - .3 Field observations, including any problems, difficulties, or concerns.
 - .4 Construction progress schedule.
 - .5 Two-week look ahead schedule.
 - .6 Submittal schedule including Status of CCOs, COs, RFIs, SIs, CAEs etc. (provide logs).
 - .7 Proposed changes in the Work.
 - .8 Shop drawing status and long lead items.
 - .9 Site Safety Issues.
 - .10 Maintenance of construction quality standards.
 - .11 Other business.
- 3.2 SHOP DRAWINGS
- 3.2.1 The term shop drawings means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data which are to be provided by the Contractor to illustrate details of a portion of the work.
- 3.2.2 Contractor shall arrange for the preparation of clearly identified shop drawings called for by the Contract Documents or as the Consultant may reasonably request.
- 3.2.3 Submitted shop drawings must indicate the name of the project and specific information as to

location within the project including reference to the drawing or specification section to which it relates.

- 3.2.4 The shop drawings shall show, but not necessarily be limited to the following:
- .1 Clear and obvious notes of any proposed changes from Drawings and Specifications.
 - .2 Fabrication and erection dimensions.
 - .3 Provisions for allowable construction tolerances and deflections provided for live loading.
 - .4 Details to indicate construction arrangements of the parts and their connections, and interconnections with other work.
 - .5 Location and type of anchors, and exposed fastenings.
 - .6 Materials and finishes.
 - .7 Descriptive names of equipment.
 - .8 Mechanical and electrical characteristics when applicable.
 - .9 Information to verify that superimposed loads will not affect function, appearance, and safety of the work detailed as well as of interconnected work.
 - .10 Assumed design loadings, and dimensions and material specifications for load bearing members.
 - .11 Dimensions and dimensioned locations of proposed chases, sleeves, cuts and holes in structural members.
- 3.2.5 Prior to submission to the Consultant the Contractor shall review all shop drawings. By this review the Contractor represents that he has determined and verified all field measurements, field construction criteria, materials, catalogue numbers, and similar data, or will do so, and that he has checked and coordinated each shop drawing with the requirements of the work and of the Contract Documents. The Contractor's review of each shop drawing shall be indicated by stamp, date, and signature of a responsible person.
- 3.2.6 Contractor shall submit drawings to the Consultant for his review with reasonable promptness and in orderly sequence so as to cause no delay in the work or the work of other Contractors. If either the Contractor or the Consultant so requests they shall jointly prepare a schedule fixing the dates for the submission and return of shop drawings. Shop drawings shall be submitted in the form of one reproducible transparency and one white print. Where the subject of the shop drawings involves the structural, mechanical, or electrical Engineers, in addition to the one reproducible transparency, submit two white prints. At time of submission the Contractor shall notify the Consultant in writing of any deviation in the shop drawings from the requirements of the Contract Drawings.
- 3.2.7 Contractor shall make any changes in the shop drawings which the Consultant may require consistent with the Contract Documents and resubmit unless otherwise directed by the Consultant. When resubmitting, Contractor shall notify the Consultant in writing of any revision other than those requested by the Consultant.
- 3.2.8 Shop drawings shall define the division of responsibility between the trades and items shown on shop drawings. Shop drawings shall show materials, methods of construction, and attachment or anchorage, erection, connections and other details necessary to complete the work. Shop drawings shall show cross references to Drawings and specifications.
- 3.2.9 Review by the Consultant is for the sole purpose of ascertaining conformance with the general design concept. Review shall not mean that the Consultant approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same and such review does not relieve Contractor of his responsibility for errors or omissions in the shop drawings, or his responsibility for meeting all requirements of the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that

pertains solely to fabrication processes or technique of construction and installation, and for coordination of the work of all its subtrades and work of other Contractors.

- 3.2.10 Any adjustments made on the shop drawings by the Consultant are not intended to change the Contract Sum. If the Contractor deems that such adjustments affect the value of the work, he shall so state in writing before proceeding with the fabrication and installation of the work.
- 3.2.11 Submit two copies of each final reviewed shop drawing to the Consultant.
- 3.2.12 After final review, the Consultant will return reviewed copies to the Contractor, who shall reproduce, at his expense the number of prints required.
- 3.2.13 Submit 6 copies of standard preprinted shop drawings. Assemble submittals of more than 2 pages in individual booklet form, after final review. Consultant will return at least 3 copies of shop drawings to the Contractor.
- 3.2.14 After final review, the Consultant will return one copy to the Contractor.
- 3.2.15 Shop drawings which require the approval of a legally constituted authority having jurisdiction shall be submitted by the Contractor to such authority for approval. Such shop drawings shall receive final approval of authority having jurisdiction before being submitted to the Consultant.
- 3.2.16 No work requiring a sample or shop drawing submission shall be commenced until the submission has received the Consultant's final review. All such work shall be in accordance with reviewed samples and shop drawings.
- 3.3 **SAMPLES**
 - 3.3.1 For the purpose of this Article samples means: Samples, models and templates.
 - 3.3.2 Samples shall be submitted to the Consultant in a number as specified in the respective Section in sufficient time to permit review process before the item is needed to be installed or as directed otherwise.
 - 3.3.3 If either the Contractor or the Consultant so requests, they shall jointly prepare a schedule fixing the dates for submission and return of samples, including time allowances for re-submissions.
 - 3.3.4 Samples shall be submitted by the Contractor only.
 - 3.3.5 Samples which are "rejected" shall be removed by the Contractor.
 - 3.3.6 Samples will receive consideration only when hand delivered or mailed accompanied with a covering letter signed by the Contractor. Letter shall be sent via First Class mail and shall contain a list of samples being submitted, name of project, Contractor, Subcontractor, manufacturer, brand, also the project number, specification article and paragraph numbers to which the samples refer, and such additional information as may be required by the specification for the particular item being furnished. A copy of the letter shall be enclosed with the samples and any sample received without identification letter will be considered "unclaimed goods" and will be held for a limited time only.
 - 3.3.7 Each sample shall be labelled to indicate name of project, Contractor, Subcontractor, manufacturer, brand, job number, as required.
 - 3.3.8 Where samples are rejected by the Consultant, new samples shall be submitted as soon as

possible after notification of the rejection and shall be marked "Second submissions" or subsequent submissions in addition to the other information required on the label.

- 3.3.9 Review by the Consultant is for the sole purpose of ascertaining conformance with general design concept. This review shall not mean that the Consultant approves the detail design inherent in the samples, responsibility for which shall remain with the Contractor submitting same and such review shall not relieve the Contractor of his responsibility for errors or omissions or of his responsibility for meeting all requirements of the Contract Documents.
- 3.3.10 Cost of all samples shall be paid by the Contractor including all carrying charges, which shall be prepaid.
- 3.3.11 Where colour, pattern, or texture is a criterion, submit the full range of samples.
- 3.3.12 Field samples and mock-ups may form part of the Work if so agreed to by the Consultant.
- 3.3.13 Construct each sample or mock-up complete, including the work of all trades.
- 3.3.14 Reviewed samples or mock-ups will become standards of workmanship and material against which installed work shall be checked.

3.4 ACCESS PANELS AND ACCESS DOORS

- 3.4.1 Before commencing the installation of mechanical and electrical work, the Contractor with his mechanical and electrical Subcontractors shall prepare on a set of Drawings provided for that purpose, a complete lay out of all access panels and access doors which will be required. These lay outs shall be submitted for review as specified for shop drawings, and shall show exact sizes and locations of access panels and doors. Revisions may be required to the lay out before final review.
- 3.4.2 Items requiring access panels shall be located behind removable materials wherever possible. Location of access panels may be relocated by the Consultant to more unobtrusive locations.
- 3.4.3 Access panels and doors shall be finished to match adjacent wall and/or ceiling finish unless otherwise specified or indicated.

3.5 PROGRESS SCHEDULE

- 3.5.1 Contractor shall prepare and deliver to the Consultant for submitting to the Owner, within ten (10) days after the award of the contract, a progress schedule, indicating the dates for:
 - .1 Submission of shop drawings for the various Sections of the Work; shop drawings schedule for mechanical and electrical work shall contain a list identifying the contents of each shop drawing by subject matter, item, manufacturer's name and supplier's name.
 - .2 Commencement and completion of each major division of work, including the work to be done by the Subcontractors.
 - .3 Final completion date.
- 3.5.2 After the Owner issues the Award Letter, the Contractor is to submit the following documents as per the the Award Letter:
 - .1 WSIB Certificate
 - .2 Proof of Insurance
 - .3 Electronic Bonds

- 3.5.3 Furnish monthly progress reviews as related to the work schedule. Reviews shall include comments on both, the parts of the Work and general progress of the project. Correlate reviews to progress payment applications.
- 3.5.4 Update and re-issue the progress schedule as required to conform to monthly progress reviews.
- 3.5.5 Maintain progress schedule, as the work progresses.
- 3.5.6 Progress review shall show weather conditions, dates of commencement, progress and completion of various trades and items of work. Particulars pertaining to erection and removal of forms, pouring of concrete and type and quantity of equipment employed daily, shall be noted.
- 3.5.7 Completely update schedule and cash flow chart whenever changes occur to scheduling, in a manner and at times satisfactory to the Owner.
- 3.5.8 Provide competent and experienced staff familiar with scheduling work of this type to prepare, maintain, revise, direct and check implementation of schedule.
- 3.6 IMPERIAL
 - 3.6.1 Contractor's submittals containing measurements of any kind shall be in the Imperial system of measurement.
- 3.7 PROGRESS PHOTOGRAPHS
 - 3.7.1 Before starting work, photograph interiors, to record existing conditions and send electronically to the Consultant and the Owner.
 - .1 The number of photographs, close or otherwise must be sufficient to ensure that existing conditions are adequately recorded to minimize the possibility of unjustified claims against the Contractor and Owner.
 - .2 Where parts of existing buildings are concealed pending demolition work of this Contract, photograph immediately on exposure.
 - 3.7.2 Upon commencement of the Work, and thereafter at monthly intervals until Completion of the Contract, the Contractor shall supply the Consultant with three copies of photographs with sufficient views, 4 locations, of the progress on all parts of the Work.
 - 3.7.3 Contractor shall include for the total number of photographs stated herein, but the Consultant shall have the right to request that fewer photographs be taken at certain intervals, so that more photographs may be taken at other times, providing the total number of photographs taken remains the same.
 - 3.7.4 Photographs shall be taken from exterior locations as determined by the Consultant.
 - 3.7.5 Monthly Digital photograph by email is acceptable.
- 3.8 AS-BUILT DRAWINGS
 - 3.8.1 Upon completion of Work, distribute As-Built Drawings electronically to the Consultant and the Owner in PDF and CAD format.
- 3.9 MOCK-UPS
 - 3.9.1 Where required by the Contract Documents or as may reasonably be requested by the

Consultant during the course of the Work, Provide field or shop erected example of work complete with specified materials and workmanship.

- 3.9.2 Erect mock-ups at locations as specified and as acceptable to Consultant. Do not proceed with work for which mock-ups are required prior to Consultant's review of mock-ups.
- 3.9.3 Modify or remove and replace mock-ups as many times as required to secure acceptance of the Consultant. Such removal and replacement shall be done at no increase in either the Contract Price or the Contract Time.
- 3.9.4 Protect and maintain mock-ups until directed to be removed. Commence work demonstrated in mock-up only after review and acceptance of workmanship. If possible, mock-up may become part of finished work, at sole discretion, and with prior written acceptance, of Consultant.
- 3.9.5 Reviewed and accepted mock-ups will become standards of workmanship and material against which installed work will be compared.
- 3.9.6 Remove and replace materials or assemblies not matching reviewed mock-ups.
- 3.9.7 Resubmit mock-ups until written acceptance is obtained from Consultant.
- 3.10 EXTRA MATERIALS
 - 3.10.1 Supply extra materials at completion of Project as specified in Trade Sections of this Specification.
 - 3.10.2 Deliver extra materials to location designated by the Owners representative.
- 3.11 WASTE MANAGEMENT
 - 3.11.1 Contractor shall prepare and submit waste audit and reduction plan in compliance with the requirements of Ontario Regulations 102/94, Waste Audits and Waste Reduction Workplans and 103/94, Industrial, Commercial and Institutional Source Separation Programs under the Environmental Protection Act of Ontario. For definitions refer to Ontario Regulation 105/94, Definitions.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- 1.1.1 Comply with all Sections of Division 1, General Requirements and all documents referred to therein.
- 1.1.2 Provide all labour, materials, products, equipment and services required to complete the work of alterations and make good to existing building according to the Specifications and/or Drawings.
- 1.1.3 Execute each part of the Work related to existing building by tradesmen specializing in such work.
- 1.1.4 Schedule Work to avoid interference with progress of new construction Work.

1.2 PERMITS AND REGULATIONS

- 1.2.1 Arrange and pay for all permits, notices and inspections necessary for the proper execution and completion of the alteration work. For the exception of Building Permit which is to be paid for and provided by the Owner.
- 1.2.2 Follow Ontario Office of the Fire Marshall "Guidelines for Maintaining Fire Safety During Construction in Existing Buildings".

1.3 EXISTING BUILDING

- 1.3.1 Visit the site and become fully knowledgeable of existing building drawings and specifications and of conditions affecting the Work.
- 1.3.2 Ensure the operations of the existing building, the existing tenants' premises and access to the existing building areas, are not restricted or disrupted.
 - .1 Maintain existing exits and ensure that proper and safe means of egress from all parts of existing building to open spaces are provided at all times to the approval of authorities having jurisdiction. Locate and install exit lights, and illuminate temporary means of egress.
- 1.3.3 Before any work is commenced in any portion of the existing building, the Owner will remove all furnishing and movable furniture that do not require disconnecting from services, storing same in some other portion of the building or off the premises. All other items not removed from any section of the building being renovated, shall be removed from the premises by the Contractor.
- 1.3.4 All noisy, dusty and disruptive work to be completed outside of school hours.
- 1.3.5 The removal of hazardous and asbestos-containing materials will be under same contract and shall be the first scope undertaken before all other.

PART 2 - PRODUCTS

2.1 SALVAGE MATERIALS

- 2.1.1 Salvage materials, products, and equipment indicated. Carefully remove items to be salvaged, protect during alteration and reinstall in locations indicated.
- 2.1.2 Refer to sprinkler, mechanical and electrical Drawings and specifications for sprinkler, mechanical and electrical work to be reused.

- 2.1.3 Salvage the items as indicated on the Drawings for reuse and return to the Owner in an adequately preserved and usable condition on date of Substantial Performance or other mutually agreed date.
- 2.1.4 All materials and products from the alteration not required for reuse shall become the property of the Contractor. Remove all material and debris from the site as quickly as possible and dispose of legally. Burning of debris on the site will not be permitted.

2.2 SERVICES IN EXISTING BUILDING

- 2.2.1 Ensure that existing services are not damaged during demolition and construction. Arrange with mechanical and electrical Subcontractors to immediately cut off and cap concealed services uncovered during work.
- 2.2.2 Do not interrupt mechanical or electrical services of the existing building except for temporary close-downs to make connections to new work, and as approved by prior arrangements. Give the Owner minimum 72 hour notice of intention to interrupt mechanical or electrical services in existing building in any area. Notice is dependent on partial or full shutdown. For full shutdown up to 5 days notice is required.
- 2.2.3 In no case shall service interruptions affect the total existing building.
- 2.2.4 Should existing services be accidentally uncovered and disrupted, make complete restoration immediately, and ensure adequate protection to avoid further disruption until alternative means of providing permanent continuation of the services are made.
- 2.2.5 Make payment for work specified in the foregoing at no additional cost to the Owner if, in the opinion of the Consultant, such work could have been reasonably foreseen by examination at time of bidding and which has been caused by lack of proper care and protection.
- 2.2.6 Unless otherwise specified, restore services on which work is performed to original condition.

PART 3 - EXECUTION

3.1 SCREENS

- 3.1.1 Provide temporary fire rated partitions, screens, enclosures, tarpaulins etc., as may be required to enclose work areas from other areas of the building, to maintain security and to confine dust, noise and workmen to the work area. Locate screens as directed by the Consultant.
- 3.1.2 It is essential that the existing building be maintained weather-tight at all times. Provide temporary protection, enclosures, tarpaulins, etc., as may be required to weatherproof any openings made in the Work.
- 3.1.3 Construct fire rated, dust proof and wind-proof screens as required to completely enclose the work areas and the access passages to the work areas from the other areas of the existing building. Locate partitions as directed by the Consultant.
- 3.1.4 Build screens of 3-5/8" metal studs at 16" centres sheathed with sheets of 5/8" sheetrock firecode 'c' panels on both sides with close joints smoke and fire sealed at junctions typical. Where exposed to the weather, fully cover screens with a heavy waterproof and dustproof paper with lapped and sealed joints. Fill spaces between studs with 4" fibrous glass or mineral wool insulation batts to deaden sound.

3.1.5 Thoroughly pack framing and sealed at junctions of screens with floors, walls and ceilings with batt insulation in a manner to prevent infiltration of smoke, dust, dirt, etc. Over all junctions of screens with floors, walls and ceilings, apply continuous 1-1/2" wide strips of masking tape both sides of screen to ensure that rooms within closed off areas which are not being altered are kept dust free.

3.2 SEQUENCE OF ALTERATIONS

3.2.1 Schedule phasing of alterations and demolition as indicated on Drawings.

3.3 DEMOLITION

3.3.1 Demolition of, or alteration to, any portion of the existing buildings shall proceed only after approval of the Owner, and after weather-tight and dustproof partitions have been erected to provide thorough protection to the adjoining areas and rooms.

3.3.2 When permission has been granted to proceed with alterations in the existing buildings, work shall be carried out expeditiously and continuously to completion.

3.3.3 If suspected hazardous or contaminated materials are encountered, advise Consultant and the Owner and await instructions regarding removal and disposal of such contaminants which may be considered hazardous to health, prior to demolition.

3.4 RECONSTRUCTION, ALTERATIONS AND MAKING GOOD

3.4.1 The work shown on the Drawings, Schedules and Specifications may or may not be all the work required, do all demolition, make good all finishes and execute all necessary work including incidentals to make a complete job of the alterations.

3.4.2 Do not undermine, damage, or endanger existing pipe lines, electrical conduit and wiring by digging, cutting or any other operation in the performance of the Work of the Contract. Immediately repair and make good to any existing work so affected to the Consultant's satisfaction at the Contractor's expense.

3.4.3 Cut off, cap, divert, or remove existing water, gas, electric and other services in areas being altered which are affected by the changes as required or as directed by the municipal authorities and the utility company concerned, and the Consultant. Protect and maintain active services to the existing building.

3.4.4 Perform the Work in such a manner so as to cause a minimum of noise or interference to the use of the existing building.

3.4.5 Whenever it becomes necessary to cut or interfere in any manner with existing apparatus for short periods of time, Do work at such times as agreed upon between the Owner, Consultant, and the Contractor.

3.4.6 Where new work connects with existing and where existing work is altered, all necessary cutting and fitting required to make satisfactory connections with the existing work shall be performed under this Contract, so as to leave the entire work in a finished and workmanlike condition.

3.4.7 Make good materials and finishes which are damaged or disturbed during the process of additions and reconstruction under the Contract.

- 3.4.8 Where existing work is to be made good, the new work shall match exactly the old work in material, form, construction and finish unless otherwise noted or specified.
- 3.4.9 Perform drilling of existing work carefully, leaving a clean hole no larger than required.
- 3.4.10 Provide, throughout the entire construction period, proper and safe means of fire exit from all zones of the existing building at all times to the approval of the authorities having jurisdiction.
- 3.4.11 Protect work in the existing buildings, such as floors, finishes, trim, etc., as completely as possible to hold the replacing of damaged work by each Section to a minimum.
- 3.4.12 Provide openings through existing roof as required by new mechanical equipment. Maintain watertight at all times. Provide new blocking, curbs and cants and make good roof and provide flashing as may be required.
- 3.4.13 Protect existing roofs, roof flashings, parapets and all items on roofs from damages of any cause, and make good damages at no cost to the Owner.
- 3.4.14 Ensure the public is protected against falling debris, chemicals and water.
- 3.4.15 Properly co-ordinate the various Sections taking into account also the existing installations to assure the best arrangement of pipes, conduits, ducts and mechanical, electrical and other equipment, in the available space. Under no circumstances will any extra cost be allowed due to the failure by the Contractor to co-ordinate the work. If required, in critical locations, interference and/or installation drawings shall be prepared showing the work of the various Sections as well as the existing installation, and these drawings shall be submitted to the Consultant for review before the commencement of work.
- 3.4.16 Removal and relocation of mechanical and electrical items indicated as relocated and reused are specified under respective Mechanical and Electrical Drawings. Co-ordinate the removal and relocation of these items.
- 3.4.17 Remove existing finishes as indicated on the Drawings to neat, straight lines and leave substrate clean and even, suitable for new finishes indicated.
- 3.4.18 Without limiting the generality of the foregoing, do the following repairs:
 - .1 Replace existing windows as located on the Drawings. Solidly anchor and make weather tight.
- 3.4.19 Remove temporary partitions and screens when no longer required, and make good damaged or blemished adjoining work as directed by Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 For the purposes of this Section, independent inspection and testing agencies are referred to as "Inspector(s)".

1.1.2 The Owner, or the Consultant on his behalf, may obtain the services of Inspectors for the purpose of maintaining quality assurance and compliance with the Contract Documents. Reports by Inspectors shall in no way relieve the Contractor of his obligation to perform the work in accordance with the Contract Documents, or to maintain his own quality control.

1.1.3 The cost of supplying materials, products, and labour for testing purposes, and erection of entire mock ups, prototypes, and sample installations where specified, shall be borne by the Contractor and constitutes a part of the Work

1.2 REFERENCES

1.2.1 ASTM E329-14a Standard Specification for Agencies Engaged in Construction Inspection, Testing or Special Inspection.

1.3 QUALIFICATION OF INSPECTORS

1.3.1 Inspectors shall be authorized to operate in the Province in which the Project is located.

1.3.2 Inspectors required to provide laboratory services shall meet "Recommended Requirements for Independent Laboratory Qualification", published by the American Council of Independent Laboratories.

1.3.3 Where applicable, Inspector shall meet basic requirements of ASTM E329.

1.4 APPOINTMENT AND PAYMENT

1.4.1 Cost of inspection and testing shall be paid out of cash allowances listed in Section 01 21 00 Allowances, where so specified. Additional inspection and testing required for Owner's quality control will be paid by the Owner, except as otherwise stipulated in the Contract Documents.

1.4.2 The Contractor shall co-ordinate and the Owner shall pay independent inspection companies who shall inspect and test site conditions, procedures and materials related but not limited to the following:

- Asphalt Paving
- Foundations
- Fireproof spray
- Fill and compaction
- Concrete
- Mortar
- Steel reinforcement
- Steel erection
- Waterproofing
- Roofing and Air Barrier, Building Envelope
- Millwork (AWMAC)
- Windows

1.4.3 The Consultant will appoint Inspectors to perform services specified in respective Specification Sections, except for the following:

- .1 Inspection and testing required by laws, ordinances, rules, regulations, or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience or their own quality control.
 - .3 Testing, adjustment, and balancing of conveying systems, mechanical and electrical equipment and systems.
 - .4 Mill tests and certificates of compliance.
 - .5 Tests specified to be carried out by Contractor under the supervision of the Consultant.
- 1.5 INSPECTOR'S RESPONSIBILITIES
- 1.5.1 Co-operate with the Consultant and the Contractor; provide qualified personnel after due notice.
- 1.5.2 Perform specified inspections, sampling, and testing of materials and methods of construction:
- .1 Comply with specified standards, requirements of authorities having jurisdiction and as specified.
 - .2 Ascertain compliance of materials with requirements of Contract Documents.
- 1.5.3 Promptly notify Consultant, Owner, and Contractor of observed irregularities or deficiencies of work and products.
- 1.5.4 Submit within 4 days of inspection and testing electronic copies of reports of such inspection and tests to:
- .1 Owner
 - .2 Consultant
 - .3 Contractor
- 1.5.5 Submit additional copies as directed or as specified under respective Sections.
- 1.5.6 Include in each report:
- .1 Date issued.
 - .2 Project title and number.
 - .3 Testing and inspection agency name, address and telephone number.
 - .4 Name and signature of individual responsible for test or inspection.
 - .5 Date and time of sampling or inspection.
 - .6 Record of temperature and weather conditions.
 - .7 Date of Test.
 - .8 Identification of produce and reference to Specification Section.
 - .9 Location of sample or test in Project.
 - .10 Type of inspection or test.
 - .11 Results of tests and compliance with Contract Documents.
 - .12 Interpretation of test results, when requested by the Consultant.
- 1.5.7 Perform additional services as required by Owner.
- 1.5.8 Inspector is not authorized to:
- .1 Revoke, alter, enlarge on, or release requirements of Contract Documents.
 - .2 Approve or accept any portion of the Work.
 - .3 Perform any duties of the Contractor's.

PART 2 - EXECUTION

2.1 CONTRACTOR'S RESPONSIBILITIES

- 2.1.1 Contractor shall maintain his own quality control to ensure that the requirements of the Contract Documents are attained.
- 2.1.2 Co-operate with Inspector's personnel. Provide access to work, and to manufacturer's operations to facilitate execution of required services.
- 2.1.3 Secure and deliver to Inspector adequate quantities of representative samples of materials proposed to be used which require testing.
- 2.1.4 Furnish mix designs proposed to be used for concrete, mortar, grout, and other material mixes with certification by an independent inspection and testing company that such mix designs meet the requirements of the Contract Documents.
- 2.1.5 Furnish copies of product tests, or mill test reports of steel products, as required.
- 2.1.6 Furnish labour and facilities to:
 - .1 Provide access to work to be inspected.
 - .2 Facilitate inspections and tests, including obtaining and handling samples at Project site or at source of product to be tested.
 - .3 Make good any work disturbed by inspection and test.
- 2.1.7 Provide storage on site for Inspector's exclusive use to store equipment and cure test samples.
- 2.1.8 Notify Inspector and Consultant sufficiently in advance of operations to allow assignment of personnel and scheduling of tests. When tests or inspections cannot be performed after such notice, reimburse Owner for Inspector's personnel and travel expenses incurred due to Contractor's negligence.
- 2.1.9 Pay costs for uncovering and make good work that has been covered before the required inspection or testing is completed and approved by the Consultant.

2.2 RESPONSIBILITIES OF THE CONSULTANT

- 2.2.1 The Contractor will submit a list of Inspection and Testing companies to the Consultant for his review.
- 2.2.2 The Consultant and Contractor will direct inspection and testing companies in the type and extent of inspection and testing to be undertaken.
- 2.2.3 The Consultant will receive submitted reports of inspections and tests for evaluation and will decide upon any actions that may be required.
- 2.2.4 The Consultant will provide Drawings and Specifications required by inspection and testing companies.

2.3 FAULTY WORK

- 2.3.1 Where tests or inspections reveal work not in accordance with Contract requirements, the Contractor shall bear costs for such additional tests or inspections as the Consultant deems necessary to verify the acceptability of corrected work.
- 2.3.2 All testing shall be conducted in accordance with the requirements of the Consultant.

2.3.3 Defective work discovered before expiration of the warranty period specified in the General Conditions of the Contract, as may be extended in this Specification, will be rejected, whether or not it has been previously inspected. If rejected, defective materials or work incorporating defective materials or workmanship shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

2.4 TOLERANCES FOR INSTALLATION OF WORK

2.4.1 Unless acceptable tolerances are otherwise specified in a Section or a reference standard or are otherwise required for proper functioning of equipment, site services, and mechanical and electrical systems:

- .1 "plumb and level" shall mean plumb or level within 3mm in 3048mm (1/8" in 10').
- .2 "square" shall mean not in excess of 10 seconds lesser or greater than 90 degrees.
- .3 "straight" shall mean within 3mm (1/8") under a 3048mm (10') long straight edge.

END OF SECTION

PART 1 - GENERAL

1.1 TEMPORARY OFFICES AND SHEDS

1.1.1 Contractor is not permitted to use any part of existing facility for storage, meeting spaces, site offices, washrooms facilities or lunch rooms.

1.1.2 Provide an adequate temperature controlled and ventilated Contractor's field office, with suitable lighting for own use.

- .1 Temporary field offices shall be designated on site. No other location shall be used for temporary field office. Temporary site office shall be sufficiently sized.
- .2 Heat, cool, ventilation and light office to minimum code requirements for office buildings.
- .3 Keep temporary field office clean and remove all rubbish at the end of each work day.
- .4 Include construction and operating hardware, with security locks, as required by the Owner.

1.1.3 Site Storage:

- .1 Contractor to provide their own storage trailers or construct weather-tight storage sheds for storage of materials that may be damaged or defaced by weather, in locations indicated by the Owner.
- .2 Include security locks, as required.
- .3 Install lighting in storage areas and heat in those storage areas containing materials damaged by low temperature.
- .4 Provide separate shed located where directed in writing by Consultant for storage of volatile materials.
- .5 Owner is not responsible for securing Products or materials at the Place of the Work.
- .6 Handle and store materials so as to prevent damage or defacement to the Work and surrounding property.
- .7 The Contractor is solely responsible for any materials, tools, material and equipment left on-site.

1.2 TEMPORARY SERVICES

1.2.1 Power, light, water and heat are available within the site. No exterior source of light, power, water, heat. Make arrangements with the Owner for use of these services.

1.2.2 Contractor to be responsible for the distribution of temporary power during construction. Exposed extension cords are not permitted outside the work areas.

1.2.3 Provide an adequate pure fresh water supply for the use of all Sections. Run supply pipe or pipes from the nearest available sources and maintain in good condition until the permanent system is installed and ready for use.

1.2.4 Provide temporary lighting and heating, to requirements of authorities having jurisdiction and at a level for the proper execution of the Work.

1.2.5 Provide temporary sanitary facilities to be located within the approved staging area. These facilities must be locked prior to leaving the site each day for the use of the workers engaged in the work, in compliance with local bylaws.

1.3 REMOVALS

SECTION 01 50 00

CONSTRUCTION FACILITIES AND TEMPORARY CONTROL

- 1.3.1 Provide temporary and/or permanent supports and bracing as indicated, before demolition of walls, floors, roofs or other structural members that would endanger portion of building to remain.
- 1.3.2 Provide temporary and/or permanent mechanical and electrical service as indicated, to maintain Owner's operation without interruption, before cutting, relocating or removal of existing services.
- 1.4 HANDLING AND STORAGE
 - 1.4.1 Handle and store materials and products on the job in such a manner that no damage shall be done to the material and products, the structure, the site and surrounding property. Construct and maintain such service roads as may be necessary to provide at all times safe, convenient and adequate access for materials, products and other supplies.
 - 1.4.2 Confine operations of the work of this Contract to limits indicated on Drawings.
 - 1.4.3 Store materials and products brought to the job by all Sections in the area of the site agreed upon with the Owner as a staging area. Keep the storage area tidy at all times. Do not use other areas of the site for storage. Additionally, this area is on the exterior of the building and Contractor to provide their own container for storage as noted above Section.
 - 1.4.4 Lobbies, corridors, and washrooms shall be kept clean of construction materials at all times.
 - 1.4.5 The building shall be properly closed and locked at nights, Sundays, holidays and other occasions when the work is not in progress.
 - 1.4.6 Protect materials and products from damage during handling, storage and installation.
 - 1.4.7 Store materials in dry weather-tight, lockable enclosures.
 - 1.4.8 Store cementitious and clay products clear of the earth or concrete floors and away from walls.
 - 1.4.9 Keep sand dry and clean and store on tight, wooden platforms, and covered with tarpaulins during inclement weather, if exposed to same.
 - 1.4.10 Protect metals against damage, dirt or dampness.
 - 1.4.11 Store packaged or bundled products in original and undamaged condition with manufacturer's seals and labels intact.
 - 1.4.12 Provide flat, solid support for all sheet products during storage.
 - 1.4.13 Store and mix paints in a room assigned for this purpose. Keep room under lock and key. Remove oily rags and any other combustible materials every night. Take every precaution to prevent spontaneous combustion.
 - 1.4.14 Make good or replace damaged materials to the satisfaction of the Consultant.
- 1.5 LIMITS OF THE SITE
 - 1.5.1 Confine materials, products, equipment and temporary structures within the limits of the site as shown on the Drawings.
- 1.6 PLANT AND MACHINERY

CONSTRUCTION FACILITIES AND TEMPORARY CONTROL

- 1.6.1 Provide formwork, scaffolding, ladders, cranes, derricks, tackle, gangways, planks, fans, screens, gantries, tarpaulins, tools and machinery for the proper execution of the Work.
- 1.7 ACCESS/DELIVERIES AND TRAFFIC CONTROL
 - 1.7.1 Arrange for delivery of materials, products and equipment to arrive when needed and at times to prevent interfering with vehicular traffic on the streets and pedestrian traffic on sidewalks.
 - 1.7.2 Provide Access roads as may be necessary to provide safe and adequate access for materials, products and other supplies. Provide and maintain access sidewalks, roadways, and similar facilities as may be required for access to the Work. Do not block public roads, or impede traffic or danger safety of the students during work of this Project and to temporary block traffic then provide flag person to direct traffic acceptable to Ministry of Labour Standard. Remove accumulations of ice and snow from areas providing access to Site. Ensure that access is available for emergency vehicles. Comply with fire plan for vehicular traffic. Bridge excavations with construction and steel cover plate to safely support any load that could be imposed and provide personnel to assist in deliveries to building(s) as required.
 - 1.7.3 Access to the site shall be as established by the Owner at the commencement of the Work.
 - 1.7.4 Delivery of materials, removal of refuse, and disruption to vehicular traffic shall be restricted to occur before 7:00 am or after 4:00 pm. No such delivery or disruptions shall occur between 7:00 am and 4:00 pm.
- 1.8 HOURS OF WORK
 - 1.8.1 Normal working hours as specified in Tender Documents.
 - 1.8.2 All core drilling required for electrical, telephone or mechanical installations is restricted to off normal hours and to be approved by Owner.
- 1.9 TEMPORARY FIRE PROTECTION
 - 1.9.1 Operable fire extinguishers shall be provided by the Contractor, and shall be kept within the work areas throughout the construction period. Extinguishers shall be sufficient in number and of suitable types to combat potential fires in the work area.
- 1.10 SYSTEM SHUT DOWNS
 - 1.10.1 Requests for any system shutdowns will be processed a week in advance.
- 1.11 GARBAGE REMOVAL
 - 1.11.1 The Contractor shall ensure that all his subcontractors, including telephone company, remove all garbage and debris from the Work on a daily basis. Should it be necessary for the Owner to remove Contractor's garbage or debris due to inaction by the Contractor, the Contractor shall be invoiced for the cost thereof. Temporary storage of garbage or debris outside the Work areas is not permitted. The Contractor is not permitted to use any of the Owner's garbage bins for disposal of construction materials.
 - 1.11.2 Corridors, lobbies, and other common areas are to be kept clear of any residual debris.
 - 1.11.3 Garbage of a flammable nature (eg paper) shall not be allowed to accumulate, but shall be removed from the site as quickly as possible.

1.12 TRANSPORTING MATERIALS ON STREETS

- 1.12.1 The Contractor shall, if so directed by the Consultant or the City Engineer, provide "tight trucks", approved by the Engineer, to haul soft or wet material over streets, in order to prevent litter on the streets. In all cases where any materials are dropped from the trucks of the Contractor, he shall clean up same as often as directed and also keep all sidewalks clean and free from dirt and mud.
- 1.12.2 If the Contractor refuses or neglects to clean up said litter when order to do so by the Consultant or Engineer, the Owner will have the necessary cleaning and the cost of same will be deducted from monies due to the Contractor.
- 1.12.3 All construction and demolition materials shall be transported in accordance with the City requirements and by-laws, including all amendments.

1.13 PARKING

- 1.13.1 All parking by the Contractor is his responsibility. The Owner makes no representation that parking will be available. Under no circumstances shall vehicles impede or block access to the existing building.

1.14 HOISTS AND LIFTING FACILITIES

- 1.14.1 Install and operate an adequate number of elevators or hoists which shall be available for use by all trades and subcontractors. Hoists or elevators shall be properly positioned so as not to interfere with the construction, and if located outside the building, the exterior walls shall be protected against damage.

1.15 DUST NUISANCE

- 1.15.1 Prevent nuisance to adjacent properties near the work from dust, by taking appropriate anti-dust measures at such times as found necessary, and in response to complaints of dust received from the public.

1.16 REMOVAL OF TEMPORARY FACILITIES

- 1.16.1 Remove temporary facilities from the site when directed by the Consultant.

1.17 TRAFFIC CONTROL

- 1.17.1 Do not block roads or impede traffic. Keep construction traffic to designated roads only. Provide flag-person to direct traffic as required.
- 1.17.2 Provide a hard surface area at the Place of the Work for cleaning down trucks prior to entry onto municipal roads or private roads outside of the Place of the Work.
- 1.17.3 Keep public and private roads free of dust, mud and debris resulting from truck, machinery and vehicular traffic related specifically to this Project, for the duration of Work.
- 1.17.4 Clean roads regularly, public or private. Wash down and scrape flush roads at least daily when earth moving operations take place. Maintain public property in accordance with requirements of authorities having jurisdiction.

1.18 ENVIRONMENTAL/POLLUTION CONTROL/SITE CLEANING

SECTION 01 50 00

CONSTRUCTION FACILITIES AND TEMPORARY CONTROL

- 1.18.1 Prevent the escape of untreated effluent, be it liquid or gaseous substance or any liquid or solid wastes, being objectionable or detrimental to adjoining areas of the construction site.
- 1.18.2 Burning or burying of rubbish, waste, and the like is not permitted on construction site.
- 1.18.3 Only fires for heating bitumen and temporary heaters as specified are permitted on site.
- 1.18.4 Take care to prevent staining or smoke damage to structure or materials. Replace stained or damaged work.
- 1.18.5 Make every effort to provide environmental protection, take precautionary measures to prevent excessive noise, sounds, vibrations, dust, air pollution, smoke, etc., which may become objectionable to people occupying adjacent areas.
- 1.18.6 Keep building site clean and free of unsightly collection of waste materials and debris. Provide for temporary storage and collection of waste materials, and dispose to local authorities having jurisdiction recommendations at intervals to maintain a clean site condition.
- 1.18.7 Confine apparatus, the storage of materials and the operations of workers to the site. Do not unreasonably encumber the premises with construction materials.

END OF SECTION

PART 1 - GENERAL

1.1 PRODUCT QUALITY

1.1.1 Products supplied for work shall be new and as far as possible and unless otherwise specified, of Canadian manufacture.

1.2 STANDARDS

1.2.1 The work of each trade shall be carried out by skilled, experienced personnel who have been certified to carry out the work by various trade associations and in accordance with the Apprenticeship and Trades Qualifications Act and applicable regulations.

1.2.2 Where reference is made to specification standards produced by various organizations, conform to the latest edition of the standards specified as amended and revised to the date of the Contract.

1.2.3 Each subcontractor must possess and be familiar with the specified standards which affect their work.

1.2.4 Generally, materials and workmanship shall meet or exceed the requirements of CAN/CSA, ASTM, CGSB, CAN/UL and manufacturer's printed instructions.

1.2.5 Where required, conform to the requirements of LEED® Certification.

1.3 SUBSTITUTIONS

1.3.1 The Contractor shall base his Tender Price upon the Tender Documents.

1.3.2 Prior to the Close of Tender, the Owner and the Consultant may consider requests for substitutions from that specified in the Tender Documents, providing the requests are submitted in writing describing such substitutions in full detail, the type of material, equipment or method and reasons for deviating from the Tender Documents. In addition, submit any increase or decrease in price of any substitution.

1.3.3 In making a request for a substitution, confirm in writing that:

- .1 The Contractor has investigated the proposed product and method and determined it to be equal or superior in all respects to that specified.
- .2 The same guarantee is given for the proposed substitution as for the product and method originally specified.
- .3 The installation of the proposed substitution will be coordinated into the Work, and such changes in the Work will be made as required to accept the substitution and to ensure the Work is complete in all respects. The cost of changes in the Work necessary to incorporate a proposed substitution is to be included in any proposed increase or decrease to the Contract Price associated with the proposed substitution.
- .4 Do not substitute materials, equipment or methods unless such substitutions have been determined acceptable and approved by the Owner and Prime Consultant via Addendum prior to Tender close.
- .5 The Owner reserves the right to accept or reject, at its sole discretion, any proposed

substitution.

1.4 WORKMANSHIP

1.4.1 All work shall be carried out in accordance with the best trade practice, by mechanics skilled in the type of work concerned.

1.4.2 Products, materials, systems and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the applicable manufacturer's printed directions.

1.4.3 Where specified requirements are in conflict with manufacturer's written directions, follow manufacturer's directions, but inform the Consultant in writing prior to proceeding with affected work. Where specified requirements are more stringent than manufacturer's directions, comply with specified requirements.

END OF SECTION

PART 1 - GENERAL

- 1.1 SUBSTITUTIONS - MATERIALS AND PRODUCTS
- 1.1.1 Work of the Project shall be based upon using new materials and products specified or indicated by reference to standards, codes, specifications, to a manufacturer's name, by trade name or by catalogue reference, except where a material or product is indicated as being reused. Where two or more trade names are specified the choice shall be optional with the Contractor.
- 1.1.2 Contract Price shall be based on the materials and products specified, whether available or not at the time of bidding.
- 1.1.3 Requests for substitutions AFTER Bid Date will not be accepted.
- 1.1.4 Materials and products specified without the "or other approved manufacture" clause following the name of the material or product shall be supplied without substitution.
- 1.1.5 Where the Specifications include the "or other approved manufacture" clause substitutions will be considered by the Consultant if:
- .1 products specified are not available, or
 - .2 substitute products to those specified, which are brought to the attention of, and considered by the Consultant as equivalent to those specified will result in a credit to the Contract Price, or
 - .3 substitute products to those specified, which are brought to the attention of, and considered by the Consultant as superior to those specified will not result in a change to the Contract Price and Contract Time.
- 1.1.6 Substitutions may be proposed by the Contractor under the following conditions:
- .1 Submission of proposed substitutions shall show the material and product names and complete specifications and shall state what difference, if any, will be made in the Contract Price and Contract Time for each substitution, should it be accepted.
 - .2 Indicate name and manufacturer of product specified, for which substitute is requested and where in Specification product is specified.
 - .3 Respective costs of items originally specified and the proposed substitution.
 - .4 Confirmation of proposed substitution delivery, in writing by Product manufacturer.
 - .5 Compliance with the building codes and requirements of authorities having jurisdiction.
 - .6 Affect concerning compatibility and interface with adjacent building materials and components.
 - .7 Compliance with the intent of the Contract Documents.
 - .8 Reasons for the request.
- 1.1.7 Substitutions not permitted if Contractor fails to order a specified product or order a product by a specified manufacturer in adequate time to meet Contractor's construction progress schedule, Consultant will not consider that valid reason to accept a Substitution.
- 1.1.8 Should proposed substitution be accepted either in part or in whole the Contractor shall assume full responsibility when the substitution affects any other work. Any Contract Document changes required as a result of the substitution shall be executed by the Consultant at the Contractor's expense.
- 1.1.9 Proposed substitutions shall satisfy all design conditions and other specified requirements. Properties included but not limited to the following, as applicable, will be considered:

- .1 Physical dimension requirements to satisfy the space limitations, static and dynamic weight limitations, structural properties, audible noise levels, vibration generation, interchangeability of parts or components, accessibility for maintenance, possible removal or replacement, colours, textures and compatibility with other materials, products, assemblies and components.
- 1.1.10 Cost of all changes in work of other Sections necessitated by use of proposed material and product substitutions shall be borne by the Contractor.
- 1.1.11 Bring to the attention of Owner and Consultant, in writing, the effect of all changes in the work of other Sections necessitated by use of proposed material and product substitutions. Should the contractor fail to bring to the attention of the Owner and the Consultant, the effect of any and all changes, due to the use of proposed materials or product substitutions, then cost of changes in the work of other Sections shall be borne by the Contractor.
- 1.1.12 Substitutions submitted on shop drawings without following requirements of this section prior to submission of the affected shop drawings will cause the shop drawings to be rejected.
- 1.2 SUBSTITUTIONS - METHODS OR PROCESSES
 - 1.2.1 Contractor may suggest for consideration of the Consultant, substitutions to methods or processes described in the Specifications and/or shown on the Drawings and other Contract Documents ONLY IF there is a reason for it during construction – example: delivery delay, product/material no longer available. There shall be no obligation for the Owner and Consultant to accept any such suggestions. The Owner will not entertain any substitutes after Bid date.
 - 1.2.2 Contractor shall be responsible for substitutions to methods or processes concerning such work, and the warranty covering all parts of the work shall not be affected.
 - 1.2.3 Cost of all changes in work of other Sections, necessitated by the use of substituted methods or processes, shall be borne by the Contractor. Contract Document changes required as a result of the substitution shall be executed by the Consultant, at Contractor's expense.
 - 1.2.4 Substituted methods or processes shall be accommodated by space allotted for the specified methods or processes.
- 1.3 CREDITS ARISING FROM SUBSTITUTIONS
 - 1.3.1 Any and all credits arising from accepted substitutions shall be credited to the Contract in such sums as may be assessed by the Consultant and Contract Price will be adjusted accordingly. No substitutions will be permitted without prior written approval of the Consultant.
- 1.4 CODE REQUIREMENTS SUBSTITUTIONS
 - 1.4.1 All proposed substitutions for materials, products, methods and processes shall meet the requirements of the National Building Code, Ontario Building Code, and the requirements of authorities having jurisdiction.
 - 1.4.2 Proposed substitute materials, products, methods and processes shall not negate the compliance of adjacent materials, products and constructions with the requirements of the National Building Code, Ontario Building Code, and the requirements of authorities having jurisdiction, to which the proposed substitutions may be applied or attached.

- 1.4.3 Contractor shall obtain written approval of proposed substitutions from authority having jurisdiction and shall submit approval with the proposed substitution for the Consultant's consideration.

END OF SECTION

PART 1 - GENERAL

1.1 CLEAN UP DURING CONSTRUCTION

- 1.1.1 During construction, maintain the work in a tidy condition and free from accumulation of waste products, debris, snow and ice other than that caused by the Owner, Other Contractors or their employees.
- 1.1.2 At reasonable intervals during progress of the Work, clean-up site, building and access, and dispose of waste materials, rubbish and debris. Provide containers and locate on site for collection of waste materials, rubbish and debris. Do not allow waste materials, rubbish and debris to accumulate and become unsightly or hazardous.
- 1.1.3 Move waste materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights. Fog spray dusty debris with water.
- 1.1.4 Conduct clean up and disposal operations to comply with local ordinances and anti-pollution laws. Burning or burying of rubbish and waste materials on the Project site is not permitted. Do not dispose of volatile fluid wastes (such as mineral spirits, oil or paint thinner) in storm or sanitary sewer systems or into streams or waterways. Remove waste materials, rubbish and debris from the site and legally dispose of at public or private dumping areas off the Owner's property. All of the actions listed herein to follow all municipal, provincial and federal regulations and laws.
- 1.1.5 Vacuum clean interior building areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until building is ready for acceptance or occupancy.
- 1.1.6 Wash down exterior exposed aluminum surfaces using a solution of mild domestic detergent in warm water, applied with soft clean wiping cloths. Take special care to remove all dirt from corners. Wipe interior surfaces clean when curtain wall work is completed.
- 1.1.7 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable by the sealant manufacturer and the metal fabricator.
- 1.1.8 Where the accumulation of dirt does not respond to the washing or cleaning, refer the condition to the Consultant, with recommendations as to the remedial action required; but, do not undertake any cleaning procedure of a more severe nature without the written approval of the Consultant.
- 1.1.9 Remove concrete and alkali wash-offs on surfaces to prevent etching of glass and/or metal.
- 1.1.10 Remove temporary protective materials and coatings.
- 1.1.11 Clean exterior glass during construction, every 3 months or more frequently, to prevent the glass from being etched by alkaline bearing water.

1.2 CLEANING AT SUBSTANTIAL PERFORMANCE

- 1.2.1 Upon attaining Substantial Performance of the Work, remove surplus products, tools, construction machinery and equipment not required for the performance of the remaining work. Also remove waste products and debris and leave the work clean and suitable for occupancy by the Owner unless otherwise specified.
- 1.2.2 All final cleaning shall be carried out under this Section and the building shall be left in condition to meet the approval of the Consultant. The final cleaning shall not commence until authorized by the Consultant. This work shall include, without being limited to, the cleaning of floors, walls,

windows, ceilings, fixtures and equipment, the removal of debris and all work required on the interior and exterior to complete the building and site cleaning.

- 1.2.3 All floors shall be cleaned in a manner acceptable to the Consultant.
- 1.2.4 Stains, paint, grease, oil, temporary protection and covers, plaster, mortar droppings, labels, caulking and sealant compounds, and dirt shall be removed. Damaged painted areas shall be touched up. All surfaces and items, including without being limited to, walls, ceilings, doors, windows, glass, partitions, fixtures, hardware, mechanical and electrical equipment shall be dusted and/or polished.
- 1.2.5 Replace broken and scratched glass.
- 1.2.6 Remove debris off roofs. Sweep and wash clean paved areas outside the building. Rake clean landscaped areas.
- 1.2.7 Replace heating, ventilating and air conditioning filters if units were used during construction. Vacuum clean ducts, fans, blowers and coils if units were used without filters during construction.
- 1.2.8 Ensure that the inside of all air handling systems are clean and free from dust, and debris when building is turned over to Owner.
- 1.2.9 Vacuum out and wipe clean all electrical and signal panels, switchboards, transformers and other electrical equipment.
- 1.2.10 Use experienced workmen or professional cleaners for final cleaning. Use only cleaning materials recommended by manufacturer of surface to be cleaned. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.
- 1.2.11 Completion of the Contract shall not be attained until the Contractor has removed surplus products, tools, construction machinery and equipment. Removed waste products and debris, other than that caused by the Owner, other Contractors or their employees.
- 1.3 HAZARD CONTROL
 - 1.3.1 Conduct cleaning and disposal operations in strict accordance with all applicable codes, ordinances and anti-pollution laws.
 - 1.3.2 Store volatile matters in covered metal containers and remove from site at end of each working day. Do not dispose of volatile and toxic wastes in storm or sanitary drains, streams or waterways.

END OF SECTION

1 GENERAL

1.1 Definition

1.1.1 Warranty = guarantee dated from date of Substantial completion.

1.2 Submission Requirements

1.2.1 Submit warranties as part of "Operating and Maintenance Manuals" in accord with requirements of Section 01 78 00.

1.2.2 Arrange warranties in systematic order matching Specification format. Include a table of contents listing warranties in same order.

1.2.3 Each warranty must show:

- .1 Name and address of project.
- .2 Name of Owner
- .3 Section Number and Title

1.2.4 All warranties issued by the manufacturer must be presented under the Contractor's letterhead, seal and signature and must bear the wording specified in Contract Documents.

1.3 List of Warranties

1.3.1 The following list of extended warranties is shown here for convenience only:

Item	Period
Entire Building, General Contract	1 year
Building Insulation	2 years
Sealant	5 years
Caulking	5 years
Paint and Finishing	2 years
Mechanical	As specified under respective section
Electrical	As specified under respective section

1.3.2 Refer to Divisions 20, 21, 22, 23, 24, 25, 26 and 27 for Mechanical and Electrical warranty requirements.

END OF SECTION

PART 1 - GENERAL

1.1 CONTRACT COMMISSIONING

- 1.1.1 Expedite and complete deficiencies and defects identified by the Consultant.
- 1.1.2 Submit required administrative and technical documentation, such as Statutory Declarations, Worker's Compensation Certificate, warranties, certificates of approval or acceptance from regulating bodies.
- 1.1.3 Review inspection and testing reports to verify conformation to the intent of the Documents and that changes, repairs or replacements have been completed.

1.2 AS BUILT-DRAWINGS

- 1.2.1 Prior to application for Substantial Performance, allowing sufficient time for review, clearly, neatly, and accurately transfer information from marked up white prints to CADD files saved on a USB key. Print lettering and numbers in size to match original. Lines may be drawn freehand but shall be neat and accurate. Add "AS-BUILT" at each drawing title block. Should extensive changes and deviations to a drawing make the information illegible, re draft the drawing. Submit one copy of marked up drawings on PDF file for review. When PDF file is approved by Consultant, submit electronic copies of CAD files and PDF files of all drawings, to the Owner.

1.3 OPERATIONS AND MAINTENANCE MANUAL

- 1.3.1 Provide **1 electronic (via email)** of Operations and Maintenance (OM) Manual, together with the record drawings as specified in the preceding Article, to the Owner prior to the date of Substantial Performance.
- 1.3.2 Submit one copy of the OM Manual for the Consultant's review prior to submitting the OM Manual to the Owner.
- 1.3.3 In the OM Manual separate each Section and Warranty by Tabs.
- 1.3.4 The OM Manual shall contain the name of the Contractor and the date of Substantial Performance for the Project. Supply the following data:
 - .1 Complete listing of materials, products, and equipment including serial numbers, manufacturer's names, and sources of supply.
 - .2 Description of each system, with the description of each major component of the systems.
 - .3 Operation and installation instructions for each assembly, component and system.
 - .4 Complete maintenance instructions for each assembly, component and system. Include warnings of harmful practices.
 - .5 Lists of spare parts for each assembly, component and system complete with names and addresses of suppliers.
 - .6 Cleaning, maintaining and preserving instructions for all materials, products and surfaces. Include warnings of harmful cleaning, maintaining and preserving practices.
 - .7 A lubrication schedule of all equipment.
 - .8 Final reviewed shop drawings.
 - .9 Copies of all warranties.
 - .10 Operating curves of mechanical and electrical equipment.
 - .11 Page-size Valve Tag Schedule and Flow diagrams.
 - .12 Water treatment procedures and tests.
 - .13 Final balancing reports for the mechanical systems.

- .14 "As-built" drawing as per 1.2.1 item above
- 1.3.5 Terminology used in the various indexed sections of the books shall be consistent.
- 1.4 MAINTENANCE MATERIALS
 - 1.4.1 The Owner requires only electronic copy of maintenance materials.
- 1.5 DISTRIBUTION SYSTEM DIAGRAMS
 - 1.5.1 Prior to application for Substantial Performance, submit framed single line diagrams of the electrical distribution systems.
- 1.6 TRIAL USAGE AND INSTRUCTIONS – MECHANICAL
 - 1.6.1 Thoroughly instruct the Owner's authorized representative in the safe operation of the systems and equipment.
 - 1.6.2 Arrange and pay for the services of qualified manufacturer's representatives to instruct Owner on specialized portions of the installation; such as, refrigeration machines, boilers, automatic controls, and water treatment.
 - 1.6.3 Submit a complete record of instructions as part of the maintenance instructions and data book given to the Owner. For each instruction period, supply the following data:
 - .1 Date.
 - .2 System or equipment involved.
 - .3 Names of persons giving instructions.
 - .4 Names of persons being instructed.
 - .5 Other persons present.
 - 1.6.4 Instructional period shall be carried out during a continuous period of 30 days.
 - 1.6.5 The Owner shall be permitted trial usage of systems or parts of system for the purpose of testing and learning operational procedures. Trial usage shall not affect the warranties, not be construed as acceptance thereof; and no claim for damage shall be made against the Owner for any injury or breakage to any part or parts of such systems due to the aforementioned tests, where such injuries and/or breakage are caused, directly or indirectly, by a weakness or inadequacy of parts, or by defective materials or workmanship of any kind whatsoever.
- 1.7 TRIAL USAGE AND INSTRUCTIONS – ELECTRICAL
 - 1.7.1 Provide services of manufacturer's specialized representatives to instruct Owner in operation of systems and equipment.
 - 1.7.2 Permit the Owner's representatives, in order to familiarize themselves with the equipment, to operate systems for a reasonable period of time, as may be arranged.
 - 1.7.3 Trial usage of any equipment by the Owner shall not affect the warranties, nor be construed as acceptance of the equipment or system, and no claim for damage shall be made against the Owner for injury or breakage to any part or parts of the aforementioned system or systems due to any such test, where such injuries or breakage are caused, in whole or in part, directly or indirectly, by a weakness or inadequacy of parts, or by defective materials or workmanship of any kind whatsoever.

1.7.4 Review information provided in maintenance instructions and data book with the Owner's representatives to ensure the Owner has a complete understanding of the electrical equipment and systems and their operation.

1.8 WARRANTIES

1.8.1 Extended warranties (warranties of more than two years duration) where specified in the Contract Documents, shall be provided by the Contractor and shall be in a form acceptable to the Consultant.

1.8.2 Where manufacturers offer, as a general policy, extended warranties on their products or other greater benefits than those called for in the specifications, the Contractor shall obtain the benefit of such extended warranties for the Owner and shall certify that he has done so before making the final claim for payment.

1.8.3 Upon completion of the Contract by the Contractor, or upon other termination of this Contract, the Contractor hereby agrees and covenants to assign to the Owner all warranties and guarantees which the Contractor has received from the sub trades employed by him on the Project.

1.8.4 Specified warranty periods shall not be construed as limiting the provisions of the General Conditions.

1.8.5 The carrying out of replacement work and making good of defects shall be executed at times convenient to the Owner and this may require work outside of normal working hours at the Contractor's expense.

1.9 SUBSTANTIAL PERFORMANCE OF THE WORK

1.9.1 Refer to Owner's Front End Specification document.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- 1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.
- 1.1.2 Provide labour, materials, products, equipment and services required to complete the selective demolition work required and/or indicated on the Drawings and specified herein.
- 1.1.3 Visit site to establish extent of demolition to be carried out.
- 1.1.4 If suspected hazardous or contaminated materials are encountered, advise Consultant and the Owner, and await instructions regarding removal and disposal of such contaminants which may be considered hazardous to health, prior to demolition.

1.2 RELATED WORK

- 1.2.1 Removal and relocation of mechanical and electrical items indicated as relocated and reused are specified under respective Mechanical and Electrical Drawings. Co-ordinate the removal and relocation of these items.

1.3 REFERENCE STANDARDS

1.3.1 American National Standards Institute (ANSI):

- .1 ANSI A10.8-2011, Scaffolding Safety Requirements

1.3.2 National Fire Protection Association (NFPA):

- .1 NFPA 241-09, Standard for Safeguarding Construction, Alteration, and Demolition Operations

1.3.3 Provincial Legislation:

- .1 Legislation specific to Authority Having Jurisdiction for work governed by this Section

1.4 DEFINITIONS

- 1.4.1 Demolish: Detach items from existing construction and legally dispose of them off site, unless indicated to be removed and salvaged or removed and reinstalled.
- 1.4.2 Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
- 1.4.3 Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- 1.4.4 Existing to Remain: Existing items of construction that are not removed and that are not otherwise indicated as being removed, removed and salvaged, or removed and reinstalled.

1.5 EXAMINATION

- 1.5.1 Visit and examine the site and note all characteristics and irregularities affecting Work of this Section. Submit a pre-demolition inspection report. Ensure the Owner of premises being inspected is represented at inspection.
- 1.5.2 Prepare a photographic or video record of existing conditions, particularly of existing work scheduled to remain.
- 1.5.3 Where applicable, examine adjacent tenancies not part of the scope of work. Determine extent of protection required to areas and related components not subject to demolition.

1.6 PROTECTION

- 1.6.1 Do not commence demolition until all personnel and Owner's equipment are removed from the area being demolished.

PART 2 - PRODUCTS

2.1 SALVAGE MATERIALS

- 2.1.1 Salvage materials, products, and equipment indicated. Carefully remove items to be salvaged, protect during alteration and reinstall in locations indicated.
- 2.1.2 Refer to sprinkler, mechanical and electrical Drawings and specifications for sprinkler, mechanical and electrical work to be reused.
- 2.1.3 Salvage the following items for reuse and return to the Owner in an adequately preserved and usable condition on date of Substantial Performance or other mutually agreed date:
 - .1 Millwork, fire extinguishers, lockers, lights, clocks, bells and plumbing fixtures.
 - .2 Remove existing ceiling and light fixtures, as indicated for reuse or return to the Board.
- 2.1.4 All materials and products from the demolition except noted otherwise shall become the property of the Contractor. Remove all material and debris from the site as quickly as possible and dispose of legally. Burning of debris on the site will not be permitted.
- 2.1.5 Salvage materials, products, and/or equipment as directed by the Consultant. Remove carefully items to be salvaged to the locations designated. Protect during demolition and store above items. Materials and/or equipment directed to be salvaged shall remain the property of the Owner.

2.2 REPAIR MATERIALS

- 2.2.1 Use repair materials identical to existing materials:
 - .1 If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - .2 Use a material whose installed performance equals or surpasses that of existing material.
 - .3 Comply with material and installation requirements specified in individual Specification Sections.

- 2.2.2 Floor Patching and Levelling Compounds: Cement based, trowelable, self-levelling compounds compatible with specified floor finishes; gypsum based products are not acceptable for work of this Section.
- 2.2.3 Concrete Unit Masonry: Lightweight concrete masonry units, and mortar, cut and trimmed to fit existing opening to be filled. Provide standard hollow core units, square end units and bond beam units as indicated on drawings.
- 2.2.4 Brick: Install brick and mortar, cut and trimmed to fit existing opening to be filled, once demolition of hollow metal door and frame is completed. Match brick and mortar to existing adjacent materials as approved by the Consultant. Provide ties and accessories as required to complete the installation.
- 2.2.5 Gypsum Board Patching Compounds: Joint compound to ASTM C475, bedding and finishing types thinned to provide skim coat consistency to patch and prepare existing gypsum board walls ready for new finishes in accordance with Section 09 21 16 – Gypsum Board Systems.
- 2.2.6 Fireproofing: Patch and repair all fireproofing damaged during demolition of adjacent surfaces with compatible fireproofing materials. Provide test reports from fireproofing manufacture warranting installation, adhesion and compatibility between existing and new fireproofing materials.
- 2.2.7 Roofing: Remove no more existing roofing than can be covered in one day by new roofing. Refer to Division 7 for new roofing requirements.

PART 3 - EXECUTION

- 3.1 SEQUENCE OF ALTERATIONS
 - 3.1.1 Schedule sequence of alterations and demolition as indicated on Drawings.
- 3.2 SCREENS
 - 3.2.1 Provide temporary barriers, guard rails, protective covers, screens, enclosures, tarpaulins etc., as may be required to enclose work areas from other areas of the building, to maintain security, to confine dust, noise and workmen to the work area, and to give full protection to the public, building occupants, workmen employed for demolition and to adjoining property, in compliance with authorities having jurisdiction. Locate screens as directed by the Consultant.
 - 3.2.2 It is essential that the existing building be maintained weathertight at all times. Provide temporary protection, enclosures, tarpaulins, etc., as may be required to weatherproof any openings made in the Work.
 - 3.2.3 Construct dustproof and windproof screens as required to completely enclose the work areas and the access passages to the work areas from the other areas of the existing building. Locate partitions as directed by the Consultant.
 - 3.2.4 Build screens of 90 mm (3-5/8") metal studs at 400 mm (16") centres sheathed with sheets of 16 mm (5/8") gypsum board on both sides with close joints. Where exposed to the weather, fully cover screens with a heavy waterproof and dustproof paper with lapped and sealed joints. Fill spaces between studs with 100 mm (4") fibrous glass or mineral wool insulation batts to deaden sound.

- 3.2.5 Thoroughly pack framing at junctions of screens with floors, walls and ceilings with batt insulation in a manner to prevent infiltration of dust, dirt, etc. Over all junctions of screens with floors, walls and ceilings, apply continuous 40 mm (1-1/2") wide strips of masking tape both sides of screen to ensure that rooms within closed off areas which are not being altered are kept dust free.
- 3.2.6 Remove screens and make good damaged or blemished adjoining work when directed.
- 3.3 EXISTING SERVICES
 - 3.3.1 Arrange and pay for the disconnection, capping and for plugging of all gas, water, hydro, telephone and other services to the structures.
 - 3.3.2 Notify in advance each utility company involved and obtain approvals before commencing work.
- 3.4 DEMOLITION WORK
 - 3.4.1 Refer to Drawings for extent of selective demolition work. Do all demolition work not specified to be done under other Sections.
 - 3.4.2 Carry out selective demolition in strict accordance with provincial and municipal authorities having jurisdiction.
 - 3.4.3 Take precautions to guard against movement of existing building and structures and displacement of elements of the building to remain. If at any time the safety of such elements appear to be in danger, suspend operations and notify the Consultant promptly. Take measures to support such elements. Do not resume demolition until the Consultant issues instructions.
 - 3.4.4 The work shown on the Drawings, Schedules and Specifications may or may not be all the work required, do all demolition, make good all finishes and execute all necessary work including incidentals to make a complete job of the alterations.
 - 3.4.5 Cut off, cap, divert, or remove existing water, gas, electric and other services in areas being altered which are affected by the changes as required or as directed by the municipal authorities and the utility company concerned, and the Consultant. Protect and maintain active services to the existing building.
 - 3.4.6 Perform the Work in such a manner so as to cause a minimum of noise or interference to the use of the existing building.
 - 3.4.7 Whenever it becomes necessary to cut or interfere in any manner with existing apparatus for short periods of time, Do work at such times as agreed upon between the Owner, Consultant, and the Contractor.
 - 3.4.8 Where new work connects with existing and where existing work is altered, all necessary cutting and fitting required to make satisfactory connections with the existing work shall be performed under this Contract, so as to leave the entire work in a finished and workmanlike condition.
 - 3.4.9 Make good materials and finishes which are damaged or disturbed during the process of additions and reconstruction under the Contract.
 - 3.4.10 Where existing work is to be made good, the new work shall match exactly the old work in material, form, construction and finish unless otherwise noted or specified.
 - 3.4.11 Perform drilling of existing work carefully, leaving a clean hole no larger than required.

- 3.4.12 Provide, throughout the entire construction period, proper and safe means of fire exit from all zones of the existing building at all times to the approval of the authorities having jurisdiction.
- 3.4.13 Protect work in the existing buildings, such as floors, finishes, trim, etc., as completely as possible to hold the replacing of damaged work by each Section to a minimum.
- 3.4.14 Properly co-ordinate the various Sections taking into account also the existing installations to assure the best arrangement of pipes, conduits, ducts and mechanical, electrical and other equipment, in the available space. Under no circumstances will any extra cost be allowed due to the failure by the Contractor to co-ordinate the work. If required, in critical locations, interference and/or installation drawings shall be prepared showing the work of the various Sections as well as the existing installation, and these drawings shall be submitted to the Consultant for review before the commencement of work.
- 3.4.15 Remove existing finishes as indicated on the Drawings to neat, straight lines and leave substrate clean and even, suitable for new finishes indicated.
- 3.4.16 At the end of each work shift leave work in a safe condition so that no part of the building or its finishes are in danger of toppling, collapsing or falling.

END OF SECTION

PART 1 GENERAL

1.1 General and Related Work

- .1 Read this Section in conjunction with all drawings and all other Sections so as to comply with the requirements of the General Conditions of the Contract.
- .2 Related work specified elsewhere:
 - .1 Section 02 82 00.01 Asbestos Abatement – Type 1 Procedures
 - .2 Section 02 82 00.02 Asbestos Abatement – Type 2 Procedures
 - .3 Section 02 82 00.04 Asbestos Abatement – Type 2 Glove Bag Method
- .3 Site Conditions identifies all known hazardous building materials within the Project Area. The information provided is for general reference only. It is recommended each Contractor confirm existing conditions on site prior to tender close.
 - .1 The specification fulfils the requirements of Section 30 of the Ontario Occupational Health and Safety Act.
 - .2 The specification fulfils the requirements of the Section 10 of Ontario Regulation 278/05.
- .4 The Outline of Work identifies the location, condition and quantities of hazardous building materials to be removed as part of this project.
 - .1 It is the intent that work prescribed this Section will result in the removal of all hazardous materials as outlined and the decontamination of all surfaces or materials which may have been or become contaminated by hazardous materials either during or prior to work of this Contract.

1.2 Site Conditions

- .1 Refer to the report entitled “Hazardous Building Materials Assessment (Pre-construction), P01947 Benchmark Project, Hess Street Elementary School, 107 Hess Street North, Hamilton, Ontario”, dated February 22, 2024, prepared by Pinchin Ltd., file number 320572.021.

1.3 Outline of Work

- .1 Coordinate the following items with the Owner’s Project Manager and the Construction Manager, which is to be included in the abatement contractor’s scope of work, including but not limited to: electrical isolations, GFI connection, water connections, HVAC and exhaust ventilation system isolation, bin placement, schedule, disconnects, etc.
- .2 Refer to the Contract Drawings for the extent of construction work and the Work Areas.
- .3 Install Hoarding Walls between Abatement Work Areas and Occupied Areas as required.

- .4 Using Type 1 procedures prescribed in the Section identified in Related Work, remove and dispose of the following where scheduled for removal and/or where affected by the work:
 - .1 Asbestos-containing vinyl floor tiles.
 - .2 Sinks with asbestos-containing gold mastic.
 - .3 Roofing materials and tar from decking as required for openings/penetrations in the roof.
- .5 Using Type 2 procedures, with a full enclosure, prescribed in the Section identified in Related Work, remove and reinstall asbestos-containing ceiling tiles:
 - .1 Remove ceiling tiles as required to facilitate the demolition and installation of mechanical/plumbing and or any other work required.
 - .2 Clean dust and debris from ceiling tiles to remain and from ceiling track.
 - .3 Store asbestos-containing ceiling tiles are to be stored on polyethylene and covered with polyethylene until reinstallation in an acceptably locations and which is labelled asbestos-containing.
 - .4 Do not damage ceiling tiles, grid/supports or any ceiling mounted items.
 - .5 Reinstall removed asbestos-containing ceiling tiles and any removed ceiling mounted items following completing of required work.
- .6 Using Type 2 procedures, with a full enclosure, prescribed in the Section identified in Related Work, remove and dispose of the following where scheduled for removal:
 - .1 Drywall walls/ceilings/bulkheads with asbestos-containing joint compound.
 - .2 Plaster ceilings. Concealed asbestos-containing pipe insulation is presumed present above.
 - .3 Masonry block walls scheduled for demolition and openings in masonry block walls with asbestos-containing paint.
- .7 Using Type 2 procedures prescribed in the Section identified in Related Work, remove and dispose of all concealed asbestos-containing pipe insulation and debris where present in wall cavities/pipe chases and above solid ceilings.
 - .1 Alternately, Glove Bag procedures can be used.
 - .2 Follow Type 3 procedures as outlined in O.Reg. 278/05 where quantities exceed 1m².

- .8 Using Type 2 procedures prescribed in the Section identified in Related Work, perform the following work using power tools equipped with a HEPA filtered dust collection device. Site Isolation is to include visual barrier comprised of rip-proof polyethylene sheeting, where necessary and where occupants are present.
 - .1 Remove all items where scheduled for removal, including but not limited to; tackboards, millwork, electrical/mechanical items, light fixtures, conduit, junction boxes, supports, exit signs, fire alarm devices, speakers, partitions, door frames, basketball net backboards/supports, scoreboards, gym mats, washroom partitions and fixtures, etc. attached to drywall walls/ceilings with asbestos-containing drywall joint compound, and/or to masonry block walls with asbestos-containing paint. Seal exposed edges of block walls drywall materials where damaged, with lagging compound.
 - .2 Install/attach items, including but not limited to, tackboards, millwork, electrical/mechanical items, exit signs, fire alarm devices, speakers, door frames, basketball net backboards/supports, scoreboards, gym mats, washroom partitions and fixtures, etc. attached to drywall walls/ceilings with asbestos-containing drywall joint compound, and to masonry block walls with asbestos-containing paint.
 - .3 Drill holes as required for new installation in asbestos-containing drywall joint compound, and to masonry block walls with asbestos-containing paint. Seal exposed edges of block walls drywall materials where damaged, with lagging compound.
- .9 Follow mercury procedures when removing all light fixtures and fluorescent light tubes. Place all light fixtures into containers to avoid breakage.
- .10 Following Polychlorinated Biphenyls (PCB) procedures, remove and dispose of PCB-containing ballasts.
- .11 Refer to Specification Sections identified in the Related Work for specified personnel protective measures for the safe handling, removal, clean-up, enclosure, or repair of hazardous materials in each phase or work area.
- .12 Protect surfaces, building fabrics and items remaining within the Abatement Work Area.
- .13 Without disturbing hazardous materials, perform removals where required, prior to abatement work.
 - .1 Maximize waste diversion by use of resale of building materials, or recycling.
- .14 Isolate the Abatement Work Area from adjoining Occupied and Non-Occupied Areas whether present at an interior or exterior location.

- .15 Maintain emergency and fire exits from Abatement Work Area, or establish alternative exits satisfactory to Provincial Fire Marshall and local authorities having jurisdiction. Maintain extra routes from occupied areas. Place emergency exit signs at locations to clearly mark exit route. Seal emergency exit doors so as not to impede use of door during emergency evacuation.
- .16 Remove, clean, store and replace at completion of work, non-operating mechanical and electrical equipment, ducts, building components, materials or items removed to accommodate asbestos removal.
- .17 Perform selective demolition of mechanical and electrical equipment, building components, materials and items scheduled for demolition at locations required to facilitate asbestos removal. Refer to all Contract Documents for responsibility of demolition work and disposal.
- .18 Remove and dispose of as appropriate waste, building components, materials and items contaminated by hazardous materials that cannot be effectively cleaned.
- .19 Encapsulate remaining hazardous materials at locations where removal is deemed impractical by the Abatement Consultant.
- .20 Encapsulation will not be permitted where removal of building materials or structures scheduled for demolition will facilitate access to the asbestos materials in question.
- .21 Final clean work area to remove visible signs of asbestos and other hazardous materials, other debris or settled dust.
- .22 Apply lock-down agent to exposed surfaces throughout the work area and to surfaces from which any hazardous materials have been removed.
 - .1 Do not apply lock-down to materials which would be damaged by its application.
- .23 Unless otherwise specified, the handling, removal, clean-up or repair of hazardous materials or surfaces contaminated with hazardous materials is to be performed following wet removal techniques.

1.4 Schedule

- .1 Provide necessary manpower, supervision, equipment and materials to maintain and complete the project on schedule.
- .2 Work Hours:
 - .1 Coordinate all work, scheduling and phasing with the Owner.
 - .2 Duration for which HVAC systems may remain shutdown to accommodate quiet hours work will vary in accordance with outside weather conditions and internal demand. Duration of quiet hours work will have to be scheduled accordingly and in consultation with the Abatement Consultant and Owner.

- .3 Provide 48 hours written notice to the Abatement Consultant of any request to work outside normal working hours. Obtain written approval before proceeding.

1.5 Definitions

- .1 Abatement Consultant: Owner's Representative providing inspection and air monitoring.
- .2 Abatement Contractor: Contractor or sub-contractor performing work of this section.
- .3 Abatement Work Area: Area where work takes place which will, or may, disturb hazardous materials.
- .4 Amended Water: Water with wetting agent added for the purpose of reducing surface tension to allow thorough wetting of materials.
- .5 Asbestos: Any of the fibrous silicates defined in Regulation 278/05 including: actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite.
- .6 Asbestos-Containing Material (ACM): Material identified under Site Conditions including any debris, overspray, fallen material and settled dust.
- .7 Authorized Visitors: Building Owner, Abatement Consultant, or designated representative, and persons representing regulatory agencies.
- .8 Competent Worker: A worker who is qualified because of knowledge, training and experience to perform the work, is familiar with Regulation 278/05 and the Occupational Health and Safety Act, and has knowledge of the potential or actual danger to health and safety in the work.
- .9 Contaminated Waste: Material identified under Site Conditions, including fallen material, settled dust, other debris and materials or equipment deemed to be contaminated by the Abatement Consultant.
- .10 Curtained Doorway: Doorway consisting of two (2) overlapping flaps of rip-proof polyethylene arranged to permit ingress and egress from one room to another while permitting minimal air movement between rooms.
- .11 DOP Test: A testing method used to determine the integrity of the Negative Pressure unit or vacuum using a Dispersed Oil Particulate (DOP) or Poly Alpha Olefin (PAO) HEPA filter leak test. This test is to be conducted on site where units are to be installed. Refer to the Environmental Abatement Council of Ontario (EACO) DOP/PAO Testing Guideline 2013 or ANSI/ASME N510-2007.
- .12 Fitting: Individual segments or pieces of a mechanical service line which may include but is not limited to the hangers, tees, elbows, joints, valves, unions, etc.
- .13 Friable Material: Material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- .14 HEPA: High Efficiency Particulate Aerosol filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.

- .15 Mercury Waste: Equipment, materials or items containing mercury or contaminated with mercury.
- .16 Milestone Inspection: Inspection of the Abatement Work Area at a defined point in the abatement operation.
- .17 Negative Pressure: A reduced pressure within the Abatement Work Area (> 0.02 inches of water column) established by extracting air directly from Abatement Work Area and discharging it to exterior of building.
- .18 Non-Friable Material: Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .19 Occupied Area: Any area of the building or adjoining space outside the Abatement Work Area.
- .20 Personnel: All Contractor's employees, sub-contractors employees, supervisors.
- .21 PCBs: Monochlorinated or Polychlorinated Biphenyls (or any mixture of both).
- .22 PCB Material: means solid material containing PCBs at a concentration of more than fifty milligrams per kilogram (mg/kg) or 50 parts per million (ppm), or liquid with greater than 2 mg/kg or ppm.
- .23 PCB Waste: PCB Equipment, PCB Material, PCB Liquids and materials or items contaminated with PCBs.
- .24 PCM: Phase Contrast Microscopy.
- .25 Remove: Remove means remove and dispose of (as applicable type of waste) unless followed by other instruction (e.g. remove and turn over to Owner).
- .26 TEM: Transmission Electron Microscopy.

1.6 Regulations and Guidelines

- .1 Comply with Federal, Provincial, and local requirements, provided that in any case of conflict among those requirements or with these Specifications, the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed.
- .2 Where regulations are not present, follow accepted industry standards and applicable Guideline documents.
- .3 Regulations and Guidelines include but are not limited to the following:
 - .1 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.

- .2 Ministry of the Environment and Climate Change Regulation for the disposal of waste, including R.R.O. 1990, Reg. 347 as amended.
- .3 PCB Regulations, SOR 2008-273 and R.R.O. 1990, Reg 362.
- .4 Regulation 490/09 Designated Substances.
- .5 Environmental Abatement Council of Ontario (EACO), Lead Guideline For Construction, Renovation, Maintenance or Repair, October 2014.
- .6 Ministry of Labour, Guideline, Silica on Construction Projects, 2011.

1.7 Quality Assurance

- .1 Removal and handling of hazardous materials is to be performed by persons trained in the methods, procedures and industry practices for Abatement.
- .2 Ensure work proceeds to schedule, meeting all requirements of this Specification.
- .3 Complete work so that at no time airborne dust, visible debris, or water runoff contaminate areas outside the Abatement Work Area.
- .4 Any contamination of surrounding area (indicated by visual inspection or air monitoring) shall necessitate the clean-up of affected area, and in the same manner applicable to an Abatement Work Area at no cost to the Owner.
- .5 All work involving electrical, mechanical, carpentry, glazing, etc., shall be performed by licensed persons experienced and qualified for the work required.

1.8 Supervision

- .1 Provide on site for each work shift, a Shift Superintendent(s), who has authority regarding all aspects related to manpower, equipment and production.
- .2 Supervisory personnel must hold a recognized certificate proving attendance at an asbestos removal training course (2 day minimum duration) and have performed supervisory functions on at least five (5) other asbestos abatement projects of similar size and complexity.
- .3 At all times during work, the Shift Superintendent(s) must be on site. Failure to comply with this requirement will result in a stoppage of all work, at no cost to the Owner.
- .4 Replace supervisory personnel, with approved replacements, within three (3) working days of a written request from the Owner. Owner reserves the right to request replacement of supervisory personnel without explanation.
- .5 Do not replace supervisory personnel without written approval from the Owner.

1.9 Instruction and Training

- .1 Instruction and training must be provided by a competent person.

- .2 All workers completing Type 1, 2 or 3 asbestos abatement must be trained in compliance with Section 19 of O.Reg. 278/05.
 - .1 For Type 3 asbestos abatement, workers must be trained and certified per Section 20 of O.Reg. 278/05.

1.10 Notification

- .1 Before commencing work, notify orally and in writing, an inspector at the office of the Ontario Ministry of Labour nearest the project site, where required.
- .2 Inform all trades on site of the presence and location of hazardous materials identified in the Contract documents.
- .3 Notify the Owner or Owner's Representative, the Joint Occupational Health and Safety Committee and the Provincial Ministry of Labour, if suspected asbestos-containing materials not identified in the contract documents are discovered during the course of the work. Stop work in these areas immediately.
- .4 Notify Sanitary Landfill site as per O.Reg. 347/90 as amended.

1.11 Submittals

- .1 Submit prior to starting work:
 - .1 Provincial Workers' Compensation Board Clearance Certificate.
 - .2 Insurance certificates.
 - .3 Copy of Company Health and Safety Policy and applicable programs.
 - .4 Ministry of Labour Notice of Project form.
 - .5 Copy of Certificate of Approval for disposal of hazardous materials waste and location of landfill.
 - .6 Pre-removal damage survey of the Abatement Work Area(s), waste transport routes, and bin storage areas
- .2 Submit the following information regarding personnel prior to starting work:
 - .1 Proof in the form of a certificate that supervisory personnel have been certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.
 - .2 Proof in the form of a certificate that workers have been certified under the Ministry of Training, Colleges and Universities course 253W.
 - .3 Proof in the form of a certificate that supervisory personnel have attended a training course on asbestos removal or are certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.

- .4 Written statement that personnel have had instruction on hazards of exposure to hazardous materials identified within this scope, the use of respirator, protective clothing, worker and waste decontamination procedures, and all aspects of work procedures and protective measures.
- .5 WHMIS training certificates for all personnel.
- .6 Certificate proving that each worker on site has been fit tested for the respirator appropriate for the work being performed.
- .3 Submit the following information regarding HEPA filtered devices prior to construction of enclosure or asbestos abatement:
 - .1 Performance data on HEPA filtered vacuums including DOP tests no more than 3 months old.
 - .2 Performance data on negative air units including DOP tests which must be no more than 3 months old if the unit is vented outdoors or which must be performed on site immediately prior to initial usage and when HEPA filters are changed if the unit is vented indoors.
 - .3 DOP tests to be performed by an independent testing company.
 - .1 DOP testing company is required to submit a detailed technical report of testing protocol, including Introduction, Methodology, Results, Conclusions, and Recommendations, including results of the Air-Aerosol Mixing Uniformity test as per ASME N510-1989 (1995).
 - .2 DOP testing company must also provide calibration certificates from an independent calibration firm or from the manufacturer of the testing equipment for both the aerosol photometer and the pressure gauge on the aerosol generator dated within 1 calendar year from the on-site testing date.
 - .3 DOP testing company must also provide the National Sanitation Foundation (NSF) certification name and number of the on-site technician performing the testing.
 - .4 Proof of calibration of DOP testing equipment.
- .4 Submit the following prior to isolating the work area:
 - .1 Safety Data Sheets for chemicals or material used in the course of the Abatement Project.
- .5 Submit the following upon completion of the work.
 - .1 Manifests, waybills, bills of lading etc. as applicable for each type of waste.

1.12 Inspection

- .1 From commencement of work until completion of clean-up operations, the Abatement Consultant is empowered by the Owner to inspect for compliance with the requirements of governing authorities, adherence to specified procedures and materials, and to inspect for final cleanliness and completion.
- .2 The Abatement Consultant is empowered by the Owner to order a shutdown of work when leakage of asbestos from the controlled work area has occurred or is likely to occur.
- .3 Any deviation from the requirements of the Specifications or governing authorities that is not approved in writing may result in a stoppage of work, at no cost to the Owner.
- .4 Additional labour or materials expended by the Contractor to rectify unsatisfactory conditions and to provide performance to the level specified shall be at no additional cost to the Owner.
- .5 Inspection and air monitoring performed as a result of Contractor's failure to perform satisfactorily regarding quality, safety, or schedule, shall be back-charged to the Contractor.
- .6 Facilitate inspection and provide access as necessary. Make good work disturbed by inspection and testing at no cost to the Owner.
- .7 Refer to the Sections identified in Related Work for specified milestone inspections which are to take place at defined points throughout the abatement operation specific to each phase or work area.
- .8 Provide 24 hours written notice to the Abatement Consultant of any request for scheduling of milestone inspections or transportation of waste through Occupied Areas.
- .9 The following Milestone Inspections may take place, at the Owner's cost, as outlined in each related specification section:
 - .1 Milestone Inspection - Clean Site Preparation
 - .1 Inspection of preparations and set-up prior to contaminated work in the Abatement Work Area.
 - .2 Milestone Inspection – Bulk Removal Inspection
 - .1 Inspection during asbestos removal, monitoring removal methods, site deficiencies, performing occupied air monitoring, etc.
 - .3 Milestone Inspection - Visual Clearance
 - .1 Inspection of Abatement Work Area after completion of all abatement, but prior to application of lock-down agents or dismantling of enclosure.
- .10 Refer to the Sections identified in Related Work for specified milestone inspections which are to take place at defined points throughout the abatement operation specific to each phase or work area.
- .11 Do not proceed with next phase of work until written approval of each milestone is received from the Abatement Consultant.

1.13 Air Monitoring - Asbestos

- .1 Air monitoring will be performed using Phase Contrast Microscopy (PCM) following the National Institute for Occupational Safety and Health Method 7400.
- .2 Co-operate in the collection of air samples, including providing workers to wear sample pumps for up to full-shift periods. Contractor will be responsible for the cost of testing equipment repairs or resampling resulting from the actions of the Contractor's forces.
- .3 Results of PCM samples at or exceeding 0.05 fibres per cubic centimeter of air (fibre/cc) or greater, outside an Abatement Work Area, or from within the Abatement Work Area during or following Glove Bag Work, will indicate asbestos contamination of these areas. Respond as follows:
 - .1 Suspend work within the adjoining Abatement Work Area until written authorization to resume work has been received from the Abatement Consultant.
 - .2 Isolate and clean area in the same manner applicable to the Abatement Work Area.
 - .3 Maintain work area isolation, and repeat clean-up operations until visual inspection and air monitoring results are at a level equal to that specified.
 - .4 At the discretion of the Abatement Consultant provide additional negative air units at locations specified in response to elevated fibre levels being detected in the Clean Change Room or Occupied Areas.
- .4 Results of PCM samples at or greater than 0.01 fibres per cubic centimeter of air (fibre/cc), collected within the Abatement Work Area enclosure after the site has passed a visual inspection, and an acceptable coat of lock-down agent has been applied, will indicate asbestos contamination of these areas. Respond as follows:
 - .1 Maintain work area isolation and re-clean entire work area. Then apply another acceptable coat of lock-down agent to exposed surfaces throughout the work area.
 - .2 Repeat above measures until visually inspected and air monitoring results are at a level equal to that specified
 - .3 Alternate to items above, the Asbestos Abatement Contractor can pay for analysis of PCM samples by Transmission Electron Microscopy (TEM) at NVLAP accredited laboratory.
 - .1 Enclosure to remain sealed, with negative pressure maintained, and subject to required daily inspections until TEM results are received.
- .5 Additional labour or materials expended by the Contractor to rectify unsatisfactory conditions and to provide performance to the level specified shall be at no additional cost to the Owner.

- .6 Cost of additional inspection and sampling performed as a result of elevated fibre levels in areas outside the Abatement Work Area or from within the work area following completion of work, will be back-charged to the Contractor.

1.14 Worker Protection

- .1 Instruct workers before allowing entry to the Abatement Work Area. Instruction shall include training in use of respirators, dress, showering, entry and exiting from an Abatement Work Area, and all other aspects of work procedures and protective measures.
- .2 Workers shall not eat, drink, chew gum or tobacco, vape or smoke in the Abatement Work Area.
- .3 Workers shall be fully protected at all times when possibility of disturbance of hazardous materials exists.
- .4 Provide soap, towels and facilities for washing of hands and face, which shall be used by all personnel when leaving the Abatement Work Area.
- .5 Respiratory Protection
 - .1 Refer to each particular Section of the Specification for specified type of respiratory equipment specific to each phase or work area.
 - .2 Respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Abatement Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.
 - .8 Provided with new filters as necessary, according to manufacturer's instructions.
 - .9 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing.
 - .10 Instruction on proper use of respirators must be provided by a competent person as defined by the Occupational Health and Safety Act.
 - .3 Provide protective clothing, to all personnel which:
 - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres or lead/silica dust.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
 - .3 Once coveralls are worn, treat and dispose of as contaminated waste.
 - .4 Is replaced or repaired if torn or ripped.

- .4 Use hard hats, safety footwear and other protective equipment and apparel required by applicable construction safety regulations.

1.15 Visitor Protection

- .1 Provide clean protective clothing and equipment to Authorized Visitors.
- .2 Instruct Authorized Visitors in the use of protective clothing and Abatement Work Area entry and exit procedures.
- .3 Authorized visitors are required to be fit tested on respirators, prior to entering Abatement Work Area.
 - .1 Respirator worn must be compliant with Section 13 and Table 2 of O.Reg. 278/05.

1.16 Signage

- .1 Asbestos Abatement Signs: Post signs at access points to the Abatement Work Area, stating at minimum, the following:
 - .1 There is an asbestos dust hazard.
 - .2 Access to the work area is restricted to persons wearing protective clothing and equipment.
- .2 Vehicles, Bins and Asbestos Waste Containers: Post signs on both sides of every vehicle used for the transportation of asbestos waste and on every asbestos waste container. Signs must display thereon in large, easily legible letters that contrast in colour with the background the word “CAUTION” in letters not less than ten centimetres in height and the words:
 - .1 CONTAINS ASBESTOS FIBRES
 - .2 Avoid Creating Dust and Spillage
 - .3 Asbestos May be Harmful To Your Health
 - .4 Wear Approved Protective Equipment.
- .3 Place placards in accordance with Transportation of Dangerous Goods Act.

1.17 Waste and Material Handling

- .1 Waste bins must be placed on grade or in receiving.
- .2 All bins for hazardous materials must be covered and locked when waste transfer is not being performed.
- .3 Ensure redundant non-ACM, rubble, debris, etc. removed during contaminated work are treated, packaged, transported and disposed of as appropriate waste.

- .4 Clean, wash and apply Post Removal Sealant to metal waste prior to removal from Abatement Work Area. Recycle metals.
- .5 Clean, wash and apply Post Removal Sealant to non-porous materials prior to disposal as clean waste. Obtain prior written approval from the Abatement Consultant for each individual type of material.
- .6 Clean and wash equipment prior to removal from Abatement Work Area if removed prior to completion.
- .7 Place all equipment, tools and unused materials that cannot be cleaned in Abatement Waste Containers.
- .8 As work progresses, and at regular intervals, transport the sealed and labelled waste containers from the Abatement Work Area to waste bin.
- .9 Place items in bins according to waste classification. Place asbestos waste, metals, non-asbestos waste, etc. in separate bins.
- .10 Removal of waste containers and decontaminated tools and materials from the Abatement Work Area shall be performed as follows:
 - .1 Remove any visible contamination from the surface of non-porous or cleanable waste being removed from the Abatement Work Area. If the item can be cleaned, remove it from the site as clean waste.
 - .2 Place waste or item in Waste Container and seal closed.
 - .3 Wet wipe outside of Waste Container.
 - .4 Within Decontamination Facility, Transfer Room or at the perimeter of the Abatement Work Area, place in second Waste Container. Seal closed.
 - .5 Remove waste containers and transport to appropriate bin.
- .11 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.
- .12 Provide workers transporting waste with means to access full personal protective equipment and all tools required to properly clean up spilled material in the case of a rupture of a Waste Container.
- .13 Pick-up and drop off of garbage bin shall be at pre-approved times, and must not interfere with the Owners operations.
- .14 Transport hazardous waste to landfill or waste transfer station licensed by the provincial Ministry of the Environment.

- .15 Cooperate with the provincial Ministry of the Environment inspectors and immediately carry out instructions for remedial work at dump to maintain environment, at no additional cost to the Owner.

1.18 Re-establishment of Objects and Systems

- .1 Re-establish objects and items relocated by the Contractor's workforce to facilitate work.
- .2 Re-establish electrical, communication, HVAC and other services previously disconnected or otherwise isolated to accommodate work by this Section.
- .3 Make good at completion of work, all damage not identified in pre-removal survey.

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

- .1 Refer to the Sections identified in Related Work for specified materials, equipment or facilities specific to each phase or work area.
- .2 Materials and equipment must be in good condition and free of debris and fibrous materials. Disposable items must be of new materials only.
- .3 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.
- .4 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of materials.
- .5 Asbestos Waste Container: A container acceptable to disposal site, Ministry of the Environment, and Ministry of Labour, comprised of the following:
 - .1 Dust tight.
 - .2 Suitable for the type of waste.
 - .3 Impervious to asbestos.
 - .4 Identified as asbestos waste.
- .6 Discharge Ducting: Polyethylene Tubing. Reinforced with wire. Diameter to equal negative pressure machine discharge. Not to be longer than required, or so long that negative pressure is compromised.
- .7 Ground Fault Panel: Electrical panel as follows:
 - .1 Ground fault circuit interrupters of sufficient capacity to power temporary electrical equipment and lights in Asbestos Work Area.
 - .2 Interrupters to have a 5 mA ground fault protection.

- .3 Necessary accessories including main switch disconnect, ground fault interrupter lights, test switch to ensure unit is working, and reset switch.
- .4 Openings sealed to prevent moisture or dust penetration.
- .5 Inspected by the Electrical Safety Authority.
- .6 Panel uses CSA approved parts and been constructed, inspected and installed by a licensed electrician.
- .7 Provide one Ground Fault Panel for each 5,000 square feet (500 square metres) of Abatement Work Area.
- .8 HEPA Filtered Negative Pressure Machine: Portable air handling system which extracts air directly from the Abatement Work Area and discharges the air to the exterior of the building. Equipped as follows:
 - .1 Prefilter and HEPA filter. Air must pass HEPA filter before discharge.
 - .2 Pressure differential gauge to monitor filter loading.
 - .3 Auto shut off and warning system for HEPA filter failure.
 - .4 Separate hold down clamps to retain HEPA filter in place during change of prefilter.
- .9 HEPA Vacuum: Vacuum with necessary fittings, tools and attachments. Discharged air must pass through a HEPA filter.
- .10 Hose: Leak-proof, minimum bursting strength of 500 PSI or greater if required, abrasion resistant covering, reinforcing, and machined-brass couplings. Maintained and tested. Hose to be temperature resistant if it is to carry domestic hot water.
- .11 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints.: 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints.
- .12 Post Removal Sealant (or Lockdown): Sealant that when applied to surfaces serves the function of trapping residual asbestos fibres or other dust. Product must have flame spread and smoke development ratings both less than 50. Product shall leave no stain when dry. Post Removal Sealant shall be compatible with replacement insulation or fireproofing where required and capable of withstanding service temperature of substrate. Apply to manufacturer's instructions.
- .13 Protective Clothing: Disposable coveralls complete with head covering and full body covering that fits snugly at the ankles, wrists and neck.
- .14 Rip-Proof Polyethylene Sheeting: 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and two (2) layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps.

- .15 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.
- .16 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.
- .17 Wetting Agent: Non-sudsing surfactant added to water to reduce surface tension and increase wetting ability.

PART 3 EXECUTION

- .1 Refer to the Sections identified in Related Work for specified procedures for work area preparation, maintenance, site dismantlement, application of lock-down agent and all other procedures for the safe handling, removal and clean-up of hazardous materials specific to each phase or work area.

END OF SECTION

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PART 1 GENERAL

1.1 General and Related Work

- .1 Read this Section in conjunction with all drawings and all other Sections so as to comply with the requirements of the General Conditions of the Contract.
- .2 Requirements specified elsewhere:
 - .1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

- .1 Refer to Section 02 81 00 Hazardous Materials – General Provisions for the Outline of Work.
- .2 The intent of this Section is to provide safe work practices and procedures to govern the handling, removal, clean-up and disposal of asbestos-containing materials following Type 1 or Low Risk procedures, and Pinchin and Owner specific requirements.

1.3 Personal Protection

- .1 Protect all personnel at all times when possibility of disturbance of ACM exists.
 - .1 Provide non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters when requested by personnel.
 - .2 When requested by personnel, provide protective clothing.
- .2 Provide protective clothing, to all personnel entering the Abatement Work Area.
- .3 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

1.4 Inspections

- .1 Refer to Section 02 81 00 – General Provisions.
- .2 The following Milestone Inspections are to be scheduled:
 - .1 Milestone Inspection - Clean Site Preparation
 - .2 Milestone Inspection – Bulk Removal Inspection
 - .3 Milestone Inspection - Visual Clearance

PART 2 PRODUCTS AND FACILITIES

- .1 Refer to Section 02 81 00.

PART 3 EXECUTION

3.1 Site Preparation

- .1 Remove stored or non-fixed items from the Abatement Work Area including but not limited to equipment, furniture, waste etc. Store in area provided by Owner.
- .2 Moving of equipment, tools, supplies, and stored materials that can be performed without disturbing ACM will be performed by others.
- .3 Remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping.
- .4 Install one layer of polyethylene sheeting on walls, floors, finishes, millwork, electrical equipment, equipment and furnishings remaining in the Abatement Work Area.

- .5 Install one layer of rip-proofing polyethylene sheeting over one layer of polyethylene sheeting on walls, floors, finishes, millwork, electrical equipment, equipment and furnishings remaining in the Abatement Work Area.
- .6 Install polyethylene drop sheets below areas of work.
- .7 Install polyethylene sheeting on openings in walls and floors (as required) and seal.
- .8 Install signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.
- .9 Isolate, at panel, and disconnect existing power supply to Abatement Work Area. Power supply to remaining areas of building must not be disrupted during work of this section.
 - .1 Lock-out/tag-out power at electrical panels.
 - .2 Mark/tag any items within or passing through the Abatement Work Area that are to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.
- .10 Provide power from ground fault interrupt circuits.
- .11 Shut down HVAC systems serving the Abatement Work Area.
 - .1 Install polyethylene sheeting over openings in ducts and diffusers and seal.
 - .2 HVAC to remaining areas of building must not be disrupted during work of this section.
 - .3 System shall remain inoperative until completion of work, unless ducts can be effectively capped.
 - .4 Perform work at scheduled times after shutting down HVAC systems affecting the Abatement Work Area.
- .12 Provide amended water for wetting ACM, and adequate method of wetting (garden sprayers, airless sprayers, etc).
- .13 Without disturbing asbestos-containing materials, remove and dispose of non-hazardous materials as clean waste prior to asbestos removal work, where possible.

3.2 Maintenance of Abatement Work Area

- .1 Inspect polyethylene sheeting and ensure it is effectively sealed and taped. Repair damage and remedy defects immediately.
- .2 Inspect electrical panels and ensure locks and tags are on panels prior to entering the Abatement Work Area.
- .3 Maintain Abatement Work Area in tidy condition.
- .4 Remove any standing water on polyethylene/floor at the end of every shift.
- .5 Turn off water supply to any hoses and reduce pressure in hose, prior to leaving the Abatement Work Area at end of shift.

3.3 Asbestos Removal - General

- .1 Do not use powered tools or non-hand held tools.
- .2 Do not use compressed air to clean or remove dust or debris.
- .3 Do not break, cut, drill, abrade, grind, sand or vibrate ACM if it cannot be wetted. Type 2 procedures would be required if the material cannot be wetted due to hazard or damage.
- .4 Wet ACM prior to work and keep ACM wet throughout the removal process.

- .5 Frequently and at regular intervals during the work, clean up dust and waste using HEPA vacuums and/or wet sweeping or mopping.
- .6 Frequently and at regular intervals, place all waste in asbestos waste containers.
- .7 Immediately upon completion of work, clean area with HEPA vacuum and/or wet sweeping or mopping.

3.4 Asbestos Removal - Vinyl Asbestos Tile

- .1 Wedge a heavy duty scraper in seam of two adjoining tiles and gradually force edge of one tile up and away from floor. Do not break off pieces of tile, but continue to force balance of tile up.
- .2 Place tile, without breaking into smaller pieces, into Asbestos Waste Container.
- .3 Force scraper through tightly adhered areas by striking scraper handle with a hammer.
- .4 Heat tile thoroughly with a hot air gun until heat penetrates through tile and softens adhesive in areas where scraper will not remove tile.
- .5 Deposit waste into asbestos waste disposal bag.
- .6 HEPA vacuum floor on completion of work in area.

3.5 Asbestos Removal - Removal of Roofing Materials and Tar

- .1 Wet all material to be disturbed.
- .2 Use only non-powered hand-held tools to remove ACM. If power tools are required to complete removals, perform the work following either Type 2 asbestos procedures with power tools with a HEPA dust collection device or following Type 3 asbestos procedures.
- .3 Scrape to remove material adhered to substrate.
- .4 Place removed ACM directly into an asbestos waste container.
- .5 Clean up roofing materials debris where it has fallen on to the ceiling/floor space below within the school following the removal of the roofing.

3.6 Asbestos Removal - Removal of Other Non-Friable Asbestos Materials - Sinks

- .1 Wet all material to be disturbed.
- .2 Undo fasteners if necessary to remove material.
- .3 Break material only if unavoidable, and wet material if broken during work.
- .4 Use only non-powered hand-held tools to remove ACM.
- .5 Scrape to remove material adhered to substrate.
- .6 Place removed ACM directly into an asbestos waste container.

3.7 Abatement Work Area Dismantling

- .1 Wash or HEPA vacuum equipment and tools used in contaminated Abatement Work Area to remove all asbestos contamination, or place in Asbestos Waste Containers prior to being removed from Abatement Work Area.
- .2 Place tools and equipment used in contaminated work site but not cleaned in polyethylene bags prior to removal from Abatement Work Area.
- .3 Clean polyethylene sheeting and drop sheets which with HEPA vacuum or wet cleaning methods at completion of work.

- .4 Wet drop sheets and polyethylene sheeting.
- .5 Carefully roll polyethylene sheeting and drop sheets toward the centre. As polyethylene is rolled away, immediately remove visible debris beneath with a HEPA vacuum.
- .6 Remove remaining polyethylene sheeting and tape.
- .7 Place polyethylene sheeting, drop sheets, tape, disposal clothing and other contaminated waste in asbestos waste containers, wet wipe and place in second asbestos waste container.

3.8 Waste and Material Handling

- .1 Refer to Section 02 81 00.

END OF SECTION

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PART 1 GENERAL

1.1 General and Related Work

- .1 Read this Section in conjunction with all drawings and all other Sections so as to comply with the requirements of the General Conditions of the Contract.
- .2 Requirements specified elsewhere:
 - .1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

- .1 Refer to Section 02 81 00 Hazardous Materials – General Provisions for the Outline of Work.
- .2 The intent of this Section is to provide safe work practices and procedures to govern the handling, removal, clean-up and disposal of asbestos-containing materials following Type 2 or Moderate Risk procedures, and Pinchin and Owner specific requirements.

1.3 Personal Protection

- .1 Protect all personnel at all times when possibility of disturbance of ACM exists.
- .2 Provide the following minimum respiratory protection to all personnel:
 - .1 Full face respirators with P100 high efficiency (HEPA) cartridge filters, for:
 - .1 Removal of all or part of a ceiling if asbestos is likely lying on the surface.
 - .2 Use of a HEPA filtered power tool on non-friable ACM if the material is not wetted.
 - .2 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.
- .3 Provide protective clothing, to all personnel entering the Abatement Work Area.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

1.4 Inspections

- .1 Refer to Section 02 81 00 – General Provisions.
- .2 The following Milestone Inspections are to be scheduled:
 - .1 Milestone Inspection - Clean Site Preparation
 - .2 Milestone Inspection – Bulk Removal Inspection
 - .3 Milestone Inspection - Visual Clearance

PART 2 PRODUCTS AND FACILITIES

- .1 Refer to Section 02 81 00.

2.2 Hoarding Walls

- .1 Type A Hoarding Wall: One layer of rip-proof polyethylene sheeting installed floor to ceiling, secured with telescopic poles, clips, or other suitable methods.
- .2 Windows: Install sufficient transparent windows area in hoarding walls to allow observation of entire work area from outside the enclosure where existing solid walls do not make up the perimeter.

2.3 Transfer Room

- .1 Transfer Room to be generally 2000 mm x 2000 mm x 2200 mm high. Increase size accordingly to accommodate number of workers.
- .2 Install walls as follows:
 - .1 Install 38 x 89 mm wood framing at 610 mm o/c with continuous top and sill plates.
 - .2 Install one layer rip-proof polyethylene sheeting on interior walls of Transfer Room.
- .3 Install one layer of rip-proof polyethylene sheeting over two layers of 6 mil polyethylene sheeting beneath entire Transfer Room.
- .4 Install one layer rip-proof polyethylene sheeting over roof.
- .5 Turn 600 mm of polyethylene down the sides over polyethylene on the perimeter walls.
- .6 Install a fire extinguisher, mount to wall.

2.4 Curtained Doorways

- .1 Construct as follows:
 - .1 Install two flap doors, full width and height of door opening at all doors to Abatement Work Area and both ends of Transfer Room.
 - .2 Construct each flap door of two layers of polyethylene sheeting with all edges reinforced with tape. Use wood strapping to securely fasten flap doors to head and alternate jambs.
 - .3 Install weights attached to bottom edge of each door flap.
 - .4 Provide direction arrows on flaps to indicate opening.

PART 3 EXECUTION

3.1 Site Preparation - General

- .1 Remove stored or non-fixed items from the Abatement Work Area including but not limited to equipment, furniture, waste etc. Store in area provided by Owner.
- .2 Moving of equipment, tools, supplies, and stored materials that can be performed without disturbing ACM will be performed by others.
- .3 Remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping.
- .4 Isolate, at panel, and disconnect existing power supply to Abatement Work Area. Power supply to remaining areas of building must not be disrupted during work of this section.
 - .1 Lock-out/tag-out power at electrical panels.
 - .2 Mark/tag any items within or passing through the Abatement Work Area that are to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.
- .5 Provide power from ground fault interrupt circuits.
- .6 Shut down HVAC systems serving the Abatement Work Area.
 - .1 Install polyethylene sheeting over openings in ducts and diffusers and seal.
 - .2 HVAC to remaining areas of building must not be disrupted during work of this section.

- .3 System shall remain inoperative until completion of work, unless ducts can be effectively capped.
- .4 Perform work at scheduled times after shutting down HVAC systems affecting the Abatement Work Area.
- .7 Provide amended water for wetting ACM, and adequate method of wetting (garden sprayers, airless sprayers, etc).

3.2 Site Preparation –Enclosure Required

- .1 Install polyethylene enclosure complete with Windows at Abatement Work Areas for the following work:
 - .1 Removal of friable asbestos-containing materials (less than 1 square metre).
 - .2 Removal of a false ceiling (or part of) where asbestos-containing material is presumed or known to be present on the surface.
- .2 Install Transfer Room where duration of work is to last longer than one 8 hour shift.
- .3 Seal openings in floor using tape, polyethylene, etc. Floor openings are to be sealed independently prior to installation of floor polyethylene.
- .4 Install polyethylene sheeting on floors of Abatement Work Area. Use sufficient layers to provide adequate protection for carpeting and equipment.
 - .1 Minimum requirement over carpet is one layer of 6 mil polyethylene under one layer of rip-proof polyethylene.
 - .2 Cover floors first so that polyethylene on walls is overlapped by at least 305 mm.
- .5 Construct Hoarding Walls (as required) between Abatement Work Area perimeter and occupied areas.
- .6 Install polyethylene sheeting at openings in walls (as required) and seal.
- .7 Install 6 mil polyethylene sheeting on walls within the Abatement Work Area., including existing walls that make up, or are within, the Abatement Work Area.
- .8 Provide a completely sealed polyethylene top for free standing enclosures.
- .9 Extend to underside of ceiling system, enclosures for access into ceilings. Enclosure may be supported from the ceiling system if ceiling can support the polyethylene.
- .10 Install Curtained Doorways.
- .11 Install one layer of 6 mil polyethylene sheeting so as to protect all equipment and finishes in the Abatement Work Area that may be damaged. Items to remain include but are not limited to:
 - .1 Millwork.
 - .2 Doors.
 - .3 Bulkheads.
 - .4 Toilet Partitions.
 - .5 Plumbing fixtures.
 - .6 Electrical Equipment.
 - .7 Mechanical Equipment.
- .12 Install temporary lighting in enclosure to a level that will provide for safe and efficient use of work area - minimum 550 LUX.

- .13 Establish negative pressure in Abatement Work Areas as follows:
 - .1 Provide sufficient HEPA filtered negative pressure machines to exchange a volume of air equivalent to that of the Abatement Work Area a minimum of every 20 minutes.
 - .2 Provide additional HEPA filtered negative pressure machines as required to ensure air flow from Occupied Area into Abatement Work Area.
 - .3 Arrange negative air units to maximize the distance between units and decontamination facilities.
 - .4 Provide weighted flaps in perimeter Hoarding Walls as necessary to provide make-up air.
 - .5 Operate HEPA filtered negative pressure machines continuously from first disturbance of ACM until completion of dismantling.
 - .6 Replace prefilters to maintain specified flow rate.
 - .7 Replace HEPA filter as required to maintain flow rate and integrity of unit.
 - .8 Discharge HEPA filtered negative air machines as follows:
 - .1 To building exterior.
 - .1 Remove existing glazing where necessary and replace with a 19 mm plywood panel.
 - .2 Install panel securely in window frame so that it cannot be pushed into the building and make weather-tight with caulking.
 - .3 For each negative pressure unit, provide a 300 mm diameter, screened, duct opening through panel.
 - .4 Direct discharge away from building access points.
 - .5 Reinstall glazing to match existing upon completion of work.
 - .2 Into Occupied Areas as required.
 - .1 Install and make airtight all negative air discharge ducting.
 - .2 Use metal reinforced polyethylene discharge ducting in locations where the ducting must be protected from damage or collapse.
- .14 Place required tools to complete the abatement with the Abatement Work Area.
- .15 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.

3.3 Maintenance of Abatement Work Area

- .1 Inspect polyethylene sheeting and ensure it is effectively sealed and taped. Repair damage and remedy defects immediately.
- .2 Inspect electrical panels and ensure locks and tags are on panels prior to entering the Abatement Work Area.
- .3 Inspect HEPA filtered negative pressure machines including discharge ducting at the beginning and end of each working period. Inspection must be performed by competent person.
- .4 Maintain Abatement Work Area in tidy condition.
- .5 Remove standing water on polyethylene/floor at the end of every shift.
- .6 Turn off water supply to any hoses and reduce pressure in hose, prior to leaving the Abatement Work Area at end of shift.

3.4 Asbestos Removal - General

- .1 Do not use compressed air to clean or remove dust or debris.
- .2 Frequently and at regular intervals during the work, clean up dust and waste using HEPA vacuums and/or wet sweeping or mopping.
- .3 Frequently and at regular intervals, place all waste in asbestos waste containers.
- .4 Immediately upon completion of work, clean area with HEPA vacuum and/or wet sweeping or mopping.

3.5 Asbestos Removal – Thermal Systems Insulation (less than 1 Square Metre)

- .1 Construct an enclosure around Abatement Work Area and use the procedures described above under *Site Preparation – Enclosure Required*.
- .2 Adequately wet exterior of the ACM with amended water to suppress dust.
- .3 Remove asbestos-containing mechanical insulations in layers, maintaining all exposed surfaces of insulation in a wet condition.
- .4 Remove wetted ACM directly into waste containers. Do not allow ACM to fall to the floor of the Abatement Work Area.
- .5 Clean all surfaces from which ACM has been removed with scouring pads, vacuuming or wet-sponging to remove all visible material after completion of removal of ACM.
- .6 Remove visible dust and debris.
- .7 Seal exposed ends of asbestos-containing insulation to remain, with canvas and lagging.
- .8 HEPA vacuum or wet clean entire Abatement Work Area, including any surfaces not covered with polyethylene sheeting. Any materials removed to access ACM that are to be re-used, and any abatement equipment, must be wet cleaned or HEPA vacuumed prior to completion.
- .9 Apply Post Removal Sealant to all surfaces within the Abatement Work Area including those from which ACM has been removed.

3.6 Asbestos Removal – More than 7.5 square Metres of Ceiling Tiles

- .1 Use the procedures described above under *Site Preparation – Enclosure Required*.
- .1 Slightly lift first tile, HEPA vacuum the ceiling grid the perimeter of tile.
- .2 Lift tile vertically, and while keeping level, slide tile over to adjacent tile.
- .3 HEPA vacuum back of all tiles within reach.
- .4 Mist surface of ceiling tiles with amended water.
- .5 Remove ceiling tiles intact. Do not damage, break or pulverize.
- .6 Place ceiling tiles on a drop sheet in a designated areas to be reinstated upon completion of mechanical work.
- .7 Remove visible dust and debris including at grid.
- .8 Do not damage or remove grid where ceiling tiles are to be reinstated.
- .9 Wet clean or HEPA vacuum the entire Abatement Work Area, including surfaces not covered with polyethylene sheeting (i.e. ceiling grid).
- .10 Any materials or equipment removed to access ACM that are to be reused, must be wet

cleaned or vacuumed prior to reinstatement.

3.7 Reinstatement of Ceiling Tiles

- .1 Use the procedures described above under *Site Preparation – Enclosure Required*.
- .2 Mist surface of ceiling tiles with amended water and place ceiling tiles back into grid.
- .3 Do not damage or remove grid.
- .4 Wet clean or HEPA vacuum the entire Abatement Work Area, including surfaces not covered with polyethylene sheeting (i.e. ceiling grid).
- .5 Any materials or equipment removed to access ACM that are to be reused, must be wet cleaned or vacuumed prior to reinstatement.

3.8 Asbestos Removal - Drywall with Asbestos Drywall Joint Compound (greater than 1 square metre)

- .1 Use the procedures described above under *Site Preparation – Enclosure Required*.
- .2 Protect drywall around area to be removed by covering with polyethylene and taping seams to wall.
- .3 Cut drywall and remove using non-powered hand-held tools. Place directly into polyethylene waste bag, or sealed container until at waste bin.
- .4 Remove all screws and fasteners in studs or strapping.
- .5 Remove studs and strapping where specified. Clean metal studs and remove from Abatement Work Area.
- .6 Wet clean or HEPA vacuum the entire Abatement Work Area, including surfaces not covered with polyethylene sheeting. Any materials or equipment removed to access ACM that are to be reused, must be wet cleaned or vacuumed prior to reinstatement.

3.9 Asbestos Removal – Plaster Ceilings

- .1 Use the procedures described above under *Site Preparation – Enclosure Required*.
- .2 Protect walls around area to be removed by covering with polyethylene and taping seams to wall.
- .3 Cut plaster and remove using non-powered hand-held tools. Place directly into polyethylene waste bag, or sealed container until at waste bin.
- .4 Remove all lath, supports etc.
- .5 Wet clean or HEPA vacuum the entire Abatement Work Area, including surfaces not covered with polyethylene sheeting. Any materials or equipment removed to access ACM that are to be reused, must be wet cleaned or vacuumed prior to reinstatement.

3.10 Asbestos Disturbance - Removal/Installation of Items Affixed to Drywall and Paint with HEPA Filtered Power Tools

- .1 Use the procedures described above under *Site Preparation – No Enclosure Required*.
- .2 Site isolation to include a visual barrier comprised of rip-proof polyethylene sheeting, where incessancy and where occupants are present.
- .3 Wet all material to be disturbed.
- .4 Use only power tools with an effective HEPA dust collection device.
- .5 Turn on HEPA dust collection device attached to power tool. HEPA device to remain

operational throughout work.

- .6 Remove/install all items affixed to walls and ceilings as required.
- .7 Place ACM waste directly into an asbestos waste container.
- .8 Wet clean or HEPA vacuum the entire Abatement Work Area, including surfaces not covered with polyethylene sheeting. Any materials or equipment removed to access ACM that are to be reused, must be wet cleaned or vacuumed prior to reinstatement.

3.11 Asbestos Removal – Removal of Masonry Block Walls and Openings in Masonry Block Walls with Asbestos-Containing Paint

- .1 Use the procedures described above under *Site Preparation – Enclosure Required*.
- .2 Protect walls around area to be removed by covering with polyethylene and taping seams to wall.
- .3 Remove masonry block walls where scheduled for demolition.
- .4 Place ACM waste directly into an asbestos waste container.
- .5 Create openings in painted masonry walls, where required, using power tools equipped with an effective HEPA dust collection device.
- .6 Wet clean or HEPA vacuum the entire Abatement Work Area, including surfaces not covered with polyethylene sheeting. Any materials or equipment removed to access ACM that are to be reused, must be wet cleaned or vacuumed prior to reinstatement.

3.12 Application of Post Removal Sealant

- .1 Apply one coat of Post Removal Sealant with an airless sprayer, in accordance with Manufacturer's Instructions, to cover all surfaces on all items in the Abatement Work Area, including but not limited to polyethylene, ACM substrate, structural steel, and surfaces scheduled for demolition.
- .2 Do not apply post removal sealant to materials that will be damaged by its application.

3.13 Abatement Work Area Dismantling

- .1 Wash or HEPA vacuum equipment and tools used in contaminated Abatement Work Area to remove all asbestos contamination, or place in Asbestos Waste Containers prior to being removed from Abatement Work Area.
- .2 Place tools and equipment used in contaminated work site but not cleaned in polyethylene bags prior to removal from Abatement Work Area.
- .3 Clean polyethylene sheeting and drop sheets which with HEPA vacuum or wet cleaning methods at completion of work.
- .4 Wet drop sheets and polyethylene sheeting.
- .5 Carefully roll polyethylene sheeting and drop sheets toward the centre of enclosure. As polyethylene is rolled away, immediately remove visible debris beneath with a HEPA vacuum.
- .6 Remove remaining polyethylene sheeting and tape, and dispose of as asbestos waste.
- .7 Place polyethylene sheeting, drop sheets, tape, disposal clothing and other contaminated waste in asbestos waste containers, wet wipe and place in second asbestos waste container.
- .8 Remove remaining site isolation, seals, tape, etc.

- .9 Remove Transfer Room.
- .10 Remove seals, tape, Signage etc.
- .11 Immediately upon shutting down negative air units, seal air inlet grill and exhaust vent with polyethylene and tape.
- .12 Seal openings in HEPA vacuums.
- .13 Remove and dispose of the pre-filters from HEPA filtered negative pressure machines as asbestos waste.
- .14 Remove HEPA filtered negative pressure machines and discharge ducting or HEPA vacuums.
- .15 Remove temporary lights.
- .16 Remove ground fault panels.
- .17 Place contaminated materials including polyethylene sheeting, drop sheets, seals, tape, disposable coveralls, and other contaminated waste in asbestos waste containers.

3.14 Waste and Material Handling

- .1 Refer to Section 02 81 00.

3.15 Re-Establishment of Items

- .1 Upon completion of work:
 - .1 Move items that were removed from Abatement Work Area prior to work, back into same location within Abatement Work Area.
 - .2 Remove and disconnect Ground fault Panel, tags and locks from electrical panels and re-energize equipment and items.
 - .3 Remove negative air discharge panel and reinstall glazing to match existing.
 - .4 Clean, mop and vacuum Abatement Work Area and area beneath Decontamination Facilities.
 - .5 Enable building air handling systems.

END OF SECTION

PART 1 GENERAL

1.1 General and Related Work

- .1 Read this Section in conjunction with all drawings and all other Sections so as to comply with the requirements of the General Conditions of the Contract.
- .2 Requirements specified elsewhere:
 - .1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

- .1 Refer to Section 02 81 00 Hazardous Materials – General Provisions for the Outline of Work.
- .2 The intent of this Section is to provide safe work practices and procedures to govern the handling, removal, clean-up and disposal of asbestos-containing materials following Glove Bag procedures, and Pinchin and Owner specific requirements.
- .3 If for reasons of pipe temperature, geometry or access, Glove Bag procedures cannot be used, remove and dispose of asbestos-containing insulations as per Section 02 82 11 for less than 1 square meter, or per O.Reg. 278/05 for greater than 1 square meter.

1.3 Personal Protection

- .1 Protect all personnel at all times when possibility of disturbance of ACM exists.
- .2 Provide the following minimum respiratory protection to all personnel:
 - .1 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.
- .3 Provide protective clothing, to all personnel entering the Abatement Work Area.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

1.4 Inspections

- .1 Refer to Section 02 81 00 – General Provisions.
- .2 The following Milestone Inspections are to be scheduled:
 - .1 Milestone Inspection - Clean Site Preparation
 - .2 Milestone Inspection – Bulk Removal Inspection
 - .3 Milestone Inspection - Visual Clearance

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

- .1 Refer to Section 02 81 00.
- .2 Glove Bag: Prefabricated bag which provides a completely sealed envelope surrounding a given section of piping to permit the removal of asbestos-containing insulation from within the bag while maintaining the integrity of the bag and preventing the spread of airborne asbestos fibres. The glove bag shall be equipped with,
 - .1 sleeves and gloves that are permanently sealed to the body of the bag to allow the worker to access and deal with the insulation and maintain a sealed enclosure throughout the work period,

- .2 valves or openings to allow insertion of a vacuum hose and the nozzle of a water sprayer while maintaining the seal to the pipe, duct or similar structure,
 - .3 a tool pouch with a drain,
 - .4 a seamless bottom and a means of sealing off the lower portion of the bag, and
 - .5 a high strength double throw zipper and removable straps, if the bag is to be moved during the removal operation.
- .3 Securing Straps: For some types of Glove Bag, reusable nylon straps at least 25mm wide with metal tightening buckle for sealing ends of bags around pipe and/or insulation.

PART 3 EXECUTION

3.1 Site Preparation - General

- .1 Remove to the extent necessary to access piping, stored or non-fixed items from the Abatement Work Area including but not limited to equipment, furniture, waste etc. Store in area provided by Owner.
- .2 Moving of equipment, tools, supplies, and stored materials that can be performed without disturbing ACM will be performed by others.
- .3 Shut down HVAC systems serving the Abatement Work Area.
 - .1 Install polyethylene sheeting over openings in ducts and at diffusers and seal.
 - .2 HVAC to remaining areas of building must not be disrupted during work of this section.
 - .3 System shall remain inoperative until completion of work, unless ducts can be effectively capped.
 - .4 Perform work at scheduled times after shutting down HVAC systems affecting the Abatement Work Area.
- .4 Install caution tape around work area where existing walls are not present.
- .5 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.
- .6 Remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping.
- .7 Cover walls, floors, finishes, millwork, equipment and furnishings below the pipe to be worked on in the Abatement Work Area with polyethylene sheets before disturbing ACM. Drop sheets shall extend a minimum of 1,800 mm from pipe.
- .8 Use existing lighting or install temporary lighting to a level that will provide for safe and efficient use of work area - minimum 550 LUX.
- .9 Provide Amended Water for wetting ACM, in garden sprayers. Provide one garden sprayer for each worker.
- .10 Do not used compressed air to clean or remove and dust or debris when completing work of this section.
- .11 Place HEPA Vacuum in Abatement Work Area for each worker.
- .12 Place required tools to complete the abatement within the Abatement Work Area.
- .13 Post Notice of Project, where required by O.Reg. 278/05.

3.2 Maintenance of Abatement Work Area

- .1 Maintain Abatement Work Area in tidy condition.

3.3 Glove Bag Removal

- .1 Do not use Glove Bags on hot pipes that may damage Glove Bag. Refer to manufacturer's limitations.
- .2 Prior to use of Glove Bag on damaged or unjacketed insulation:
 - .1 Spray any areas of damaged insulation jacketing with mist of Amended Water.
 - .2 Tape over damaged insulation to provide temporary repair.
 - .3 Mist areas of insulation with no jacketing and wrap with polyethylene sheeting and seal with tape.
- .3 Place any tools necessary to remove insulation in tool pouch built into Glove Bag.
- .4 Inspect the Glove Bag for damage and defects immediately before it is attached to the pipe or duct.
 - .1 If damage or defects are observed, dispose of Glove Bag.
- .5 Install Glove Bag as per manufacturer's instructions.
- .6 Remove metal jacketing or banding carefully. Do not damage the Glove Bag.
- .7 Remove insulation from pipe as per manufacturer's directions.
 - .1 Volume and weight of insulation must not exceed capacity of the Glove Bag or supports.
 - .2 Arrange insulation in the Glove Bag to maximize use of the Glove Bag.
- .8 Only glove bags designed to be moved may be re-used on other sections of pipe or moved down same section of pipe (e.g. Safe-T-Strip).
- .9 At regular intervals during its use, if damage or defects are observed during the use of the Glove Bag, which cannot be readily repaired with tape and not affect the integrity or strength of the glove bag.
 - .1 Discontinue use of Glove Bag.
 - .2 Wash inner surface of Glove Bag.
 - .3 Wet insulation.
 - .4 Pull an Asbestos Waste Container over Glove Bag before removing from pipe.
 - .5 Remove Glove Bag and Asbestos Waste Container, seal with tape.
 - .6 Place in a second Asbestos Waste Container and seal with tape.
 - .7 Clean immediate area with a HEPA Vacuum prior to resuming work.
- .10 If bag is to be moved along pipe for use on adjacent section of insulation:
 - .1 Wash inner surface of Glove Bag.
 - .2 Wash tools and place tools in pouch.
 - .3 Wet surface of insulation in lower section of bag and any exposed end of asbestos insulation remaining on pipe with Amended Water.
 - .4 Insert nozzle of HEPA filtered vacuum cleaner into bag through valve and evacuate air from bag.
 - .5 Seal closure strip.

- .6 Loosen securing straps to maintain a loose seal of Glove Bag to insulation or pipe.
- .7 Use double throw zipper as necessary to pass hangers.
- .8 Tighten straps once bag is in new position and continue insulation removal until Glove Bag is full, work is completed on the pipe or an obstruction prevents further movement of the bag.
- .11 If bag is to be removed from a pipe for use on a new section of pipe, perform the following:
 - .1 Wash inner surface of Glove Bag.
 - .2 Wash tools and place tools in pouch.
 - .3 Wet surface of insulation in lower section of bag and any exposed end of asbestos insulation remaining on pipe with Amended Water.
 - .4 Insert nozzle of HEPA filtered vacuum cleaner into bag through valve and evacuate air from bag.
 - .5 Seal valve cover on valve Glove Bags.
 - .6 Seal closure strip.
 - .7 Wash top section of Glove Bag and tool pouch thoroughly.
 - .8 Undo securing straps, unfasten zipper and carefully move bag to new section of pipe.
- .12 To remove bag after completion of insulation removal operation:
 - .1 Wash inner surface of Glove Bag.
 - .2 Wash and place all tools in one hand (glove), pull hand out inverted, twist to create a separate pouch, tape inverted hand at two separate locations 25 mm apart so as to seal pouch.
 - .1 Remove inverted hand and tools by cutting between the two tape seals.
 - .2 Place inverted hand pouch and tools into the next clean Glove Bag to be used or into a water bucket, open pouch underwater and clean tools.
 - .3 Wet surface of insulation in lower section of bag and any exposed end of asbestos insulation remaining on pipe with Amended Water.
 - .4 Insert nozzle of HEPA filtered vacuum cleaner into bag through valve and evacuate air from bag.
 - .5 Seal valve cover on valve Glove Bags.
 - .6 Seal closure strip if equipped with one. Twist bag at tapered point and secure with tape.
 - .7 Pull an Asbestos Waste Container over Glove Bag before removing from pipe.
 - .1 Undo straps and unzipper, or cut upper portion of single-use Glove Bag.
 - .2 Seal Asbestos Waste Container with tape.
 - .8 Ensure pipe is clean of all residue after removal of Glove Bag. If necessary, after removal of each section of asbestos, vacuum all surfaces of pipe, using HEPA vacuum or wipe with wet cloth.
- .13 Seal all surfaces of freshly-exposed pipe with Post Removal Sealer.
- .14 Cover exposed ends of any remaining asbestos insulation with canvas and lagging using Type 2 Procedures.

3.4 Clean-Up and Dismantling

- .1 Clean and remove from Abatement Work Area:
 - .1 Equipment and tools.
 - .2 Temporary lighting if used.
 - .3 Polyethylene seals from HVAC systems.
- .2 Place polyethylene sheeting, drop sheets, seals, tape, clothing and other contaminated waste in asbestos waste containers, wet wipe and place in second asbestos waste container.
- .3 Clean Abatement Work Area with HEPA vacuums or wet wiping/mopping.
- .4 Seal openings in HEPA vacuums.
- .5 Proceed with the dismantlement of all barricades, etc. following receipt of authorization to proceed from the Asbestos Abatement Consultant.
- .6 Remove barricades, caution tape, signs, etc.

3.5 Waste and Material Handling

- .1 Refer to Section 02 81 00.

3.6 Re-Establishment of Items

- .1 Upon completion of work:
 - .1 Move all items that were removed from Abatement Work Area prior to work, back into same location within Abatement Work Area.
 - .2 Remove tags and locks from electrical panels and re-energize equipment and items.
 - .3 Enable building air handling systems.
 - .4 Clean and vacuum Abatement Work Area.

END OF SECTION

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PART 1 - GENERAL

1.1 SUMMARY

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 This Section includes supply and installation of unit masonry assemblies consisting of the following:

- .1 Veneer Brick
- .2 Architectural Concrete Masonry Units (CMUs)
- .3 Mortar, and Grout
- .4 Reinforcing steel
- .5 Masonry joint reinforcement
- .6 Ties and anchors
- .7 Miscellaneous masonry accessories

1.2 REFERENCES

- 1.2.1 ASTM C216 Standard SW Severe Weather (Cold Climate)
- 1.2.2 ASTM A82-02 Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
- 1.2.3 ASTM A116-11 Standard Specification for Metallic-Coated, Steel Woven Wire Fence Fabric.
- 1.2.4 ASTM A123/A123M-13 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- 1.2.5 ASTM A153/A153M-09 Standard Specification for Zinc Coated (Hot-Dip) on Iron and Steel Hardware.
- 1.2.6 ASTM A167-99 (2009) Standard Specification for Stainless and Heat-Resistant Chromium-Nickel Steel Plate, Sheet and Strip.
- 1.2.7 ASTM A580/A580M-15 Standard Specification for Stainless Steel Wire.
- 1.2.8 ASTM C207-06(2011) Standard Specification for Hydrated Lime for Masonry Purposes.
- 1.2.9 ASTM C331/C331M-14 Standard Specification for Lightweight Aggregates for Concrete Masonry Units.
- 1.2.10 CSA A23.1-09/A23.2-09 Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- 1.2.11 CAN/CSA G164-M92 (R2003) Hot Dip Galvanizing of Irregularly Shaped Articles.
- 1.2.12 CSA A-82 EG Exterior Grade Masonry Unit
- 1.2.13 CSA S304-14 Design of Masonry Structures.

- 1.2.14 CSA A82.56-M1976 Aggregate for Masonry Mortar.
- 1.2.15 CSA A165 Series-14 CSA Standards on Concrete Masonry Units.
- 1.2.16 1 CSA A179-14 Mortar and Grout for Unit Masonry.
- 1.2.17 CSA A370-14 Connectors for Masonry.
- 1.2.18 CSA A371-14 Masonry Construction for Buildings.
- 1.2.19 CSA G30.3-M1983(R1998) Cold Drawn Steel Wire for Concrete Reinforcement.
- 1.3 DEFINITIONS
 - 1.3.1 Solid block: A masonry unit with a net cross sectional area of at least 75% of its gross sectional area in any plane parallel to its bearing surface.
 - 1.3.2 One hundred percent (100%) solid block: A masonry unit with plain flat ends and without cores.
 - 1.3.3 Administrative Requirements - Pre-Construction Conference: Arrange a site meeting attended by the contractor's superintendent, the Subcontractor's representative and foreman for this project, the Consultant, materials supplier(s), and other relevant personal before commencement of work for this Section; agenda for meeting will include; but not be limited to, the following:
 - .1 Confirmation of specifications and details for the project
 - .2 Required mortar, grout and concrete testing, batch control and grouting procedures
 - .3 Installation requirements of air/vapour membranes and insulation and coordination with other components of the Work
 - .4 Confirmation of cavity compartmentalization and drainage requirements
 - .5 Confirmation of appearance of exposed block lintels
 - .6 Confirmation of reinforcement at corners and wall intersections
 - .7 Coordination of interior and exterior crack control measures
 - .8 Confirmation of trowelled or tooled joints to concealed and exposed masonry faces
 - .9 Confirmation of methods for keeping mortar out of cavity space
 - .10 Confirmation of methods for controlling efflorescence during construction
 - .11 Confirmation of membranes and membrane flashing materials and details used for construction
 - .12 Review of submitted masonry unit samples
 - .13 Review of hot and cold weather requirements
 - 1.3.4 Coordination: Coordinate components of the work of this Section with work performed by other Sections including; but not limited to, the following:
 - .1 Rain Screen Wall Construction: Masonry veneer forms a part of the exterior rain screen and protective facing. Construct assembly to allow for ventilation, drainage and pressure equalization of the voids between the veneer and the insulation with the outside pressures. Construct cavity space divided into separate compartments as a means of controlling these pressure differences within the building envelope.
 - .2 Steel Support Angles and Brackets: Coordinate requirements for structural steel support angles and brackets supplied and installed onto the building structure by Section 05 50 00.
- 1.4 DESIGN REQUIREMENTS

- 1.4.1 Fire and smoke separations: Where masonry walls, partitions and furring are required to act as fire and smoke separations or barriers or as fire protection for structural steel, they shall conform to Supplementary Guidelines to the latest OBC, with respect to equivalent thickness and type of concrete and to requirements of authorities having jurisdiction.
- 1.4.2 Comply with CSA A370, CSA A371, CSA S304, local building codes, authorities having jurisdiction and these Specifications. Should conflict occur, the more strict shall govern.
- 1.4.3 Comply with CAN3-A371 for construction tolerances. Tolerances shall not accumulate.
- 1.4.4 Irregularity in mortar joints of wall faces exposed or painted in the completed work shall not be noticeable when viewed from a distance of 15'.
- 1.5 SOURCE QUALITY CONTROL
 - 1.5.1 The Consultant may appoint an independent testing company to test each type of masonry unit and mortar. Tests for masonry units shall be in accordance with CSA S304, and CSA A165 as appropriate. Submit products selected at random in presence of Consultant to the testing company for testing when directed.
 - 1.5.2 Submit unit compression test and net area and absorption tests to Consultant prior to delivery of materials to the site.
 - 1.5.3 Include testing cost as part of this Section.
- 1.6 FIELD QUALITY CONTROL
 - 1.6.1 Perform field quality control tests as part of work of this Section.
 - 1.6.2 Perform site tests to determine moisture content of unit at time of delivery to site.
 - 1.6.3 Submit three test reports for each type of mortar and grout in accordance with CSA A179 .
 - 1.6.4 Site test clay masonry units to determine initial rate of absorption in accordance with CSA A179.
- 1.7 SUBMITTALS
 - 1.7.1 Submit two samples of each type of masonry unit, reinforcing, ties, anchors, accessories and cured coloured mortar for approval before delivery of materials to the site.
 - 1.7.2 Submit two brick samples, each consisting of 6 bricks, showing range of colours and texture, stacked with simulated joints.
 - 1.7.3 Submit layout of cavity wall locations for approval.
 - 1.7.4 Products on site shall match approved samples.
 - 1.7.5 Shop Drawings: Submit shop drawings indicating the following:
 - .1 Indicate sizes, profiles, coursing, and locations of special shapes for concrete masonry units.
 - .2 Indicate sizes, profiles, and locations of each stone trim unit required.
 - .3 Detail corner units, end dam units, and other special applications for fabricated flashings.

- 1.7.6 Informational Submittals: Provide the following submittals when requested by the Consultant: Submit ULC Assembly Listings and Materials cut sheets for fire rated assemblies as follows:
- .1 Not later than 30 working days following Award of Contract, submit copies of ULC Assembly and Materials Listing for indicating ULC Number and how assembly meets the rating criteria for assemblies listed on drawings or meets requirements of Supplementary Standard SB-3 of Ontario Building Code
 - .2 Use the same system and material as would be required for a tested assembly for the project; ULC Listings are tested with the specific materials indicated; substitutions will not be permitted unless evidence of equivalency is confirmed.
 - .3 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.
- 1.8 MOCK-UP
- 1.8.1 Prior to commencement of work, construct a 1000 mm (40") high and 1500 mm (60") long sample wall for each type of masonry wall on site at locations on the building approved by the Consultant.
- 1.8.2 Allow Consultant to inspect sample wall during the various stages of its construction.
- 1.8.3 Sample wall shall show the specified mortar, bond, joint treatment, back-up masonry, cast-in-place concrete and metal stud, reinforcement, insulation, vapour barrier, and flashing where applicable. Remove rejected sample walls from site. Approved sample wall may form part of the completed work. All work shall match approved sample wall.
- 1.8.4 Co-ordinate erection of sample wall with Sections providing back up construction.
- 1.9 PRODUCT DELIVERY, STORAGE AND HANDLING
- 1.9.1 Deliver and store masonry units, palletized, level and under protective covering. Do not overload structure.
- 1.9.2 Protect materials and products from deterioration by weather, mechanical damage and other causes, and from soiling.
- 1.9.3 Keep masonry materials and products completely free from frost, snow and ice.
- 1.10 COLD WEATHER WORK
- 1.10.1 Comply with CSA A371 and the following:
- .1 Where possible, deliver materials required to the site in advance of freezing temperatures.
 - .2 Use dry, unfrozen masonry units.
 - .3 Building on frozen work is prohibited. Remove sections of masonry deemed frozen and damaged before continuing construction of that section.
 - .4 Do not use scorched sand, salts, or anti-freeze admixtures.

1.10.2 Cold Weather Construction Requirements

.1 Provisions for work in progress:

Condition	Requirement
Ambient temperature above 40°F (4.5°C)	Normal construction practice. Cover stored materials.
Ambient temperature below 40°F (4.5°C) or temperature of units below 40°F (4.5°C)	Heat mortar materials to produce mortar temperatures between 40°F (4.5°C) and 120°F (49°C) at time of mixing. Maintain mortar above freezing until used in masonry. If units have a temperature below 20°F (-7°C), heat to above 20°F (-7°C). Remove visible ice from units.

Condition	Requirement
Ambient temperature is between 25°F (-4°C) and 20°F (-7°C)	Heat masonry under construction from both sides. Install wind breaks when wind velocities reach 15 mph (24 km/h).
Ambient temperature is below 20°F (-7°C)	Provide heat enclosure for masonry under construction and maintain temperature above 32°F (0°C) within that enclosure.

2. Protection of newly completed work:

Condition	Requirement
Mean daily temperature above 40°F (4.5°C)	Normal construction practice. Cover top of unfinished masonry work to protect it from weather.
Mean daily temperature between 40°F (4.5°C) and 25°F (-4°C)	Cover completed masonry with weather resistive membrane to protect from rain or snow for 24 hours after construction.
Mean daily temperature between 25°F (-4°C) and 20°F (-7°C)	Cover masonry with insulating blankets or equivalent protection for 24 hours after construction.
Mean daily temperature below 20°F (-7°C)	Maintain temperature of masonry above 32°F (0°C) for 24 hours after construction.

1.11 HOT WEATHER PROTECTION

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

PART 2 - PRODUCTS

2.1 MATERIAL

- 2.1.1 Concrete block: CSA A165.1, autoclaved, low pressure steam or bubble cured. All interior walls and partitions corners to be bullnose unit.

- .1 Classification: S/15/A/M, 75% solid for all locations where structural members bear on concrete block.
- .2 H/15/A/M, for all other block work.
- .3 Fire Resistant Concrete Masonry Units: Manufactured in accordance with CSA A165:
 - .1 2 Hour Fire Rating: H/15/C/O
 - .2 1 Hour Fire Rating: H/15/A/O
- .4 Size: Modular imperial to sizes indicated on Drawings.
- .5 Special shapes:
 - .1 Provide square units for exposed corners.
 - .2 Provide purpose made shapes for lintels and bond beams.
 - .3 Provide additional special shapes required for project.
 - .4 Manufacture special shapes at same time and with the same batch as standard concrete block to be used.

- 2.1.2 Metric Brick: ASTM C216 Standard and CSA A-82 exterior grade masonry unit, Modular, Architectural series type FBX by Brampton Brick or equivalent, texture and colour to be confirmed by Architect.

- .1 Special shapes: Provide special sizes and shapes as shown on drawings and as required including but not limited to, plain ends, halves, jambs, sash, lintel, bullnose, and other shapes. Special shapes shall be manufactured to shape, not cut.
- .2 Notwithstanding the appearance requirements of the above mentioned CSA Standards, block shall be free from all surface indentations, surface cracks and other defects detrimental to the appearance of the finished surface. Block having visual defects shall be rejected for exposed areas but may be used for concealed or unfinished areas.
- .3 Efflorescence: When testing in accordance with CSA A82.2, concrete blocks shall be efflorescence free.
- .4 Freeze/thaw resistance: Free of disintegration, weight loss, delamination, and pop outs when tested in accordance with CSA A165.3.
- .5 Load bearing, hollow, normal weight units: H/15/A/M.
- .6 Walls and partitions exposed to weather, normal weight: H/15/A/M.
- .7 Load bearing, solid normal weight units: S/15/A/M.
- .8 Load bearing, solid, lightweight units: S/15/B/M.
- .9 Load bearing, hollow, lightweight units: H/15/B/M.
- .10 Non load bearing, hollow, normal weight units: H/15/A/M.
- .11 Non load bearing, solid, normal weight units: S/15/A/M.
- .12 Non load bearing, hollow, lightweight units: H/15/B/M.
- .13 Non load bearing, solid, lightweight units: S/15/B/M.
- .14 Fire ratings: Provide concrete blocks having void to solid ratios and aggregate as required to achieve required fire ratings for width of fire rated walls shown. Use concrete block units as specified above and of special aggregate type L1 as required to obtain fire

- ratings of walls, which cannot be achieved with concrete block units of standard type S or N aggregates.
- .15 Aggregates for light weight concrete blocks: ASTM C331.
 - .16 Aggregates for normal weight concrete blocks: CSA A23.1.
 - .17 Architectural concrete block: 2-Rib, Split-Face,.
 - .18 Supply masonry units in compliance with "Intended Use of Different Types of Masonry Units as listed in Appendix 'C' of CSA A165.1..
- 2.1.3 Architectural Block: Architectural Block series by Brampton Brick or equivalent, texture and colour to be confirmed by Architect.
- 2.1.4 Portland cement: Type 10.
- 2.1.5 Masonry cement: Type H or Type L.
- 2.1.6 Sand: CSA A82.56M, as amended by CSA A179.
- 2.1.7 Lime: ASTM C207, hydrated lime.
- 2.1.8 Water: Clear and free from injurious amounts of deleterious substances.
- 2.1.9 Colour pigments: Pure mineral pigment, mineral oxide content minimum 70%. Fillers; inert. Maximum carbon black content; 1% water soluble matter. Colours to be selected by Consultant to match existing mortar at exterior brick.
- .1 Extra Strong Colour by Elementis Pigments Inc.,
 - .2 Staybrite by Sternson Limited, or other approved manufacture.
- 2.1.10 Non-shrink grout: Minimum compressive strength of 35 Mpa (5000 psi) at 28 days. Include non-ferrous expansion agents where exposed to view or weather.
- .1 Sika Grout 212 By Sika,
 - .2 Sealtight CG-86 by W.R. Meadows of Canada Ltd.,
 - .3 Thoro Multigrout by Harris Specialty Chemicals, or other approved manufacture
- 2.1.11 Parging mortar: Type N, having a compressive strength of 5.0 Mpa (759 psi) minimum, 1 part Portland cement to not less than 2 1/2 nor more than 3 1/2 parts sand by volume.
- 2.1.12 Control joint material:
- .1 Rapid Control Joint by Dur O Wal Limited,
 - .2 Titewall BL-A by Blok lok Ltd., or other approved manufacture.
- 2.1.13 Premoulded filler: 100% over sized:
- .1 Rodofoam PR grade by Sternson Limited,
 - .2 Sealtight Rescor by W.R. Meadows of Canada Ltd., or other approved manufacture.
- 2.1.14 Mineral wool filler: Mineral fibre batt insulation by Roxul Company, or other acceptable equivalents.
- 2.1.15 Through-wall flashing material: Modified bitumen, glass scrim reinforced elastomeric, 0.9 mm (35 mils) thick, Blueskin TWF by Henry Company, or other approved manufacture.

2.1.16 Flexible anchors and adjustable ties: 9 gauge galvanized rods.

2.1.17 Horizontal reinforcing:

- .1 Reinforcing: Truss type, consisting of 9 ga. wire complying with CSA G30.3, two side rods welded to a continuous diagonal formed cross rod forming a truss design with alternating welds not exceeding 8". Width of reinforcing unit shall be 1 1/2" less than nominal thickness of wall, BL 30 Blok Truss by Blok Lok or other approved manufacture.
- .2 Galvanizing: ASTM A116 Class 3 mill galvanized for interior walls and ASTM A153 Class B2 hot dipped galvanized after fabrication for exterior walls.

2.1.18 Masonry Unit Veneer/Concrete or Concrete Masonry Unit Substrate Tie Systems:

- .1 Backer Plate: Fabricated from stainless steel meeting requirements of CSA A370-04(R2009) and ASTM A1011/A101aM-12; designed to transfer wind loads to steel stud framing; length to suit total cavity, insulation and sheathing thickness, as detailed on Drawings.
- .2 Ties: Wire ties fabricated from stainless steel wire in accordance with CSA G30.18-09; length to allow for cavity width and to extend minimum 2" into masonry unit joint.
- .3 Fasteners: Self tapping metal screws to metal stud backup as recommended by tie manufacturer consisting of close tolerance bits for use in percussion drills, and hammer driven anchors with pullout strengths of 5.4 kN for 20 MPa concrete and 3.75 kN for hollow concrete masonry unit with a 1" embedment:
 - .1 Fero Holdings Ltd., Rap-Tie System
 - .2 Blok-Lok, BL-407

2.1.19 Insulation fasteners: Wedge Lok by Block Lok Limited.

2.1.20 Interior and Exterior Single Wythe Concrete Block Walls:

- .1 Single wythe interior and exterior concrete block walls: Horizontal reinforcement shall be ladder type or truss type having two parallel side rods 3/16" diam. welded to 3/16" cross rods forming a ladder or truss design. Side rods shall be notched or knurled. Design ladder or truss reinforcement to allow placement of side rods at center-line of both face shells of concrete block.

2.1.21 Minimum corrosion protection for masonry connectors and horizontal reinforcing, as outlined in CSA A370:

- .1 Interior masonry not subjected to moisture; Mill galvanized carbon steel.
- .2 Interior masonry subject to moisture, below grade masonry in contact with ground, and above grade exterior masonry in buildings less than 32'-0" in height (measured from the floor level of the first storey); Hot-dipped galvanized after fabrication with minimum zinc coating in accordance with ASTM A153, Class B wire ties/reinforcing 1.5 oz/ft² and ASTM A123 plates/strips/sheets 2 oz/ft², on each face.

2.1.22 Masonry connectors shall meet the following performance tolerance requirements as outlined in CSA A370:

- .1 Deflection; Maximum 3/32" including free play when acted upon by a lateral load of 0.05 ton force in all possible positions.
- .2 Linkage preventing separation of components i.e. brick tie/connector reinforcing, etc.
- .3 Free play of multi-part connectors; not more than 0.048" when assembled in all possible configurations and not subject to a load.

2.1.23 All steel anchors, reinforcement and other accessories: Stainless steel conforming to ASTM A167 or hot dip galvanized, complying with CSA G164, as herein specified.

2.1.24 Trim Units: Manufactured in accordance with CSA A165, and as follows:

- .1 Architectural Sill Profile:
 - .1 Size: 5-1/2" deep, complete with drip edge, 3-1/2" high, and angled to 3-1/4" high, with beveled edges.
 - .2 At locations requiring sills to wrap a corner, provide corner sill unit as a one (1) piece unit completed with beveled profile to match adjacent sill units. Miter joints are not permitted, unless prior written approved by the Consultant is obtained.
 - .3 Colour: As indicated on the Drawings.
 - .4 Basis of Cambridge Series, Architectural Sills Model R24/3.5 Angled, by Richvale York Block Inc.

2.2 MORTAR TYPES

2.2.1 Mortar types in parts by volume, complying with CSA A179-M shall be as follows:

TYPE	PORTLAND CEMENT	HYDRATED LIME OR LIME PUTTY	MASONRY CEMENT TYPE H	AGGREGATE LOOSE DAMP CONDITION	28 DAY COMPRESSIVE STRENGTH
S	1	1/2	0	4-1/2	12.5 MPa (1800 psi)
	1/2	0	1	4-1/2	
N	1	1	0	6	5 MPa (750 psi)
	0	0	1	3	

2.2.2 Use premixed masonry mortars prepared with Betomix 1.1.6 and Betomix Plus, by Daubois Inc., or other approved manufacture, for exterior face work.

2.2.3 Other masonry cement may be used only on interior masonry.

2.2.4 Add colouring pigment to mortar for face work if required. Colours shall be as later directed to match existing mortar at exterior brickwork. Under no circumstances shall colour pigment loading exceed 6% per 55 lb. of dry mixed mortar. Mix colouring pigment into mortar in accordance with manufacturer's written instructions and as required to ensure colour uniformity and consistency.

2.3 MORTAR LOCATIONS

2.3.1 Type SW hard burned clay face brick with initial rate of absorption range of 10 to 20 grams: Type N.

2.3.2 Back up masonry to exterior walls: Type S.

- 2.3.3 Bearing courses: Type S. Rake joints back 1/2" if such courses are to be exposed and point to match remainder of wall.
- 2.3.4 Non load bearing partitions: Type N.
- 2.3.5 Grout in around all beams, joists, truss bearing plates bearing on masonry work: Type S.

2.4 MORTAR PREPARATION

- 2.4.1 Measure and mix mortar products accurately according to CSA A179. Proportion products by either the property specifications or the proportion specifications of CSA A179.
- 2.4.2 Mortar of the products and proportions used shall be mixed to an initial flow of 100% to 115% and shall have a flow after suction of not less than 70% of original flow.
- 2.4.3 Do not mix different types of mortar in the same mixer unless the mixer is thoroughly cleaned first.
- 2.4.4 When air temperature is 27°C or higher, use and place mortar in its final position within two hours of mixing it. When air temperature is less than 27°C use and place mortar in its final position within 2 1/2 hours of mixing it. Discard mortar not used within above times.
- 2.4.5 Mortars which have stiffened within mix/use time limits due to moisture evaporation may be re tempered by adding enough water as is necessary to produce proper workability consistent with the initial rate of absorption of the masonry units.

2.5 GROUTS

- 2.5.1 Measure and mix grout products accurately according to CSA A179M.
- 2.5.2 Do not mix different types of grout in same mixer or mixer used for mixing of mortar unless mixer is thoroughly cleaned.
- 2.5.3 Use and place grout in its final position within 2 1/2 hours of mixing it. Discard grout not used within 2 1/2 hours.
- 2.5.4 Grout types by volume shall be as follows:

TYPE	PORTLAND CEMENT	HYDRATED LIME OR LIME PUTTY	AGGREGATE MEASURED IN LOOSE DAMP STATE
<hr/>			
Fine			
Grout	1	0 to 1/10	2-1/4 to 3 times the sum of the cementitious materials
<hr/>			
Coarse			
Grout	1	0 to 1/10	1 to 2 times the sum of the cementitious materials
<hr/>			

- 2.5.5 Use coarse grout where required, in spaces 2" or more in least horizontal dimension. Use fine grout in spaces less than 2" in horizontal dimension.

2.6 ACCESSORIES

2.6.1 Weepholes: PVC 'T' shaped brick vents by Goodco Limited, or cadium plated airplane type 'Weep Holes-343' by Blok-Lok Limited, set 32" O.C. for architectural block in the following locations:

- .1 Bottom course of manufactured stone masonry units throughout;
- .2 Top courses of manufactured stone masonry units throughout.

2.6.2 Mortar Dropping Control Devices:

- .1 High density, polyethylene or nylon woven mesh type mortar dropping control devices with trapezoidal "zigzag" shaped top edge, designed to allow moisture/water to flow/drain downward in cavity/collar joints to the weepholes, thicknesses to suit cavies and collar joints, 'The Mortar Net' by Mortar Net USA Ltd., and distributed by JV Building Supply, division of Consolidated Materials Corporation, or approved equal.

PART 3 - EXECUTION

3.1 LINES AND LEVELS

3.1.1 Provide general lines and levels. Be responsible for accurate dimensions, lines and levels of work of this Section. Make work plumb and true.

3.2 CUTTING AND PATCHING

3.2.1 Do all cutting, fitting and patching of masonry to receive work of other trades, to make work properly come together and to make good to match adjacent masonry.

3.3 BUILT INS

3.3.1 Install items supplied by other trades to be built into masonry walls, plumb, level, properly aligned, rigid and secure. Build in miscellaneous metal work, loose lintels, bearing plates, sleeves, anchor bolts, anchors, wood nailers and all other items which required attachment or building into the masonry.

3.3.2 Set access doors and panels with front face flush with final wall finish. Such fittings shall be located precisely as directed.

3.3.3 Anchor steel door frames in place and build masonry around them. Do not attach door frames to walls by fastening to wood nailers. Use steel anchors. Solidly grout voids between masonry and steel frames for doors full with masonry mortar or fine grout. Keep exposed faces of frames free from mortar. Remove droppings promptly.

3.4 PROVISIONS FOR OTHER TRADES

3.4.1 Provide openings in masonry walls where required or indicated.

3.4.2 Accurately locate chases and opening and neatly finish to required sizes.

3.4.3 Where masonry encloses conduit or piping, bring to proper level indicated and as directed. Do not cover any pipe or conduit chases or enclosures until advised that work has been inspected and tested.

3.5 ERECTION – GENERAL

- 3.5.1 Erect masonry to correct dimensions, plumb, true and with level courses.
- 3.5.2 Maintain joints vertical in alternate courses or as broken by bond pattern in line, throughout the entire height.
- 3.5.3 Reinforce masonry as required, to support wall mounted equipment, building components and fixtures provided under other Sections.
- 3.5.4 Verify the loads to be supported and the arrangement and type of fastenings with the appropriate Section.
- 3.5.5 Lay masonry exposed to view or to receive a brushed or sprayed finish carefully with even joint widths, and with exposed faces flush and even throughout. Broken corners and spoiled units are not acceptable. Do not use units which are too contrasting in appearance. Provide satisfactory blending of tones and textures.
- 3.5.6 Where resilient base is indicated, tool joints to within 4" of the floor. Strike joints at base flush.
- 3.5.7 Lay block to receive adhesive-applied gypsum board plumb, with joints finished flush.
- 3.5.8 Level, align and plumb masonry for application of thin set applied ceramic tile to requirements of 09 30 00 - Ceramic Tile, with joints struck flush.
- 3.5.9 The corners of concrete masonry units projecting into habitable areas and exposed or painted in the finished work shall be single or double bullnosed as required to suit the particular location. Lay specially shaped masonry units required or shown on Drawings.
- 3.5.10 Completely fill and tool head and bed joints to provide support for vapour barrier adhesive.
- 3.5.11 Completely fill joints in solid block masonry with mortar. Fully cover the end areas and bearing areas of the face shells of hollow units with mortar.
- 3.5.12 Provide anchors, ties, crimps, and other mason's iron work required for the construction of the work.
- 3.5.13 Build in anchors, nailers, accessories, flashings and other items required as the masonry work progresses. Solidly fill with non-shrink grout all voids in masonry into which anchor bolts or other connection materials are built.
- 3.5.14 Fill hollow metal door and borrowed light frames occurring in masonry with grout.
- 3.5.15 Provide grout setting bed for flashing under window sills.
- 3.5.16 Determine the location and size of openings to be left in masonry walls for heating, ventilating, plumbing, electrical fixtures, ducts, boxes and other items. Pass conduits and piping through hollow cells of blocks or build around them and split blocks. Build chases and openings as required accurately located and neatly finished, as the work progresses. Cut block for electrical boxes and recessed equipment accurately using a carborundum saw. Provide square clean edges.
- 3.5.17 Tooth new masonry into existing, where existing openings are to be filled in. necessary for construction purposes to "stop-off" a horizontal run of masonry, rake back 1/2-block length in each course. Tothing is not permitted, except with the written approval of the Consultant.

- 3.5.18 Tool joints in exposed masonry to a neat concave finish using 5/8" diameter non staining tool. Before tooling, ensure that surface of mortar is thumb print hard and has lost water sheen. Strike joints flush in concealed locations. Rake alternate joints back 1/2" where masonry is to receive plaster directly. Do not rake back joints containing reinforcing.
- 3.5.19 Where fresh masonry joins masonry that is partially or totally set, clean and lightly wet the exposed surface of the set masonry so as to obtain the best possible bond with the new work.
- 3.5.20 Where the joints in interior masonry will be apparent in the completed building, start interior walls and the back-up masonry for exterior walls with a 4" starter course, or as necessary to achieve a neat appearance at the door head/lintel condition.
- 3.5.21 Where insulation and vapour barrier are to be built into masonry walls. Co-ordinate the erection of the masonry with the installation of insulation under Section 07 21 00, Building Insulation. Strike joints flush on exterior face of interior wythes and parge this surface with a 1/4" thick coating of cement mortar. Trowel surface smooth to receive vapour barrier adhesive. Build exterior wythe tight to completed insulation.
- 3.5.22 Provide light weight aggregate as required for fire rated partitions.
- 3.5.23 Lay all joint 3/8" thick unless otherwise specified or indicated on Drawings.
- 3.5.24 Use lightweight aggregate units for concrete masonry visible or painted in the finished work.
- 3.5.25 Other masonry units shall be of lightweight aggregate or of regular sand and gravel aggregates.
- 3.6 COMPOSITE EXTERIOR WALLS
- 3.6.1 Construct exterior brick masonry using brick to match existing brick. Use only clean, sound brick. Brickwork shall match adjacent existing brickwork in coursing, bonding, colouring of brick and mortar and shall blend into existing, to approval of Consultant.
- 3.6.2 Tooth new brickwork into existing.
- 3.6.3 Supply insulation fasteners to Section 07 21 00 for installation.
- 3.7 PARTITIONS
- 3.7.1 Unless otherwise shown or specified, lay concrete block masonry in running bond.
- 3.7.2 Build up non load bearing walls to within 1" of underside of structure unless shown otherwise. Obtain lateral support anchors from Section 05 10 00. Secure lateral support anchors to structure along wall. Perform necessary drilling of concrete. Where junction of wall and structure will be visible in the completed building, lay sash block so that grooves engage in legs of metal anchors such that anchorage is concealed. Where junction of wall and structure will be concealed, lay top course to engage lateral support angles. Install mineral wool filler in void between top of wall and underside of structure. Cut filler around legs of concealed anchors. Leave ready for caulking.
- 3.7.3 Use concrete aggregate block for walls and partitions on slabs on grade. At all other locations use light weight block.
- 3.7.4 Carry partitions up through ceiling to slab or metal deck above.

3.7.5 Where walls and partitions are pierced by structural members, ducts, pipes, fill voids with mortar to within 1" of such members flush with wall face. Fill spaces between partition and structural members, ducts and pipes with glass fibre or mineral wool insulation compressed 50% completely from one side of wall to other.

3.8 REINFORCING AND ANCHORING

3.8.1 Reinforce and anchor masonry as required by local by laws when greater requirements are not specified or shown.

3.8.2 Unless otherwise shown, tie walls at corners in masonry bond, alternate courses.

3.8.3 At wall intersections, terminate one wall at the face of the other and build in prefabricated sections of truss type connectors at 16" o.c. vertically.

3.8.4 Provide horizontal reinforcing above first block course above floors slab and in first block course below floor slab, with box ties to anchor face masonry to back up.

3.8.5 Reinforce hollow concrete masonry walls with truss reinforcing every 16" o.c. to suit wall thickness.

3.8.6 Cut alternate continuous reinforcing at control joints in straight walls. Lap splices in continuous length reinforcing 6".

3.8.7 Install masonry reinforcing in two consecutive courses above and below openings in walls, extending not less than 3' 0" on both sides of opening.

3.8.8 Use adjustable wall ties where the horizontal joints in adjacent wythes of masonry walls requiring reinforcing are not in vertical alignment. Install ties 12" o.c. horizontally and 16" vertically.

3.8.9 Solidly fill with mortar all voids in masonry into which anchor bolts, reinforcing steel or other connection materials are built.

3.9 LINTELS

3.9.1 Lintels over openings in masonry shall have a minimum bearing of 8" on each side of opening. Provide building paper bond barrier at ends and under bearing parts of lintels.

3.9.2 Install loose steel lintels and bearing plates. Grout under lintels and/or bearing plates at each jamb with full bed of mortar.

3.9.3 Provide reinforced concrete block lintels of same thickness as wall for block walls of less than 8" thickness and for other block walls where units are to be painted or visible in the completed work. Construct lintels with special concrete lintel units. Supervise the filling of voids of units with concrete and their reinforcing with deformed steel bars. Cure before applying loads. Provide temporary support for lintels consisting of 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. Lay masonry units with full mortar coverage on all abutting edges with joints shoved tight. Where masonry construction is continued above the lintel, place the first course of masonry units on the lintel in a full mortar bed.

3.10 BEARING AND ANCHORAGE

3.10.1 Provide at least 16" of 100% solid masonry under bearing of beams, girders, trusses and lintels extending 8" beyond each side of bearing, at least 8" of 100% solid masonry under joists and under slabs. Hollow units filled with concrete are not acceptable. Provide a concrete distribution pad in lieu of solid masonry specified above for bearing plates anchored with bolts. Solid masonry in locations visible in the completed work shall be of same material and appearance as adjacent wall surface.

3.11 INSTALLATION DAMPPROOF COURSES

3.11.1 At walls having grout fill, turn dampproof course material up at least 8" on the face of the back-up masonry and terminate in a reglet.

3.11.2 In all cases extend dampproof course material through full thickness of face masonry.

3.11.3 Make 100% watertight seal between dampproof course material strips with waterproof adhesive. Make 100% watertight seal between dampproof course material and items passing through it.

3.12 REPOINTING

3.12.1 Cut back defective joints 1/2" taking care not to damage units. Remove dust and loose materials by brushing or by water jet. If water jet is used, allow excess water to drain before repointing.

3.12.2 Repoint with mortar similar to original mortar mix. Pre hydrate mortar by mixing with only a portion of required water, two hours before use. At end of curing period, rework mortar, adding remaining water.

3.12.3 Pack mortar tightly in thin layers and tool to required joint finish.

3.13 CLEANING

3.13.1 Clean masonry according to masonry unit manufacturer's written instructions.

3.13.2 Where mortar or stains cannot be removed as specified above, propose other methods to the Consultant for approval. Employ methods approved by the Consultant and remove mortar and stains.

3.14 PROTECTION

3.14.1 Provide and maintain protection against entry of moisture into masonry whenever work is interrupted. Use non staining water repellent paper, polyethylene sheet or tarpaulins overhanging walls 2' 0" minimum and secured in place to prevent wind uplift. Similarly protect exposed ledges to be covered by flashing or other material until such materials are installed.

3.14.2 Provide and maintain protective non staining boards to external corners which may be damaged by construction activities. Secure protection without damaging the work.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- 1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.
- 1.1.2 Provide all labour, materials, products, equipment and services required to complete the metal fabrications work necessary and/or indicated on the Drawings and specified herein including all metal work which is not specified elsewhere.

1.2 REFERENCES

- 1.2.1 ASTM A53/A53M-12: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- 1.2.2 ASTM A123/A123M-13 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- 1.2.3 ASTM A143/A143M-07(2014) Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedures for Detecting Embrittlement.
- 1.2.4 ASTM A153 / A53M-09 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- 1.2.5 ASTM A167-99(2009) Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate.
- 1.2.6 ASTM A307-14 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
- 1.2.7 ASTM A325-14 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- 1.2.8 ASTM A394-08(2015) Standard Specification for Steel Transmission Tower Bolts, Zinc-Coated and Bare.
- 1.2.9 ASTM A563-15 Standard Specification for Carbon and Alloy Steel Nuts.
- 1.2.10 ASTM A653/A653M-15 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- 1.2.11 ASTM A780/A780M-09(2015) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- 1.2.12 ASTM 1011/A1011M-14 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength, Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra High-Strength.
- 1.2.13 ASTM C939-10 Standard Test Method for Flow of Grout for preplaced-aggregate Concrete (Flow Cone Method)

- 1.2.14 ASTM C1107/1107M-14a Standard Specification for Packaged Dry Hydraulic-Cement Grout (Nonshrink)
- 1.2.15 CAN/CGSB 1.108-M89 Bituminous Solvent Type Paint.
- 1.2.16 CAN/CGSB 1.171-98 Inorganic Zinc Coating.
- 1.2.17 CAN/CGSB 1.181-99 Organic, Ready Mixed, Zinc Rich Coating.
- 1.2.18 CAN/CSA-G40.20-04(R2009) General Requirements for Rolled or Welded Structural Quality Steel.
- 1.2.19 CAN/CSA-G40.21-04(R2009) Structural Quality Steel.
- 1.2.20 CAN/CSA G164-M92 (R2003) Hot Dip Galvanizing of Irregularly Shaped Articles.
- 1.2.21 CISC/CPMA 2-75 Quick-Drying Primer For Use on Structural Steel.
- 1.2.22 CSA W47.1-09(R2014) Certification of Companies for Fusion Welding of Steel Structures.
- 1.2.23 CSA W47.2-11 Certification of Companies for Fusion Welding of Aluminum.
- 1.2.24 CSA W59-13 Welded Steel Construction (Metal Arc Welding).
- 1.2.25 CAN/CSA W117.2-12 Safety in Welding, Cutting and Allied Processes.
- 1.3 QUALIFICATIONS OF WELDING
 - 1.3.1 Welding of steel and aluminum shall be undertaken only by a fabricator fully approved by the Canadian Welding Bureau and CSA W47.1 and CSA W47.2, as may be applicable.
 - 1.3.2 Conform to safety requirements of CAN/CSA W117.2 for welding operations.
- 1.4 DESIGN
 - 1.4.1 Design the work of this Section in accordance with the Ontario Building Code and the by-laws of the local municipality.
 - 1.4.2 Maximum deflection for individual members shall not exceed 1/360th, of the span.
 - 1.4.3 Work of this Section which will support other items or will be required to support structural loads of any nature shall be designed by a Professional Structural Engineer registered in Ontario and who shall affix his/her professional seal and signature to the shop drawings for such items.
 - 1.4.4 Work of this Section to be executed by firm thoroughly conversant with laws, by-laws and regulations which govern, and capable of workmanship of best grade of modern shop and field practice known to recognized manufacturer's specializing in this work.
- 1.5 SUBMITTALS
 - 1.5.1 Shop drawings:

- .1 Make thorough examination of drawings and details, determine the intent, extent, and materials, and be fully cognizant of requirements when preparing shop drawings.
 - .2 Submit shop drawings showing and describing in detail all work of this Section including large scale detail of members and materials, of connection and interfacing with work of other Sections, jointing details, and of anchorage devices, dimension, gauges, thicknesses, description of materials, metal finishing, as well as other pertinent data and information.
 - .3 Digital files of design drawings shall not be used in the preparation of shop drawings.
- 1.5.2 Submit necessary templates and instructions where fastenings or anchors have to be built in by other trades.
- 1.5.3 Work designed by a Professional Engineer shall bear signature and stamp of the engineer.
- 1.5.4 Submit adequate written instructions for protection of completed work, and proper methods and materials to be used in cleaning.
- 1.6 **STORAGE, DELIVERY, HANDLING AND PROTECTION**
- 1.6.1 Coordinate deliveries to comply with construction schedule and arrange ahead for strategic off the ground, under cover storage locations. Do not load any area beyond the design limits.
- 1.6.2 Adequately protect and crate all components against damage, dirt, disfigurement and weather during delivery and storage. Damaged materials shall not be used and shall be replaced by approved material.
- 1.6.3 Cover and protect the work of other Sections in the area of work from damage. Make good all damage to the satisfaction of the Consultant.
- Protect the installed work of this Section and on completion the work shall be examined and damage shall be remedied to the complete satisfaction of the Consultant.
- 1.7 **WARRANTY**
- 1.7.1 Warrant Miscellaneous metals work of this Section against defects in materials and workmanship in accordance with General Conditions but for an extended period of two (2) years and agree to repair or replace faulty materials or work which appears during warranty period, without cost to the Owner/Tenant. Defects shall include, but not limited to, deflection, opening of joints, or deterioration of metal.

PART 2 - PRODUCTS

- 2.1 **MATERIALS**
- 2.1.1 Structural Steel Sections and Steel Plate: New stock (not weathered or rusted); to conform to CAN/CSA-G40.21, Grade 300W (44W) and Grade 350W (50W) for wide flange shapes.
- 2.1.2 Hollow Structural Sections (HSS): New stock; to conform to CAN/CSA-G40.21, Grade 350W (50W), Class C, stress relieved.
- 2.1.3 Sheet Steel (Structural Quality): Conforms to ASTM A1011/A1011M.
- 2.1.4 Sheet Steel (Commercial Quality): Conforms to ASTM A653/A653M, stretcher levelled or temper rolled.

- 2.1.5 Tube: Conforms to ASTM A53.
- 2.1.6 Welding materials: Complying with CSA W59.
- 2.1.7 Interior primer: Complying with CISC/CPMA 2-75, oil alkyd type.
- 2.1.8 Stainless steel: Type 302 or 304 alloy, complying with ASTM A167.
- 2.1.9 Aluminum sheet: 1100 alloy, H14 temper, anodizing quality.
- 2.1.10 Aluminum extrusions: Alcan 6063 alloy, T5 temper.
- 2.1.11 Steel members, fabrications and assemblies shall be galvanized after fabrication by the hot dip process in accordance with CAN/CSA G-164 or ASTM A123.
- 2.1.12 Bolts, nuts and washers and iron and steel hardware components shall be galvanized in accordance with CAN/CSA G-164 or ASTM A153. Nuts and bolts shall be supplied in accordance with ASTM A307, A325, A394 and A563 as applicable.
- 2.1.13 Products shall be safeguarded against embrittlement in conformance with ASTM A143.
- 2.1.14 Organic zinc rich primer: Complying with CAN/CGSB 1.181 "Galvafruid SB Grade" by W.R. Meadows of Canada Ltd., "Kem Organic Zinc Rich Primer No. 6430" by Sherwin-Williams Company of Canada Ltd., "Glid-Guard Glid-Zinc Organic Line 5526 Line" by the Glidden Company Limited, or other approved manufacture.
- 2.1.15 Inorganic zinc coating: Complying with CAN/CGSB 1.171, "Glid-Guard Glid-Zinc No. 5535 Line" by Glidden Company Limited, or other approved manufacture.
- 2.1.16 Interior primer for steel: Complying with CISC/CPMA 2-75a.
- 2.1.17 Bituminous paint: Complying with CAN/CGSB 1.108.
- 2.1.18 Non-Shrink Grout: Premixed, high strength, maximum bearing, impact resistant, non-shrink non-metallic aggregate grout having minimum 76 Mpa 28 day compressive strength and conforms to ASTM C939 and ASTM C1107/C1107M, 'Embeco Premixed Grout' by Master Builders Technologies Ltd., or 'Tartan Grout Iron' by Webster & Sons Ltd., or 'Sika Grout 212 HP' by Sika Canada Inc.
- 2.2 FABRICATION
 - 2.2.1 Verify all dimensions on the site before preparing Drawings or proceeding with shop work.
 - 2.2.2 Insofar as practical, execute fitting and assembly in the shop with various parts of assemblies ready for erection at the building site.
 - 2.2.3 Fabricate the work true to dimensions and square. Accurately fit members with hairline joints, and join using adequate fastening.
 - 2.2.4 Construct finished work free from distortion and defects detrimental to appearance and performance.
 - 2.2.5 File or grind exposed welds smooth and flush. Do not leave grinding marks. Construct internal and external corners with sharp lines. Provide continuous welds unless otherwise approved by the Consultant in writing.

- 2.2.6 Fabricate metal work complete with all components required for anchoring to concrete; bolting or welding to structural frames; standing free; or resting in frames or sockets in a safe and secure manner.
- 2.2.7 Weld all connections unless approved otherwise in writing by the Consultant.
- 2.2.8 Execute exposed fastenings neatly where approved and of the same material, colour and finish as the base metal, on which they occur.
- 2.2.9 Counter sink exposed fastenings, where such are approved in writing, and make as inconspicuous as possible with bolts cut off flush with nuts. Construct fastenings of the same material and finish as the base material on which they occur.
- 2.2.10 Insulate contact surfaces to prevent electrolysis due to metal to metal contact or between metal and masonry or concrete. Use bituminous paint, butyl tape, building paper or other approved means.
- 2.2.11 Thoroughly de-scale steel work before delivery to project site. Remove roughness and irregularities, clean with a wire brush, remove oil and grease and prime with one shop coat of paint to a 2 mil thickness.
- 2.2.12 Primer interior steel work supplied under this Section with one shop coat of interior primer.
- 2.2.13 Do not prime the following surfaces:
- .1 steel to be encased in concrete;
 - .2 non-ferrous metals;
 - .3 surfaces and edges to be field welded. If painted, remove paint for field welding for a distance of at least 2" in all sides of the paint.
- 2.2.14 Hot-dip galvanize steel, where specified, in accordance with CAN/CSA G164 (coating weight as prescribed for type of article), or ASTM A653/G90 (coating weight; 1.25 oz./sq.ft.) as applicable. Galvanize after fabrication where possible. Follow recommended precautions to avoid embrittlement of the base metal by overpickling, overheating or during galvanizing.
- 2.2.15 Touch-up galvanized steel where galvanizing is damaged during installation with zinc rich primer, in accordance with ASTM A780.
- 2.2.16 Stainless steel shall be finished in No. 4 bright, brush finish, unless otherwise noted.
- 2.3 ANCHOR BOLTS AND OTHER MEANS OF ANCHORAGE
- 2.3.1 Provide all anchor bolts and expansion bolts or other means of anchorage required for building into floors, walls and ceilings, where it is necessary to secure metal and wood to concrete, masonry or steel work. Supply anchor bolts, nuts and similar hardware to the respective Sections for fastening.
- 2.4 MISCELLANEOUS STEEL SECTIONS
- 2.4.1 Supply and install all steel items not indicated to be supplied under other Sections.
- 2.4.2 Where sections are required to be built into masonry or concrete supply such members to the respective Sections.

2.5 CONCEALED SUPPORT ELEMENTS AND FRAMING

- 2.5.1 Supply and install all support elements and framing as shown on the Drawings for the items listed herein. Construct supports from rolled steel sections assembled by welding.
- 2.5.2 Design supports to withstand, within acceptable deflection limitations, their own weight, the weight of the items to be supported, loads imposed by the motion of supported items, where applicable, and all live loads, static and dynamic which might be applied to the supported items in the course of their normal function. Design supports with a safety factor of 3. Design supports further as required to accommodate structural deflection.
- 2.5.3 Provide all accessories, inserts and fixings necessary for attachment of supports to building structure. Drill supports as required to receive attachment of supported items. Arrange supports to avoid conflicts with pipes, ducts, precast concrete connections, thermal and vapour barrier construction, framing provided under other sections, and such that supports and their fixings are fully concealed from view within the finished work.
- 2.5.4 Paint all supports unless galvanizing is specified.
- 2.5.5 Provide concealed support elements or framing as required for the following items:
 - .1 Vanities.
 - .2 Grab bars occurring on gypsum board partitions.

2.6 LINTELS

- 2.6.1 Supply loose steel lintels to other Sections where required for building into the work. Fabricate lintels as shown on the Drawings. Galvanize lintels which will be exposed to the exterior.
- 2.6.2 Lintels for wall of less than 8" nominal thickness shall be masonry lintels supplied and installed under Section 04200.

PART 3 - EXECUTION

3.1 INSTALLATION

- 3.1.1 Install miscellaneous metals work in the correct locations and positions, plumb, level, structurally sound, securely fastened, free from defects detrimental to finished appearance and to the approval of the Consultant.
- 3.1.2 Install the work of this Section using skilled craftsmen and in accordance with manufacturer's recommendations where applicable.
- 3.1.3 After installation, spot prime field bolt heads and nuts, field rivets, welds and any abrasions or damage to the shop coat of the primer.
- 3.1.4 Perform drilling of steel and/or concrete masonry to fasten the work of this Section.
- 3.1.5 All surfaces prime painted under the Section shall be free from runs, sags, crawls and other defects. This Section shall repair any such defects to the satisfaction of the Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- 1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.
- 1.1.2 Provide all labour, materials, products, equipment and services to complete the rough carpentry indicated on the Drawings and specified herein and/or necessary.

1.2 REFERENCES

- 1.2.1 CSA-O141-05(R2014) Softwood Lumber
- 1.2.2 CAN/ULC-S102-10 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
- 1.2.3 CAN/CSA O80-Series-15 Wood Preservation
- 1.2.4 CSA B111-1974 (R2003) Wire Nails, Spikes and Staples
- 1.2.5 CSA O121-08(R2013) Douglas Fir Plywood

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

- 1.3.1 Accept delivery of pressed steel door frames. Be responsible for any damage to frames from time of delivery until accepted by the Consultant after installation.
- 1.3.2 Provide dry storage areas for rough carpentry materials. Stack lumber 6" clear of floor.
- 1.3.3 Protect fire-retardant materials against high humidity and moisture.
- 1.3.4 Install temporary wood protection strips at door jambs and similar locations vulnerable to damage.
- 1.3.5 Cover materials stored on site with tarpaulins or polyethylene sheets to prevent moisture, absorption and impairment of structural and aesthetic-properties.

1.4 QUALITY ASSURANCE

- 1.4.1 Identify all lumber and plywood delivered to the site by the grading stamp of an approved association or independent grading agency.

PART 2 - PRODUCTS

2.1 MATERIALS

- 2.1.1 Wood materials: Straight, sawn square, true, dressed four sides, properly sized and shaped to correct dimensions from nominal sizes indicated or specified.
- 2.1.2 Lumber grade and moisture content: Comply with official grading rules of NLGA for the particular lumber and grade, and structurally complying with the latest requirements of the NBC. Use only grade marked lumber.
- 2.1.3 Maximum moisture content of lumber: 7% for interior work, 19% for exterior work.

- 2.1.4 Softwood lumber: Comply with CSA O141.
- 2.1.5 Douglas Fir Plywood: Complying with CSA O121, COFI Exterior.
- 2.1.6 Framing lumber: Lumber for structural components shall be of species and grade specified, well seasoned, processed and stamped at same mill with appropriate grade markings. Conform to requirements of Standard Grading Rules for Canadian Lumber of National Lumber Grades Authority the (NLGA) with latest supplements, approved by the Canadian Lumber Standards Administrative Board.
 - .1 No. 1 Construction grade, Spruce, Balsam Fir, Lodgepole Pine or Ponderosa Pine.
- 2.1.7 All wood materials: Well seasoned, free from defects that would impair strength or durability.
- 2.1.8 Wood curbs: Vacuum/pressure impregnated in accordance with CAN/CSA O80.1 to an average net retention of [6.0 kg/m³][0.40 lb./ft³]. Wolman CCA preservative or other approved manufacture. Species shall be southern pine, ponderosa pine, fir, western hemlock or jack pine.
- 2.1.9 Blocking, concealed framing, cant strips, grounds, nailing strips: No. 2 Ontario White Pine, No. 2 Red Pine, or Construction No. 1 Jack Pine, all complying with the grading rules of NLGA, or Construction Douglas Fir complying with COFI standard grading and dressing rules.
- 2.2 PRESSURE PRESERVATIVE TREATED MATERIALS FOR ALL EXTERIOR APPLICATIONS / FRAMING
 - 2.2.1 Pressure Preservative Treated Lumber: Lumber graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Accreditation Board in accordance with CAN/CSA O80 Series.
 - .1 Species: Pine or Spruce-Pine
 - .2 Grade: No.2 or better structural posts and lumber, pieces may be grade stamped or shipment certified by letter of compliance.
 - .3 Grading authority: NLGA, paragraph 131CC
 - .4 Material having twisted grain or structural defects affecting integrity of lumber will not be acceptable for this project.
 - .5 Use only material with radius edges, minimum 6 mm.
 - .6 Kiln dry lumber materials to 8% moisture content or less.
 - 2.2.2 Pressure Preservative Treated Plywood: Treated in accordance with CAN/CSA O80 Series, using water-borne preservative to obtain minimum net retention of 4 kg/m³ of wood. Plywood or laminated materials shall be manufactured with exterior grade adhesives. After treatment, plywood shall be kiln dried to moisture content of 8% or less.
- 2.3 PRESSURE FIRE RETARDANT TREATED MATERIALS
 - 2.3.1 Treat by pressure impregnation with fire-retardant chemicals in accordance with CAN/CSA O80 Series to provide classification for flame spread of not more than 25, smoke developed of not more than 75 in accordance with CAN/ULC S102.
 - 2.3.2 All fire retardant wood must comply with the requirements in AWPA Standard C20 for lumber and C27 for plywood.

- .1 AWPA C20: Structural Lumber, Fire-Retardant Pressure Treatment, lumber materials shall only be of species listed. After treatment, lumber 50 mm or less in thickness shall be kiln dried to moisture content of 8% or less.
 - .2 AWPA C27: Plywood, Fire-Retardant Pressure Treatment, plywood or laminated materials shall be manufactured with exterior grade adhesives. After treatment, plywood shall be kiln dried to moisture content of 8% or less.
 - .3 All species to comply with CAN/ULC S102 for surface-burning characteristics and shall bear identification showing classification and type of fire retardant.
- 2.3.3 Each piece or bundle of fire-retardant treated material or panel to bear ULC inspection label or stamp attesting to FRS rating indicating flame spread, smoke developed, and fuel contributed classification meeting AWPA standard C20 and C27 for Type A Use.
- 2.3.4 Fire retardant chemicals used to treat lumber must comply with FR-1 of AWPA Standard P17 and shall be free of halogens, sulphates and ammonium phosphate.
- 2.3.5 Acceptable materials: Plywood and lumber materials treated by licensed applicators with fire retardant materials from the following:
- .1 Hickson Corporation – Dricon FRTW
 - .2 Hoover Treated Wood Products Inc. – Pyro-Guard
 - .3 Chemical Specialties Inc. – D-Blaze
- 2.3.6 Rough hardware: Nails, screws, bolts, lag screws, anchors, special fastening devices and supports as required for the erection of all rough carpentry items.
- 2.3.7 Fastenings, nails, bolts, screws, lag screws, anchors, special fastening devices and supports as required for the erection of all rough carpentry items: Complying with CSA B111.
- 2.4 FABRICATION
- 2.4.1 Comply with CAN/CSA-O86 for all fabrication and assembly of structural components off site, or on site.
- 2.4.2 Treat wood in contact with masonry, or concrete, with wood preservative before setting in place. Apply preservatives in accordance with the manufacturer's written instructions.
- 2.4.3 Design construction details for expansion and contraction of materials.
- 2.4.4 Machine sand surfaces exposed in the finished work. Hand sand to an even smooth surface free from scratches.
- 2.4.5 Refer to structural drawings for sizes and structural requirements.
- 2.5 FABRICATION - FIRE RETARDANT TREATMENT
- 2.5.1 Pressure fire retardant treat lumber prior to final milling. Each piece shall bear the mark of Underwriters' Laboratories of Canada indicating conformance to Standard CAN/ULC-S102.

PART 3 - EXECUTION

- 3.1 INSTALLATION - GENERAL

- 3.1.1 Supply all labour, materials, equipment, services and perform all operations required to complete all rough carpentry work to the full intent of the drawings and as herein specified.
- 3.1.2 Consult with and co-operate with other Sections in advance and build-in or make provisions for installation of other work.
- 3.1.3 Provide running members of the longest lengths obtainable.
- 3.1.4 Slowly feed machine-dressed members using sharp cutters. Provide finished members free from drag, feathers, splinters or roughness of any kind. Remove machine marks by sanding.
- 3.1.5 Properly frame material with tight joints and rigidly secure in place. Use glue-blocks where necessary.
- 3.1.6 Design construction methods for expansion and contraction of the materials.
- 3.1.7 Conceal joints and connections wherever possible. Locate prominent joints only where directed.
- 3.1.8 Erect work plumb, level, square and to the required lines.
- 3.1.9 Do not regard blocking, strapping and other rough carpentry indicated as complete or exact. Provide rough carpentry items required for the installation of the work of other Sections. Blocking shall be through-bolted to structure.
- 3.1.10 Set and secure wood level, plumb and to correct locations indicated on Drawings. Ensure horizontal bowing is kept to a minimum.
- 3.1.11 Provide temporary bracing and anchorage required to hold members in place until permanently secured. Ensure member ends have sufficient bearing area.
- 3.2 **INSTALLATION - GROUNDS, STRAPPING AND FURRING**
 - 3.2.1 Install grounds of a thickness required for the application of finishes. Install roomside surfaces of grounds plumb and in true plane throughout. Secure grounds to metal furring with 16 ga. galvanized soft annealed tie wire.
 - 3.2.2 Provide wood furring and strapping for applied facings, cupboards, caseworks, lockers, cubicles etc.
 - 3.2.3 Provide 1" x 2" strapping at 16" o.c. to suit details. Secure to nailing strips.
 - 3.2.4 Furring generally shall be 2" x 2" at 16" o.c. erected to suit job conditions, where indicated.
 - 3.2.5 Shim members as required to provide a true and plumb surface.
- 3.3 **INSTALLATION - CANT STRIPS, BLOCKING AND CURBS**
 - 3.3.1 Apply wood preservative to all surfaces of wood cant strips and blocking to be covered with flashing.
 - 3.3.2 Provide wood blocking as indicated. Provide curbs around roof openings wider than 10" in any direction. Build up curbs of 2" x 6" members to 12" minimum above finished roof level. Bolt or anchor curbs securely in place at 2'-0" o.c. Provide blocking under cants equal to insulation thickness.

- 3.3.3 Provide 3/4" thick, fire retardant treated, plywood mounting boards as required for mechanical and electrical equipment. Securely fasten to concrete, masonry or gypsum wallboard framing.
- 3.3.4 Immediately apply, in instance where primed work is cut, a coat of wood preservative to the resulting raw surfaces.
- 3.3.5 Provide wood blocking for anchoring of window frames.
- 3.3.6 Provide double studs or wood blocking and bolts in stud partitions for fastening of handrails, grab bars, to be capable of supporting 230 kg (500 lb) downward pull. Provide double studs and blocking for anchoring of door frames, and other items anchored to stud partitions.
- 3.3.7 Provide 5/8" thick fire retardant treated plywood fastened to metal stud framing, at washroom mirrors. Provide 5/8" thick plywood backing for mirrors fastened to block.
- 3.3.8 Co-ordinate with Section 09 29 00 - Gypsum Board, the installation of wood blocking for fastening of wall mounted accessories and casework
- 3.4 **INSTALLATION - ROUGH HARDWARE**
- 3.4.1 Supply and install rough hardware, including hardware for temporary enclosures.
- 3.4.2 Provide fasteners long enough so that at least half their length penetrates into the second member and as recommended by COFI. Minimize splitting of wood members by staggering the fasteners in the direction of the grain and by keeping fasteners well in from edges. Use spiral, annular or resin coated nails for plywood.
- 3.4.3 Fasten to hollow masonry units with toggle bolt, to solid masonry or concrete with lead expansion shields and lag screws. Do not use organic fibre or wood plugs.
- 3.5 **INSTALLATION - PRESSED STEEL FRAMES**
- 3.5.1 Set frames plumb and square in their exact location. Firmly block and brace to prevent shifting. Shim up where required to ensure proper alignment dimensions from finished floor to head of frame. Install temporary wood spreaders at midheight.
- 3.5.2 Where pressed steel frames are installed in concrete walls, secure frames to concrete using lead expansion shields and anchor bolts. Perform drilling of concrete as required. Fill recessed bolt heads flush to frame face with approved metal filler and sand smooth.
- 3.5.3 Install fire rated door frames in accordance with requirements of authorities having jurisdiction to provide the required rating.
- 3.5.4 Install fire rated door frames in accordance with requirements of National Fire Protection Association and authorities having jurisdiction to provide the required rating.
- 3.6 **PRESSURE PRESERVATIVE TREATED WOOD INSTALLATION**
- 3.6.1 Comply with AWPA M4.
- 3.6.2 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation. Allow first coating to fully soak into grain before applying second coating in accordance with manufacturer's instructions.
- 3.6.3 Remove with fine sandpaper, chemical deposits on treated wood to receive applied finish.

- 3.6.4 Use only hot-dipped galvanized, corrosion resistant nail or screw fasteners. Staples are not acceptable for installation of preservative treated materials.
- 3.6.5 Use water-borne preservative treated wood for:
- .1 Wood in contact with masonry or concrete,
 - .2 Wood within 450 mm of grade,
 - .3 Wood decking and fence boards,
 - .4 Wood in contact with flashings,
 - .5 Wood in contact with waterproofing membranes, confirm compatibility with membrane manufacturer prior to application.
- 3.6.6 Use oil-borne preservative treated wood for:
- .1 Wood in contact with the ground,
 - .2 Wood in contact with freshwater,
 - .3 Landscaping timbers,
 - .4 Retaining walls,
 - .5 Piers or docks,
 - .6 Pilings,
 - .7 Bases of utility poles,
 - .8 Bases of fence posts.
- 3.7 PRESSURE FIRE RETARDANT TREATED WOOD INSTALLATION
- 3.7.1 Field Cuts:
- .1 Do not rip, mill or conduct extensive surfacing of fire retardant treated lumber, label will be voided.
 - .2 Only end cuts, drilling holes and joining cuts are permitted.
 - .3 All cuts on plywood will be considered end cuts.
 - .4 Fire-retardant lumber and plywood can be given a light sanding for cosmetic cleaning after treatment.
 - .5 Pre-cut to the greatest extent possible before treating.
- 3.7.2 Fire retardant treated plywood used in structural applications shall be graded or span-rated material.
- 3.7.3 Use only hot-dipped galvanized, corrosion resistant nail or screw fasteners. Staples are not acceptable for installation of fire resistant treated materials.
- 3.7.4 Where humidity conditions are such that moisture may condense between hardware and treated wood, hardware shall be back-primed with a corrosive-inhibitive paint.
- 3.7.5 Back-prime at contact points and fasteners to prevent electrolysis when fire retardant framing members are used in metal buildings.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and documents referred to therein.

1.1.2 Provide labour, materials, products, equipment and services required to complete the fire stopping and smoke seals work.

1.2 RELATED WORK SPECIFIED ELSEWHERE

1.2.1 Caulking and Sealants: Section 07 90 00.

1.2.2 Fire dampers in all locations where ductwork services and conduits passes through wall, partition, roof or ceiling, required to be fire rated: Mechanical & Electrical & IT Division.

1.3 REFERENCES

1.3.1 ASTM E814-13a Standard Test Method of Fire Tests of Penetration Firestop Systems.

1.3.2 CAN/ULC S115-11 Standard Method of Fire Tests of Firestop Systems.

1.4 SYSTEM DESCRIPTION

1.4.1 Work of this Section comprises fire stopping and smoke seal materials and/or systems to provide closures to fire and smoke at openings around penetrations, at unpenetrated openings, at projecting or recessed items, and at openings and joints within fire separations and assemblies having a fire-resistance rating, including openings and spaces at perimeter edge conditions.

1.4.2 Provide seals to form draft tight barriers to retard the passage of flame and smoke.

1.4.3 The installed seal shall provide and maintain a fire resistance rating equivalent to the rating of the adjacent floor, wall or other fire separation assembly to the requirements of and as acceptable to the authorities having jurisdiction and the Consultant.

1.4.4 Fire stopping and smoke seals within mechanical (i.e. inside ducts, dampers) shall be provided as part of the work of Division 15. Fire stopping and smoke seals around the outside of such mechanical assemblies where they penetrate rated fire separations shall be part of the work of this Section.

1.5 QUALITY ASSURANCE

1.5.1 Provide the work of this Section using experienced and competent installers, approved, trained and licensed by the material or system manufacturer.

1.5.2 Fire stopping and smoke seal materials shall conform to the temperature and flame rating, and fire hose rating of CAN/ULC S115 and ASTM E814, and other requirements of authorities having jurisdiction.

1.6 SUBMITTALS

1.6.1 Submit shop drawings indicating the ULC assembly number, the required temperature and flame rating, thickness, installation methods and materials of fire stopping and smoke seals, damming

materials, anchorages and fastenings.

- 1.6.2 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions sufficient for identification at the Project site. Include manufacturer's printed instructions for installation.
- 1.6.3 Submit samples of each type of fire stopping and smoke seal material.
- 1.6.4 Submit manufacturer's certification that installed fire stopping and smoke seal materials comply with specified requirements.
- 1.7 **MOCK-UP**
 - 1.7.1 Apply one sample installation on representative substrate of each type of installation and required fire rating.
 - 1.7.2 Sample shall comply with requirements as to thickness and density of application to achieve fire rating required.
 - 1.7.3 Acceptable mock-up may remain as part of completed work.
- 1.8 **DELIVERY, STORAGE AND HANDLING**
 - 1.8.1 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels intact. Protect from damage and environmental conditions in accordance with manufacturer's recommendations.
- 1.9 **SITE CONDITIONS**
 - 1.9.1 Comply with manufacturer's recommended requirements for temperature, relative humidity, and substrate moisture content during application and curing of materials.

PART 2 - PRODUCTS

- 2.1 **ACCEPTABLE MANUFACTURERS**
 - 2.1.1 Fire stopping and smoke seal materials of the following manufacturers complying with these specifications are acceptable:
 - .1 Canadian General Electric Company Limited.
 - .2 Electrovert Ltd.
 - .3 Firestop Systems Inc.
 - .4 M.W. McGill and Associates.
 - .5 Tremco Ltd.
 - .6 Hilti (Canada) Corporation.
 - .7 or other approved manufacture.
- 2.2 **MATERIALS**
 - 2.2.1 Fire stopping and smoke seals: Asbestos free materials and systems complying with standards specified herein, by one or more of the specified acceptable manufacturers, installed in accordance with tested assemblies acceptable to authorities having jurisdiction to provide an effective barrier against the passage of fire, smoke and gases, and to provide a fire resistance rating not less than the fire resistance rating of the surrounding floor, wall or other assembly.

- 2.2.2 Products shall be manufactured under ULC Follow-up Program and each package/container shall bear ULC label or listing mark.
- 2.2.3 Service penetration assemblies: Certified by ULC in accordance with CAN/ULC S115 and listed in ULC Guide No. 40 U19.
- 2.2.4 Service penetration firestop components: Certified by ULC in accordance with CAN/ULC S115 and listed in ULC Guide No. 40 U19.13 under the Label Service of ULC.
- 2.2.5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: An elastomeric seal; do not use a cementitious or rigid seal at such locations.
- 2.2.6 Firestopping and smoke seals at openings around penetrations for pipes, duct work and other mechanical items requiring round and vibration control: Elastomeric, do not use cementitious or rigid seal at such locations.
- 2.2.7 Primers: To manufacturer's recommendation for specific material, substrate, and end use.
- 2.2.8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- 2.2.9 Damming and backup materials, supports and anchoring devices: To manufacturer's recommendations, and in accordance with the tested assembly being installed as acceptable to authorities having jurisdiction.
- 2.2.10 Sealants for vertical joints: Non-sagging.

PART 3 - FABRICATION

3.1 FIRESTOPS

- 3.1.1 Supply and install mineral wool firestop material at all suspended slabs, between edge of slabs and exterior cladding and in vertical positions at air shafts. Place firestop material under permanent 35% compression. Use impaling clips or metal trims to hold insulation in place.
- 3.1.2 Supply and install stick clips at maximum [300 mm|1'-0"] o.c. secured to concrete in an approved manner, to support firestop material in place.
- 3.1.3 Supply and install continuous steel angles, hot dipped, galvanized, minimum [10 mm|3/8"] thick for firestopping where shown and as required.

PART 4 – EXECUTION

4.1 PREPARATION

- 4.1.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are dry and frost free.
- 4.1.2 Clean bonding surfaces to remove deleterious substances including dust, paint, rust, oil, grease and other foreign matter which may otherwise impair effective bonding.
- 4.1.3 Do not apply fire stopping and smoke seals to substrates and surfaces previously painted or treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- 4.1.4 Remove insulation from insulated pipe and duct where such pipes or ducts penetrate a fire

separation unless ULC certified assembly permits such insulation to remain within the assembly.

- 4.1.5 Beginning of installation shall indicate acceptance of existing conditions.
- 4.1.6 Prepare surfaces and prime in accordance with manufacturer's directions.
- 4.1.7 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.
- 4.2 MIXING
 - 4.2.1 Mix components in a mixer clean and free of used and set materials and surface contaminants.
 - 4.2.2 Thoroughly mix components in accurate proportions.
 - 4.2.3 Apply mixed materials within time limit recommended by the manufacturer.
- 4.3 APPLICATIONS
 - 4.3.1 Apply fire stopping and smoke seals in strict accordance with manufacturer's instructions and tested designs to provide the required temperature and flame rated seal, and to prevent the passage of smoke.
 - 4.3.2 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
 - 4.3.3 Completely fill and seal voids with fire stopping and smoke seal materials.
 - 4.3.4 Tool or trowel exposed surfaces.
 - 4.3.5 Remove excess compound promptly as work progresses and upon completion.
 - 4.3.6 Allow materials to cure. Do not cover up materials until full curing has taken place.
 - 4.3.7 Notify Consultant when completed installations are ready for inspection and prior to concealing or enclosing fire stopping and smoke seals.
- 4.4 SCHEDULE OF LOCATIONS
 - 4.4.1 Provide fire stopping and smoke seal materials at openings and penetrations in fire resistance rated assemblies, including but not limited to, the following locations:
 - .1 Penetrations through fire resistance rated masonry, concrete, and gypsum board partitions and walls.
 - .2 Top of fire resistance rated masonry and gypsum board partitions.
 - .3 Intersection of fire resistance rated masonry and gypsum board partitions.
- 4.5 CLEAN UP
 - 4.5.1 Remove excess materials and debris and clean adjacent surfaces immediately after application.
 - 4.5.2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- 1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.
- 1.1.2 All labour, materials, products, equipment and services to complete the joint caulking and sealants work necessary and/or indicated on the Drawings and specified herein.
- 1.1.3 All caulking and sealing required to make the building sealed tightly from the exterior and caulked from the interior to withstand the action of the elements and to complete the building vapour barrier and not specified under other Sections, shall be the work of this Section.

1.2 WORK INCLUDED UNDER OTHER SECTIONS

- 1.2.1 Cast-in-Place Concrete: Section 03 30 00.
- 1.2.2 Masonry Wall: Section 04 20 00.
- 1.2.3 Fire stopping and smoke seals: Section 07 84 00.
- 1.2.4 Gypsum Board: Section 09 29 00.

1.3 REFERENCES

- 1.3.1 CGSB 19-GP-5M Sealing Compound, One-Component, Acrylic Base, Solvent Curing (Incorporating Amendment No. 1)
- 1.3.2 CAN/CGSB 19.24-M90 Multicomponent, Chemical-Curing Sealing Compound

1.4 QUALITY ASSURANCE

- 1.4.1 Perform the work by a recognized established caulking and sealing contractor having at least five years experience and skilled mechanics thoroughly trained and competent in the use of caulking and sealing equipment and the specified materials.
- 1.4.2 Arrange with the caulking and sealant manufacturers for visit at the job site by one of their technical representatives before beginning the caulking and sealing installation to discuss with the Contractor and the Consultant the procedures to be adopted, to analyze site conditions and inspect the surfaces and joints to be sealed, in order that recommendations may be made.
- 1.4.3 Discuss the following items:
 - .1 Weather condition under which work will be done;
 - .2 Anticipated frequency and extent of joint movement;
 - .3 Joint design;
 - .4 Suitability of Durometer hardness and other properties of material to be used.
- 1.4.4 Technical representative shall randomly inspect preparation of substrate and perform random testing of installed work at least ten (10) locations.
 - 1. Cut tests locations to be 150mm long.
 - 2. Certify thickness, hardness and surface finish conforms to intended design.
 - 3. Report to consultant.

1.5 SUBMITTALS

1.5.1 Submit a signed letter from the sealant and caulking manufacturers prior to commencement of work of this Section which states:

- .1 Sealants and caulking materials selected for use from those specified;
- .2 Surface preparation requirements;
- .3 Priming and application procedures;
- .4 Verification that sealant and caulking are suitable for purposes intended and joint design;
- .5 Sealants and caulking are compatible with other materials and products with which they come in contact including but not limited to sealants provided under other Sections, insulation adhesives, bitumen, block, concrete, metals and metal finishes;
- .6 Verification that sealants and caulking are suitable for temperature and humidity conditions at time of application.

1.6 ENVIRONMENTAL CONDITIONS

1.6.1 Ambient and substrate surface temperatures shall be above 5°C during application and during the work of this Section.

1.7 WARRANTY

1.7.1 Submit a five year warranty of the materials and workmanship for the sealing work. Under the warranty, the materials shall not breakdown, decompose, lose their resiliency, crack, or lose bond with sides of joints.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 All caulking and sealants: Non-bleeding and capable of supporting their own weight except for the self-levelling type sealant for horizontal surfaces.

2.1.2 Caulking: One component acrylic base (solvent release type) complying with CGSB 19-GP-5M.

2.1.3 Caulking for horizontal surfaces: Self-levelling pourable grade, Shore "A" hardness of 25-35, fully water resistant for continuous wet conditions, grey in colour, Duoflex SL by Sika, or other approved manufacture.

2.1.4 Sealant: Multi-component chemical curing, complying with CAN/CGSB 19.24-M Type 2, Dymeric 240FC by Tremco Manufacturing Company (Canada) Ltd., or other approved manufacture.

2.1.5 Sealant for saw-cut horizontal surfaces: Multi-component, self-levelling, conforming to ASTM D2240 Tremco Control Joint Sealant, BASF Masterfill 300, or Sika Loadflex.

2.1.6 Sealant for Joints around Interior Door Frames, Windows and Under Exterior Thresholds: One-part, low or medium modulus, neutral curing 100% silicone joint sealant, conforming to ASTM C920-11, Type S, Grade NS, Class 35.

- .1 DC CWS by Dow Corning.
- .2 SWS by GE
- .3 SikaSil WS-305CN by Sika

2.1.7 Sealant for Exterior Wall Joints: Air-seal sealant: One part, silicone, shore A hardness 15-25,

conforming to CGSB 19-GP-13M, classification C-1-40-B-N and C-1-25-B-N and ASTM C920-11, Type S, Grade NS, Class 25. Use NT, M, G, A and O:

- .1 DC 791 by Dow Corning
- .2 UltraPruf II SCS 2902 by GE
- .3 Spectrum 3 by Tremco
- .4 SikaSil N-Plus by Sika

2.1.8 Sealant for vanity and kitchen counter splash-backs and washroom fixtures: Mould and mildew resistant, Shore A Hardness 15-25, conforming to ASTM C920, Type S, Grade NS, Class25, use NT, G, and A:, colour white.

- .1 SCS1700 by GE
- .2 DC 786 by Dow Corning
- .3 Tremsil 200 by Tremco
- .4 Omni Plus by Sonneborn
- .5 SikaSil –GP by Sika

2.1.9 All caulking, sealants, cleaning solvents, fillers and primers: Compatible with each other.

2.1.10 Colours for caulking and sealants: As selected later by the Consultant and not necessarily standard colours.

2.1.11 Joint backing: White non-absorbent open cell foam polyethylene, Sof Rod, by Tremco, or other approved manufacture. Filler diameter shall be 50% greater than joint width before installation.

2.1.12 Bond breaker: Tape of type supplied or recommended by sealant or caulking manufacturer.

2.1.13 Primers: As recommended by the caulking and sealant manufacturer. Primers shall suit the various job conditions.

2.1.14 Cleaning material: Xylol, Methyl-ethyl-ketone, Toluol or as recommended by the caulking and sealant manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

3.1.1 Ensure joints to receive sealant and caulking are suitable to accept the sealant and caulking.

3.1.2 Ensure that surfaces to be caulked or sealed are sound, dry, free from dirt, water, frost, loose scale, corrosion asphalt, paints or other contaminants which may adversely affect the performance of the caulking or sealing materials.

3.1.3 Before any caulking or sealing is commenced, test the materials for indications of staining or poor adhesion.

3.1.4 Do not apply caulking or sealing to masonry until mortar has cured.

3.1.5 Ensure joints and spaces which are to receive caulking or sealing compound are in no case less than [10 mm|3/8"] deep; nor less than [6 mm|1/4"] wide nor more than [20 mm|5/8"] wide.

3.2 PREPARATION

- 3.2.1 Perform cleaning to the extent required to achieve acceptable joint surfaces.
- 3.2.2 Ensure ambient and existing site conditions are suitable for installation of sealant work.
- 3.2.3 Protect adjacent finishes from damage, where heavy abrasive cleaning is required such as sandblasting, grinding or wire brushing.
- 3.2.4 Cleaning procedures:
 - .1 Metal:
 - .1 Blast cleaning: Sandblast or iron shot blast surfaces requiring heavy cleaning to bright metal. Remove loose matter by compressed air or commercial vacuum cleaner.
 - .1 Power tool cleaning: Clean surfaces by wire brush, impact tools, abrasive wheels or by buffing. Remove loose matter by compressed air or vacuum cleaner.
 - .3 Solvent cleaning: Clean with solvent applied by spray or brush. Wipe with clean wiping cloth. Remove paints with paint remover and wipe with solvent. Remove residue.
 - .2 Concrete and Masonry:
 - .1 Remove all friable material with wire brush or chipping, until surfaces are sound. Remove surface residue with a stiff brush, vacuum cleaner or compressed air.
 - .2 Concrete surfaces shall be cured for at least 28 days. Acid etch joint surfaces to remove alkaline salts and neutralize acid with a solution of trisodium phosphate, followed by rinsing with clean, cold water.
 - .3 Allow joints to dry thoroughly.
 - .4 Completely remove resinous products used as curing compounds and form release agents.
 - .3 Glass, Ceramics and Porcelain:
 - .1 Brush with solvent and wipe with clean wiping cloths. Remove residue.
 - .4 Wood:
 - .1 Remove foreign matter such as soil, paint, grease, asphalt, resin with solvents, abrasives and paint removers; make surfaces clean and dry.
- 3.2.5 Do not exceed shelf life, and pot life of the materials and installation times, as stated by the manufacturers.
- 3.2.6 Become familiar with the work life of the sealant to be used. Do not mix two part materials until required for use.
- 3.2.7 Mix sealants thoroughly with a mechanical mixer capable of mixing at 80-100 rpm without mixing air into the materials. Continue mixing until the material is a uniform colour and free from streaks of unmixed material.
- 3.2.8 Mask areas adjacent to the joints as required. Prevent contamination of adjacent surfaces. Remove masking promptly after the joint has been completed.
- 3.3 INSTALLATION
 - 3.3.1 Install materials in compliance with the recommendations of their manufacturers.
 - 3.3.2 Fill joints to within [10 mm|3/8"] of the surface with filler material.
 - 3.3.3 If recommended by the manufacturer of the caulking or sealing materials, prime joints to prevent staining, or to assist the bond or to stabilize pouring surfaces. Apply primer with a brush which

will permit all joint surfaces to be primed. Perform priming immediately before installation of caulking or sealant.

- 3.3.4 Caulking and sealants shall be of gun or knife grade consistency to suit the joint condition. Use gun nozzles of the proper sized to suit the joints and the caulking and sealing material.
- 3.3.5 Install caulking and sealant with manually operated or air pressure operated guns.
- 3.3.6 Use sufficient pressure to fill all voids and joints. Caulking compounds and sealants shall bond to both sides of joint but not backing material.
- 3.3.7 Ensure that the correct sealant depth is maintained. Superficial painting with a skin bead will not be accepted.
- 3.3.8 Caulking installations shall be a full bead free from air pockets and embedded impurities and having smooth surfaces, free from ridges, wrinkles, sags, air pockets and imbedded impurities.
- 3.3.9 After joints have been completely filled, tool them neatly to a slight concave surface.

3.4 CLEANING

- 3.4.1 Immediately clean adjacent surfaces which have been soiled and leave work in a neat clean condition. Remove excess materials and droppings using recommended cleaners and solvents.

3.5 REPAIR

- 3.5.1 Cut out damaged caulking and sealing, re-prepare and prime joints and install new material as specified to the Consultant's satisfaction.

3.6 PROTECTION OF COMPLETED WORK

- 3.6.1 Provide wood planks or other approved, non-staining means of protection for the completed caulking and sealants installations where required to protect the work from mechanical, thermal, chemical and other damage by other construction operations and traffic.
- 3.6.2 Maintain protection securely in place until project completion. Remove protection when so directed by the Consultant.

3.7 LOCATION SCHEDULE

- 3.7.1 Use sealing compounds for joints to be filled on the exterior or weather side of the construction.
- 3.7.2 Seal between vanity and kitchen counter splash-back and wall finish, and sinks and taps to counter.
- 3.7.3 Seal between washroom fixtures and wall and/or floor.
- 3.7.4 Seal inside corners of tiled walls in washrooms.
- 3.7.5 Use caulking compounds to fill all other joints.
- 3.7.6 In general, seal the following joints:

- .1 Exterior wood and metal frames - exterior side;

- .2 Control and expansion joints in exterior walls, garage floors, and paving.
- .3 Joints between walls and floating slabs.
- .4 At shelf angle in exterior masonry walls.
- .5 Provide sealant between curtain wall and air/vapour barrier and curtain wall and adjacent construction on the interior face of curtain wall.

3.7.7 In general, caulk the following joints:

- .1 Interior aluminum or pressed steel frames - both sides;
- .2 Exterior aluminum and pressed steel frames - interior side.
- .3 Control joints in interior exposed masonry - both sides.
- .4 Joint between full height masonry partitions and underside of structure - both sides.
- .5 Drywall partitions extending to underside of structure - both sides.

3.7.8 Joint designations in previous paragraphs do not limit responsibility to caulk all locations required to create and secure a continuous enclosure.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 All labour, materials, equipment and services to supply the hollow metal door, and steel door and screen frame work necessary and/or indicated on the Drawings and specified herein.

1.2 RELATED WORK UNDER OTHER SECTION

1.2.1 Glass and glazing: Section 08 80 00.

1.3 REFERENCES

- | | | |
|--------|--------------------|---|
| 1.3.1 | ASTM A794/A794M-12 | Standard Specification for Commercial Steel (CS), Sheet, Carbon, (0.16% Maximum to 0.25% Maximum), Cold-Rolled. |
| 1.3.2 | ASTM A653/A653M-15 | Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process. |
| 1.3.3 | ASTM A924/M924-14 | Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process |
| 1.3.4 | CAN/CGSB 1.132-M90 | Zinc Chromate Primer, Low Moisture Sensitivity. |
| 1.3.5 | CGSB 31-GP-105M | Coating, Conversion, Zinc Phosphate, for Paint base. |
| 1.3.6 | CAN/ULC S702-14 | Standard for Thermal Insulation Mineral Fibre for Buildings. |
| 1.3.7 | CSA W47.1-09(2014) | Certification of Companies for Fusion Welding of Steel. |
| 1.3.8 | CSA W59-13 | Welded Steel Construction (Metal Arc Welding), Includes Update No. 1 (2014), Update No. 3 (2015), Update No. 4 (2015). |
| 1.3.9 | ANSI/DHI A115 | Installation Guide for Doors and Hardware. |
| 1.3.10 | CSDFMA | Canadian Steel Door and Frame Manufacturers Association. |

1.4 SUBMITTALS

1.4.1 Shop drawings: Provide shop drawings in accordance with Section 01 33 00 - Submittals. Show, in as large a scale as practical, components, construction, methods of joining, welds, fastening and sleeving, type of metal, gauges and finishes, door swing, location of hardware and all other pertinent data. Clearly locate visible fixings on shop drawings.

1.4.2 Door and frame schedule: Identify each door and frame with a symbol listed in the schedule and place legibly on the unit at the time of manufacture. Co-ordinate symbol with architectural drawing symbols and indications.

- 1.4.3 Certificate: Substantiate design and construction of fire doors and frames, if required by the Consultant.
- 1.4.4 Submit full size hollow metal door and frame for approval, before production.
- 1.4.5 Upon Substantial Completion, provide Owner with a written Warranty, identifying both supplier and manufacturer, on materials and workmanship, for a period of one (1) year following date of completion. Deficiency correction during the period of warranty is the mutual responsibility of the General Contractor and the supplier.
- 1.4.6 Informational Submittals: Provide the following submittals when requested by the Consultant:
Source Quality Control Submittals: Submit information on zinc coating treatment and primer spot treatment, including instructions for surface treatment before site painting and any restrictions or special coating requirements.

1.5 QUALITY ASSURANCE

- 1.5.1 Acceptable manufacturers listed below are members of The Canadian Steel Door & Frame Manufacturers' Association:
 - All Steel Doors Ltd.
 - Daybar Industries Ltd.
 - Fleming Steel DoorsAcceptable manufacturers: Member of The Canadian Steel Door & Frame Manufacturers' Association.
- 1.5.2 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.
- 1.5.3 Fire protection requirements: fire rated doors; frames and sidelights shall bear ULC labels.
- 1.5.4 Frames shall be welded type; knockdown frames will not be acceptable.
- 1.5.5 All steel door and frame products shall be supplied from one manufacturer.
- 1.5.6 Owner to direct hardware requirements.

1.6 INSPECTION AND TESTING

- 1.6.1 One door will be selected at random by the Consultant and shall be submitted for deconstructive testing by the inspection and testing company appointed by the Consultant to verify conformance with the requirements of these specifications.
- 1.6.2 Door testing shall include:
 - .1 Verification that the door is internally reinforced with the specified core, steel sheet thickness, and other specified requirements.
 - .2 The cost of door inspection and testing shall be paid by the Owner. Replacement of tested door at no additional cost to the Contract.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

- 1.7.1 Carefully wrap doors and frames ensuring complete protection during shipping and storage.

- 1.7.2 Deliver units to the site in undamaged condition and store in a suitable location. Store units vertically.
- 1.7.3 Stockpile doors and frames inside the building with the identification symbol readily visible, and in the general order in which they will be required for installation and in such a way that the floor structure is not loaded beyond the capacity for which it was designed.
- 1.7.4 Touch-up damaged galvanized units promptly with zinc-rich primer. Touch-up prime coated units with primer.
- 1.7.5 Remove damaged units, installed or not, and install new units. Replace or make good adjacent work damaged on account of such replacements at no extra cost to the Owner.
- 1.8 SITE CONDITIONS
 - 1.8.1 Site Measurements: Verify actual dimensions of openings by site measurements before fabrication and indicate measurements on shop drawings; coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1.8.2 Established Measurements: Establish dimensions and proceed with fabricating doors and frames without site measurements where site measurements cannot be made without delaying the Work; coordinate construction to ensure that actual site dimensions correspond to established dimensions.
- 1.9 WARRANTIES
 - 1.9.1 Submit a two (2) year warranty of the materials, products and labour of this Section and warranty that windows and panels are water and weather-tight, structurally sound and free from distortion; that aluminum finishes will not develop excessive fading or non-uniformity of colour, and will not crack, peel or otherwise corrode; that glazing splines and sealant will be free from deterioration from sunlight, weather and oxidation, and will be free from permanent deformation under load.
 - 1.9.2 Submit a two (2) year warranty that aluminum finishes will not develop excessive fading, non-uniformity of colour, and will not crack, peel, delaminate, or otherwise corrode.
 - 1.9.3 Submit a ten (10) year warranty of the insulating glass units and warranting that the insulating glass units shall be free from material obstruction of vision as a result of dust or film formation on the internal glass surfaces by any cause, under normal conditions, other than extrinsic glass breakage.
 - 1.9.4 Upon Final Completion, provide Owner with a written Warranty, identifying both supplier and manufacturer, on materials and workmanship, for a period as listed above following date of completion. Deficiency correction during the period of warranty is the mutual responsibility of the General Contractor and the supplier.
 - 1.9.5 Warranties shall include the prompt remedy of defect upon written notification from the Owner that defects exist. Remedy shall include labour, materials, equipment, and services required to make good defective areas of the work, and in case of the factory fabricated components, to supply and install new components, all at no cost to the Owner. Warranties shall also include making good other adjoining parts and finishes or other Owner's property damaged or disturbed in the process or remedying defects. Warranty period shall recommence on remedied work.

- 1.9.6 In the case of work performed by subcontractors and where warranties are specifically required or requested by the Consultant, secure such additional written warranties and deliver same to the Owner.
- 1.9.7 Warranties shall be in be in a form approved by the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Sheet steel:

- .1 Exterior doors and frames galvanized steel sheet: commercial quality to ASTM A653, A653M. Hot dip coating to ASTM-A924/A924M, coating designation Z275 (G90) minimum steel thicknesses shall be in accordance with this specification. Finish painting of exterior frames and doors by others.
- .2 Interior Doors and frames galvanized steel sheet: commercial grade steel to ASTM A653, CS Type B, coating designation ZF75 (A60) minimum steel thickness shall be in accordance with this specification. Frames to be supplied with factory prime paint; H.M. doors supplied with a factory paint finish.

2.1.2 Wipe coat galvanized with a minimum zinc coating of 107 g/sq m (0.35 oz/sq.ft.) to ASTM A653/A653M Coating Class A01.

2.1.3 Hot dip galvanized: Minimum 183 g/sq m (0.60 oz/sq.ft.) and having a Rockwell B maximum of 65 and suitable for forming and bending without metal or coating fracture.

2.1.4 Minimum thicknesses (Gauges), uncoated and zinc wipe coat steel:

- | | | |
|----|---|---|
| .1 | Door face sheets for interior doors | 16 gauge (1.34 mm) base metal thickness, galvanized coating Z75 (A60). |
| .2 | Door face sheets for exterior doors | 16 gauge (1.34 mm) base metal thickness, galvanized hot dip coating Z275 (G90). |
| .3 | Top and bottom end channels spot
Welded to the door faces | (16 ga.) |
| .4 | Provide all interior, hollow metal doors with factory applied finish to meet or exceed ANSI/SDI A250.3-2007. Test procedure and acceptance criteria for factory applied finish coatings for steel doors and frames. Colour to be chosen by Architect. | |
| .5 | Provide all exterior hollow metal doors with factory applied prime finish to meet or exceed ANSI/SDI A250.10-1998. Test procedures and acceptance criteria for prime painted steel surfaces for steel doors and frames. Finish coats by Section 09900 – Painting. | |
| .6 | Doors to be bevelled 3 mm (1/8") in 50 mm (2") on hinge and lock edges, and have welded seams at hinge and lock edges. | |

- .7 Doors shall have mortised hardware preparations and be adequately reinforced for all surface mounted hardware.
- .8 Doors shall contain fixed metal louvres and/or lights as indicated on the drawings.
- .9 Doors where shown or required shall be complete with approved fire labels.
- .10 Reinforcements

Mortised template hinges	3.12 mm (10 ga.), with integral high-frequency angle, and integral field-conversion from standard-weight to heavy-weight hinges at all locations in both doors and frames.
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- .11 Continuous hinges

Lock and Strike reinforcement	2.36 mm (12 ga.) continuous reinforcement in both doors and frames
Flush bolt reinforcement and Jamb floor anchors	1.34mm (16 ga.)
Channel spreaders	1.34 mm (16 ga.)
Guard boxes	0.66 mm (22 ga.)
Hinge reinforcement	2.36 mm (12 ga.)
Anchors	
T anchors	1.34 mm (16 ga.)
L anchors	1.06 mm (18 ga.)
Closer	2.36 mm (12 ga.)
Surface mounted hardware	2.36 mm (12 ga.)

2.1.5 Door Cores:

- .1 Exterior doors (non-heated areas) and interior heavy duty (high-traffic) doors (stairs, vestibules, general purpose room, and main entrance): hollow steel, vertically stiffened with 20 ga. steel ribs spot welded or laminated to face sheets. Fill voids with polystyrene insulation or fibreglass insulation. Edge seams to be continuously welded the full height of the door, filled and ground smooth with no visible seams. Exterior H.M. doors to be supplied factory primed painted. Interior H.M. doors to be supplied factory painted.
- .2 Exterior doors (heated area): H.M. door stiffened and insulated with polyurethane or polyisocyanurate core. Edge seams to be continuously welded the full height of the door, filled and ground smooth with no visible seams. Exterior H.M. doors to be supplied factory primed painted.
- .3 Interior doors standard duty: honeycomb structural small cell 25.4 mm (1") maximum kraft paper 'honeycomb'. Weight: 36.3 kg (80 lb.) per ream minimum, density: 16.5 kg/m³, (1.03 PCF) minimum, sanded to required thickness. Lockseam edges to be tack welded, filled and ground smooth. Interior doors to be supplied with a factory applied finish paint.

2.1.6 Primer: CAN/CGSB 1.132-M, Zinc chromate rust inhibitive primer.

2.1.7 Zinc rich primer: Galvafruid SB grade by W.R. Meadows Ltd., Kem Organic Zinc Rich Primer No. 6430, by Sherwin Williams Co. of Canada Ltd., Glidden No. 16113 zinc rich primer by Glidden Co. Ltd., or other approved manufacture.

- 2.1.8 Phosphatizing: CGSB 31-GP-105M.
- 2.1.9 Double stud bumpers: Black #52, by Stanley Works of Canada Ltd., or other approved manufacture.
- 2.1.10 Glass stops: 0.037" C-shaped, 16 mm (5/8") high, flush screw applied.
- 2.1.11 Fasteners for stops: Cadmium plated, recessed, flat or oval head Phillips screws.
- 2.1.12 Anchors: As required to suit condition.
- 2.1.13 Rubber Bumpers: 3 per door.
- 2.1.14 Insulation: CAN/ULC S702, Type 1, minimum density 24 kg/cu m (1.5 lb/cu.ft.) consisting of durable fibrous material processed from rock, slag or glass, bound with deterioration resistant binders.
- 2.1.15 Materials for fire-rated doors and frames: Complying with ULC requirements.
- 2.1.16 Sound and light seal: Drop seal mortise type 16 mm (5/8") neoprene insert by Pemko Mfg. Co., or mortise type drop seal #36H by Zero Weather-Stripping Co. Ltd., or other approved manufacture.
- 2.1.17 Gaskets: 16 mm (5/8") square neoprene rubber, closed cell extrusion.
- 2.2 FABRICATION – GENERAL
 - 2.2.1 Assemble units by arc welding in accordance with CSA W59 to produce a finished unit square, true and free of distortion. Welding shall be continuous unless specified otherwise. Welding shall be undertaken only by a fabricator fully approved by the Canadian Welding Bureau to the requirements of CSA W47.1.
 - 2.2.2 Permit access to an approved inspection and testing company for the purpose of inspecting at random, doors under construction for this project.
 - 2.2.3 Make provisions in doors and frames to suit requirements of trade or Section providing security devices. Provide removable plates or knock-outs for electrical contacts. Provide conduit and fish wire to location of electric strike on concealed face of frames.
 - 2.2.4 Provide all function holes for all latching and locking hardware, including those for through-bolted lever trim. (CSDFMA-08100, Article 2.3.5).
 - 2.2.5 Factory mortise, reinforce, drill, and tap all preparations for mortise template hardware. Site-drill and tap for installation of surface-applied hardware, in accordance with hardware manufacturer=s installation templates. (CSDFMA-08100, Article 2.3.4).
- 2.3 FABRICATION - FRAMES AND SCREENS
 - 2.3.1 Interior frames shall be wrap around frame and be made of 16 gauge (1.34mm thick) A60 galvanized and have a minimum coating weight 0.6 oz/s.f. Frames to be supplied factory prime painted.

- 2.3.2 Exterior frames shall be wrap around frame and be made of 14 gauge (1.7mm thick) G90 galvanized. Fill jambs with batt insulation or spray in place polyurethane foam. Insulation to provide by frame install sub. Frames to be supplied factory primed.
- 2.3.3 Frames shall be set up and arc welded continuously on the inside of the face and ground smooth. Spreader bars are to be attached at the bottom and supplied with 3 rubber bumpers installed on strike jamb after final coat of paint has be supplied.
- 2.3.4 Frames with electronic hardware preparations are to be shipped to site with junction boxes welded to the frame at all mortised electric hardware preparations. Electrical boxes are supplied by this section. Frames shipped to site without required junction boxes will be rejected and returned to the supplier to be rectified. Knockdown frames will not be acceptable.
- 2.3.5 Form frames accurately to profiles indicated. Construct frames straight and free from twist or warp.
- 2.3.6 Blank, drill, reinforce and tap frames to receive templated hardware. Reinforce frames for installation of closers. Install stiffener plates or two angle spreaders where required to prevent bending of frame and to maintain alignment when setting. Weld reinforcement in place.
- 2.3.7 Punch frame mitres accurately and weld on inside of frame face. Fill frame corners, exposed surface depressions and butted joints with air-drying paste filler. Sand to a smooth uniform finish. Apply one coat of primer.
- 2.3.8 Supply jamb and mullion extensions and anchors required to secure screens to the structure. Fabricate anchorage to prevent transfer of load from support framing to the screens when deflection of structure occurs.
- 2.3.9 For all existing frames being modified to accommodate new standard height doors, each opening will require to be site measured. Confirm existing frame profile in order to fabricate horizontal mullions to fit. Notch mullions on both sides and fully weld in place. Construct new fire rated HM panels with two layers of 12mm or 16mm fire rated drywall laminated to two sheets of 18 gauge A60 Galvanized steel. Fastened panels using standard 12mm x 16mm glazing bead and self-drilling, self-tapping #6 x 1" glazing bead screws.
- 2.3.10 Where frames terminate at finished floor, supply floor plates for anchorage to slab. Check depth of extension of finished floor to structural slab and provide jamb extension anchorage as required. Provide 50 mm (2") minimum adjustment.
- 2.3.11 Provide three adjustable "T" anchors per jamb or six "L" anchors per jamb for frames up to 2300 mm (7'-6"). Add one "T" anchor or two "L" anchors per jamb for additional 600 mm (2'-0") or fraction thereof in frame height.
- 2.3.12 Supply removable stop and frame, where required for the overhead concealed door closers, properly connected to frame and prepared for attachment to closer, prior to shipment.
- 2.3.13 Provide three double stud bumpers per single door, four bumpers per double door, except for exterior doors. Lowest bumper shall be 230 mm (9") minimum above bottom of door.
- 2.3.14 Reinforce door frame head if opening is wider than 1500 mm (5'-0"). Reinforce jambs and mullions at junction of heads.
- 2.3.15 Fabricate metal screens to sizes shown.

- 2.3.16 Knock-down frames will not be permitted unless it can be shown that preassembled frames are impossible to install.
- 2.3.17 Install gaskets into 6 mm x 6 mm (1/4" x 1/4") deep groove in jambs and head of door frames, as shown. Apply with approved adhesive.
- 2.3.18 Where openings to receive hollow metal frames have already been built, supply reverse channel bucks, one for each 600 mm (2'-0") or fraction thereof. Reinforce bucks where frame is to be fire rated.
- 2.3.19 Fire rated frames in fire separations: Constructed to ULC approval and bearing ULC, ULI or Warnock Hersey Professional Services label, as acceptable to authorities having jurisdiction and as specified for doors. Locate label on inside of hinge jamb, midway between top hinge and head of door frame, so that it is concealed when door is closed.
- .1 Frame System: Proprietary TRR framing system meeting the specified fire and resistive ratings and acceptable to fire rated glass systems installed under Section 08 80 00.
- 2.3.20 Where glass openings are indicated, provide integrally formed cutouts and sections with steel framed glass mouldings and glazing stop. Cutouts and moulded sections to allow for single snap in door glazing stop and double glazing stop. Aluminum mouldings will not be permitted.
- 2.4 FABRICATION - HOLLOW METAL DOORS
- 2.4.1 Fabricate doors 45 mm (1-3/4") thick, flush face, seamless and to conform to details and schedules.
- 2.4.2 Provide vertical steel stiffened core construction for all interior doors. Laminate steel stiffened core material to both inside faces of door, completely fill the inside hollow of the door with fiberglass insulation core material. Join door faces at vertical door edges by tack welding every 150mm (6"), filling, grinding and dressing smooth.
- 2.4.3 Provide insulated hollow steel construction for exterior doors and high traffic interior doors are required. Edge seams, continuously welded, filled and sanded flush. Weld recessed end channel closures to close top and bottom of door. Weld vertical stiffeners to face sheets at a maximum of 150 mm (6") o.c. Fill voids with insulation.
- 2.4.4 Equip fire labelled exterior doors with factory installed flush steel top caps.
- 2.4.5 Top and bottom of doors shall be provided with inverted, recessed, nominal 1.5 mm steel end channels [; nominal 2.74 mm steel end channels for acoustic doors], welded to each face sheet at 150mm on centre.
- 2.4.6 Mortise, reinforce, drill and tap doors to receive templated hardware and reinforce for surface mounted hardware. Check hardware list for details.
- 2.4.7 Provide both stiles of single doors bevelled 3 mm in 50 mm (1/8" in 2"). Fabricate doors with clearance of 3 mm (1/8") to the frame and 19 mm (3/4") to finished floor.
- 2.4.8 Provide flush top edge on exterior doors, with drip on exterior side.
- 2.4.9 Fill voids in stile and rail type doors, including stiles, transom head and bottom rail in glazed doors, with core material.

- 2.4.10 Where glass openings are indicated, provide integrally formed cutouts and sections with steel framed glass mouldings and glazing stop. Cutouts and moulded sections to allow for single snap in door glazing stop and double glazing stop. Aluminum mouldings will not be permitted.
- 2.4.11 Install sound and light gaskets using mortise type drop seal at bottom of door and gaskets at jamb and head of door. Set gaskets into a 6 mm x 6 mm (1/4" x 1/4") deep groove and fastened with approved adhesive.
- 2.4.12 Thermally broken doors shall be constructed in two sections, joined rigidly with thermal break material. Fabricate anchors for thermally broken frames to suit wall conditions; avoid cold transfer from exterior frame section to interior frame section.
- 2.4.13 Provide insulated sealed glazing kits to all exterior door with sidelight or glazed transom.
- 2.5 FABRICATION - FIRE RATED HOLLOW METAL DOORS
- 2.5.1 Construct fire rated doors to ULC requirements, bearing ULC, ULI, or Warnock-Hersey International Ltd., label, and acceptable to authorities having jurisdiction. Provide fire protection ratings indicated and time/ temperature rise label to requirements or authorities having jurisdiction.
- 2.5.2 Face sheets: Minimum nominal 1.5 mm (16 Ga.) base steel sheet thickness.
- 2.5.3 [Stiffened and sound deadened with vertical steel stiffeners laminated under pressure to each face sheet. Fill voids in between stiffeners with fiberglass insulation] [Stiffened, insulated and sound deadened with manufacturer's proprietary Temperature Rise Rated (TRR) core material.]
- 2.5.4 Locate labels on the inside of door at hinge jamb midway between the top hinge and door head.
- 2.5.5 Construct and reinforce for hardware, fire-rated doors similar to standard units.
- 2.6 ACOUSTICAL DOORS AND FRAMES
- 2.6.1 Acoustical doors: Sound reduction doors, Series S, 45 mm (1-3/4") thick, complete with door frames, acoustical seals, automatic mortised door bottom, and complete assembly to provide minimum 43 STC when installed, by Stanley-Bumeda Ltd., or other approved manufacture.
- 2.7 INSULATED EXTERIOR STEEL DOOR FRAMES
- 2.7.1 Thermally broken frames shall be constructed in two sections, joined rigidly with thermal break material. Fabricate anchors for thermally broken frames to suit wall conditions; avoid cold transfer from exterior frame section to interior frame section.
- 2.7.2 Separate interior and exterior frame sections by a polyvinyl chloride (PVC) thermal break. Do not connect sections to each other by screws welds, grommets or other fastening devices.
- 2.7.3 Design wall and floor anchors to suit wall conditions and not to permit thermal transfer from exterior to interior surfaces of frame sections.
- 2.8 HARDWARE PREPARATION
- 2.8.1 Prepare for template hardware in accordance with ANSI/DHI A115 Standards, unless noted otherwise herein. Locate hardware preparations vertically in accordance with CSDFMA Recommended Dimensional Standards, unless noted otherwise herein.

2.9 FINISHING

2.9.1 Doors and frames manufactured from zinc wipe coated steel or hot dipped galvanized: Factory-applied touch-up primer to areas where coating has been removed or abraded due to grinding or handling.

2.9.2 Doors and frames to exterior: G90 Hot dipped galvanized.

2.9.3 Doors and frames to all other areas: A60 Wipe coat galvanized.

PART 3 - EXECUTION

3.1 EXAMINATION

3.1.1 Examine substrates, door swing arcs, areas of installation and conditions affecting installation for compliance with requirements for manufacturers installation tolerances and other conditions affecting performance of work of this Section.

3.1.2 Verify roughing-in for embedded and built-in anchor locations before installing frames.

3.1.3 Verify door and frame size, door swing and ratings with door opening number before installing frames.

3.1.4 Installation of hollow metal doors and frames will denote acceptance of site conditions.

3.2 INSTALLATION

3.2.1 Supply doors and frames to Sections responsible for installation.

3.2.2 Door Frames:

- .1 Remove temporary spreaders before installing door frames, leaving exposed surfaces smooth and undamaged.
- .2 Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set; limit of acceptable frame distortion 1/16" out of plumb measured on face of frame, maximum twist corner to corner of 1/8"; align horizontal lines in final assembly.
- .3 Brace frames rigidly in position until adjacent construction is complete; install wooden spreaders at third points of frame rebate to maintain frame width, install centre brace to support head of frames 4' and wider in accordance with ANSI A250.1; do not use temporary metal spreaders for bracing of frames.
- .4 For frames over 1220mm (4') in width, provide vertical support at the centre of head.

3.2.3 Frame Tolerances: Install frames to tolerances listed in ANSI A250.11, and as follows:

- .1 Squareness: Maximum 0.8mm (1/32") measured across opening between hinge jamb and strike jamb.
- .2 Plumbness: Maximum 0.8mm (1/32") measured from bottom of frame to head level.
- .3 Alignment: Maximum 0.8mm (1/32") measured offset between face of hinge jamb and strike jamb relative to wall construction.
- .4 Twist: Maximum 0.8mm (1/32") measured from leading edge of outside frame rabbet to leading edge of inside frame rabbet.

3.2.4 Doors:

- .1 Fit hollow metal doors accurately in frames within clearances required for proper operation; shim as necessary for proper operation.
- .2 Install hardware in accordance with manufacturers' templates and instructions.
- .3 Adjust operable parts for correct clearances and function.
- .4 Install glazing materials and door silencers where required.
- .5 Install fire rated doors within clearances specified in NFPA 80.
- .6 Install louvers and vents.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:

1. Swinging doors.

- B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Cylinders specified for doors in other sections.

- C. Related Sections:

1. Division 01 Section "Cash Allowances".
2. Division 01 Section "Product Allowances".
3. Division 01 Section "Closeout Procedures"
4. Division 08 Section "Door Hardware Schedule".
5. Division 08 Section "Hollow Metal Doors and Frames".

- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
8. Local Building Codes, Local Amendments.

- E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Shop Drawings: Details of electrified access control hardware indicating the following:
1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
 - a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
 - b. Complete (risers, point-to-point) access control system block wiring diagrams.
 - c. Wiring instructions for each electronic component scheduled herein.
 2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.
- D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

- F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

- B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

- C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

- D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

- E. Building Information Modeling (BIM) Qualifications: BIM software tools and processes are used to produce and support data integration of product and technical information used in specifications, submittals, project reviews, decision support, and quality assurance during all phases of Project design, construction, and facility management. Door and hardware schedules and the associated product data parameters are to be derived, updated, and fully integrated with the coordinated Building Information Modeling as required under Division 01.

- F. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

- G. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

- H. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.

4. Installation of permanent keys, cylinder cores and software.
 5. Address and requirements for delivery of keys.
- I. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 3. Review sequence of operation narratives for each unique access controlled opening.
 4. Review and finalize construction schedule and verify availability of materials.
 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- J. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

- D. Building Information Modeling (BIM) Support: Utilize designated BIM software tools and obtain training needed to successfully participate in the Project BIM processes. All technical disciplines are responsible for the product data integration and data reliability of their Work into the coordinated BIM applications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Please note that ASSA ABLOY is transitioning the Yale Commercial brand to ASSA ABLOY ACCENTRA. This affects only the brand name; the products and product numbers will remain unchanged. The brand transition is expected to be complete in or about May of 2024, and products shipping after that time will be branded ASSA ABLOY ACCENTRA.
- D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 BUTT HINGES

- A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 4. Hinge Options: Comply with the following:
 - a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
 5. Manufacturers:
 - a. McKinney (MK) - TA/T4A Series, 5-knuckle.

2.3 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.
1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
 2. Furnish dust proof strikes for bottom bolts.
 3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
 4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
 5. Manufacturers:
 - a. Rockwood (RO).

2.4 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
 - 1. Manufacturers:
 - a. Match Existing, Field Verify.
- B. Cylinder Types: Per Owner's Direction. Original manufacturer cylinders able to supply the following cylinder formats and types:
 - 1. Threaded mortise cylinders with rings and cams to suit hardware application.
 - 2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - 3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
 - 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 - 5. Keyway: Manufacturer's Standard.
- C. Large Format Interchangeable Cores: Provide removable cores (LFIC) as specified, core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware.
- D. Permanent Cores: Match standard. Reference Division 01 "Cash Allowances" for material required under project. Installation to be included under Division 08 "Door Hardware" base bid package.
- E. Keying System: Each type of lock and cylinders to be factory keyed.
 - 1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
 - 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 - 3. Existing System: Field verify and key cylinders to match Owner's existing system.
- F. Key Quantity: Provide the following minimum number of keys:
 - 1. Change Keys per Cylinder: Two (2)
 - 2. Master Keys (per Master Key Level/Group): Five (5).
 - 3. Construction Keys (where required): Ten (10).
- G. Key Registration List (Bitting List):
 - 1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
 - 2. Provide transcript list in writing or electronic file as directed by the Owner.

2.5 KEY CONTROL

- A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.
 - 1. Manufacturers:

- a. Lund Equipment (LU).
- b. MMF Industries (MM).
- c. Telkee (TK).

2.6 MORTISE LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): Provide ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed mortise locksets. Listed manufacturers shall meet all functions and features as specified herein.
 1. Manufacturers:
 - a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA) - 8800FL Series.
 - b. Corbin Russwin Hardware (RU) - ML2000 Series.
 - c. Sargent Manufacturing (SA) - 8200 Series.

2.7 CYLINDRICAL LOCKS AND LATCHING DEVICES

- A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed cylindrical locksets. Listed manufacturers shall meet all functions and features as specified herein.
 1. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - CLX3300 Series.
 - b. Sargent Manufacturing (SA) - 10X Line.

2.8 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:
 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 3. Dustproof Strikes: BHMA A156.16.

2.9 ELECTRIC STRIKES

- A. Standard Electric Strikes: Electric strikes conforming to ANSI/BHMA A156.31, Grade 1, for use on non-rated or fire rated openings. Strikes shall be of stainless steel construction tested to a minimum of 1500 pounds of static strength and 70 foot-pounds of dynamic strength with a minimum endurance of 1 million operating cycles. Provide strikes with 12 or 24 VDC capability,

fail-secure unless otherwise specified. Where specified provide latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike.

1. Manufacturers:

a. HES (HS) - 1500/1600 Series.

B. Provide electric strikes with in-line power controller and surge suppressor by the same manufacturer as the strike with the combined products having a five year warranty.

2.10 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.

1. Manufacturers:

- a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA) - 3500 Series.
- b. Corbin Russwin Hardware (RU) - DC6000 Series.
- c. Norton Rixson (NO) - 8500 Series.
- d. Sargent Manufacturing (SA) - 1431 Series.

2.11 ELECTROMECHANICAL DOOR OPERATORS

A. Electromechanical Door Operators (Moderate Traffic): Provide ANSI/BHMA A156.19 Certified Products Directory (CPD) listed low energy operators that are UL325/991 and UL10C certified and comply with requirements for the Americans with Disabilities Act (ADA). Operators shall accommodate openings up to 200 pounds and 48" wide.

1. Provide operators with features as follows:

- a. Non-handed with push and pull side mounting.
 - b. Activation by push button, hands-free or radio frequency devices.
 - c. Adjustable opening force and closing power.
 - d. Two-year limited warranty.
 - e. Wi-Fi interface.
 - f. Mounting backplate to simplify and speed up installation.
2. Operators shall have the following functionality:
- a. Adjustable Hold Open: Amount of time a door will stay in the full open position after an activation.
 - b. Emergency Interface Relay: Door closes and ignores any activation input until signal is discontinued.
 - c. Infinite Hold Open: Door will hold open at set position until power is turned off.
 - d. Latch Assist: At closed position, after an activation, the door is pulled in. After the door has closed, the door is pulled in to assist with latch release/engagement.
 - e. Obstruction Detection: Door closes if it hits an obstruction while opening; door will reverse to open position if it hits an obstruction while closing. Door will stop once it hits an obstruction and will rest against the obstruction until removed.
 - f. Open Delay: Delays operator opening for locking hardware.
 - g. Outside Wall Switch Disable: When contact is closed, outside wall switch is disabled.
 - h. Power Assist: Senses the door is being opened manually and applies small amount of power to assist the user in opening the door with force less than 5 lbs. The door opens only as far as it is moved manually, then closes once released.
 - i. Power Close: Additional force to assist door closing between 7° and 2°.
 - j. Push & Go: As the door is manually opened, the operator "senses" movement and opens door to the full-open position.
 - k. Selector Mode Switch: Off disables the signal inputs, on activates the signal inputs, hold open activates the unit to the hold open position.
 - l. Vestibule Delay: When the wall switch is pressed, first door in vestibule will open the second door will open once vestibule door delay has expired. Delay shall be adjustable.
 - m. Executive Mode Feature: When the door receives an activation signal it opens and remains open until either a second signal is received, or the door is manually moved in closing direction.
3. Manufacturers:
- a. ASSA ABLOY Entrance Systems (BE) - SW100 Series.
 - b. Norton Rixson (NO) - 6200 Series.

2.12 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, 050-inch thick.
5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:
 - a. Rockwood (RO).

2.13 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 1. Manufacturers:
 - a. Rockwood (RO).
- C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
 1. Manufacturers:
 - a. Norton Rixson (RF).
 - b. Rockwood (RO).
 - c. Sargent Manufacturing (SA).

2.14 ELECTRONIC ACCESSORIES

- A. Switching Power Supplies: Provide power supplies with either single or dual voltage configurations at 12 or 24VDC. Power supplies shall have battery backup function with an integrated battery charging circuit and shall provide capability for power distribution, direct lock control and Fire Alarm Interface (FAI) through add on modules. Power supplies shall be expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and/or individually protected, relay controlled outputs.
 1. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
 2. Manufacturers:

- a. Securitron (SU) - AQD Series.

2.15 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.16 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. DHI TDH-007-20: Installation Guide for Doors and Hardware.

3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Power Operator products and accessories are required to be installed through current members of the manufacturer's "Power Operator Preferred Installer" program.
- D. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection (Punch Report): Reference Division 01 Sections "Closeout Procedures". Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.
1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.
- B. Fire Door Assembly Inspection: Reference Division 01 Sections "Closeout Procedures". Conduct an initial fire door assembly inspection, including documentation reporting, upon completion of door hardware installation according to NFPA 80 Standard for Fire Doors and Other Opening Protectives, paragraph 5.2.4, requirements.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing and sizing all products.
3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

- B. Manufacturer's Abbreviations:

1. MK - McKinney
2. RO - Rockwood
3. SA - SARGENT
4. OT - Other
5. HS - HES
6. RF - Rixson
7. NO - Norton
8. BM - Besam
9. AK - Alarm Controls
10. SU - Securitron

Hardware Sets

Set: 1.0

Pair A-105A, A-105B,

Description: Pair x Classroom x OHS x KP

6 Hinge, Full Mortise	TA2714 NRP 4-1/2" x 4-1/2"	US26D	MK
2 Flush Bolt	555	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Classroom Lock	LC 10XG37 LL	US26D	SA
1 Cylinder	PER OWNER REQUIREMENTS		OT
2 Surf Overhead Stop	55-X36	689	RF
2 Kick Plate	K1050 8" x WIDTH SA	US26D	RO
2 Silencer	608-RKW		RO

Set: 2.0

Single A-124D,

Description: Single x Entry IND x OHS x KP

3 Hinge, Full Mortise	TA2714 NRP 4-1/2" x 4-1/2"	US26D	MK
1 Office/Inner Entry Lock	LC V20 8256 VN1L	US26D	SA
1 Cylinder	PER OWNER REQUIREMENTS		OT
1 Surf Overhead Stop	55-X36	689	RF
1 Kick Plate	K1050 8" x WIDTH SA	US26D	RO
3 Silencer	608-RKW		RO

Set: 3.0

Single A-125,

Description: Single x PP x CL x KP

3 Hinge, Full Mortise	TA2714 NRP 4-1/2" x 4-1/2"	US26D	MK
1 Door Pull	BF 112	US26D	RO
1 Push Plate	70C-RKW SA	US26D	RO
1 Surface Closer	8501	689	NO
1 Kick Plate	K1050 8" x WIDTH SA	US26D	RO
1 Floor/Wall Stop	441H /403	US26D	RO
3 Silencer	608-RKW		RO

Set: 4.0

Single A-126,

Description: Universal Washroom

3 Hinge, Swing Clear, Hvy Wt	T4A3795 4-1/2"	US26D	MK
1 Storeroom/Closet Lock	LC 10XG04 LL	US26D	SA
1 Cylinder	PER OWNER REQUIREMENTS		OT
1 Electric Strike (fail safe)	1500C-LM	630	HS
1 Door Operator	SW100		BM
1 Kick Plate	K1050 8" x WIDTH SA	US26D	RO
1 Floor/Wall Stop	441H /403	US26D	RO
3 Silencer	608-RKW		RO
1 Switch	3287		SA
1 Advanced Logic Relay	CX-33		OT
1 Occupancy Indicator	CM-AF500 "OCCUPIED WHEN LIT"		OT
1 Push To Lock Button & Indicator Combination Control	CM-AF550R		OT
1 Flush Mount UWR Call System	CX-WEC10K2		OT
1 Emergency Touch Strips	LONDON MAT NEXGEN EMERGENCY STRIP 610mm		OT
1 Safety Scanner	BEA SUPERSCAN II	BLK	OT

**SECTION 08 71 00
DOOR HARDWARE**

2 LED	LDR-F	AK
2 Push Plate Switch (6" round)	CM60/4	OT
1 Power Supply	AQD1	SU
1 Custom Sign Detailing Washroom Locking Operation	BY SIGNAGE CONTRACTOR	OT

NOTE - WIRE WALL MOUNTED TAPE SWITCHES IN PARALLEL WITH THE CX-WEC10K2 PUSH FOR ASSISTANCE BUTTON.

NOTE - LED DOME LIGHT - ONE OUTSIDE THE WASHROOM AND ONE AT TBD LOCATION.

DOOR NORMALLY CLOSED AND UNLATCHED AND OCCUPIED INDICATOR UNLIT.
ENTRY BY PRESSING CORRIDOR SIDE OPERATOR BUTTON OR BY PUSHING DOOR OPEN.
UPON ENTRY AND DOOR CLOSING, PRESSING WALL MOUNTED PUSH-TO-LOCK SWITCH,
LOCKS DOOR FROM CORRIDOR SIDE TRAFFIC AND CHANGES ILLUMINATES OCCUPIED
INDICATOR AND LIGHTS INTERIOS LOCKED INDICATOR.
EGRESS BY PRESSING INTERIOR OPERATOR BUTTON OR BY USING INTERIOR LEVER.
SYSTEM RESETS ON EGRESS.
FREE EGRESS AT ALL TIMES.
PRESSING RED ASSISTANCE REQUIRED BUTTON LIGHTS AND SOUND INDICATORS INSIDE AND
OUTSIDE THE WASHROOM AND UNLOCKS THE DOOR. RED FLASHING LIGHT INDICATOR AT
RECEPTION OR OTHER.
FREE EGRESS AT ALL TIMES.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- 1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.
- 1.1.2 Provide all labour, materials, products, equipment and services to supply and install gypsum board systems and light gauge metal framing required and/or indicated on the Drawings and specified herein.

1.2 REFERENCES

- 1.2.1 ASTM C475/C475M-15 Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- 1.2.2 ASTM C1002-14 Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- 1.2.3 ASTM C1047-14a Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
- 1.2.4 ASTM C1178/C1178M-13 Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel.
- 1.2.5 ASTM E90-09 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- 1.2.6 CAN/CGSB 7.1-98 Lightweight Steel Wall Framing Components.
- 1.2.7 CAN/CGSB 19.21-M87 Sealing and Bedding Compound Acoustical.
- 1.2.8 CAN/CSA A82.27-M91 Gypsum Board
- 1.2.9 CAN/CSA A82.31-M91 Gypsum Board Application.
- 1.2.10 CAN/CSA A123.2-03(R2013) Asphalt-Coated Roofing Sheets.
- 1.2.11 CAN/ULC S702-14 Standard for Thermal Insulation Mineral Fibre for Buildings.

1.3 DESIGN

- 1.3.1 Fire Rated Construction: Construct to approved ULC design for fire resistance ratings indicated. Submit written proof of construction meeting ULC design.
- 1.3.2 Sound rated construction: STC tested in accordance with ASTM E90.

1.4 SUBMITTALS

- 1.4.1 Submit shop drawings showing pertinent construction details for fire and sound rated construction in large scale detail.
- 1.4.2 Product Data: Submit manufacturer's current technical literature for each component.
- 1.4.3 Samples: Supply for Consultant's review, if requested, samples of the following:

- .1 Board: Submit sample of each panel product specified, 150mm (6") square.
- .2 Trim: Submit sample of each type of trim specified, 305mm (12") long.
- .3 Texture: Submit sample, 305mm (12") square, of textured coated gypsum board.

1.4.4 Quality Assurance Submittals:

- .1 Design Data, Test Reports: Provide manufacturer's test reports indicating product compliance with indicated requirements.
- .2 Manufacturer's Instructions: Provide manufacturer's written installation instructions.

1.5 QUALITY ASSURANCE

- 1.5.1 Contractor executing work of this Section shall have a minimum of five (5) years continuous Canadian experience in successful installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- 1.6.1 Deliver materials in original, unopened containers or bundles stored in a place providing protection from damage and exposure to elements.
- 1.6.2 Store board on flat, smooth and dry base.
- 1.6.3 Coordinate deliveries to comply with construction schedule and arrange ahead for off the ground, enclosed, under cover storage location. Do not load any area beyond the design limits.
- 1.6.4 Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings.
- 1.6.5 Store material in original, undamaged containers or wrappings with manufacturer's seals and labels intact, in accordance with GA-238 and manufacturer's recommendations.
- 1.6.6 Protect bagged products from excessive moisture or wetting. Store metal component sections in crates to prevent damage to material. Do not use bent or deformed material.

1.7 ENVIRONMENTAL REQUIREMENTS

- 1.7.1 Temperature within the building shall be maintained uniformly within the range of 12°C to 21°C, 24 hours before installation and until joint cement has dried.
- 1.7.2 Provide adequate ventilation to eliminate excessive moisture within the building before commencement of the work of this Section.

PART 2 - PRODUCTS

2.1 MATERIALS - GENERAL

- 2.1.1 Materials required for fire rated construction: Listed and labelled by ULC.

2.2 MATERIALS - GYPSUM BOARD

- 2.2.1 Gypsum board: Conforming to ASTM C1396, ivory paper faced, tapered edges, 1220mm (48") wide sheets of maximum practical lengths to minimize end joints, 1/2" thick unless indicated otherwise on drawings.

- .1 Sheetrock Brand Gypsum Panels by CGC Inc.
 - .2 ProRoc Regular by CertainTeed.
 - .3 ToughRock Gypsum Wallboard by Georgia-Pacific Canada.
- 2.2.2 Fire-Rated Gypsum Board 'Type X': Conforming to ASTM C1396, 1220mm (48") wide sheets of maximum practical lengths to minimize end joints, tapered edges, 16mm (5/8") thick, as indicated on drawing.
- .1 Sheetrock Brand Gypsum Panels, Firecode Core by CGC Inc.
 - .2 ProRoc Type X by CertainTeed.
 - .3 ToughRock Fireguard Gypsum Board by Georgia-Pacific Canada.
- 2.2.3 Gypsum Ceiling Board: Sag Resistant Gypsum Board: Meeting requirements of ASTM C1396M, ceiling board manufactured to have more sag resistance than regular type gypsum board with long edges tapered, and as follows:
- .1 Location: Ceiling surfaces.
 - .2 Acceptable Materials:
 - .1 Sheetrock Interior Ceiling Board by CGC Inc.
 - .2 Tough Rock CD Ceiling Board by Georgia Pacific Canada.
 - .3 ProRoc Interior Ceiling Board by CertainTeed.
- 2.2.4 Tile Backer Board: Glass Mat Water Resistant Gypsum Backer Board: Manufactured in accordance with ASTM C1178 and C1658 to produce greater resistance to water penetration and to provide improved surface bonding characteristics for ceramic tile than standard gypsum board:
- .1 Location: Substrate for ceramic tile.
 - .2 Acceptable Materials:
 - .1 Fiberock Aqua Tough Tile Backerboard by CGC Inc.
 - .2 Diamondback Tile Backer by CertainTeed.
 - .3 GlasRoc Tile Backer by Georgia-Pacific Canada.
- 2.2.5 Cement Board: Cementitious Backer Board: Reinforced portland cement board, reinforcing mesh embedded near both faces in accordance with ASTM C1325 or ANSI A118.9:
- .1 Substrate for high impact areas.
 - .2 Acceptable Materials:
 - .1 Durock by CGC Inc.
 - .2 PanaRoc by CertainTeed.
- 2.2.6 Abuse Resistant Gypsum Board: Manufactured to produce greater resistance to surface indentation and impact penetration resistance than standard gypsum panels:
- .1 Gypsum panels with glass fibre reinforced core, tapered edges, minimum 5/8" thickness, [Type X ULC fire rating], conforming to ASTM C1396M and tested to the following performance ratings.
 - .2 Acceptable Materials:
 - .1 Sheetrock Abuse Resistant [Firecode] by CGC Inc.
 - .2 Abuse Resistant [Type X] by CertainTeed.
 - .3 ToughRock Abuse Resistant [Fireguard] by Georgia Pacific Canada.
- 2.2.7 Water (Moisture) and Mould Resistant Wallboard: Conforming to ASTM C1396 or ASTM C1278, 1220mm (48") wide panels of maximum practical lengths to minimize end joints, tapered edges, 13mm (1/2") thick, with water (moisture) and mould resistant core. Mould resistant panel score of

10 when tested in accordance with ASTM D3273 and evaluated to ASTM D3274. Less than 5% water absorption by weight after 2-hour immersion, as per ASTM C473.

- .1 Acceptable Materials: Paperless, coated fibreglass mat on face, back and long edges, water-resistant treated core gypsum board. Conforming to ASTM C1658:
 - .1 DensArmour Plus High Performance Interior Panels by Georgia Pacific Canada.
 - .2 Fiberock Brand Aqua-Tough Interior Panels, by CGC Inc.

2.2.8 Exterior Sheathing Board: Glass mat faced, water-resistant treated core gypsum board, 1220mm (48") wide sheets of maximum practical lengths to minimize end joints, 13mm (1/2") thick, silicone treated gypsum core, front and back faces penetrated with inorganic glass fibre mats, square edge, conforming to ASTM C1177. Mould resistant panel score of 10 when tested in accordance with ASTM D3273 and evaluated to ASTM D3274.

- .1 Acceptable Materials:
 - .1 Securock Glass-Mat Sheathing by CGC Inc.
 - .2 Dens-Glass Gold by Georgia-Pacific Canada.
 - .3 GlasRoc Sheathing by CertainTeed.

2.2.9 Exterior Soffit Board: Mould and moisture resistant cement board, non-combustible, 48" wide sheets of maximum practical lengths to minimize end joints, 1/2" thick, aggregated portland cement core wrapped in polymer-coated, glass-fiber mesh. panel score of 10 when tested in accordance with ASTM D3273:

- .1 Acceptable Materials:
 - .1 Durock by CGC Inc.
 - .2 PermaBase Cement Board by CertainTeed
 - .3 ToughRock Fireguard Soffit Board by Georgia-Pacific Canada.

2.3 MATERIALS - FRAMING MEMBERS

2.3.1 Metal track: CAN/CGSB 7.1, 26 ga. galvanized steel, roll formed of width to suit metal studs.

2.3.2 Metal studs: CAN/CGSB 7.1, 26 ga. galvanized steel, cold-rolled formed face at least 1-5/8" wide, depth as indicated. Provide knock-outs in studs to facilitate pipe, and conduit installation.

2.3.3 Hangers: 9 lwg minimum soft annealed and galvanized wire for 1/2" thick gypsum board; 3/16" diameter galvanized mild steel pencil rods for thicker gypsum board.

2.3.4 Ceiling runner or carrying channels: Cold formed 18 ga. mild steel channels, weighing not less than 0.60 lbs/ft., coated with a rust inhibitive paint or galvanized.

2.3.5 Ceiling furring channels: 26 ga. cold formed galvanized steel hat-shaped section.

2.3.6 Metal furring clips: 10 IW ga. minimum.

2.3.7 Wall furring channel: 26 ga. cold rolled galvanized steel hat-shaped section, 1-3/8" wide at crown, 2-3/4" wide at brim, 7/8" deep.

2.3.8 Resilient channels: RC-1 by CGC, or other approved manufacture.

2.3.9 Tie wire: 16 ga. extra pliable, soft, annealed, galvanized wire of high strength.

2.3.10 Hanger wire anchors: "RedHead TW-1614" anchors, by Phillips Drill Company, Division of ITT Industries of Canada Ltd., or other approved manufacture.

2.4 MATERIALS - ACCESSORIES

- 2.4.1 Accessories shall comply with ASTM C1047.
- 2.4.2 Joint treatment: 2" wide perforated tape reinforcement, joint filler or compound, and topping compound. Joint compound and tape shall be of the same manufacturer as gypsum board and comply with ASTM C475/C475M.
- .1 Joint Compound for Tile Backing Panels: Gypsum based tile backing board: Use setting type taping and setting type, sandable topping compounds.
 - .2 Joint Compound for Exterior Sheathing Boards [and Soffit Panels]: Fibreglass mesh tape.
 - .3 Joint Compound for Abuse-Resistant Panels:
 - .1 ToughRock™ Sandable Joint Compound, by Georgia-Pacific.
 - .2 Durabond/Sheetrock Setting-Type Joint Compound, by CGC Canada Inc.
- 2.4.3 Laminating adhesive: Sheetrock brand laminating compound by Canadian Gypsum Co. Ltd., or other approved manufacture.
- 2.4.4 Tape for use with water resistant gypsum board: 2" wide 10 x 10 glass mesh tape.
- 2.4.5 Water: Clean, fresh, potable, free from deleterious materials.
- 2.4.6 Fasteners: Galvanized or aluminum, #6 x 1", 1-1/4", 1-5/8" drywall screws, flat head Phillips or recessed square socket type. 3/8" pan head door frame screws, (Type S12), and complying with ASTM C1002.
- 2.4.7 Fasteners for exterior soffit boards: 1-1/4", Type S-12, Wafer Head, Climaseal finished, screws.
- 2.4.8 Casing bead: Galvanized steel J-shaped trim, maximum lengths x thickness to suit gypsum board, concealed in the finish work by joint tape and joint compound, 200-A by CGC or other approved manufacture.
- 2.4.9 Control joint trim: Casing bead as specified above.
- 2.4.10 Corner bead and reveal trim: Galvanized steel L-shaped trim, maximum lengths, concealed in the finish work by joint tape and joint compound, 200-B by CGC or other approved manufacture.
- 2.4.11 Use No. 200-A trim or appropriate Beadex trim at reveals.
or
- 2.4.12 Reveal trim: No.200-B by Canadian Gypsum Company.
- 2.4.13 Acoustic sealant: CAN/CGSB 19.21, Acoustical Sealant by Tremco Ltd., or other approved manufacture.
- 2.4.14 Sealant for water-resistant gypsum board cut edges: Sheetrock Brand W/R sealant by Canadian Gypsum Co. Ltd., or other approved manufacture.
- 2.4.15 Sealant at ducts and frames and similar locations: Mono 555 as by Tremco Ltd., or other approved manufacture.
- 2.4.16 Sound insulation: Complying with CAN/ULC S702, "AFB" by Roxul Inc., "Noise Stop" sound attenuation blankets "Thermafibre" by CGC, or other approved manufacture.
- 2.4.17 Neoprene sponge strip: Moisture resistant closed cell insulating material.

- 2.4.18 Thermal break material: Neoprene sponge.
- 2.4.19 Asphalt felt: CAN/CSA A123.2-03(2008)
- 2.4.20 Mineral wool safing insulation: Firebarrier Firestopping by Double A/D Distributors Limited, Fire-Bloc Firestopping by M. W. McGill and Associates Ltd., Thermafibre by United States Gypsum Co., or other approved manufacture.
- 2.4.21 Access Panels: As indicated in Section 10 99 00.

PART 3 - EXECUTION

3.1 INSPECTION

- 3.1.1 Examine the work of other Sections which is to receive the work of this Section and proceed only when conditions are satisfactory.
- 3.1.2 Do not apply gypsum board over mechanical or electrical work which requires inspection and approval by authorities having jurisdiction and the Consultant. Ensure that insulation, if required, has been completed to walls, pipes and other items. Neglect of this instruction will nullify any claims for extra payment for removal and replacement of work of this Section.
- 3.1.3 Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
- 3.1.4 Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.2 INSTALLATION - GENERAL

- 3.2.1 Install all materials in accordance with the latest printed directions of the manufacturer and in accordance with CAN/CSA A82.31-M.
- 3.2.2 Perform all work by skilled craftsmen.
- 3.2.3 Provide partitions of thickness indicated on the Drawings.
- 3.2.4 Comply with CAN/CSA A82.31-M, except to its clauses referring to nailing.
- 3.2.5 Extend gypsum board to the underside of the structure above unless otherwise indicated.
- 3.2.6 Provide gypsum board baffles above ceilings, to underside of structure above, where indicated for sound barriers.
- 3.2.7 Install access doors supplied by respective Sections. Gypsum board infill at access panels shall have taped edges. Apply gypsum board with adhesive. Ensure finish of access panel is suitable for board, prime for adhesion if required. Fill and sand smooth perimeter edges as specified for joint finishing.
- 3.2.8 Locate vertical joints at least 12" from jamb lines of openings.
- 3.2.9 Where vapour barrier carries over metal framing members ensure that installation of insulation and vapour barrier and perimeter seals is complete before applying gypsum board finish.

- 3.2.10 Co-ordinate work of this Section with the Sections installing equipment above or in the suspended ceiling areas so as to produce a layout of hangers, carrying channels and furring channels suitable to accommodate fittings and units of equipment in a proper manner. This shall apply especially to flush mounted lighting fixtures, outlet boxes, diffusers and similar material. Failure to follow this procedure will require that the hangers and channels be revised to suit as necessary without extra cost to the Owner.
- 3.2.11 Provide bulkhead framing and gypsum board, were required, whether shown or not, for ductwork and plumbing. Coordinate with Mechanical Division.
- 3.3 INSTALLATION - PARTITION FRAMING
- 3.3.1 Accurately layout partitions as indicated on drawings. Securely attach floor and ceiling runners at 24" o.c. to the structure.
- 3.3.2 Position studs vertically in runners at 16" o.c. maximum unless otherwise indicated. Locate studs not more than 2" from all abutting partitions, partition corners and other construction.
- 3.3.3 Anchor studs located adjacent to door and window frames, partition intersections and corners to runner flanges with lock fasteners or by positive screw arrangement through each stud flange and runner flange.
- 3.3.4 When necessary, splice studs by nesting two studs with a minimum lap of 8" and attaching flanges together with two screws in each flange.
- 3.3.5 Make allowances for deflection at top of partitions to avoid transmission of structural loads to framing system.
- 3.3.6 Locate 2 framing members on each side of framed openings. Frame over and below openings with runner sections at least 6" longer than the rough openings. Cut ends to fit and bend web up and screw anchor to adjacent studs. Install cut to length intermediate vertical studs in same manner and spacing as wall studs over such framed openings. Securely anchor studs to head and jamb anchor of door frames by bolt or screw attachment. Insert intermediate studs above and below channels to support gypsum board.
- 3.3.7 Provide adequate reinforcing for framing to receive wall mounted counters and vanities.
- 3.3.8 Provide double studs or wood blocking and bolts in stud partitions for fastening of handrails, grab bars, to be capable of supporting 230 kg (500 lb) downward pull. Provide double studs and blocking for anchoring of door frames, and other items anchored to stud partitions.
- 3.3.9 At duct openings pack space between framing members and ducts with mineral wool safing insulation and seal with sealant.
- 3.3.10 Provide double stud partitions where indicated.
- 3.3.11 Provide asphalt felt under runners for partitions on slabs on grade.
- 3.3.12 Provide resilient channels at right angles to studs where indicated on special sound proof partitions. Space channels at 16" o.c.
- 3.3.13 Provide thermal break material to isolate metal studs and furring from steel framing, to eliminate cold bridges.
- 3.4 INSTALLATION - CEILING FRAMING

- 3.4.1 Space hangers at centres not exceeding 4'-0" each way, in rows parallel with the walls. Area between hangers shall not exceed 16 sq.ft. Supply hanger inserts or tabs in ample time and with instructions for their proper placement.
- 3.4.2 Use hangers of length required to assure secure anchorage and correct ceiling heights, straight and with a 90° bend at the lower end to engage the runner channels.
- 3.4.3 Do not secure hangers to pipes, ducts or any electrical or mechanical items.
- 3.4.4 Provide a row of hangers adjacent to and parallel with the walls for the support of the ends of runner channels at not more than 6" from the ends of runner channels.
- 3.4.5 Provide hangers to suspend gypsum board ceilings independent of partitions.
- 3.4.6 Start runners or carrying channels parallel to and not more than 6" away from edge of the ceiling. Ends of channels shall not contact vertical surfaces. Securely wire channels in parallel rows at not more than 4'-0" o.c. to hangers with double strand of tie wire. Twist tie wires up tight without slack.
- 3.4.7 Channels shall be level and true to a tolerance of 1/8" in 12'-0" in all directions.
- 3.4.8 Provide 12" lap at runner channel splice. Secure splice with double strand of tie wire at each end. Clustering or lining up of splices will not be permitted.
- 3.4.9 Frame around fixtures, grilles and other openings. Where ducts, or where a combination of ducts and other items interfere so that hanger spacing exceeds 4'-0" increase the size of the main runners and hanger wire accordingly, to sustain increased loading and span. Provide additional hangers as required to support the weight of lighting fixtures, diffusers, grilles and other built-in items occurring in ceilings.
- 3.4.10 Securely install furring channels at right angles to the runner channels and at 24" o.c. using furring clips or a double strand of tie wire. Fur around ducts, bulkheads and the like.
- 3.5 **INSTALLATION - METAL FURRING DIRECT ATTACHMENT TO MASONRY OR CONCRETE**
- 3.5.1 Secure metal furring runners to masonry or concrete vertically, spaced 24" o.c. Fasten runners 24" o.c. through alternate flanges of runners. Shim runners as required to present a true, plumb line for application of gypsum board.
- 3.5.2 At windows, doors or similar openings having returns, install lengths of notched and 90° bent pieces of channel horizontally at the returns spaced approximately 24" o.c. Locate runners not more than 2" away from all openings, interior corners, intersections, frames, jambs, control joints and the like.
- 3.5.3 Mitre furring around all corners. Form mitres by cutting the flanges and bending the web. Do not cut the web to form corners.
- 3.6 **APPLICATION - GYPSUM BOARD**
- 3.6.1 Take all measurements accurately. Cut boards by scoring the face paper, snapping the core of the board and then cutting the back paper. Smooth the cut edges with a rasp or coarse sandpaper.
- 3.6.2 Erect gypsum board vertically or horizontally whichever results in fewer end joints. Butt joints loosely with maximum gap of 1/4". Do not force boards into position. Place tapered edges next to one another. All end joints shall occur over framing members.

- 3.6.3 Minimize end joints. Align joints with edge of wall openings.
- 3.6.4 Provide approved thermal break material at edges of gypsum board in contact with non-thermally broken metal windows and at exterior door frames.
- 3.6.5 At curved surfaces, score back of gypsum board and wet boards, bend to required radius, and block in position until dry. Apply joint compound and trowel smooth to provide continuous, smooth radius, free from flat spots, facets or trowel marks.
- 3.6.6 Where gypsum board baffle occurs over door or glazed opening, extend baffle across door or glazing opening.
- 3.6.7 Provide special trim as specified at reveals.
- 3.6.8 Apply thermal break material to metal studs, where indicated, before applying gypsum board.
- 3.6.9 In areas where opposite side of partition is open to space below, provide metal lath on concealed side. Install lath with long dimension across the studs. Secure with tie wires at 6" o.c.
- 3.7 APPLICATION - GYPSUM BOARD LAMINATED TO CONCRETE AND/OR CONCRETE BLOCK MASONRY
 - 3.7.1 Ensure base is straight, dry, uncoated, clean and free from efflorescence. Mix laminating adhesive in accordance with manufacturer's directions. Allow to stand 30 minutes before using.
 - 3.7.2 Apply adhesive with a notched trowel to leave 3/8" x 1/2" ribbons, 1-1/4" apart over entire back side of face layer.
 - 3.7.3 Erect gypsum board immediately after spreading adhesive. Use moderate pressure to develop full adhesive contact with substrate.
 - 3.7.4 Temporarily secure gypsum board in place with concrete nails or bracing. Ensure that joints are accurately aligned. Avoid impact or movement of boards until adhesive sets firmly. Remove temporary support when adhesive has set.
- 3.8 APPLICATION - GYPSUM BOARD (MULTIPLE LAYERS)
 - 3.8.1 Use square edged gypsum board for base layer and tapered edge for face layer. Place face layer at right angles to preceding layer. Apply base layer to framing members so that there will be a minimum number of end joints in the face layer. Offset the joints between the two layers a minimum of 10".
 - 3.8.2 Apply base layer to framing members with 1" screws at 12" o.c. in the field and 8" o.c. at the end and edges. End joints may occur on or between framing members provided back blocking with supporting strips is used to assure alignment.
 - 3.8.3 Mix laminating adhesive in accordance with manufacturer's written specifications. Allow to slake.
 - 3.8.4 Cut and fit face layer and spread adhesive over back side with a metal spreader blade that has "V" shaped notches 1/2" deep, 5/16" wide and spaced 1-1/2" to 2" o.c.
 - 3.8.5 Apply face layer, loosely butting all joints and temporarily hold in place with fasteners of sufficient length to penetrate framing member 3/4". Wipe off any adhesive forced out along the edges. Place temporary fasteners at 16" o.c.

3.9 APPLICATION - WATER RESISTANT GYPSUM BOARD

- 3.9.1 Provide water resistant gypsum board to walls in washrooms.
- 3.9.2 Apply water resistant gypsum board where ceramic tile is scheduled.
- 3.9.3 Provide water resistant gypsum board behind mirrors.
- 3.9.4 Apply water resistant gypsum board in strict accordance with manufacturers' written instructions.
- 3.9.5 Do not apply water resistant board to ceilings.
- 3.9.6 Apply coated water resistant gypsum board with black side out.
- 3.9.7 Give particular attention to sealing of cut edges, utility holes and joints, with approved sealant material. Seal all openings with sealant.
- 3.9.8 Apply tape over joints and angles.
- 3.9.9 Apply full bodied coat of sealer prior to application of fixtures and trim.

3.10 APPLICATION - CEILING

- 3.10.1 Unless otherwise noted, construct ceilings in 1/2" thick gypsum board, screw attached at 8" o.c. maximum.
- 3.10.2 Suspended gypsum board ceilings with joints taped shall be level, to within 1/8" in 12'-0" in all directions.
- 3.10.3 Make allowance for air-transfer openings in above ceiling partition construction. Review Mechanical Drawings to establish locations. Provide openings in gypsum board baffle (in plenum space) to accommodate all cross-talk silencer ducts. Refer to Mechanical Drawings and specifications for type and location. Co-ordinate with Partition Type and partition Location Plans.
- 3.10.4 Where slab to slab or baffle above ceiling partitions occur and large mechanical ducts prevent installation of such, a lead blanket is to be used as an alternate. Ensure complete continuous sound seal is provided.
- 3.10.5 At all gypsum board ceiling areas, air supply and return shall be via continuous slim-line linear diffusers. Locations as indicated on Mechanical Drawings.
- 3.10.6 Provide all openings in gypsum board ceilings to accommodate sprinklers, exit lights, access panels, pot lights, air diffusers and speakers.
- 3.10.7 Caulk perimeter of gypsum board ceilings where suspended with sound isolation hangers.

3.11 TILE BACKING PANELS

- 3.11.1 Install standard gypsum board panels in areas not subject to wetting to produce a flat surface.
- 3.11.2 Install water resistant gypsum board in locations requiring tile applications in washrooms, and as indicated on the Drawings.
- 3.11.3 Shim surfaces to produce a uniform plane across panel surfaces where tile backing panels abut other types of panels in the same plane.

3.12 EXTERIOR SHEATHING BOARD

- 3.12.1 Install exterior sheathing board to exterior walls in accordance with manufacturer's written instructions. Seal all cut edges, ends, utility holes and fastener heads, as recommended by manufacturer.
- 3.12.2 Receive masonry veneer anchors from Section 04200 - Masonry and install the masonry veneer anchor to the structural studs. Spacing of the masonry veneer anchor system must be maximum 406mm (16") vertically O.C. and stud spacing horizontally. Sufficient anchors must be provided on each structural stud prior to erection of stud. Sequentially lift anchors as exterior sheathing board is being installed such that each anchor rests on edge of the exterior sheathing board.
- 3.12.3 Tape and fill all joints and fastener heads using materials recommended by exterior sheathing board manufacturer.

3.13 FIRE RESISTANT ASSEMBLIES

- 3.13.1 Fire resistance rating of gypsum board assemblies and framing shall be as called for on drawings or schedules, and as required to conform with applicable codes and requirements of authorities having jurisdiction.
- 3.13.2 Appropriate ULC designs as listed in current ULC list of equipment and materials, Volume II, Building Construction, shall be placed when applicable. Extend partitions full height through ceiling space unless otherwise noted on drawings.
- 3.13.3 Vertical bulkheads in ceiling spaces over fire rated glazed partitions, doors and the like shall have same fire rating as the door or partition over which they occur. All such bulkheads shall be of drywall construction unless otherwise noted.
- 3.13.4 Use fire rated gypsum board as specified.
- 3.13.5 Where lighting fixtures, diffusers, and the like are recessed into fire rated ceilings or bulkheads, provide enclosure to maintain required fire rating. Form removable panel to give access to fixture outlet box.
- 3.13.6 Where fire hose cabinets or other fixtures or equipment are recessed in fire rated walls or partitions, provide drywall enclosure or backing to maintain required fire rating, unless otherwise detailed.

3.14 INSTALLATION - FASTENERS AND FASTENING

- 3.14.1 Apply gypsum board to metal furring, studs, runner channels, angles and other framing with approved screws. Use 1" long screws for fastening gypsum board up to 5/8" thickness to metal and wood furring and framing, and 1-1/4" long screws for fastening gypsum board up to 1" thickness to metal angle and channel runners.
- 3.14.2 Space screws 12" o.c. in field of board and 8" o.c. staggered along abutting edges. Start securing the board in the central portion and work toward the edges and ends. Drive all screws so screw heads provide a slight depression below the surface of the gypsum board without puncturing the face paper. Do not drive screws closer than 3/8" from edges and ends of gypsum board.
- 3.14.3 Use adhesive application for laminating gypsum board direct to other gypsum board in two or more layer construction and direct to concrete and masonry as specified herein before.

3.15 FINISHING

- 3.15.1 Finish gypsum board in conformance to CAN/CSA A82.31-M, except as herein specified.
- 3.15.2 Apply corner beads to all external vertical and horizontal corners and edges. Apply casing beads where the gypsum board butts against a surface having no trim concealing the juncture.
- 3.15.3 Erect corner beads and casing beads plumb and level with a minimum number of joints and secured at 6" o.c. with screws in each flange. Stagger fasteners in each flange.
- 3.15.4 Do not treat joints of laminated gypsum board for at least 24 hours after lamination.
- 3.15.5 Mix joint compound in accordance with manufacturer's specifications and allow to stand a minimum of thirty minutes before using.
- 3.15.6 Fill all gaps and screw nail depressions with three coats of joint compound. Allow preceding coat to set before applying subsequent coats.
- 3.15.7 On all corners apply joint compound to one side of corner and allow to set before applying compound to the other side of corner.
- 3.15.8 Apply a thin coat of joint compound over the board on each side of joints and embed the reinforcing tape and roll firmly into place. Cover all edges of tape with a thin coat of joint compound. Neatly crease tape at all internal corners. Allow to dry for 24 hours.
- 3.15.9 Apply joint compound over flanges of all corner beads and casing beads flush with nose of bead and extending at least 3" onto the surface of the board.
- 3.15.10 After bedding coat has set, apply second coat of joint compound feathered at least 6" on each side of butt joints and 4" past flanges of all beads.
- 3.15.11 After second coat has set, apply third coat of joint compound and feather to 8" on each side of butt joints and 5" past flanges of all beads.
- 3.15.12 Feather all coats of joint compound onto adjoining surfaces so that all joints, tape holes and flanges of beads are invisible.
- 3.15.13 After complete treatment has thoroughly set and after at least 24 hours, sand lightly with fine grit sandpaper to leave it smooth and ready for decoration.
- 3.15.14 Make the finished work smooth, seamless, plumb, true, flush and with square, plumb, neat corners and edges.
- 3.15.15 Do not finish joints of non-fire-rated walls in mechanical rooms, above finished ceilings or where acoustic tiles are scheduled.
- 3.15.16 Provide casing beads to edge of gypsum board on demising partitions where board meets ceiling, and convector cabinet enclosures, and at gypsum board terminations at recesses to accept carpet base and gypsum board terminations at coffered ceilings and to perimeter of gypsum board panels.
- 3.15.17 Tape joints in preparation for liquid applied vapour barrier.
- 3.15.18 Prepare surfaces ready for paint. Correct imperfections appearing after application of prime coat of paint.

3.16 CONTROL JOINTS

- 3.16.1 Install control joints in gypsum board where it is applied to concrete or masonry, either on furring or by adhesion, in the following locations; at masonry control joints and at junction of dissimilar wall materials.
- 3.16.2 Provide Control Joints at door panels, at each side of jamb, extending above door head.
- 3.16.3 Provide control joints in continuous runs of gypsum board at locations indicated or, if not indicated, spaced 30'-0" o.c. maximum at locations as directed by the Consultant.
- 3.16.4 Install double casing beads, back to back, fitted tightly together, on gypsum board edges at control joints. Finish casing beads but not joint between them.
- 3.16.5 Where application is on studs, double up studs at control and expansion joints, place one stud on each side of joint.

3.17 SOUND INSULATION

- 3.17.1 Provide sound attenuation blankets where indicated or required to attain sound attenuation, minimum STC 45 or as otherwise indicated.
- 3.17.2 Completely fill all spaces between studs laterally with blankets, run continuously from floor to ceiling or structure, over door frames and opening and around corners.
- 3.17.3 Provide sound attenuation blankets above ceilings as shown, completely covering ceiling to thickness indicated.
- 3.17.4 Pack sound insulation around cut openings in gypsum board walls and ceilings, behind outlet boxes around plumbing, heating or structural items passing through the system.
- 3.17.5 Pack sound insulation around openings in floors.
- 3.17.6 Secure blankets by adhesive or staples to one interior face of gypsum board.
- 3.17.7 Provide neoprene strips at perimeter of sound partitions as shown.
- 3.17.8 Provide batt insulation at air transfer ducts.

3.18 SEALING

- 3.18.1 Provide perimeter sealant (sound seal) at junction of gypsum board with structure, other partitions and at junction with dissimilar materials and adjacent construction. Apply in concealed locations only. Install in strict accordance with sealant manufacturer's written instructions.
- 3.18.2 Seal shall consist of 2 (STC 48 or less), 4 (STC 51) or 5 (STC 52) beads to meet or exceed partition rating.
- 3.18.3 Seal openings around ducts and similar protrusions passing through drywall system, at walls and ceilings.
- 3.18.4 Gypsum board shall be made air-tight around window and door openings. Return gypsum board at door and window openings and butt into window and door frames. At window stools, return gypsum board under stool. Perimeter edges where gypsum board butts to the frame shall be made air-tight with sealant.

3.18.5 In order to provide a continuous air barrier, the gypsum board on the exterior walls shall extend behind interior partitions, ducts, mechanical chases, heating units, etc. Coordinate with all relevant trades.

3.19 CUTTING AND PATCHING

3.19.1 Do all cutting, patching and making good as required by the installation of work of other trades and co-operate closely with these trades to assure a satisfactory finish. Remove and make good any work which, in the opinion of the Consultant is defective and not acceptable, at no additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 All labour, materials, products, equipment and services to supply and install the porcelain and ceramic tile work required and/or indicated on the Drawings and specified herein.

1.2 REFERENCES

1.2.1 ASTM C206-14 Standard Specification for Finishing Hydrated Lime.

1.2.2 ASTM C207-06(2011) Standard Specification for Hydrated Lime for Masonry Purposes.

1.2.3 CAN/CGSB 19.22-M89 Mildew-Resistant Sealing Compound for Tubs and Tiles.

1.2.4 CAN/CSA A3000-13 Cementitious materials compendium(Consists of A3001, A3002, A3003, A3004 and A3005), Includes Update No. 1 (2014), Update No. 2 (2014), Update No. 3 (2014).

1.2.5 CSA A82.56-M76 Aggregate for Masonry Mortar.

1.3 QUALIFICATIONS

1.3.1 Subcontractor executing work of this Section shall employ installers having a minimum of five (5) years continuous Canadian experience in successful installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.

1.3.2 Work of this Section shall be executed by workers especially trained and experienced in this type of work. Have a full time, senior, qualified representative at the Site to direct the work of this Section at all times. Representative shall meet Consultant's approval.

1.3.3 Ensure proper use of proprietary materials in strict accordance with the material manufacturer's directions. It shall be the responsibility of the material manufacturer or supplier to furnish these directions to the Contractor and to check periodically at the site to ensure that they are being carried out.

1.4 SUBMITTALS

1.4.1 Submit two samples of all materials and products to the Consultant for review.

1.4.2 Submit two full size tile samples of each colour and tile selected.

1.4.3 Maintenance Instructions: Upon completion of the Work, furnish Consultant with copies of maintenance instructions, containing complete detailed and specific instructions for maintaining, preserving and keeping clean the surfaces of this Work and in particular, giving adequate warning of maintenance practices of materials detrimental to the work of this Section for inclusion in the Operation and Maintenance Manual.

1.5 SITE MOCK-UP

1.5.1 Following the pre-installation conference, the Contractor shall install a 10'-0" x 10'-0" dry sample areas of porcelain tiles, ceramic mosaic tiles and ceramic wall tile showing all colours of tiles and layout in areas designated later by the Consultant.

- 1.5.2 After approval of tile colours and layout the Contractor shall set tile and grout including one caulked joint under the supervision of the material manufacturer's representative.
- 1.5.3 Upon completion and approval, sample areas shall serve as a standard of quality for the balance of the work of this Section. Subsequent work carried out and not in the Consultant's opinion, equal to the quality standard shall be removed and replaced at no additional cost to the Owner.
- 1.5.4 It shall be the responsibility of the material manufacturer's representative to visit the site during installation, at intervals agreed upon with the Consultant to ensure proper use of proprietary materials and assist the Contractor as may be required, and shall also submit a report to the Consultant of their findings after each site review to ensure their directions are being adhered to.
- 1.5.5 Co-ordinate work of mock-up with related work of other Sections.
- 1.5.6 Accepted work may form a part of the final installation.
- 1.6 EXTRA STOCK
 - 1.6.1 At completion of work, deliver to the Owner 5% extra quantity of each type of tile, from same production run as installed tiles. Include cost of extra stock as part of the work of this Section.
- 1.7 DELIVERY, STORAGE, HANDLING AND PROTECTION
 - 1.7.1 Co-ordinate deliveries to comply with construction schedule and arrange ahead for off the ground, under cover storage location. Do not load any area beyond the design limits.
 - 1.7.2 Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings.
 - 1.7.3 Store material in original, undamaged containers or wrappings with manufacturer's seals and labels intact.
 - 1.7.4 Restrict traffic by other trades during installation.
 - 1.7.5 Provide adequate protection of completed tiled surfaces to prevent damage by other trades until final completion of this project. Minimum protection shall consist of 4 mil polyethylene sheets lapped 4" and taped.
 - 1.7.6 Heavily travelled areas shall have additional 1/2" thick fibreboard sheet protection with taped joints over polyethylene sheet protection as specified above.
 - 1.7.7 Protect exposed edges of floor tile with same thickness as tile x 4" wide tapered strip of plywood adhered to floor until adjoining floor finish is to be installed.
- 1.8 ENVIRONMENTAL REQUIREMENTS
 - 1.8.1 Maintain ambient temperature between 10 deg C and 20 deg C, for a period of 72 hours before commencement, during installation and 72 hours after installation.
 - .1 Temperature: Maintain tile materials and substrate temperature between TTMAC recommended minimum and maximum temperature range; unless indicated otherwise by manufacturer, for 48 hours before and during installation until materials are fully set and cured; provide additional heat during winter months or at any other time when there is a risk that surface temperatures may drop below minimum recommended temperatures.

- .2 Ventilation: Maintain adequate ventilation where Work of this Section generates toxic gases or where there is a risk of raising relative humidity to levels that could damage building finishes and assemblies.
- 1.8.2 Moisture content of floor shall not exceed a maximum of 3 lbs. of water per 1,000 sq. ft. of concrete slab area over a 24 hour period as measured by one of the following methods, as approved by Consultant:
- .1 Does not exceed 3% as measured by Calcium Carbide Hygrometer procedure.
 - .2 Does not exceed 5% as measured by normal Protimeter.
- 1.9 WARRANTY
- 1.9.1 Warrant the work of this Section against defects in materials for a period of five (5) years and in workmanship for a period of two (2) years, except as a result of structural failure of substrate.
- 1.10 LEED™ STRATEGIES
- 1.10.1 All trades must examine practices, as outlined in the related sections, to assist the team in achieving these results.
- 1.10.2 Related Sections:
- .1 01 35 20 General LEED® Requirements
 - .2 01 35 50 Waste Management Disposal
 - .3 01 35 90 Indoor Air Quality Management
 - .4 01 61 10 LEED® Product Requirements
 - .5 31 25 00 Construction Pollution Prevention.
- 1.10.3 Materials used for Work in this section are to include, but are not limited to the following criteria:
- .1 All materials under Work of this Section, including but not limited to, coatings, sealants, primers and adhesives are to have low VOC contents, in accordance with Section 01 35 63.
 - .2 Materials used in work of this Section are to contain high amounts of recycled content and
are to be sourced regionally from within 800 km via truck or 2400 km via rail or ship from jobsite in accordance with Section 01 61 10.
- 1.10.4 The following must be submitted as appropriate for Consultant's review and approval:
- 1. Submit an MSDS or product data sheet stating the VOC and urea-formaldehyde content, along with Schedule A of Section 01 35 63 LEED Product Requirements Schedules following the measures outlined in Section 01 35 90, for all applicable products.
 - 2. Submit Schedules A and D, as appropriate, of Section 01 61 10A LEED Product Requirements Schedules following the measures outlined in Section 01 61 10, for all applicable products.

PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
- 2.1.1 Dynamic Coefficient of Friction: Tile installed on walkway surfaces shall achieve a DCOF measurement of 0.42 as determined by testing identical products per ANSI A137.1-2012. Where tile is installed in wet environments, including washrooms and showers, test method shall also be carried out on wet tile.

- 2.1.2 Floor Level Tolerances: Provide materials to attain floor levelness tolerances required by this Section; calculate quantity of materials based on the difference between the specified tolerance and the initial tolerance specified in Section 03 35 00; measurements will be made in the same manner as used in Section 03 35 00.
- .1 Small format floor tile: Tiles having dimensions less than 100 mm x 100 mm require floor flatness as specified in Section 03 35 00.
 - .2 Standard format floor tile: Tiles having dimensions from 100 mm x 100 mm and less than 400 mm x 400 mm require floor flatness measured to a minimum FF35; equivalent to 5 mm with no more than 2 gaps under a 3000 mm straightedge measurement.
 - .3 Large format floor tile: Tiles having dimensions 400 mm x 400 mm and larger require floor flatness measured to a minimum of FF50; equivalent to 3 mm with no more than 2 gaps under the 3000 mm straightedge measurement.
 - .4 Wall tiles: Provide wall leveling similar to that specified for floors, for tiles having similar sizes listed above.

2.2 MATERIALS

- 2.2.1 Porcelain floor tile and matching base tile (Non-Slip): 600 mm x 600 mm (24" x 24"), "Ideal-natural" by "Glocal Series" distributed by Centura Tile or equivalent – exact colour to be selected at a later date by the Board and Consultant. Allow for up to three colours in a single location.

- 2.2.2 Provide all special units, coves, corners, caps, bullnose as required.

2.3 TRIMS:

- 2.3.1 Straight Edge Strips: [Solid brass] [Extruded [mill finished] [clear satin anodized] aluminum] [Roll formed stainless steel] edge strips, 3 mm wide at top edge; height as required to suit tile installation; with integral perforated anchoring leg for setting the strip into the setting material: Basis-of-Design Materials: Schlüter Schiene AE
- 2.3.2 Transition Edge Strips: [Solid brass] [Extruded [mill finished] [[clear] [brass] satin anodized] aluminum] edge strips; height as required to suit tile installation; with integral perforated anchoring leg for setting the strip into the setting material and [sloped] [sloped, narrow profile] [sloped, wide profile] [flat, smooth profile] transition. Basis-of-Design Materials: Schlüter Reno [[M] [A] [AMB] [ACB]]-[[U] [TK] [UK] [T]
- 2.3.3 Stair Nosings: Extruded thermoplastic rubber, heavy traffic use, slip resistant stair nosing set into extruded [aluminum support section] [stainless steel support section] with integral perforated anchoring leg for setting the assembly into the setting material; width [25 mm] [50 mm] x height to suit application; colour as selected by Consultant from standard range, first tread and last tread of a contrasting colour [; complete with [end caps] [and] [replacement inserts representing 20% of installation]: Basis-of-Design Materials: Schlüter Trep [SE] [S] [B].
- 2.3.4 Cove Base Trims: Roll formed stainless steel inside corner, cove shaped joint profile with perforated anchoring legs for setting the corner joint into the setting material; heights as required to suit installation, complete with pre-formed outside corners, [pre-formed 3-way inside corners], pre-formed 2-way inside corners, connections, and pre-formed end caps: Basis-of-Design Materials: Schlüter Dilex [EHK] [EHKS].

2.4 SETTING BEDS

- 2.4.1 Cement: CAN/CSA A3000-08, grey or white Portland cement for mortar, white Portland cement for grout.

- 2.4.2 Sand: CSA A82.56-M, sharp, screened concrete sand free from inorganic and deleterious materials.
- 2.4.3 Water: Clean and free from oil, acid, alkali, organic matter or other deleterious substances.
- 2.4.4 Lime: ASTM C206 or ASTM C207, Type S, hydrated lime.
- 2.4.5 Surface Preparation Materials: Levelling Bed/Mortar Additive: Performance standard meeting requirements of ANSI A108.1, Type 2; Acceptable material:
- .1 Flextile Ltd., Mortar Bed with #43 Additive.
 - .2 MAPEI Inc. Mapecem Premix PL50.
 - .3 Custom Building Products Level Quik Underlayment
- 2.4.6 Interior Thin Set Wall System: Dry set mortar meeting or exceeding the requirements of ANSI A108.1 formulated for thin set applications of ceramic biscuit tile, factory sanded mortar consisting of portland cement, sand and additives requiring only potable water to be added for installation:
- .1 Flextile Ltd., #51 Floor and Wall Mix
 - .2 MAPEI Inc. Kerabond
 - .3 Custom Building Products Premium Blend Thinset
- 2.4.7 Interior Thin Set Floor System: Dry set mortar meeting or exceeding the requirements of ASTM C627 for Heavy installation using latex modified, portland cement mortar meeting requirements of ANSI A108.1:
- .1 Flextile Ltd., #53 Floor Mix
 - .2 MAPEI Inc. Kerabond
 - .3 Custom Building Products Master Blend Thinset
- 2.4.8 Large Format Tile Mortar: Medium bed, dry set polymer modified mortar system designed specifically for use with large format tile materials over 305mm x 305mm (12" x 12"), requiring only the addition of water, rated for extra heavy service installation:
- .1 Flextile Ltd., #50 PM Medium Bed Thin Set Mortar
 - .2 MAPEI Inc., Ultracontact
 - .3 Custom Building Products, Complete Contact
- 2.4.9 Epoxy Adhesive Setting Materials: Thin set adhesive system using 100% solids epoxy resin and epoxy hardener meeting or exceeding the requirements for ANSI A108.1; stain proof, chemical resistant and having high temperature resistance, water cleanable.
- .1 Flextile Ltd., Flex Epoxy 100 Setting
 - .2 MAPEI Inc. Ker 410 Kerapoxy Mortar
 - .3 Custom Building Products 100% Solids Epoxy Mortar
- 2.4.10 All materials comprising a system shall be from one manufacturer and shall be compatible with each other.
- 2.5 GROUT
- 2.5.1 Epoxy Floor Grout: stain resistant Latapoxy SP-100 Colour selected by consultant must be a dark colour.

- 2.5.2 Wall Grout: unsanded dry set Laticrete 600 Series/1776
- 2.6 MIXES
 - 2.6.1 Underlayment, by volume: 3 parts sand, 1 part cement and water with latex additive as required for proper trowelling consistency.
 - 2.6.2 Thin set mortar: Mix to manufacturer's recommendations.
- 2.7 MISCELLANEOUS MATERIALS
 - 2.7.1 Primers: As recommended by the manufacturer of the setting bed for the various substrate conditions.
 - 2.7.2 Edge moulding: L-shaped extruded aluminum, anodized finish, 1/4" face depth x 7/8" perforated concealed flange, one piece length per location, by Ramca Tile, or other approved manufacture.
 - 2.7.3 Polyethylene film: 0.1 mm (4 mil) thick.
 - 2.7.4 Sealant and backing: CAN/CGSB 19.22-M, one component silicone, 'DC786' by Dow Corning Canada Limited or other approved manufacture, colour to match grout; tested by sealant manufacturer for non-staining of tile specified. Submit test reports. Joint filler as recommended by sealant manufacturer.
- 2.8 MEMBRANES
 - 2.8.1 Crack Suppression Membranes: Load bearing, premanufactured self adhering lightweight fabric reinforced crack isolation membrane; nominal 1 mm thick manufactured to accommodate in-plane substrate movement in thin set applications meeting requirements of ANSI A108.1 and as follows:
 - .1 Flextile Ltd., 1000 Flexilastic Crack Isolation Membrane
 - .2 MAPEI Inc., Mapeguard 2
 - 2.8.2 Waterproofing Membranes: Load bearing, reinforced, liquid applied membrane; manufactured to accommodate flood testing and reduce the incidence of thermal shock cracking to tiling installations; meeting requirements of ANSI A108.1 and as follows:
 - .1 Flextile Ltd., Flex WP-980 Waterproof and Crack Isolation Membrane
 - .2 MAPEI Inc. Mapelastic 315 Waterproofing and Reinforcing Fabric
 - .3 Custom Building Products Level Quik Waterproof and Anti-Fracture Membrane
- 2.9 SEALERS
 - 2.9.1 Floor sealer and protective coating: Clear, non-slip "Traction Master", or other approved manufacture.

PART 3 - EXECUTION

- 3.1 INSPECTION
 - 3.1.1 Examine the work upon which the work of this Section depends and report any defects to the Consultant.
 - 3.1.2 Ensure that backings are structurally sound, level and plumb within the required tolerances.

- 3.1.3 Tolerance of substrate for thin set mortar or epoxy setting bed is used, ensure that overall surface variations do not exceed plus/minus 3 mm (1/8") and 1.6 mm (1/16") within any single running foot, non-cumulative.
- 3.1.4 Ensure that access doors are set to provide a flush installation of the tile.
- 3.2 PREPARATION
 - 3.2.1 Where work is applied to areas having floor drains, apply primer at the rate of 5 sq m to 6 sq m/4.5 (250/300 sq.ft./gal.). Trowel apply underlayment to form a continuous and uniform slope from the room edges to drains provided.
 - 3.2.2 Prime gypsum board before application of dry set mortar setting bed.
 - 3.2.3 Ensure that concrete substrates are free from latency and foreign matter which would impair bond. Grind concrete if necessary to present a sufficiently smooth surface to ensure proper performance of membrane. Vacuum substrate.
 - 3.2.4 Crack Suppression Membranes:
 - .1 Prepare all surfaces of non-structural and structural cracks in strict accordance with the crack suppression membrane manufacturer's written instructions.
 - .2 Prime and fill all surfaces of non-structural and structural cracks in strict accordance with the crack suppression membrane manufacturer's written instructions.
- 3.3 INSTALLATION - GENERAL
 - 3.3.1 Do tile work in accordance with Specification Guide 09 30 00 Tile Installation Manual 2009/2010, produced by Terrazzo Tile and Marble Association of Canada (TTMAC) and Construction Specifications Canada (CSC), except where specified otherwise.
- 3.4 INSTALLATION - SETTING BED
 - 3.4.1 Use thin set with latex mortar system for application of tile to concrete floors in accordance with TTMAC Detail No. 311F-07.
 - 3.4.2 Thin set mortar system for masonry or concrete walls: Apply slight levelling coat plaster base and bond coat in accordance with TTMAC Detail 303W-02.
 - 3.4.3 Thin set mortar with latex additive for application of tile to water resistant gypsum board in accordance with Detail 304W-02.
 - 3.4.4 Use epoxy setting bed for ceramic wall tile on plywood.
 - 3.4.5 On metal access doors, install ceramic tile using epoxy setting bed with rust-inhibitive additives. Pressure apply setting bed to 1.6 mm (1/16") thickness with trowel and comb it prior to the setting of tiles. Mix setting bed in accordance with the written recommendations of the manufacturer.
- 3.5 INSTALLATION - TILE
 - 3.5.1 Back-mortar, tile larger than 150 mm x 150 mm (6" x 6").
 - 3.5.2 Unless otherwise detailed, lay out tile so that fields or patterns are centred on wall and floor areas, or architectural features and so that no tile less than one-half size occurs. Align wall, floor and base tile joints at wall base, if tile sizes are suitable. Do not use cut tiles at finished ceiling level.

- 3.5.3 Schedule delivery of tile so that a homogeneous blend of colours can be achieved throughout entire extent of this work. Colour blend tile.
- 3.5.4 Distribute production run varieties evenly maintaining the continuity of pattern.
- 3.5.5 Unless otherwise detailed, arrange accessories in tile work so that they are evenly spaced, centred with joints and set true with correct projection. Ensure that each tile has continuous solid backing. Saw cut and trim tile as required around fittings, pipes, holdfasts, and fixtures. Cut or drill and set holdfasts, bolts and anchors required for fastening fixtures and fittings in tile areas. Grind cut edges smooth.
- 3.5.6 Back butter all floor tile.
- 3.5.7 Finish tile work clean, free of broken, damaged or defective tiles. Reject warped tiles.
- 3.5.8 Joints in base shall match floor patterns. Joints shall be watertight without voids, cracks or excess grout.
- 3.5.9 Cure tile installations for three days, sponging and wetting down as necessary.
- 3.5.10 Unless otherwise noted, install tile with 4.6 mm (3/16") maximum width joints.
- 3.5.11 Finish exposed edge of tiles with edge moulding at termination of wall, termination of wall tile panels, at external corner and elsewhere as required to provide finished appearance to tile application where bullnosed tile is not used. Secure moulding to substrate straight and true, Grout in perforated flange.
- 3.5.12 Sound tiles after setting and remove and replace tiles not fully bedded.
- 3.5.13 Re-point joints after cleaning to eliminate imperfections. Avoid scratching tile surfaces.
- 3.5.14 Finished tile work shall be clean and free of tiles which are pitted, chipped, cracked or scratched. All damaged tile shall be removed and replaced.
- 3.5.15 Where indicated on Drawings or as required, install continuous single piece metal edge trims centred under doors in closed position and other locations where tile meets other floor finishes.
- 3.6 CONTROL JOINTS AND SEALANT
 - 3.6.1 Provide control joint in tile at locations where substrate changes to different material or construction, between new and existing substrates, where tile abuts other hard material, where areas change direction, at similar joints in structure, where structural substrate abuts non-structural substrate, at 4.8 m (16'-0") maximum in each direction as determined by tile pattern, around room perimeter and where indicated.
 - 3.6.2 Apply sealant around fittings penetrating tile work including pipes and drains, around door frames, between tile and threshold, around fixtures, escutcheon plates, along floor/wall junction, and similar areas. Coordinate sealant application at wall/base junction with floor and base installation.
- 3.7 GROUTING
 - 3.7.1 Ensure setting bed has cured before commencing grouting.
 - 3.7.2 Grout floor tile using acid resistant grout.

- 3.7.3 Grout wall tile using dry curing grout.
- 3.7.4 Grout epoxy set tile using epoxy grout.
- 3.7.5 Where indicated, colour grout to match middle range of tile colours, as directed. Grout to suit the contour of the tile. Fill joints, tool and make uniform in appearance without voids or cracks and watertight. Where floor and wall tile are matching, use floor grout on walls.
- 3.7.6 Make joints between tile uniform, plumb, straight, true and aligned with adjacent tile. Ensure sheet layout is not visible after installation. Align patterns.
- 3.7.7 When grout hardens damp cure for next 3 days.

3.8 WATERPROOFING

- 3.8.1 Install waterproofing in accordance with waterproofing manufacturer's written instructions to produce a waterproof membrane of uniform thickness bonded securely to substrate.
- 3.8.2 Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.9 SEALING

- 3.9.1 Seal unglazed floor tile in accordance with manufacturer's instructions to provide a matte sheen.

3.10 FIELD QUALITY CONTROL

- 3.10.1 Sound walls and floors with a solid object. If there is a hollow sound remove grout around that tile and check tile adhesion.
- 3.10.2 Ensure that adhesive containers bear certification of compliance with specified standards.
- 3.10.3 Ensure that tile containers are labelled with grade seals.

3.11 CLEANING AND FINISHING

- 3.11.1 Clean, seal and finish tile works installed under this Section of the work in accordance with TTMAC Maintenance Guide.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- 1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.
- 1.1.2 This Section includes requirements for supply and installation of ceilings consisting of acoustic panels, complete with exposed suspension system and trim.

1.2 REFERENCES.

- 1.2.1 ASTM A653/A653M-15 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.
- 1.2.2 ASTM C635/C635M-13a Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- 1.2.3 ASTM C636/C636M-13 Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
- 1.2.4 ASTM E84-15a Standard Test Method for Surface Burning Characteristics of Building Materials.
- 1.2.5 ASTM E1477-98a(2013) Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
- 1.2.6 CAN/CGSB 1.132-M90 Zinc Chromate Primer, Low Moisture Sensitivity.

1.3 QUALITY ASSURANCE

- 1.3.1 Install ceilings by mechanics skilled in this trade and in accordance with system manufacturer's printed directions to produce a finished ceiling level, in true plane, free from warped, soiled or damaged tile or grid. Where manufacturer's directions are at variance with Drawings, consult the Consultant before proceeding.

1.4 SUBMITTALS

- 1.4.1 Product Data: Submit product data for each type of product specified.
- 1.4.2 Submit shop drawings indicating complete layout of sound baffles, hanger spacing, fastening details, splicing method and change in level details. Show areas of co-ordination with other trades and erection sequence.
- 1.4.3 Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling mounted items indicating the following:
 - .1 Ceiling suspension system members.
 - .2 Method of attaching suspension system hangers to building structure.
 - .3 Ceiling mounted items including light fixtures; air outlets and inlets; speakers; sprinklers; and special mouldings at walls, column penetrations, and other junctures of acoustic ceilings with adjoining construction.

- 1.4.4 Submit 3 copies of manufacturer's maintenance instructions.
- 1.4.5 For special size units, conduct a load test to ensure ceiling grid will not deflect more than 1/360 span. Submit test report.
- 1.4.6 Obtain approval of hydro authorities having jurisdiction for ceiling grid and supports as related to the support of light fixtures. Adjust grid, fixing devices, and support hangers or guy wire to obtain approval. Submit copy of approval in triplicate to the Consultant.
- 1.4.7 Obtain and submit anchor manufacturer's certification for hanger anchors to be used, stating that anchors are suitable for hanger loading, spacing, and other conditions relating to use intended. Submit anchor manufacturer's instructions for anchor installation.
- 1.4.8 Submit representative samples of colour and finish of all exposed materials.
- 1.5 **MOCK-UP**
 - 1.5.1 Erect in area designated a 10'-0" x 10'-0" sample installation. Modify or replace mock-up to obtain approval. After acceptance, retain mock-up as standard of quality for acoustical ceiling installation. Mock-up shall contain typical lighting fixture, and diffusers.
 - 1.5.2 Do not begin fabrication and erection of remainder of ceiling system until mock-up has been inspected and approved.
- 1.6 **PRODUCT DELIVERY, HANDLING, AND STORAGE**
 - 1.6.1 Deliver materials in their original wrappings or containers with manufacturer's labels and seals intact and store in a dry area under cover and clear of the ground.
 - 1.6.2 Ship grid members and mouldings in rigid crates and avoid damage. Bent or deformed material will be rejected.
 - 1.6.3 Suitably wrap members and protect against damage.
- 1.7 **ENVIRONMENTAL REQUIREMENTS**
 - 1.7.1 Do not commence installation until glazing has been completed and exterior openings closed in. Maintain humidity not exceeding 65% where mineral panels are used and temperature in the range of 12°C for 72 hours prior to commencement of work and maintain this temperature until completion.
- 1.8 **EXTRA STOCK**
 - 1.8.1 Leave five (5) percent in sealed cartons of each type of panel upon completion, and two (2) percent of each suspension system and trim for Owner's maintenance. Panels shall be from same production run as panels installed. Identify cartons as to type and location of installation.
- 1.9 **WARRANTY**
 - 1.9.1 **Manufacturer Warranty:** Provide manufacturers standard ten (2) year written warranty indicating replacement of fabrics that have sagged or failed to anchor to edge clip system arising from defects in materials or workmanship.

1.9.2 Warrant work of this Section to remain dimensionally stable throughout the year and to not sag or distort due to variations in temperature and humidity conditions. Grain patterns and seams shall remain, level, plumb, true and aligned.

1.10 LEED™ STRATEGIES

1.10.1 All trades must examine practices, as outlined in the related sections, to assist the team in achieving these results.

1.10.2 Related Sections:

- .1 01 35 20 General LEED® Requirements
- .2 01 35 50 Waste Management Disposal
- .3 01 35 90 Indoor Air Quality Management
- .4 01 61 10 LEED® Product Requirements
- .5 31 25 00 Construction Pollution Prevention.

1.10.3 Materials used for Work in this section are to include, but are not limited to the following criteria:

- .1 Materials used in work of this Section are to contain high amounts of recycled content and are to be sourced regionally from within 800 km via truck or 2400 km via rail or ship from jobsite in accordance with Section 01 61 10.

1.10.4 The following must be submitted as appropriate for Consultant's review and approval:

- .1 Submit Schedules A and D, as appropriate, of Section 01 61 10A LEED Product Requirements Schedules following the measures outlined in Section 01 61 10, for all applicable products.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

2.1.1 Acceptable Materials Manufacturers: Subject to compliance with requirements specified in this Section, manufacturers offering products that may be incorporated into the Work include the following:

- .1 Armstrong World Industries, Inc.
- .2 Chicago Metallic
- .3 CertainTeed
- .4 CGC Interiors, a USG Company

2.2 DESIGN CRITERIA

2.2.1 Superimposed Loads: Determine superimposed loads applied to suspension systems by components of the building and verify that adequate hangers are installed to support additional loads in conjunction with normal loads of the ceiling system, and as follows:

- .1 Maximum Deflection: Limit deflection to L/360 in accordance with ASTM C635 deflection test.

2.3 SUSPENSION - GENERAL

- 2.3.1 Suspension system shall support ceiling assembly indicated on the Drawings, or specified herein, with a maximum deflection of 1/360 of the span, in accordance with ASTM C635/C635M intermediate duty classification. Suspension system shall be hot dipped galvanized metal.
- .1 Main and Cross Tees: 15/16" face exposed tee system, standard white finish. Basis of design product: Suprafine XL, by Armstrong Ceiling Systems.
 - .2 Perimeter Wall Molding: Shadow molding to provide a 15/16" face, 15/16" vertical leg and a 3/4" x 3/4" reveal, standard white finish.
 - .3 Transition Molding: Shadow molding from acoustic tile to gypsum board ceiling to provide a 15/16" face and 3/4" x 3/4" reveal, standard white finish. Acoustic tile and gypsum board to align at the same elevation.
 - .4 Edge Trim: 2" nominal height profile with vertical fin detail, attaching to metal suspension system. Standard white finish. Basis of design product: Axiom Vector Trim, 2" Profile, by Armstrong Ceiling Systems.
 - .5 Hangers, Braces, Ties: Nominal 14 ga. diameter steel wire, galvanized.
 - .6 Accessories: Stabilizer bars, access splines, and required anchors and attachment to structure, 22 ga. minimum steel.
 - .7 Tie Wire: 3/64" galvanized soft annealed steel wire.
- 2.3.2 Suspension system shall lock together in a positive manner providing pull out values in tension of 300 lb. or greater.
- 2.4 ACOUSTICAL PANELS
- 2.4.1 Acoustic Panels (ACT-1): Provide manufacturer's standard panels of configuration indicated in accordance with ASTM E1264 classifications as designated by the nominal values for types, patterns, acoustic ratings, and light reflectance class listed in this Section; with flame spread rating of 25 or less and smoke developed rating of 50 or less when tested in accordance with CAN/ULC S102 and as follows:
- .1 Physical Properties: Type: III, Form: 1
 - .2 Dimensions: 24" x 48" x 3/4"
 - .3 Edge Profile: Square
 - .4 Colour: White.
 - .5 Acoustic and Visual Performance (Minimum Nominal):
 - 1. Noise Reduction Coefficient: 0.70
 - 2. Ceiling Attenuation Class: 35
 - 3. Light Reflectance: 0.86
 - .6 Basis of Design Product:
 - 1. Cirrus Square Lay-in by Armstrong World Industries, Inc.
 - 2. Eclipse ClimaPlus lay-in by CGC Interiors, a USG Company
- 2.4.2 Steel members: Galvanized in accordance with ASTM A653/A653M, light commercial coating class or coated with rust inhibitive primer complying with CAN/CGSB 1.132-M.
- 2.4.3 Exposed metal surfaces: Baked-on, special white enamel, with a gloss value of 25 when tested in accordance with ASTM E1477.

PART 3 - EXECUTION

3.1 INSPECTION

- 3.1.1 Ensure work above ceilings is complete, inspected and approved by authority having jurisdiction before commencing installation.
- 3.2 INSTALLATION WORK
- 3.2.1 Co-ordinate work with all trades affected by work of this Section. Provide a layout of hangers and framing suitable to accommodate fittings and units of equipment. Failure to follow this procedure will require that hangers and channels be revised to suit as necessary without additional cost to the Owner.
- 3.2.2 Where ducts or other equipment prevent the regular spacing of hangers, reinforce nearest adjacent hangers and all related carrying channels and furring as required to span the greater distance.
- 3.2.3 Lay out work in accordance with reflected ceiling plans. Provide a tolerance of 1/360 of span and 5/64" maximum between adjacent edges of metal pans. Allowable tolerance of finished acoustical ceiling system: 1/8" in 12'-0" and 1/64" between adjacent metal members. Tolerances shall not be cumulative.
- 3.2.4 Install acoustical ceilings in accordance with ASTM C636/C636M, "Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels."
- 3.2.5 Supply hangers or inserts for installation to respective section in ample time and with clear instructions for their correct placement. Provide additional hangers and inserts as required.
- 3.2.6 Design and space hangers and carrying members to support entire ceiling system, including lighting fixtures, diffusers and grilles. Recessed objects shall replace or be centred on acoustical panels, except where indicated otherwise. Consult with mechanical and electrical trades to co-ordinate the work.
- 3.2.7 Secure hangers to structure. Hang suspended ceilings independently of walls, columns, ducts, pipes and conduit. Where carrying members are spliced avoid visible displacement of longitudinal axis of face plane of adjacent members.
- 3.2.8 Centre acoustical ceiling installation on room axis leaving equal border pieces. Provide a row of hangers adjacent to and parallel with walls for support of ends of main tee runners at not more than 6" from ends of runners. Lay directionally patterned tile one way with pattern parallel to longest room axis unless otherwise directed.
- 3.2.9 Install components to form a level ceiling with all parts flush and true, parallel to module lines, and to pattern shown. Install panels in level, uniform plane free from twist, warp, dents and flush, without gaps and exposed face of carrying members. Fit border units neatly against abutting surfaces.
- 3.2.10 Do not support fixtures from main runners or cross runners if weight of fixture causes total dead load to exceed deflection capability of suspension system. In such cases, support fixture load by supplementary hangers located within 6" of each corner, or support fixture independently. Do not install fixtures so that main runners and cross runners will be eccentrically loaded. Where fixtures installation would produce rotation of runners, provide stabilizer bars. Provide carrying channels to transfer fixture load to carrying members as required. Ensure that joints in suspension do not occur at recessed fixture sides. Frame around recessed fixtures, diffusers, grilles, and other openings; provide allowance for thermal movement. Furr around ducts, beams, and bulkheads as required. Suspension of electrical fixtures shall comply with requirements of hydro.

3.2.11 Accessibility percentage: 100.

3.3 INSTALLATION - GRID SYSTEM

3.3.1 Grid system shall consist of the following components: Hangers, Exposed main tee, exposed cross tee, wall moulding, lay-in panels, and hold-down clips where required.

3.3.2 Install hangers of correct length at 4'-0" o.c. maximum in each direction.

3.3.3 Install main runners level and in maximum length available. Do not bend hangers as a means of levelling. Form wire loops tightly to prevent vertical movement or rotation within the loop.

3.3.4 Join abutting sections of main tees by means of suitable connections such as splices, interlocking ends, tab locks, pin locks. Intersecting tees shall form a right angle. Butt ends of cross tees flush to exposed edge of intersecting member. Fur around ducts, beams and bulkheads as required. Provide edge moulding at intersection of ceiling and vertical surfaces.

3.3.5 Provide edge moulding at intersection of vertical surfaces using maximum lengths, straight, true to line and level. Mitre corners. Provide edge transition moulding at junction with gypsum board ceilings as indicated. Where bullnose concrete block occurs, provide preformed closers to match edge moulding.

3.3.6 Carefully fit acoustic tile in place, no broken edges permitted.

3.3.7 Install hold-down clips on all lay-in panels to hold such panels tight to grid system where within 20'-0" of an exterior door.

3.3.8 Recessed items shall replace or be centred on acoustical tiles, except where indicated otherwise. Consult with mechanical and electrical trades to co-ordinate the work.

3.4 ADJUSTMENTS

3.4.1 Adjust any sags or twists which develop in suspension system and replace any part of complete system which is damaged or faulty.

3.5 CLEANING

3.5.1 Thoroughly clean all acoustic ceiling surfaces upon completion of the installation.

3.5.2 Promptly as the work proceeds and on completion, remove all surplus materials and debris resulting from the work of this Section.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.

1.1.2 This Section includes, but is not limited to, the following:

- .1 Vinyl composition floor tile.
- .2 Static dissipative floor tile.
- .3 Rubber tile flooring.
- .4 Resilient wall bases.
- .5 Resilient accessories for transition strips, area dividers

1.2 REFERENCES

- 1.2.1 CAN/CSA A126.5-87 Resilient Wall Base.
- 1.2.2 ASTM F1066-04(2014)e1, Standard Specification for Vinyl Composition Floor Tile
- 1.2.3 ASTM F 1344-15 Standard Specification for Rubber Floor Tiles
- 1.2.4 ASTM F1516-13, Standard Practice for Sealing Seams of Resilient Flooring Products by the Heat Weld Method (when Recommended)
- 1.2.5 ASTM F1700 Standard Specification for Solid Vinyl Floor Tiles
- 1.2.6 ASTM F1861-08(2012)e1, Standard Specification for Resilient Wall Base
- 1.2.7 ASTM F1869-11, Standard Test Method for Measuring Moisture Vapour Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

1.3 SUBMITTALS

1.3.1 Product Data: Submit one copy of product data for each type of product specified.

1.3.2 Shop Drawings: Submit shop drawings indicating:

- .1 Location of seams and edges
- .2 Location of columns, doorways, enclosing partitions, built-in furniture, cabinets, and cut-out locations
- .3 Type and style of resilient transition strip used between adjacent flooring types

1.3.3 Submit the following samples to the Consultant for approval: 2 samples 300mm x 300 mm (12" x 12") of each colour of sheet flooring, 1 300mm (12") length of edge strip.

1.3.4 Submit three copies of maintenance data for incorporation into maintenance manual. Manual shall give specific warning of any maintenance practice which may damage or disfigure sheet flooring.

1.3.5 Site Quality Control Test Results: Submit results or moisture emission testing of concrete subfloors prior to installation of flooring. Results shall include comparison of manufacturer's recommended moisture content to actual moisture vapour emission rate.

1.4 SITE MOCK-UP

- 1.4.1 Following the pre-installation conference, the Contractor shall install a 10'-0" x 10'-0" dry sample areas of flooring material and accessories, indicating all colour variations, and layout in areas designated later by the Consultant.
- 1.4.2 After approval of tile colours and layout, install flooring materials and accessories, under the supervision of the material manufacturer's representative.
- 1.4.3 Upon completion and approval, sample areas shall serve as a standard of quality for the balance of the work of this Section. Subsequent work carried out and not in the Consultant's opinion, equal to the quality standard shall be removed and replaced at no additional cost to the Owner.
- 1.4.4 It shall be the responsibility of the material manufacturer's representative to visit the site during installation, to ensure proper use of proprietary materials and assist the Contractor as may be required.
- 1.4.5 Co-ordinate work of mock-up with related work of other Sections.
- 1.4.6 Accepted work may form a part of the final installation.
- 1.5 EXTRA STOCK
 - 1.5.1 Provide 5% of each colour of flooring material and 30' lineal feet coil stock of each colour of base specified, boxed and labelled. Store maintenance materials on the premises as directed by the Owner.
- 1.6 QUALITY ASSURANCE
 - 1.6.1 Contractor executing work of this Section shall have a minimum of five (5) years continuous Canadian experience in successful and installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.
 - 1.6.2 Resilient Flooring Installer: Use an installer who is competent in heat welding and have a minimum of five (5) years documented experience in the installation of resilient sheet flooring and seams in accordance with manufacturer's training or certification program:
- 1.7 DELIVERY, STORAGE, HANDLING AND PROTECTION
 - 1.7.1 Coordinate deliveries to comply with Construction Schedule and arrange ahead for off-the-ground, under cover storage location. Do not load any area beyond the design limits.
 - 1.7.2 Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings.
 - 1.7.3 Store material in original, undamaged containers or wrappings with manufacturer's seals and labels intact.
 - 1.7.4 Restrict traffic by other trades during installation.
 - 1.7.5 Provide adequate protection of completed tiled surfaces to prevent damage by other trades until final completion of this project. Minimum protection shall consist of kraftpaper.
- 1.8 ENVIRONMENTAL CONDITIONS
 - 1.8.1 Temperature of room, floor surface and materials shall not be less than 21 deg C for 48 hours before, during and for 48 hours after installation. Concrete floors shall be aged for a minimum of 28 days and shall be dry before application of the resilient floor tile.

1.8.2 Moisture content of floor shall not exceed a maximum of 3 lbs. of water per 1,000 sq. ft. of concrete slab area over a 24 hour period as measured by one of the following methods, as approved by Consultant:

- .1 Rubber Manufacturer's Association (RMA) moisture test using anhydrous calcium chloride.
- .2 Does not exceed 3% as measured by Calcium Carbide Hygrometer procedure.
- .3 Does not exceed 5% as measured by normal Protimeter.

1.8.3 Avoid exposure to high humidity, cold drafts and abrupt temperature changes.

1.9 WARRANTY

1.9.1 Warrant the work of this Section against defects in materials and workmanship in accordance with the General Conditions but for an extended period of five (5) years and agree to repair or replace faulty materials or work which become evident during warranty period without cost to the Owner. Defects shall include, but not limited to, bond failure, and extensive colour fading.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

2.1.1 Basis-of-Design Manufacturers: Manufacturers named in this Section were approved to provide work specified in this Section. Additional manufacturers offering similar products may be incorporated into the work of this Section provided they meet the performance requirements indicated and provided requests for substitution are provided a minimum of five (5) days in advance of Bid Closing.

2.1.2 Approved manufacturers:

- .1 Johnsonite
- .2 Armstrong Flooring
- .3 Altro Flooring

2.2 TILE FLOORING MATERIALS

2.2.1 Vinyl Composition Floor Tile (VCT): Asbestos free uniform in thickness with uniform colour and pattern through the full thickness, with straight, sharp and square edges and corners, accurately cut to size, conforming to ASTM F1066 and the following:

- .1 Classification: Class 2 – Through Pattern
- .2 Colour: to be confirmed by Architect.
- .3 Thickness: 1/8"
- .4 Size 12" x 12"
- .5 Basis of Design Product: Standard EXCELON by Armstrong Flooring, or equivalent

2.3 RESILIENT ACCESSORIES

2.3.1 Resilient Wall Base (RB 1): Smooth, matte finish exposed face, supplied in maximum practical length, with pre-moulded end stops and external corners to match base, conforming to ASTM F1861 and as follows:

- .1 Type: TS – Rubber, vulcanized thermoset
- .2 Group: Circularity
- .3 Style: B – Traditional

- .4 Height: 4" (10.2 cm)
 - .5 Thickness: 1/8" (3.2 mm)
 - .6 Length: 120 foot coils
 - .7 Color: Burnt Umber 63
 - .8 Basis of Design Product: Traditional Rubber Wall Base by Johnsonite
- 2.3.2 Resilient Transition and Edge Strips: Extruded vinyl shapes meeting or exceeding ADA Recommendations for change of level transitions for transition between floors finishes having different levels, i.e.: between resilient flooring on underlayment to carpet with no cushion or underlayment; acceptable materials as follows:
- .1 The following list is included to indicate the most commonly used transition and edge strip accessories; additional materials may be required where transition heights differ from the products listed and shall be included as a part of the Contract.
 - .2 Transition Strip: TS1 – Carpet to Resilient Flooring Transition: Johnsonite CTA-XX-A Transitional Moulding between flooring materials having dissimilar thicknesses; colour: selected from manufacturer's standard range.
 - .3 Transition Strip: TS2 – Ceramic Tile to Resilient Flooring Transition: Johnsonite CTA-XX-K Transitional Moulding between flooring materials having dissimilar thicknesses; colour: selected from manufacturer's standard range.
 - .4 Transition Strip: TS4 – Resilient Flooring to Concrete Slab Transition: Johnsonite SSR-XX-B Transitional Moulding between materials having a thickness to materials having no thickness; colour: selected from manufacturer's standard range.
- 2.3.3 Resilient Stair Accessories: Complying with ASTM F2169 and the following:
- .1 Composition:[B – Vinyl]
 - .2 Colour: Selected from manufacturers standard range.
 - .3 Component:
 - .1 Stair Nosing: [square] nose profile, [3mm] thickness, [50mm] vertical face, 70mm horizontal surface, double lock for butting to resilient flooring, ribbed, slip resistant profile; colour [selected from manufacturers standard range].
 - .2 Stair Tread: [square] nose profile, [4mm] overall thickness, 50mm vertical face, width and depth to suit tread, [ribbed] profile [with colour contrasting strip at nosing]; colour [selected from manufacturers standard range] [, complete with integral riser].
 - .3 Resilient stair treads with intergrated riser to be Fast Lane CFLTR with 1/4" flexible vinyl stair nosing RCN XX A by Johnsonite.
- 2.3.4 Games lines: Solid colour vinyl composite feature strips or tiles, as specified above in colours indicated on the Drawings. Lines shall follow dimensions given, without exception.
- 2.3.5 Sub-floor leveller system: Johnsonite Leveler Strip, slope as required at carpet and quarry tile, by height difference. Adhesive for use with leveler strip: Johnsonite #965.
- 2.3.6 Primers and adhesives: Waterproof, of the types recommended by resilient flooring manufacturer for applicable substrate.
- 2.3.7 Sub-floor filler: White pre-mix latex requiring water only to produce cementitious paste.
- 2.3.8 Welding rods: As approved by the manufacturer, to match floor, colours selected by Consultant.
- 2.3.9 Metal edge strip: Aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.
- 2.3.10 Sealer and wax: Type recommended by sheet vinyl flooring material manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

- 3.1.1 Ensure that floors are clean, level and dry, free from cracks, ridges, dusting, scaling and carbonation.
- 3.1.2 Test concrete substrate for excessive moisture content by a method acceptable to the Consultant and material manufacturer.
- 3.1.3 Maintain room and material temperature at 21°C for at least 24 hours before, during and 7 days after flooring installation. Concrete shall be at least 28 days old before commencing application.
- 3.1.4 Do not install sheet flooring until ceiling and partition finishing work are completed.
- 3.1.5 Before spreading primer or adhesive, thoroughly clean the surface of the floor, remove dust and debris.
- 3.1.6 Apply filler as may be required. Prohibit traffic until filler has cured.
- 3.1.7 Prime concrete slabs to flooring manufacturer's recommendations.

3.2 FLOORING INSTALLATION

- 3.2.1 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.
- 3.2.2 Lay flooring to produce a minimum number of seams. Border widths minimum 1/3 width of full material.
- 3.2.3 Run sheets parallel to length of room. Double cut sheet joints and continuously heat or chemically weld.
- 3.2.4 As installation progresses, roll flooring with 45kg (100lb) roller to ensure full adhesive, according to manufacturer's instructions.
- 3.2.5 Cut flooring and fit neatly around fixed or excessively heavy objects.
- 3.2.6 Provide flush joint transition strip where sheet resilient flooring meets carpet.
- 3.2.7 Terminate flooring with metal edge strips at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- 3.2.8 Layout tile flooring as follows:
 - .1 Lay tile with joints parallel to building lines to produce a symmetrical tile pattern.
 - .2 Install tile flooring so that perimeter tile width is minimum 1/2 full size.

3.3 SEAMING

- 3.3.1 After adhesive has set, groove seams with equipment recommended by flooring manufacturer. Width of groove; 3.5mm (0.14") wide x 2.5mm (1/10") deep.
- 3.3.2 Clean seams carefully by vacuum.

3.3.3 Use high-speed hot-air welding gun to weld all grooved seams, in accordance with flooring manufacturer's instructions.

3.3.4 Trim off excess surplus material in two operations.

3.4 INSTALLATION – BASE

3.4.1 Provide resilient base or cove base as indicated on Room Finish Schedule.

3.4.2 Securely adhere cove base filler at juncture of wall and floor. Spread adhesive up wall, full coverage.

3.4.3 Extended flooring material to form cove base, ensure solid backing behind base.

3.4.4 Terminate top of base in base cap, straight, level and true.

3.5 CLEAN AND WAXING

3.5.1 Remove excess adhesive from floor, base and wall surfaces without damage.

3.5.2 Clean, seal and wax floor surface to flooring manufacturer's instructions.

END OF SECTION

PART 1 – GENERAL

1.1 SECTION INCLUDES

1.1.1 Supply and installation of the indoor resilient multipurpose surfacing.

1.1.2 Application of the game lines.

1.1.3 References for the correct construction and preparation of concrete slabs to receive resilient flooring.

1.2 SUBMITTALS

1.2.1 Product Data:

.1 Manufacturer's promotional brochures, specifications and installation instructions.

1.2.2 Manufacturer Certifications:

.1 Provide certification that accurately identifies the Original Equipment Manufacturer (OEM) of flooring furnished for this project including manufacturer's name, address and factory location.

.2 Suppliers of private label flooring for this project must identify themselves as such and fully disclose the OEM information listed above.

.3 All "manufacturer" requirements in these specifications must be complied with by the OEM, including warranties, certifications, qualifications, product data, test results, environmental requirements, performance data, etc.

1.2.3 Samples:

.1 Submit for selection and approval three (3) sets of the indoor resilient multipurpose surfacing, manufacturer's brochures, samples or sample boards of all of the available colors, textures and styles.

.2 Submit color samples of all the available game line paint colors for selection and approval.

1.2.4 Closeout Submittals:

.1 Submit three (3) copies of the indoor resilient multipurpose surfacing and manufacturer's maintenance instructions.

.2 Submit three (3) copies of the material and installation warranties as specified.

1.3 QUALITY ASSURANCE

1.3.1 Qualifications:

.1 The indoor resilient multipurpose surfacing shall have been actively marketed for a minimum of ten (10) years.

.2 The indoor resilient multipurpose surfacing shall be manufactured in an ISO 9001 certified plant.

.3 The indoor resilient multipurpose surfacing shall be manufactured in an ISO 14001 certified plant.

- .4 The indoor resilient multipurpose surfacing supplier shall be an established firm, experienced in the field, and competent in the techniques required by the manufacturer.
- .5 The installer of the indoor resilient multipurpose surfacing shall have a minimum of five (5) years of experience in the field installing indoor resilient multipurpose surfacing and have worked on at least five (5) projects of similar size, type and complexity.

1.3.2 Certifications:

- .1 Installer to submit the indoor resilient athletic surfacing manufacturer's or distributor's certification attesting that they are an approved installer of the indoor resilient multipurpose surfacing.
- .2 The indoor resilient multipurpose surfacing manufacturer to submit official ISO 9001 certification for the facility in which the indoor resilient multipurpose surfacing is manufactured.

1.3.3 Testing:

- .1 Tests shall be relative for multi-purpose use with certificates from independent testing resources to be made available upon request. Test results shall be performed according to ASTM standard testing procedures including ASTM F2772 "Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems".

1.4 DELIVERY, STORAGE AND HANDLING

1.4.1 Delivery:

- .1 Material shall not be delivered until all related work is in place and finished and/or proper storage facilities and conditions can be provided and guaranteed stable according to Advantage Sport recommendations.

1.4.2 Storage:

- .1 Store the material in a secure, clean and dry location.
- .2 Maintain temperature between 55° and 85° Fahrenheit or between 13° to 30° Celcius.
- .3 Store the indoor resilient athletic surfacing rolls in an upright position on a smooth flat surface immediately upon delivery to jobsite.
- .4 Rolls shipped in rigid protective cardboard containers can be laid horizontally prior to unpacking and installation.

1.5 PROJECT/SITE CONDITIONS

- 1.5.1 It is the responsibility of the general contractor/construction manager to maintain project/site conditions acceptable for the installation of the indoor resilient multipurpose flooring.
- 1.5.2 The area in which the indoor resilient multipurpose surfacing will be installed shall be dry and weather tight. Permanent heat, light and ventilation shall be installed and operable

- 1.5.3 All other trades shall have completed their work prior to the installation of the resilient athletic flooring. The general contractor or construction manager shall maintain a secure and clean working environment before, during and after the installation.
- 1.5.4 Maintain a stable room temperature of at least 65°F for a minimum of one (1) week prior to, during and thereafter installation.
- 1.5.5 An effective low-permeance vapor barrier is placed directly beneath the concrete subfloor. For “on” or “below grade” installations, it is recommended to provide a permanent vapor barrier resistant to long term hydrostatic pressure/moisture exposure. Protrusions should be sealed to prevent moisture migration into the slab. Moisture should not be allowed to enter the slab after the completed construction.
- 1.5.6 Concrete subfloor surface pH level within the 7 to 10 range dependent upon installation type.
- 1.5.7 Concrete subfloor should be no greater than 1/8" within a 10 ft diameter. This tolerance can be measured in accordance with ASTM E1155.
- 1.5.8 A specified (F_F) of 50 and an (F_L) of 30 should reach this degree of floor flatness and floor level. There is no numerical correlation between F numbers and the deviation from the straight edge. However, the above specified numbers should achieve a flat floor with minimal deviation in the slab. Reference ACI 117 and ACI 302.1R. The general contractor should provide a certificate of compliance with the above recommendations.
- 1.5.9 Concrete subfloor must be clean and free of all foreign materials or objects including, but not limited to, curing compounds and sealers.
- 1.5.10 Fill cracks, grooves, voids, depressions, and other minor imperfections. Follow the manufacturer’s directions. Moveable joints must be treated utilizing specific transitioning joint devices depending upon the architect’s recommendations. Follow current ASTM F710 guidelines for the preparation of concrete slabs to receive resilient flooring.
- 1.5.11 Refer to ACI 302.2R “Guidelines for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials” for concrete design and construction.
- 1.5.12 Concrete slab shall be fortified with continual steel reinforcement. Fiber reinforcement alone shall not be considered adequate fortification.

1.6 WARRANTY

- 1.6.1 **Special Limited Warranty:** Manufacturer's standard form in which manufacturer agrees to repair or replace sports flooring including labor that fails within specified warranty period.
- 1.6.2 **Material warranty must be direct from the product manufacturer.** Material warranties must come from original manufacturer or division thereof. Private label warranties from distributors or brokers are not valid. Supply original point of manufacturing upon request.
- 1.6.3 **Failures include, but are not limited to, the following:**
 - .1 Material manufacturing defects.

- .2 Surface wear and deterioration to the point of wear-through of wear layer per ASTM F410/ASTM F1303.
- .3 Failure due to substrate moisture exposure exceeding 92% relative humidity when tested according to ASTM F2170.

1.6.4 Warranty Period:

- .1 For material defects and surface wear-through: 25 years from date of Substantial Completion.

1.6.5 Installer’s Limited Warranty:

- .1 Installer's standard form in which installer agrees to repair or replace sports flooring that fails due to poor workmanship or faulty installation within the specified warranty period.
- .2 Warranty Period: 2 years from date of Substantial Completion.

1.7 ADDITIONAL MATERIALS

- 1.7.1 Furnish to the owner additional materials containing a total of at least 1% of each different color or design of the indoor resilient athletic surfacing used on the project.

1.8 LEED™ CERTIFICATION

- 1.8.1 The indoor resilient athletic surfacing should be able to help this facility to achieve points towards *LEED™ certification*.
- 1.8.2 LEED categories positively affected by the indoor resilient athletic surfacing:

LEED™ V4 Credit		Contribution
Materials & Resources: Building Product Disclosure & Optimization (BPDO)		
MRc3: Sourcing of Raw Materials	Options 1 & 2	2 Points
MRc4: Material Ingredients	Option 1	1 Point
MRc5: Construction and Demolition Management	Reclamation and Recycling	ReStart® Program

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- 2.1.1 The basis of the design for the indoor resilient multipurpose surfacing is Omnisports MultiFlex as manufactured by Tarkett or ‘Taraflex Multi-Use 6.2” by Gerflor , or equivalent.
- 2.1.2 All other installation accessories and related components must be either made or approved by the indoor resilient athletic surfacing manufacturer.
- 2.1.3 Other products may be approved as equal if deemed qualified and submitted in accordance with the General Conditions.

2.1.4 Test reports confirming compliance from an independent sports laboratory must be provided along with samples, technical data, installation, maintenance, and warranty prior to acceptance as an alternative product.

2.2 APPROVED FLOORING CONTRACTORS

2.2.1 Advantage Sport

2.2.2 Markville Carpet and Flooring

2.2.3 Or approved alternative authorized Tarkett and Gerflor installer.

2.3 MATERIALS

2.3.1 Omnisports MultiFlex - Prefabricated sport surface 6.5mm with wood flooring design, single surface embossing as supplied by Advantage Sport (888.605.3380).

- .1 Embossing of wood design and solid colors must be the same; varying embossing or surface textures will not be allowed.
- .2 Printing of wood design shall closely resemble standard wood strip flooring in size, color, board length, and grain appearance.
- .3 Surface embossing combined with TopClean XP surface treatment must offer proper balance of surface friction per the ASTM F2772.
- .4 Surface embossing combined with TopClean XP surface treatment must provide resistance to stains and scratches. Surface profile must not incorporate linear embossing.
- .5 The wood design shall be protected by a clear layer of pure PVC (Polyvinyl Chloride) and TopClean XP surface treatment, a factory-applied UV cured urethane treatment.
- .6 The foam force reduction layer shall be high-density closed cell PVC foam with honeycomb embossing, and is applied in one continuous manufacturing process.
- .7 Laminated or adhered foam layers will not be allowed.
- .8 Field constructed products will not be accepted.
- .9 Physical properties of the indoor resilient athletic surfacing shall conform to the following minimums:

Width	—	6.5' (2 m)
Length	—	67.25' (20.5 m) approx.
Wear Layer	—	2 mm
Total Thickness	—	6.5 mm
Wear Layer	Type 1- Grade 1	ASTM F1303/F410
Vertical Deformation	PASSED	ASTM F2772
Rolling Load	PASSED	≤0.50 mm (EN 1569 {11/1999})
Surface Finish Effect	PASSED	ASTM F2772 (80 – 110)
Chemical Resistance	Excellent	ASTM F925
Impact Resistance	PASSED	EN 1517
Abrasion Resistance	PASSED	0.10 (EN ISO 5470-1 {06/1999})
Static Load Limit	PASSED	ASTM F970 - Load 175 lb
Sound Insulation	Excellent	+/- 20 dB (ISO 717/2)
Ball Rebound	PASSED	ASTM F2772 >90%
Force Reduction	PASSED	ASTM F2772 Class 2
Fire Rating	PASSED	ASTM E648 Class 1

Phthalate-free technology	—	YES
REACH Compliant	—	YES
Heavy Metals	—	NO
ISO 9001	—	YES
ISO 14001	—	YES

- A. Design
 - 1. Color: As available from the indoor resilient athletic surfacing manufacturer’s standard range.
 - 2. Hardwood Design Series: High definition printing for a realistic wood surface appearance as available from the indoor resilient athletic surfacing manufacturer’s standard range.
 - 3. Texture: Texture to remain consistent between solid colors and wood design when blending colors.
- B. Welding Rod:
 - 1. As supplied by the indoor resilient athletic surfacing manufacturer or supplier.
 - 2. Color to blend with the indoor resilient athletic surfacing color or design.
 - 3. All seams shall be welded to create a monolithic and impermeable surface.
- C. Adhesive: As approved by the indoor resilient athletic surfacing manufacturer.
- D. Game Line Paint and Primer: As approved by the indoor resilient athletic surfacing manufacturer.

2.4 PRODUCT SUBSTITUTIONS

2.4.1 Substitutions: No substitutions permitted.

PART 3 – EXECUTION

3.1 EXAMINATION

- 3.1.1 It is the responsibility of the general contractor/construction manager to ensure that project/site conditions are acceptable for the installation of the indoor resilient athletic flooring.
- 3.1.2 Verify that the area in which the indoor resilient athletic surfacing will be installed is dry and weather tight. Verify that permanent heat, light and ventilation are installed and operable.
- 3.1.3 Verify that all other work that could cause damage, dirt and dust or interrupt the normal pace of the indoor resilient athletic flooring installation is completed or suspended..
- 3.1.4 Verify that there is a stable room temperature of at least 65°F.
- 3.1.5 Verify that there are no foreign materials or objects on the subfloor and that the subfloor is clean and ready for installation.
- 3.1.6 For GreenLay™ Installation to Concrete Subfloor: moisture content less than 92% RH when tested per ASTM F2170.
- 3.1.7 Follow Advantage Sport installation recommendations.
- 3.1.8 Do not average the results of the tests. Report all field test results in writing to the General Contractor, Architect, and End User prior to installation.

- 3.1.9 Verify that the concrete subfloor surface pH level is within the 7 - 10 range.
- 3.1.10 Document the results confirming the slab is within manufacturer's tolerances for slab deviation.
- 3.2 PREPARATION OF SURFACES
 - 3.2.1 Sand the entire surface of the concrete slab.
 - 3.2.2 Sweep the concrete slab so as to remove all dirt and dust. If a sweeping compound is to be used it must be a sweeping compound that does not contain oil or other items that may inhibit the adhesive bond.
 - 3.2.3 Slab must be dust free. In the event that dust impairs adhesive bond, priming the slab prior to application of adhesive may be necessary. Follow installation guidelines.
 - 3.2.4 Follow OSHA guidelines
- 3.3 INSTALLATION
 - 3.3.1 The installation area shall be closed to all traffic and activity for a period to be set by the indoor resilient athletic surfacing installer. The indoor resilient athletic surfacing installation shall not begin until the installer is familiar with the existing conditions.
 - 3.3.2 All necessary precautions should be taken to minimize noise, smell, dust, the use of hazardous materials and any other items that may inconvenience others.
 - 3.3.3 Install the indoor resilient athletic surfacing in strict accordance with the indoor resilient athletic surfacing manufacturer's written instructions.
 - 3.3.4 Install the indoor resilient athletic surfacing minimizing cross seams. Provide a seam diagram during the submittal process for approval prior to installation. Vinyl Sheet Flooring Seams: Comply with ASTM F 1516. Rout joints and heat weld to permanently and seamlessly fuse sections together.
 - 3.3.5 Paint game lines using approved game line paint primer and game line paint in strict accordance with the game line paint manufacturer's instructions.
 - 3.3.6 Install appropriate threshold plates or transition strips where necessary.
- 3.4 CLEANING
 - 3.4.1 Remove all unused materials, tools, and equipment and dispose of any debris properly. Clean the indoor resilient athletic surfacing in accordance with the manufacturer's instructions.
- 3.5 PROTECTION
 - 3.5.1 If required, protect the indoor resilient athletic surfacing from damage using coverings approved by the manufacturer until acceptance of work by the customer or their authorized representative.
- 3.6 RELATED STANDARDS AND GUIDELINES

- 3.6.1 ASTM F2170 “Standard Test Method for Determining Relative Humidity In Concrete Floor Slabs Using In-Situ Probes”
- 3.6.2 ASTM F710 “Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring”
- 3.6.3 ACI 302.2R-06 “Guideline for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials”
- 3.6.4 ASTM F2772-11 “Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems”

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- 1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.
- 1.1.2 Provide all labour, materials, products equipment and services to complete the acoustical wall and ceiling panels necessary and/or indicated on the Drawings and specified herein.

1.2 REFERENCES

- 1.2.1 CAN/ULC S702-14 Standard for Thermal Insulation Mineral Fibre for Buildings.
- 1.2.2 ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials

1.3 QUALITY ASSURANCE

- 1.3.1 Installation: By skilled mechanics and in accordance with system manufacturer's printed directions to produce a finished wall, level, in true plane, free from warped, soiled or damaged panels. Where manufacturer's directions are at variance with the drawings, consult the Consultant before proceeding.
- 1.3.2 The Gymnasium & Auditorium ceiling shall be field measured prior to manufacture and installation of the acoustical panels and submit shop drawings for approval by indicating the location of the panels to avoid joists, beams, lights etc. The shop drawings shall also indicate the mounting and fixing method. The panels to be securely mounted onto 2½" metal stud frame with wood trim and fill void with sound batt insulation. The metal stud frame to be mounted securely to the existing roof framing. The gymnasium and auditorium ceiling panels shall have a total surface area equal to as shown on the drawing. Panels shall be distributed as evenly as possible around the entire ceiling area.
- 1.3.3 Walls supporting acoustical panels shall be field measured prior to manufacture and installation. The shop drawings shall indicate the mounting and fixing method. It should be checked that all reveal acoustical panels with dimensions shown on the Architectural drawings can be accommodated by the available wall surfaces. Where acoustical panels fill the entire height and/or width of a wall above millwork etc., the available wall surface shall be field measured and the panels produced to the appropriate dimensions. Where acoustical panels are shown occupying the full height of a wall above millwork. A 1" reveal at the ceiling is acceptable to allow for mechanical installation.

1.4 SUBMITTALS

- 1.4.1 Product Data: Submit product data including construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- 1.4.2 Shop drawings: Indicate the complete layout of panels, fastening details, splicing method corners and change in level details. Show area of co-ordination with other Sections and erection sequence.
- 1.4.3 Samples: Submit 305mm x 305mm (12" x 12") samples for each type of exposed finish specified for verification by the Consultant prior to ordering.
- 1.4.4 Maintenance data: Three copies of manufacturer's maintenance instructions.

1.5 PRODUCT DELIVERY, HANDLING AND STORAGE

- 1.5.1 Handle and store materials to prevent damage to materials or structure.
- 1.5.2 Deliver materials in their original wrappings or containers with manufacturer's labels and seals intact and store in a dry area under cover and clear of the ground.
- 1.5.3 Suitably wrap members and protect against damage.

1.6 MOCK-UP

- 1.6.1 Provide 4'-0" x 8'-0" sample installation of acoustic wall panel and 4'-0" x 8'-0" ceiling panel work, at locations as designated. Modify or replace mock-up to obtain approval. After acceptance, retain mock-up as standard of quality for remaining work. Mock up may form part of the Work.
- 1.6.2 Do not begin fabrication and erection of the remainder of the wall system until the mock-up have been inspected and approved.

1.7 ENVIRONMENTAL REQUIREMENTS

- 1.7.1 Do not commence installation until glazing has been completed and exterior openings closed in. Maintain humidity not exceeding 65% where mineral panels are used and the temperature in the range of 12 deg C for 72 hours prior to commencement of work and maintain this temperature until completion.
- 1.7.2 Ambient Conditions: Install acoustical panels only when building is fully enclosed and HVAC system is operational; maintain manufacturer's recommended temperature and humidity conditions in the area of installation for 24 hours before, during and after installation.

1.8 WARRANTY

- 1.8.1 Manufacturer Warranty: Provide manufacturers standard five (5) year written warranty indicating replacement of fabrics that have sagged or failed to anchor to edge clip system arising from defects in materials or workmanship.
- 1.8.2 Warrant work of this Section to remain dimensionally stable throughout the year and to not sag or distort due to variations in temperature and humidity conditions. Grain patterns and seams shall remain, level, plumb, true and aligned.

1.9 LEED™ STRATEGIES

- 1.9.1 All trades must examine practices, as outlined in the related sections, to assist the team in achieving these results.

1.9.2 Related Sections:

- .1 01 35 20 General LEED® Requirements
- .2 01 35 50 Waste Management Disposal
- .3 01 35 90 Indoor Air Quality Management
- .4 01 61 10 LEED® Product Requirements
- .5 10 22 39 Folding Panel Partition
- .6 31 25 00 Construction Pollution Prevention.

- 1.9.3 Materials used for Work in this section are to include, but are not limited to the following criteria:
- .1 All materials under Work of this Section, including but not limited to, coatings, sealants, primers and adhesives are to have low VOC contents, in accordance with Section 01 35 90.
 - .2 Materials used in work of this Section are to contain high amounts of recycled content and are to be sourced regionally from within 800 km via truck or 2400 km via rail or ship from jobsite in accordance with Section 01 61 10.
- 1.9.4 The following must be submitted as appropriate for Consultant's review and approval:
- .1 Submit an MSDS or product data sheet stating the VOC and urea-formaldehyde content, along with Schedule A of Section 01 35 90A LEED Product Requirements Schedules following the measures outlined in Section 01 35 90, for all applicable products.
 - .2 Submit Schedules A and D, as appropriate, of Section 01 61 10A LEED Product Requirements Schedules following the measures outlined in Section 01 61 10, for all applicable products.

PART 2 - PRODUCTS

2.1 ACOUSTIC PANELS

- 2.1.1 Normal Impact (NI) Acoustical Panels: 2" thick, semi-rigid fiberglass with a density of at least 7.5 lb/ft³ with reinforced edges, wrapped in acoustically transparent polyester fabric or perforated vinyl, as selected by Consultant. NRC value of wrapped panel shall be 1.00 when laboratory tested with a Type A mount.
- 2.1.2 High Impact (HI) Acoustical Panels: 2 1/8" thick, composed of 2" semi-rigid fiberglass with a density of at least 7.5 lb/ft³ and a 1/8" thick high density fiberglass impact resistant layer on the outer face. Panels shall have reinforced edges. Panels shall be wrapped in fabric or perforated vinyl as selected by Consultant. NRC value of wrapped panel shall be at least 0.95 when laboratory tested with a Type A mount.
- 2.1.3 Fabric and Perforated Vinyl: Grade, colour and texture as indicated.
- 2.1.4 Acoustical batt insulation: "noise Stop" sound attenuation blankets by Roxul Inc., "Thermafibre" by CGC, or other approved manufacture, complying with CAN/ULC S702, Type 1.
- 2.1.5 Panel edge reinforcing: Chemically hardened edge to a depth of 1/8" with Barcol hardness of 35.
- 2.1.6 Furring: 2" x 26 ga. cold-rolled, hat-shaped, galvanized steel.
- 2.1.7 Mounting: Concealed mechanical system, allowing panels to be demounted and replaced.

2.2 ACOUSTIC CEILING PANEL

- 2.2.1 Acoustical Ceiling System as manufactured by Eurospan® Stretch Systems or equivalent with the following characteristics:
- 2.2.2 Fabric: Eurospan® Classic Ceiling Textile, Classic White color.

- .1 Fabric Type: Fiber content and locking weave not affected by heat or humidity, capable of elongating 25 percent, spot cleanable and dry cleanable. Coated with light polyurethane coating cleanable with water or solvent-based cleaners.
 - .2 Fabric Size: No seams up to 16 feet; seams allowed over 16 feet.
 - .3 Fire Performance: NFPA Class A or UBC Class I, ASTM E84 flame spread index 5 or less and smoke developed 15 or less.
 - .4 Light Reflectance: Minimum light reflectance of 0.85 for white color.
 - .5 Penetrations: Self supporting at penetrations, cut in fabric without additional reinforcement rings or support.
- 2.2.3 Acoustical Core: Standard 1 inch thick medium density glass fiber core.
- .1 Acoustic Performance: ASTM C 423, Type E 400 mounting with minimum NRC of 1.00.
- 2.2.4 Mounting: 1 inch fire-retardant rigid polymer high-strength extrusions or aluminum extrusions produced in perimeter and mid-seam profiles. Staples, 18 gauge with mechanical ability to attach extrusions, suitable for mounting substrate.
- .1 Fire Performance, Assembly: NFPA Class A or UBC Class I, ASTM E84 flame spread index 5 or less and smoke developed 35 or less.
 - .2 Perimeter Track: Square, with exposed edges selective covered with matching fabric or painted to match the fabric.
 - .3 Mid Joint Track: Square track as required to achieve design indicated on the Drawings. Capable of installing panels continuously without joints.
 - .4 Furring: If core material is thicker than track profile, provide fire retardant treated wood grounds or furrings prior to mounting the track. If edges of grounds are exposed, finish with fabric or painted as selected.
- 2.3 FABRICATION
- 2.3.1 Fabrication panels to exact field dimensions, to a tolerance of +/- [0.5 mm|0.02"], dimensionally stable and shall not warp.
- 2.3.2 Mechanically sand panel face after sizing to ensure best possible surface prior to fabric application.

PART 3 - EXECUTION

- 3.1 INSTALLATION
- 3.1.1 Co-ordinate the work with all trades affected by the work of this Section.
 - 3.1.2 Provide furring channels at 24" o.c. fastened to studs to fasten acoustic panels to.
 - 3.1.3 Completely fill air space within furring with acoustic insulation.
 - 3.1.4 Mechanically fasten panels to furring.
 - 3.1.5 Install components to form an even surface with all parts flush and true, parallel to the module lines, and to the pattern shown.
 - 3.1.6 Install work level, in uniform plane, free from twist, warp, dents and flush, without gaps to exposed face of carrying members. Fit border units neatly at abutting surfaces.

- 3.1.7 Acoustical Panels mounted on the Ceiling of the Gymnasium and Auditorium shall be 2" thick Normal Impact (NI) Acoustical Panels mounted with the rear surface at least 2" below the ceiling surface, using suitable metal channel. 2" thick batt insulation with a density of at least 7.5 lb/ft³ shall be inserted into the airspace between the ceiling and the back of the panel (see architectural detail). The batt insulation shall fill the entire airspace above the panel, terminating 1" inside all edges of the panel. The batt insulation shall be neatly cut at all outer panel edges.
- 3.1.8 Install components to form an even surface with all parts flush and true, parallel to the module lines, and to the pattern shown on architectural drawings.
- 3.1.9 Install work level, in uniform plane, free from twist, warp, dents and flush, without gaps to exposed face of carrying members. Fit border units neatly at abutting surfaces.
- 3.1.10 Install products in accordance with manufacturer's written instructions and in proper relationship with adjacent construction including the following:
- .1 Inspect fabric prior to installation. Do not install damaged, imperfect or soiled fabric.
 - .2 Apply mounting system tracks to surfaces to receive system. Secure with 1 inch staples spaced on 2 inch centers.
 - .3 Install mounting system tracks level and straight, flush and in proper alignment.
 - .4 Install acoustical core material continuous and flush to the edge of the track in largest sizes practical and secure in place with appropriate adhesives or staples. For fabric closer than 1/4 inch to the core, caulk joints or provide a white scrim or lining to prevent read through. Scrim or lining shall not inhibit the acoustical performance of the system, and meet fire safety code requirements.
- 3.2 ADJUSTMENTS
- 3.2.1 Adjust any sags or twists which develop in the system and replace any part of the complete system which is damaged or faulty.
- 3.2.2 Cleaning: Clean exposed surfaces of acoustical wall panels in accordance with manufacturer's recommendations and as follows:
- .1 Trim and remove all loose threads
 - .2 Remove surplus materials, rubbish and debris resulting from installation and leave areas of installation in a neat, clean condition.
 - .3 Touch up minor finish damage; remove and replace work which cannot be successfully cleaned and repaired to eliminate evidence of damage.
- 3.2.3 Protection: Protect installed work from damage due to subsequent construction activity, including temperature and humidity limitations and dust control, so that the work will be without damage and deterioration at the time of acceptance by the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- 1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.
- 1.1.2 Provide all labour, materials, products, equipment and services to complete the painting and finishing work required and/or indicated on the Drawings and specified herein.
- 1.1.3 Provide surface preparation to receive painting and finishing specified under this Section of the work, in accordance with the the Master Painters Institute (MPI) Painting Specification Manual and as specified herein.
- 1.1.4 Examine the Specifications and Drawings for the work of other Sections regarding the provisions for prime and finish coats. Paint or finish all materials installed throughout the project which are required to be painted and which are left unfinished or unpainted by other Sections.
- 1.1.5 The only exception to the requirements of the preceding paragraph is where the drawings, Specifications, or Schedules state positively and explicitly that a surface is not to be finished.
- 1.1.6 For areas indicated as unfinished in the specifications, Finish Schedules, and Drawings, painting is not required, except for doors and frames, windows and frames, railings, steel stairs, insulation on mechanical equipment, pipes and fittings, and other items requiring protection including electrical panels.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- 1.2.1 Shop painting of structural, miscellaneous and ornamental metal.
- 1.2.2 Shop coating of hollow metal doors and frames: Section 08 11 00.
- 1.2.3 Colour code markings for identification of piping and ductwork: Division 15.

1.3 REFERENCES

- 1.3.1 ASTM D523-14 Standard Test Method for Specular Gloss.
- 1.3.2 CAN/CGSB 1.213-2004 Etch Primer (Pretreatment Coating or Tie Coat) for Steel and Aluminum.
- 1.3.3 CAN/CGSB 85.100-93 Painting.

1.4 QUALITY ASSURANCE

- 1.4.1 Arrange with the paint manufacturer's and Canadian Paint and Coatings Association (CPCA) representatives to visit the site prior to the commencement of the painting operation to discuss the painting and finishing procedures to be used and to analyse the surface conditions in order that alternative recommendations may be made to the Consultant should adverse conditions exist.
- 1.4.2 Arrange with the paint manufacturer and CPCA to visit the site at intervals during the surface preparation and painting operations to insure that the proper surface preparation has been completed, the specified paint products are being used, the proper number of coats are being applied and the agreed finishing procedures are being used, and that the paint manufacturer

regularly submits written reports to the Consultant.

1.5 QUALIFICATIONS

- 1.5.1 Use only paint manufacturers and products as listed under the Approved Products section of the MPI Manual Architectural Painting Specification Manual.
- 1.5.2 Applicator shall have a minimum of ten (10) years proven satisfactory experience and shall maintain a qualified crew of painters throughout the duration of the work, who shall be qualified to fully satisfy the requirements of this specification. Only qualified journeymen (and apprentices) shall be engaged in painting and decorating work who have Tradesman Qualification certificate of proficiency.

1.6 SUBMITTALS

- 1.6.1 Submit 2 samples of every colour, in the required number of coats on 8"x 8" pieces of hardboard. Include specifications of materials, products and installation procedure used to obtain the finish. Resubmit samples until colours have been approved by the Consultant.
- 1.6.2 Colours shall match those specified in the Colour Schedule.
- 1.6.3 Retain samples at job site until completion of the work.
- 1.6.4 Two weeks after award of Contract submit to the Consultant a complete list of paint and finish materials to be used, showing the name of the manufacturer, the catalogue number, grade and quality of the materials proposed for use.
- 1.6.5 Materials and products delivered to the work shall comply with the approved list.

1.7 MOCK UP

- 1.7.1 A sample installation area located in the building will be designated by the Consultant.
- 1.7.2 Apply samples of finishes in the presence of the Consultant, Contractor and paint manufacturer. Apply samples with the correct material, number of coats, colour, texture and degree of gloss required. Refinish if required, until approval of the Consultant is obtained.
- 1.7.3 Leave sample installation undisturbed until completion of the Work. Approved sample installation shall serve as a standard for similar work throughout the Project. Work which does not match the approved finishes shall be corrected and refinished at no expense to the Owner.

1.8 PRODUCT DELIVERY, STORAGE AND HANDLING

- 1.8.1 Store materials in a single place. Keep storage clean and tidy.
- 1.8.2 Accept only paint and finishing materials and products delivered to the site in the manufacturer's unbroken, sealed containers, with manufacturer's label indicating type of paint, colour and instructions for reducing.
- 1.8.3 Store packaged materials undamaged in their original wrappings or containers with manufacturer's labels and seals intact.
- 1.8.4 Before commencement of work, remove electrical plates, surface hardware, canopies of lighting fixtures, and other escutcheons or appurtenances. Reinstall items in satisfactory condition when painting is completed. Do not clean hardware with solvents which will remove permanent lacquer

finish.

- 1.8.5 Use sufficient drop cloth and protective coverings for the full protection of floors and surfaces not to be painted.
- 1.8.6 Protect materials and products from frost.
- 1.9 ENVIRONMENTAL REQUIREMENTS
 - 1.9.1 Atmosphere at the area of work shall be dust free.
 - 1.9.2 Temperatures, humidity, and moisture content of surfaces shall conform to the following:
 - .1 Temperatures; No painting shall be performed when temperatures on the surface, or the air in the vicinity of painting work are below 5°C. The minimum temperatures allowed for latex paints shall be 7°C. for interior work and 10°C for exterior work, unless specifically approved by the Consultant.
 - .2 Relative humidity shall not be higher than 85%.
 - .3 Moisture of surfaces shall be tested by an electronic Moisture Meter.
 - .4 Moisture content of wallboard shall not exceed 12%, of masonry, concrete or concrete block, 12% for solvent type paint.
 - .5 Masonry surfaces shall be tested for alkalinity.
 - .6 Maximum moisture content of wood; 15%.
 - 1.9.3 Masonry and concrete block must be installed at least 28 days prior to painting, with a moisture content not exceeding 12%, before painting commences. This is not to be construed as including a "wetting down" process for latex.
 - 1.9.4 Painting work shall not proceed unless a minimum of 15 candle power/sq ft lighting is provided on the surface to be painted.
 - 1.9.5 All areas where painting work is proceeding shall have adequate continuous ventilation and sufficient heating to maintain temperatures above 7°C. for 24 hours before and after paint application.
 - 1.9.6 Take all necessary precautions to prevent fire hazard and spontaneous combustion.
 - 1.9.7 Where toxic materials, and both toxic and explosive solvents are used, take appropriate precautions and prohibit smoking.
- 1.10 INSPECTION AND WARRANTY
 - 1.10.1 Inspections shall be carried out in accordance with the Canadian Painting Contractors' Architectural Painting Specification Manual.
 - 1.10.2 Warrantee the work of this Section against faulty workmanship for a period of two (2) years from date of Substantial Completion.
 - 1.10.3 Warrantee shall be in a form acceptable to the Consultant.
- 1.11 PROTECTION
 - 1.11.1 Adequately protect other surfaces from paint and damage and make good any damage caused by failure to provide suitable protection.

- 1.11.2 Furnish sufficient drop cloths, shields and protective equipment to prevent spray or dropping from fouling surfaces not being painted and in particular, surfaces within storage and preparation area.
- 1.11.3 Cotton waste, cloths and material which may constitute a fire hazard shall be placed in closed metal containers and removed daily from the site.
- 1.11.4 Remove all electrical plates, surface hardware, fittings and fastenings, prior to painting operations. Carefully store, clean and replace these items on completion of work in each area. Do not use solvent that will remove the permanent lacquer to clean hardware.

PART 2 - PRODUCTS

2.1 MATERIALS

- 2.1.1 Paint, varnish, stain, enamel, lacquer, fillers and other finishing materials shall comply with or exceed CAN/CGSB 85.100 for Premium Grade Work, highest grade, top line quality products of the specified manufacturers, and be of a type and brand herein specified and listed under "Paint Product Recommendations" as covered in the CPCA Painting Manual, for the specific purposes
 - 2.1.2 Paints shall use a latex bonding agent.
 - 2.1.3 Paint materials such as linseed oil, shellac, turpentine, etc., and any of the above materials not specifically mentioned herein but required for first class work shall be the highest quality of an approved manufacturer. All coating materials shall be compatible.
 - 2.1.4 Paints, finishing and cleaning products shall be formulated with no petroleum based or other organic solvents (no V.O.C.'s) wherever possible.
 - 2.1.5 The approval of the manufacturer of the painting and finishing materials will be based on his agreement to provide the supervision service herein before specified.
 - 2.1.6 The following manufacturers are acceptable:
 - .1 Pittsburgh Paints (PPG) Manor Hall Series
 - .2 Benjamin Moore Aura exterior/interior paint
 - .3 Dulux Diamond exterior/interior paint
 - 2.1.7 The Consultant reserves the right to refuse any paint or finishing material if in his opinion it is not suitable or adequate for the use which it is proposed.
 - 2.1.8 Exterior paints: Factory tinted to scheduled colours.
 - 2.1.9 Interior galvanized metal primer: to comply with LEED VOC limit of 250g/L per Green Seal GC-03 Anti-Corrosive Paints.
 - 2.1.10 Etch primer: Complying with CAN/CGSB 1.213.
- ### **2.2 MIXING**
- 2.2.1 Paints shall be ready-mixed unless otherwise specified, except that any coating in paste or powder form, or to be field-catalysed shall be field-mixed in accordance with directions of its manufacturer. Pigments shall be fully ground and shall maintain a soft paste consistency in the vehicle during storage that can and shall be dispersed readily and uniformly by paddle to a complete homogeneous mixture.

- 2.2.2 Paint shall have good flowing and brushing properties and shall dry cure free of sags and runs etc. to yield the desired finish specified.

PART 3 - EXECUTION

3.1 INSPECTION

- 3.1.1 Examine the work upon which the work of this Section depends prior to commencement of work. If surfaces cannot be put in proper condition by customary cleaning, sanding and puttying, report any defects to the Consultant.
- 3.1.2 Failure to report defects will constitute acceptance of surfaces. Refinish the faulty work at no expense to the Owner.
- 3.1.3 Test all surfaces by an approved moisture testing device for moisture content before commencing work. Do not apply paint to substrates when the moisture content exceeds 12%.

3.2 PREPARATION

- 3.2.1 Refer to Canadian Painting Contractors' Architectural (CPCA) Painting Specification Manual for surface preparations.
- 3.2.2 Clean floors, adjacent surfaces and surfaces to be painted before work is commenced.
- 3.2.3 Cut out scratches, cracks and abrasions in wall surfaces and adjoining trim, as required, and fill with an approved non-shrink patching compound flush with adjoining surface. When dry, sand the patch smooth and seal before the application of the prime coat.
- 3.2.4 Fill nail holes, screw holes and other similar defects after the first coat of paint has been applied. The filler shall match the colour of the finish.
- 3.2.5 Surfaces to be finished shall be clean, free from machine, tool, or sanding marks, dust, grease, soil or other extraneous matter which could be detrimental to an acceptable finish.
- 3.2.6 Wood: Prepare in accordance with CAN/CGSB 85.100 Sand smooth, removing all tool marks, and dust clean. Apply one coat of aluminum primer to all knots and sap streaks, on wood if to be painted or one coat of white shellac if to be stained and varnished. Putty nail holes, cracks and defects only after the correct priming coat is dry. Fine sanding and dusting to be carried out between coats.
- 3.2.7 Gypsum board: Inspect to ensure properly filled joints, sand smooth. Remove contamination.
- 3.2.8 Concrete, Masonry: Surfaces shall be clean, free from all contamination. Scrape off all mortar nibs and cement spatter. Remove form oil by washing with Xylol. Remove efflorescence by brushing or washing with a dilute solution of muriatic acid - 1 part commercial muriatic acid to 20 parts water by volume - followed by complete rinsing with clean water. Remove mildew by the application of one part sodium hypochloride (Javex) to three parts water. If dirt is also in evidence, add 1/2 lb. trisodium phosphate to 1 gallon of the above solution. Scrub surface well and follow with a thorough clean water rinse.
- 3.2.9 Wash masonry surfaces which are to be painted with a solution consisting of 2.0 lb. of zinc sulphate to 1 gallon of water. Rinse with clean water and allow to dry thoroughly. Remove mortar spots and sharp edges with a scraper and ensure that patching is done where required.

- 3.2.10 Mildew removal: Scrub with solution of T.S.P. and bleach, rinse with clear water and allow surface to dry completely.
- 3.3 APPLICATION - GENERAL
- 3.3.1 Apply paint according to accepted trade method.
- 3.3.2 Apply each coat at proper consistency.
- 3.3.3 Sand lightly between coats to provide anchor for successive coat.
- 3.3.4 Each coat of paint shall be slightly darker than preceding coat unless otherwise approved.
- 3.3.5 Do not apply finishes on surfaces that are not sufficiently dry. Each coat of finish shall be dry and hard before next coat is applied unless manufacturer's directions state otherwise. (Refer to polyurethane coatings).
- 3.3.6 Tint filler to match wood when clear finishes are specified. Work filler well into grain and before it has set wipe excess from surface.
- 3.3.7 On exterior work do not paint during temperatures under 5°C, or immediately following rain, frost or dew. On interior work do not paint during temperatures under 5°C, or on surfaces where condensation has formed or is likely to form (unless specifically formulated paints are used). Minimum temperatures allowed for latex paints shall be 7°C for interior work and 10°C for exterior work.
- 3.4 FIELD QUALITY CONTROL
- 3.4.1 Use pink litmus paper for testing surfaces for alkalinity. Where extreme alkali conditions occur, neutralize surface by washing. Wash shall consist of a 4% solution of Zinc Sulphate. Does not apply to surfaces to receive latex paints.
- 3.5 APPLICATION - PRIMERS
- 3.5.1 Apply one coat of primer to exposed ferrous metal surfaces including structural steel, mechanical and electrical equipment, piping, ducts and conduit that have not received a shop coat of primer.
- 3.5.2 Touch up primed metal work after loose paint and scale have been removed.
- 3.5.3 Thoroughly clean galvanized steel, including piping and ductwork of oil and grease with mineral spirits, treat with an approved chemical phosphoric metal etch and allow to dry, unless galvanized metal primer is to be used.
- 3.5.4 Wash masonry surfaces which are to be painted, with a solution consisting of 2.0 lb. of zinc sulphate to 1 gal. of water. Rinse with clean water and allow to dry thoroughly. Remove mortar spots and sharp edges with a scraper and ensure that patching is done where required. Prime masonry block surfaces with primer/block filler to fill all pores including pin holes.
- 3.5.5 Apply primer to piping having bituminous covering which is compatible with finish paint which will prevent bitumen bleeding through finish.
- 3.5.6 Apply sealer and prime coat on walls to receive mirrors before installation of mirrors.

- 3.5.7 When the primer-sealer coat is dry, touch up all visible suction spots before the first finish coat is applied and do not proceed with the work until all suction spots are sealed.
- 3.5.8 Minimal cracks, holes and imperfections appearing after application of prime coat shall be filled, patched and smoothed to match adjoining surface by Section providing the surface being painted.
- 3.6 APPLICATION - FINISH COATS
- 3.6.1 Mix materials thoroughly before application, apply evenly under adequate illumination and free from sags, runs, crawls and other defects. Do cutting in neatly.
- 3.6.2 Apply finish coats of the proper consistency as received from the container, and brush well showing a minimum of brush marks.
- 3.6.3 Sand semi-gloss, medium and high gloss lightly between coats.
- 3.6.4 Gloss terms shall have the following values when tested in accordance with ASTM D523 "Test for Specular Gloss":
- | | | | |
|----|---------------|-------------|--------------|
| .1 | Gloss Term | Gloss Value | Pittsburgh |
| .2 | Flat | 5 to 20 | Less than 15 |
| .3 | Eggshell | 20 to 40 | 5 to 20 |
| .4 | Lo-Lustre | 15 to 25 | |
| .5 | Satin | 15 to 35 | |
| .6 | Semi-gloss | 40 to 60 | 30 to 65 |
| .7 | Gloss, medium | 60 to 80 | over 65 |
| .8 | Gloss, High | 80 to 90 | |
- 3.6.5 Finish walls in eggshell, ceilings in flat and frames in semi-gloss, unless noted otherwise.
- 3.6.6 Apply coats only when the previous coat of paint, varnish or enamel is perfectly dry. Each finish coat shall be a tint lighter than the following. Only the last coat shall match the accepted samples.
- 3.6.7 Finish tops, bottoms and edges of doors in the same manner as the remainder of the door.
- 3.6.8 Finish the work uniformly as to sheen, gloss, colour and texture.
- 3.6.9 Apply materials in accordance with the directions and instructions of the manufacturers of the various materials. Do not use adulterants.
- 3.6.10 Finish closets and the interior of cabinets the same as adjoining surfaces of rooms, unless otherwise specified. Finish all other surfaces the same as the nearest or adjoining surfaces unless otherwise specified or directed by the Consultant.
- 3.6.11 Spray painting may be used only with the approval of the Consultant.
- 3.6.12 Repaint the entire plane of areas showing incomplete coverage. Patching is prohibited.
- 3.6.13 Paint surfaces and items visible through convector covers, grilles, heating cabinets, louvres and soffits with two coats black matte paint.
- 3.6.14 Do not paint over fire rating labels on doors and frames and over identification labels on mechanical and electrical equipment.

- 3.6.15 Paint reveals the same colour as the surface in which it occurs, unless otherwise indicated.
- 3.6.16 All interior metalwork which is exposed in the completed work, in rooms which are shown on the "Room Finish Schedules" to have a finish on the walls or ceiling shall receive two coats of interior paint over the prime coat. Painting shall include without being limited to, all structural steel, mechanical and electrical equipment, ductwork, and piping.
- 3.6.17 All interior metalwork in unfinished areas shall receive one coat of interior paint over the prime coat. Painting shall include without being limited to structural steel, steel ladders, mechanical and electrical equipment, piping and ductwork.
- 3.6.18 The following generally, will be painted in colour, texture and sheen to match adjacent surfaces:
- .1 Access doors
 - .2 Registers
 - .3 Radiators and covers
 - .4 Prime coated butts
 - .5 Prime painted door closers
 - .6 Exposed piping.

3.7 APPLICATION - EXISTING SURFACES

- 3.7.1 Main off-white paint colour used in classrooms and corridors to match Pratt & Lambert 2127 – "Snowflake", semi-gloss only; to be used on gypsum wallboard as well.
- 3.7.2 Paint or repaint all existing surfaces of rooms where noted on the "Room Finish Schedule" including "new" work which has been incorporated into the existing work and existing work which has been damaged, altered, or otherwise disturbed during renovation operations.
- 3.7.3 Repaint surfaces or rooms adjacent to rooms where alterations or renovations have been carried out and which have been damaged or otherwise disturbed by the alterations or renovations. Where such damage occurs, repaint completely.
- 3.7.4 Remove from existing surfaces to be coated all rust, scale, oil, grease, mildew, chemicals, and other foreign matter.
- 3.7.5 If coatings on existing surfaces have failed so as to affect the proper performance or appearance of coatings to be applied, or if such coatings can be easily scraped off, remove them and prepare their substrates properly. Dull hard or glossy surfaces by sanding, sandblasting, or by other abrasive methods prior to painting.
- 3.7.6 Repaint surfaces entirely between changes of plane which have been incorporated into the existing work and existing work which has been damaged, altered, or otherwise disturbed during renovation operations. Give existing surfaces two coats of paint or enamel over existing finish to match the previous finish.
- 3.7.7 Paint existing mechanical and electrical items exposed to view in areas indicated.

3.8 CLEANING

- 3.8.1 Promptly as the work proceeds and on completion of the work, remove all paint where spilled, splashed or spattered. During progress of the work keep premises free from unnecessary accumulation of tools, equipment, surplus materials and debris. At conclusion of the work leave

premises neat and clean to the satisfaction of the Consultant, Paint Inspector and/or Owner.

3.9 INTERIOR FINISHES

3.9.1 Finish the various interior surfaces as follows, in addition to previously specified treatments, coatings or primers:

Concrete Block	1 coat masonry block filler and primer 2 coats eggshell latex
Galvanized Steel	1 coat galvanized metal primer or pretreatment 2 coats vinyl latex or epoxy of selected sheen
Gypsum Drywall	1 coat primer-sealer
Ceilings	2 coats flat vinyl-latex paint
Walls	2 coats eggshell latex paint
Steel, Miscellaneous	1 coat rust inhibiting primer 2 coats alkyd enamel of selected sheen
Shop Primed Steel	1 coat vinyl wash primer 2 coats alkyd paint of selected sheen
Piping, Conduit & Ductwork	1 coat metal primer 1 coat fire retardant and mildew resistant paint of selected sheen
Mechanical Equipment	2 coats gloss enamel
High heat areas	2 coats heat resistant paint
Insulation on pipes and ducts	1 coat fire retardant and latex sealer 2 coats latex paint of selected sheen
Metal Convectors & Heating Units	2 coats gloss enamel

3.10 EXTERIOR FINISHES

3.10.1 Finish the various exterior surfaces as follows:

Galvanized Steel	1 coat rust inhibiting metal primer 1 coats exterior epoxy or vinyl enamel of selected sheen
Shop Primed	1 coat vinyl wash primer
Steel	2 coats alkyd paint of selected sheen
Steel	1 coat rust inhibiting primer 2 coats exterior alkyd enamel

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- 1.1.1 Comply with Division 1, General Requirements and documents referred to therein.
- 1.1.2 Provide labour, materials, products, equipment and services to supply and install chalkboards, whiteboards and tackboards.
- 1.1.3 Provide labour, materials, products, equipment and services to supply and install decorative plastic control panels, complete with aluminum trim.

1.2 REFERENCES

- 1.2.1 ANSI/NEMA LD 3-2005 High-Pressure Decorative Laminates.
- 1.2.2 ASTM E84 Standard Test for Surface Burning Characteristics for Building Materials.
- 1.2.3 ASTM B221 Standard Specification for Aluminum and Aluminium Alloy Extruded Bars, Rods, Wires, Profiles and Tubes.
- 1.2.4 PEI-1002 Manual and Performance Specifications for Porcelain Enamel Writing Surfaces.
- 1.2.5 GREENGUARD Gold Standard for Chemical Emissions for Building Materials, Finishes and Furnishings.

1.3 QUALIFICATIONS

- 1.3.1 Engage an experienced installer who is an authorized representative of visual display board manufacturer for both installation and maintenance of the type of products required for this Project.

1.4 SUBMITTALS

- 1.4.1 Provide shop drawings as specified in Section 01 30 00, Submittals, clearly indicating the material being supplied and showing all connections, attachments, reinforcing, anchorage and location of exposed fastenings.
- 1.4.2 Provide necessary instructions where fastenings or anchors have to be built in by others.
- 1.4.3 Product Data: Submit product data for each type of visual display board indicated.
- 1.4.4 Samples for Initial Selection: Provide Manufacturer's colour charts showing the full range of colours and textures for initial selection of materials for the following: Chalkboards and Marker Boards: Actual sections of porcelain enamel finish for each type of chalkboard and marker board required.

1.5 SITE CONDITIONS

- 1.5.1 Verify field measurements before preparation of shop drawings and before fabrication to ensure proper fitting and as follows:

- .1 Coordinate fabrication schedule with construction progress to avoid delaying the Work;
 - .2 Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.
- 1.5.2 Establish dimensions and proceed with fabricating visual display surfaces without field measurements where field measurements cannot be made without delaying the work, coordinate wall construction to ensure actual dimensions correspond to established dimensions.
- 1.6 WARRANTY
- 1.6.1 Provide manufacturers written guarantee, signed and issued in the name of Owner, to replace the following items for defective material and workmanship for the time stated from date of Substantial Performance:
- .1 Framing, Panels and hardware: Failure of performance requirements specified in Contract Documents; 1 year.
- 1.7 PROTECTION
- 1.7.1 After installation, chalkboards and tackboards shall be suitably protected and handed over free of scratches and in first class condition.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
- 2.1.1 Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- .1 Architectural School Products Ltd.
 - .2 Claridge Products and Equipment Inc.
 - .3 C.P. Distributors Ltd.
 - .4 Crestway Systems Ltd.
 - .5 Egan Visual Inc.
 - .6 Malem Architectural Specialties Ltd.
 - .7 Shanahan's Ltd.
 - .8 Moyer Vico Corporation
 - .9 Clark Porcelain
- 2.2 MATERIALS AND PRODUCTS
- 2.2.1 Aluminum: Extruded Alcan 6063 alloy, T5 temper aluminum.
- 2.2.2 Trim for chalkboards, whiteboards, control panels and tackboards shall be extruded aluminum, Classic 400 Series by Architectural School Products Ltd., Moyer Vico Corporation or Clarke Porcelain Company, having a clear anodized finish on all exposed surfaces.
- 2.3 CHALKBOARDS
- 2.3.1 Three-coat ceramic porcelain on 18 ga. enamelled steel. Porcelain in accordance with P.E.I. Standards. Core shall be 7/16" thick, exterior grade plywood. Backing, of zinc coated steel or aluminium sheet. Colour to be selected by Consultant from manufacturer's standard colour range.

CHALKBOARDS, WHITEBOARDS AND TACKBOARDS

- 2.3.2 Provide projecting type chalk tray at chalkboards and map rail with integral core insert.
- 2.4 WHITEBOARDS
- 2.4.1 Felt marker boards shall be Rite-On Wipe-Off, white porcelain enamel finish on 22 ga. steel bonded to 7/16", thick approved core and 0.018" thick steel back panel. Whiteboards shall be specially finished to permit use of dry marker pens.
- 2.4.2 Whiteboards shall be provided with tray.
- 2.5 TACKBOARDS
- 2.5.1 Tackboards: prelaminated 1/2" total thickness; 1/4" thick, Composite Fine Cork available from Ontario Cork, ASP natural cork, on 1/4" particle board backing.
- 2.5.2 Linoleum Faced Tackboards: Balanced, high pressure laminated, linoleum tackboards of 3 ply construction consisting of face sheet, core material, and backing.
- .1 Face Sheet: 6 mm thick resilient linoleum tackable surface composed of granulated cork, linseed oil, rosin binders and calendared onto a jute backing with a coloured facing.
- .1 Acceptable materials: Forbo Bulletin Board.
- 2.5.3 Tackboards shall be free of joints in length x 4'-0" high, unless otherwise shown.
- 2.6 CONTROL PANELS
- 2.6.1 Control Panels: High pressure decorative laminate, thermally fused to 3/8" thick plywood backing.
- 2.6.2 High pressure decorative laminate: Complying with ANSI/NEMA LD 3, VGL Grade.
- 2.6.3 Refer to Drawings for sizes and provide openings to accommodate electrical equipment as shown.
- 2.7 SLIDING UNITS
- 2.7.1 Horizontal Sliding Display Board Panels:
- .1 Fabricate panels from manufacturer's standard components, with the exception that movable panels require a backing sheet; use any one of the following backing materials to the manufacturer's standard:
- .1 0.38 mm thick, aluminum sheet backing.
- .2 0.127 mm thick, aluminum foil sheet backing.
- .3 0.45 mm thick, galvanized steel sheet backing.
- .2 Provide panels required that operate smoothly under manual activation without vibration or chatter using manufacturer's standard horizontal sliding hardware consisting of overhead extruded-aluminum track with nylon ball-bearing rollers and channel-shaped bottom guides.
- 2.8 FABRICATION
- 2.8.1 Chalkboard, whiteboards, control panels and tackboards shall be complete with extruded clear anodized aluminum frames.

- 2.8.2 Fabricate the work true to dimensions, square, plumb and level. Accurately fit members with hairline joints. Secure intersecting members with adequate fastenings.
- 2.8.3 Shop fabricated display boards in one piece for lengths 3600 mm or less, for longer sections colour match adjacent pieces.
- 2.8.4 Apply pre-finished trim in continuous horizontal and vertical lengths, cut and mitred at corners where indicated on the Drawings.
- 2.8.5 Fabricate the finished work free from distortion and defects detrimental to appearance and performance.

PART 3 - EXECUTION

3.1 EXAMINATION

- 3.1.1 Inspect Work and conditions affecting the Work of this Section. Proceed only after deficiencies, if any, have been corrected.
- 3.1.2 Ensure that all anchors and setting or installing components provided by this Section for installation are properly located and installed.

3.2 INSTALLATION

- 3.2.1 Examine surfaces to receive the work of this Section and proceed only if conditions are satisfactory.
- 3.2.2 Verify all dimensions on the site before preparing drawings or proceeding with shop work. Shop assemble and deliver to the project site in the largest practicable sections.
- 3.2.3 Install the work true to dimensions, square, plumb and level. Accurately secure joints and intersecting members with adequate fastening.
- 3.2.4 Install the finished work free from distortion and defects detrimental to appearance and performance. Provide all components required for anchorage.

3.3 CLEANING

- 3.3.1 At completion and continuously as Work proceeds, remove all surplus materials, debris and scrap.
- 3.3.2 At completion of Work, remove all protective surface covering film and wrappings. Clean all frames and hard surfaces using mild soap or other cleaning agent approved by manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

1.1.1 This Section includes requirements for supply and installation of metal toilet partitions and accessories required for a complete and functioning installation, in the following configuration:

.1 Ceiling Hung

1.2 RELATED WORK SPECIFIED ELSEWHERE

1.2.1 Washroom Accessories Section 10 28 00

1.2.2 Plumbing Fixtures Division 22

1.3 REFERENCES

1.3.1 ASTM A666-15 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

1.4 DESIGN CRITERIA

1.4.1 Design: "barrier free access" toilet compartments conforming to CAN/CSA-B651-M, ANSI A117.1 and O.B.C. requirements.

1.5 ADMINISTRATION REQUIREMENTS

1.5.1 Coordination: Coordinate site dimensions affecting work of other Sections and provide data, dimensions and components, anchors and assemblies installed by other Sections in sufficient time for installation of products specified in this Section.

1.6 SUBMITTALS

1.6.1 Submit shop drawings in accordance with Section 01 30 00.

1.6.2 Clearly indicate fabrication details, plans, deviations, hardware and installation details.

1.6.3 Shop Drawings: Show and describe in detail materials, finishes, dimensions, details of connections and fastenings elevations, plans, sections, metal thicknesses, hardware and any other pertinent information.

1.6.4 Submit necessary templates and instructions where supports or anchors have to be built-in by others.

1.6.5 Colour: to be selected by Consultant.

1.6.6 Provide maintenance data for maintenance of metal finishes work for incorporation into Maintenance Manual.

1.7 PROTECTION

1.7.1 Factory-applied baked enamel finish to be protected by approved means during shipment and installation. Do not remove protection until immediately prior to final inspection.

1.8 SITE CONDITIONS

- 1.8.1 Site Measurements: Verify dimensions by site measurements before fabrication and indicate measurements on shop drawings where toilet compartments are indicated to fit between or around other construction; coordinate fabrication schedule with construction progress to avoid delaying the Work.
- 1.8.2 Established Dimensions: Establish dimensions and proceed with fabricating toilet compartments without site measurements where site measurements cannot be made without delaying the Work; coordinate construction to ensure that actual site dimensions correspond to established dimensions; allow for trimming and fitting.

1.9 WARRANTY

- 1.9.1 At no cost to the Owner, remedy any defects in the work of this Section due to rusting of galvanized steel components for a period of three (3) years from the date of substantial performance.

PART 2 - PRODUCTS

2.1 APPROVED PRODUCTS AND MANUFACTURERS

- 2.1.1 Basis-of-Design Products: Products named in this Section were used as the basis-of-design for the project; additional manufacturers offering similar products may be incorporated into the work of this Section provided they meet the performance requirements established by the named products.

- 2.1.2 Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include; but are not limited to, the following:

- .1 ASI Watrous - Global Partitions
- .2 Hadrian Manufacturing Inc.

- 2.1.3 Toilet Partitions Type: Floor mounted / overhead rail braced type; metal toilet partitions:

- .1 Integrated Privacy TM Toilet Partitions by ASI
- .2 Headrail Braced Toilet Partitions by Hadrian Manufacturing Inc.

2.2 MATERIALS

- 2.2.1 Doors, Panels, [and] Pilasters [and Headrails]: Sheet steel with commercial quality hot dipped zinc coating, in accordance with ASTM A653/A653M, Commercial Steel (CS), ZF001 (A01) galvanized, bonded each side of paper honeycomb core with returned and sealed edges.

- .1 Minimum steel thickness:
 - .1 Doors and Panels: 22 gauge.
 - .2 Pilasters [and head rails]: 20 gauge.
 - .3 Urinal Screen: 22 gauge.

- 2.2.2 Pilaster shoes: Stainless steel conforming to ASTM A666, Type 304, satin finish.

- 2.2.3 Handrail: Anodized aluminum with satin finish, anti-grip profile.

- 2.2.4 Brackets: Galvaneal steel channels, finished to match panels.
- 2.2.5 Hinges: Stainless steel, Type 304, satin finish, heavy duty self closing, minimum per door.
- 2.2.6 Slide Bolt and Keeper: Stainless steel with emergency access.
- 2.2.7 Door Stops: Door stop complete with rubber insert. Door stop must be part of slider/locking device designed to eliminate its use as a hook or hanger.
- 2.2.8 Door Pull: Stainless steel, for barrier-free units.
- 2.2.9 Fasteners: Stainless steel, tamperproof type.
- 2.2.10 Anchors: Floor channel fastened to pilasters with pan head screws and to floor slab with #12 x 37mm pan head screws into nylon expansion sleeves.
- 2.2.11 Latch Set: Built-in, with emergency access feature to manufacturer's standard bright finish.
- 2.2.12 Bituminous Paint: CAN/CGSB-1.108, Type 2.
- 2.2.13 Butyl Tape: Extruded, high grade macro-polyisobutylene tape of width and shore hardness to suit conditions.
- 2.2.14 Hardware and Fittings:
 - .1 Compartment panels and pilasters shall be secured with brackets made of brush finish extruded aluminum alloy.
 - .2 Doors: Provide gravity type hinges, full concealed within the thickness of the door during operation.
 - .3 Hinges: Adjustable to permit door to come to rest at specified angle when not latched.
 - .4 Mount doors on upper and lower pilaster hinge brackets of chrome plated, zinc die castings.
 - .5 Provide reinforcement for washroom accessories as required to preserve integrity of partition panels and as required to ensure secure attachment of accessories.

2.3 FABRICATION

- 2.3.1 Shop fabricate toilet partitions. Take site measurements for areas where partitions are to be located and fabricate toilet partitions to suit site dimensions.
- 2.3.2 Fabricate doors, panels, and pilasters from sheet steel laminated to both sides of core material, under pressure, using waterproof adhesive. Finished doors and panels shall be 25mm (1") thick and pilasters shall be 32mm (1-1/4") thick.
- 2.3.3 Check sizes and locations for washroom accessories and if necessary, reinforce panels.
- 2.3.4 Form all edges of doors, panels and pilasters and secure together with continuous flat locking strip with mitred and welded corners.
- 2.3.5 Fill depressions and cavities with metal filler, sand smooth, degrease and clean thoroughly.
- 2.3.6 Prepare panels to accept tissue dispensers and grab bars where indicated on drawings.

2.3.7 Design supports to withstand, within acceptable deflection limitations, their own weight, the weight of the toilet compartments, loads imposed by the motion of compartment doors and all live loads, which might be applied to the toilet compartments in the course of their normal function. Design supports as required to accommodate structural deflection. Build in reinforcing to support the grab bars and withstand a downward pull of 500 lbs. at any point on the grab bar.

2.4 FINISHES

2.4.1 Finish surfaces of doors, pilaster and partition panels with two (2) coats of baked thermosetting acrylic enamel; Colour: As selected by the Consultant from the manufacturers standard colour line.

PART 3 - EXECUTION

3.1 GENERAL

3.1.1 Verify dimension on the site before preparing shop drawings or proceeding with fabrication work.

3.1.2 Co-ordinate installation of any inserts or anchors which must be built in by other trades.

3.2 INSTALLATION

3.2.1 Install toilet compartments in accordance with manufacturer's recommended procedures and the reviewed shop drawings.

3.2.2 Erect Work straight, plumb, level, and secure to prevent distortion or displacement, or both.

3.2.3 Ensure clearance between panels and pilasters or walls does not exceed 12mm.

3.2.4 Fasten panels and pilasters to walls with brackets. Fasten headrails to walls with brackets. Joint lengths of headrails only at pilasters.

3.2.5 Securely attach fixing brackets and shoes.

3.2.6 Equip each door with hinges, latch and door stop. Provide stainless steel pull installed to door face of barrier free units.

3.2.7 Provide door plates at top and bottom of doors, through bolted.

3.3 CEILING HUNG PARTITION ERECTION

3.3.1 Secure pilasters to supporting structural framing using pilaster hangers.

3.3.2 Ensure pilaster hangers do not transmit load to finished ceiling.

3.3.3 Secure pilaster shoe in position.

3.3.4 Set bottoms of doors level with bottom of pilasters when doors are in closed position.

3.4 FLOOR SUPPORTED, OVERHEAD BRACED PARTITION ERECTION

3.4.1 Attach pilasters to floor with pilaster supports and level, plumb, and tighten installation with levelling device.

3.4.2 Secure head rail to pilaster face with not less than two fasteners for each face.

3.4.3 Secure pilaster shoes in position.

3.4.4 Set tops of doors parallel with overhead brace when doors are in closed position.

3.5 ADJUSTMENT AND CLEANING

3.5.1 Adjust and lubricate operating hardware to work smoothly and without force. Adjust hinges of toilet compartment doors so that all doors remain open to the same degree when unlatched.

3.5.2 Remove and replace damaged or defective Work from Site, at no extra cost to the Owner.

3.5.3 Remove soil and dirt deposits resulting from fabrication and installation.

3.5.4 Provide protection to prevent damage after installation.

3.5.5 Remove protection immediately prior to occupation of building by Owner. Perform final cleaning in accordance with Division 1.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- 1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.
- 1.1.2 Provide all labour, materials, products, equipment and services to supply and install washroom accessories required as shown on the Drawings and as specified herein.

1.2 REFERENCE STANDARDS

- 1.2.1 ASTM A167-99(2009) Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip (Withdrawn 2014).
- 1.2.2 ASTM A653/A653M-15 (Galvanized) Standard Specification for Steel Sheet, Zinc-Coated or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- 1.2.3 ASTM B117-11 Standard Practice for Operating Salt Spray (Fog) Apparatus.
- 1.2.4 CAN/CGSB 12.5-M86 Mirrors, Silvered.
- 1.2.5 CSA W55.3-08(R2013) Certification of Companies for Resistance Welding of Steel and Aluminum.

1.3 SUBMITTALS

- 1.3.1 Submit shop drawings, clearly indicating accessory materials, products and finishes and showing in large scale detail the construction, reinforcing, anchorage and location of exposed fastenings, where permitted. Submit a prototype of each accessory for review before delivery to the site.
- 1.3.2 Submit necessary templates and instructions where recesses, openings, fastenings or anchors have to be built in by others.
- 1.3.3 Submit three copies of list of accessories requiring supplies together with names and addresses of local distributors of the supplies.

1.4 DELIVERY AND STORAGE

- 1.4.1 Carefully wrap accessories ensuring protection during shipping and storage.
- 1.4.2 Store accessories inside the building in location directed, and so that their identification is readily visible, and in the general order in which they will be required for installation.
- 1.4.3 Adequately protect the structure and work of other Sections during delivery, storage, handling and execution of the work of the Section.
- 1.4.4 Provide tools, plant and other equipment required for the proper execution of the work of this Section.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- 2.1.1 The following manufacturers may be used for Base Bid:
- .1 Bobrick Washroom Equipment of Canada
 - .2 Frost Products Limited
 - .3 ASI Watrous
 - .4 Saferail Products Inc.
 - .5 Or other approved manufacturers meeting or exceeding these requirements.
- 2.1.2 Manufacturer's standard products shall be modified to comply with these Specifications unless otherwise stated with bid submission for work of this Section.
- 2.1.3 Washroom accessories shall be as specified in this Section, and shall be of one manufacturer except as otherwise specified or approved. Washroom accessories of the same materials, construction and finishes, and similar in function, design and appearance to those specified of other manufacturers will be considered, in accordance with the requirements of the Contract Documents for proposing substitutions.
- 2.2 MATERIALS
- 2.2.1 Stainless steel: ASTM A167 Type 304 or Type 316, of one type throughout.
- 2.2.2 Galvanized steel sheet: ASTM A653/A653M, commercial quality sheets, plain commercial galvanized or electro-galvanized.
- 2.3 FABRICATION
- 2.3.1 Fabricate accessories true, square, rigid, free from distortion and from defects detrimental to appearance and performance.
- 2.3.2 Visible joints, where permitted, shall be straight, accurate, hairline butt joints. Corner joints shall be mitred.
- 2.3.3 Assemble sheet metal accessories by welding in accordance with CSA W55.3. Conceal welds, or grind smooth such as to be invisible in completed work.
- 2.3.4 Except as otherwise specified, assemble fastenings, hardware fixings, and mounting or installation devices shall be concealed in the finished work.
- 2.3.5 Provide fasteners for mounting accessories. Fasteners shall be of non-corrosive, expansion type metal, toggle type or other approved type of positive, mechanical anchor as required to suit the construction to which the accessory is to be mounted. Exposed fasteners, where permitted, shall be finished to match adjacent accessory surface, and shall be countersunk. Where accessories are mounted to sheet metal, provide 1/8" thick minimum full size metal back plate drilled and tapped to receive machine screws and finished to match the adjacent sheet metal surface.
- 2.3.6 Unless otherwise specified, hinges shall be concealed stainless steel piano hinges and shall extend full length of hinged element. Hinged elements shall have concealed, mechanically retained, rubber bumpers for silent closing, and shall close flush with faces of fronts or frames.
- 2.3.7 Unless otherwise specified, portions of sheet metal accessory items which are visible in the completed work shall be stainless steel. Changes in plane shall be formed or continuously welded and ground smooth.

- 2.3.8 Sheet metal accessory parts concealed in the finished installation shall be electro galvanized sheet metal.
- 2.3.9 Accessories for flange type mounting shall have forged brass, full flanges drilled and countersunk for three mounting fasteners. Fix flanges to tubes using solid silver soldering.
- 2.3.10 Accessory lettering shall be silk screened with durable paint to withstand wear, or shall be engraved. Size, location and typeface of lettering shall selected by Consultant. Edges of letters shall be straight and sharp.
- 2.3.11 Washroom and Custodial Accessories:
- .1 Surface Mounted:
 - .1 Fabricate units with tight seams and joints, and exposed edges rolled.
 - .2 Hang doors and access panels with continuous stainless steel hinge.
 - .3 Provide concealed anchorage where possible.
 - .2 Recessed Mounted:
 - .1 Fabricate units of all welded construction, without mitred corners.
 - .2 Hang doors and access panels with full length, stainless steel hinge.
 - .3 Provide anchorage that is fully concealed when unit is closed.
 - .3 Workmanship shall be best grade of modern shop practice known to recognized manufacturers specializing in this work. Joints and intersecting members shall be accurately fitted, made in true planes with adequate fastening. Wherever possible fastenings shall be concealed.
 - .4 Isolate where necessary to prevent electrolysis between dissimilar metal to metal or metal to masonry or concrete contact.
 - .5 Keys: Provide universal keys for internal access to accessories for servicing and re-supplying. Provide minimum of six (6) keys to Owner's representative.

2.4 FINISHES

- 2.4.1 Finish stainless steel to a standard No. 4 mechanical finish. Where possible, arrange sheet stainless steel so that the grain of the finish runs vertically in the finished installation. Where accessories consist of stainless steel and brass, finish all visible surfaces to match a No. 4 stainless steel finish including etching, nickel strike, chromium plating and mechanical finishing.
- 2.4.2 Finish metal surfaces for paint finish visible in the completed installation with a comprehensive pre-treatment including mechanical removal of imperfections, buffing, degreasing, non etch chemical cleaning and 2 baked on coats of thermo setting acrylic enamel. Colour and gloss of enamel finish as designated by the Consultant.

2.5 WASHROOM AND CUSTODIAL ACCESSORY SCHEDULE

No.	Description / Model
CH	Coat Hooks: Surface mounted stainless steel, collapsible safety coat hook, provide 1 for each washroom, located as directed by Consultant: Frost 1150-SS
MS	Stainless Steel Shelf: 405mm (16") long and 125mm (5") wide Bobrick B-295
GB1	Grab Bar: Horizontal 1.214mm (0.048") thickness; 610 (24") long x 38mm (1-1/2") Ø, straight, stainless steel, slip resistant grip, concealed mounting, cap secured with vandal resistant set screws: ASI 3801-24P Bobrick B-6806.99x24
GB2	Grab Bar: Vertical 1.214mm (0.048") thickness; 765mm (30") long x 38mm (1-1/4") Ø, straight, stainless steel, slip resistant grip, concealed mounting, cap secured with vandal resistant set screws: ASI 3801-30P Bobrick B-6806.99x30
GBL	Grab Bar: Side "L"-shape grab bar, 760mm (30") long x 760mm (30") high 38mm (1-1/2") dia., stainless steel, slip resistant grip, concealed mounting, cap secured with vandal resistant set screws: ASI Type 04 Bobrick B-5898.99
FDGB	Fold Down Grab Bar: Swing up operation, 740mm (29") long x 32mm (1-1/4") Ø, stainless steel, concealed mounting, cap secured with vandal resistant set screws: Bobrick B-4998.99
MR1	Mirror (Tilt): Framed, 910mm (36") high x 460mm (18") wide, fixed tilt installation for disabled persons, mounted 1000mm (40") to bottom of frame: ASI 0535-1836 Bobrick B-293x1836

MR2	<p>Mirror (Flat): Framed, 910mm (36") high x 460mm (18") wide, fixed installation, mounted 1000mm (40") to bottom of frame:</p> <p style="text-align: center;"> ASI 0600-1836 Bobrick B-290 x1836 </p>
SND	<p>Sanitary Napkin Disposal: 255mm (10") high x 190mm (7.5") wide x 95mm (3 13/16" (deep), stainless steel finish, surface mounted:</p> <p style="text-align: center;"> Bobrick B-270 </p>
PTD	Paper Towel Dispenser: Supplied by Client, installed by General Contractor.
SD	Soap Dispenser: Supplied by Client, installed by General Contractor.
TPD	Toilet Paper Dispenser: Supplied by Client, installed by General Contractor.
HD	<p>Hand Dryer: High-speed hand dryer, stainless steel finish surface mounted:</p> <p style="text-align: center;"> World Dryer SLIMdri L-972 </p>

PART 3 – EXECUTION

3.1 EXAMINATION

- 3.1.1 Inspect surfaces over which the work of this Section is dependent for any irregularities detrimental to the application and performance of the work. Notify Consultant in writing of all conditions which are at variance with those in the Contract Documents and/or detrimental to the proper and timely installation of the work of this Section. The decision regarding corrective measures shall be obtained from the Consultant prior to proceeding with the affected work.
- 3.1.2 Commencement of work of this Section implies acceptance of surfaces and conditions.

3.2 INSTALLATION

- 3.2.1 Securely fasten accessories, level and plumb in the locations shown on the Drawings, specified herein and as further directed by the Consultant on the site.
- 3.2.2 Co-ordinate installation with Work of trades providing adjacent construction as required to achieve reveals or other edge conditions shown on Drawings. Install fully recessed frameless accessories so that their front face is flush with finished wall surface.
- 3.2.3 Perform drilling of steel, masonry and concrete necessary to install work of this Section.

3.2.4 Insulate accessory surfaces to prevent electrolytic action due to contact with masonry, concrete or dissimilar metal surfaces. Use bituminous paint, building paper or other approved means.

3.2.5 Do not install mirrors until back up wall has been thoroughly sealed and primed.

3.2.6 Install hand dryers in accordance with manufacturer's recommendations.

3.3 ADJUSTMENT

3.3.1 Upon completion of the work or when directed, remove all traces of protective coatings or paper.

3.3.2 Test mechanisms, hinges, locks and latches and where necessary, adjust and lubricate and ensure accessories are in perfect working order.

3.3.3 Load accessories with initial charge of supplies and leave ready for use.

3.4 CLEANING

3.4.1 Clean and make good surfaces soiled or otherwise damaged in connection with the work of this Section. Pay the cost of replacing finishes or materials that cannot be satisfactorily cleaned.

3.4.2 Upon completion of the Work, remove all debris, equipment and excess materials resulting from the work of this Section from the site.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- 1.1.1 Comply with Division 1, General Requirements and all documents referred to therein.
- 1.1.2 Provide all labour, materials, products, equipment and services to supply and install the gymnasium equipment indicated on the Drawings and specified herein.

1.2 REFERENCES

- 1.2.1 ASTM A475-03(2014) Standard Specification for Zinc-Coated Steel Wire Strand.
- 1.2.2 ASTM G40-13 Standard Terminology Relating to Wear and Erosion.
- 1.2.3 CSA W47.1-09(R2014) Certification of Companies for Fusion Welding of Steel.

1.3 SUBMITTALS

- 1.3.1 Submit samples in triplicate as specified in Section 01 30 00, Submittals.
 - 1.3.2 Submit product data for each type of product specified including, but not limited to, assembly, disassembly, and storage instructions for removable equipment, characteristics, and mounting arrangements.
 - 1.3.3 Submit shop drawings clearly showing dimensions, material being supplied, anchoring methods, attachments, reinforcing, hardware and location of exposed fastenings.
 - 1.3.4 Submit necessary templates and instructions where supports or anchors are to be built in by other Section.
 - 1.3.5 Submit complete maintenance instructions in duplicate, as specified in Section 01 70 00, Contract Closeout.
 - 1.3.6 Submit structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation including loads, point reactions, and locations for attachment of gymnasium equipment to structure.
 - 1.3.7 Submit coordination drawings indicating court layout plans coordinated with Drawings, drawn to scale, and coordinating floor inserts, game lines, and markers applied to finished flooring.
 - 1.3.8 Submit product certificates signed by product manufacturer for each type of gymnasium equipment indicating compliance with referenced standards, requirements of the Authorities Having Jurisdiction, and requirements of the Owner.
- 1.4 QUALITY ASSURANCE
- 1.4.1 Obtain each type of gymnasium equipment through one source from a single manufacturer having experience with the type of installation and complexity indicated in this Section.
 - 1.4.2 List and label electrical components, devices, and accessories in accordance Canadian Electrical Code and Canadian Standards Association using an accepted testing agency, and marked for intended use.

1.5 PROJECT CONDITIONS

1.5.1 Install gymnasium equipment when spaces are fully enclosed and weatherproof, after wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels required for project when occupied for its intended use.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

1.6.1 Store materials in original, undamaged condition. Handle and store in accordance with manufacturer's and supplier's directions.

1.7 COORDINATION

1.7.1 Coordinate installation of floor inserts with structural floors and finish flooring installation, and with court layout, game lines and markers on finish flooring.

1.7.2 Coordinate layout and installation of overhead supported gymnasium equipment and suspension system components with other construction including, but not limited to, light fixtures, HVAC equipment, fire suppression system components, and partition assemblies.

1.7.3 Coordinate wiring requirements and electrical characteristics with building electrical system for electrically powered equipment.

1.8 WARRANTY

1.8.1 Submit manufacturer's standard form of warranty indicating that manufacturer agrees to repair or replace components of gymnasium equipment that fail in materials or workmanship for a period indicated below, from date of Substantial Performance for the Project.

1.8.2 Failures will be considered to include, but are not limited to, the following:

- .1 Basketball backboard failures including glass breakage - Lifetime warranty.
- .2 Faulty operation of operable components - Five (5) years.
- .3 Safety edge padding - Eight (8) years.
- .4 Basketball backstop structure - Twenty-five (25) years.

PART 2 - PRODUCTS

2.1 FABRICATION - GENERAL

2.1.1 Equipment specified is by Gymnasium & Health Equipment Limited, equipment of other manufacturers will be considered in accordance with Section 01 63 00.

2.1.2 Fabricate work true to dimension and square. Finished work shall be free from distortion and defects detrimental to appearance and performance.

2.1.3 Welding shall comply with CSA W47.1. File or grind exposed welds smooth and flush. Do not leave grinding marks.

2.2 MATERIALS

2.2.1 Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated, and as follows:

- .1 Extruded Bars, Profiles, and Tubes: ASTM B221 (ASTM B221M).
 - .2 Cast Aluminum: ASTM B179
 - .3 Flat Sheet: ASTM B209 (ASTM B209M).
- 2.2.2 Steel: Type and shape recommended by manufacturer for use indicated and as follows:
- .1 Steel Plates, Shapes, and Bars: ASTM A36/A36M.
 - .2 Steel Tubing: ASTM A500 or ASTM A513, cold formed.
 - .3 Steel Sheet: ASTM A1011/A1011M.
- 2.2.3 Support Cable and Fittings: 6mm (1/4") diameter 7x19 galvanized steel aircraft cable in accordance with ASTM A1023 and having minimum breaking strength of 3175 kg, and correctly sized fittings in quantity recommended by manufacturer to suit installation.
- 2.2.4 Support Chain and Fittings: Grade 80 hardened alloy steel chain rated for overhead lifting in accordance with ASTM A391/A391M, having commercial quality, zinc plated steel connectors and hangars.
- 2.2.5 Castings and Hangers: Malleable iron, ASTM A47/A47M, grade required for structural loading.
- 2.2.6 Softwood Plywood: CSA O151, exterior grade.
- 2.2.7 Equipment Wall Mounting Board: Wood, neutral colour painted, finish, size, and quantity as required to mount gymnasium equipment in accordance with manufacturer's written instructions.
- 2.2.8 Anchors, Fasteners, Fittings and Hardware: Manufacturer's standard corrosion resistant or non-corrodible materials; concealed; tamperproof, vandal and theft resistant design.
- 2.2.9 Grout: Non-shrink, non-metallic, premixed, factory packaged, non-staining, non-corrosive, non-gaseous grout in accordance with ASTM C1107 having minimum compressive strength recommended in writing by gymnasium equipment manufacturer.
- 2.3 MAIN COURT BASKETBALL UNITS
- 2.3.1 Ceiling mounted single mast basketball backboards shall be BB-17A Swing up by Gymnasium & health Equipment Limited, or other approved manufacture.
- 2.3.2 Mast: Constructed of 6 5/8" o.d x .134" (10 ga) wall thickness @ 9.289 lbs/ft E.R.W. (Electric Resistance Welded) tube with custom length, welded to a 100 (4") channel @ 5.4 lbs/ft Diagonal side sway braces constructed of ASTM G40 Grade 50, or A500 Type B, HSS tubing with 1/8" wall, 2" square custom length in an "L" shall be welded to the mast channel and 6 5/8" tubing. Forced shall be transferred laterally into anti-sway braces, welded to the mast boom and cross channel.
- 2.3.3 Backstop shall be braced to the rear and shall fold up to the front. Telescopic back brace shall be constructed of a male tube 2" o.d. X .083" wall thickness E.R.W. and the female tube 1 3/4" o.d. x .083" wall thickness E.R.W that fits into each other. A simple back brace stop locks the bracing in position for play and is disengaged automatically by the movement of raising the backstop to its stored position in a forward motion.
- 2.3.4 Backstop shall be supported by a 3 1/2" o.d. pipe and securely anchored to roof framing members by specially designed and tested clamps. Each beam clamp shall support a static load of 9110 lb force. All 3 1/2" o.d. pipes exceeding 14'-0" in length shall be reinforced with special bridge trussing.

- 2.3.5 Operation: The main mast shall be suspended from two (2) custom adjustable hangers. Offsets in the position of the hinges places the centre of gravity forward of the hinged point to ensure that the unit locks into playing position. Hoisting cable shall be 1/4" diam. galvanized aircraft cable with a breaking strength of 7000 lbs.
- 2.3.6 Electric operated winch shall be designed to raise and lower the basketball unit. Where required swivel style pulleys shall be used, with steel sheaves and maintenance free oil impregnated bushings shall be used to route the hoisting cable to the winch.
- 2.3.7 Backboard: Official size 1067 mm 1829 mm (42" x 72") ½" thick tempered glass, (12 mm glass will not be considered equal to ½" glass) with white border and target lines permanently fused onto the surface, set in durable .200 extruded "F" channel aluminum frame, with steel corner brackets, BB-29RG11 by Gymnasium & Health Equipment Ltd. Vinyl shock absorbing material shall insulate glass from frame. Goal mounting holes shall be standard 127 mm (5") horizontal and 101.4 mm (4") vertical centres. Acrylic cushioning pad shall be used between steel mounting plate and glass to protect against possible breakage.
- 2.3.8 Backboard padding: High density polyurethane foam with solid colour exterior skin. Pro-Mold -44 by Gymnasium & Health Equipment Ltd., or other approved manufacture. Padding shall meet requirements of NCAA, NBA and NFHS. Colour shall be selected by Consultant from manufacturer's standard colours.
- 2.3.9 Basketball goal: Positive lock break-away goal. Constructed with an enclosed positive lock mechanism to hold rim in solid playing position. Goal shall be designed so that any possible entrapment areas have been eliminated. Goal shall be official size 18" ring of 5/8" diameter steel with continuous no-tie net attachment, full wing brace design, an durable orange powder coat finish. Anti-whip net and hardware included. Hole spacing shall be 5" x 5". Goal BB-33 2000+ Collegiate Breakaway Goal by Gymnasium & Health Equipment Ltd, or other approved manufacture.
- 2.3.10 All complying with NCAA and high school requirements.
- 2.3.11 Winch: Designed to lift an 820 kg (1800 lbs) backstop assembly with a safety line stall pull of 1000 kg (2200 lbs). Winch shall have a rope speed of 3.5 m (12'-0") per minute. Motor shall be instant reverse, low maximum current draw design, thermally protected, 110 volt, 60 cycle, 1 HP .75 KW, 13 amp. TW2000 Torkwinch by Gymnasium & Health Equipment Limited or other approved manufacture.
- .1 Duty cycle: Standard: 10 minutes on, 20 minutes off.
 - .2 Gear reduction: Proprietary composite self lubricating gearing with no oil bath.
 - .3 Rope drum: Grooved for accurate winding. Supported in large diameter ball bearings with positive, through the drum type rope anchoring.
 - .4 Braking: double, self-locking worm gearing plus passive uni-directional brake.
 - .5 Pressure roller: constant pressure type with torsion spring mounting.
 - .6 Limit switches: Heavy duty upper and lower switches, gear driven for high accuracy. Maximum travel 13.8 m (45 ft).
 - .7 Frame construction: Precision interlocking steel frame for high rigidity and precision alignment. Semi enclosed for safety. Powder coated for corrosion resistance.
 - .8 Weight: 29 kg (64 lbs).
- 2.3.12 Posilock Safety Strap: Fail-Safe, self-checking, checks speed of the rotating reel 6 times per revolution and will lock if the trip speed is exceeded under any condition., by Gymnasium & Health Equipment Limited, or other approved manufacture.
- .1 Warning label on inner-end of strap shows when maximum safe extension has been

- exceeded.
 - .2 Coloured breakaway indicator signals that the unit has operated under a falling load.
 - .3 Load strap yields a breaking strength of 7,300 lbs.
 - .4 Tension type clamps tested to 10,000 lbs.
 - .5 Versatile mounting.
 - .6 Positive recoil.
 - .7 Strap reel utilized two bearings to give maximum support under load.
 - .8 Tripping speed-sudden free-fall: 0.6 m.sec. (1.5/
- 2.3.13 All metal parts to be primed and painted with semi-gloss rust inhibitive enamel
- 2.4 SIDE COURT UNITS
- 2.4.1 Fan shaped basketball backstops: Institutional quality, rear mounted, BB-22B Rear Mounted Steel by Gymnasium & Health Equipment Limited.
- .1 889 mm x 1372 mm (35" x 54") fan shaped single piece 12 gauge steel, reinforced with heavy gauge vertical centre channel and heavy gauge horizontal channels. All reinforcing sections shall be welded to the shell to make a single vibration free unit.
 - .2 Provide keyhole slots in horizontal channels spaced at 508 mm (20") vertically by 889 mm (35") horizontally o.c. for mounting. Mounting points reinforced, including 2 safety mount holes. Rear goal mounting, 102 mm (2") x 92 mm (3 5/8") hole spacing.
 - .3 Goal mounting holes in rear channel shall be reverse mount pattern to accept reverse mount goals.
 - .4 Backboard shall be phosphate pre-treated and have durable white powder-coat finish.
 - .5 Provide 5 year limited warranty on backboard.
- 2.4.2 Height adjustable adapter framing: BB-3 by Gymnasium & Health Equipment Limited, or other approved manufacture.
- .1 Operation of raising and lowering is from the floor with a crank handle.
 - .2 Manufactured from 38 mm (1 1/2") square HSS tubing, screw driven to raise or lower goal; from 10'-0" to 8'-0". Screw shall be 3/4" ACME threaded rod. Screw drive shall have a loop welded to the bottom to allow attachment of awning style crank.
- 2.4.3 The wall brackets are constructed of 1/4" thick steel plate 4" x 15" in length, with (2) two slots provided for mounting. Offset extensions mounted on these wall brackets on opposite sides, allow for the unit to swing to one side or the other. The framework of the BB-10 is constructed of 1/8" wall, 2" square and 3/16" wall 2" x 3" rectangular E.R.W. (Electric Resistance Welded) HSS tubing. Either steel front board holders or a height adjustable BB-3 frame can accommodate this unit. A BB-3 height adjustable frame will supply a goal height of between (10'-0") and (8'-0") [3048mm to 2438mm]. These units can come in 35" or 63" horizontal centers and 20" or 36" vertical centers. A swivel pulley assembly along with aircraft cable is mounted above the wall brackets for added safety and support. The aircraft cable is 1/4" \varnothing [6.35mm], ASTM A475 STD. 7 strands / 19 wires galvanized, with a breaking strength of 7000 lbs. ASTM G40 GRADE 50, or A-500 TYPE B material shall be used for wall brackets, frame, and extensions. All hardware is of Grade #5 quality.
- 2.4.4 The backstop shall be support by (3) three through wall anchors; 18" in length or (3) three Hilti HY-20 epoxy anchors on each wall bracket, and installed to Hilti specifications using Hilti anchors.
- 2.4.5 This is a main or side court type basketball unit. A crank handle is supplied in order to raise and lower the height adjustable BB-3 frame. A locking arm provides the flexibility, so that the unit can side swing to one side but also lock in position for game play. **In order to have a properly**

operating side swing unit the extension from the wall to the face of the backboard shall not be less than 36" and greater than 108".

2.4.6 Basketball Goals: Institutional Rear Mount Fixed Goal with nylon net, BB-66 by Gymnasium & Health Equipment Limited or other approved manufacture.

- .1 Fixed rear mount 457 mm (18") single ring of 16 mm (5/8") round steel with no tie net holders on underside and reinforced for almost half of its circumference with 5 mm x 38 mm (3/16" x 1 1/2") steel braces.
- .2 Back plate (6" x 8 1/8") to accommodate reverse mount fan-shaped backboard, 102 (4") x 98 mm (3 7/8") hole spacing.
- .3 Metal powder coat finished
- .4 Provide net and hardware.

2.4.7 All metal parts shall be painted with one (1) coat of black or white semi-gloss rust-inhibiting enamel. Custom colors are available upon request at an extra cost.

2.5 WALL PADDING

2.5.1 Safety wall padding shall be removable 50 mm (2") thick, consisting of 18 oz polyester reinforced vinyl. Wall padding shall contain 2.2 lb. 100ILD polyurethane foam. Sewing shall be 23 lb test nylon thread. All seams shall be double sewn. Velcro around edges shall be 1st grade, full 2" wide, allowing for expanded surfaces and easy mounting on VEL-69A velcro strip. Standard colour Blue.

2.5.2 Padding shall be in 1220 mm (4'-0") wide x 2134 mm (7'-0") high, or as shown, panels, covered with 510 gm (18 oz.) deluxe vinyl coated nylon.

2.5.3 Provide 44 mm (1 3/4") wide semi-rigid high impact vinyl extrusion velcro strip mounted into extra strong light weight aluminum extrusion, WP-69A by Gymnasium & Health Equipment Limited, for mounting padding to walls.

2.6 FLOOR SOCKETS

2.6.1 Deep brass, designed for use with 60 mm (2 3/8") o.d. posts, FS-2 by Gymnasium & Health Equipment Limited or other approved manufacturer. Sockets shall be manufactured to ISO 9000 standards.

2.6.2 Sockets shall be complete with lid.

PART 3 - EXECUTION

3.1 EXAMINATION

3.1.1 Examine substrates, areas, and conditions for compliance with requirements for play court layout, alignment of mounting substrates, installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance.

3.1.2 Verify critical dimensions.

3.1.3 Examine supporting structure and subgrade, subfloors and footings below finished floor.

3.1.4 Examine wall assemblies, where reinforced to receive anchors and fasteners, to verify that locations of concealed reinforcements have been clearly marked. Locate reinforcements and

mark locations.

3.1.5 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

3.2.1 Install and assemble products in accordance with manufacturer's written instructions and competition rules indicated for each type of gymnasium equipment.

3.2.2 Install gymnasium equipment after other finishing operations, including painting, have been completed.

3.2.3 Permanently Placed Gymnasium Equipment and Components:

- .1 Install rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated on Shop Drawings; in proper relation to adjacent construction; and aligned with court layout.
- .2 Coordinate location of floor inserts with application of game lines and markers, and core drill floor for inserts after game lines have been applied.
- .3 Coordinate floor insert elevation heights with installation of finish flooring and type of floor plate.

3.2.4 Floor Insert Setting:

- .1 Position sleeve in oversized, recessed voids in concrete slabs.
- .2 Clean voids of debris.
- .3 Fill void around sleeves with grout, mixed and placed to comply with grout manufacturer's written instructions.
- .4 Protect portion of sleeve above subfloor from splatter.
- .5 Verify that sleeves are set plumb, aligned, and at correct height and spacing; hold in position during placement and finishing operations until grout is sufficiently cured.
- .6 Set insert so top surface of completed unit is flush with finished flooring surface.

3.2.5 Verify relationship of mounting height, height of pad, and presence or absence of fire suppression sprinklers.

3.2.6 Use anchors and fasteners where necessary for securing built-in and permanently placed gymnasium equipment to structural support and for properly transferring load to in-place construction.

3.2.7 Coordinate installation with work of trades providing adjacent construction as required.

3.2.8 Install basketball goals in accordance with manufacturer's instructions and NBA requirements.

3.2.9 Install safety wall padding with Valcro in accordance with manufacturer's instructions.

3.3 ADJUSTMENT

3.3.1 Upon completion of work or when directed, remove all traces of protective coatings and/or paper.

3.3.2 Test operation, and where necessary, adjust and lubricate and ensure that accessories are in perfect working order.

END OF SECTION

APPENDIX A

Appendix A – Construction School Specific Information Sheet Sample

In addition to the terms and conditions of the Contract Documents, the Contractor shall follow the protocols of the Construction Site Specific Information Sheet, sample provided below. A completed version of this document, with site specific content, will be provided to the Contractor at the pre-construction meeting.

1. School Information:

School Name: Insert School Name

Bell Times

Morning (School Entry): 0:00 AM
Afternoon (School Dismissal): 0:00 PM
Aftercare Program Dismissal: 6:00 PM

Caretaking Phone Number: 000-000-0000

Caretaking Hours

September to June 6:00 AM – 10:00 PM
December Holiday Break 6:00 AM – 2:00 PM
March Break 6:00 AM – 2:00 PM
July to August 6:00 AM – 2:00 PM
Saturday / Sunday CLOSED

PasWord Account Code: HP0000

Security Panel Code: 0000

2. School Entry for afterhours, school holidays or closures:

Please follow these steps upon entry to the building outside of caretaker hours and on school holidays or closures:

1. Call PasWord Protection at 1-800-561-3099 or 905-522-6680 and notify them in advance of the day(s) and time(s) that access to the building will be required. They will require the PasWord account code noted above.
2. Disarm the security panel when arriving.
3. Arm the security panel when leaving.
4. Call PasWord to verify that the building is armed and secure.

Failure to follow this procedure outside of caretaker hours and on school holidays or closures will result in an automatic dispatch of a security guard to the building to verify who has entered/exited the building. Security costs associated with the dispatch of a security guard for failing to follow the procedure will be expensed to the contractor responsible for the incident.

3. Fire Safety Plan and Procedures:

The following procedures are to ensure the safe evacuation of the job site and school in the event of a fire alarm:

1. All employees, subcontractors, workers, and all visitors to the site are to review and follow the Hamilton Wentworth District School Board (HWDSB) posted room specific evacuation cards and school specific Fire Safety Plan located in the main office, on the health & safety board and in the fire manual binder (see caretaker).
2. Construction hoarding, fencing and temporary exits are to be implemented to ensure all fire routes are maintained for safe exiting.
3. In the event of a fire alarm, all construction activities must stop and all site personnel are to vacate the building and job site.
4. All site personnel are to meet at the predetermined meeting area as identified in the contractor's fire safety plan. contractor fire safety plan to be submitted with the Health & Safety submittals upon construction initiation.

4. Fire Alarm Bypass Protocols:

Please follow these steps to put the fire alarm on bypass. The FA system should not be put on test at any time. The following protocols are established by the HWDSB Fire Safety Plan and in the event that there is a discrepancy in a procedure the HWDSB Fire Safety Plan shall govern.

1. Contractor to contact Hamilton Fire Control (HFC) per the contact information below and make arrangements to review the site requirements for bypass – i.e. complete a walkthrough with HFC to determine which devices need to be bypassed, if any, if a device/s is/are to be red capped and protected from construction debris or damage, if a rate-of-rise device is to be installed or device disconnected and how to address the trouble on the panel.

Contact: Michael Fleet - Hamilton Fire Control
Phone: (905) 527-7042
Email: michael@hamiltonfirecontrol.ca

2. Hamilton Fire Control to coordinate fire alarm bypass with HWDSB caretaker and PasWord.
3. The caretaker will post a notice that the school is on Fire Watch on the exterior doors. This is required anytime that the fire alarm Panel is in trouble, a fire alarm device is bypassed or impeded in any way (i.e. disconnected, gloved, red capped, etc.).
4. The caretaker will contact PasWord and the school main office to notify them the system is on bypass.

Construction School Specific Information Sheet

5. The contractor is to take all necessary precautions during this period to protect any FA devices in the construction zone from activating the emergency fire alarm system, including not conducting heat/smoke generating activities in proximity to the detectors (i.e. do not solder near the detector, protect devices from debris/ dust, disconnect device when required to perform work that may activate the emergency fire alarm system).
6. The contractor is responsible for Fire Watch at all times within the construction area including at any time that a fire alarm device is affected (i.e. disconnected, bypassed, trouble on the panel, device is red capped or gloved). The contractor must maintain and make available a copy of the hourly fire watch log. Fire Watch during unoccupied times is not required.
7. The caretaker will be responsible for Fire Watch within the occupied area of the school up to the delineation of the construction work area during occupied times when a fire alarm device is affected. Fire Watch during unoccupied times is not required.
8. In the event a fire alarm device is activated, all occupants of the school, including contractors, must follow the HWDSB Fire Safety Protocol and Fire Safety Plan and Procedures as outlined in this document, and evacuate the school.
9. The caretaker is responsible to notify the Fire Department should there be a trouble on the panel for longer than 72 hours.

5. Please follow these steps for planning any service (electrical, gas, water) shutdowns:

A. Internal Localized System/Service Shutdowns:

1. Localized shutdowns **require minimum 3 days' notice** to HWDSB project supervisor for coordination with the school facility and staff.
2. Shutdowns must be completed outside of school bell times/operational hours which vary by facility and must be scheduled for evenings after 6:00 PM, weekends or board holidays.
3. If a shutdown will impact the security system, the contractor shall contact PasWord Protection at 1-800-561-3099 or 905-522-6680 and notify them in advance of the day(s) and time(s) of the shutdown.
4. If a shutdown impacts the fire alarm system, the contractor shall follow the Fire Alarm Bypass Protocol, section 4 above.
5. If required, the contractor is to coordinate with Board vendor/s to be on site to ensure boilers, roof top units, heat pumps, etc. are functioning properly after service disruption has concluded.
 - Chamberlain Building Services Inc - info@chbs.ca, 905-664-1914 or
 - Union Boiler Company Limited - info@unionboiler.com, 905-528-7977
6. Process will vary based on services shutdown and ability to localize shutdown.

B. Complete School System/Service Shutdowns:

1. Complete building shutdowns **require minimum 5 days' notice** to HWDSB project supervisor.
2. Shutdowns must be completed outside of school bell times/operational hours which vary by facility and must be scheduled for evenings after 6:00 PM, weekends or board holidays.
3. Contractor to contact PasWord Protection at 1-800-561-3099 or 905-522-6680 and notify them in advance of the day(s) and time(s) of shutdown.
4. During the shutdown, the contractor is responsible for following Fire Alarm Bypass Protocol, section 4 above.
5. The contractor is to coordinate with Board vendor/s to be on site to ensure boilers, roof top units, heat pumps, etc. are functioning properly after service disruption has concluded.
 - Chamberlain Building Services Inc - info@chbs.ca, 905-664-1914 or
 - Union Boiler Company Limited - info@unionboiler.com, 905-528-7977
6. HWDSB project supervisor will coordinate with other HWDSB departments to ensure all systems (IIT, security, communications) are up and running after service disruption has concluded.
7. If required, HWDSB project supervisor will coordinate with City of Hamilton staff if site has shared facilities such as recreation centre, community centre, pool or library, etc.
8. Process will vary based on service shutdown.

C. Heating and Cooling System Shutdowns:

1. Heating and cooling system shutdowns **require minimum 5 days' notice** to HWDSB project supervisor
2. Shutdowns must be completed outside of school bell times/operational hours which vary by facility and must be scheduled for evenings after 6:00 PM, weekends or board holidays.
3. The contractor is to coordinate with Board vendor/s to be on site to ensure boilers, roof top units, heat pumps, etc. are functioning properly after service disruption has concluded.
 - Chamberlain Building Services Inc - info@chbs.ca, 905-664-1914 or
 - Union Boiler Company Limited - info@unionboiler.com, 905-528-7977
4. If the boiler system is drained, the contractor upon refilling the system, is responsible for coordinating Board approved chemical treatment vendor to treat water.
 - Aquarian Chemicals Inc - info@aquarianchemicals.com, 905-825-3711
5. Process will vary based on services shutdown and ability to localize shutdown.

D. Asbestos Abatement and Designated Substance Related Work:

1. Designated substance related work **requires minimum 5 days' notice** to HWDSB project supervisor.
2. Designated substance related work in occupied areas must be completed outside of school bell times/operational hours which vary by facility and must be scheduled for evenings after 6:00 PM, weekends or board holidays.

APPENDIX B



Hazardous Building Materials Assessment (Pre-construction)

P01947 Benchmark Project
Hess Street Elementary School
107 Hess Street North,
Hamilton, Ontario

Prepared for:

Hamilton-Wentworth District School Board

20 Education Court
Hamilton, Ontario, L9A 0B9

February 22, 2024

Pinchin File: 320572.021



Issued to: Hamilton-Wentworth District School Board
Issued on: February 22, 2024
Pinchin File: 320572.021
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EXECUTIVE SUMMARY

Hamilton-Wentworth District School Board (Client) retained Pinchin Ltd. (Pinchin) to conduct a hazardous building materials assessment at Hess Street Elementary School located at 107 Hess Street North, Hamilton, Ontario. Pinchin performed the assessment on December 19, 2023 and February 9, 2024.

The objective of the assessment was to identify specified hazardous building materials in preparation for building renovation. The proposed work as identified by the Client for the P01947 Benchmark Project.

The results of this assessment are intended for use with a properly developed scope of work or performance specifications and safe work procedures.

SUMMARY OF FINDINGS

The following is a summary of significant findings; refer to the body of the report for detailed findings:

Asbestos:

- Acoustic (lay-in) ceiling tiles
- Plaster
- Drywall joint compound
- Vinyl floor tiles
- Vinyl floor tile mastic (presumed)
- Roofing tar
- Paint
- Gold sink mastic

Lead:

- Lead is present in paints and coatings.
- Batteries of emergency lights contain solid lead.

Silica: Crystalline silica is present in concrete and other materials such as masonry, drywall, ceiling tiles and plaster.

Mercury: Mercury vapour is present in lamp tubes.

Polychlorinated Biphenyls (PCBs): Based on the date of construction, PCBs may be present in light ballasts.

Mould and Water Damage: Visible mould and water damage was not observed.



SUMMARY OF RECOMMENDATIONS

The following is a summary of significant recommendations; refer to the body of the report for detailed recommendations.

1. Conduct further investigation of the following items, which was not completed during this assessment:
 - a. Any items listed as exclusions in this report, prior to disturbance.
2. Prepare a scope of work or specifications and safe work procedures for the hazardous materials removal required for the planned work.
3. Do not disturb suspected hazardous building materials discovered during the planned work, which have not been identified in this report and arrange for further evaluation and testing.
4. Remove and properly dispose of asbestos-containing materials prior to demolition or renovation activities.
5. Remove and properly dispose of PCB ballasts when fixtures are decommissioned. All PCB lamp ballasts must be removed from service and properly disposed of by December 31, 2025.
6. Recycle mercury-containing lamp tubes and thermostats when removed from service.
7. Follow appropriate safe work procedures when handling or disturbing asbestos, lead, and silica.

This Executive Summary is subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.



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1.0 INTRODUCTION AND SCOPE

Hamilton-Wentworth District School Board (Client) retained Pinchin Ltd. (Pinchin) to conduct a hazardous building materials assessment at Hess Street Elementary School located at 107 Hess Street North, Hamilton, Ontario.

Pinchin performed the assessment on December 19, 2023 and February 9, 2024. The surveyors were unaccompanied during the assessment. The assessed area was occupied at the time of the assessment.

The objective of the assessment was to identify specified hazardous building materials in preparation for building renovation. The results of this assessment are intended for use with a properly developed scope of work or performance specification.

1.1 Scope of Assessment

The **assessed area** is limited to the portion(s) of the building to be renovated, as described by the Client, and identified in the drawings in Appendix I.

The assessment was performed to establish the type of specified hazardous building materials, locations and approximate quantities incorporated in the structure(s) and its finishes.

For the purpose of the assessment and this report, hazardous building materials are defined as follows:

- Asbestos
- Lead
- Silica
- Mercury
- Polychlorinated Biphenyls (PCBs)
- Mould

The following Designated Substances are not typically found in building materials in a composition/state that is hazardous and were not included in this assessment:

- Arsenic
- Acrylonitrile
- Benzene
- Coke oven emissions
- Ethylene oxide
- Isocyanates



- Vinyl chloride monomer

2.0 METHODOLOGY

Pinchin conducted a room-by-room assessment to identify the hazardous building materials as defined in the scope.

The assessment included limited demolition of wall and ceiling finishes (drywall or plaster) to view concealed conditions at representative areas as permitted by the current building use. Limited destructive testing of flooring was conducted where possible (under ceramic tiles, carpets, or multiple layers of flooring). Demolition of exterior building finishes, masonry walls (chases, shafts etc.), and structural surrounds was not conducted.

Limited demolition of masonry block walls (core holes) was conducted to investigate for loose fill vermiculite insulation. Sampling of roofing materials was conducted.

For further details on the methodology including test methods, refer to Appendix III.

3.0 BACKGROUND INFORMATION

3.1 Building Description

Description Item	Details
Use	Elementary School
Number of Floors	The building is 2 storeys.
Total Area	The total area of the building is approximately 20,000 square feet. The assessed area is approximately 6,650 square feet.
Year of Construction	The building was constructed in 1973 and renovated in 2014.
Structure	Structural steel and concrete
Exterior Cladding	Brick
HVAC	Rooftop AC, boiler and hot water heating to radiators
Roof	Built-up
Flooring	Vinyl floor tiles, terrazzo, and laminated wood
Interior Walls	Concrete block, and drywall
Ceilings	Plaster, drywall, and acoustic ceiling tiles

3.2 Existing Reports

Pinchin previously prepared the following reports, which have been reviewed as part of this assessment:

- “Hazardous Building Materials Assessment, 107 Hess Street North, Hamilton, Ontario”, dated October 4, 2016 (Pinchin File No. 115161.006).

4.0 FINDINGS

The following section summarizes the findings of the assessment and provides a general description of the hazardous building materials identified. For details on approximate quantities, condition, friability, accessibility, and locations of hazardous building materials; refer to the Hazardous Material Summary / Sample Log and All Data Report in Appendices V and VI.

Any quantities listed in this report or data tables are estimated based on visual approximations only and are subject to variation.

4.1 Asbestos

4.1.1 Pipe Insulation

Pipes in the assessed area are either uninsulated or insulated with non-asbestos fibreglass (photos 1 and 2) or other non-asbestos insulation such as mineral fibre or elastomeric foam insulation.

Pipes insulated with asbestos-containing insulations may be present in inaccessible spaces such as above solid ceilings, in chases, in column enclosures and within shafts.



Photo 1



Photo 2

4.1.2 Duct Insulation and Mastic

Ducts are either uninsulated (photo 1) or insulated (photo 2) with non-asbestos fibreglass (foil-faced or canvas jacketing).



Photo 1

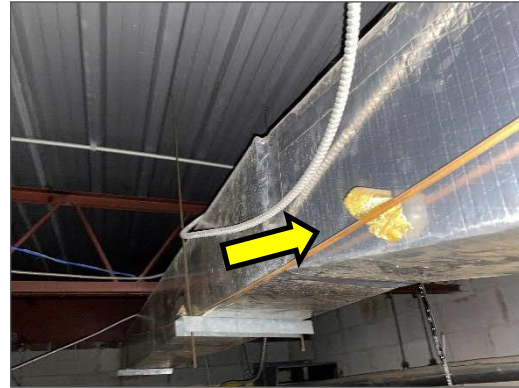


Photo 2

4.1.3 Mechanical Equipment Insulation

Mechanical equipment (e.g., furnace, hot water tanks, boilers) is either uninsulated or insulated with non-asbestos fibreglass.


4.1.4 Vermiculite

Destructive testing was conducted of masonry block walls, including creating penetrations at four locations. The locations of destructive testing have been indicated on the drawings in Appendix I.

Loose fill vermiculite was not observed within the cavities.

4.1.5 Acoustic Ceiling Tiles

The following is a summary of acoustic ceiling tiles sampled, for a complete list of locations, refer to Appendix V.

Description	Sample Location	Sample Number, Date Code or Material Composition	Asbestos	Photo
24"x48", lay-in, pebble pattern	Previously sampled	2975-34-C13	Amosite and Chrysotile	

4.1.6 Plaster

Textured plaster, containing asbestos (samples S0011A-E), is present in the assessed area (photo 1).

Non-asbestos smooth plaster is present in the assessed area, (samples S0010A-C and S0012A-G, photo 2).



Photo 1



Photo 2

4.1.7 Drywall Joint Compound

Drywall joint compound, containing asbestos, is present on wall and ceiling finishes throughout the assessed area (samples S0006A-E, photos 1 and 2).



Photo 1

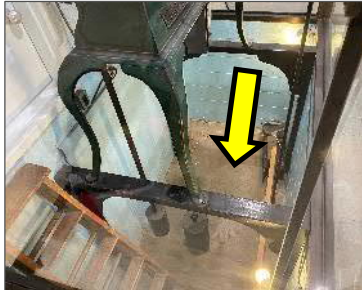


Photo 2

4.1.8 Vinyl Floor Tiles

The following is a summary of vinyl floor tiles sampled, for a complete list of locations, refer to Appendix V

Description	Sample Location (Location #)	Sample Number	Asbestos (Tile / Adhesive)	Photo
12"x12", beige with brown fleck	Storage 105B and Equip 105A (Location 3307, 3308)	S0004A-C	No / No	
12"x12", grey with brown streaks	Storage 105A (Location 3854)	S0007A-C	Yes / No	

Description	Sample Location (Location #)	Sample Number	Asbestos (Tile / Adhesive)	Photo
12"x12", beige	Lobby 202 (Location 3301)	N/A	Presumed asbestos	

4.1.9 Roofing Products

Tar, containing asbestos, is present in the bottom layer of the built-up roofing over the entire building (samples S0002A-C, photo 1).

Tar, containing asbestos, is present at roof pipe penetrations (samples S0003A-C, photo 2).






Photo 1



Photo 2

4.1.10 Other Building Materials

The following is a summary of other materials sampled, for a complete list of locations, refer to Appendix V.

Description	Sample Location (Location #)	Sample Number	Asbestos	Photo
Paint on concrete block	Throughout the building	S0005A-G	Yes	
Terrazzo	Men's Changeroom (Location 3309) Women's Changeroom (Location 3310)	S0008A-C	No	
Gold sink mastic	Staff Room (Location 3317) Storage (Location 3314)	S0009A-C	Yes	

4.1.11 Excluded Materials

The following is a list of materials which may contain asbestos and was excluded from the assessment. These materials are presumed to contain asbestos until otherwise proven by sampling and analysis:

- Floor levelling compound
- Electrical components
- Mechanical packing, ropes, and gaskets
- Vermiculite
- Caulking and putties
- Fire resistant doors
- Vibration dampers on HVAC equipment

- Ropes and gaskets in cast-iron bell and spigot joints
- Sealants on pipe threads





4.2 Lead

4.2.1 Paints and Surface Coatings

Refer to the lab report(s) in Appendix II-B and the Hazardous Material Summary / Sample Log in Appendix V for details on paints sampled and their locations.

The following table summarizes the analytical results of paints sampled.

Sample Number	Colour, Substrate Description	Sample Location	Lead (%)	Photo
L0001	White on concrete block	Storage and Stairs (Location 3307)	0.095	
L0002	Yellow on concrete block	Storage and Stairs (Location 3307)	0.10	
L0003	Blue on concrete block	Gymnasium (Location 3304)	0.018	

Sample Number	Colour, Substrate Description	Sample Location	Lead (%)	Photo
L0004	Lime green on concrete block	Storage (Location 3305)	<0.0056	
L0005	Yellow on metal	Gymnasium (Location 3304)	0.012	
L0006	Peach on concrete block	Staff Room (Location 3317)	0.018	
L0007	Light blue on concrete block	Vestibule (Location 3319)	<0.0059	
L0008	Pink on concrete block	Girls Washroom (Location 3365)	<0.0029	N/A

Results less than or equal to 0.1% (1,000 mg/kg), but equal to or greater than 0.009% (90 mg/kg), are considered low-level lead paints or surface coatings in accordance with the EACC guideline.

Paint containing less than 0.009% (90 mg/kg) lead is assumed to be insignificant.

4.2.2 *Lead Products and Applications*

Lead-containing batteries may be present in emergency lighting (photo 1).

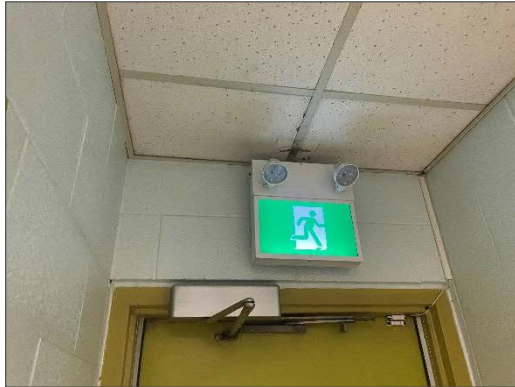


Photo 1

4.2.3 *Excluded Lead Materials*

Lead is known to be present in several materials which were not assessed or sampled. The following materials, where found, should be presumed to contain lead.

- Electrical components, including wiring connectors, grounding conductors, and solder
- Solder on pipe connections

4.3 **Silica**

Crystalline silica is assumed to be a component of the following materials where present in the building.

- Concrete
- Masonry and mortar
- Plaster
- Drywall
- Ceiling tiles

4.4 **Mercury**

4.4.1 *Lamps*

Mercury vapour is present in fluorescent lamp tubes and other lighting that is known to contain mercury such as mercury vapour lamps, metal halide lamps, high pressure sodium lamps and neon lamps.



4.4.2 *Mercury-Containing Devices*

Mercury-containing devices were not found during the assessment.

4.5 Polychlorinated Biphenyls

4.5.1 *Lighting Ballasts*

The building has not been comprehensively re-lamped with energy efficient light fixtures (evidence of T-12 fixtures, and as such, a percentage of light ballasts may be manufactured prior to 1980 and may contain PCBs.

4.5.2 *Transformers*

Transformers were not found during the assessment.

4.5.3 *Excluded PCB Materials*

PCBs are known to be present in several materials and equipment which were not assessed or sampled. The following materials, where found, should be presumed to contain PCBs until sampling proves otherwise.

- Caulking
- Capacitors within or associated with electrical equipment
- Oil impregnated cables
- Voltage regulators and capacitors
- Lubricants

4.6 Mould and Water Damage

Visible mould growth and water damage was not found during the assessment.

5.0 RECOMMENDATIONS

5.1 General

1. Prepare scope of work or performance specifications for hazardous material removal required for the planned work. The specifications should include safe work practices, personal protective equipment, respiratory protection, and disposal of waste materials.
2. If suspected hazardous building materials are discovered during the planned work, which are not identified in this report, do not disturb, and arrange for further testing and evaluation.



3. Conduct further investigation of the following items, areas, or locations, which were not completed during this assessment:
 - a. Any items listed as exclusions in this report, prior to disturbance.
4. Provide this report and the detailed plans and specifications to the contractor prior to bidding or commencing work.
5. Retain a qualified consultant to specify, observe and document the successful removal of hazardous materials.
6. Update the asbestos inventory upon completion of the abatement and removal of asbestos-containing materials and any other relevant findings.

5.2 Building Renovation Work

The following recommendations are made regarding renovation involving the hazardous materials identified.

5.2.1 Asbestos

Remove asbestos-containing materials (ACM) prior to renovation, alteration, or maintenance if ACM may be disturbed by the work. If the identified ACM will not be removed prior to commencement of the work, any potential disturbance of ACM must follow asbestos precautions appropriate for the type of work being performed.

Asbestos-containing materials must be disposed of at a landfill approved to accept asbestos waste.

5.2.2 Lead

For paints identified as having low levels of lead (i.e., equal to or above 0.009% (90 mg/kg) but less than or equal to the EACC guideline of 0.1% (1,000 mg/kg) for lead-containing paints) special precautions are not recommended unless aggressive disturbance (grinding, blasting, torching) is planned. Exposure from construction disturbance of paints containing lead less than 0.009% (90 mg/kg) is assumed to be insignificant.

Items painted with paints containing elevated levels of lead may be a hazardous waste. Test lead-painted materials for leachable lead and other metals prior to disposal. Metallic components coated with lead paint do not require leachate testing and can be disposed of as non-hazardous construction and demolition (C&D) waste.

Lead-containing items should be recycled when taken out of service.



5.2.3 *Silica*

Construction disturbance of silica-containing products may result in excessive exposures to airborne silica, especially if performed indoors and dry. Cutting, grinding, drilling or demolition of materials containing silica should be completed only with proper respiratory protection and other worker safety precautions that comply with applicable regulations and guidelines.

5.2.4 *Mercury*

Do not break lamps. Recycle and reclaim mercury from fluorescent lamps when taken out of service. Mercury is classified as a hazardous waste and must be disposed of in accordance with applicable regulations.

5.2.5 *PCBs*

As light fixtures are removed from service, examine light ballasts for PCB content. If ballasts are not clearly labelled as “non-PCB” or are suspected to contain PCBs, package, and ship ballasts for destruction at a federally permitted facility. As per the PCB Regulation (SOR/2008-273), all PCB light ballasts must be removed from service and properly disposed of by December 31, 2025.

6.0 **TERMS AND LIMITATIONS**

This work was performed subject to the Terms and Limitations presented or referenced in the proposal for this project.

Information provided by Pinchin is intended for Client use only. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law. Any use by a third party of reports or documents authored by Pinchin or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.

7.0 **REFERENCES**

The following legislation and documents were referenced in completing the assessment and this report:

1. Asbestos on Construction Projects and in Buildings and Repair Operations, Ontario Regulation 278/05.
2. Designated Substances, Ontario Regulation 490/09.
3. Lead on Construction Projects, Ministry of Labour Guidance Document.

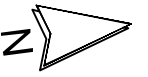


4. The Environmental Abatement Council of Canada (EACC) Lead Guideline for Construction, Renovation, Maintenance or Repair.
5. Ministry of the Environment Regulation, R.R.O. 1990 Reg. 347 as amended.
6. Ministry of the Environment Regulation, R.R.O. 1990 Reg. 362 as amended.
7. Silica on Construction Projects, Ministry of Labour Guidance Document.
8. Alert – Mould in Workplace Buildings, Ontario Ministry of Labour.

\\PIN-HAM-FS02\job\320000s\0320572.000 HAMILTON-WENT,Various2023Pr,ASB,CONS\0320572.021
HWDSB,HessStES,BenchmarkReno,HAZ,ASSMT\Deliverables\320572.021 HBMA Report P01947 Hess Street Elementary ES HWDSB Feb 22 2024.docx

Template: Master Report for Hazardous Materials Assessment (Pre-Construction), HAZ, October 31, 2022

APPENDIX I
Drawings



LEGEND

- ASSESSED AREA
- (X) PINCHIN LOCATION NUMBER
- (C) ASBESTOS BULK SAMPLE
- (▲) LEAD BULK SAMPLE
- (M) VERMICULITE DRILLHOLE
- ASBESTOS-CONTAINING MATERIALS:
- (S) SINK MASTIC
- CEILING TILES
- DRYWALL JOINT COMPOUND ON WALLS
- CEILING TEXTURED PLASTER FINISH
- TAR ON ROOF
- VINYL FLOOR TILES

FOR CLARITY, THE FOLLOWING ASBESTOS-CONTAINING MATERIALS, ARE PRESENT IN THE ASSESSED AREA, BUT HAVE NOT BEEN HATCHED ON THE DRAWING:

- DRYWALL JOINT COMPOUND ON CEILINGS
- PAINT

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.



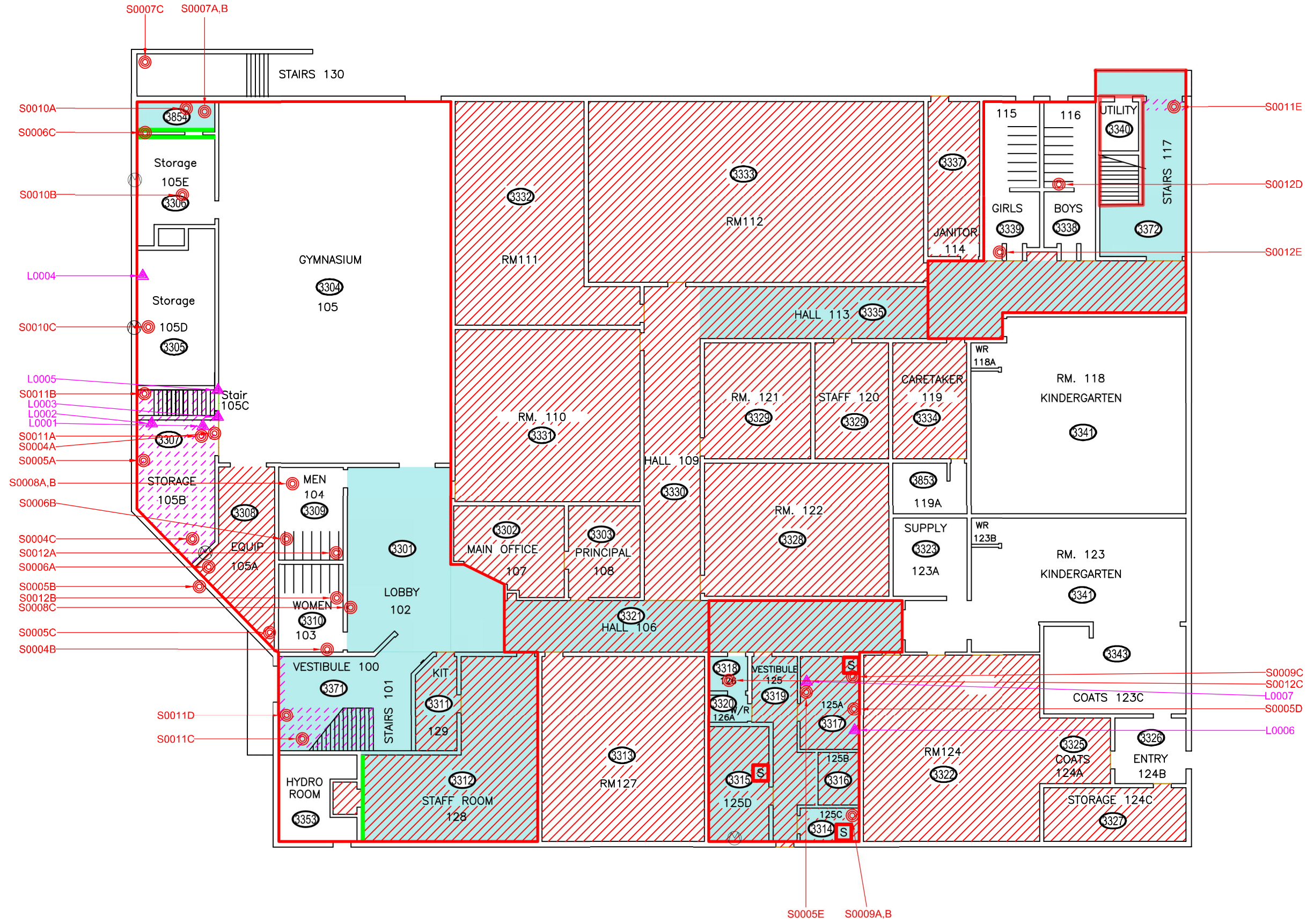
PROJECT NAME:
HAZARDOUS BUILDING MATERIALS ASSESSMENT

CLIENT NAME:
HAMILTON-WENTWORTH DISTRICT SCHOOL BOARD

PROJECT LOCATION:
HESS STREET ELEMENTARY SCHOOL, 107 HESS STREET NORTH, HAMILTON, ONTARIO

FIGURE NAME:
GROUND FLOOR PLAN

PROJECT NUMBER: 320572.021	SCALE: NOT TO SCALE
DRAWN BY: NJ	REVIEWED BY: MM
DATE: JANUARY 2024	FIGURE NUMBER: 1 OF 3



- S0007C
- S0007A,B
- S0010A
- S0006C
- S0010B
- L0004
- S0010C
- L0005
- S0011B
- L0003
- L0002
- L0001
- S0011A
- S0004A
- S0005A
- S0008A,B
- S0006B
- S0004C
- S0012A
- S0006A
- S0005B
- S0012B
- S0008C
- S0005C
- S0004B

- S0011E
- S0012D
- S0012E

- S0009C
- S0012C
- L0007
- S0005D
- L0006

- S0005E
- S0009A,B



LEGEND

- ASSESSED AREA
- X PINCHIN LOCATION NUMBER
- ASBESTOS BULK SAMPLE
- ▲ LEAD BULK SAMPLE
- M VERMICULITE DRILLHOLE
- ASBESTOS-CONTAINING MATERIALS:
- S SINK MASTIC
- CEILING TILES
- DRYWALL JOINT COMPOUND ON WALLS
- CEILING TEXTURED PLASTER FINISH
- TAR ON ROOF
- VINYL FLOOR TILES

FOR CLARITY, THE FOLLOWING ASBESTOS-CONTAINING MATERIALS, ARE PRESENT IN THE ASSESSED AREA, BUT HAVE NOT BEEN HATCHED ON THE DRAWING:

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- PAINT

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LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.



PROJECT NAME:
HAZARDOUS BUILDING MATERIALS ASSESSMENT

CLIENT NAME:
HAMILTON-WENTWORTH DISTRICT SCHOOL BOARD

PROJECT LOCATION:
HESS STREET ELEMENTARY SCHOOL, 107 HESS STREET NORTH, HAMILTON, ONTARIO

FIGURE NAME:
SECOND FLOOR PLAN

PROJECT NUMBER:
320572.021

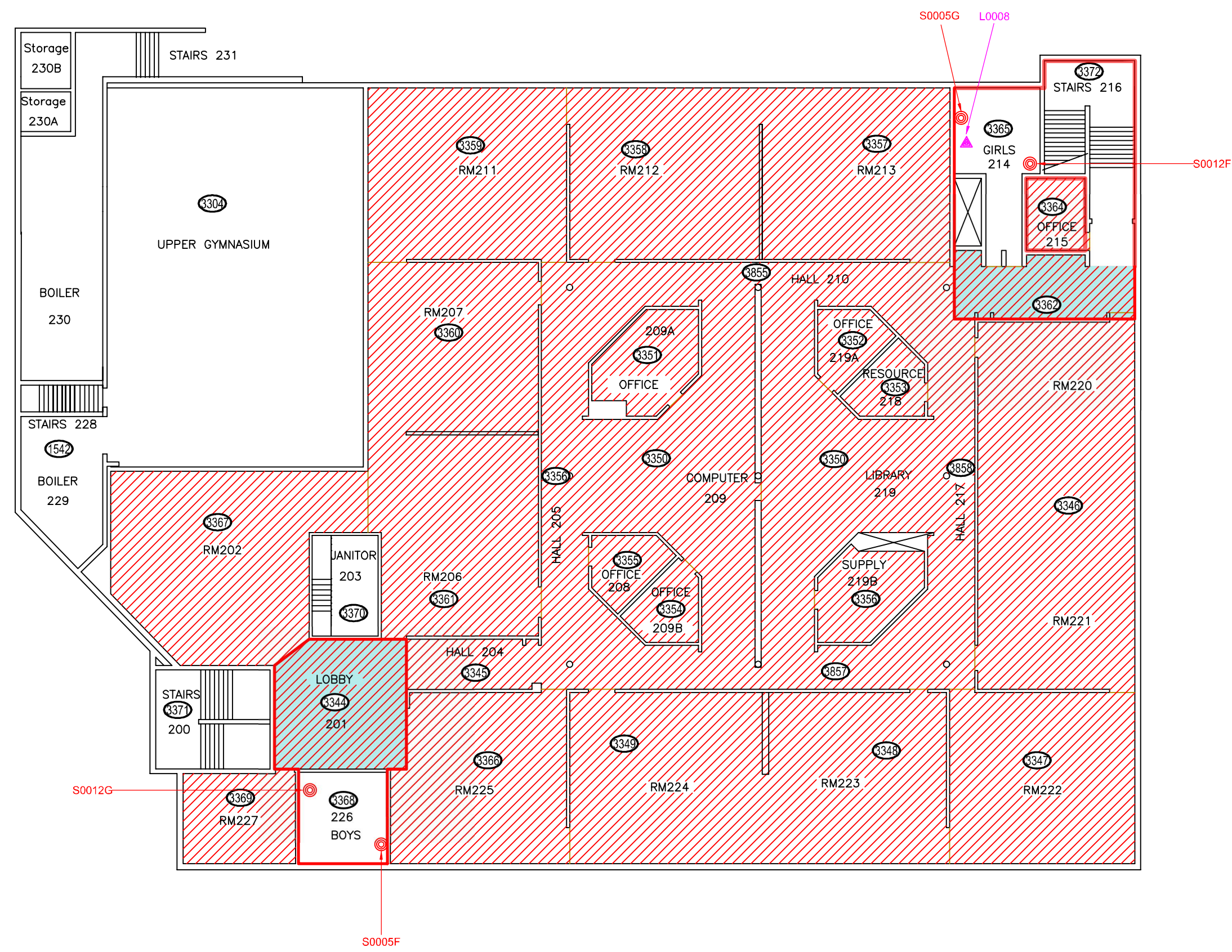
SCALE:
NOT TO SCALE

DRAWN BY:
NJ

REVIEWED BY:
MM












DATE:
JANUARY 2024

FIGURE NUMBER:
2 OF 3





LEGEND

-  ASSESSED AREA
-  PINCHIN LOCATION NUMBER
-  ASBESTOS BULK SAMPLE
-  LEAD BULK SAMPLE
-  VERMICULITE DRILLHOLE
- ASBESTOS-CONTAINING MATERIALS:
 -  SINK MASTIC
 -  CEILING TILES
 -  DRYWALL JOINT COMPOUND ON WALLS
 -  CEILING TEXTURED PLASTER FINISH
 -  TAR ON ROOF
 -  VINYL FLOOR TILES

FOR CLARITY, THE FOLLOWING ASBESTOS-CONTAINING MATERIALS, ARE PRESENT IN THE ASSESSED AREA, BUT HAVE NOT BEEN HATCHED ON THE DRAWING:

- DRYWALL JOINT COMPOUND ON CEILINGS
- PAINT

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.



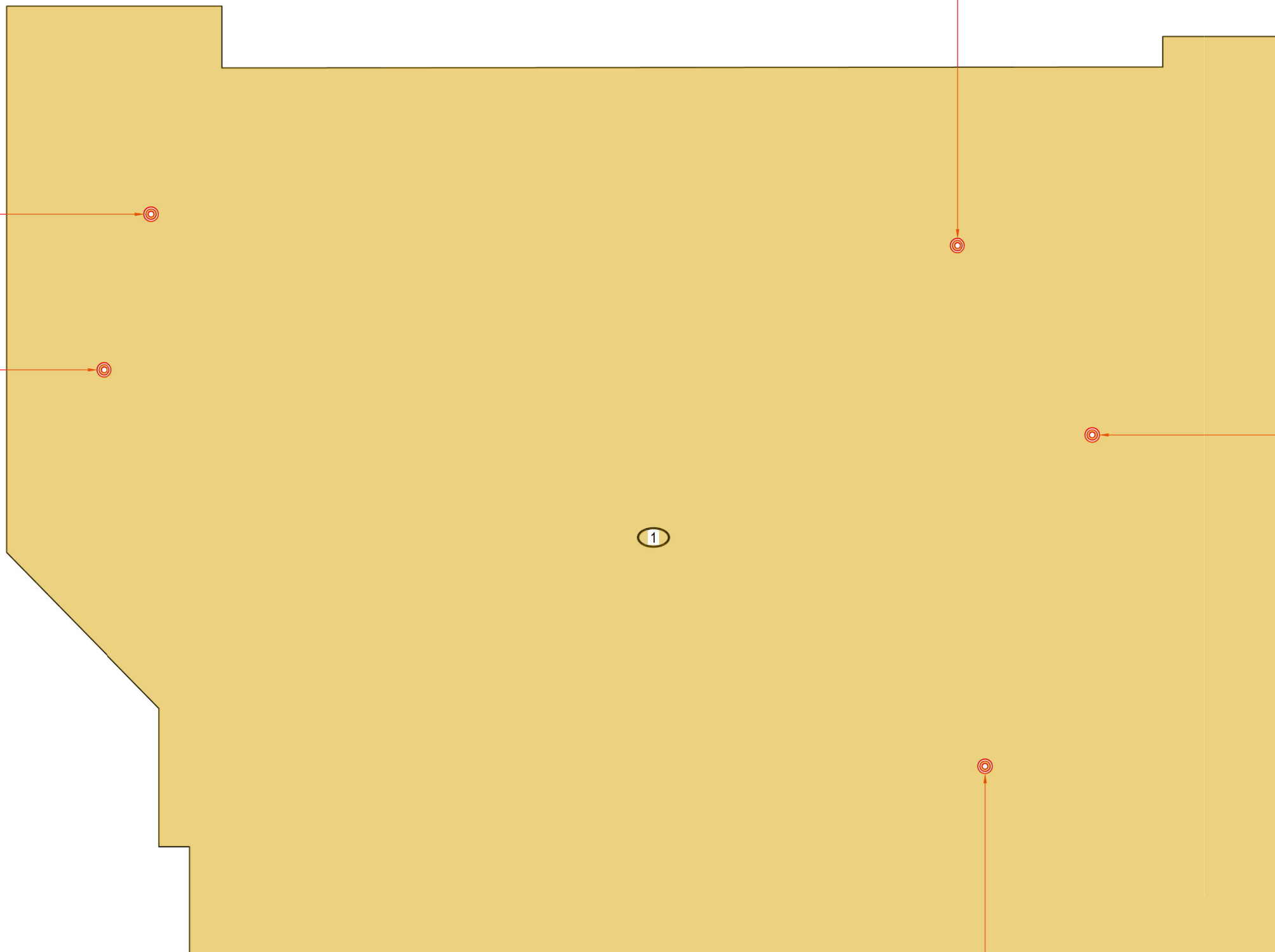
PROJECT NAME:
HAZARDOUS BUILDING MATERIALS ASSESSMENT

CLIENT NAME:
HAMILTON-WENTWORTH DISTRICT SCHOOL BOARD

PROJECT LOCATION:
HESS STREET ELEMENTARY SCHOOL, 107 HESS STREET NORTH, HAMILTON, ONTARIO

FIGURE NAME:
ROOF PLAN

PROJECT NUMBER: 320572.021	SCALE: NOT TO SCALE
DRAWN BY: NJ	REVIEWED BY: MM
DATE: JANUARY 2024	FIGURE NUMBER: 3 OF 3



S0002A

S0003A,B

S0003C

S0002B

1

S0002C

APPENDIX II-A
Asbestos Analytical Certificates



Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and
40 CFR, Part 763, Subpart E, App.E



Customer: Pinchin Ltd.
151 York Boulevard Suite 200
Hamilton, ON L8R 3M2

Attn: Jessica Cozzitorto
Justin Appleby

Lab Order ID: 10039843
Analysis: PLM
Date Received: 12/22/2023
Date Reported: 01/03/2024

Project: HWDSB Hess Street Elementary

Sample ID	Description	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes
Lab Sample ID	Lab Notes				Treatment
S0003A	Tar,Pipe Penetrations,Loc:1,Roof	8% Chrysotile		92% Other	Black Non-Fibrous Homogeneous
10039843_0001					Dissolved
S0003B	Tar,Pipe Penetrations,Loc:1,Roof	Not Analyzed			
10039843_0002					
S0003C	Tar,Pipe Penetrations,Loc:1,Roof	Not Analyzed			
10039843_0003					
S0004A - A	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With Brown Fleck,Loc:3307,Storage and	None Detected		100% Other	Beige Non-Fibrous Homogeneous
10039843_0004	tile				Dissolved
S0004A - B	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With Brown Fleck,Loc:3307,Storage and	None Detected		100% Other	Black Non-Fibrous Homogeneous
10039843_0055	mastic				Dissolved
S0004B - A	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With Brown Fleck,Loc:3308,Equipment R	None Detected		100% Other	Beige Non-Fibrous Homogeneous
10039843_0005	tile				Dissolved
S0004B - B	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With Brown Fleck,Loc:3308,Equipment R	None Detected		100% Other	Black Non-Fibrous Homogeneous
10039843_0056	mastic				Dissolved
S0004C - A	Floor,Vinyl Floor Tile And Mastic,12x12 Beige With Brown Fleck,Loc:3307,Storage and	None Detected		100% Other	Beige Non-Fibrous Homogeneous
10039843_0006	tile - ashed				Ashed

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogenous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Byron Stroble (33)

Analyst

Approved Signatory



Bulk Asbestos Analysis

By Polarized Light Microscopy
 EPA Method: 600/R-93/116 and
 40 CFR, Part 763, Subpart E, App.E



Customer: Pinchin Ltd.
 151 York Boulevard Suite 200
 Hamilton, ON L8R 3M2

Project: HWDSB Hess Street Elementary

Attn: Jessica Cozzitorto
 Justin Appleby

Lab Order ID: 10039843
Analysis: PLM
Date Received: 12/22/2023
Date Reported: 01/03/2024

Sample ID	Description	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes
Lab Sample ID	Lab Notes				Treatment
S0004C - B	Floor, Vinyl Floor Tile And Mastic, 12x12 Beige With Brown Fleck, Loc:3307, Storage and	None Detected		100% Other	Black Non-Fibrous Homogeneous
10039843_0057	mastic				Dissolved
S0005A	Wall, Paint, Concrete Block, Loc:3307, Storage and Stairs	2% Chrysotile		98% Other	White, Gray Non-Fibrous Heterogeneous
10039843_0007					Dissolved, Crushed
S0005B	Wall, Paint, Concrete Block, Loc:3308, Equipment Room	Not Analyzed			
10039843_0008					
S0005C	Wall, Paint, Concrete Block, Loc:3301, Lobby	Not Analyzed			
10039843_0009					
S0005D	Wall, Paint, Concrete Block, Loc:3317, Staff Room	Not Analyzed			
10039843_0010					
S0005E	Wall, Paint, Concrete Block, Loc:3319, Vestibule	Not Analyzed			
10039843_0011					
S0005F	Wall, Paint, Concrete Block, Loc:3368, Boys Washroom	Not Analyzed			
10039843_0012					
S0005G	Wall, Paint, Concrete Block, Loc:3365, Girls Washroom	Not Analyzed			
10039843_0013					

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogenous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Byron Stroble (33)

Analyst

Approved Signatory



Bulk Asbestos Analysis

By Polarized Light Microscopy
 EPA Method: 600/R-93/116 and
 40 CFR, Part 763, Subpart E, App.E



Customer: Pinchin Ltd.
 151 York Boulevard Suite 200
 Hamilton, ON L8R 3M2

Project: HWDSB Hess Street Elementary

Attn: Jessica Cozzitorto
 Justin Appleby

Lab Order ID: 10039843
Analysis: PLM
Date Received: 12/22/2023
Date Reported: 01/03/2024

Sample ID	Description	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes
Lab Sample ID	Lab Notes				Treatment
S0006A	Bulkhead,Drywall Compound,Loc:3308,Equipment Room	3% Chrysotile		97% Other	Gray Non-Fibrous Homogeneous
10039843_0014					Teased
S0006B	Ceiling,Drywall And Joint Compound,Loc:3309,Men's Changeroom	Not Analyzed			
10039843_0015					
S0006C	Wall,Drywall And Joint Compound,Loc:3854,Storage	Not Analyzed			
10039843_0016					
S0006D	Ceiling,Drywall And Joint Compound,Loc:3368,Boys Washroom	Not Analyzed			
10039843_0017					
S0006E	Ceiling,Drywall And Joint Compound,Loc:3365,Girls Washroom	Not Analyzed			
10039843_0018					
S0007A - A	Floor,Vinyl Floor Tile And Mastic,12x12 Grey With Brown Streaks,Loc:3854,Storage	4% Chrysotile		96% Other	Gray Non-Fibrous Homogeneous
10039843_0019	tile				Dissolved
S0007A - B	Floor,Vinyl Floor Tile And Mastic,12x12 Grey With Brown Streaks,Loc:3854,Storage	None Detected		100% Other	Black Non-Fibrous Homogeneous
10039843_0058	mastic				Dissolved
S0007B - A	Floor,Vinyl Floor Tile And Mastic,12x12 Grey With Brown Streaks,Loc:3854,Storage	Not Analyzed			
10039843_0020	tile				

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogenous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Byron Stroble (33)

Analyst

Approved Signatory



Bulk Asbestos Analysis

By Polarized Light Microscopy
 EPA Method: 600/R-93/116 and
 40 CFR, Part 763, Subpart E, App.E



Customer: Pinchin Ltd.
 151 York Boulevard Suite 200
 Hamilton, ON L8R 3M2

Attn: Jessica Cozzitorto
 Justin Appleby

Lab Order ID: 10039843
Analysis: PLM
Date Received: 12/22/2023
Date Reported: 01/03/2024

Project: HWDSB Hess Street Elementary

Sample ID	Description	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes
Lab Sample ID	Lab Notes				Treatment
S0007B - B	Floor, Vinyl Floor Tile And Mastic, 12x12 Grey With Brown Streaks, Loc:3854, Storage	None Detected		100% Other	Black
10039843_0059	mastic				Non-Fibrous
					Homogeneous
					Dissolved
S0007C - A	Floor, Vinyl Floor Tile And Mastic, 12x12 Grey With Brown Streaks, Loc:3854, Storage	Not Analyzed			
10039843_0021	tile				
S0007C - B	Floor, Vinyl Floor Tile And Mastic, 12x12 Grey With Brown Streaks, Loc:3854, Storage	None Detected		100% Other	Black
10039843_0060	mastic				Non-Fibrous
					Homogeneous
					Dissolved
S0008A	Floor, Terrazzo, Loc:3309, Men's Changeroom	None Detected		100% Other	Gray
10039843_0022					Non-Fibrous
					Homogeneous
					Crushed
S0008B	Floor, Terrazzo, Loc:3309, Men's Changeroom	None Detected		100% Other	Gray
10039843_0023					Non-Fibrous
					Homogeneous
					Crushed
S0008C	Floor, Terrazzo, Loc:3310, Women's Changeroom	None Detected		100% Other	Gray
10039843_0024					Non-Fibrous
					Homogeneous
					Crushed
S0009A	Sink, Mastic, Gold, Loc:3317, Staff Room	4% Chrysotile		96% Other	Gold
10039843_0025					Non-Fibrous
					Homogeneous
					Dissolved
S0009B	Sink, Mastic, Gold, Loc:3317, Staff Room	Not Analyzed			
10039843_0026					

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogeneous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Byron Stroble (33)

Analyst

Approved Signatory



Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and
40 CFR, Part 763, Subpart E, App.E



Customer: Pinchin Ltd.
151 York Boulevard Suite 200
Hamilton, ON L8R 3M2

Attn: Jessica Cozzitorto
Justin Appleby

Lab Order ID: 10039843

Analysis: PLM

Date Received: 12/22/2023

Date Reported: 01/03/2024

Project: HWDSB Hess Street Elementary

Sample ID	Description	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes
Lab Sample ID	Lab Notes				Treatment
S0009C	Sink,Mastic, Gold,Loc:3314,Storage	Not Analyzed			
10039843_0027					

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogenous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.


Byron Stroble (33)

Analyst

Approved Signatory

10039843

Version 1-15-2012

Client: Pinchin Ltd. Contact: Justin Appleby / Jessica Cozzitorto Address: ON Phone: Fax: Email: jappleby@pinchin.com jcozzitorto@pinchin.com	<p align="center">*Instructions: Use Column "B" for your contact info</p> <p align="center">To See an Example Click the bottom Example Tab.</p> <p align="center">27</p> <p>Begin Samples with a "<<" above the first sample</p> <p align="center">and end with a ">>" below the last sample. Only Enter your data on the first sheet "Sheet1"</p> <p align="center"><i>Note: Data 1 and Data 2 are optional fields that do not show up on the official report, however they will be included in the electronic data returned to you to facilitate your reintegration of the report data.</i></p>	<p align="center">Scientific Analytical</p>  <p align="center">Institute</p> <p align="center">4604 Dundas Dr. Greensboro, NC 27407 Phone: 336.292.3888 Fax: 336.292.3313 Email: lab@sailab.com</p>
Project: HWDSB Hess Street Elementary Stop positive on all samples. Perform ashing on third vinyl floor tile if first two are ND.		
Client Notes:		
P.O. #: 320572.021 Date Submitted: 12-20-2023		
Analysis: PLM BULK EPA 600 TurnAroundTime: Regular 5 days		

Sample Number	Data 1 (Lab use only)	Sample Description	Data 2 (Lab use only)
<<			
S0003A		Tar,Pipe Penetrations,Loc:1,Roof	
S0003B		Tar,Pipe Penetrations,Loc:1,Roof	
S0003C		Tar,Pipe Penetrations,Loc:1,Roof	
S0004A		Floor,Vinyl Floor Tile And Mastic,12x12 Beige With Brown Fleck,Loc:3307,Storage and Stairs	
S0004B		Floor,Vinyl Floor Tile And Mastic,12x12 Beige With Brown Fleck,Loc:3308,Equipment Room	
S0004C		Floor,Vinyl Floor Tile And Mastic,12x12 Beige With Brown Fleck,Loc:3307,Storage and Stairs	
S0005A		Wall,Paint,Concrete Block,Loc:3307,Storage and Stairs	
S0005B		Wall,Paint,Concrete Block,Loc:3308,Equipment Room	
S0005C		Wall,Paint,Concrete Block,Loc:3301,Lobby	
S0005D		Wall,Paint,Concrete Block,Loc:3317,Staff Room	
S0005E		Wall,Paint,Concrete Block,Loc:3319,Vestibule	
S0005F		Wall,Paint,Concrete Block,Loc:3368,Boys Washroom	
S0005G		Wall,Paint,Concrete Block,Loc:3365,Girls Washroom	
S0006A		Bulkhead,Drywall Compound,Loc:3308,Equipment Room	
S0006B		Ceiling,Drywall And Joint Compound,Loc:3309,Men's Changeroom	
S0006C		Wall,Drywall And Joint Compound,Loc:3854,Storage	
S0006D		Ceiling,Drywall And Joint Compound,Loc:3368,Boys Washroom	
S0006E		Ceiling,Drywall And Joint Compound,Loc:3365,Girls Washroom	
S0007A		Floor,Vinyl Floor Tile And Mastic,12x12 Grey With Brown Streaks,Loc:3854,Storage	
S0007B		Floor,Vinyl Floor Tile And Mastic,12x12 Grey With Brown Streaks,Loc:3854,Storage	
S0007C		Floor,Vinyl Floor Tile And Mastic,12x12 Grey With Brown Streaks,Loc:3854,Storage	
S0008A		Floor,Terrazzo,Loc:3309,Men's Changeroom	
S0008B		Floor,Terrazzo,Loc:3309,Men's Changeroom	
S0008C		Floor,Terrazzo,Loc:3310,Wömen's Changeroom	
S0009A		Sink,Mastic, Gold,Loc:3317,Staff Room	
S0009B		Sink,Mastic, Gold,Loc:3317,Staff Room	
S0009C		Sink,Mastic, Gold,Loc:3314,Storage	
>>			

Accepted Rejected

Bohulley *12/20*

1030A



Pinchin Ltd. Asbestos Laboratory *Certificate of Analysis*

Project Name: HWDSB, Hess Street Elementary, ON
Project No.: 0320572.021
Prepared For: J. Appleby / J. Cozzitorto

Lab Reference No.: b306175
Analyst(s): C. Luong

Date Received: December 22, 2023 **Samples Submitted:** 3
Date Analyzed: January 8, 2024 **Phases Analyzed:** 16

The Pinchin Ltd. Mississauga asbestos laboratory is accredited by the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP Lab Code 101270-0) for the 'EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples,' and the 'EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials'; and meets all requirements of ISO/IEC 17025:2017. The Pinchin asbestos laboratory uses the aforementioned methods of analysis.

Bulk samples are checked visually and scanned under a stereomicroscope. Slides are prepared and observed under a Polarized Light Microscope (PLM) at magnifications of 40X, 100X or 400X as appropriate. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the percentage of asbestos present. A reported concentration of less than (<) the regulatory threshold indicates the presence of confirmed asbestos in trace quantities, limited to only a few fibres or fibre bundles in an entire sample. This method complies with provincial regulatory requirements where applicable. Multiple phases within a sample are analyzed and reported separately.

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three months. Samples may be retrieved, upon request, for re-examination at any time during that period.

This report relates only to the items tested.

This report relates only to the items tested and is valid only when signed with a protected, authorized, electronic signature. This report may not be reproduced, except in full, without the written approval of Pinchin Ltd. The client may not use this report to claim product endorsement by NVLAP or any agency of the U.S. Government. Internal verification studies, quality assurance / control data and laboratory documentation on measurement uncertainty are available upon request.



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: HWDSB, Hess Street Elementary, ON
 Project No.: 0320572.021
 Prepared For: J. Appleby / J. Cozzitorto

Lab Reference No.: b306175
 Date Analyzed: January 8, 2024

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)			
		ASBESTOS		OTHER	
S0002A Roofing Material, Roof Core, Loc:1, Roof	6 Phases:				
	a) Non-homogeneous, black, tar material on the surface of man-made vitreous fibres.	Chrysotile	0.5-5%	Man-Made Vitreous Fibres	0.5-5%
				Tar and other non-fibrous	> 75%
	b) Non-homogeneous, black, tar material.	None Detected		Man-Made Vitreous Fibres	0.5-5%
				Tar and other non-fibrous	> 75%
	c) Non-homogeneous, brown, tar paper with woven fibres.	None Detected		Cellulose	> 75%
			Man-Made Vitreous Fibres	5-10%	
			Tar and other non-fibrous	10-25%	
d) Homogeneous, black, layered, tar material.	None Detected		Tar and other non-fibrous	> 75%	
e) Homogeneous, black, layered, hard, tar-impregnated, compressed, fibrous material.	None Detected		Cellulose	50-75%	
			Synthetic Fibres	0.5-5%	
			Hair	0.5-5%	
			Tar and other non-fibrous	25-50%	
f) Homogeneous, black, textured, tar material.	None Detected		Tar and other non-fibrous	> 75%	
Comments:	Man-made vitreous fibres are present on the surface of this sample.				



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: HWDSB, Hess Street Elementary, ON
 Project No.: 0320572.021
 Prepared For: J. Appleby / J. Cozzitorto

Lab Reference No.: b306175
 Date Analyzed: January 8, 2024

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S0002B Roofing Material, Roof Core, Loc:1, Roof	5 Phases:		
	a) Non-homogeneous, black, tar material.	None Detected	Man-Made Vitreous Fibres 0.5-5% Tar and other non-fibrous >75%
	b) Non-homogeneous, brown, tar paper with woven fibres.	None Detected	Cellulose > 75% Man-Made Vitreous Fibres 5-10% Tar and other non-fibrous 10-25%
	c) Homogeneous, black, layered, tar material.	None Detected	Tar and other non-fibrous > 75%
	d) Homogeneous, black, layered, hard, tar-impregnated, compressed, fibrous material.	None Detected	Cellulose 50-75% Synthetic Fibres 0.5-5% Hair 0.5-5% Tar and other non-fibrous 25-50%
e) Homogeneous, black, textured, tar material.	None Detected	Tar and other non-fibrous > 75%	
Comments:	Man-made vitreous fibres are present on the surface of this sample.		



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: HWDSB, Hess Street Elementary, ON
 Project No.: 0320572.021
 Prepared For: J. Appleby / J. Cozzitorto

Lab Reference No.: b306175
 Date Analyzed: January 8, 2024

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S0002C Roofing Material, Roof Core, Loc:1, Roof	5 Phases:		
	a) Homogeneous, brown, tar paper.	None Detected	Cellulose > 75% Tar and other non-fibrous 10-25%
	b) Homogeneous, black, tar material.	None Detected	Tar and other non-fibrous > 75%
	c) Homogeneous, black, layered, hard, tar-impregnated, compressed, fibrous material.	None Detected	Cellulose 50-75% Synthetic Fibres 0.5-5% Hair 0.5-5% Tar and other non-fibrous 25-50%
	d) Homogeneous, black, layered, tar material.	None Detected	Tar and other non-fibrous > 75%
	e) Homogeneous, black, textured, tar material.	None Detected	Tar and other non-fibrous > 75%
Comments:	Man-made vitreous fibres are present on the surface of this sample.		

Reviewed by:

Reporting Analyst:

Analyzed by: C.L.
 Reviewed by: JRB
 Report Sent by: KD

16

**Pinchin Ltd. - Asbestos Laboratory
 Internal Asbestos Bulk Sample Chain of Custody**

Client Name:	HWDSB			Project Address:	ON		
Portfolio/Building No:	Hess Street Elementary			Pinchin File:	320572.021		
Submitted by:	Justin Appleby			Email:	jappleby@pinchin.com		
CC Results to:	Jessica Cozzitorto			CC Email:	jcozzitorto@pinchin.com		
Date Submitted:	December	20	2023	Required by:	January	2	2024
# of Samples:	3			Priority:	5 Day Turnaround		
Year of Building Construction (Mandatory, Years ONLY):	1973						
Do NOT Stop on Positive (Sample Numbers):							
Pinchin Group Company (Mandatory Field):	Pinchin						
HMIS2 Building Reference #:	128393/2023111828087437						
To be Completed by Lab Personnel Only:							
Lab Reference #:	b306175KB			Time:	24 hour clock		
Received by:	DEC 22 2023			Date:	Month	Day	Year
Name(s) of Analyst(s):	C.L.			Jan 08 2023			
Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)				
S	0002	A	Roofing Material, Roof Core, Loc: 1, Roof a) CH0.5-57. b) ND c) ND d) ND e) ND f) ND				
S	0002	B	Roofing Material, Roof Core, Loc: 1, Roof a) ND b) ND c) ND d) ND e) ND				
S	0002	C	Roofing Material, Roof Core, Loc: 1, Roof a) ND b) ND c) ND d) ND e) ND				



Your Project #: 320572.021

Attention: Jessica Cozzitorto

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2024/02/21

Report #: R8036141

Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C445130

Received: 2024/02/14, 09:41

Sample Matrix: Solid
Samples Received: 15

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Asbestos by PLM - 0.5 RDL (1)	12	N/A	2024/02/20	COR3SOP-00002	EPA 600R-93/116
Asbestos by PLM - 0.5 RDL (1)	3	N/A	2024/02/21	COR3SOP-00002	EPA 600R-93/116

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Bureau Veritas' Asbestos Laboratory is accredited by NVLAP for bulk asbestos analysis by polarized light microscopy, NVLAP Code 600136-0.

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Bureau Veritas' scope of accreditation includes EPA -- 40 CFR Appendix E to Subpart E of Part 763, "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" and EPA-600/R-93/116: "Method for the Determination of Asbestos in Bulk Building Materials".

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



Your Project #: 320572.021

Attention: Jessica Cozzitorto

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2024/02/21
Report #: R8036141
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C445130

Received: 2024/02/14, 09:41

(1) P.O.B. - Percent of Bulk

When Asbestos data is reported with other data, this report contains data that are not covered by the NVLAP accreditation.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Nilushi Mahathantila, Project Manager
Email: Nilushi.Mahathantila@bureauveritas.com
Phone# (905) 817-5700

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This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.



Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0010A					
CEILING, PLASTER, SMOOTH, LOC: 3854, STORAGE					
Bureau Veritas ID: YJL644		Date Analyzed: 2024/02/20			
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	10	Homogeneous white plaster	Not Detected		Non-Fibrous
Layer 2	90	Non-homogeneous light grey/white plaster/powdery material	Not Detected		Non-Fibrous Perlite

S0010B					
CEILING, PLASTER, SMOOTH, LOC: 3306, STORAGE					
Bureau Veritas ID: YJL645		Date Analyzed: 2024/02/20			
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	5	Non-homogeneous white drywall joint compound	Not Detected		Non-Fibrous
Layer 2	40	Homogeneous white plaster	Not Detected		Non-Fibrous
Layer 3	55	Non-homogeneous light grey plaster	Not Detected		Non-Fibrous Perlite

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
 Date Format : yyyy/mm/dd



Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0010C					
CEILING, PLASTER, SMOOTH, LOC: 3305, STORAGE					
Bureau Veritas ID: YJL646		Date Analyzed: 2024/02/20			
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	5	Non-homogeneous white drywall joint compound	Not Detected		Non-Fibrous
Layer 2	40	Homogeneous white plaster	Not Detected		Non-Fibrous
Layer 3	55	Non-homogeneous light grey plaster	Not Detected		Non-Fibrous Perlite

S0011A					
CEILING, PLASTER, TEXTURED, LOC: 3307, STORAGE AND STAIRS					
Bureau Veritas ID: YJL647		Date Analyzed: 2024/02/20			
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	100	Non-homogeneous light grey/white plaster/powdery material	Not Detected		Non-Fibrous Perlite

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
 Date Format : yyyy/mm/dd



BUREAU VERITAS

Bureau Veritas Job #: C445130
Report Date: 2024/02/21

Pinchin Ltd
Client Project #: 320572.021
Sampler Initials: MM

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0011B CEILING,PLASTER,TEXTURED,UNDER STAIRS,LOC:3307,STORAGE AND STAIRS						
Bureau Veritas ID: YJL648		Date Analyzed: 2024/02/20				
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>		<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	100	Non-homogeneous light grey/white plaster/powdery material	Not Detected			Non-Fibrous Perlite

S0011C CEILING,PLASTER,TEXTURED,LOC:3371,VESTIBULE						
Bureau Veritas ID: YJL649		Date Analyzed: 2024/02/21				
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>		<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	100	Non-homogeneous white plaster/powdery material	Chrysotile	0.5%		Non-Fibrous

S0011D CEILING,PLASTER,TEXTURED,LOC:3371,VESTIBULE						
Bureau Veritas ID: YJL650		Date Analyzed: 2024/02/21				
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>		<u>Other Fibres</u>	<u>Particulate</u>
Layer 1			N/A			
		Comment: Not Analyzed - Positive Stop				

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0011E					
CEILING,PLASTER,TEXTURED,LOC:3372,STAIRS 117					
Bureau Veritas ID: YJL651		Date Analyzed: 2024/02/21			
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1			N/A		
Comment: Not Analyzed - Positive Stop					

S0012A CEILING,PLASTER,LOC:3309,MEN'S CHANGEROOM					
Bureau Veritas ID: YJL652		Date Analyzed: 2024/02/20			
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	2	Homogeneous white plaster	Not Detected		Non-Fibrous
Layer 2	98	Non-homogeneous light grey/white plaster/powdery material	Not Detected		Non-Fibrous Perlite

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
 Date Format : yyyy/mm/dd



Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0012B CEILING,PLASTER,LOC:3310,WOMEN'S CHANGEROOM					
Bureau Veritas ID: YJL653		Date Analyzed: 2024/02/20			
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	30	Homogeneous white plaster	Not Detected		Non-Fibrous
Layer 2	70	Non-homogeneous light grey/white plaster/powdery material	Not Detected		Non-Fibrous Perlite

S0012C CEILING,PLASTER,LOC:3318,WASHROOM					
Bureau Veritas ID: YJL654		Date Analyzed: 2024/02/20			
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	30	Homogeneous white plaster	Not Detected		Non-Fibrous
Layer 2	70	Non-homogeneous light grey/white plaster/powdery material	Not Detected		Non-Fibrous Perlite

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
 Date Format : yyyy/mm/dd



Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0012D CEILING,PLASTER,LOC:3338,BOYS WASHROOM					
Bureau Veritas ID: YJL655		Date Analyzed: 2024/02/20			
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	30	Homogeneous white plaster	Not Detected		Non-Fibrous
Layer 2	70	Non-homogeneous light grey/white plaster/powdery material	Not Detected		Non-Fibrous Perlite

S0012E CEILING,PLASTER,LOC:3339,GIRLS WASHROOM					
Bureau Veritas ID: YJL656		Date Analyzed: 2024/02/20			
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	2	Homogeneous white plaster	Not Detected		Non-Fibrous
Layer 2	98	Non-homogeneous light grey/white plaster/powdery material	Not Detected		Non-Fibrous Perlite

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



BUREAU
VERITAS

Bureau Veritas Job #: C445130
Report Date: 2024/02/21

Pinchin Ltd
Client Project #: 320572.021
Sampler Initials: MM

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0012F CEILING,PLASTER,LOC:3365,GIRLS WASHROOM					
Bureau Veritas ID: YJL657		Date Analyzed: 2024/02/20			
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	5	Homogeneous white plaster	Not Detected		Non-Fibrous
Layer 2	95	Non-homogeneous light grey/white plaster/powdery material	Not Detected		Non-Fibrous Perlite

S0012G CEILING,PLASTER,LOC:3368,BOYS WASHROOM					
Bureau Veritas ID: YJL658		Date Analyzed: 2024/02/20			
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	5	Homogeneous white plaster	Not Detected		Non-Fibrous
Layer 2	95	Non-homogeneous light grey/white plaster/powdery material	Not Detected		Non-Fibrous Perlite

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



BUREAU
VERITAS

Bureau Veritas Job #: C445130
Report Date: 2024/02/21

Pinchin Ltd
Client Project #: 320572.021
Sampler Initials: MM

TEST SUMMARY

Bureau Veritas ID: YJL644
Sample ID: S0010A CEILING,PLASTER,SMOOTH,LOC:3854,STORAGE
Matrix: Solid

Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL645
Sample ID: S0010B CEILING,PLASTER,SMOOTH,LOC:3306,STORAGE
Matrix: Solid

Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL646
Sample ID: S0010C CEILING,PLASTER,SMOOTH,LOC:3305,STORAGE
Matrix: Solid

Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL647
Sample ID: S0011A CEILING,PLASTER,TEXTURED,LOC:3307,STORAGE AND STAIRS
Matrix: Solid

Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL648
Sample ID: S0011B CEILING,PLASTER,TEXTURED,UNDER STAIRS,LOC:3307,STORAGE AND STAIRS
Matrix: Solid

Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL649
Sample ID: S0011C CEILING,PLASTER,TEXTURED,LOC:3371,VESTIBULE
Matrix: Solid

Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL649 Dup
Sample ID: S0011C CEILING,PLASTER,TEXTURED,LOC:3371,VESTIBULE
Matrix: Solid

Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif



BUREAU
VERITAS

Bureau Veritas Job #: C445130
Report Date: 2024/02/21

Pinchin Ltd
Client Project #: 320572.021
Sampler Initials: MM

TEST SUMMARY

Bureau Veritas ID: YJL650
Sample ID: S0011D CEILING,PLASTER,TEXTURED,LOC:3371,VESTIBULE
Matrix: Solid
Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL651
Sample ID: S0011E CEILING,PLASTER,TEXTURED,LOC:3372,STAIRS 117
Matrix: Solid
Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL652
Sample ID: S0012A CEILING,PLASTER,LOC:3309,MEN'S CHANGEROOM
Matrix: Solid
Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL653
Sample ID: S0012B CEILING,PLASTER,LOC:3310,WOMEN'S CHANGEROOM
Matrix: Solid
Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL654
Sample ID: S0012C CEILING,PLASTER,LOC:3318,WASHROOM
Matrix: Solid
Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL655
Sample ID: S0012D CEILING,PLASTER,LOC:3338,BOYS WASHROOM
Matrix: Solid
Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL655 Dup
Sample ID: S0012D CEILING,PLASTER,LOC:3338,BOYS WASHROOM
Matrix: Solid
Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif



BUREAU
VERITAS

Bureau Veritas Job #: C445130
Report Date: 2024/02/21

Pinchin Ltd
Client Project #: 320572.021
Sampler Initials: MM

TEST SUMMARY

Bureau Veritas ID: YJL656
Sample ID: S0012E CEILING,PLASTER,LOC:3339,GIRLS WASHROOM
Matrix: Solid

Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL657
Sample ID: S0012F CEILING,PLASTER,LOC:3365,GIRLS WASHROOM
Matrix: Solid

Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif

Bureau Veritas ID: YJL658
Sample ID: S0012G CEILING,PLASTER,LOC:3368,BOYS WASHROOM
Matrix: Solid

Collected: 2024/02/09
Shipped:
Received: 2024/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	9229431	N/A		Dina Yousif



BUREAU
VERITAS

Bureau Veritas Job #: C445130
Report Date: 2024/02/21

Pinchin Ltd
Client Project #: 320572.021
Sampler Initials: MM

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C445130
Report Date: 2024/02/21

Pinchin Ltd
Client Project #: 320572.021
Sampler Initials: MM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Jon Delos Santos, Laboratory Supervisor

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.



14-Feb-24 09:41

Antonella Brasil



C445130

Analyzed by: _____

Reviewed by: _____

Report Sent by: _____

Internal Asbestos Bulk Sample Chain of Custody
 Laboratory

Client Name:	HWDSB	Project Address:	ON
Portfolio/Building No:	Hess	Pinchin File:	320572.021
Submitted by:	Michael Medeiros	Email:	mmedeiros@pinchin.com
CC Results to:	Jessica Cozzitorto	CC Email:	jcozzitorto@pinchin.com
Date Submitted:	February 09 2024	Required by:	February 16 2024
# of Samples:	15	Priority:	5 Day Turnaround
Year of Building Construction (Mandatory, Years ONLY):			
Do NOT Stop on Positive (Sample Numbers):			
Pinchin Group Company (Mandatory Field):			
			Pinchin
HMIS2 Building Reference #:			
			128393/2023111828087437
To be Completed by Lab Personnel Only:			
Lab Reference #:		Time:	24 hour clock
Received by:	FEB 13 2024	Date:	Month Day Year
Name(s) of Analyst(s):			
Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0010	A	Ceiling,Plaster,Smooth,Loc:3854,Storage
S	0010	B	Ceiling,Plaster,Smooth,Loc:3306,Storage
S	0010	C	Ceiling,Plaster,Smooth,Loc:3305,Storage
S	0011	A	Ceiling,Plaster,Textured,Loc:3307,Storage and Stairs
S	0011	B	Ceiling,Plaster,Textured, Under Stairs,Loc:3307,Storage and Stairs
S	0011	C	Ceiling,Plaster,Textured,Loc:3371,Vestibule
S	0011	D	Ceiling,Plaster,Textured,Loc:3371,Vestibule
S	0011	E	Ceiling,Plaster,Textured,Loc:3372,Stairs 117
S	0012	A	Ceiling,Plaster,Loc:3309,Men's Changeroom

W445130 0941

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0012	B	Ceiling,Plaster,Loc:3310,Women's Changeroom
S	0012	C	Ceiling,Plaster,Loc:3318,Washroom
S	0012	D	Ceiling,Plaster,Loc:3338,Boys Washroom
S	0012	E	Ceiling,Plaster,Loc:3339,Girls Washroom
S	0012	F	Ceiling,Plaster,Loc:3365,Girls Washroom
S	0012	G	Ceiling,Plaster,Loc:3368,Boys Washroom

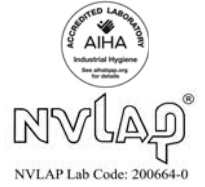
[Handwritten signature]

[Handwritten text] 09/11/20



Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020



Customer: Pinchin Environmental Ltd
11-875 Main St West
Hamilton, Ontario L8S 4R9

Attn: Damian Palus

Lab Order ID: 1111639

Analysis ID: 1111639PLM

Date Received: 8/19/2011

Project: 61677 Hess St School WO 174353

Date Reported: 8/19/2011

Sample ID	Description	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes
Lab Sample ID	Lab Notes				Treatment
001a	Boiler Room Ceiling, Location ID 1542	None Detected		100% Other	Gray Non Fibrous Heterogeneous
1111639PLM_1					Crushed
001b	Boiler Room Ceiling, Location ID 1542	None Detected		100% Other	Gray Non Fibrous Heterogeneous
1111639PLM_2					Crushed
001c	Boiler Room Ceiling, Location ID 1542	None Detected		100% Other	Gray Non Fibrous Heterogeneous
1111639PLM_3					Crushed

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogeneous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Estimated MDL is 0.1%.

Dorlos Ammerman (3)

Analyst

Nathaniel Durham, MS or Approved Signatory

111639

Client: Contact: Address: Phone: Fax: Email: Project: Client Notes: P.O. # Date Submitted: Analysis: TurnAroundTime:	Pinchin Environmental Ltd. Damian Palus 11-875 Main St. W. Hamilton, ON 905-577-6206 905-577-6207 dpalus@pinchin.com 61677 Hess St School WO 174353 PLM EPA 600/R-93/116, Stop Position Analyze Asbestos Samples to 0.5% 61677 WO 174353 August 18 2011 PLM EPA 600/R-93/116 12 hour	*Instructions: Use Column "B" for your contact info To See an Example Click the bottom Example Tab. Enter samples between "<<" and ">>" Begin Samples with a "<<" above the first sample and end with a ">>" below the last sample. Only Enter your data on the first sheet "Sheet1" as per the Ontario Regulation 278/05. Note: Data 1 and Data 2 are optional fields that do not show up on the official report, however they will be included in the electronic data returned to you to facilitate your reintegration of the report data.	Scientific Analytical Institute, Inc. 302-L Pomona Dr. Greensboro, NC 27407 Phone: 336.292.3888 Fax: 336.292.3313 Email: lab@sailab.com
---	--	---	---

Sample Number	Data 1	Sample Description	Data 2
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<<
 001a
 001b
 001c

Boiler Room Ceiling, Location ID 1542
 Boiler Room Ceiling, Location ID 1542
 Boiler Room Ceiling, Location ID 1542

DPalus 8-19 10:30A

Accepted
 Rejected



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name:	HWDSB, Hess Street School, 107 Hess Street, Hamilton		
Project No.:	115161.006		
Prepared For:	K. Tipler / J. Cozzitorto	Date Received:	October 3, 2016
Lab Reference No.:	b133946	Date Analyzed:	October 3, 2016
Analyst(s):	K. Cockburn	# Samples submitted:	3
		# Phases analyzed:	3

Method of Analysis:

EPA 600/R-93/116 - Method for the Determination of Asbestos in Bulk Building Materials dated July, 1993

Bulk samples are checked visually and scanned under a stereomicroscope. Slides are prepared and observed under a Polarized Light Microscope (PLM) at magnifications of 40X, 100X or 400X as appropriate. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the percentage of asbestos present. A reported concentration of less than (<) the regulatory threshold (see chart below) indicates the presence of confirmed asbestos in trace quantities, limited to only a few fibres or fibre bundles in an entire sample. This method complies with provincial regulatory requirements where applicable. Multiple phases within a sample are analyzed and reported separately.

Provincial Jurisdiction	Regulatory Threshold	Provincial Jurisdiction	Regulatory Threshold
Ontario, British Columbia, Nova Scotia	0.5%	Manitoba	0.1% friable 1% non-friable
Quebec	0.1%	Saskatchewan	0.5% friable 1% non-friable
Alberta, NWT, Yukon, Nunavut	1%	Newfoundland and Labrador, PEI and New Brunswick	1%

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three months. Samples may be retrieved, upon request, for re-examination at any time during that period.

Pinchin Ltd. is accredited by the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP Lab Code 101270-0) for the 'EPA-600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples,' and the 'EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials'; and meets all requirements of ISO/IEC 17025:2005.

This report relates only to the items tested.

NOTE: *This test report may not be reproduced, except in full, without the written approval of the laboratory. The client may not use this report to claim product endorsement by NVLAP or any agency of the U.S. Government. This report is valid only when signed in blue ink by the analyst. Vinyl asbestos floor tiles contain very fine fibres of asbestos and may be missed by some laboratories using the PLM method. Internal verification studies performed by Pinchin indicate that the chance of missing asbestos in floor tiles is no higher than about 2%. The vinyl tile study and laboratory documentation on measurement uncertainty is available upon request. The analysis of dust samples by PLM cannot be used as an indicator of past or present airborne asbestos fibre levels.*



Pinchin Ltd. Asbestos Laboratory
Certificate of Analysis

Project Name: HWDSB, Hess Street School, 107 Hess Street, Hamilton
Project No.: 115161.006
Prepared For: K. Tipler / J. Cozzitorto

Lab Reference No.: b133946
Date Analyzed: October 3, 2016

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
0001A Drywall joint compound, Second Floor, Room 206	Homogeneous, white, drywall joint compound.	None Detected	Non-Fibrous Material > 75%
0001B Drywall joint compound, Second Floor, Room 223	Homogeneous, white, drywall joint compound.	None Detected	Non-Fibrous Material > 75%
0001C Drywall joint compound, Second Floor, Room 220	Homogeneous, white, drywall joint compound.	None Detected	Non-Fibrous Material > 75%

Reviewed by:

Reporting Analyst:

Section 4 Results

Materials that were suspected of being asbestos-containing were grouped homogeneously; that is, they were grouped as to similar composition (colour, texture), system and general appearance (age, type, etc.). Collected samples were organized by the mechanical or structural system (i.e. wall, floor and ceiling materials).

Samples were also described as being friable or non-friable. Friable describes a material that is loose in composition and can be pulverized by hand pressure. Non-friable materials are materials which indicate a solid composition requiring power tools for the pulverization of the material.

4.1 Homogeneous Materials

The following table represents all of the homogeneous materials identified within Hess Street Elementary School, including the analytical results and friability of each product.

Table 1 - Homogeneous Materials within Hess Street Elementary School

Table Notes:

1. Shading of homogeneous materials indicates asbestos minerals were detected above 0.5%.
2. Complete laboratory results are provided in Appendix A.

Homogeneous Number	Location ID (OESN Functional Space Location)	Material and Building Floor	Friability	Asbestos Content and Type	Sample Number
Floor Materials					
HF-01	-	Floor Tile – 9"x 9"	Non-Friable	Chrysotile	*Not Observed
HF-02	-	Floor Tile – 12"x 12"	Non-Friable	Chrysotile	Not Sampled
HF-03	-	Floor Tile (HWDSB Renovations)	Non-Friable	Non-Asbestos	*See Appendix D
Wall Materials					
1974					
HW-01	3312 (1032)	Drywall and Joint Compound (First Floor)	Friable	1.7% Chrysotile 2.0% Chrysotile 2.3% Chrysotile	2975-34-W01 2975-34-W02 2975-34-W03
HW-02	3858 (2025)	Drywall and Joint Compound (Second Floor)	Friable	Non-Asbestos Non-Asbestos Non-Asbestos Non-Asbestos Non-Asbestos Non-Asbestos	2975-34-W04 2975-34-W05 2975-34-W06 2975-34-W07 2975-34-W08 2975-34-W09 2975-34-W10

Homogeneous Number	Location ID (OESN Functional Space Location)	Material and Building Floor	Friability	Asbestos Content and Type	Sample Number
Ceiling Materials					
1974					
HC-01	3372 (1001)	Textured Plaster	Non-Friable	0.5% Chrysotile	2975-34-C01
				Non-Asbestos	2975-34-C02
				0.7% Chrysotile	2975-34-C03
	Non-Asbestos			2975-34-C04	
	Non-Asbestos			2975-34-C05	
HC-02	3372 (1001)	Smooth Plaster Ceiling	Non-Friable	Non-Asbestos	2975-34-C06
				Non-Asbestos	2975-34-C07
	Non-Asbestos			2975-34-C08	
	Non-Asbestos			2975-34-C09	
	Non-Asbestos			2975-34-C10	
	Non-Asbestos			2975-34-C11	
3371 (1034)	Non-Asbestos	2975-34-C12			
	3368 (2009)	Non-Asbestos	2975-34-C12		
HC-03	3341 / 3343 (1010)	Ceiling Tile – 2' x 4' Pebble	Non-Friable	2% Amosite	2975-34-C13
				<1% Chrysotile	2975-34-C14
				Not Analyzed	2975-34-C15
HC-04	3341 / 3343 (1010)	Ceiling Tile – 2' x 4' Random Fissure	Non-Friable	Non-Asbestos	2975-34-C16
				Non-Asbestos	2975-34-C17
				Non-Asbestos	2975-34-C18
HC-05	3853 (1014)	Drywall and Joint Compound	Friable	Non-Asbestos	2975-34-C19
				Non-Asbestos	2975-34-C20
				Non-Asbestos	2975-34-C21
HC-06	3853 (1014)	Ceiling Tile – 2' x 4' Strata	Non-Friable	Non-Asbestos	2975-34-C22
				Non-Asbestos	2975-34-C23
				Non-Asbestos	2975-34-C24
HC-07	3344 / 3345 (2024)	Ceiling Tile – 2' x 4' Fissure on 2'	Non-Friable	Non-Asbestos	2975-34-C25
				Non-Asbestos	2975-34-C26
				Non-Asbestos	2975-34-C27

The results of the assessment and analysis indicate that **four (4)** homogeneous materials contain asbestos minerals. A summary of the asbestos-containing materials and their locations within Hess Street Elementary School are presented below in **Table 2**. A log of photographs of the materials identified to be asbestos-containing within the school can be found within **Table 3**.

Table 2 – Summary of Material Locations within Hess Street Elementary School

Table Notes:

1. Shading of homogeneous materials indicates asbestos minerals were detected above 0.5%.
2. Complete laboratory results are provided in Appendix A.

Client ID	OESN Functional Space Number and Location Identification	Material	Asbestos Content and Type	Homogeneous Number
First Floor				
3372	1001 / Stairwell	Floor Tile	Chrysotile	HF-02
		Textured Plaster (ceiling)	0.7% Chrysotile	HC-01
		Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3338	1002 / Boy's Washroom	Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3339	1003 / Girl's Washroom	Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3337	1004 / Custodial Storage	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3333	1005 / Room 106	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3332	1006 / Room 105	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3331	1007 / Room 104	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3303	1008 / Principal's Office	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3302	1009 / Main Office	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3341 / 3343	1010 / Room 107	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3324	1011 / Washroom	Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3324	1012 / Washroom	Smooth Plaster (ceiling)	Non-Asbestos	HC-02

Client ID	OESN Functional Space Number and Location Identification	Material	Asbestos Content and Type	Homogeneous Number
First Floor (Continued)				
3334	1013 / Custodial Office	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3853	1014 / Electrical Room	Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
		Drywall and Joint Compound (ceiling)	Non-Asbestos	HC-05
		Ceiling Tile 2' x 4' Strata	Non-Asbestos	HC-06
3329	1015 / Supplies	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3329	1016 / Room 122	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3328	1017 / Music Room	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3322 / 3325	1018 / Room 102	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3326	1019 / Foyer at Kindergarten	Floor Tile	Chrysotile	HF-02
		Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3327	1020 / Storage	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3342	1021 / Washroom	Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3342	1022 / Washroom	Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3323	1023 / Storage	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3319	1024 / Corridor	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03

Client ID	OESN Functional Space Number and Location Identification	Material	Asbestos Content and Type	Homogeneous Number
First Floor (Continued)				
3317	1025 / Room 120	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Strata	Non-Asbestos	HC-06
3316	1026 / Office/20A	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Strata	Non-Asbestos	HC-06
3314	1027 / Office Supply	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3315	1028 / Office	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3320	1029 / Washroom	Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3318	1030 / Food Storage	Floor Tile	Chrysotile	HF-02
		Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3313	1031 / Room 101	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3312	1032 / Staff Room	Floor Tile	Chrysotile	HF-02
		Drywall and Joint Compound (wall)	2.3% Chrysotile	HW-01
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3311	1033 / Staff Kitchen	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3371	1034 / Stairwell	Textured Plaster (ceiling)	0.7% Chrysotile	HC-01
		Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3310	1035 / Women's Washroom	Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3309	1036 / Men's Washroom	Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3304	1037 / Gym	Floor Tile	Non-Asbestos	HF-03
3308	1038 / Storage	****Unable to access at time of inspection****		

Client ID	OESN Functional Space Number and Location Identification	Material	Asbestos Content and Type	Homogeneous Number
First Floor (Continued)				
3307	1039 / Storage	Floor Tile	Non-Asbestos	HF-03
		Textured Plaster (ceiling)	0.7% Chrysotile	HC-01
3305	1040 / Girl's Locker Room	Floor Tile	Non-Asbestos	HF-03
		Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3306	1041 / Boy's Locker Room	Floor Tile	Non-Asbestos	HF-03
		Smooth Plaster (ceiling)	Non-Asbestos	HC-02
		Drywall and Joint Compound (wall)	2.3% Chrysotile	HW-01
3854	1042 / Storage (custodial)	Floor Tile	Chrysotile	HF-02
		Drywall and Joint Compound (wall)	2.3% Chrysotile	HW-01
		Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3301	1043 / Foyer (Main)	Floor Tile	Chrysotile	HF-02
3321	1044 / Corridor	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3330	1045 / Corridor	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3335	1046 / Corridor	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3340	1047 / Exterior Storage Room	****Unable to access at time of inspection****		
Second Floor				
3364	2001 / Room 207	Floor Tile	Non-Asbestos	HF-03
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3365	2002 / Girls Washroom	Floor Tile	Non-Asbestos	HF-03
		Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3357 / 3358	2003 / 12A (Room 209)	Floor Tile	Non-Asbestos	HF-03
		Drywall and Joint Compound (wall)	Non-Asbestos	HW-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03



Client ID	OESN Functional Space Number and Location Identification	Material	Asbestos Content and Type	Homogeneous Number
Second Floor (Continued)				
3359	2004 / Room 210	Floor Tile	Non-Asbestos	HF-03
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3360 / 3361	2005 / (14A) Room 211	Floor Tile	Non-Asbestos	HF-03
		Drywall and Joint Compound (wall)	Non-Asbestos	HW-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3370	2006 / Custodial Room	Drywall and Joint Compound (wall)	Non-Asbestos	HW-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3367	2007 / (Room 16) Room 212	Floor Tile	Non-Asbestos	HF-03
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3369	2008 / Room 201	Floor Tile	Chrysotile	HF-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Strata	Non-Asbestos	HC-06
3368	2009 / Boy's Washroom	Floor Tile	Non-Asbestos	HF-03
		Smooth Plaster (ceiling)	Non-Asbestos	HC-02
3366	2010 / Room 203	Floor Tile	Non-Asbestos	HF-03
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3349 / 3348	2011 / (10B) Room 204	Floor Tile	Non-Asbestos	HF-03
		Drywall and Joint Compound (wall)	Non-Asbestos	HW-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3347	2012 / (9) Room 205	Floor Tile	Non-Asbestos	HF-03
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3346	2013 / (8b) Room 206	Floor Tile	Non-Asbestos	HF-03
		Drywall and Joint Compound (wall)	Non-Asbestos	HW-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3353	2014 / (11b) Room 218 A	Floor Tile	Non-Asbestos	HF-03
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03

Client ID	OESN Functional Space Number and Location Identification	Material	Asbestos Content and Type	Homogeneous Number
Second Floor (Continued)				
3352	2015 / Library Office (218B)	Floor Tile	Non-Asbestos	HF-03
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3350	2016 / Library	Floor Tile	Non-Asbestos	HF-03
		Drywall and Joint Compound (wall)	Non-Asbestos	HW-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3356	2017 / Resource Room Room 216	Floor Tile	Non-Asbestos	HF-03
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3350	2018 / Computer Room	Floor Tile	Non-Asbestos	HF-03
		Drywall and Joint Compound (wall)	Non-Asbestos	HW-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3354	2019 / (11C) Room 215	Floor Tile	Non-Asbestos	HF-03
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3355	2020 / (11D) Room 215A	Floor Tile	Non-Asbestos	HF-03
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
3351	2021 / (11) Room 217	Floor Tile	Non-Asbestos	HF-03
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
		Ceiling Tile 2' x 4' Fissure on 2'	Non-Asbestos	HC-07
3855	2022 / Corridor	Floor Tile	Non-Asbestos	HF-03
		Drywall and Joint Compound (wall)	Non-Asbestos	HW-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3856	2023 / Corridor	Floor Tile	Non-Asbestos	HF-03
		Drywall and Joint Compound (wall)	Non-Asbestos	HW-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04

Client ID	OESN Functional Space Number and Location Identification	Material	Asbestos Content and Type	Homogeneous Number
Second Floor (Continued)				
3344 / 3345	2024 / Corridor	Floor Tile	Non-Asbestos	HF-03
		Drywall and Joint Compound (wall)	Non-Asbestos	HW-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Fissure on 2'	Non-Asbestos	HC-07
3857	2025 / Corridor	Floor Tile	Non-Asbestos	HF-03
		Drywall and Joint Compound (wall)	Non-Asbestos	HW-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04
3858	2026 / Corridor	Floor Tile	Non-Asbestos	HF-03
		Drywall and Joint Compound (wall)	Non-Asbestos	HW-02
		Ceiling Tile 2' x 4' Pebble	2% Amosite <1% Chrysotile	HC-03
		Ceiling Tile 2' x 4' Random Fissure	Non-Asbestos	HC-04

HESS STREET SCHOOL - SAMPLE RESULTS

<u>SCHOOL ID</u>	<u>Location ID#</u>	<u>MATERIAL</u>	<u>ASBESTOS CONTENT & TYPE</u>	<u>LEAD CONTENT</u>	<u>RESULTS DATED</u>
Boiler room	1542	ceiling texture coat (grey)	No asbestos		Dec. 12, 1989
Boiler room	1542	elbow lagging	No asbestos		Dec. 12, 1989
Boiler room	1542	ceiling	No asbestos		Aug. 19, 2011
Boiler room	1542	ceiling	No asbestos		Aug. 19, 2011
Boiler room	1542	ceiling	No asbestos		Aug. 19, 2011
Girl's washroom - 2nd floor	3365	ceiling paint (white)		0.005%	Feb. 10, 2014
Gym storage room	3308	texture coat (grey)	No asbestos		Dec. 14, 1998
Room 7	3341	Glue pucks behind tack board (brown; hard)	No asbestos		July 5, 2013
Room 7	3341	Glue pucks behind tack board (brown; hard)	No asbestos		July 5, 2013
Room 7	3341	Glue pucks behind tack board (brown; hard)	No asbestos		July 5, 2013
Stage - platform and chair storage		texture coat (grey)	No asbestos		Dec. 12, 1989

APPENDIX II-B
Lead Analytical Certificates



Analysis for Lead Concentration in Paint Chips

by Flame Atomic Absorption Spectroscopy
EPA SW-846 3050B/6010C/7000B



Customer: Pinchin Ltd.
151 York Boulevard Suite 200
Hamilton, ON L8R 3M2

Attn: Jessica Cozzitorto
Justin Appleby

Lab Order ID: 10039845

Analysis: PBP

Date Received: 12/22/2023

Date Reported: 01/03/2024

Project: HWDSB Hess Street Elementary

Sample ID	Description	Mass (g)	Concentration (ppm)	Concentration (% by weight)
Lab Sample ID	Lab Notes			
L0001	Wall, Masonry, White Concrete Block, Loc:3307, Storage and Stairs	0.0753	950	0.095%
10039845_0001				
L0002	Wall, Masonry, Yellow Concrete Block, Loc:3307, Storage and Stairs	0.1039	1000	0.10%
10039845_0002				
L0003	Wall, Masonry, Blue Concrete Block, Loc:3304, Gymnasium	0.0648	180	0.018%
10039845_0003				
L0004	Wall, Masonry, Lime Green Concrete Block, Loc:3305, Storage	0.0715	<56	<0.0056%
10039845_0004				
L0005	Struct, Metal, Yellow, Loc:3304, Gymnasium	0.0202	120	0.012%
10039845_0005				
L0006	Wall, Masonry, Peach Concrete Block, Loc:3317, Staff Room	0.0633	180	0.018%
10039845_0006				
L0007	Wall, Masonry, Light Blue Concrete Block, Loc:3319, Vestibule	0.0674	<59	<0.0059%
10039845_0007				
L0008	Wall, Masonry, Pink Concrete Block, Loc:3365, Girls Washroom	0.1366	<29	<0.0029%
10039845_0008				

Disclaimer: Unless otherwise noted blank sample correction was not performed on analytical results. Scientific Analytical Institute participates in the AIHA ELPAT program. ELPAT Laboratory ID: 173190. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. Analytical uncertainty available upon request. The quality control samples run with the samples in this report have passed all EPA required specifications unless otherwise noted. RL: (Report Limit for an undiluted 50ml sample is 4µg Total Pb).

Matthew Caffey (6)
Athena Summa (2)

Analyst

Approved Signatory

10039845

Version 1-15-2012

Client:	Pinchin Ltd.	<p>*Instructions: Use Column "B" for your contact info</p> <p>To See an Example Click the bottom Example Tab.</p> <p style="text-align: center;">8</p> <p>Begin Samples with a "<<" above the first sample and end with a ">>" below the last sample. Only Enter your data on the first sheet "Sheet1"</p> <p>Note: Data 1 and Data 2 are optional fields that do not show up on the official report, however they will be included in the electronic data returned to you to facilitate your reintegration of the report data.</p>
Contact:	Justin Appleby / Jessica Cozzitorto	
Address:	ON	
Phone:		
Fax:		
Email:	jappleby@pinchin.com jcozzitorto@pinchin.com	
Project:	HWDSB Hess Street Elementary	
Client Notes:		
P.O. #:	320572.021	
Date Submitted:	12-20-2023	
Analysis:	Paint Chips Flame AA	
TurnAroundTime:	Regular 5 days	

Scientific Analytical Institute



4604 Dundas Dr.
Greensboro, NC 27407
Phone: 336.292.3888
Fax: 336.292.3313
Email: lab@sallab.com

Sample Number	Data 1 (Lab use only)	Sample Description	Data 2 (Lab use only)
<<			
L0001		Wall, Masonry, White Concrete Block, Loc:3307, Storage and Stairs	
L0002		Wall, Masonry, Yellow Concrete Block, Loc:3307, Storage and Stairs	
L0003		Wall, Masonry, Blue Concrete Block, Loc:3304, Gymnasium	
L0004		Wall, Masonry, Lime Green Concrete Block, Loc:3305, Storage	
L0005		Struct, Metal, Yellow, Loc:3304, Gymnasium	
L0006		Wall, Masonry, Peach Concrete Block, Loc:3317, Staff Room	
L0007		Wall, Masonry, Light Blue Concrete Block, Loc:3319, Vestibule	
L0008		Wall, Masonry, Pink Concrete Block, Loc:3365, Girls Washroom	
>>			

Accepted

Rejected

Appleby
12/22
1030/0

APPENDIX III
Methodology



1.0 GENERAL

An inspection was conducted to identify the type of Hazardous Building Materials incorporated in the structure and its finishes.

Information regarding the location and condition of hazardous building materials encountered and visually estimated quantities were recorded. The locations of any samples collected were recorded on small-scale plans. As-built drawings and previous reports were referenced where provided.

Sample collection was conducted in accordance with our Standard Operating Procedures.

1.1 Asbestos

The inspection for asbestos included friable and non-friable asbestos-containing materials (ACM). A friable material is a material that when dry can be crumbled, pulverized or powdered by hand pressure.

A separate set of samples was collected of each type of homogenous material suspected to contain asbestos. A homogenous material is defined by the US EPA as material that is uniform in texture and appearance, was installed at one time, and is unlikely to consist of more than one type or formulation of material. The homogeneous materials were determined by visual examination and available information on the phases of construction and prior renovations.

Samples were collected at a rate that is in compliance with the requirements of local regulations and guidelines. The sampling strategy was also based on known ban dates and phase out dates of the use of asbestos; sampling of certain building materials is not conducted after specific construction dates. In addition, to be conservative, several years past these dates are added to account for some uncertainty in the exact start / finish date of construction and associated usage of ACM. In some cases, manufactured products such as asbestos cement pipe were visually identified without sample confirmation.

The asbestos analysis was completed using a stop-positive approach. Only one result meeting the regulated criteria was required to determine that a material is asbestos-containing, but all samples must be analyzed to conclusively determine that a material is non-asbestos. The laboratory stopped analyzing samples from a homogeneous material once a result equal to or greater than the regulated criteria is detected in any of the samples of that material. All samples of a homogeneous material were analyzed if no asbestos is detected. In some cases, all samples were analyzed in the sample set regardless of result.

The analysis was performed in accordance with Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, July 1993.

Analytical results were compared to the following criteria.

Jurisdiction	Friable	Non-Friable
Ontario	0.5%	0.5%

Where building materials are described in the report as “non-asbestos” or “does not contain asbestos”, this means that either no asbestos was detected by the analytical method utilized in any of the multiple samples or, if detected, it is below the lower limit of an asbestos-containing material in the applicable regulation. Additionally, these terms are used for materials which historically are known to not include asbestos in their manufacturing.

1.2 Lead

Samples of distinctive paint finishes, and surface coatings present in more than a limited application, where removal of the paint is possible was collected. The samples were collected by scraping the painted finish to include base and covering applications.

Analysis for lead in paints or surface coatings was performed in accordance with EPA Method No. 3050B/Method No. 7420; flame atomic absorption.

Analytical results were compared to the following criteria.

Jurisdiction	Units (%)	Units (ppm) / (mg/kg)
Ontario	0.1	1000

Other lead building products (e.g. batteries, lead sheeting, flashing) were identified by visual observation only.

1.3 Silica

Building materials known to contain crystalline silica (e.g. concrete, cement, tile, brick, masonry, mortar) were identified by visual inspection only. Pinchin did not perform sampling of these materials for laboratory analysis of crystalline silica content.

1.4 Mercury

Building materials, products or equipment (e.g. thermostats, barometers, pressure gauges, lamp tubes), suspected to contain mercury was identified by visually inspection only. Dismantling of equipment suspected of containing mercury was not performed. Sampling of these materials for laboratory analysis of mercury content was not performed.



1.5 Polychlorinated Biphenyls

The potential for light ballast and oil filled transformers to contain PCBs was based on the age of the building, a review of maintenance records and examination of labels or nameplates on equipment, where present and accessible. The information was compared to known ban dates of PCBs and Environment Canada publications.

Dry type transformers were presumed to be free of dielectric fluids and hence non-PCB.

Fluids (mineral oil, hydraulic, Aroclor or Askarel) in transformers or other equipment were not sampled for PCB content.

1.6 Visible Mould

The presence of mould or water damage was determined by visual inspection of exposed building surfaces. If any mould growth or water damage was concealed within building cavities it was not addressed in this assessment.

Template: Methodology for Hazardous Building Materials Assessment, HAZ, January 26, 2023

APPENDIX IV
Location Summary Report

Client: Hamilton-Wentworth District School Board
Building Name: Hess Street Elementary
Survey Date:
Building Phases: A: 1973

Site: 107 Hess Street North, Hamilton, ON
Last Re-Assessment:

Location No.	Name or Description	Area ft ²	Floor No.	Bldg. Phase	Notes
1	Roof	0		A	
3301	Lobby, room no. 102	500	1	A	
3304	Gymnasium, room no. 105	2400	1	A	
3305	Storage, room no. 105D	290	1	A	
3306	Storage, room no. 105E	225	1	A	
3307	Storage and Stairs, room no. 105B	280	1	A	
3308	Equipment Room, room no. 105A	210	1	A	
3309	Men's Changeroom, room no. 104	150	1	A	
3310	Women's Changeroom, room no. 103	150	1	A	
3311	KIT	155		A	
3312	Staff Room	450		A	
3314	Storage, room no. 125C	65	1	A	
3315	Storage, room no. 125D	185	1	A	
3316	Storage, room no. 125B	100	1	A	
3317	Staff Room, room no. 125A	170	1	A	
3318	Washroom, room no. 126	40	1	A	
3319	Vestibule, room no. 125	200	1	A	
3320	Washroom, room no. 126A	40	1	A	
3321	Corridor, room no. 106	500	1	A	
3335	Corridor, room no. 113	500	1	A	
3338	Boys Washroom, room no. 116	70	1	A	
3339	Girls Washroom, room no. 115	70	1	A	
3344	Lobby, room no. 201	150	2	A	
3362	Corridor, room no. 210	100	2	A	
3365	Girls Washroom, room no. 214	90	1	A	
3368	Boys Washroom, room no. 226	90	1	A	
3371	Vestibule	370	1	A	
3372	Stairs 117	96		A	
3854	Storage, room no. 105F	75	1	A	

APPENDIX V

Hazardous Materials Summary Report / Sample Log

Client: Hamilton-Wentworth District School Board

Site: 107 Hess Street North, Hamilton, ON

Building Name: Hess Street Elementary

Survey Date:

HAZMAT	Sample No	System/Component/Material/Sample Description	Locations	Bldg-Phase	LF	SF	EA	%	Type	Positive	Friability
Asbestos	S0002 ABC	Other Roofing Material Roof Core	1	A	0	0	0	100	Chrysotile	Yes	NF
Asbestos	S0003 ABC	Other Tar Pipe Penetrations	1	A	0	5	0	0	Chrysotile	Yes	NF
Asbestos	S0004 ABC	Floor Vinyl Floor Tile And Mastic 12x12 Beige With Brown Fleck	3304,3305,3306,3307,3308	A	0	3405	0	0	None Detected	No	
Asbestos	S0005 ABCDEFG	Wall Paint Concrete Block	3301,3304,3305,3306,3307,3308,3309,3310,3311,3312,3314,3315,3316,3317,3318,3319,3320,3321,3335,3338,3339,3344,3362,3365,3368,3371,3372,3854	A	0	15580	0	0	Chrysotile	Yes	NF
Asbestos	S0006 ABCDE	Ceiling, Other, Wall, Ceiling, Wall Bulkhead Drywall Compound	3308,3309,3312,3320,3365,3368,3854	A	0	505	0	0	Chrysotile	Yes	NF
Asbestos	S0007 ABC	Floor Vinyl Floor Tile And Mastic 12x12 Grey With Brown Streaks	3301,3311,3312,3314,3315,3316,3317,3318,3319,3320,3321,3335,3344,3362,3371,3372,3854	A	0	3646	0	0	Chrysotile	Yes	NF
Asbestos	S0008 ABC	Floor Terrazzo	3309,3310,3320	A	0	340	0	0	None Detected	No	
Asbestos	S0009 ABC	Other Sink Mastic, Gold	3314,3315,3317	A	0	0	3	0	Chrysotile	Yes	NF
Asbestos	S0010 ABC	Ceiling Plaster Smooth	3305,3306,3371,3854	A	0	895	0	0	None Detected	No	
Asbestos	S0011 ABCDE	Ceiling Plaster Textured	3307,3371,3372	A	0	1226	0	0	Chrysotile	Yes	PF
Asbestos	S0012 ABCDEFG	Ceiling Plaster	3309,3310,3318,3338,3339,3365,3368	A	0	0	0	100	None Detected	No	
Asbestos	V9000	Ceiling Acoustic Tile Ceiling Tiles (lay-in) 24x48 Pebble Pattern	3308,3311,3312,3314,3315,3316,3317,3319,3321,3335,3344,3362	A	0	2605	0	0	Confirmed Asbestos	Yes	PF
Asbestos	V9000	Wall Drywall And Joint Compound	3306	A	0	520	0	0	Confirmed Asbestos	Yes	NF
Asbestos	V9500	Floor Vinyl Floor Tile And Mastic 12x12 Beige	3301	A	0	50	0	0	Presumed Asbestos	Yes	NF
Asbestos	V0000	Ceiling Acoustic Tile Ceiling Tiles (lay-in) 24x48 Pinhole With Width Wise Fissures	3362	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Ceiling Wood	3301	A	0	0	0	100	Non Asbestos	No	
Paint	L0001	Wall Masonry White Concrete Block	3301,3304,3305,3306,3307,3308,3309,3310,3314,3315,3316,3317,3318,3320,3321,3335,3338,3339,3344,3362,3365,3368,3854	A	0	9635	0	0	Lead (Low)	Yes	-
Paint	L0002	Wall Masonry Yellow Concrete Block	3304,3307,3314,3318,3320	A	0	325	0	0	Lead (Low)	Yes	-
Paint	L0003	Wall Masonry Blue Concrete Block	3304,3338,3339,3368	A	0	1620	0	0	Lead (Low)	Yes	-
Paint	L0004	Wall Masonry Lime Green Concrete Block	3305,3306,3854	A	0	225	0	0	Lead (Low)	Yes	-
Paint	L0005	Structure Metal Yellow	3304	A	0	0	0	100	Lead (Low)	Yes	-
Paint	L0006	Wall Masonry Peach Concrete Block	3317	A	0	100	0	0	Lead (Low)	Yes	-
Paint	L0007	Wall Masonry Light Blue Concrete Block	3319	A	0	400	0	0		No	-
Paint	L0008	Wall Masonry Pink Concrete Block	3365	A	0	120	0	0		No	-

HAZMAT	Sample No	System/Component/Material/Sample Description	Locations	Bldg. Phase	LF	SF	EA	%	Type	Positive	Friability
PCB	V9500	Light Ballasts	3301,3304,3305,3306,3307,3309,3310,3314,3315,3316,3317,3318,3319 3320,3321,3335,3338,3339,3344,3362,3365,3368,3854	A	0	0	0	100	Presumed PCB	Yes	-
Hg	V9500	Light Fixture	3301,3304,3305,3306,3307,3308,3309,3310,3314,3315,3316,3317,3318 3319,3320,3321,3335,3338,3339,3344,3362,3365,3368,3854	A	0	0	0	100	Presumed Hg	Yes	-

Legend:

Sample number		Units			
S####	Asbestos sample collected	SF	Square feet	NF	Non Friable material.
L####	Paint sample collected	LF	Linear feet	F	Friable material
P####	PCB sample collected	EA	Each	PF	Potentially Friable material
M####	Mould sample collected	%	Percentage		
V####	Material visually similar to numbered sample collected				
V0000	Known non Hazardous Material				
V9000	Material is visually identified as Hazardous Material				
V9500	Material is presumed to be Hazardous Material				
[Loc. No.]	Abated Material				

APPENDIX VI
HMIS All Data Report

Client: Hamilton-Wentworth District School Board
Location: #1 : Roof
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor:

Building Name: Hess Street Elementary
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 0

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Other		Tar, Pipe penetrations			A	Y		5			SF	S0003ABC	Chrysotile	5-10%	Confirmed Asbestos	NF
Other		Roofing material, Roof core			A	Y		100			%	S0002ABC	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3301 : Lobby
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 102
Last Re-Assessment: 0000-00-00

Area (sqft): 500

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Wood			A	Y		100			%	V0000	Non-Asbestos		None	
Duct	Not Accessible															
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		450			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Floor		Vinyl Floor Tile and Mastic, 12x12 beige			B	Y		50			SF	V9500	Presumed Asbestos		Presumed Asbestos	NF
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		1000			SF	S0005C	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3301 : Lobby
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 102
Last Re-Assessment: 0000-00-00

Area (sqft): 500

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	125		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3301 : Lobby
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 102
Last Re-Assessment: 0000-00-00

Area (sqft): 500

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
 Location: #3301 : Lobby
 Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
 Floor: 1

Building Name: Hess Street Elementary
 Room #: 102
 Last Re-Assessment: 0000-00-00

Area (sqft): 500

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

Client: Hamilton-Wentworth District School Board
Location: #3304 : Gymnasium
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105
Last Re-Assessment: 0000-00-00

Area (sqft): 2400

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		None Found														
Duct		Not Insulated			C	Y										
Floor		Vinyl Floor Tile and Mastic, 12x12 beige with brown fleck			A	Y		2400			SF	V0004	None Detected	N.D.	None	
Mechanical Equipment		None Found														
Piping		Fibreglass			A	Y										
Structure		Steel			C	Y										
Structure		Metal			C	Y										
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		4800			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3304 : Gymnasium
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105
Last Re-Assessment: 0000-00-00

Area (sqft): 2400

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	3400		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	
Wall	Masonry	100		SF	V0002	Yellow concrete block	Pb: 0.10 %	Lead (Low)	
Wall	Masonry	1300		SF	L0003	Blue concrete block	Pb: 0.018 %	Lead (Low)	
Structure	Metal	100		%	L0005	Yellow	Pb: 0.012 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3304 : Gymnasium
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105
Last Re-Assessment: 0000-00-00

Area (sqft): 2400

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3304 : Gymnasium
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105
Last Re-Assessment: 0000-00-00

Area (sqft): 2400

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed



ALL DATA REPORT



Client: Hamilton-Wentworth District School Board
Location: #3305 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105D
Last Re-Assessment: 0000-00-00

Area (sqft): 290

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Plaster, Smooth			C	Y		225			SF	S0010C	None Detected	N.D.	None	
Duct	Not Accessible															
Floor		Vinyl Floor Tile and Mastic, 12x12 beige with brown fleck			A	Y		290			SF	V0004	None Detected	N.D.	None	
Mechanical Equipment	Not Accessible															
Piping		Fibreglass			A	Y										
Structure	Not Accessible															
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		580			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3305 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105D
Last Re-Assessment: 0000-00-00

Area (sqft): 290

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	480		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	
Wall	Masonry	100		SF	L0004	Lime green concrete block	Pb: 0.012 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3305 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105D
Last Re-Assessment: 0000-00-00

Area (sqft): 290

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3305 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105D
Last Re-Assessment: 0000-00-00

Area (sqft): 290

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

Client: Hamilton-Wentworth District School Board
Location: #3306 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105E
Last Re-Assessment: 0000-00-00

Area (sqft): 225

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Plaster, Smooth			C	Y		225			SF	S0010B	None Detected	N.D.	None	
Duct	Not Accessible															
Floor		Vinyl Floor Tile and Mastic, 12x12 beige with brown fleck			A	Y		225			SF	V0004	None Detected	N.D.	None	
Mechanical Equipment	Not Accessible															
Piping		Fibreglass			A	Y										
Structure	Not Accessible															
Wall		Drywall and joint compound			A	Y		520			SF	V9000	Confirmed Asbestos		Confirmed Asbestos	NF
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		450			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3306 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105E
Last Re-Assessment: 0000-00-00

Area (sqft): 225

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Masonry	350		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)
Wall	Masonry	100		SF	V0004	Lime green concrete block	Pb: 0.012 %	Lead (Low)

Client: Hamilton-Wentworth District School Board
Location: #3306 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105E
Last Re-Assessment: 0000-00-00

Area (sqft): 225

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3306 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105E
Last Re-Assessment: 0000-00-00

Area (sqft): 225

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed



ALL DATA REPORT



Client: Hamilton-Wentworth District School Board
Location: #3307 : Storage and Stairs
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105B
Last Re-Assessment: 0000-00-00

Area (sqft): 280

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Plaster, Textured			C	Y		560			SF	S0011AB	Not Analyzed	0.5-5%	Confirmed Asbestos	PF
Duct	Not Accessible															
Floor		Vinyl Floor Tile and Mastic, 12x12 beige with brown fleck			A	Y		280			SF	S0004AC	None Detected	N.D.	None	
Mechanical Equipment	Not Accessible															
Piping		Fibreglass			A	Y										
Structure	Not Accessible															
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		560			SF	S0005A	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3307 : Storage and Stairs
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105B
Last Re-Assessment: 0000-00-00

Area (sqft): 280

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	460		SF	L0001	White concrete block	Pb: 0.095 %	Lead (Low)	
Wall	Masonry	100		SF	L0002	Yellow concrete block	Pb: 0.10 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3307 : Storage and Stairs
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105B
Last Re-Assessment: 0000-00-00

Area (sqft): 280

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3307 : Storage and Stairs
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105B
Last Re-Assessment: 0000-00-00

Area (sqft): 280

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed



ALL DATA REPORT



Client: Hamilton-Wentworth District School Board
Location: #3308 : Equipment Room
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105A
Last Re-Assessment: 0000-00-00

Area (sqft): 210

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Acoustic Tile	Ceiling Tiles (lay-in), 24x48 pebble pattern			C	Y		210			SF	V9000	Confirmed Asbestos		Confirmed Asbestos	PF
Duct	Not Accessible															
Floor		Vinyl Floor Tile and Mastic, 12x12 beige with brown fleck			A	Y		210			SF	S0004B	None Detected	N.D.	None	
Mechanical Equipment	Not Accessible															
Other	Bulkhead	Drywall Compound			C	Y		100			SF	S0006A	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Piping		Fibreglass			A	Y										
Structure		Steel			C	N										
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		420			SF	S0005B	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3308 : Equipment Room
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105A
Last Re-Assessment: 0000-00-00

Area (sqft): 210

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Masonry	420		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)

Client: Hamilton-Wentworth District School Board
Location: #3308 : Equipment Room
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105A
Last Re-Assessment: 0000-00-00

Area (sqft): 210

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3309 : Men's Changeroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 104
Last Re-Assessment: 0000-00-00

Area (sqft): 150

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Plaster			C	Y						S0012A	None Detected	N.D.	None	
Duct	Not Accessible															
Floor		Terrazzo			A	Y		150			SF	S0008AB	None Detected	N.D.	None	
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Drywall and joint compound			A	Y		50			SF	S0006B	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		300			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3309 : Men's Changeroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 104
Last Re-Assessment: 0000-00-00

Area (sqft): 150

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	300		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3309 : Men's Changeroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 104
Last Re-Assessment: 0000-00-00

Area (sqft): 150

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3309 : Men's Changeroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 104
Last Re-Assessment: 0000-00-00

Area (sqft): 150

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed



ALL DATA REPORT



Client: Hamilton-Wentworth District School Board
Location: #3310 : Women's Changeroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 103
Last Re-Assessment: 0000-00-00

Area (sqft): 150

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Plaster			C	Y		100			%	S0012B	None Detected	N.D.	None	
Duct	Not Accessible															
Floor		Terrazzo			A	Y		150			SF	S0008C	None Detected	N.D.	None	
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		300			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3310 : Women's Changeroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 103
Last Re-Assessment: 0000-00-00

Area (sqft): 150

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	300		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3310 : Women's Changeroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 103
Last Re-Assessment: 0000-00-00

Area (sqft): 150

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3310 : Women's Changeroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 103
Last Re-Assessment: 0000-00-00

Area (sqft): 150

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

Client: Hamilton-Wentworth District School Board
Location: #3311 : KIT
Survey Date: 2024-02-09

Site: 107 Hess Street North, Hamilton, ON
Floor:

Building Name: Hess Street Elementary
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 155

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Acoustic Tile	Ceiling Tiles (lay-in), 24x48 pebble pattern			C	Y		115			SF	V9000	Confirmed Asbestos		Confirmed Asbestos	PF
Duct		Fibreglass			C	N										
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		155			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment		Fibreglass			C	N										
Piping		Fibreglass			A	Y										
Structure		Steel			C	N										
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		370			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3312 : Staff Room
Survey Date: 2024-02-09

Site: 107 Hess Street North, Hamilton, ON
Floor:

Building Name: Hess Street Elementary
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 450

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Acoustic Tile	Ceiling Tiles (lay-in), 24x48 pebble pattern			C	Y		450			SF	V9000	Confirmed Asbestos		Confirmed Asbestos	PF
Duct		Fibreglass			C	N										
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		450			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment		Fibreglass			C	N										
Piping		Fibreglass			A	Y										
Structure		Steel			C	N										
Wall		Drywall and joint compound			A	Y		115			SF	V0006	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		370			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3314 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125C
Last Re-Assessment: 0000-00-00

Area (sqft): 65

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Acoustic Tile	Ceiling Tiles (lay-in), 24x48 pebble pattern			C	Y		185			SF	V9000	Confirmed Asbestos		Confirmed Asbestos	PF
Duct		Fibreglass			C	N										
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		65			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment		Fibreglass			C	N										
Other	Sink	Mastic, Gold			A	Y		1			EA	S0009C	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Piping		Fibreglass			A	Y										
Structure		Steel			C	N										
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		130			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3314 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125C
Last Re-Assessment: 0000-00-00

Area (sqft): 65

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	65		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	
Wall	Masonry	65		SF	V0002	Yellow concrete block	Pb: 0.10 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3314 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125C
Last Re-Assessment: 0000-00-00

Area (sqft): 65

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3314 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125C
Last Re-Assessment: 0000-00-00

Area (sqft): 65

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed



ALL DATA REPORT



Client: Hamilton-Wentworth District School Board
Location: #3315 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125D
Last Re-Assessment: 0000-00-00

Area (sqft): 185

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Acoustic Tile	Ceiling Tiles (lay-in), 24x48 pebble pattern			C	Y					SF	V9000	Confirmed Asbestos		Confirmed Asbestos	PF
Duct		Fibreglass			C	N										
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		185			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment		Fibreglass			C	N										
Other	Sink	Mastic, Gold			A	Y		1			EA	V0009	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Piping		Fibreglass			A	Y										
Structure		Steel			C	N										
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		370			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3315 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125D
Last Re-Assessment: 0000-00-00

Area (sqft): 185

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	370		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3315 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125D
Last Re-Assessment: 0000-00-00

Area (sqft): 185

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3315 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125D
Last Re-Assessment: 0000-00-00

Area (sqft): 185

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

Client: Hamilton-Wentworth District School Board
Location: #3316 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125B
Last Re-Assessment: 0000-00-00

Area (sqft): 100

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Acoustic Tile	Ceiling Tiles (lay-in), 24x48 pebble pattern			C	Y		100			SF	V9000	Confirmed Asbestos		Confirmed Asbestos	PF
Duct		Fibreglass			C	N										
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		100			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment		None Found														
Piping		Fibreglass			C	N										
Structure		Steel			C	N										
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		200			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3316 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125B
Last Re-Assessment: 0000-00-00

Area (sqft): 100

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	200		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3316 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125B
Last Re-Assessment: 0000-00-00

Area (sqft): 100

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3316 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125B
Last Re-Assessment: 0000-00-00

Area (sqft): 100

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

Client: Hamilton-Wentworth District School Board
Location: #3317 : Staff Room
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125A
Last Re-Assessment: 0000-00-00

Area (sqft): 170

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Acoustic Tile	Ceiling Tiles (lay-in), 24x48 pebble pattern			C	Y		170			SF	V9000	Confirmed Asbestos		Confirmed Asbestos	PF
Duct		None Found														
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		170			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment		None Found														
Other	Sink	Mastic, Gold			B	N		1			EA	S0009AB	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Piping		Fibreglass			C	N										
Structure		Steel			C	N										
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		340			SF	S0005D	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3317 : Staff Room
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125A
Last Re-Assessment: 0000-00-00

Area (sqft): 170

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	240		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	
Wall	Masonry	100		SF	L0006	Peach concrete block	Pb: 0.018 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3317 : Staff Room
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125A
Last Re-Assessment: 0000-00-00

Area (sqft): 170

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3317 : Staff Room
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125A
Last Re-Assessment: 0000-00-00

Area (sqft): 170

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed



ALL DATA REPORT



Client: Hamilton-Wentworth District School Board
Location: #3318 : Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 126
Last Re-Assessment: 0000-00-00

Area (sqft): 40

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Plaster			C	Y		100			%	S0012C	None Detected	N.D.	None	
Duct	Not Accessible															
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		40			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		80			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3318 : Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 126
Last Re-Assessment: 0000-00-00

Area (sqft): 40

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	50		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	
Wall	Masonry	30		SF	V0002	Yellow concrete block	Pb: 0.10 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3318 : Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 126
Last Re-Assessment: 0000-00-00

Area (sqft): 40

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3318 : Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 126
Last Re-Assessment: 0000-00-00

Area (sqft): 40

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed



ALL DATA REPORT



Client: Hamilton-Wentworth District School Board
Location: #3319 : Vestibule
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125
Last Re-Assessment: 0000-00-00

Area (sqft): 200

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Acoustic Tile	Ceiling Tiles (lay-in), 24x48 pebble pattern			C	Y		125			SF	V9000	Confirmed Asbestos		Confirmed Asbestos	PF
Duct		None Found														
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		200			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment		None Found														
Piping		Fibreglass			C	N										
Structure		Steel			C	N										
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		400			SF	S0005E	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3319 : Vestibule
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125
Last Re-Assessment: 0000-00-00

Area (sqft): 200

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	400		SF	L0007	Light blue concrete block	Pb: <0.0059 %	No	

Client: Hamilton-Wentworth District School Board
Location: #3319 : Vestibule
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125
Last Re-Assessment: 0000-00-00

Area (sqft): 200

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3319 : Vestibule
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 125
Last Re-Assessment: 0000-00-00

Area (sqft): 200

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

Client: Hamilton-Wentworth District School Board
Location: #3320 : Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 126A
Last Re-Assessment: 0000-00-00

Area (sqft): 40

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Drywall and joint compound			C	Y		40			SF	V0006	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Duct	Not Accessible															
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		40			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Floor		Terrazzo			A	Y		40			SF	V0008	None Detected	N.D.	None	
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		80			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3320 : Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 126A
Last Re-Assessment: 0000-00-00

Area (sqft): 40

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	50		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	
Wall	Masonry	30		SF	V0002	Yellow concrete block	Pb: 0.10 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3320 : Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 126A
Last Re-Assessment: 0000-00-00

Area (sqft): 40

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3320 : Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 126A
Last Re-Assessment: 0000-00-00

Area (sqft): 40

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

Client: Hamilton-Wentworth District School Board
Location: #3321 : Corridor
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 106
Last Re-Assessment: 0000-00-00

Area (sqft): 500

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Acoustic Tile	Ceiling Tiles (lay-in), 24x48 pebble pattern			C	Y		500			SF	V9000	Confirmed Asbestos		Confirmed Asbestos	PF
Duct		None Found														
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		500			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment		None Found														
Piping		Fibreglass			C	N										
Structure		Steel			C	N										
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		340			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3321 : Corridor
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 106
Last Re-Assessment: 0000-00-00

Area (sqft): 500

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	1000		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3321 : Corridor
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 106
Last Re-Assessment: 0000-00-00

Area (sqft): 500

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3321 : Corridor
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 106
Last Re-Assessment: 0000-00-00

Area (sqft): 500

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

Client: Hamilton-Wentworth District School Board
Location: #3335 : Corridor
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 113
Last Re-Assessment: 0000-00-00

Area (sqft): 500

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Acoustic Tile	Ceiling Tiles (lay-in), 24x48 pebble pattern			C	Y		500			SF	V9000	Confirmed Asbestos		Confirmed Asbestos	PF
Duct		None Found														
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		500			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment		None Found														
Piping		Fibreglass			C	N										
Structure		Steel			C	N										
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		1000			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3335 : Corridor
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 113
Last Re-Assessment: 0000-00-00

Area (sqft): 500

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	1000		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3335 : Corridor
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 113
Last Re-Assessment: 0000-00-00

Area (sqft): 500

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3335 : Corridor
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 113
Last Re-Assessment: 0000-00-00

Area (sqft): 500

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

ALL DATA REPORT

Client: Hamilton-Wentworth District School Board
Location: #3338 : Boys Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 116
Last Re-Assessment: 0000-00-00

Area (sqft): 70

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Plaster			C	Y						S0012D	None Detected	N.D.	None	
Duct	Not Accessible															
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure		Metal			C	Y										
Structure	Not Accessible															
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		140			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3338 : Boys Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 116
Last Re-Assessment: 0000-00-00

Area (sqft): 70

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	40		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	
Wall	Masonry	100		SF	V0003	Blue concrete block	Pb: 0.018 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3338 : Boys Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 116
Last Re-Assessment: 0000-00-00

Area (sqft): 70

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3338 : Boys Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 116
Last Re-Assessment: 0000-00-00

Area (sqft): 70

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

Client: Hamilton-Wentworth District School Board
Location: #3339 : Girls Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 115
Last Re-Assessment: 0000-00-00

Area (sqft): 70

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Plaster			C	Y		100			%	S0012E	None Detected	N.D.	None	
Duct	Not Accessible															
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure		Metal			C	Y										
Structure	Not Accessible															
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		140			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3339 : Girls Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 115
Last Re-Assessment: 0000-00-00

Area (sqft): 70

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	40		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	
Wall	Masonry	100		SF	V0003	Blue concrete block	Pb: 0.018 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3339 : Girls Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 115
Last Re-Assessment: 0000-00-00

Area (sqft): 70

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3339 : Girls Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 115
Last Re-Assessment: 0000-00-00

Area (sqft): 70

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

Client: Hamilton-Wentworth District School Board
Location: #3344 : Lobby
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 2

Building Name: Hess Street Elementary
Room #: 201
Last Re-Assessment: 0000-00-00

Area (sqft): 150

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Acoustic Tile	Ceiling Tiles (lay-in), 24x48 pebble pattern			C	Y		150			SF	V9000	Confirmed Asbestos		Confirmed Asbestos	PF
Duct		None Found														
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		150			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment		None Found														
Piping		Fibreglass			C	N										
Structure		Steel			C	N										
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		300			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3344 : Lobby
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 2

Building Name: Hess Street Elementary
Room #: 201
Last Re-Assessment: 0000-00-00

Area (sqft): 150

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	300		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3344 : Lobby
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 2

Building Name: Hess Street Elementary
Room #: 201
Last Re-Assessment: 0000-00-00

Area (sqft): 150

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3344 : Lobby
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 2

Building Name: Hess Street Elementary
Room #: 201
Last Re-Assessment: 0000-00-00

Area (sqft): 150

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

Client: Hamilton-Wentworth District School Board
Location: #3362 : Corridor
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 2

Building Name: Hess Street Elementary
Room #: 210
Last Re-Assessment: 0000-00-00

Area (sqft): 100

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Acoustic Tile	Ceiling Tiles (lay-in), 24x48 pebble pattern			C	Y		100			SF	V9000	Confirmed Asbestos		Confirmed Asbestos	PF
Ceiling	Acoustic Tile	Ceiling Tiles (lay-in), 24x48 pinhole with width wise fissures			C	Y						V0000	Non-Asbestos		None	
Duct		None Found														
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		100			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment		None Found														
Piping		Fibreglass			C	N										
Structure		Steel			C	N										
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		200			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3362 : Corridor
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 2

Building Name: Hess Street Elementary
Room #: 210
Last Re-Assessment: 0000-00-00

Area (sqft): 100

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	200		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3362 : Corridor
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 2

Building Name: Hess Street Elementary
Room #: 210
Last Re-Assessment: 0000-00-00

Area (sqft): 100

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3362 : Corridor
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 2

Building Name: Hess Street Elementary
Room #: 210
Last Re-Assessment: 0000-00-00

Area (sqft): 100

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

Client: Hamilton-Wentworth District School Board
Location: #3365 : Girls Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 214
Last Re-Assessment: 0000-00-00

Area (sqft): 90

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Plaster			C	Y		100			%	S0012F	None Detected	N.D.	None	
Ceiling	Bulkhead	Drywall and joint compound			C	Y		50			SF	S0006E	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Duct	Not Accessible															
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure		Metal			C	Y										
Structure	Not Accessible															
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		180			SF	S0005G	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3365 : Girls Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 214
Last Re-Assessment: 0000-00-00

Area (sqft): 90

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	60		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	
Wall	Masonry	120		SF	L0008	Pink concrete block	Pb: <0.0029 %	No	

Client: Hamilton-Wentworth District School Board
Location: #3365 : Girls Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 214
Last Re-Assessment: 0000-00-00

Area (sqft): 90

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3365 : Girls Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 214
Last Re-Assessment: 0000-00-00

Area (sqft): 90

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed



ALL DATA REPORT



Client: Hamilton-Wentworth District School Board
Location: #3368 : Boys Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 226
Last Re-Assessment: 0000-00-00

Area (sqft): 90

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Plaster			C	Y		100			%	S0012G	None Detected	N.D.	None	
Ceiling	Bulkhead	Drywall and joint compound			C	Y		50			SF	S0006D	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Duct	Not Accessible															
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure		Metal			C	Y										
Structure	Not Accessible															
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		180			SF	S0005F	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3368 : Boys Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 226
Last Re-Assessment: 0000-00-00

Area (sqft): 90

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	60		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	
Wall	Masonry	120		SF	V0003	Blue concrete block	Pb: 0.018 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3368 : Boys Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 226
Last Re-Assessment: 0000-00-00

Area (sqft): 90

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3368 : Boys Washroom
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 226
Last Re-Assessment: 0000-00-00

Area (sqft): 90

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed



ALL DATA REPORT



Client: Hamilton-Wentworth District School Board
Location: #3371 : Vestibule
Survey Date: 2024-02-09

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 370

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Plaster, Smooth			C	Y		370			SF	V0010	None Detected	N.D.	None	
Ceiling		Plaster, Textured			C	Y		560			SF	S0011CD	Not Analyzed	0.5-5%	Confirmed Asbestos	PF
Duct	Not Accessible															
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		370			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		1000			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3372 : Stairs 117
Survey Date: 2024-02-09

Site: 107 Hess Street North, Hamilton, ON
Floor:

Building Name: Hess Street Elementary
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 96

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Plaster, Textured			C	Y		12			SF	S0011E	Not Analyzed	0.5-5%	Confirmed Asbestos	PF
Ceiling		Plaster			C	Y		94			SF	V0011	Not Analyzed	0.5-5%	Confirmed Asbestos	PF
Duct	Not Accessible															
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		96			SF	V0007	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		1000			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3854 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105F
Last Re-Assessment: 0000-00-00

Area (sqft): 75

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Plaster, Smooth			C	Y		75			SF	S0010A	None Detected	N.D.	None	
Duct	Not Accessible															
Floor		Vinyl Floor Tile and Mastic, 12x12 Grey with brown streaks			A	Y		75			SF	S0007ABC	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment	Not Accessible															
Piping	Not Accessible															
Structure	Not Accessible															
Wall		Drywall and joint compound			A	Y		100			SF	S0006C	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Wall		Masonry			A	Y										
Wall		Paint, Concrete block			A	Y		350			SF	V0005	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #3854 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105F
Last Re-Assessment: 0000-00-00

Area (sqft): 75

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Masonry	125		SF	V0001	White concrete block	Pb: 0.095 %	Lead (Low)	
Wall	Masonry	25		SF	V0004	Lime green concrete block	Pb: 0.012 %	Lead (Low)	

Client: Hamilton-Wentworth District School Board
Location: #3854 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105F
Last Re-Assessment: 0000-00-00

Area (sqft): 75

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	100	%	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #3854 : Storage
Survey Date: 2023-12-19

Site: 107 Hess Street North, Hamilton, ON
Floor: 1

Building Name: Hess Street Elementary
Room #: 105F
Last Re-Assessment: 0000-00-00

Area (sqft): 75

PCB						
Component	Quantity	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	100	%	V9500			Presumed

Legend:



Sample number		Units		Other	
S####	Asbestos sample collected	SF	Square feet	A	Access
L####	Paint sample collected	LF	Linear feet	V	Visible
P####	PCB sample collected	EA	Each	AP	Air Plenum
M####	Mould sample collected	%	Percentage	F	Friable material
V####	Material is visually identified to be identical to S####	LF	Linear feet	NF	Non Friable material
V0000	Known non hazardous material			PF	Potentially Friable material
V9000	Material visually identified as a Hazardous Material			Pb	Lead
V9500	Material is presumed to be a hazardous material			Hg	Mercury
				As	Arsenic
				Cr	Chromium

Access	
A	Accessible to all building occupants
B	Accessible to maintenance and operations staff without a ladder
C	Accessible to maintenance and operations staff with a ladder. Also rarely entered, locked areas
D	Not normally accessible

Condition	
Good	No visible damage or deterioration
Fair	Minor, repairable damage, cracking, delamination or deterioration
Poor	Irreparable damage or deterioration with exposed and missing material

Visible	
Y	The material is visible when standing on the floor of the room, without the removal or opening of other building components (e.g. ceiling tiles or access panels).
N	The material is not visible to view when standing on the floor of the room and requires the removal of a building component (e.g. ceilings tiles or access panels) to view and access. Includes rarely entered crawlspaces, attic spaces, etc. Observations will be limited to the extent visible from the access points.

Air Plenum	
Yes or No	The material is in a return air plenum or in a direct airstream or there is evidence of air erosion (e.g. duct for heating or cooling blowing directly on or across an ACM). This field is only completed where Air Plenum consideration is required by regulation.

Colour Coding	
	The material is known to contain regulated concentrations of asbestos; either by analytical results or visible identification (use of the V9000 code).
	The material is presumed to contain asbestos; based on visual appearances; typically a material known to historically contain asbestos; however, not sampled due to limited access or the destructive nature of the sampling.