AECOM Imagine it. Delivered.

KAWARTH PINE RIDGE DISTRICT SCHOOL BOARD

Interior Renovations at Queen Elizabeth Public School

Issued for Tender & Permit

PROJECT NO: 60624142

March 26, 2020

Specifications

1.1 OWNER:

Kawartha Pine Ridge District School Board
1994 Fisher Drive
Peterborough, Ontario

1.2 PROJECT:

Interior Renovations at Queen Elizabeth Public School
830 Barnardo Avenue, Peterborough, Ontario

1.3 PROFESSIONAL SEALS AND SIGNATURES

.1 Professional seals and signatures are provided as required by the Ontario Building Code (latest edition), Ontario Regulation 403/97 **(350/06)**, Subsection 2.3.1 **(Division C, Part 1, Subsection 1.2.1)** and all amendments thereto, for the Project stated above and apply only to those documents and specifications prepared by the respective Architect of Record, in Document 00 01 10, List of Contents. The professional seal and signature stated above are as follows:

ARCHITECT OF RECORD (A):

AECOM Canada Architects Ltd.

Address: 300 Water Street
Whitby, Ontario
L1N 9J2

Phone: (905) 215-1400
Fax: (905) 668-0221

Amin Sadeghi — March 26, 2020

Architect of Record — Date

Division 00 Procurement and Contracting Requirements

Division 1 General Requirements

Division 2 Existing Conditions

Division 6 Wood, Plastics and Composites

Division 7 Thermal and Moisture Protection

Division 8 Openings

Division 9 Finishes

Division 10 Specialties

Division 12 Furnishings

Supplementary Information

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1 requirements apply to all Sections of Work.

1.2 SUMMARY OF WORK

.1 Provide all items, articles, materials, services and incidentals, whether or not expressly specified or shown on Drawings, to make finished work complete and fully operational, consistent with the intent of the Contract Documents.

.2 Provide all work indicated in Contract Documents, regardless whether located within or outside Owner's property lines.

.3 The following work is not included in this Contract:

.1 Work designated N.I.C. on the Drawings.

1.3 THE CONTRACT DOCUMENTS

.1 Work will be performed under one Contract; the Contract will be in the form of the Agreement between Owner and Contractor.

.2 Division 1 General Requirements, of the Specification generally specify work and coordination of the work that is the direct responsibility of the Contractor but shall not be interpreted to define absolutely the limits of responsibility that must be established between the Contractor and his Subcontractors by their separate agreements.

.3 Ensure that Subcontractors understand that the General Conditions of the Contract, and Division 1 General Requirements, apply to Sections of the Specification governing their work.

.4 Ensure that the work includes all labour, equipment and products required, necessary or normally recognized as necessary for the proper and complete execution of the work of each trade.

.5 Work in this Specification is divided into descriptive Sections which are not intended to identify absolute contractual limits between Subcontractor, nor between the General Contractor and his Subcontractors. The Contractor shall organize division of labour and supply of materials essential to complete the Project in all its parts and provide a total enclosure and protection from weather of interior spaces, as established in the General Conditions of the Contract.

.6 As a result, the Consultant shall not be required to decide on questions arising with regard to agreements or contracts between the Contractor and Subcontractors or Suppliers, nor to the extent of the parts of the Work assigned thereto.

.7 Further, no extra will be allowed as a result of the failure to coordinate and allocate the Work such that the Work is provided in accordance with the Contract Documents.

.8 Wherever the word "building" occurs in the Contract Documents it shall be taken to mean all the buildings included in the Contract.

.9 Wherever in the Contract Documents the words "approval", "approved", "direction", "directed", "selection", "selected", "request", "requested", "report", and similar words are used, such approvals, directions, selections, requests and reports shall be given by the Consultant in writing unless specifically stated otherwise.

.10 Wherever in the Contract Documents the word "supply" is used in any form, it shall mean that the work specified to be supplied includes delivery to site and unloading at location directed.

.11 Wherever in the Contract Documents the word "installed" issued in any form, it shall mean that the work specified for installation includes uncrating, unpacking, etc; moving from stored location to place of installation; and installing to meet specified requirements.

.12 Wherever in this Specification it is specified that work is to proceed or to meet approval, direction, selection or request of authorities having jurisdiction or others, such approval, direction, selection or request shall be in writing.

.13 Wherever in this Specification or as directed by the Consultant it is specified that work shall be repaired, made good or replaced, it shall be performed without any additional cost to the Owner.

.14 Whenever in the Specifications the term "and/or" is used, the Consultant shall decide which of the possible meanings, to be derived at from the sentence where this term occurs shall govern.

1.4 STANDARDS AND CODES

.1 Contract forms, codes, specifications, standards, manuals and installation, application and maintenance instructions referred to in these specifications, unless otherwise specified, amended or date suffixed, shall be latest published editions at Contract date.

1.5 METRIC PROJECT

.1 This project is based on The International System of Units (SI). Measurements are expressed in metric (SI) units and depending on the progress made in the various sectors of the industry are either hard or soft converted units.

.2 All metric units specified shall be taken to be the minimum acceptable unless otherwise noted.

.3 It is the Contractor's responsibility to check and verify with manufacturers and suppliers on the availability of materials and products in either metric or imperial sizes.

.4 Where a material or product cannot be obtained in the metric size specified, provide the next larger imperial size available.

.5 Where both metric and imperial sizes or dimensions are shown, the metric size or dimension shall govern.

1.6 LAWS, NOTICES, PERMITS AND FEES

.1 Comply with codes, by-laws, and regulations of authorities having jurisdiction over the Place of the Work. Codes and regulations form an integral part of the Contract Documents.

.2 Permits:

.1 The Owner has paid and obtained for the Building Permit for this Project.

.2 The Contractor shall obtain and pay for all permits, licenses, deposits and certificates of inspection as part of the Work, including permits for road closures.

.3 The Contractor shall obtain permits required to execute work on municipal rights of way. Obtain damage deposits for sidewalks, roads and services, unless otherwise indicated.

.3 Arrange for inspection, testing and acceptance of the Work required by the authorities having jurisdiction. Be responsible for necessary preparations, provisions and pay costs.

.4 It is the responsibility of the Contractor to schedule notifications and inspections required by authorities having jurisdiction such that notifications can be properly received and that inspections can be properly undertaken without causing a delay in the Work. The Contractor, at no additional cost to the Owner, shall be solely responsible for any delay in the Work caused by failure to properly schedule required notifications and inspections.

1.7 DISCREPANCIES AND CLARIFICATIONS

.1 Advise Consultant of discrepancies discovered in requirements of the Contract Documents and request clarification from Consultant in written form.

.2 Advise Consultant when clarifications are required pertaining to meaning or intent of requirements of Contract Documents and request clarification from Consultant in written form.

.3 Do not proceed with related work until written clarification is provided by Consultant.

.4 Failure to notify Consultant shall result in Contractor incurring responsibility for resulting deficiencies and expense at no additional cost to the Owner.

.5 Written instructions issued by Consultant for the purpose of clarification, implicitly supersede applicable and relevant aspects of the Contract Documents irrespective of whether or not these documents are explicitly or specifically cited in clarification requests or clarification instructions.

1.8 SITE PROGRESS RECORDS

.1 Maintain at site a permanent written record of progress of work. Make the record available at all times with copies provided when requested. Include in record each day:

.1 Weather conditions with maximum and minimum temperatures.

.2 Conditions encountered during excavation. Record quantities pumped for dewatering.

.3 Commencement and completion dates of the work of each trade in each area of Project.

.4 Erection and removal dates of formwork in each area of Project.

.5 Dates, quantities, and particulars of each concrete pour.

.6 Dates, quantities, and particulars of roofing installation.

.7 Attendance of Contractor's and Subcontractor's work forces at Project and a record of the work they perform.

.8 Dates, status and particulars of submissions, i.e. shop drawings, samples, mock-ups and the like.

.9 Dates, status and particulars of deliveries, i.e. manufacturing dates, delivery and installation dates.

.10 Visits to site by Owner, Consultant, authorities having jurisdiction, testing companies, Contractor, Subcontractors, and suppliers.

.2 Maintain a progress chart in approved format. Show on chart proposed work schedule and progress of work by Contractor and Subcontractor. The status of delivery items, i.e. shop drawings status, manufacture dates - delivery and installation dates.

1.9 DOCUMENTS AT THE PLACE OF THE WORK

.1 Maintain at the Place of the Work, one copy of each of following:

.1 Contract Documents including drawings, specifications, addenda, and other modifications to the Contract, including copies of standards and codes referenced in the Contract Documents.

.2 'Reviewed' or 'Reviewed as Modified' shop drawings. Refer to Section 01 33 00 for details of schedules required.

.3 Construction, inspection and testing, and submittal schedules.

.4 Supplemental Instructions, proposed Change Orders, Change Orders, and Change Directives.

.5 Field Test Reports.

.6 Consultant’s field review reports and deficiency reports.

.7 Reports by authorities having jurisdiction.

.8 Building and other applicable permits, and related permit documents.

.9 Daily log of the Work.

.10 Project record drawings recording as-built conditions, instructions, changes, and the like, as called for in Section 01 33 00, prior to being concealed.

.2 Make above material available to Consultant upon request.

1.10 EXAMINATION

.1 Examine site, and ensure that each Section performing work related to site conditions has examined it, so that all are fully informed on all particulars which affect the Project Work (thereon and at the place of the building, and in order that construction proceeds competently and expeditiously).

.2 Ensure by examination that all physical features at the work, and working restrictions and limitations which exist are known, so that the Owner is not restricted in his use of the premises for his needs.

.3 Previously Completed Work:

.1 Where dimensions are required for proper fabrication, verify dimensions of completed work in place before fabrication and installation of work to be incorporated with it.

.2 Verify that previously executed work and surfaces are satisfactory for installation or application, or both, and that performance of subsequent work will not be adversely affected.

.3 Ensure that work installed in an unsatisfactory manner is rectified by those responsible for its installation before further work proceeds.

.4 Commencement of work will constitute acceptance of site conditions and previously executed work as satisfactory.

.5 Defective work resulting from application to, or installation on, or incorporation with, unsatisfactory previous work will be considered the responsibility of those performing the later work.

.4 Construction Measurements:

.1 Take site dimensions of completed work before installation of work to be incorporated commences.

.2 Before commencing installation of work, verify that its layout is accurately in accordance with intent of Drawings, and that positions, levels, and clearances to adjacent work are maintained.

.3 Before commencing work, verify that all clearances required by authorities having jurisdiction can be maintained.

.4 If work is installed in wrong location, rectify it before construction continues.

.5 Where dimensions are not available before fabrication commences, the dimensions required shall be agreed upon between the trades concerned.

.6 All measurements shall be Imperial.

1.11 PROTECTION OF WORK, PROPERTY AND PERSONS

.1 Include in work necessary methods, materials, and construction to ensure that no damage or harm to work, materials, property and persons results from the work of this Contract. Temporary facilities relating to protection are specified in Section 01 50 00.

.2 Comply with all instructions and/or orders issued by authorities having jurisdiction.

.3 Ensure that compulsory wearing of hard hats and safety boots is observed by all persons employed on the work. Provide spare hard hats for visitors, refuse admission to the premises to those refusing to wear same.

.4 Keep excavations, and pits free of rainwater, ground water, backing up of drains and sewers, and all other water. Pump dry as required.

.5 Protect adjacent private and public property from damage and, if damaged, make good immediately. Make good private property to match in all details its original condition in material and finishes as approved, and public property in accordance with requirements specified and/or instructed by its Owner or as directed by the Consultant.

.6 Keep surfaces, on which finish materials will be applied, free from grease, oil, and other contamination which would be detrimental in any way to the application of finish materials.

.7 Do not apply visible markings to surfaces exposed to view in finished state or that receive transparent finishes.

.8 Protect surfaces of completed work exposed to view from staining, disfigurement and all other damage by restriction of access or by use of physical means suitable to the material and surface location. Establish with each Subcontractor the suitability of such protection in each case.

.9 Brace and shore masonry walls until their designed lateral support is incorporated at both top and bottom, in accordance with safe construction practices.

.10 Enforce fire prevention methods at site for new work. Maintain existing in accordance with local authorities having jurisdiction. Do not permit bonfires, open flame heating devices or accumulation of debris. Use flammable materials only if proper safety precautions are taken, both in use and storage.

.11 Do not store flammable materials in the building. Take necessary measures to prevent spontaneous combustion. Place cloths and other disposable materials that are a fire hazard in closed metal containers and remove them from the building every night.

.12 Where flammable materials are being applied, ensure that adequate ventilation is provided, spark-proof equipment is used, and smoking and open flames are prohibited.

.13 Ensure that volatile fluid wastes are not disposed of in storm or sanitary sewers or in open drain courses.

.14 Public Utilities and Services:

.1 Verify location of and limitations imposed by, existing mechanical, electrical, telephone and similar services, and protect them from damage. If necessary, relocate active services to ensure that they function continuously wherever possible in safety and without risk of damage or down time to the existing buildings.

.2 Cap off and remove unused utility services encountered during work after approval is given by the utilities concerned or authorities having jurisdiction, which ever may apply. Relocation, removal, protection and capping of existing utility services shall be performed only by the applicable utility, and of other services by licensed mechanics.

.3 Make arrangements and pay for connection charges for services required for the Work.

.15 Ensure that precautions are taken to prevent leakage and spillage from plumbing and mechanical work that may damage surfaces and materials finished or unfinished.

.16 Give constant close supervision to roofing/waterproofing membranes following their installation, during the time they are temporarily protected or exposed, to ensure that no damage occurs to them before completion of building.

.17 Prevent spread of dust beyond the construction site by wetting, or by other approved means, as required or as directed by the Consultant and/or authorities having jurisdiction.

.18 Make good roads, soft landscaping, walkways, curbs, sidewalks, possessions and property, soiled or damaged due to the Work, to requirements of authorities having jurisdiction and requirements of and Making Good, as applicable.

1.12 SAFETY AND SECURITY

.1 Be responsible for security of all areas affected by work of this Contract until taken over by Owner. Take steps to prevent entry to the Work by unauthorized persons and guard against theft, fire and damage by any cause.

.2 Provide suitable surveillance equipment and/or employ guard services, as required to adequately protect the Work.

.3 Maintain fire protection for work. Store paints and volatile substances in a separate and controlled location and inspect frequently. Inspect temporary wiring, drop cords, extension cables for defective insulation or connections frequently. Remove combustible wastes frequently. Prohibit smoking in areas where volatile and flammable substances are used.

.4 Do not cut, bore or sleeve through any loadbearing member, new or existing without Consultant's written authorization, unless specifically indicated on Drawings.

1.13 SALVAGE

.1 Unless otherwise specified, surplus material resulting from construction, and construction debris shall become the property of Contractor, who shall dispose of it away from site.

.2 Treasure, such as coins, bills, papers of value, and articles of antiquity, discovered during digging, demolition and cutting at the site shall remain property of Owner, and shall be delivered immediately into his custody.

1.14 USE OF SITE

.1 Accept full responsibility for assigned work areas from the time of Contract award until Substantial Performance of the Work.

.2 Check means of access and egress, rights and interests which may be interfered with. Do not block lanes, roadways, entrances or exits. Direct construction traffic and locate access to site as directed by municipality.

.3 Where encroachment beyond property limits is necessary make arrangement with respective property owners.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 GENERAL

.1 Prices included in the Contract shall be complete for the applicable work, and shall constitute the full consideration, payment, compensation and remuneration to the Contractor for all such work. For greater certainty, but without limitation to the foregoing, such prices shall constitute full and complete consideration, payment, compensation and remuneration to the Contractor for the following (subject to adjustment only as specified in the Contract Documents):

.1 Expenditures for wages and for salaries of workmen, engineers, superintendents, draftsmen, foremen, timekeepers, accountants, expediters, clerks, watchmen and such other personnel as may be approved, employed directly under the Contractor and while engaged on the applicable work at the site and expenditures for travelling and board allowances of such employees when required by location of the applicable work or when covered by trade agreements and when approved; provided, however, that nothing shall be included for wages or salary of the Contractor if an individual, or of any member of the Contractor's firm if the Contractor is a firm or the salary of any officer of the Corporation if the Contractor is a corporation, unless otherwise agreed to in writing;

.2 Expenditures for material used in or required in connection with the construction of the applicable work including material tests and mix designed required by the laws or ordinances of any authority having jurisdiction and not included under Subparagraph .9.

.3 Expenditures for preparation, inspection, delivery, installation and removal of materials, plant, tools and supplies;

.4 Temporary facilities as required for the applicable work;

.5 Travelling expenses properly incurred by the Contractor in connection with the inspection and supervision of the applicable work or in connection with the inspection of materials prepared or in course of preparation for the applicable work and in expediting their delivery;

.6 Rentals of all equipment whether rented from the Contractor or others, in accordance with approved rental agreements including any approved applicable insurance premiums thereon and expenditures for transportation to and from the site of such equipment, costs of loading and unloading, cost of installation, dismantling and removal thereof and repairs or replacements during its use on the applicable work, exclusive of any repairs which may be necessary because of defects in the equipment when brought to the work or appearing within thirty (30) days thereafter;

.7 The cost of all expendable materials, supplies, light, power, heat, water and tools (other than tools customarily provided by tradesmen) less the salvage value thereof at the completion of the applicable work;

.8 Assessments under the Workplace Safety Insurance Act, the Unemployment Insurance Act, Canada Pension Act, statutes pay or any similar statutes; or payments on account usual vacations made by the contractor to his employees engaged on the applicable work at the site to the extent to which such assessments or payments for vacations with pay relate to the work covered by the specified price; and all sales taxes or other taxes where applicable;

.9 The amounts of all Subcontracts related to the specified price;

.10 Premiums on all insurance policies and bonds called for under this Contract as related to the specified price;

.11 Royalties for the use of any patented invention on the applicable work;

.12 Fees for licences and permits in connection with the applicable work;

.13 Duties and taxes imposed on the applicable work; and

.14 Such other expenditures in connection with the applicable work as may be approved; provided always that except with the consent of the Owner, the above items of cost shall be at rates comparable with those prevailing in the locality of the work.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 APPROVED ALTERNATES AND APPROVED EQUALS

.1 Named Products alternates or equals, indicated by the phrases "or approved alternate by XYZ Manufacturing" or "or approved equal by XYZ Manufacturing", shall be interpreted to mean that named Product alternate or equal, if selected for use in lieu of indicated or specified Product, meets or exceeds performance, appearance, general arrangement, dimensions, availability, code and standards compliance, and colour of specified Product.

.2 Be responsible for costs and modifications associated with the inclusion of named Product alternate or equal at no additional cost to the Owner.

.3 The process for proposing and approving alternates or equals, including alternate design solutions, shall be the same process as for proposing and approving substitutions (refer to paragraph 1.2 below).

.4 Confirm delivery of specified items prior to proposing alternates or equals.

1.2 SUBSTITUTIONS

.1 Submission of substitutions:

.1 Proposals for substitutions of Products and materials must be submitted in accordance with procedures specified in this section.

.2 Consultant may review submissions, if directed by Owner, but in any case with the understanding that the Contract Time will not be altered due to the time required by the Consultant to review the submission and by the Contractor to implement the substitution in the Work.

.2 Submission requirements:

.1 Description of proposed substitution, including detailed comparative specification of proposed substitution with the specified Product.

.2 Manufacturer’s Product data sheets for proposed Products.

.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 Effect on Contract Time.

.9 Reasons for the request.

.3 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.

.4 Proposed substitutions shall include costs associated with modifications necessary to other adjacent and connecting portions of the Work.

.5 Consultant’s decision concerning acceptance or rejection of proposed substitutions is final. Should it appear to the Consultant that the value of services required to evaluate the substitution exceeds the potential reduction, the Consultant will advise the Owner that the substitution does not merit consideration before proceeding with a full evaluation. If the substitution will produce a reduction commensurate with or exceeding the value of the Consultant’s services to evaluate the substitution, the Consultant will request the Owner’s direction to proceed with evaluation.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 REQUEST FOR INTERPRETATION - RFI

.1 A request for interpretation (RFI) is a formal process used during the Work to obtain an interpretation of the Contract Documents.

.2 Submittal procedures:

.1 RFI form:

.1 Submit RFI on “Request for Interpretation” form, appended to this section. The Consultant shall not respond to an RFI except as submitted on this form.

.2 Where RFI form does not provide sufficient space for complete information to be provided thereon, attach additional sheets as required.

.3 Submit with RFI form necessary supporting documentation.

.2 RFI log:

.1 Maintain log of RFIs sent to and responses received from the Consultant, complete with corresponding dates.

.2 Submit updated log of RFIs with each progress draw submittal.

.3 Submit RFIs sufficiently in advance of affected parts of the Work so as not to cause delay in the performance of the Work. Costs resulting from failure to do this will not be paid by the Owner.

.4 RFIs shall be submitted only to the Consultant.

.5 RFIs shall be submitted only by Contractor. RFIs submitted by Subcontractors or Suppliers shall not be accepted.

.6 Number RFIs consecutively in one sequence in order submitted.

.7 Submit one distinct RFI per RFI form.

.8 Consultant shall review RFIs from the Contractor submitted in accordance with this section, with the following understandings:

.1 Consultant’s response shall not be considered as a Change Order or Change Directive, nor does it authorize changes in the Contract Price or Contract Time or changes in the Work.

.2 Only the Consultant shall respond to RFIs. Responses to RFIs received from entities other than the Consultant shall not be considered.

.9 Allow ten (10) Working Days for review of each RFI by the Consultant.

.1 Consultant’s review of RFI commences on date of receipt by the Consultant of RFI submittal and extends to date RFI returned by Consultant.

.2 When the RFI submittal is received by Consultant before noon, review period commences that day; when RFI submittal is received by Consultant after noon, review period begins on the next Working Day.

.10 Contractor shall satisfy itself that an RFI is warranted by undertaking a thorough review of the Contract Documents to determine that the claim, dispute, or other matters in question relating to the performance of the Work or the interpretation of the Contract Documents cannot be resolved by direct reference to the Contract Documents. Contractor shall describe in detail this review on the RFI form as part of the RFI submission. RFI submittals that lack such detailed review description, or where the detail provided is, in the opinion of the Consultant, insufficient, shall not be reviewed by the Consultant and shall be rejected.

Contractor's Request for Interpretation

Contractor's Supplemental Instructions

Date	# of Pages
To	From
Co.	Co.
Phone #	Phone #
Fax #	Fax #

Project: _____ RFI No.: _____

Owner: _____ Date of Request: _____

To: _____ *Contractor*: _____
(*Consultant's* Representative)

Project No.: _____ *Contractor's* Representative: _____

Consultant's Fax No.: _____ Fax No.: _____

Interpretation Requested: (Description of request for interpretation and references to relevant portions of Contract Documents)

Attachments: _____
Requested by: _____

Consultant's Supplemental Instruction:

Attachments: _____
Reply By: _____

The work shall be carried out in accordance with these *Supplemental Instructions* issued in accordance with the *Contract Documents* without change in *Contract Price* or *Contract Time*. Prior to proceeding with these instructions, indicate acceptance of these instructions as being consistent with the *Contract Documents* by returning a signed copy to the *Consultant*.

Supplemental Instruction Issued: *Supplemental Instruction* Accepted:

By: _____ By: _____

Consultant Date *Contractor* Date

Cc: ☐ *Owner* ☐ *Consultant* ☐ Contractor ☐ Field ☐ Other: _____

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 DESCRIPTION

.1 Coordination of the work of all Sections of the Specification is the responsibility of the Contractor.

.2 The Contractor will be deemed to possess the necessary technical skills to carefully evaluate all requirements of the Contract, and to have included in the Price all costs for the proper implementation of these requirements.

.3 The Contractor's responsibility includes, but is not restricted to, co-ordination specified in this Section, except where otherwise specified.

1.2 RELATED MECHANICAL AND ELECTRICAL WORK

.1 Coordination of the installation of mechanical and electrical systems indicated on the Drawings, including the interrelating operation and functioning between components of a system and between systems, is the responsibility of those performing the mechanical and electrical work, with final coordination the responsibility of the Contractor.

.2 Provide interference drawings as herein specified to ensure proper co-ordination of subtrade work. No extras will be considered for work not properly coordinated prior to installation.

.3 Ensure that service poles, pipes, conduit, wires, fill-pipes, vents, regulators, meters and similar Project service work is located in inconspicuous locations. If not indicated on Drawings, verify location of service work with Consultant before commencing installation.

1.3 QUALITY ASSURANCE

.1 Requirements of Regulatory Agencies:

.1 Coordinate requirements of authorities having jurisdiction.

.2 Quality Control:

.1 Ensure that work meets specified requirements.

.2 Schedule, supervise and coordinate inspection and testing as specified in Section 01 45 00.

.3 Job Records:

.1 Maintain job records and ensure that such records are maintained by Subcontractors.

1.4 SUPERINTENDENCE

.1 Provide superintendent and necessary supporting staff personnel who shall be in attendance at the Place of the Work while Work is being performed, with proven experience in erecting, supervising, testing and adjusting projects of comparable nature and complexity.

.2 The Contractor shall appoint a superintendent at the Place of the Work who shall have overall authority at the Place of the Work and shall speak for the Contractor and represent the Contractor’s interest and responsibilities at meetings at the Place of the Work and in dealings with the Consultant and the Owner.

.3 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 Contract Documents and the maintenance of quality standards. Ensure that the supervisory staff includes personnel competent in supervising all Sections of Work required.

.4 Arrange for sufficient number of qualified assistants to the supervisor as required for the proper and efficient execution of the Work.

1.5 SUBMITTALS

.1 Provide a complete set of all required Contract Documents, together with instructions for changes to the work which are issued, to each firm preparing shop drawings.

.2 Schedule and expedite submission of specified submittals.

.3 Review submittals and make comments as specified in Section 01 33 00.

.4 Ensure that each original submission, and their subsequent revisions and resubmissions are made on schedule.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 It is the responsibility of the Contractor to ensure that the supplier or distributor of materials specified or accepted alternatives, which have been bid, has materials on the site when required. The Contractor shall obtain confirmed delivery dates from the supplier, and ensure no delay in the progress of the work

.2 Provide equipment delivery schedule, coordinated with construction and submittals schedule, showing delivery dates for major and/or critical equipment. Provide delivery access and unloading areas.

.3 Make available areas for storage of products and construction equipment to meet specified requirements, and to ensure a minimum of interference with progress of the work and relocation.

.4 Make access available for transference of stored products and construction equipment to work areas.

.5 The Contractor shall contact the Consultant immediately upon receipt of information indicating that any material or item will not be available on time, in accordance with the original schedule, and similarly it shall be the responsibility of all subcontractors and suppliers to so inform the Contractor.

.6 The Consultant reserves the right to receive from the Contractor at any time, upon request, copies of actual purchase or work orders of any material or products to be supplied for the work.

.7 If materials and products have not been placed on order, the Consultant may instruct such items to be placed on order, if direct communication in writing from the manufacturer or prime suppliers is not available indicating that delivery of said material will be made in sufficient time for the orderly completion of the Work.

.8 The Consultant's review of purchase orders or other related documentation shall in no way release the Contractor, or his subcontractors and suppliers from their responsibility for ensuring the timely ordering of all materials and items required, including the necessary expediting, to complete the work as scheduled in accordance with the Contract Documents.

1.7 JOB CONDITIONS

.1 Ensure that conditions within the building are maintained and that work proceeds under conditions meeting specified environmental requirements.

.2 Ensure that protection of adjacent property and the work is adequately provided and maintained to meet specified requirements.

1.8 WARRANTIES

.1 Ensure that warranties are provided, as indicated in Section 01 78 36 Warranties.

.2 Coordinate warranty conditions of interconnected work to ensure that full coverage is obtained.

1.9 CO-ORDINATION

.1 Review Contract Documents and advise the Consultant of possible conflicts between parts of the work before preparation of shop drawings, ordering of products or commencement of affected work.

.2 Coordinate and be responsible for layout of all work in each area and work on which subsequent work depends to facilitate mutual progress, and to prevent conflict between parts of the work.

.3 No addition to the Total Price will be allowed because of interference between the parts of the work of a trade or between the work of different trades unless such interference was brought to the attention of the consultant in writing prior to the start of construction.

.4 Ensure that each Section makes known, for the information of the Contractor and other Sections, the environmental and surface conditions required for the execution of its work; and that each Section makes known the sequences of others' work required for installation of its work.

.5 Ensure that each Section, before commencing work, knows requirements for subsequent work and that each Section is assisted in the execution of its preparatory work by Sections whose work depends upon it.

.6 Ensure that work to be enclosed within ceiling and/or wall spaces can be so accommodates without interference and with other parts of the work.

.7 Ensure that setting drawings, templates, and all other information necessary for the location and installation of materials, holes, sleeves, inserts, anchors, accessories, fastenings, connections, and access panels are provided by each Section whose work requires cooperative location and installation by other Sections, and that such information is communicated to the applicable installer.

.8 Deliver materials supplied by one Section to be installed by another well before the installation begins, as per Construction Progress Schedule.

.9 Sections giving installation information in error, or too late to incorporate in the work, shall be responsible for having additional work done which is thereby made necessary.

.10 Remove and replace work installed in error which is unsatisfactory for subsequent work.

.11 Prepare interference and equipment placing drawings to ensure that all components will be properly accommodated within the spaces provided.

.12 Prepare drawings to indicate coordination and methods of installation of a system with other systems where their relationship is critical. Ensure that all details of equipment apparatus, and connections are coordinated.

.13 Ensure that clearance required by authorities having jurisdiction and for proper maintenance are indicated on Drawings.

.14 Distribute coordination drawings well in advance of fabrication and installation of work affected. Place no orders for affected equipment without submission of coordination drawings to the supplier.

1.10 COOPERATION

.1 Provide forms, templates, anchors, sleeves, inserts and accessories required to be fixed to or inserted in the Work and set in place or instruct separate Subcontractors as to their location.

.2 Supply items to be built in, as and when required together with templates, measurements, shop drawings and other related information and assistance.

.3 Pay the cost of extra work and make up time lost as a result of failure to provide necessary information and items to be built in.

1.11 PROJECT RECORD DRAWINGS

.1 Record, as the work progresses, work constructed differently than shown on Contract Documents. Record all changes in the work caused by site conditions; by Owner, Consultant, sub-consultants, Contractor, and Subcontractor originated changes; and by site instructions, supplementary instructions, field orders, change orders, addendums, correspondence, and directions of authorities having jurisdiction. Accurately record location of concealed structure, and mechanical and electrical services, piping, valves, conduits, pull boxes, junction boxes and similar

work not clearly in view, the position of which is required for maintenance, alteration work, and future additions. Do not conceal critical work until its location has been recorded.

.2 Dimension location of concealed work in reference to building walls, and elevation in reference to floor elevation. Indicate at which point dimension is taken to concealed work. Dimension all terminations and offsets of runs of concealed work.

.3 Make records in a neat and legibly printed manner with a non-smudging medium.

.4 Identify each record drawing as "Project Record Copy". Maintain drawings in good condition and do not use them for construction purposes.

.5 After completion of the work, purchase a complete set of white prints from the Consultant and transfer the information recorded on the white prints accurately, neatly in red ink with dimensions, as applicable. Return these marked-up as-built white prints plus two additional sets of white prints to the Consultant for his review. Any subsequent changes found by the Consultant shall remain the responsibility of the contractor and new white prints will be issued for these changes and re-submitted back to the Consultant at no charge to the Owner.

.6 Maintain Project record drawings in a state current to Project. Such state will be considered a condition precedent for validation of applications for payment. The Consultant's visual inspection will constitute proof that record drawings are current.

.7 Provide Consultant with accurate red-marked record drawings for their transfer to latest version of AutoCad with application for Certificate of Substantial Performance. Final acceptance of the Work will be predicated on receipt and approval of record drawings.

1.12 DETAIL FINISHING DRAWINGS

.1 During the course of the work, the Owner will provide the Contractor with detail drawings showing the interior finishes and furnishings of the building. The Contractor shall read these drawings in conjunction with the Contract Documents. The Contractor shall check the detail drawings against the Contract Documents and shall report any discrepancies to the Consultant.

1.13 CUTTING AND PATCHING

.1 Before cutting, drilling, or sleeving structural load-bearing elements, obtain approval of location and methods from the Structural Engineer and the General Contractor.

.2 Do not endanger work or property by cutting, digging, or similar activities. No Section shall cut or alter the work of another Section unless such cutting or alteration is approved by the latter Section and the General Contractor.

.3 Cut and drill with true smooth edges and to minimum suitable tolerances.

.4 Fit construction tightly to ducts, pipes and conduits to stop air movement completely. The Section performing work that penetrates a fire, air, vapour, moisture, thermal or acoustic separation of the building shall pack voids tightly with rock wool, fibreglass or fire stop material as may be required; seal air, vapour and moisture barriers; and caulk joints as may be required to ensure that no air movement through the penetration is possible.

.5 Cutting, drilling and sleeving of work shall be done only by the Section who has installed it. The Section requiring drilling and sleeving shall inform the Section performing the work of the location and other requirements for drilling and sleeving.

.6 Replace, and otherwise make good, all damaged work, as identified by the Consultant or Contractor.

.7 Cutting and Patching for Holes Required by Mechanical and Electrical work:

.1 Include under mechanical or electrical work for cutting or provision of holes up to and including 50 square inches and related patching, except as otherwise indicated.

.2 Include under work of this Division holes and other openings larger than 50 square inches, and chases, bulkheads, furring and required patching. This Section shall be responsible for determination of work required for holes in excess of 50 square inches.

.8 This Section shall be responsible for all cutting and patching in addition to that specified for mechanical and electrical work, and shall directly supervise performance of cutting and patching by other Sections.

.9 Patching or replacement of damaged work shall be done by the Subcontractor under whose work it was originally executed, and at the expense of the Subcontractor who caused the damage.

.10 Make patches as invisible as possible in final assembly to the approval of the Consultant/Owner. Unacceptable work will be replaced at no charge to the Owner.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 ADMINISTRATIVE

.1 Schedule and administer meetings every 2 weeks (or more frequently as required) with the Consultant throughout the progress of the Work. Schedules to be updated with the Consultant every 2 weeks for distribution at each meeting.

.2 Prepare agenda for such meetings.

.3 The Consultant shall chair such meetings. The Consultant shall administer such meetings and prepare minutes within three (3) days after the meeting date for distribution to the Owner and the Contractor.

.4 Distribute written notice of each meeting four (4) days in advance of meeting date to the Consultant and the Owner and other affected parties.

.5 Representatives of parties attending meetings shall be authorized to act on behalf of the parties they represent. Subcontractors and Suppliers do not attend meetings unless authorized by the Consultant and the Owner.

.6 Prepare and distribute monthly progress reports in accordance with Section 01 32 16, and containing updated schedules, construction photos in accordance with Section 01 33 00, shop drawing logs, requests for interpretation logs, submittals and budget.

1.2 CONTRACT START-UP MEETING

.1 Within five (5) days after award of Contract, request a meeting of parties in Contract to discuss and resolve administrative procedures and responsibilities prior to the commencement of the Work.

.2 The Owner, the Consultant, the Contractor, site superintendent(s), inspection and testing company, and authorities having jurisdiction, as applicable and at their discretion, will be in attendance.

.3 Agenda to include the following:

.1 Appointment of official representative of participants in the Project.

.2 Status of permits, fees and requirement of authorities having jurisdiction. Action required.

.3 Review of standard project forms.

.4 Requirements for Contract modification and interpretation procedures, including, but not limited to: requests for interpretation, proposed Change Orders, Change Orders, Change Directives, Supplemental Instructions, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.5 Requirements for notification for reviews. Allow a minimum of two (2) Working Days' notice to Consultant for review of the Work.

.6 Review of schedules and scheduling procedures and requirements in accordance with Section 01 32 16.

.7 Appointment of inspection and testing agencies or firms, Section 01 45 00.

.8 Requirements for temporary facilities, signs, offices, storage sheds, utilities; Section 01 50 00.

.9 Security requirements at and for the Place of the Work, Section 01 50 00.

.10 Record drawings, Section 01 33 00.

.11 Maintenance manuals, Section 01 33 00.

.12 Take-over procedures, acceptance, Section 01 78 00.

.13 Warranties, Section 01 78 36.

.14 Progress claims, administrative procedures, holdbacks.

.15 Insurances, transcripts of policies.

.16 Contractor's safety procedures.

.17 Cleaning/staging area for vehicles.

.18 Workplace Safety and Insurance Board Certificate.

.4 The Consultant shall organize and chair the contract start-up meeting. Consultant shall record minutes of the contract start-up meeting and distribute a copy to each participant within ten (10) days of meeting.

1.3 PRE-INSTALLATION MEETINGS

.1 During the course of the Work prior to Substantial Performance of the Work, schedule pre-installation meetings as required by the Contract Documents and coordinated with the Consultant.

.2 As far as possible, pre-installation meetings shall be scheduled to take place on the same day as regularly scheduled progress meetings.

.3 Agenda to include the following:

.1 Appointment of official representatives of participants in the Project.

.2 Review of existing conditions and affected work, and testing thereof as required.

.3 Review of installation procedures and requirements.

.4 Review of environmental and site condition requirements.

.5 Review of schedules and scheduling procedures and requirements of the applicable portions of the Work in accordance with Section 01 32 16, in particular:

.1 Schedule of submission of samples, mock-ups, and items for Consultant's consideration.

.2 Delivery schedule of specified equipment.

.3 Requirements for notification for reviews. Allow a minimum of two (2) Working Days' notice to Consultant for review of the Work.

.6 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences, Section 01 50 00.

.7 Requirements for inspections and tests, as applicable.

.1 Schedule and undertake inspections and tests in accordance with Sections 01 32 16 and 01 45 00.

.8 Special safety requirements and procedures.

.4 The following shall be in attendance:

.1 Contractor.

.2 Subcontractors affected by the work for which the pre-installation meeting is being conducted.

.3 Consultant.

.4 Manufacturer's representatives, as applicable.

.5 Inspection and testing company, as applicable.

1.4 PROGRESS MEETINGS

.1 During the course of the Work prior to Substantial Performance of the Work, schedule progress meetings as directed by the Consultant.

.2 In advance of progress meetings, Contractor shall submit to the Consultant a two week look ahead schedule of items of work to be undertaken in the two weeks subsequent to the progress meeting. Two week look ahead schedule will be reviewed at the meeting and recorded in the minutes of the meeting. Refer to Section 01 32 16 for requirements for look ahead schedule.

.3 Attendees at progress meetings shall include the following:

.1 Contractor.

.2 Contractor's site superintendent(s).

.3 Consultant.

.4 Owner.

.4 Agenda to include the following:

.1 Review, approval of proceedings of previous meeting.

.2 Review of items arising from proceedings.

.3 Review of progress of the Work since previous meetings.

.4 Review of schedules in accordance with Section 01 32 16, including:

.1 Revisions to construction schedule.

.2 Progress and schedule for subsequent period of the Work: Two (2) week look-ahead.

.3 Problems that impede compliance with construction schedule.

.4 Review of off-site fabrication delivery schedules.

.5 Review of material delivery dates/schedule.

.6 Corrective measures and procedures to regain construction schedule.

.7 Review of submittal schedules: expedite as required.

.5 Field observations, problems, conflicts.

.6 Review status of submittals.

.7 Maintenance of quality standards.

.8 Pending changes and substitutions.

.9 Review of Contract modifications and interpretations including, but not limited to: requests for interpretation and log, proposed Change Orders, Change Orders, Change Directives, Supplemental Instructions, for effect on construction schedule and on Contract Time.

.10 Review of status of as-built documents.

.11 Other business.

1.5 PRE-TAKEOVER MEETING

.1 Prior to application for Substantial Performance of the Work, schedule a pre-takeover meeting.

.2 Agenda to include the following:

.1 Review, approval of proceedings of previous meeting.

.2 Review of items arising from proceedings.

.3 Review of procedures for Substantial Performance of the Work, completion of the Contract, and handover of the Work.

.4 Field observations, problems, conflicts.

.5 Review of outstanding Contract modifications and interpretations including, but not limited to: requests for interpretation and log, proposed Change Orders, Change Orders, Change Directives, Supplemental Instructions, for effect on construction schedule and on Contract Time.

.6 Problems which impede Substantial Performance of the Work.

.7 Review of procedures for deficiency review. Corrective measures required.

.8 Progress, schedule, during succeeding period of the Work.

.9 Review submittal requirements for warranties, manuals, and all demonstrations and documentation required for Substantial Performance of the Work.

.10 Review of status of as-built documents and record drawings.

.11 Other business.

1.6 POST-CONSTRUCTION MEETING

.1 Prior to application for completion of Contract, schedule a post-construction meeting. Four days prior to date for meeting, Consultant shall confirm a date for meeting based on evaluation of completion requirements.

.2 Agenda to include the following:

.1 Review, approval of proceedings of previous meeting.

.2 Confirmation that no business is arising from proceedings.

.3 Confirmation of completion of the Contract, and handover of reviewed documentation from the Consultant to the Owner.

.4 Confirmation of completion of proposed Change Orders, Change Orders, Change Directives, and Supplemental Instructions.

.5 Problems that impede Contract completion.

.6 Identify unresolved issues or potential warranty problems.

.7 Confirmation of completion of deficiencies.

.8 Corrective measures required.

.9 Confirm submittal requirements for warranties, manuals, and demonstrations and documentation for Contract completion are in order.

.10 Review of procedures for communication during post-construction period.

.11 Handover of reviewed record documents by the Consultant to the Owner.

.12 Handover of Contract completion insurance policy transcripts by Contractor.

.13 Submission of final application for payment.

.14 Review and finalize outstanding claims, pricing, and allowance amounts.

.15 Status of commissioning and training.

.16 Demobilization and the Place of the Work restoration.

.17 Review of requests for interpretation log.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 PLANNING, SCHEDULING AND MONITORING - GENERAL

.1 This section includes requirements for the preparation, monitoring and revision of construction schedules.

.2 The purpose of the schedules and reports mandated in this section is to:

.1 Ensure adequate planning and execution of the Work by the Contractor;

.2 Establish the standard against which satisfactory completion of the project will be judged;

.3 Assist the Owner and the Consultant in monitoring progress;

.4 Assess the impact of changes to the Work.

.3 The Contractor has the obligation and responsibility at all times to plan and monitor all of its activities, anticipating and scheduling its staff, materials, plant and work methods in a manner that is likely to ensure completion of the Work in accordance with the terms and conditions of the Contract and at a rate that will allow the Work to be completed on time.

1.2 CONSTRUCTION SCHEDULE

.1 Within five (5) days of Contract award, submit in format acceptable to Consultant, the Contractor's critical path construction schedule.

.2 Set up format to permit plotting of actual construction progress against scheduled progress.

.3 Schedule shall show:

.1 Commencement and completion dates of Contract.

.2 Commencement and completion dates of construction stages/phases, if any.

.3 Commencement and completion dates of each trade. Major trades shall be further broken down as directed by Consultant; generally follow Specification format.

.4 Order and delivery dates for major or critical equipment.

.5 Critical dates for shop drawing/sample submissions.

.6 Any other information relating to orderly progress of Contract, considered by Contractor or Consultant to be pertinent.

.4 The total number of activities and the distribution of activities shall reflect the complexity of the Work and shall be finite, measurable, identify a specific function and identify a trade responsible for its completion.

.5 Prepare a narrative to accompany the preliminary construction schedule that provides a detailed description of the labour, materials, plant, means and methods that the Contractor intends to utilize in carrying out the Work to achieve the planned rates of production required to support the activity durations shown in the schedule. The narrative shall also provide explanations supporting the use of lead-lag relationships and, where permitted, constrained dates.

.6 Consultant, together with Contractor shall review construction progress once a month during or immediately following regular site meeting, or more often as directed by Consultant.

.7 Update construction schedule, whenever changes occur, in manner and at times acceptable to Consultant.

1.3 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Schedules shall be submitted to the Consultant in both hard copy and electronic forms. Electronic schedule submissions shall be in an original scheduling software data file type that permits modification of the layouts and data. In case of a discrepancy between an electronic copy of the

schedule and the corresponding hard-copy schedule, the hard copy of the schedule that has been formally submitted and reviewed in accordance with the requirements of Section 01 33 00 shall govern.

.3 Include costs for execution, preparation and reproduction of schedule submittals in tendered price.

.4 Submission of the schedules referred to in this Section shall constitute the Contractor's representation that:

.1 Contractor and its Sub-Contractors intend to execute the Work in the sequence indicated on such schedule;

.2 Contractor has distributed the proposed schedule to its Sub-Contractors for their review and comment, and has obtained their concurrence;

.3 All elements of the Work required for the performance of the Contract are included. Failure to include any such element shall not excuse the Contractor from completing the Work within the Contract Time and within any other constraints specified in the Contract;

.4 Seasonal weather conditions have been considered and included in the planning and scheduling of the Work influenced by high and low ambient temperatures and/or precipitation;

.5 Contractor has thoroughly inspected the Site and has incorporated any other special conditions in planning the Work such as specified or required non-work periods, etc.

.5 Cash flow diagram:

.1 Contractor shall submit an updated cash flow diagram quarterly.

.2 Cash flow diagram shall be in format acceptable to the Owner.

.3 Cash flow diagram shall represent Contractor's anticipated invoicing.

1.4 PROGRESS RECORD

.1 Maintain on site, permanent written record of progress of work. Record shall be open to inspection by Consultant at all times and copy shall be furnished to Consultant upon request.

.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.

.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.

1.5 PROGRESS MONITORING

.1 Monitor progress of Work in detail to ensure integrity of critical path, by comparing actual completions of individual activities with their scheduled completions, and reviewing progress of activities that have started but are not yet completed. Monitoring should be undertaken sufficiently often so that causes of delays are immediately identified and removed if possible.

.2 On an ongoing basis, record "progress to date" on copy of schedule to be available at the Site. Inspect Work with the Owner and the Consultant at least bi-weekly to establish progress on each current activity.

1.6 UPDATES AND REVISIONS TO SCHEDULE

.1 The Contractor's schedule is to be updated and resubmitted to the Consultant as a progress schedule at least once per month, on a date to be mutually agreed by the Contractor and the Consultant, together with the related data and reports required by this Section. Updated schedule is to include a 2 week look-ahead schedule in the form of a bar chart.

.2 Each progress schedule shall record and report actual completion and/or start dates for each completed or in-progress activity, activity percent complete for in-progress activities and forecast

completion dates for all activities that are not yet complete. Do not automatically update actual start and finish dates by using default mechanisms found in scheduling software. The progress schedule will show the projected completion date of the Work based on the progress information inserted into it, without changes to the schedule logic or the original duration of any activity. The Contractor shall use the retained logic option when executing schedule calculations. The final as-planned schedule (or an approved revision thereto) will be shown as a target schedule to indicate whether the current progress schedule remains on target, has slipped or is ahead of schedule.

.3 The Contractor may then, in a second and subsequent update to the progress schedule, incorporate any logic and duration changes that represent its revised planning, provided all such changes are identified and documented in the schedule narrative required to accompany the progress schedule, and are agreed to by the Consultant.

.4 If it appears that the progress schedule submitted by the Contractor no longer represents the actual sequencing and progress of the Work, the Consultant may instruct the Contractor to revise the progress schedule.

.5 In order to improve the schedule, eliminate unforeseen problems or reduce the time required for an activity, modifications to the schedule may be suggested by the Contractor, Sub-Contractors, Owner or Consultant during the execution of the Contract, and such modifications may be implemented by mutual agreement. The Contractor shall submit to the Consultant for acceptance proposed adjustments to the final as-planned schedule or any subsequent updates that will not change the Contract Time.

.6 If, at any time, the work is behind schedule with respect to the progress schedule currently in force, and if the Consultant believes there is a risk of the Work not being completed within the Contract Time as a result of such delay, the Contractor shall take all necessary measures to make up for such delay either by increasing staff, plant or facilities, or by amending its work methods, whichever is applicable.

.7 In all cases of delay or potential delay, the Contractor shall keep the Owner and the Consultant informed of its intentions with regard to mitigation of such delay and the Owner's Consultant may, if it is deemed necessary, require the Contractor to revise all or part of its current progress schedule.

.8 The current Contract Schedule can only be revised as agreed with the Owner and the Consultant by Change Order or an accepted revision to the logical sequence of described construction operations.

.9 Once accepted, the revised schedule will become the current Contract Schedule against which progress is reported and to which subsequent updates will be compared. The new Contract Schedule will be clearly identified to show it as the current Contract Schedule.

.10 Where the progress schedule shows completion of the Contract, or of any interim milestone, later than the Contract or milestone completion dates, acceptance of such progress schedules and of the monthly progress report will not constitute acceptance of the delay by the Consultant or the Owner.

1.7 RECORD DRAWINGS

.1 Obtain and keep on site at all times a complete and separate set of black line white prints.

.2 Note clearly, neatly, accurately and promptly as the work progresses all architectural, structural mechanical and electrical changes, revisions and additions to the work and deviations from the Contract Documents.

.3 Accurate location, depth, position, size and type of concealed and underground services, both inside and outside shall be included as part of these record drawings.

.4 Record drawings shall be available for review at each site meeting.

.5 Refer to Section 01 31 13 for requirements on submission of record drawings.

1.8 PROGRESS PHOTOGRAPHS

.1 Concurrently with monthly application for payment submit two sets of 200 mm x 250 mm coloured, glossy photographs as follows:

.1 Up to four photographs shall be taken from positions determined by Consultant.

.2 Photographs shall be properly exposed and in focus; views shall be unobstructed.

.3 Identify each photograph on back stating name of project, name of photographer, description of view and date of photograph taken.

1.9 PRODUCT DELIVERY CONTROL

.1 It is the responsibility of the Contractor to ensure that the supplier or distributor of materials specified or alternatives accepted, which he intends to use, has materials on the site when required. The Contractor shall obtain confirmed delivery dates from the supplier.

.2 Provide equipment delivery schedule, coordinated with construction and submittals' schedule, showing delivery dates for major and/or critical equipment.

.3 The Contractor shall contact the Consultant immediately upon receipt of information indicating that any material or item will not be available on time, in accordance with the original schedule, and similarly it shall be the responsibility of all subcontractors and suppliers to so inform the Contractor.

.4 The Consultant reserves the right to receive from the Contractor at any time, upon request, copies of actual purchase or work orders of any material or products to be supplied for the work.

.5 If materials and products have not been placed on order, the Consultant may instruct such items to be placed on order, if direct communication in writing from the manufacturer or prime suppliers is not available indicating that delivery of said material will be made in sufficient time for the orderly completion of the Work.

.6 The Consultant's review of purchase orders or other related documentation shall in no way release the Contractor, or his subcontractors and suppliers from their responsibility for ensuring the timely ordering of all materials and items required, including the necessary expediting, to complete the work as scheduled in accordance with the Contract Documents.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 GENERAL

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

.2 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.

.3 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.

.4 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 As part of their scope of work, Consultant shall review shop drawings no more than twice. Should three or more reviews be required due to reasons of Contractor omissions causing resubmission requests, then Contractor shall reimburse the Consultant for time expended in these extra reviews. Time shall be invoiced to the Owner (to be deducted from monies due to the Contractor and paid to Consultant by Owner) at rates recommended by Consultant's professional association and disbursements shall be invoiced at Consultant's cost. The Contractor shall cover directly costs and administration associated with courier services and the like for these extra shop drawing reviews.

.4 Consultant's review and markings on submittals do not authorize changes in the Work or the Contract Time.

.5 Submittals received but not required by the Contract Documents or requested by the Consultant will not be reviewed by the Consultant and will be marked 'NOT REVIEWED' by the Consultant and returned to the Contractor.

.5 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.

.6 Submittals that contain substitutions will be rejected.

.7 Do not proceed with work affected by a submittal, including ordering of Products, until relevant submittal has been reviewed by Consultant.

.8 Prepare submittals using SI (metric) units.

.9 Contractor's responsibility for errors and omissions in submittals is not relieved by Consultant's review of submittals.

.10 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.

.11 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.

.12 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.

.13 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.

1.2 SUBMISSION PROCEDURES

.1 Coordinate each submittal with requirements of the Work and Contract Documents. Individual submittals will not be reviewed until related information is available.

.2 Distribute copies of submittals to parties whose work is affected by submittals except Consultant and Owner before final submission for review by Consultant.

.3 Accompany submittals with transmittal letter, in duplicate, containing:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Identification and quantity of each submittal.

.5 Other pertinent data.

.4 Each submittal shall be identified numerically by relevant specification section number with a numeric indicator for multiple submittals by that section followed by revisions number, for example 08 11 13-01-R0.

.5 Make any changes in submittal that Consultant may require, consistent with Contract Documents, and resubmit as directed by Consultant.

.6 Notify Consultant, in writing, when resubmitting, of any revisions other than those requested by Consultant.

.7 After Consultant's review, distribute copies to affected parties.

1.3 PRODUCT DATA SHEETS

.1 Submit Product data sheet prints; three (3) sets for Consultant (which includes 1 set that will be returned once submittal has been reviewed), 1 set for Contractor and 1 set each of applicable consulting engineers.

.2 Submit Product data sheets for requirements requested in the Contract Documents and as the Consultant may reasonably request where shop drawings will not be prepared due to a standardized manufacture of a Product. Manufacturers' catalogue cuts will be acceptable in such cases, providing that they are 8-1/2" x 11" originals, and that they indicate choices including sizes, colours, model numbers, options and other pertinent data, including installation instructions. Submissions showing only general information are not acceptable.

.3 Where requirements of Contract Documents are more stringent than design proposed on Product data sheets, the requirements of the Contract Documents take priority.

.4 Upon completion of review by Consultant, one (1) marked set of Product data sheets will be returned to Contractor for reproduction and distribution.

.5 Retain one (1) complete set of prints of reviewed Product data sheets for issuance to Owner immediately prior to Substantial Performance of the Work, in an acceptable, bound manner.

1.4 SHOP DRAWINGS

.1 Submit shop drawings for which submission is required in other Sections of this Specification. Include in final shop drawing submissions detailed information, templates and installation instructions required for incorporation and connection of the work concerned, and other details as may be specified in other Sections.

.2 In addition to shop drawings specified in other Sections, submit shop drawings required by authorities having jurisdiction in accordance with their requirements.

.3 The General Contractor shall check, sign, and make notations he considers necessary on shop drawings before each submission to the Consultants for their review.

.4 Indicate on each submission changes from the Contract Drawings and Specification that have been incorporated in the shop drawings. The Contractor shall be responsible for changes made from the Contract Drawings and Specification which are not indicated or otherwise communicated in writing with the submission.

.5 Shop drawing review by Consultant or sub-consultants is for the sole purpose of ascertaining conformance with the general design concept and as a precaution against oversight or error. This review shall not mean that Consultant and sub-consultants approve the detail design inherent in the shop drawings, 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 in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents. No review of design shall be assumed made when such design is a responsibility of the Contractor included in the work. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of the work of all Subcontractors.

.6 Show on shop drawings all pertinent information required for materials and installation, and for proper integration of this installation with work of others.

.7 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.

.8 Submit shop drawings folded into 8-1/2" x 11" size with title block appearing on outside. Four (4) copies of engineering data sheets, catalogue cuts and standard diagrams may be substituted for shop drawings where applicable. One (1) reproducible and three (3) white prints of each drawing are required.

.9 Shop drawings which require extensive correction or are in substantial disagreement with intent of contract documents will be sent back for revisions and resubmission. The reproducible copy will be returned.

.10 Otherwise, shop drawings will be sent back with review comments only. The reproducible copy and two (2) white prints will be returned. One (1) white print will be retained.

.11 Conform to review comments and stamped instructions of each shop drawings reviewer.

.12 Only drawings noted for revision and resubmission need be resubmitted. Include revisions required by previous reviews before resubmission of shop drawings.

.13 Do not add new details or information to shop drawings after they have been reviewed, unless requested by the reviewer, requiring a re-submission.

.14 Do not proceed with work dependent on shop drawing information until approval is given and verification received from Contractor. The Contractor shall be responsible for work performed prior to receipt of reviewed shop drawings. No review comments shall be construed as authorization for Changes in the work.

.15 Fabricate work exactly as shown on shop drawings. If shop practice dictates revisions, revise drawings and resubmit.

.16 File one (1) copy of each finally revised and corrected shop drawing on site.

.17 Provide shop drawings as called for in the Trade Sections of these Specifications.

1.5 SAMPLES

.1 Submit samples for which submission requirement is specified in Trade Sections of this Specification.

.2 Submit samples in triplicate of adequate size to represent the material in its intended use on Project. Submit an extreme range of samples when the degree of marking or colour cannot be represented by a single sample.

.3 Label samples with Project name, number, Contractor, and date.

.4 Include in the work cost of delivery and handling, assembly, and return to supplier of samples.

.5 If sample is disapproved, two samples will be returned. If sample is approved, one sample will be returned, marked "Approved".

.6 Approved samples shall serve as a model against which the products incorporated in the work shall be judged.

.7 Each product incorporated in the work shall be precisely the same in all details as the approved sample.

.8 Should any change of material, colour, texture, finish, dimensions, performance, function, operation, construction, joining, fastening, fabrication techniques, service characteristics, and other qualities be made to a product after approval has been given, submit for approval of the revised characteristics in writing and resubmit samples of the product for approval if requested.

.9 When samples are very large, require assembly, or require evaluation at the site, they may be delivered to the site, but only with approval and as directed.

.10 Provide samples as called for in the Trade Sections of these Specifications.

1.6 MOCK-UPS

.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.

.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 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.

.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.

.5 Reviewed and accepted mock-ups will become standards of workmanship and material against which installed work will be compared.

.6 Remove and replace materials or assemblies not matching reviewed mock-ups.

.7 Resubmit mock-ups until written acceptance is obtained from Consultant.

1.7 INSERT LOCATION DRAWINGS

.1 Submit insert location drawings which are required for installation of work.

.2 Indicate on insert location drawings the location and size of sleeves, anchor bolts, openings and miscellaneous items to be incorporated in the work.

.3 Submit insert location drawings well in advance of construction of work incorporating built-in work.

1.8 COORDINATION DRAWINGS

.1 Prepare interference and equipment placing drawings to ensure that all components will be properly accommodated within the spaces provided.

.2 Prepare drawings to indicate coordination and methods of installation of a system with other systems where their relationship is critical. Ensure that all details of equipment, apparatus, and connections are coordinated.

.3 Ensure that clearance required by authorities having jurisdiction and for proper maintenance are indicated on Drawings.

.4 Distribute coordination drawings well in advance of fabrication and installation of work affected. Place no orders for affected equipment without submission of coordination Drawings to the supplier.

1.9 PROJECT RECORD DRAWINGS

.1 Submit Project Record Drawings specified under work of Section 01 31 13 with application for Certificate of Substantial Performance. Final acceptance of the work will be predicted on receipt and approval of record drawings.

1.10 WARRANTIES

.1 The Contractor shall submit all the warranties as herein specified, in an approved uniform format as indicated in Section 01 78 36 Warranties.

1.11 MAINTENANCE MANUAL AND OPERATING INSTRUCTIONS

.1 Submit Operations and Maintenance Manuals at completion of Project on two (2) USB sticks in PDF format.

.1 Maintenance Manual shall consist of shop drawings, extended warranties and Project Data Book.

.2 Include in Maintenance Manual one copy of each final approved shop drawing issued for Project of which have been recorded changes made during fabrication and installation caused by unforeseen conditions.

.3 Submit extended warranties together with Operations and Maintenance Manuals in PDF format.

.4 USB sticks shall also contain the following:

.1 Contain maintenance instructions as specified in various Sections and as referenced in Section 01 78 00.

.2 Contain brochures and parts lists on all equipment.

.3 Contain a list of manufacturers and trade names of finishes and coatings applied.

.4 Contain sources of supply for all proprietary products used in the work.

.5 Contain lists of supply sources for maintenance of all equipment in Project of which more detailed information is not included above.

.6 Contain finished hardware schedule.

.7 Contain charts, diagrams and reports indicated on Mechanical and Electrical Drawings.

1.12 AS-BUILT DOCUMENTS

.1 Obtain from the Consultant and pay cost for one copy of Specifications and one set of white prints of the Contract Drawings at the commencement of Work, and, prior to the date of Substantial Performance, an extra set of white prints of Contract Drawings, for as-built purposes.

.2 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.3 As Work progresses, clearly mark in a neat and legible form with red pen on Specifications and drawing white prints all significant changes and deviations from the Contract Drawings and Specifications caused by site conditions, Supplemental Instructions and Change Orders.

.1 Changes and deviations marked on as-built record drawings and specifications by reference to Supplemental Instructions, Change Orders and other documents are not acceptable.

.4 Record the following changes and deviations on drawing white prints:

.1 Depths of various elements of foundation in relationship to the first floor level.

.2 Field changes of dimensions.

.3 Changes made by Addenda and change orders.

.4 Details not on original Contract Drawings.

.5 Other significant deviations and changes which are concealed in construction and cannot be identified by visual inspection.

.5 Show actual locations of the following on drawing white prints:

.1 Access doors and panels.

.2 Inverts of services at key points within the building, at points where entering and leaving the building, and at the property lines. Dimension services in relation to the structure and building grid lines.

.3 Measured horizontal and vertical locations of site utilities and appurtenances, referenced to permanent surface improvements.

.4 Ductwork, piping, conduit, mechanical and electrical equipment and associated work.

.5 Concealed piping, conduit and equipment, including such items provided for future use.

.6 Record the following information on the Specifications.

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.3 Accepted substitutions and alternatives.

.4 Other approved changes and deviations to items specified.

.7 Have white prints and specifications available for review at all times.

.8 Final As Built Drawings: Prior to the date of Substantial Performance, allowing for Consultant's review, clearly, neatly and accurately transfer information from the marked-up drawing white prints to a set of clean white prints.

.1 Print lettering and numbers in size to match original.

.2 Lines may be drawn free hand, provided they are neat and accurate. Add "AS-BUILT RECORD" at each drawing title block. Should extensive changes and deviations to a drawing make the information illegible, re-draft the changed areas as required.

.3 Submit drawing white prints made containing as-built record information for Consultant's review. Correct as directed by Consultant.

.4 Submit to the Consultant, finalized as-built record drawings and specifications on USB sticks in PDF Writer format, two weeks prior to application for Certificate of Substantial Performance.

1.13 EXTRA MATERIALS

.1 Supply extra materials at completion of Project as specified in Trade Sections of this Specification.

.2 Deliver extra materials to location designated by the Owners representative.

1.14 INSPECTION COMPANY REPORTS

.1 Submit copies of test and verification reports as specified in Section 01 45 00 and in other Sections of the Specifications of "Source Quality Control" and "Field Quality Control" immediately they are completed.

.2 Submit one copy of each report unless specified otherwise, and signed by a responsible officer of the inspection and testing company to the Owner and Consultant.

.3 Submit an additional report directly after it is completed to:

.4 Applicable design engineer.

.5 The Contractor.

.6 Authorities having jurisdiction when such reports are required by them.

.7 Each report shall include:

.1 Date of issue.

.2 Project name and number.

.3 Name and address of inspection and testing company.

.4 Name and signature of inspector or tester.

.5 Date of inspection or test.

.6 Identification of product and Specifications Section covering inspected or tested work.

.7 Location of inspection or from which tested material was derived.

.8 Type of inspection or test.

.9 Remarks and observations on compliance with Contract Documents.

1.15 PROGRESS PHOTOGRAPHS

.1 Unless otherwise specified, provide and submit two prints of each from six (6) difference vantage points on the project site as directed, and taken as soon as possible after the first day of each month throughout the project.

.2 Prints shall be 8" x 10" glossy mounted on muslin with 3/4" binding hems along the side of each. Identify prints at bottom of each, stating name of project, name of Contractor, name of Consultant and date. Include short log describing camera position, also direction of view for each print and a constant location number. The Consultant may request changes of vantage points, either interior or exterior, as the job progresses. He may further request more than six (6) in which case, the additional photographs will be paid for by the Owner as an addition to the contract amount.

.3 Submit two prints of each photograph with each application for payment.

1.16 PROGRESS BILLING

.1 Coordinate progress billing with cost breakdown.

.2 Include value of work completed during billing period.

.3 Include running total of value of work completed by the end of the billing period.

.4 Format of progress billing shall be as requested by and approved by the Owner.

.5 Progress billings shall be dated and submitted on the 25th day of each month.

.6 Progress billings shall be discussed as part of the preconstruction meeting.

1.17 PRICING OF CHANGES TO WORK

.1 Submit with quotations for changes to work detailed estimate sheets showing initial and revised quantities of labour, materials and equipment, and the related unit costs.

.2 Payment for use of small tools, travelling, out-of-town accommodations and preparation of price change submittals will be considered a part of overhead as specified in the Supplementary Conditions.

.3 Submit quotations within ten (10) days of issuance of the contemplated change for changes to work with full documentation to Consultant.

1.18 WASTE MANAGEMENT

.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 Work plans 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.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 PERMITS, LICENCES, FEES

.1 Comply with requirements of GC 10.2.

.2 Where permits, licences and inspection fees are required by authorities having jurisdiction for specific trade functions, they shall be obtained by particular subtrade responsible for that work.

.3 Review building permit set with Consultant immediately following receipt of building permit and jointly determine whether or not changes to Contract are required.

.4 Be responsible for ensuring that no work is undertaken which is conditional on permits, approvals, reviews, licences, fees, until all applicable conditions are met. No time extension will be allowed for delay in obtaining necessary permits.

.5 Report to the Consultant in writing any condition which would prohibit granting of any permit or approval before work affecting such items is commenced.

.6 Give notice of completion of project prior to occupancy, as required by applicable legislation.

1.2 BUILDING CODE, BY-LAWS, REGULATIONS

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

.2 Comply with requirements, regulations and ordinances of other jurisdictional authorities.

.3 Where it is necessary to carry out work outside property lines, such as sidewalks, paving or concrete curbs, comply with applicable municipal requirements.

.4 Promptly submit written notice to Consultant, of observed variance of Contract Documents from requirements of Building Code and authorities having jurisdiction. Assume responsibility for work known to be contrary to such requirements and performed without notifying Consultant.

1.3 AUTHORITIES HAVING JURISDICTION

.1 Where reference is made to "authorities having jurisdiction", it shall mean all authorities who have within their constituted powers the right to enforce the laws of the place of the building.

1.4 REQUIREMENTS OF REGULATORY AGENCIES

.1 Work shall include protection measures consisting of materials constructions and methods, and first-aid equipment and personnel, required by the latest edition of The Occupational Health and Safety Act, and the Workplace Safety and Insurance Board (WSIB) Regulations, of the Province of Ontario, and as otherwise imposed by authorities having jurisdiction to save persons and property from harm.

.2 Ensure that pollution, noise pollution and environmental control of construction activities are exercised as required during the work.

.3 Except where special permission is obtained, maintain clear access for roads and sidewalks on public property.

.4 Maintain all (Municipal and Provincial) roads and sidewalks clear of construction materials and debris, including excavated material. Clean roads and sidewalks as frequently as required to ensure that they are cleared of materials, debris and excavated material.

.5 Remove snow and ice from sidewalks as required and to the standards acceptable by the Municipality.

1.5 CONSTRUCTION SAFETY

.1 Comply with requirements of GC 3.6.

.2 Be governed by pertinent safety requirements of Federal or Provincial Governments and of municipal bodies having authority, particularly the Ontario Construction Safety Act, and regula-

tions of Ontario Ministry of Labour, and work in conjunction with proper safety associations operating under the authority of Ontario Workers' Compensation Act.

.3 Do not, in the performance of the work, in any manner endanger the safety or unlawfully interfere with the convenience of the public.

.4 Notify the Ontario Ministry of Labour of intended work of this Contract as required by the Occupational Health and Safety Act. One copy of the "Notice of Project" shall be handed to Consultant.

1.6 FIRE PROTECTION

.1 Refer to technical Sections of Specifications and Drawings for fire protection requirements.

.2 Test methods used to determine fire hazard classification and fire endurance rating shall be as required by Ontario Building Code.

.3 Upon request, furnish Consultant with evidence of compliance with project fire protection requirements.

.4 Materials and components used to construct fire rated assemblies and materials requiring fire hazard classification shall be listed and labelled, or otherwise approved, by fire rating authority. Labelled materials and their packaging shall bear fire rating authorities label showing product classification.

.5 Fire rated door assemblies shall include doors, frame, anchors and hardware and shall bear label of fire rating authority showing opening classification and rating.

.6 Materials having a fire hazard classification shall be applied or installed in accordance with fire rating authority`s printed instructions.

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

.8 Construct fire separations as continuous, uninterrupted elements except for permitted openings. Extend fire rated walls and partitions from floor to underside of structural deck above.

.9 Fill and patch voids and gaps around openings and penetrations in and at perimeter of assemblies so as to maintain continuity and to produce a fire resistant smoke tight seal, acceptable to jurisdictional authorities and Consultant.

1.7 HAZARDOUS MATERIALS

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

.2 Ensure that Material Safety Data Sheets (MSDS) are available on site prior to first delivery to site of any controlled material or substance.

.3 Maintain on site for duration of Contract a hazardous materials log containing all required MSDS.

.4 Log shall be open for inspection for Owner, Consultant and all personnel on site.

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

1.8 WASTE MANAGEMENT

.1 Comply with applicable regulations of the Ministry of Environment and Energy governing waste management.

.2 Prepare and submit waste audit, waste reduction and source separation plans in accordance with applicable regulatory requirements.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 REFERENCE STANDARDS

.1 Where edition date is not specified, consider that references to manufacturer's and, published codes, standards and specifications are made to the latest edition (revision) approved by the issuing organization, current at the date of this Specification.

.2 Reference standards and specifications are quoted in this Specification to establish minimum standards. Work of quality or of performance characteristics that exceeds these minimum standards will be considered to conform.

.3 Should the Contract Documents conflict with specified reference standards or specification, the General Conditions of the Contract shall govern.

.4 Where reference is made to manufacturer's directions, instructions or specifications they shall include full information or storing, handling, preparing, mixing, installing, erecting, applying, or other matters concerning the materials pertinent to their use and their relationship to materials with which they are incorporated.

.5 Have a copy of each code, standard and specification, and manufacturer's directions, instructions and specifications, to which reference is made in the Specifications, always available at construction site.

.6 Standards, specifications, associations, and regulatory bodies are generally referred to throughout the specifications by their abbreviated designations. These are as follows:

ABBREVIATION	MEANING
AA	ALUMINUM ASSOCIATION
AAMA	ARCHITECTURAL ALUMINUM MANUFACTURERS` ASSOCIATION
AASHO	AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS
ACI	AMERICAN CONCRETE INSTITUTE
AGA	AMERICAN GAS ASSOCIATION
AIA	AMERICAN INSTITUTE OF ARCHITECTS
AIMA	ACOUSTICAL & INSULATING MATERIALS ASSOCIATION
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
AMCA	AIR MOVING AND CONDITIONING ASSOCIATION INC.
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIRCONDITIONING ENGINEERS
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWI	ARCHITECTURAL WOODWORK INSTITUTE (USA)
AWMAC	ARCHITECTURAL WOODWORK MANUFACTURERS ASSOCIATION OF CANADA
AWS	AMERICAN WELDING SOCIETY
CCA	CANADIAN CONSTRUCTION ASSOCIATION
CCRC	CANADIAN CODE FOR RESIDENTIAL CONSTRUCTION
CEC	CANADIAN ELECTRICAL CODE
CFUA	CANADIAN FIRE UNDERWRITERS ASSOCIATION
CGA	CANADIAN GAS ASSOCIATION
CGSB	CANADIAN GENERAL STANDARDS BOARD
CIQS	CANADIAN INSTITUTE OF QUANTITY SURVEYORS
CISC	CANADIAN INSTITUTE OF STEEL CONSTRUCTION
CITC	CANADIAN INSTITUTE OF TIMBER CONSTRUCTION
CLA	CANADIAN LUMBERMEN`S ASSOCIATION
CMHC	CANADA MORTGAGE & HOUSING CORPORATION
COFI	COUNCIL OF FOREST INDUSTRIES OF BRITISH COLUMBIA
CPCI	CANADIAN PRESTRESSED CONCRETE INSTITUTE

CRCA	CANADIAN ROOFING CONTRACTORS ASSOCIATION
CSA	CANADIAN STANDARDS ASSOCIATION
CSC	CONSTRUCTION SPECIFICATIONS CANADA
CSI	CONSTRUCTION SPECIFICATIONS INSTITUTE (USA)
CSPI	CORRUGATED STEEL PIPE INSTITUTE
CSSBI	CANADIAN SHEET STEEL BUILDING INSTITUTE
CUA	CANADIAN UNDERWRITERS` ASSOCIATION
CWB	CANADIAN WELDING BUREAU
CWC	CANADIAN WOOD COUNCIL
DND	DEPARTMENT OF NATIONAL DEFENCE, CANADA
FM	FACTORY MUTUAL ENGINEERING CORPORATION
FS	FEDERAL SPECIFICATION (USA)
IES	ILLUMINATING ENGINEERING SOCIETY
IGMAC	INSULATED GLASS MANUFACTURERS ASSOCIATION OF CANADA
LTIC	LAMINATED TIMBER INSTITUTE OF CANADA
MIA	MARBLE INSTITUTE OF AMERICA
MPMDD	MODIFIED PROCTOR MAXIMUM DRY DENSITY
NAAMM	NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (USA)
NBFU	NATIONAL BOARD OF FIRE UNDERWRITERS
NBC	NATIONAL BUILDING CODE OF CANADA
NBS	NATIONAL BUREAU OF STANDARDS (USDC)
NEMA	NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NHLA	NATIONAL HARDWOOD LUMBER ASSOCIATION (USA)
NLGA	NATIONAL LUMBER GRADES AUTHORITY
NRC	NATIONAL RESEARCH COUNCIL
OBC	ONTARIO BUILDING CODE
OHSA	OCCUPATIONAL HEALTH AND SAFETY ACT
OPSS	ONTARIO PROVINCIAL STANDARD SPECIFICATIONS
PCA	PORTLAND CEMENT ASSOCIATION
PCI	PRESTRESSED CONCRETE INSTITUTE
RAIC	ROYAL ARCHITECTURAL INSTITUTE OF CANADA
SDI	STEEL DECK INSTITUTE
SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
SPMDD	STANDARD PROCTOR MAXIMUM DRY DENSITY
SSPC	STEEL STRUCTURES PAINTING COUNCIL
TTMAC	TERRAZZO, TILE & MARBLE ASSOCIATION OF CANADA
ULC	UNDERWRITERS' LABORATORIES OF CANADA
ULI	UNDERWRITERS' LABORATORIES, INC. (USA)
USAS	UNITED STATES OF AMERICA STANDARDS INSTITUTE
WSIB	WORKPLACE SAFETY AND INSURANCE BOARD

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 GENERAL

.1 Related Requirements Specified Elsewhere:

.1 Inspections and testing required by the laws, ordinances, rules and regulations of authorities having jurisdiction:

.1 General Conditions of the Contract.

.2 Verification by certification that specified products meet requirements of reference standards:

.1 In applicable Sections of the Specification.

.3 Testing, balancing and adjusting of equipment:

.1 In applicable mechanical and electrical Sections of the Specification.

.4 Cutting and Patching:

.1 Section 01 31 13.

.5 Submission of Inspection and Testing Reports:

.1 Section 01 33 00.

1.2 TOLERANCES FOR INSTALLATION OF WORK

.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.

1.3 CONSTRUCTION REVIEW

.1 The Consultant and his sub-consultants may carry out construction review during the progress of the work. The Consultant's general review during construction, and inspection and testing by independent inspection and testing companies reporting to the Consultant, are both undertaken to inform the Owner of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve him of contractual responsibility.

1.4 QUALITY CONTROL

.1 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and state his recommendations in writing.

.2 The Consultant may appoint and direct inspection and testing companies to review completed work in addition to inspection and testing specified for inclusion in the work under Source and Field Quality Control in other Sections.

1.5 INSPECTION AND TESTING

.1 Source and Field Quality Control Specified in Other Sections:

.1 This Section includes requirements for performance of inspection and testing specified under Source Quality Control and Field Quality Control in other Sections of the Specification.

.2 Do not include in work of this Section responsibilities and procedures that relate solely to an inspection and testing company's function under the direction of the Owner and that

are specified in another Section which is paid for directly by the Owner. Such information is included in this Section for only the Contractor's information.

.2 Do not limit responsibility for ensuring that products and execution of the work meet Contract requirements and inspection and testing required to this end, to specified inspection and testing.

.3 Payment for Inspection and Testing Services:

.1 Payment for specified inspection and testing will be made by the Contractor, as required by each applicable Section.

.2 Payment for reinspection and retesting of defective and rejected work shall be made by the Owner and back charged to the Contractor.

.3 Contractor to engage approved company(s) for inspections and tests for additional inspections and tests as may be performed for the Contractor's own purposes and convenience. Include cost of this inspection and testing in the Stipulated Price Contract.

.4 Include cost in the Stipulated Price Contract for tests of reinforcing steel for which no mill tests are submitted.

1.6 INSPECTION AND TESTING SERVICES AND REFERENCE STANDARDS

.1 Qualifications of Inspection and Testing Companies:

.1 Companies engaged for inspection and testing shall provide equipment, methods of recording and evaluation, and knowledgeable personnel to conduct tests precisely as specified in reference standards.

.2 If requested, submit affidavits and copies of certificates of calibration made by an accredited calibrator to verify that testing equipment was calibrated and its accuracy ensured within the previous twelve months.

.3 Inspection and testing of concrete and concrete materials will be carried out by a CSA Certified testing laboratory to CSA A283, for review in accordance with CSA A23.1/A23.2.

.2 Reference Standards:

.1 Perform inspection and testing in accordance with standards quoted and as required by procedures described in specified reference standards that are applicable to the work being inspected and tested.

1.7 SUBMITTALS

.1 Submit inspection and testing reports in accordance with Section 01 33 00.

1.8 RESPONSIBILITIES OF THE CONSULTANT

.1 The Contractor will submit a list of Inspection and Testing companies to the Consultant for his review.

.2 The Consultant and Contractor will direct inspection and testing companies in the type and extent of inspection and testing to be undertaken.

.3 The Consultant will receive submitted reports of inspections and tests for evaluation and will decide upon any actions that may be required.

.4 The Consultant will provide Drawings and Specifications required by inspection and testing companies.

1.9 RESPONSIBILITIES OF THE CONTRACTOR

.1 Inspection and testing performed by firms engaged for Source and Field Quality Control specified in other Sections shall not relieve the Contractor from responsibility of performing his work in accordance with the Contract Documents.

.2 Provide access for inspection and testing personnel to work in progress and to fabricator's operations.

.3 Provide samples of materials to be tested in required quantities at locations testing is performed.

.4 Submit copies of mill test reports in accordance with Section 01 33 00.

.5 Provide labour and facilities:

.1 To facilitate inspections and tests.

.2 For storing of specimens at required temperature and free from vibration, in conformance with reference standard and inspection and testing company instructions.

.3 For obtaining, handling and transporting of samples at site and plant.

.6 Notify Consultant, and inspection and testing company at least 48 hours before work to be inspected and tested commences.

.7 When it is discovered on inspection that work is proceeding with incorrect materials or methods, ensure that corrections are immediately made and that improperly completed work is replaced.

.8 Inspect all work done by subtrades prior to application of final cover materials i.e. pressure plates, drywall ceilings, concrete slab pours and the like.

1.10 RESPONSIBILITIES OF INSPECTION AND TESTING COMPANIES

.1 Determine from Specifications and Drawings the extent of inspection and testing required for work of contract as directed by Consultant. Notify Consultant of any omissions or discrepancies in the work inspected and/or tested.

.2 Perform applicable inspection and testing described in the Specification and as may be additionally directed.

.3 Provide competent inspection and testing personnel when notified by the Contractor that applicable work is proceeding. Inspection personnel shall co-operate with the Consultant and Contractor to expedite the work.

.4 Inform the Consultant of intended scheduling of inspections and of each visit of inspection personnel to the work site and fabricator's operations.

.5 Notify the Consultant and Contractor of deficiencies and irregularities in work immediately they are observed in course of inspections and tests.

.6 Inspection and testing companies shall not perform or supervise any of the Contractor's work, and shall not authorize:

.1 Performance of work that is not in strict accordance with the Contract Documents.

.2 Approval or acceptance of any part of the work.

1.11 INSPECTION AND TESTING PROCEDURES

.1 Perform specified inspection and testing only in accordance with specified reference standards, or as approved.

.2 Observe and report on compliance of work to requirements of Contract Documents.

.3 Ensure that inspectors are on site or at fabricator's operations for full duration of critical operations, and as otherwise required to determine that work is being performed in accordance with the Contract Documents.

.4 Identify samples.

.5 Identify sources of materials.

.6 Review and report on progress of work. Report on count of units fabricated and inspected at fabricator's operations.

.7 Observe and report on conditions of significance to work in progress at time of inspection or at fabricator's operations. Include where applicable and if critical to work in progress:

.1 Time and date of inspection.

.2 Temperature of air, materials and adjacent surfaces.

.3 Humidity of air, and moisture content of materials and adjacent materials.

.4 Presence of sunlight, wind, rain, snow and other weather conditions.

.8 Include in reports all information critical to inspection and testing.

.9 Ensure that only materials from the work and intended for use therein are tested.

.10 Determine locations for work to be tested.

1.12 DEFECTIVE WORK

.1 Where factual evidence exists that defective workmanship has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculation of structural strength made, and the like, in order to help determine whether the work must be replaced. Testing, retesting, inspections or surveys carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of the Consultant.

.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 is 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.

1.13 BUILDING ENVELOPE

.1 Requirements specified herein apply to all elements of the exterior building envelope.

.2 Continuity of air barrier/vapour retarder and insulation components is critical and must be maintained at all locations. Where different systems meet, ensure proper interface and continuity between adjacent components by implementing suitable construction sequences and by using compatible materials only.

.3 Provide control joints in exterior building components of design and spacing which will permit expansion and contraction of components without causing distortion, failure of joint seals, undue stress, cracking, bowing or other defects detrimental to appearance and performance. Review design and location of control joints with Consultant prior to start of work and follow directions given by Consultant.

.4 Anchor exterior cladding components to structure in manner suitable to accommodate structural deflection and creep. Design anchorage to withstand expected wind loads, positive and negative, in accordance with applicable regulations.

.5 Ensure that air spaces within exterior building components are firestopped in accordance with applicable regulations.

.6 Ensure that air spaces on the outside of vertical air barrier/vapour retarder (walls) are constructed with adequate drainage provisions to the exterior.

1.14 DRAINAGE

.1 Lay out and construct work to ensure that positive drainage is provided to roof drains, floor drains, site drains and catch basins, as set in their final position, preventing undrained areas and ponding.

.2 Ensure that allowable construction tolerances and structural deflection do not cause ponding of water.

.3 Report to Consultant in writing prior to executing work affected, in case adequate drainage cannot be provided.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 GENERAL

.1 Include in the work construction of temporary facilities as required for the performance of the work as construction aids and as required by authorities having jurisdiction, or as otherwise specified. Install to meet needs of construction as work progresses. Maintain construction and temporary facilities during use, repair them when damaged, relocate them as required by the work, remove them at completion of need, and make good adjacent work and property affected by their installation.

.2 Include in the work, construction of temporary facilities to provide for construction safety such as: fences, barricades, bracing, supports, storage, sanitation and first aid facilities, fire protection, stand pipes, electrical supply, temporary heat, steam supply, ventilation, construction equipment with its supports and guards, stairs, ramps, platforms, runways, ladders, scaffolds, guardrails, temporary flooring, rubbish chutes, and walkway, morality and guard lights, all as required of the Construction by the Occupational Health and Safety Act of the Province of Ontario, latest edition, as well as all other regulations of the authorities having jurisdiction.

.3 Construct temporary work of new materials unless otherwise approved.

.4 Ensure that structural, mechanical, and electrical characteristics of temporary facilities are suitable and adequate for the use intended. Be responsible that no harm is caused to persons and property by failure of temporary facilities because of placing, locations, stability, protection, structural sufficiency, removal, or any other cause.

.5 Prepare shop drawings and specifications of temporary work, and submit for approval of authorities having jurisdiction if so required. Submit duplicate copy to Consultant for his information.

.6 Locate temporary facilities where shown on Drawings or as directed.

.7 Apply two coats of paint, in approved colours, to temporary constructions, such as storage sheds; offices; supports; bracing and back side of signs; barricades; and where otherwise specified.

.8 Temporary Electric Service:

.1 Provide and maintain an adequate temporary electrical service for performance of the Work including, but not limited to, operation of electric pumps, motors, vibrators and other power tools, hoisting and related construction and general illumination during the Work. Provide power at temporary storage sheds and field office when required.

.2 Make connections available to any part of the work within distance of a 3048mm (10') extension. Each Subcontractor shall be responsible for their own extension cords.

.3 Contractor shall provide and be responsible for payment of temporary power required for all equipment for construction use in excess of available existing sources.

.4 Provide and maintain any components and equipment necessary to transform supply power to necessary temporary power voltage.

.5 Contractor will be permitted use of existing power for construction purposes at no cost to the Contractor. Provide additional temporary power for individual tasks required by the technical sections

.9 Temporary Lighting:

.1 Install lighting for the following:

.1 Emergency evacuation, safety and security throughout the Project at intensity levels required by authorities having jurisdiction.

.2 Performance of work throughout work areas as required, evenly distributed, and at intensities to ensure proper installations and applications are achieved.

.3 Performance of finishing work in areas as required, evenly distributed, and of an intensity of at least 30 foot candles.

.2 Permanent lighting may be used during construction, provided lamps, fluorescent tubes and ballasts that are so used are replaced with new at time work is turned over to Owner.

.10 Temporary Heating and Ventilation:

.1 Provide and pay for temporary heating, cooling and ventilating required for the Work, including attendance, maintenance and fuel.

.2 Provide temporary heat and ventilation as required to:

.1 Facilitate continuous uninterrupted progress of the Work.

.2 Protect the Work and Products against damage and defacement caused by weather, harmful levels of temperature, humidity, and moisture.

.3 Provide ambient temperatures and humidity levels for proper storage, installation and curing of materials, in accordance with specified standards and manufacturer's requirements.

.4 Provide adequate ventilation to meet health regulations for safe working environment.

.3 Maintain work areas at not less than 7 deg C. Increase temperatures in isolated areas to 20 deg C as required by various sections of the specifications or by Product manufacturers.

.4 Solid fuel salamanders will not be permitted.

.5 Provide temporary heat or adequate protection by means of straw or other coverings to floor slabs, footings, or any part of building not specifically designed to withstand frost penetration.

.6 Furnish other temporary heating as required by various sections of the specifications or by Product manufacturers.

.7 Replace with new, any work damaged due to failure to provide adequate heat at no cost to Owner.

.8 If possible and when approved by the Owner, the permanent heating and ventilation system may be used during construction. If approved, the Contractor shall be responsible for its operation, and for replacing and repairing damage it may suffer, and shall assume operation and maintenance of the system in all its parts and payment for fuel consumed.

.9 Operation and maintenance shall include inspection at least every two weeks of thermostats, valves, switches, lubrication, fan, belt and motor adjustment, cleaning and/or replacement of filters, and replacement of filters and re-servicing of system at completion of work.

.10 Connect electric motors only to permanent source of power, or otherwise provide proper source with correct design characteristics and with no fluctuation in voltage.

.11 Commence warranty period after re-servicing and from time the Owner takes over the premises.

.11 Temporary Water Supply:

.1 Provide water of potable quality for all construction purposes, at one location at least, on each floor area.

.2 Extend supply pipe or pipes from nearest available sources and maintain in good condition until no longer required.

.3 If possible and when approved by the Owner, the permanent site water source be used to provide water during construction.

.12 Temporary Sanitary Facilities:

.1 Provide sanitary facilities for persons on the work site as approved by the authorities having jurisdiction. Install them in sufficient number and maintain them in a sanitary condition.

.2 Do not permit construction personnel to use washroom and toilet facilities on premises which have been installed as part of the new work or which are part of the existing building for use by non-construction personnel.

.13 Temporary First-Aid Facilities:

.1 Provide site equipment and medical facilities necessary to supply first-aid service to injured personnel in accordance with regulations of the Workers' Compensation Act. Maintain facilities for duration of Contract.

.14 Connections to Utilities:

.1 Make arrangements for connections to water, sewer, gas, electric, and telephone utilities as required for temporary use during construction.

.2 The Owner is responsible for payment of final connection charges that are part of service contracts between him and each utility.

1.2 CONSTRUCTION AIDS

.1 Hoists and Cranes:

.1 Each Subcontractor is responsible for providing his own hoisting and crane operations. Equipment shall be operated by qualified hoist and/or crane operators.

.2 Where multiple trades are involved in high level work, the Contractor shall co-ordinate the hoisting and trade requirements.

.2 Building Enclosure:

.1 Include in work, temporary enclosures for building as required to protect it, in its entirety or in its parts, against the elements, to maintain environmental conditions required for work within the enclosure, and to prevent damage to materials stored within. Design enclosures to withstand wind pressures required for the building by authorities having jurisdiction.

.2 Use structural framing of building for support of temporary enclosure framing only upon verification that the load limits of the building frame will not be exceeded. Erect enclosures to allow complete accessibility for installation of materials during the time enclosures remain in place.

.3 Scaffolding:

.1 Each Subcontractor shall provide his own scaffolding.

.2 Scaffolding shall be erected clear of walls, and to ensure that it does not interfere with continuing work.

.3 Subcontractor shall be responsible for its examination for sufficiency of his scaffolding and be responsible for accidents due to its insufficiency.

.4 The Contractor will be responsible for co-ordination of scaffold work if multiple trade usage can be achieved from one installation.

.4 Provide temporary stairs, ladders, and ramps required for movement and placing of materials, equipment and personnel.

1.3 TEMPORARY BARRIERS

.1 Provide temporary hoarding and fencing as specified in Section 01 56 26 Temporary Fencing and Barriers and complying with the local Building Code, all other by-laws of the municipality and all other authorities having jurisdiction.

1.4 PROTECTION

.1 Provide temporary protection to construction as required by the Work, to protect it from damage.

.2 Box with wood or otherwise protect from damage, by continuing construction, finished sills, jambs, corners, and the like.

.3 Adequately protect the Work at all stages of operations and maintain protection until the Work is completed. Remove and replace, at no additional cost to Owner, damaged Work and materials that cannot be repaired or restored to the approval of the Consultant.

.4 Provide spare safety helmets for and enforce their use by Owner, Consultants, and representatives and authorized visitors to the site.

.5 In addition to requirements of authorities having jurisdiction, provide temporary protection and safeguards adequate to protect against:

.1 Accident or injury to workers and other persons on the site or adjacent work and properties.

.2 Damage to any part of the Work and to any adjoining or adjacent structure, property, services, and other similar items, by overloading, weather, frost, any other cause resulting from the execution of the Work.

.3 Protect work, existing property, adjacent tenant and public property from damage during performance of Work. Should any part of the Work or any buildings, services or similar items on or surrounding the areas of the work and adjacent to any road leading thereto become damaged or disfigured due to lack or failure of such protection, they shall be made good with material identical with the existing and adjoining surfaces, to the satisfaction of the authorities having jurisdiction and the Owner.

.4 Damaged work shall be made good by those performing work originally, or workers experienced or skilled in that particular type of work, at expense of those causing damage.

.5 Provide and maintain necessary temporary enclosures, hoardings, fences, gates, barriers, guards, hoists, cranes, stairs, ladders and scaffolding, walks, platforms, staging as necessary for the Work and protection of workers, public and others from injury, and for public access to adjacent buildings. All such apparatus shall meet requirements of the authorities having jurisdiction.

.6 Provide secure, rigid guard railings, hoardings and barricades around openings, as required by authorities having jurisdiction and to maintain safety.

.7 Provide proper guard devices, signs, signals and lights for the prevention of accidents.

.8 Maintain at night, sufficient and suitable warning lights to prevent accidents and injuries to persons and/or property.

.9 Alter, remove and relocate or replace hoardings, barriers and entrances as required by the Work. Hazards requiring such protection shall be eliminated as soon as possible and protection devices removed. Maintain protection until state of construction allows their removal.

.10 Provide and maintain temporary weathertight protection for all exterior openings in walls, floors and roofs until the building is closed in.

.11 Close off floor areas where walls are not finished, seal off openings and enclose building interior work area. Polyethylene or other approved translucent material shall be framed in or around wall openings. Provide temporary doors, frames, hinges, locks, keys and bolts as required.

.12 Should the work be stopped for any cause, provide protection and bracing for the Work.

.6 Lay protective 13mm (1/2") plywood over completed areas of roof on which other trades are to work.

1.5 PUBLIC PROTECTION

.1 Provide fencing, barricades, hoarding, notices and warning boards and maintain lights and signals for protection of workers engaged on the Work, for protection of adjoining property and for protection of the public.

.2 Such protective measures shall be finish painted to Owner's approved colour, when visible to the public.

.3 Where any special hazard exists from which it is not possible to protect the public safety by other means, watchpersons shall be employed to preserve public safety until the area of special hazard no longer poses a risk to public safety.

1.6 PLANT PROTECTION

.1 Protect all existing trees and landscaping which is to remain at the Place of the Work, using methods and materials recommended by the Canadian Nursery Trades Association and as approved by the Consultant.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2440 mm (8').

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

.4 Provide minimum 1.8 m high chain link fencing outside of dripline of trees or groups of trees and other plants. Leave fenced areas undisturbed; do not use areas for storage, stockpiling or any other purpose. Do not dump or flush any contaminants in areas of tree feeder roots.

.5 Where limbs or portions of plants are required to be removed to accommodate new work, they shall be removed in accordance with accepted arboricultural practice.

.6 Where root systems of protected trees adjacent to construction are exposed or damaged, they shall be neatly trimmed and the area backfilled with suitable material to prevent desiccation.

.7 Where necessary give plants an overall pruning to restore the balance between roots and top growth and/or to restore appearance.

.8 Minimize stripping of topsoil and vegetation.

.9 Restrict tree removal to areas indicated or designated by Consultant.

1.7 FIRE SAFETY REQUIREMENTS

.1 Comply with fire and safety regulations required by the authorities having jurisdiction.

.2 Take necessary precautions to eliminate fire hazards and to prevent damage to Work, building materials, equipment and other property both public and private having to do with Work. Inspect Work at minimum weekly intervals for this purpose.

.3 Store and locate products and equipment packed in cardboard cartons, wood crates and other combustible containers in orderly and accessible manner.

.4 Tarpaulins shall be fire-resistant.

.5 Open fires and burning of rubbish are not permitted on the site.

.6 Provide and maintain in working order, ULC labelled fire extinguishers or other approved fire extinguishing equipment, locate in prominent positions, in accordance with requirements of authorities having jurisdiction and insurance companies having jurisdiction, codes, regulations and bylaws in the building until the permanent fire protection system in the building is available.

.7 Provide temporary standpipe system, when required by authorities having jurisdiction.

.8 Except as otherwise specified herein, soldering, welding and cutting operations shall be carried out in areas free of combustible and flammable contents, with walls, ceilings and floors of non-combustible construction or lined with non-combustible materials.

.9 When it is not practicable to undertake welding, soldering and cutting operations in areas described in the previous paragraph, combustible and flammable materials shall either be removed minimum of 9144mm (30') from the work area or otherwise protected against ignition by sheet metal or other non-combustible material.

.10 When welding, soldering, or cutting is to be carried out near piping containing flammable gas, the section of piping located within 914mm (3') of the torch or other source of combustion shall be covered with wet, non-combustible insulating material at least 6mm (1/4") thick.

.11 Prior to initiating any open flame work or welding operation, discuss the proposed work with the Consultant and take necessary precautions to prevent inadvertent activation of the existing fire alarm system. Have sufficient suitable hand operated fire extinguishers on hand near the work area. Ensure that an additional person is readily available to operate fire extinguishers should the need arise.

1.8 PERSONAL HEALTH AND SAFETY REQUIREMENTS

.1 Comply with all requirements of the Occupational Health and Safety Act, Ministry of Labour, Construction Safety Association and all other authorities having jurisdiction in the place of the Work.

.2 Contractor shall submit company safety policy for review by Owner and Consultant. The policy must meet or exceed the requirements of the authorities having jurisdiction.

.3 Contractor shall employ and pay for services of safety supervisor in accordance with the requirements of the authorities having jurisdiction. Safety supervisor shall have training with the Construction Safety Association.

.4 Alcohol and/or drugs will not be allowed on the site. Anyone found in possession of alcohol and/or drugs shall be dismissed from the site immediately and without notice, maybe subject to civil and/or criminal proceedings.

.5 WHMIS program shall be fully enforced.

.6 Contractor shall be prepared to sign the "Guidelines for the Structure and Function of the Joint Occupational Health and Safety Committee", if requested by the Owner.

.7 When carrying out soldering, welding or cutting procedures, be it in shop or in the field, ensure that workers comply with the following:

.1 Wear appropriate protective clothing such as gloves, leather aprons and/or arm spark guards.

.2 Wear suitable goggles or face shields as appropriate.

.3 Protect co-workers from eye or other injuries through the use of fire resistant portable shielding devices.

.4 Provide and use a portable fume eliminator at all times during welding, soldering, or cutting operations within the existing building.

1.9 SECURITY

.1 Maintain security of construction site by control of access through enclosing barricades, and hoardings during times work is in progress, and by locking hardware.

.2 Properly close and lock the construction site at nights, Sundays, holidays and other occasions when the Work is not in progress.

.3 The Owner assumes no responsibility for the safeguarding of tools or equipment from theft.

.4 Take precautions to guard construction site, premises, materials and the public during and after working hours. During regular working hours, maintain watch to guard construction site and contents.

.5 Maintain security at all times construction is shut down because of a strike or a lockout.

.6 Provide security guards and security lighting during all after hour work.

.7 Provide personnel to direct traffic as required during working hours.

1.10 ACCESS ROADS, WALKS AND PARKING

.1 Access Roads and Walks:

.1 All construction vehicles and personnel required for construction shall use existing access roads and walks as determined at later date by Owner. When no longer required, or at completion of Work, make good disturbed surfaces. Maintain roads and walks, removing dirt, mud, debris, ice, snow and other obstructions during use.

.2 Provide for access of emergency vehicles at all times.

.2 Parking:

.1 Parking for Contractor's, subcontractors, suppliers and/or their employee's vehicles shall be limited to restricted area as designated by the Owner.

.2 The Owner, property management and their employees will not be responsible for parking fines incurred by the Contractor, Subcontractors, suppliers and/or their employees.

1.11 SITE SIGNS

.1 No signs, bills or posters will be allowed on the site, other than site signs as follows:

.1 Project construction sign shall be supplied and installed by Owner under work of separate Contract.

.2 Place only specified project construction sign and notices regarding safety, caution, or instructions on or near site.

.3 No unauthorized signs, bills, posters or advertisements of any kind are permitted. Should such unauthorized advertisements be applied to the temporary hoarding by the public or anyone else, upon discovery of such, the Contractor shall remove them on a weekly basis.

.4 Erect all notices as directed by Owner.

.5 Remove all notices on completion of the Contract.

1.12 FIELD OFFICES AND SHEDS

.1 Field Offices:

.1 Provide temporary offices for Owner's, Consultant's and Contractor's use. They shall contain facilities as required for Contractor, a conference table and chairs for site meetings, and facilities for the Owner and the Consultants.

.2 Temporary field offices shall be designated on site until such time where an area located inside the constructed building, can be designated by the Owner. No other location shall be used for temporary field office. Temporary site office shall not exceed 3048mm (10') x 15240mm (50').

.3 Facilities shall consist of: an office desk and chair, a two drawer filing cabinet, two chairs, use of a telephone, use of facsimile machine, and a layout table for drawings located so that when drawings are spread out their orientation is same as that of building under construction.

.4 Heat, cool and light offices to minimum code requirements for office buildings.

.5 Keep temporary field office clean and remove all rubbish at the end of each work day.

.6 Include construction and operating hardware, with security locks, as required by the Owner.

.2 Site Storage:

.1 Until such time where an area can be located inside the constructed building, designated by the Owner as a temporary site storage, provide 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 Provide floors raised 150 mm (6”) clear of ground for storage of Products.

.3 Include security locks, as required.

.4 Install lighting in storage areas and heat in those storage areas containing materials damaged by low temperature.

.5 Provide separate shed located where directed in writing by Consultant for storage of volatile materials.

.6 Owner is not responsible for securing Products or materials at the Place of the Work.

.7 Handle and store materials so as to prevent damage or defacement to the Work and surrounding property.

1.13 DUST CONTROL

.1 Provide dust tight screens or barriers to localize dust generating activities for the protection of tenants, employees, equipment, adjacent and finished areas of Work, and the public. Maintain and relocate protection until Work is complete. Respond immediately to complaints of dust received from the public, authorities having jurisdiction, Owner and Consultant.

.2 Obtain Consultant's approval of installed dustproof screens and protection methods before proceeding with construction/alteration work.

.3 Painted gypsum wallboard and metal stud dustproof screens, shall extend to underside of structure, and shall be erected to protect adjoining areas and rooms. Apply bead of sealant or other acceptable seal continuously around periphery of each face of partitioning to seal gypsum board/structure junction where dustproof screens abut fixed building components. Seal perimeter of cutouts, around fixtures and fittings and other penetrations. Tape or seal between adjacent boards. Separate construction areas from occupied areas.

.4 Provide protection for existing equipment sensitive to dust and noise. Co-ordinate location of dust barriers and dust tight doors with Consultant.

.5 Install temporary packing at bottom of doors to areas where demolition/construction shall be performed to prevent dust seepage into existing spaces. Do not permit dust and dirt to escape beyond area being constructed/altered.

.6 Provide daily vacuuming of construction dust from existing areas as work progresses; this shall be considered a minimum requirement, increase vacuuming as necessary. The Owner may have vacuuming work done by others and cost deducted from Contractor's progress payments if this requirement is not fulfilled.

.7 Provide locked doors in barriers to permit access by Consultant, Owner and Owner's security personnel to construction areas and to areas under Contractor's custody. Supply padlocks and construction cores.

.8 Remove dustproof screens at completion of work in areas and make good damaged or blemished areas. Patch and make good to access, altered and damaged areas caused by work and screens. Maintain integrity of fire or sound separation.

.9 Prevent nuisance to adjacent areas near the work from dust by taking additional appropriate anti-dust measures at such times as found necessary, and at other times complaints of dust are received from the Owner's representative and others.

1.14 NOISE AND VIBRATION CONTROL

.1 Take measures to control noise and vibration generated by the Work.

.2 Take appropriate noise and vibration control measures at times found necessary, and at other times complaints of noise are received from the public, authorities having jurisdiction, Owner and Consultant.

.3 These requirements are for the consideration of the public, tenants and employees. Requirements shall not be construed as cause for elimination or restriction of Contractor's working schedule, claims for delay of work nor additional costs.

1.15 COLD WEATHER WORKING

.1 Particular attention is drawn to the requirement that the Contractor shall commence work immediately the Contract is awarded and shall continue full scale operations throughout the winter months and thereafter until the work is completed and accepted by the Consultant.

.2 It is understood that the Contract Price includes sufficient funds for the provisions of temporary heating, temporary shelters and all other necessary cold weather measures to enable all trades to proceed without delay regardless of weather.

1.16 SNOW REMOVAL

.1 Allow no accumulation of ice and snow within the Place of the Work. There shall be no use of salt for de-icing in areas of building work.

.2 Remove snow from access routes to the Work to maintain uninterrupted progress of the Work.

1.17 PEST CONTROL

.1 Provide rodent control and other pest control programs during the Work in accordance with the requirements of authorities having jurisdiction.

1.18 FIRES

.1 Open burning fires on site will not be permitted.

1.19 FIRST AID SERVICES

.1 Provide and maintain First Aid services as required by the authorities having jurisdiction, the Workplace Safety and Insurance Board (WSIB) and Union Agreements.

1.20 TRAFFIC CONTROL

.1 Do not block roads or impede traffic. Keep construction traffic to designated roads only. Provide flag-person to direct traffic as required.

.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.

.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.

.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.

1.21 ENVIRONMENTAL/POLLUTION CONTROL/SITE CLEANING

.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.

.2 Burning or burying of rubbish, waste, and the like is not permitted on construction site.

.3 Only fires for heating bitumen and temporary heaters as specified are permitted on site.

.4 Take care to prevent staining or smoke damage to structure or materials. Replace stained or damaged work.

.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.

.6 Keep building site clean and free or 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.

.7 Confine apparatus, the storage of materials and the operations of workers to the site. Do not unreasonably encumber the premises with construction materials.

1.22 TEMPORARY DRAINAGE AND DEWATERING

.1 The Work includes the removal of collected groundwater and surface water accumulating from precipitation and groundwater infiltration throughout the course of the Work until date of Substantial Performance of the Work.

.2 Keep drainage lines and gutters open. No flow of water shall be directed across or over pavements except through pipes or properly constructed troughs. Keep portions of the Work properly and efficiently drained during construction and until completion. Be responsible for disturbances, dirt and damage which may be caused by or result from water backing up or flowing over, through, from or along any part of the Work, or due to operations which may cause water to flow elsewhere.

.3 Keep trenches and other excavations free of water. Remove water in a manner that will prevent loss of soil, and maintain the stability of existing soils.

.4 Dispose of such water in a manner that will not be hazardous to public health and safety, private property, or to the Work.

.5 Drainage of trenches or other excavation through storm drainage pipe will be allowed only with the express permission of the authority having jurisdiction.

.6 When drainage is permitted in writing to be directed to existing catch basins, regularly and at Substantial Performance of the Work inspect such catch basins and remove accumulated debris and sediment.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 SECTION INCLUDES

.1 Requirements for temporary hoarding.

1.2 PERMITS

.1 Arrange and pay for necessary permits for proper execution and completion of the work of this section.

1.3 SUBMITTALS

.1 Shop Drawings:

.1 Submit shop drawings for temporary barriers and enclosures in accordance with Section 01 33 00.

.2 Clearly indicate details of construction, profiles, jointing, fastening and other related details.

1.4 HOARDING DESIGN

.1 Design hoarding to meet bylaws and regulations of authorities having jurisdiction and obtain approvals from authorities having jurisdiction.

.2 Location and types of hoarding as indicated on Drawings.

.3 Design and install hoarding to withstand wind loads at the Place of the Work without collapse, permanent deformation, or other failure of the hoarding system.

2 Products

2.1 HOARDING MATERIALS

.1 Plywood Hoarding:

.1 Provide rough hardware required for the work of this section.

.2 Framing lumber and posts: Unless otherwise specified or indicated, NLGA No. 2 Construction SPF.

.3 Reused material may be used.

.4 Dimensions as follows, unless otherwise indicated or required by authorities having jurisdiction:

.1 Vertical posts: 89 mm x 89 mm (3-1/2" x 3-1/2").

.2 Horizontal rails: 39 mm x 89 mm (1-1/2" x 3-1/2").

.3 Hoarding: Plywood, 1220 mm x 2440 mm x 13 mm thick (4' x 8' x 1/2"), sheathing grade conforming to CSA 0141-M1978.

.4 Reused material may be used.

.5 Hoarding to be painted in accordance with Section 09 91 00. Colour: As selected by the Consultant.

.2 Chain Link Hoarding:

.1 Fence fabric: 3.75 mm diameter (No. 9 gauge) steel wire woven in a 50 mm (2") mesh, hot dipped galvanized after weaving and knuckled finish top and bottom selvage edges.

.2 Galvanized fabric to have a minimum zinc application of 490 g/m² of surface area.

.3 Posts: CLFMI (Chain Link Fence Manufacturer Institute) Type 1, standard buttwelded Schedule 40, ASTM F1083-10 standard weight, galvanized pipe.

.4 Provide prefabricated panelized chain link and post galvanized metal hoarding system.

.3 Signage: Provide suitable sized notice signs at entrance to the Place of the Work with contrasting text "RESTRICTED ACCESS - CONSTRUCTION SITE" complete with the name of Contractor.

3 Execution

3.1 HOARDING FABRICATION

.1 Provide hoarding immediately upon award of Contract.

.2 Erect framing members and install hoarding panels at the perimeter of the Place of the Work as indicated or required by authorities having jurisdiction to fully enclose the Place of the Work and as follows, unless otherwise indicated or required by authorities having jurisdiction:

.1 Height of hoarding: 2440 mm (8') minimum, unless otherwise indicated, above grade at any point.

.2 Vertical posts spaced 2440 mm (8’) on centre, maximum.

.3 Vertical posts: Set a minimum of 1220 mm (4’) in the ground.

.4 Horizontal rails securely nailed or screwed to vertical posts at top, bottom, and intermediate locations at 610 mm (24") on centre.

.5 Erect panels around objects as required.

.6 Hoarding shall contain no opening more than 100 mm (4") wide or less than 914 mm (3') above the bottom of the fence except where required for access to and from the Place of the Work.

.7 Provide no rails, other horizontal or diagonal bracing, attachments, or pattern of openings on the outside that would facilitate climbing.

.8 At access openings: Provide gates that provide performance and safety at least equivalent to hoarding and contain wire mesh of sufficient openness to provide visibility for traffic entering or exiting the Place of the Work.

.3 Provide overhead protection hoarding where public access is required.

.4 Provide hoarding, access gates, access doors, in conformance with the Contract Documents and authorities having jurisdiction.

.5 Incorporate silt control fabric from 200 mm (8”) below existing grade and attach to hoarding to provide silt control to requirements of authorities having jurisdiction and Owner.

.6 Mesh fencing: Erect metal posts at 3050 mm (10') on centre maximum with tensar mesh.

.7 Hoarding hardware: Provide rough and finish hardware as required.

3.2 DESIGN AND SAFETY REQUIREMENTS FOR TEMPORARY WORK

.1 Be responsible for design, erection, operation, maintenance and removal of temporary structural and other temporary facilities, barriers, and enclosures.

.2 Engage and pay for registered professional engineering personnel skilled in the appropriate disciplines to perform these functions where required by law or by the Contract Documents; and in cases where such temporary facilities and their method of construction are of such a nature that professional engineering skill is required to produce safe and satisfactory results.

.3 Engage and pay for professional engineer(s) registered in Place of the Work to design and supervise construction and maintenance of hoardings, covered ways, protective canopies and project sign(s). Designs provided by Consultant or Owner for such work cover general appearance only.

END OF SECTION

1 General

1.1 GENERAL

.1 Products refer to materials, manufactured components and assemblies, fixtures and equipment incorporated in the work.

.2 Use only products of Canadian manufacture unless such products are not manufactured in Canada, are specified otherwise, or are not competitive.

.3 Products for use in the Project and on which the Bid was based shall be in production at time of tender date, with a precise model and shop drawings available for viewing.

.4 Where equivalent products are specified, or where alternatives are proposed, these products claimed by the Contractor as equivalent shall be comparable in construction, type, function, quality, performance, and, where applicable, in appearance. Where specified equivalents are used in the Stipulated Price for the work, they shall be subject to final approval.

.5 Incorporate products in the work in strict accordance with Manufacturers' directions, instructions and specifications, where reference is made to them, shall include full information on storing, handling, preparing, mixing, installing, erecting, applying, and other matters concerning the materials that are pertinent to their use and their relationship to materials with which they are incorporated.

.6 Products delivered to the Project site for incorporation in the work shall be considered the property of the Owner. Maintain protection and security of products stored on the site after payment has been made for them.

.7 Do not install permanently incorporated labels, trademarks and nameplates, in visible locations unless required for operating instructions or by authorities having jurisdiction.

1.2 PRODUCT HANDLING

.1 Manufacture, pack, ship, deliver and store products so that no damage occurs to structural qualities and finish appearance, or in any other way detrimental to their function or appearance, or both.

.2 Ensure that products, while transported, stored or installed, are not exposed to an environment which would increase their moisture content beyond the maximum specified.

.3 Schedule early delivery of products to enable work to be executed without delay. Before delivery, arrange for receiving at site.

.4 Deliver and store products at site where directed by the Contractor.

.5 Brace work such as door frames, large window units and similar products to prevent distortion or breakage in handling.

.6 Deliver packaged products, and store until use, in original unopened wrapping or containers, with manufacturer's seals and labels intact.

.7 Label packaged products to describe contents, quantity and other information as specified.

.8 Label fire-rated products to indicate approval of Underwriters' Laboratories.

.9 Product handling requirements may be repeated, and additional requirements specified, in other Sections.

1.3 STORAGE AND PROTECTION

.1 Store products on site with secure protection against all harmful environmental conditions. Prevent damage, adulteration, staining and soiling of materials while stored.

.2 Protect prefinished metal surfaces by protective coatings or wrappings until time of final cleanup specified in Section 01 78 00. Protection shall be easily removable under work of Section 01 78 00 without damage to finishes.

.3 Store manufactured products in accordance with manufacturers' instructions.

.4 Store steel, lumber, masonry units, and similar products on platforms raised clear of ground.

.5 Store finished products and woodwork under cover at all times.

.6 Do not store products at locations or in such a manner that they damage previously completed work.

.7 Storage and special protection requirements may be repeated and additional requirements specified, in other Sections.

1.4 SCHEDULING OF PRODUCT DELIVERY

.1 Verify that products supplied by all Sections are ordered from suppliers in sufficient time to ensure delivery for incorporation in the work within the time limits established by approved construction schedule.

.2 Obtain confirmed delivery dates from product suppliers.

.3 Immediately inform the Consultant should supplier's confirmation of delivery dates indicate that Project completion may be delayed.

.4 Submit copies of purchase orders and confirmations of delivery dates for products as may be requested.

.5 A schedule of product delivery shall be established and reviewed at each job site meeting.

.6 When deemed necessary, plant visits shall occur by the General Contractor to ensure delivery dates given are true and accurate.

1.5 DEFECTIVE PRODUCTS AND WORK

.1 Products and work found defective; not in accordance with the Specifications; or defaced or injured through negligence of the Contractor, his employees or Subcontractors, or by fire, weather or any other cause will be rejected for incorporation in the work whether or not incorporated in the work.

.2 Remove rejected products and work from the premises immediately.

.3 Replace rejected products and work with no delay after rejection. Provide replacement products and execute replacement work precisely as required by the Specifications for the defective work replaced. Previous inspection and payment shall not relieve the Contractor from the obligation of providing sound and satisfactory work in compliance with the Specifications.

.4 Testing and retesting of any part of the work as directed by the Owner, Consultant or Contractor to establish its conformance to the Contract Documents shall be performed at no addition to the Contract Price.

1.6 WORKERS, SUPPLIERS AND SUBCONTRACTORS

.1 Assign work only to workers, suppliers, and Subcontractors who have complete knowledge, not only of the conditions of the Specifications, but of jurisdictional requirements, and reference standards and specifications.

.2 Give preference to use of local workers, suppliers and Subcontractors wherever possible.

.3 Certified and qualified installers of a specific product line shall be used when called for in these Specifications.

2 Products

2.1 SPECIFIED PRODUCTS

.1 Products used for temporary facilities may have been previously used, providing they are sound in structural qualities.

.2 Specified Options: The Work is based on materials, Products and systems specified by manufacturer's catalogued trade names, references to standards, by prescriptive specifications and by performance specifications.

.1 Where only one manufacturer's catalogued trade name is specified for a Product, the Product is single sourced and shall be supplied by the specified manufacturer.

.2 Where more than one manufacturer's catalogue trade name is specified for a Product, supply the Product from any one of those manufacturers specified.

.3 When a Product is specified by reference to a standard, select any Product from any manufacturer that meets or exceeds the requirements of the standard.

.4 When a Product or system is specified by prescriptive or performance specifications, Provide any Product or system which meets or exceeds the requirements of the prescriptive or performance specifications.

.5 The onus is on the Contractor to prove compliance with governing published standards, prescriptive specifications and with performance specifications.

.3 Products, materials, equipment and articles (referred to as Products throughout the Contract Documents) incorporated in the Work shall be new, not damaged or defective, and of the quality standards specified, for the purpose intended. If requested, furnish evidence as to type, source and quality of Products Provided.

.4 Where Contract Documents list acceptable Products or acceptable manufacturers, select as applicable, any one Product from any one manufacturer meeting performance of specifications.

.5 Where Contract Documents require design of a Product or system, and minimum material requirements are specified, the design of such Product or system shall employ materials specified within applicable section. Where secondary materials or components are not specified, augment with materials meeting applicable code limitations, and incorporating compatibility criteria with adjacent work.

.6 Defective Products, whenever identified prior to completion of the Work, will be rejected, regardless of previous reviews. Review of the Work by the Consultant or inspection and testing companies does not relieve the Contractor of the responsibility for executing the Work in accordance with the requirements of the Contract Documents, but is a precaution against oversight or error. Remove and replace defective Products and be responsible for delays and expenses caused by rejection at no additional cost to the Owner.

.7 Should any dispute arise as to quality or fitness of Products, the decision rests strictly with Consultant based upon the requirements of the Contract Documents.

.8 Unless otherwise indicated in the Contract Documents, maintain uniformity of manufacturer for any like item, material, equipment or assembly for the duration of the Work.

.9 Products exposed in the finished work shall be uniform in colour, texture, range, and quality, and be from one production run or batch, unless otherwise indicated.

.10 Permanent labels, trademarks and nameplates on Products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical, electrical, machinery or like rooms.

.11 Owner retains right to select from choices available within specified Products for colours, patterns, finishes or other options normally made available. Submit full range of Product options in accordance with 01 33 00 for such selection.

.12 Quality Control:

.1 Implement a system of quality control to ensure compliance with Contract Documents.

.2 Notify Consultant of defects in the Work or departures from intent of Contract Documents that may occur during construction. Consultant will recommend appropriate corrective action in accordance with requirements of the Contract.

3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in the Contract Documents, install or erect Products in accordance with manufacturer's printed instructions. Do not rely on labels or enclosures supplied with Products. Obtain printed instructions directly from manufacturers.

.2 Notify Consultant in writing, of conflicts between the Contract Documents and manufacturer's instructions.

.3 Improper installation or erection of Products, due to failure in complying with these requirements, authorizes Consultant to require removal and re-installation at no additional cost to the Owner.

.4 Manufacturers' representatives shall have access to the Work at all times. Contractor shall render assistance and facilities for such access in order that the manufacturers' representatives may properly perform their function.

3.2 GALVANIC/DISSIMILAR METAL CORROSION

.1 Insulate dissimilar metals from each other by suitable plastic strips, washers or sleeves to prevent galvanic corrosion where conductive liquid or electrolyte exists.

3.3 WORKMANSHIP

.1 General:

.1 Execute the Work using workers experienced and skilled in the respective duties for which they are employed.

.2 Do not employ an unfit person or anyone unskilled in their required duties.

.3 Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with Consultant, whose decision is final.

.4 Upon request by the Consultant, submit proof, in the form of CCDC 11 - Contractor's Qualification Statement, of qualifications of Subcontractors to verify Subcontractor's qualifications and experience meet or exceed the requirements of the Contract Documents.

.1 If, upon review of the Contractor's Qualification Statement, it is found that the Subcontractor does not meet the qualification requirements specified in the Contract Documents pertaining to the parts of the Work for which the Subcontractor has been retained, the Contractor shall replace the unqualified Subcontractor with a qualified Subcontractor, satisfactory to the Contractor and the Owner, at no additional cost to the Owner and at no increase in the Contract Time.

.2 Coordination:

.1 Ensure cooperation of workers in layout of the Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

.3 Cutting and Remedial Work:

.1 Perform cutting and remedial work required to make parts of the Work come together. Coordinate the Work to ensure this requirement is maintained. Obtain permission from Consultant before commencing any cutting.

.4 Fastenings:

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action and corrosion between dissimilar metals and materials.

.5 Protection of work in progress:

.1 Take reasonable and necessary measures, including those required by authorities having jurisdiction, to provide protection.

.2 Adequately protect parts of the Work completed or in progress. Parts of the Work damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired, as directed by the Consultant, at no additional cost to the Owner.

.3 Do not cut, drill or sleeve any load bearing structural member without written permission of Consultant, unless specifically indicated.

.4 Keep floors free of oils, grease or other materials likely to discolour them or affect bond of applied surfaces.

.5 Protect work of other Subcontractors from damage while doing subsequent work. Damaged work shall be made good by appropriate Subcontractors but at expense of those causing damage.

.6 Protect existing buildings, curbs, roads and lanes. If, during the Work, any buildings, curbs, roads or lanes are damaged, bear costs for repairs.

.6 Existing Utilities:

.1 When breaking into or connecting to existing services or utilities, execute the Work at times approved by Owner, with a minimum of disturbance to Owner's ongoing operations, the Work, and traffic.

.2 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in a manner approved by authority having jurisdiction and stake or otherwise record location of capped service.

.7 Operational requirements: Operable Products shall be Provided fully operational and ready for intended use.

END OF SECTION

1 General

1.1 LAYOUT AND SURVEY

.1 Lines, Levels and Locations for Building:

.1 Existing grades, lines, and site conditions shown on drawings were taken from survey information established by persons engaged directly by Owner. The accuracy of survey information is not the Consultant's responsibility.

.2 The Owner will establish location of property lines. The Contractor shall establish necessary lines and levels, and provide batter boards and other means to control the accurate positioning of all building elements.

.2 Work Adjacent to Public Property:

.1 Verify before commencing work at adjacent public property, that no plans for altering clearances, set-backs, easements, grades, or otherwise have been made by local authorities having jurisdiction, subsequent to their approval of Contract Documents, and which would affect the original intent.

1.2 SUBMITTALS

.1 Submit qualification data for land surveyor to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

.2 Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

.3 Submit two (2) copies of certified survey signed by registered land surveyor.

.4 Submit two (2) copies of final property survey showing the Work performed and record survey data.

.5 Submit a Certificate of Compliance at completion of site grading stating the “As Constructed” grading elevations, and whether or not they differ from design grades.

1.3 DRAINAGE

.1 Ensure that positive drainage is provided to roof, floor and site drains and catch basins, as set in their final positions. Provide constant slopes for drained surfaces to drains and drainage courses.

.2 Ensure that allowable construction tolerances and structural tolerances do not permit ponding of water.

.3 Verify the extent of each area served by a drain, or drainage course, to eliminate possible undrained surfaces. Coordinate the work of involved Sections before each proceeds.

1.4 RECORD DRAWINGS

.1 Prepare interference and equipment placing drawings to scale to ensure that all components will be properly accommodated within the spaces provided.

.2 Ensure that clearances required by authorities having jurisdiction and/or for easy maintenance of equipment will be shown on the above drawings.

.3 Interference drawings shall be prepared before any orders for equipment and/or materials are released to suppliers.

1.5 SURVEY REFERENCE POINTS AND LEGAL SURVEY MARKERS

.1 Verify existing base horizontal and vertical control points designated on drawings.

.2 Locate, confirm and protect control points and legal survey markers prior to starting site work; preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to Consultant.

.4 Report to Consultant when a reference point or legal survey marker is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.5 Replace control points in accordance with original survey control.

.6 Replace legal survey markers lost or destroyed as a result of construction activities.

1.6 SURVEY LAYOUT

.1 Coordinate with Contractor for layout and protection of grade controls.

.2 Establish permanent bench mark(s) as required, referred to established bench marks by survey control points; record locations, with horizontal and vertical data.

.3 Establish lines and levels, locate and layout, by instrumentation.

.4 Stake for grading, cuts and fills, slopes.

.5 Replace grade controls lost or destroyed as a result of construction activities.

1.7 CONSTRUCTION LAYOUT

.1 Verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. Notify Consultant promptly if discrepancies are discovered.

.2 Engage a land surveyor to lay out the Work using accepted surveying practices:

.1 Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.

.2 Establish dimensions within tolerances indicated; do not scale Drawings to obtain required dimensions.

.3 Inform installers of lines and levels to which they must comply.

.4 Check the location, level and plumb, of every major element as the Work progresses.

.5 Notify Consultant when deviations from required lines and levels exceed allowable tolerances.

.6 Verify accuracy of site dimensions shown on drawings.

.7 Verify that present, or known future restrictions, are not violated by construction on the site or lines of traverse to all public utilities.

.8 Verify accurately the final underground location on site of all buried storm, sanitary, water and electrical duct banks, when applicable.

.9 Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

.3 Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

.4 Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Consultant when requested.

1.8 FIELD ENGINEERING

.1 Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations:

.1 Do not change or relocate existing benchmarks or control points without prior written approval of Consultant.

.2 Report lost or destroyed permanent benchmarks or control points promptly.

.3 Report the need to relocate permanent benchmarks or control points to Consultant before proceeding.

.4 Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

.5 Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

.6 Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.

.7 Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

.2 Provide as-built site survey information after completion of demolition and excavation operations ready for construction.

.1 Survey grade elevations shall be on a 9 m grid or as required to locate property lines and new building structural grid lines.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 EXAMINATION

.1 Examine the site, existing premises and surrounding areas and be fully informed as to the conditions and limitations under which the work has to be executed. Claims for additional costs will not be entertained with respect to conditions which could reasonably have been ascertained by an inspection prior to bid closing.

.2 Prior to commencement of work, make careful examination of previously executed work, existing conditions, levels, dimensions and clearances. Promptly advise Consultant of unsatisfactory preparatory work and substrate conditions; commencement of work implies acceptance of conditions.

1.2 PROTECTION

.1 Ensure that no damage is caused to existing structures, buildings, foundations, pavement, fences, curbs, grounds, plants, property, utilities, services, and finishes during the progress of Work. Repair and make good any damage caused at no extra cost to Owner to the complete satisfaction of the respective property owners and authorities having jurisdiction. Do not proceed with repairs or remedial work without written permission of the Consultant. Only trades specifically capable of performing the work will be allowed to make remedial or repair work.

.2 Keep surfaces to receive finished flooring dry and free from oil and grease. Stockpiling of damp or wet building materials and use of mixing boxes or water buckets without protecting floors from moisture gain by approved means, is prohibited.

.3 Keep municipal roads clean of mud and debris resulting from construction traffic.

.4 Prevent soiling of pavement due to spillage, mixing of material or any other cause. Make good any damage caused.

.5 Protect new work from damage with suitable protective coverings.

.6 Protect work during periods of suspension, regardless of reason for suspension.

1.3 SERVICES AND UTILITY SYSTEMS

.1 Consult with utility companies and other authorities having jurisdiction to ascertain the locations of existing services on or adjacent to site.

.2 Information as to the location of existing services, if shown on the Drawings, does not relieve the Contractor of their responsibility to determine the exact number and location of existing services.

.3 Give proper notices for new services as may be required. Make arrangements with authorities and utilities for service connections required.

.4 Pay any charges levied by utilities or authorities for work carried out by them in connection with this Contract, unless specified otherwise.

.5 Operate and maintain all utility systems affected by work of this Contract, until the building or specific portions thereof have been accepted by the Owner.

.6 Report existing unknown services encountered during excavation to Consultant for instructions; cut back and cap or plug unused services. Be responsible for the protection of all active services encountered and for repair of such services if damaged.

1.4 SLEEVES, SUPPORTS, AND FASTENERS

.1 Unless specified in other Sections, furnish, set and secure inserts, hangers, sleeves, fasteners, adhesives, anchors and other supports and fittings required for proper installation of work.

.2 Use exposed metal fastenings and accessories of same texture, colour and finish as base metal on which they occur.

.3 Select appropriate type of anchoring and fastening devices and in sufficient quantity and in such manner as to provide positive permanent anchorage of unit to be anchored in position. Keep exposed fasteners to a minimum, evenly spaced and neatly laid out.

.4 Fasteners shall be of permanent type. Do not use wood plugs.

.5 Fasteners which cause spalling or cracking of material to which anchorage is being made shall not be used.

1.5 CONCEALMENT

.1 Conceal ductwork, piping, conduit and wiring located in finished areas, in ceiling spaces and furred construction unless specifically noted to be exposed.

.2 If any doubt arises as to means of concealment, or intent of Contract Documents in this connection, request clarification from Consultant before proceeding with portion of work in question.

1.6 CUTTING AND PATCHING

.1 Regardless of which Section of work is responsible for any portion of cutting and patching, in each case tradesmen qualified in work being cut and patched shall be employed to ensure that it is correctly done.

.2 Any cost caused by omission or ill-timed work shall be borne by party responsible therefore.

.3 Do not endanger any work by cutting, digging or otherwise altering, and do not cut nor alter any loadbearing element without written authorization by Consultant. Provide bracing, shoring and temporary supports as required to keep construction safely supported at all times.

.4 Cut holes carefully and not larger than required after they are located by Sections requiring them, using suitable equipment and tools.

.5 Patching and making good work shall be undetectable in finished work.

1.7 WORKMANSHIP

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

.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.

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

1.8 LINES AND LEVELS

.1 Verify all elevations, lines, levels and dimensions as indicated and report errors, any conflicts, or inconsistencies to the Consultant before commencing work or as soon as discovered.

.2 Arrange to have building base lines laid out by an Ontario Land Surveyor.

.3 Accurately lay out work and establish lines and levels in accord with requirements of Contract Documents.

.4 Set up, maintain and protect permanent reference points and provide general dimensions and elevations for all Sections of Work.

1.9 DIMENSIONS

.1 Check and verify dimensions wherever referring to work. Dimensions, when pertaining to work of another Section, shall be verified with Section concerned. Details and measurements of work which is to fit or conform with work installed shall be taken at site.

.2 Do not scale Drawings. If there is ambiguity, lack of information or inconsistency, immediately consult Consultant for directions. Be responsible for extra costs involved through the disregarding of this notice.

.3 Walls, partitions and screens shall be considered as extending from floor to underside of structural deck unless specifically indicated otherwise on Drawings.

1.10 LOCATION OF FIXTURES

.1 Location of fixtures, apparatus, equipment, fittings, outlets, conduits, pipes and ducts shown or specified, but not dimensioned, shall be considered approximate.

.2 Request direction from Consultant to establish exact location. Any relocation caused by Contractor's failure to request direction from Consultant shall be done by Contractor at no extra cost. Where job conditions require reasonable changes in indicated locations and arrangements, make changes at no additional cost.

.3 Conserve space and coordinate with work of other Sections to ensure that ducts, pipes, conduits and other items will fit into allocated wall and ceiling spaces, while ensuring adequate space for access and maintenance.

.4 Where ducts, piping and conduits are permitted to be exposed they shall be neatly and uniformly laid out parallel to adjacent building lines and parallel to each other where they run in the same direction. Review exposed installations with Consultant prior to start of work. At no cost to Owner make changes to exposed work as directed by the Consultant where such work is not installed in accordance with Consultant's prior review.

.5 Except where locations are specifically noted on Drawings, install exposed mechanical and electrical fixtures including outlets, switches, thermostats, panels and other items, located on walls, in orderly and neatly laid out manner, lining up with each other and grouped together where possible. Review installation with Consultant prior to start of rough-in work. Relocate at no cost to Owner any work which does not meet this requirement.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 GENERAL

.1 Be responsible for cleanliness of assigned work areas to satisfaction of Consultant. Maintain work areas in neat and orderly condition at all times.

.2 Periodically or when directed by the Consultant, remove from work areas rubbish and waste materials.

.3 Burning or burying of rubbish and waste materials on site is not permitted.

.4 Use only cleaning materials recommended by manufacturer of surface to be cleaned.

.5 Use cleaning material only on surfaces recommended by cleaning material manufacturer.

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Coordination and Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the work occurring onsite. Provide a clear delineation of responsibilities for each sub-trade.

.2 Sequencing: Ensure that the sub-trades mobilized onsite have access to the necessary bins to facilitate the separation of solid waste streams.

.3 Scheduling: Remove full bins in a timely fashion, and ensure that empty and partially full bins are properly labeled to minimize cross-contamination.

1.3 CLEANING DURING CONSTRUCTION

.1 Remove debris, packaging and waste materials frequently.

.2 Keep dust and dirt to an acceptable level, as directed.

.3 Remove oily rags, waste and other hazardous substances from premises at close of each day, or more often if required.

.4 Clear sidewalks of snow and ice, adjacent to construction site.

1.4 FINAL CLEANING

.1 Upon completion of work, or, where work is phased, upon completion of each phase, thoroughly clean all surfaces and components. Provide professional cleaning by a recognized, established cleaning company, to allow Owner to complete final cleaning and floor preparation / build-up.

.2 Remove stains, dirt and smudges from finished surfaces.

.3 Clean exposed finished surfaces in accordance with respective material manufacturer's recommendations.

.4 Clean mechanical and electrical fixtures and other fittings of labels, wrappings, paper and other foreign material.

.5 Replace heating, ventilation and air conditioning filters if units were operated during construction. Clean inside of ducts, blowers and coils.

.6 Remove from work areas all waste and surplus materials from all areas, including roofs and ceiling spaces.

.7 Steam clean existing masonry which becomes an interior exposed wall surface.

.8 Remove snow and ice from driveways, parking areas and walks.

.9 Power wash paved surfaces.

1.5 WASTE COLLECTION AND DISPOSAL

.1 All waste materials and debris resulting from the work of this Contract shall belong to the Contractor and shall be removed from the site and legally disposed.

.2 Periodically, or when directed by the Consultant remove waste material and debris.

.3 Construction Waste:

.1 Designate an area onsite for the separation and storage of waste materials. Allow enough space to accommodate multiple bins.

.2 At a minimum, provide storage bins onsite for concrete, metal, wood, cardboard, plastic, gypsum board and mixed waste. Landclearing debris, asphalt and concrete can be stockpiled onsite, as opposed to being placed in bins, for further processing.

.3 Provide signage on each bin to identify the specific waste streams that can be placed in each.

.4 The waste separation and storage area and bins are to be kept neat, and clean, and clearly marked in order to avoid contamination of materials.

.5 Hazardous waste and hazardous materials are not within the scope of this Section and must be handled in accordance with the requirements stipulated by local regulations.

.4 Domestic Recyclables

.1 “Blue Box” receptacles shall be placed in close proximity all site trailers, and throughout the building, to collect recyclable material generated by workers. At minimum, provide receptacles for metal and glass beverage and food containers and paper products.

.2 Make arrangements with the Municipality or a receiving facility to have domestic recyclables picked up regularly.

.3 Adjacent to each “Blue Box” receptacle, provide a mixed waste receptacle in order to avoid contamination of recyclables.

.5 Separate and salvage materials suitable for recycling from general waste stream and transport to recognized recycling facility.

.6 Burying, burning, selling waste materials on site is prohibited.

.7 Disposal of liquid wastes into waterways, sewers is prohibited.

1.6 SCHEDULING

.1 Ensure that an appropriately sized bin is provided onsite for each new waste stream that is introduced onsite.

.2 Arrange for the prompt collection by, or delivery to, the appropriate recycling or reuse facility when a bin is full, or nearly full.

1.7 ONSITE QUALITY CONTROL

.1 Waste Handling:

.1 Clean and strip materials (as stipulated by the receiving facility) prior to placing in collection containers. Deliver materials free of dirt, adhesives, solvents, and petroleum contamination.

.2 Ensure that no cross-contamination has occurred in bins and receptacles. Should bins become cross-contaminated, the Contractor shall separate the waste streams prior to removal from the site. The only exception to this is if a qualified off-site sorting facility is responsible for separating the waste streams.

.3 Ensure that signage is in place and clearly visible on all bins and receptacles.

.4 Ensure that bins and receptacles are easily accessible by workers and waste haulers. Supplies, equipment and materials must never restrict access.

.5 Ensure site is free and clear of accumulated debris. If materials are being stockpiled prior to removal from the site, ensure they are located away from the building, and out of the way of typical traffic patterns.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 GENERAL INSTRUCTIONS

.1 The procedures for completing Contract and acceptance by the Owner shall be in accordance with the methods prescribed by Owner.

.2 Stages will be reviewed at the Contract start-up meeting to ensure that parties understand their responsibilities. Refer to Section 01 31 19 for procedures and requirements for Contract start-up meeting.

.3 Within four (4) weeks of commencement of the Work, submit to the Consultant a list of closeout submittals required by the Contract Documents.

.4 Note that entities other than the Owner may be involved in the closeout procedures described herein, including attendance at any operation and/or maintenance training sessions required. The Owner will coordinate such attendance as required.

1.2 FINAL CLEANING

.1 Co-ordinate final clean-up with the Owner's representatives and opening requirements.

.2 In addition to requirements for cleaning-up specified in the General Conditions of the Contract, and in Section 01 11 00, include in work final cleaning by skilled cleaning specialists on completion of construction.

.3 Remove temporary protections and make good defects before commencement of final cleaning.

.4 Replace glass and mirrors that have been broken, damaged and/or etched during construction, or which are otherwise defective.

.5 Remove dust, stains, paint spots, soil, grease, fingerprints, and accumulations of construction materials, interior and exterior to the building. Perform cleaning in accordance with installer's instructions for each material. Final cleaning shall include:

.1 Washing of interior concrete floors.

.2 Cleaning and polishing of:

.1 glass;

.2 mirrors;

.3 porcelain, enamel, and finish metals;

.4 washroom accessories.

.3 Vacuum cleaning of ceilings, walls and floors.

.4 Cleaning of glazed wall surfaces.

.5 Cleaning of hardware, mechanical fixtures, lighting fixtures, cover plates, and equipment, including polishing of their finish metal, porcelain, vitreous, and glass components.

.6 Removing of visible labels left on materials, components, and equipment.

.7 Maintain cleaning until Owner has taken possession of building or portions thereof.

1.3 CLOSE-OUT SUBMITTALS

.1 Collect reviewed submittals, and assemble required closeout submittals executed by Subcontractors, Suppliers, and manufacturers. Prior to submitting closeout submittals to the Consultant, undertake the following:

.1 Review maintenance manual contents (operating, maintenance instructions, asbuilt drawings, materials) for completeness.

.2 Review in relation to Contract Price, Change Orders, Change Directives, holdbacks and other adjustments to the Contract Price.

.3 Review inspection and testing reports to verify conformance to intent of Contract Documents and that changes, repairs or replacements have been completed.

.4 Execute transition of performance bond and labour and materials payment bond to warranty period requirements.

.5 Submit a final statement of accounting giving total adjusted Contract Price, previous payments, and monies remaining at time of application for completion of the Contract. Consultant will issue a final change order reflecting approved adjustments to Contract Price not previously made, if any.

.2 No later than then (10) working days prior to submitting request for Consultant's review to determine if Substantial Performance of the Work has been achieved, submit to the Consultant the closeout submittals specified in this section, including, but not limited to, reviewed shop drawings, Product data sheets, samples, operating instructions, as-built records, and fully executed warranties and guarantees.

.3 For items of the Work delayed materially beyond date of Substantial Performance of the Work, provide updated closeout submittals within ten (10) working days after acceptance, listing date of acceptance as start of warranty period.

.4 Neither the Consultant's review to determine if Substantial Performance of the Work has been achieved, nor acceptance of the Work, will take place until receipt, by the Consultant, of acceptable copies of the closeout submittals required herein and by the Contract Documents.

.5 Maintenance materials:

.1 Deliver to a location and at a time specified by the Owner, organize items in Owner's storage area as directed by the Owner, and as follows:

.1 Use unbroken cartons, or if not supplied in cartons, material shall be strongly packaged.

.2 Clearly mark cartons or packaging as to contents, project name, and Supplier.

.3 If applicable give colour and finish, room number or area where material is used.

.2 Replace incorrect or damaged maintenance materials delivered to Owner, including damage through shipment.

.3 Provide a typed inventory list of maintenance materials prior to Substantial Performance of the Work application. List all items, complete with quantities, and storage locations.

.4 Establish a master list identifying maintenance materials and maintain a log of when materials are turned over to Owner and signing authority for acceptance of materials on behalf of Owner. Master list and log shall be in a format acceptable to the Owner.

.6 Owner communication material:

.1 Deliver Owner communication material that was applied to hoarding and/or temporary barriers and enclosures during the Work. Salvage such material in accordance with Section 01 11 00.

1.4 SUBSTANTIAL PERFORMANCE OF THE WORK

.1 Deficiency review:

.1 Neither Owner nor Consultant will be responsible for preparation or issuance of extensive lists of deficiencies. Contractor assumes prime responsibility for ensuring that items shown and described in the Contract Documents are complete. Any reviews to approve the certificate of Substantial Performance of the Work will be immediately cancelled if it becomes obvious to the Consultant that extensive deficiencies are outstanding.

.2 The Contractor shall conduct an inspection of the Work to identify deficiencies and defects, which shall be repaired. When the Contractor considers that the Work is substantially performed, the Contractor shall prepare and submit to the Consultant a comprehensive list of items to be completed or corrected and apply for a review of the

Work by the Consultant to determine if Substantial Performance of the Work has been achieved.

.3 The Contractor's request described above shall include a statement by Contractor that the Work to be reviewed by Consultant for deficiencies is, to the best of the Contractor's knowledge, in compliance with Contract Documents, reviewed shop drawings, and samples, and that deficiencies and defects previously noted by Consultant have been repaired.

.4 No later than fifteen (15) working days after the receipt of the Contractor's request described above, but contingent upon the prior receipt, by the Consultant, of the closeout submittals in the manner and form specified in this section, the Consultant and the Contractor will review the Work to identify any defects or deficiencies. If necessary, the Contractor shall tabulate a list of deficiencies to be corrected prior to Substantial Performance of the Work being certified by the Consultant.

.5 During review, the Consultant and the Contractor will decide which deficiencies or defects must be rectified before Substantial Performance of the Work can be certified, and which defects are to be treated as warranty items.

.6 Provide a schedule of planned deficiency review having regard to the foregoing.

.2 Certification of Substantial Performance of the Work:

.1 When the Consultant considers that the deficiencies and defects have been completed and that it appears that the requirements of the Contract Documents have been substantially performed, the Consultant shall issue a certificate of Substantial Performance of the Work to the Contractor, stating the date of Substantial Performance of the Work.

.2 The certificate of Substantial Performance of the Work shall be prepared in form required by Construction Lien Act.

.3 Final Inspection for completion of the Contract:

.1 Deficiencies and defects shall be made good before the Contractor submits a written request for final review of the Work and before the Contract is considered complete.

.2 When Contractor is satisfied that the Work is complete, and after the Contractor has reviewed the Work to verify its completion in accordance with the requirements of the Contract Documents, the Contractor shall submit a written request for a final review by the Consultant, who in turn will notify the Owner.

.3 If there are any deficiencies identified as a result of this review, they shall be listed by the Consultant and submitted to the Contractor. This list shall be recognized as the final deficiency list for purposes of acceptance of the Work under the Contract.

.4 Such deficiencies shall be corrected by a date mutually agreed upon between Consultant and the Contractor, unless a specific date is required by Contract, and a further review by the Consultant shall be called for by the Contractor following his own review to take place within seven (7) days from date of request.

.5 Contractor shall thereafter submit invoice for final payment.

.6 Money shall be withheld for deficiency work and will be released only when all deficiencies have been completed. No partial payment to be recognized until all work is completed.

.4 If the Contractor needs to return to the Place of the Work to complete deficiencies after the Owner has taken possession, the Contractor shall provide the Owner with a minimum of one (1) week's prior notice of such requirement.

1.5 WARRANTY PERIOD

.1 Provide on-going review and attendance to call-back, maintenance and repair problems during the warranty periods.

.2 At the beginning of the 12th month after Substantial Performance of the Work, the Owner, Contractor and Consultant, along with key Subcontractors as designated, shall carry out a complete review of the built project to determine which deficiencies are to be rectified under the warranty.

.3 Contractor shall be responsible for timely written notification of Owner, and Consultant a minimum of three (3) months prior to such end of warranty period inspection and any delay in such notification shall extend such warranty period until proper notification is received by Owner, and Consultant.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 WARRANTIES

.1 Warranties shall be in accordance with the General Conditions, as amended, and as follows:

.1 Warranties shall commence at date of Substantial Performance of the Work.

.2 Submit warranties for applicable items, signed by the applicable company responsible for each warranty.

.3 Submit warranties on form approved by Owner including, but not limited to, the following information:

.1 Name and address of Project.

.2 Warranty commencement date (date of Substantial Performance of the Work).

.3 Duration of warranty.

.4 Clear indication of what is being warranted and what remedial action will be taken under warranty.

.5 Authorized signature and seal of company providing each warranty.

.4 Owner shall be named in manufacturer's Product warranties. Submit on relevant Product manufacturer's standard warranty or guarantee form.

2 Products

Not Used

3 Execution

Not Used

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 General Conditions and Division 01 apply to this Section.

1.2 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI):

.1 ANSI A10.8-2011, Safety Requirements for Scaffolding and Comparison Document

.2 Canadian Standards Association (CSA):

.1 CSA S350- M1980 (R2003), Code of Practice for Safety in Demolition of Structures.

.3 National Fire Protection Association (NFPA):

.1 NFPA 241-2013, Standard for Safeguarding Construction, Alteration, and Demolition Operations

.4 Provincial Legislation:

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

1.3 DEFINITIONS

.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.

.2 Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.

.3 Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

.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.

1.4 DESCRIPTION

.1 Review drawings, site conditions, and other specification sections to ascertain the extent and nature of work of this section.

.2 The Work of this Section includes the following:

.1 Demolish and removal of existing windows and doors.

.2 Demolish and removal of partitions, ceilings, wall and floor finishes, as indicated on drawings.

.3 Disconnect/cap existing service in areas of demolition.

.4 Dispose of demolished materials except where required to be salvaged or reused.

.5 Refer to demolition notes indicated on drawings.

1.5 EXAMINATION

.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.

.2 Where appropriate prepare a photographic or video record of existing conditions, particularly of existing work scheduled to remain.

.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 SUBMITTALS

.1 Provide required information in accordance with Section 01 33 00.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Prepare schedule in conjunction with overall project schedule, and outline proposed methods in writing. Obtain approval before commencing demolition work, and indicate the following:

.1 Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity

.2 Interruption of utility services

.3 Coordination for shutoff, capping, and continuation of utility services

1.7 QUALITY ASSURANCE

.1 Conform to requirements of all authorities having jurisdiction.

.2 Comply with applicable requirements of CSA S350-M "Code of Practice for Safety in Demolition of Structures".

.3 Work of this Contract shall be executed by an approved company having a minimum of five (5) years continuous experience and able to deploy adequate equipment and skilled personnel to complete work expediently in an efficient and orderly manner.

.4 Perform cutting and coring, where applicable, by a firm specializing in this type of work, able to produce evidence of successful completion of similar work over a period of at least five (5) years immediately prior to date of contract.

.5 Apply for, secure, arrange and pay for all permits, notices and inspections necessary for proper execution and completion of work in this Section.

1.8 PROTECTION

.1 Prevent movement or settlement of adjacent work. Provide and place bracing or shoring and be responsible for safety and support of such work. Be liable for any such movement or settlement, and any damage or injury caused.

.2 Cease operations and notify Consultant if safety of any adjacent work or structure appears to be endangered. Take all precautions to support the structure. Do not resume operations until reviewed with the Consultant.

.3 Prevailing weather conditions and weather forecasts shall be considered. Demolition work shall not proceed when weather conditions constitute a hazard to the workers and site.

.4 Prevent damage of surrounding vegetation by construction. Install tree protection barriers to trees that are scheduled to remain, as detailed on the drawings.

.5 Prevent debris from blocking surface drainage inlets and mechanical and electrical systems which remain in operation.

.6 Temporarily suspended work that is without continuous supervision shall be closed to prevent entrance of unauthorized persons.

1.9 REMAINING AND ADJACENT STRUCTURES

.1 Do not interfere with, encumber, endanger or create nuisance, from any cause due to demolition work, to public property or any adjacent attached and/or detached structures in possession of Owner or others, which are to remain, whether occupied or unoccupied during this work.

.2 Make good damage to such structures resulting from work under this Section at no cost to Owner. Make good adjacent building surfaces damaged by work of this Section.

1.10 PROTECTION OF SERVICES AND STRUCTURES

.1 Take necessary precautions to guard against movement, settlement or collapse of existing adjacent utility services, public property and/or structures, whether to remain or not. If these or other unforeseen conditions develop, take immediate emergency measures, report to Consultant, confirm in writing, and await instructions before proceeding with any further related demolition work.

.2 Prior to saw cutting or core drilling of existing concrete slabs, use ground penetrating radar (GPR) to detect utilities and structural reinforcing. Concrete X-Rays can be used when access to both sides of concrete slab is accessible for placement of required x-ray film.

1.11 EXISTING SERVICES

.1 Prior to start of demolition disconnect all electrical and telephone service lines in the areas to be demolished. Post warning signs on all electrical lines and equipment which must remain energized to serve other areas during period of demolition. Disconnect electrical and telephone service lines in demolition areas to the requirements of local authority having jurisdiction.

.2 In each case, notify the affected utility company in advance and obtain approval where required before commencing with the work on main services.

.3 Arrange with utility companies for locating of such services and for disconnection of existing services owned by utility companies and which will be disconnected by said utility companies, provided such services do not interfere with adjacent tenancy operators.

.4 Remove sewer and water lines where required within existing building as deemed necessary, and cap to prevent leakage, in accordance with authorities having jurisdiction.

.5 Existing services are to be maintained where required for normal tenant operation during regular hours of operation and/or as deemed necessary by Owner.

2 Products

2.1 DEBRIS, SALVAGED MATERIAL AND EQUIPMENT DISPOSAL

.1 All materials and or equipment salvaged from demolition work becomes property of demolition Contractor unless designated otherwise.

.2 At no cost to Owner repair or replace material and/or equipment scheduled to remain which is damaged by demolition work. Do not sell any salvaged material or equipment directly from project site.

.3 Remove waste debris continually and entirely from project site during demolition work. Do not load vehicles transporting such debris beyond their safe capacity or in a manner which might cause spillage on public or private property. If spillage does occur, clean up immediately to prevent traffic hazards or nuisance.

2.2 PROTECTION

.1 Temporary Protection:

.1 Erect temporary hoarding protection, as indicated in Section 01 56 26, to enclose openings in exterior walls, and/or provide security to partially occupied interior spaces.

.2 Erect temporary dust screens, as indicated in Section 01 50 00, to prevent dust and debris to enter areas of the building which are not scheduled for demolition. Remove temporary dust screens when no longer required.

2.3 REPAIR MATERIALS

.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 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.

.3 Terrazzo Floor Patching: Install new terrazzo floor finish to match adjacent floor finish, as approved by the Consultant, once demolition in the area has been completed.

.4 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.

.5 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.

.6 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 Assemblies.

.7 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.

2.4 EXISTING MATERIALS

.1 Items to be retained and relocated for use in new construction include, but are not limited to the following:

.1 Playground play structure

.2 Playground swings

.3 Basketball hoops

.4 Lockers and cabinets

.5 Confirm with Consultant any materials that appear to be in re-usable condition prior to disposal.

.6 Confirm with Consultant any materials scheduled for re-use that are not in re-usable condition prior to installation.

3 Execution

3.1 GENERAL

.1 Exercise caution in dismantling, disconnecting of work adjacent to existing work designated to remain.

.2 Carry out demolition in a manner to cause as little inconvenience to the adjacent properties as possible.

.3 Carry out demolition in an orderly and careful manner.

.4 Demolition by explosives is not permitted.

.5 Selling or burning of materials on site is not permitted.

.6 Sprinkle exterior debris with water to prevent dust. Do not cause flooding, contaminated run-off or icing. Do not allow waste material, rubbish, and windblown debris to reach and contaminate adjacent properties.

.7 Lower waste materials in a controlled manner; do not drop or throw materials from heights.

.8 At end of each day's work, leave in safe condition so that no part is in danger of toppling or falling.

3.2 SAFETY AND SECURITY

.1 Maintain security of the building at all times during demolition work.

.2 Provide and maintain fire prevention equipment and alarms accessible during demolition.

3.3 ACCESS ROUTES

.1 Restrict operations to designated access routes.

.2 Do not obstruct roads, parking lots, sidewalks, hydrants and the like.

3.4 SELECTIVE DEMOLITION

.1 Provide necessary shoring and supports to assure safety of structure prior to cutting and coring.

.2 Where practical, sawcut and remove material as required.

.3 Where sawcutting is not appropriate, use suitable hand tools.

.4 Demolish, cut-out and remove from site all other work noted on drawings or required to permit new construction.

.5 Do not allow water to accumulate or flow beyond work area. Provide receptacles and mop-up as work proceeds.

.6 Fill all openings in concrete block walls with concrete masonry units, coursing to match existing, prepare ready to receive new finishes to match existing.

.1 Provide bond beams in new openings cut into existing concrete masonry unit walls.

.2 Provide finished end masonry units to patch and repair for new jamb sections in existing concrete masonry unit walls.

.7 Fill all openings in gypsum board walls with gypsum board and steel framing to match existing, skim coat to make wall smooth and even.

.8 Demolish existing flooring and wall finishes, and adhesive remnants as follows:

.1 Floor and wall substrate shall be smooth, free from ridges and depressions, and adhesive remnants that could telegraph through new flooring and wall finishes.

.9 Demolish completely all ceiling panels and grid as indicated.

.10 Remove all wall coverings scheduled for demolition. Patch and repair wall surfaces with skim coat of gypsum board joint compound leaving wall surfaces smooth and even ready for new wall finishes.

.11 Patch and repair all walls, floor and ceilings damaged during demolition with material matching adjacent walls, prepare ready for new finishes.

.1 Prepare existing surfaces schedule to receive new finish by grinding, filling, over-coating, stripping, washing, etching, shot blasting or other chemical or mechanical means, as required to ensure satisfactory installation of new finish.

3.5 PATCHING AND REPAIRING

.1 Floors and Walls:

.1 Where walls or partitions that are demolished extend from one finished area into another, patch and repair floor and wall surfaces in the new space.

.2 Provide a level and smooth surface having uniform finish colour, texture, and appearance.

.3 Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform colour and appearance.

.4 Patch with durable seams that are as invisible as possible.

.5 Provide materials and comply with installation requirements specified in other Sections of these Specifications.

.6 Where patching occurs in a painted surface, apply primer and intermediate paint coats over patch and apply final paint coat over entire unbroken surface containing patch. Provide additional coats until patch blends with adjacent surfaces.

.7 Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

.2 Ceilings: patch, repair, or re-hang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

.3 Exterior Walls: Where existing doors and/or windows are schedule to be removed during demolition, patch and repair exterior walls using similar wall construction techniques as adjacent wall construction. Ensure compatibility between insulation, air barrier and vapour retarder, providing continuous air and vapour control and wall R-Value between existing and new construction. Provide exterior and interior finish materials, matching existing adjacent materials, to provide an even-plane surface of uniform appearance.

3.6 EXCESSIVE DEMOLITION

.1 Where excessive demolition occurs, be responsible for cost of replacing such work.

.2 Consultant shall determine extent of such 'over-demolition' and method of rectification.

3.7 COMPLETION

.1 Leave project site as directed, reasonably clean and presentable, free from above grade debris, any salvaged material and/or equipment except those designated to remain.

.2 Maintain access to exits clean and free of obstruction during removal of debris.

END OF SECTION

PART 1 GENERAL

1.1 General and Related Work

.1 Read this section in conjunction with all other sections so as to comply with the General Conditions of the Contract.

.2 Related Work Specified Elsewhere:

Division 2,	Section 02 82 10	Asbestos Abatement - Type 1.
Division 2,	Section 02 82 12	Asbestos Abatement - Type 3.

.3 The site conditions identify the location and condition of all known asbestos-containing materials (ACM) to be disturbed by the work of this section. The specification fulfils the requirements of the report required by Ontario Regulation 278/05.

.4 Unless otherwise shown or specified it is the intent that work performed as per this section will result in the removal and disposal or decontamination of all ACM and all materials which have been contaminated by ACM either during or prior to work of this section.

.5 Refer to Pinchin Asbestos Work Area drawings by asbestos procedure as follows:

.1 AR-100 series for Type 1 asbestos work.

.2 AR-300 series for Type 3 asbestos work.

.6 The Pinchin report “Hazardous Building Materials Assessment, Queen Elizabeth Public School, 830 Barnardo Avenue, Peterborough, Ontario” dated March 17, 2020, Pinchin File 268661, form part of this specification and the contract documents.

1.2 Abatement Contractors

.1 The following firms have been preferred by KPRDSB for work of this contract:

.1 I&I Construction Services, Ted Barron, (905) 884-1290.

.2 JCH Environmental, Jorge Chavarria, (905) 237-1349.

.3 Ontario Insulation, Judy Connor, (905) 404-9663.

.4 D&F Insulation, Mark Lunn, (705) 745-1389.

.5 Alliance Environmental, Dean Power, (905) 940-2600.

.2 Work which may disturb asbestos must be performed by one of the five firms listed above.

1.3 Site Conditions

.1 Parging cement, containing chrysotile asbestos, is present in the following locations and quantities:

.1 On pipe fittings in the tunnel beneath corridor 116H (40 EA).

.2 As debris on the surface of dirt floor within the tunnel below corridor 116H (40 SF).

.2 Aircell pipe insulation is present on in the following locations and quantities:

.1 On heating water and domestic water piping in the tunnel beneath corridor 116H (300 LF).

.2 As debris on the surface of dirt floor within the tunnel below corridor 116H (250 SF).

.3 Presumed asbestos-containing adhesive, securing 12”x12” wood fibre ceiling tiles, in the following locations:

.1 Classrooms 107 (600 SF).

.2 Classroom 108 (600 SF).

.3 Classroom 110 (600 SF).

.4 Classroom 111 (600 SF).

.4 Asbestos cement 1’ x 1’ ceiling panels with uniform hole pattern, presumed to contain asbestos, screwed on the ceilings are present at the following locations (quantities):

.1 Classrooms 107 (100 SF).

.2 Classroom 108 (100 SF).

.3 Classroom 110 (100 SF).

.4 Classroom 111(100 SF).

.5 Mastic, containing chrysotile asbestos, is present on 12” white with fine black streak patterned vinyl floor tiles and concrete slabs in the following locations:

.1 Classroom 115 (800SF)

.6 Mastic, presumed to contain chrysotile asbestos, is present under newer non-asbestos vinyl floor tiles and concrete slabs in the following locations:

.1 Classrooms 107 (800 SF).

.2 Classroom 108 (900 SF).

.3 Classroom 110 (800 SF).

.4 Classroom 111(800 SF).

.5 Classroom 114 (800SF).

.6 Classroom 116 (800SF).

.7 Exterior dark grey caulking, containing chrysotile asbestos, present at wood trim and window frames in the following locations:

.1 Classroom 114 (80 LF).

.2 Classroom 115 (80 LF).

.3 Classroom 116 (80 LF).

.8 Interior grey joint caulking, containing chrysotile asbestos, is present at concrete block wall intersections, in the following locations:

.1 Classroom 114 (30 LF).

.2 Classroom 115 (30 LF).

.3 Classroom 116 (30 LF).

.9 Interior grey caulking, containing chrysotile asbestos, is present on both sides of door frames, in the following locations:

.1 Classroom 114 (34 LF).

.2 Classroom 115 (34 LF).

.3 Classroom 116 (34 LF).

.10 Mastic, containing chrysotile asbestos, on the underside of sinks, in the following locations:

.1 Classroom 114 (1 EA).

.2 Classroom 115 (1 EA).

.3 Classroom 116 (1 EA).

.11 Interior brown caulking, containing chrysotile asbestos, present around wood bookcase in the following location:

.1 Classroom 110 (20 LF).

.12 Green chalkboards, presumed to contain asbestos, present in the following locations:

.1 Classroom 110 (32 SF).

.2 Classroom 111(32 SF).

1.4 Work Areas

.1 All Asbestos Work Areas are shown on the provided drawing AR-100 and AR-300, and are to be referenced in conjunction with the scope of work, the architectural, mechanical and electrical drawings.

.2 Using Type 1 procedures detailed in Section 02 82 10, remove and dispose of the following in the Type 1 asbestos work areas as indicated on drawing AR-100:

.1 Asbestos-containing floor mastic, and associated vinyl floor tiles in Classroom 115.

.2 Asbestos-containing caulking around wood bookshelf Classroom 110.

.3 Asbestos-containing expansion joint caulking and exterior window frames in Classrooms 114, 115, and 116.

.4 Asbestos-containing caulking around door frames in Classrooms 114, 115 and 116.

.5 Asbestos cement chalkboards in Classrooms 110 and 111.

.6 Sinks with asbestos-containing mastic in Classrooms 114, 115 and 116.

.7 Screwed on 1’ x 1’ asbestos cement ceiling tiles Classroom 107, 108, 110 and 111.

.8 Presumed asbestos-containing adhesive used to fasten 12” x 12” wood fibre ceiling tiles in Classrooms 107, 108, 110 and 111.

.9 Presumed asbestos-containing floor tile mastic, within Classrooms 107,108,110,111, 114 and 116.

.3 Using Type 3 procedures detailed in Section 02 82 12, remove and dispose of the following found present in the Type 3 asbestos work areas as indicated on drawing AR-300:

.1 Parging cement insulation on fittings in tunnel beneath corridor 116H.

.2 Aircell hot water heating pipes within tunnel beneath corridor 116H.

.3 Pipe insulation debris on dirt floor in tunnel beneath corridor 116H.

.4 Reinsulate pipes using 1” fibreglass insulation, jacket with canvas, and paint two coats lagging compound at locations where insulations were removed by this section.

1.5 Schedule

.1 Work performed during the Summer June 30, 2020 until August 31, 2020 can be performed at any time provided that work does not interfere with owner operations.

.1 Coordinate schedule with the General Contractor.

1.6 Definitions

.1 Asbestos: Any of the fibrous silicates defined in Regulation 278/05 including: actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite.

.2 Asbestos Abatement Consultant: Owner's Representative providing inspection and air monitoring.

.3 Asbestos Abatement Contractor: Contractor or sub-contractor performing work of this section.

.4 Asbestos Cement Products: Also known as Transite.

.5 Asbestos-Containing Material(s) (ACM): Material(s) identified under Site Conditions including debris, fallen material and settled dust.

.6 Asbestos Work Area: Area where work takes place which will, or may, disturb ACM.

.7 Authorized Visitors: Prime Contractor, Building Owner or Representatives, Asbestos Abatement Consultant, 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 Friable Material: means a material when dry can be crumbled, pulverized or powdered by hand pressure or is crumbled, pulverized or powdered.

.10 HEPA Filter: High Efficiency Particulate Arresting filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.

.11 PCM: Phase Contrast Microscopy.

.12 Polyethylene: Either polyethylene sheeting or rip-proof polyethylene sheeting (as specified) with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide a continuous polyethylene membrane to protect underlying surfaces from damage, and to prevent escape of asbestos fibres through sheeting into Occupied Areas.

.13 Occupied Area: Any area of the building outside the Asbestos Work Area.

.14 Personnel: All contractors' employees, sub-contractors employees, supervisors.

.15 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).

.16 TEM: Transmission Electron Microscopy.

.17 Transite: Asbestos cement products, sheets, pipes, ducts, etc.

1.7 Submittals

.1 Submit the following to Asbestos Abatement Consultant prior to starting work:

.1 Workplace Safety and Insurance Board Clearance Certificate.

.2 Insurance certificates.

.3 Copy of Certificate of Approval for transportation of asbestos waste and location of landfill.

.4 Resumes of the supervisory personnel.

.5 Proof in the form of a certificate that supervisory personnel are certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.

.6 Proof in the form of a certificate that workers performing Type 3 abatement are certified as supervisors under the Ministry of Training, Colleges and Universities course 253W.

.7 Written statement that personnel have had instruction on hazards of asbestos exposure, the use of respirator, protective clothing, worker and waste decontamination procedures, and all aspects of work procedures and protective measures.

.8 WHMIS training certificates for all personnel.

.9 Certificate proving that each worker on site has been fit tested for the respirator appropriate for the work being performed.

.2 Submit certificates of performance data on HEPA filtered vacuums and negative air units including HEPA challenge integrity leak tests performed onsite.

.3 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. Regulations 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 Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.

.3 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

1.8 Supervision

.1 Provide onsite, a supervisor, with authority to oversee all aspects of the work, including but not limited to, health and safety, methods, scheduling, labour and equipment requirements.

.2 The supervisor must be on site at all times. Failure to comply with this requirement may result in a stoppage of work, at no cost to the Owner.

.3 Provide a minimum of one supervisor for every 10 workers.

.4 Replace supervisory personnel, with approved replacements, within 3 working days of a written request from the Asbestos Abatement Consultant. Asbestos Abatement

Consultant reserves the right to request replacement of supervisory personnel without explanation.

.5 Do not replace supervisory personnel without written approval from the Asbestos Abatement Consultant.

1.9 Quality Assurance

.1 Ensure the removal and handling of ACM or asbestos contaminated materials is performed by persons experienced in the methods, procedures and industry practices of asbestos abatement.

.2 Complete work so that at no time airborne asbestos, visible solid residue, or water runoff contaminates areas outside Asbestos Work Area. Asbestos Abatement Consultant is empowered to order a shutdown of work when a leak has occurred or is likely to occur. Cost of additional work by Asbestos Abatement Contractor and/or Asbestos Abatement Consultant to rectify unsatisfactory conditions shall be charged to the Asbestos Abatement Contractor.

.3 Perform all work involving other trades such as electrical, mechanical, carpentry, glazing etc. using licensed persons experienced and qualified for the work required.

.4 The Asbestos Abatement Consultant will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs required for the Work in accordance with the applicable construction safety legislation, other regulations or general construction practice. The Asbestos Abatement Consultant will not be responsible for or have control or charge over the acts or omissions of the Asbestos Abatement Contractor, his Subcontractors or their agents, employees or other persons performing any of the Work.

1.10 Notification

.1 Notify Sanitary Landfill site as per Ontario Regulation 347 as amended.

.2 Inform all sub trades of the presence of ACM identified in the contract documents.

.3 Notify the Owner or Owners Representative, the Joint Occupational Health and Safety Committee and the Ontario Ministry of Labour, as required by Regulation 278/05, 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.

END OF SECTION

PART 1 GENERAL

1.1 General and Related Work

.1 Read this section in conjunction with all other sections so as to comply with the requirements of Division 1 and the General Conditions of the Contract.

.2 Related Work Specified Elsewhere:

Division 2,	Section 02 82 00	Site Conditions and Outline of Work.
Division 2,	Section 02 82 12	Asbestos Abatement – Type 3.

.3 The site conditions identify the location and condition of all known asbestos-containing materials (ACM) to be disturbed by the work of this section. The specification fulfils the requirements of the report required by Ontario Regulation 278/05.

.4 Unless otherwise shown or specified it is the intent that work performed as per this section will result in the removal and disposal or decontamination of all ACM and all materials which have been contaminated by ACM either during or prior to work of this section.

.5 Refer to Pinchin Asbestos Work Area drawing by asbestos procedure as follows:

.1 AR-100 series for Type 1 asbestos work.

.2 AR-300 series for Type 3 asbestos work.

.6 Refer to drawings prepared by AECOM for asbestos work coordination and the extent of building materials to be removed under asbestos precautions.

.7 The Pinchin report “Hazardous Building Materials Assessment, Queen Elizabeth Public School, 830 Barnardo Avenue, Peterborough, Ontario” dated March 17, 2020, Pinchin File 268661.001 form part of this specification and the contract documents.

1.2 Site Conditions

.1 Refer to Section 02 82 00.

1.3 Outline of Work

.1 Refer to Section 02 82 00.

1.4 Schedule

.1 Refer to Section 02 82 00.

1.5 Definitions

.1 Refer to Section 02 82 00.

1.6 Submittals

.1 Refer to Section 02 82 00.

1.7 Regulations

.1 Refer to Section 02 82 00.

1.8 Supervision

.1 Refer to Section 02 82 00.

1.9 Quality Assurance

.1 Refer to Section 02 82 00.

1.10 Notification

.1 Refer to Section 02 82 00.

1.11 Instruction and Training

.1 Provide instruction and training to all workers including the following:

- .1 Hazards of asbestos.
- .2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that would be used and worn during abatement work, including:
  - .1 Limitations of equipment.
  - .2 Inspection and maintenance of equipment.
  - .3 Proper fitting of equipment.
  - .4 Disinfecting and cleaning of equipment.
- .3 Personal hygiene to be observed when performing the work.
- .4 The measures and procedures prescribed by this section.

.2 Instruction and training must be provided by a competent person.

1.12 Personal Protection

.1 Provide non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters when requested by personnel.

.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 Asbestos 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.

.3 Personnel must have respirators fit checked by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.

.4 As per the requirements of Regulation 278/05, when requested by personnel, provide protective clothing which:

- .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.

.2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.

.3 Is replaced or repaired if torn or ripped.

.5 Decontaminate clothing or protective clothing by using a HEPA Vacuum, or by damp wiping prior to leaving the Asbestos Work Area:

.1 Dispose of as ACM.

.6 Provide soap, towels and facilities for washing of hands and face, which shall be used by all personnel when leaving the Asbestos Work Area.

.7 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

.8 Use hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

1.13 Authorized Visitor Protection

.1 Provide clean protective clothing and equipment to Authorized Visitors.

.2 Ensure Authorized Visitors have received required training prior to granting entry into Asbestos Work Area.

1.14 Inspection

.1 From commencement of work until completion of clean-up operations, the Asbestos Abatement Consultant may be present periodically on site both inside and outside the Asbestos Work Area.

.2 Inspection of the Asbestos Work Area will be performed to confirm the Asbestos Abatement Contractor's compliance with the requirements of the contract documents and governing authorities. Any deviations from these requirements, that have not been approved in writing, may result in a stoppage of work at no additional cost to the Owner.

.3 If the Asbestos Work Area is found unacceptable by the standards specified or required by governing authorities, the remedial work required to meet these standards and obtain consent to proceed from the Asbestos Abatement Consultant, shall be performed at no additional cost to the Owner.

.4 The following Milestone Inspections may take place, at the Owner's cost:

.1 Milestone Inspection A - Clean Site Preparation

.1 Inspection of preparations and set-up prior to contaminated work in the Asbestos Work Area.

.2 Milestone Inspection D - Visual Clearance

.1 Inspection of Asbestos Work Area after removal of all asbestos, but prior to application of lock-down agent.

.5 The Asbestos Abatement Consultant is empowered by the Owner to inspect for final cleanliness at completion. Additional labour or materials expended by the Asbestos Abatement Contractor to provide satisfactory performance to the level specified shall be at no additional cost.

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

.1 All materials and equipment brought to work site must be in good condition and free of asbestos, asbestos debris, and fibrous materials.

.2 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.

.3 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.

.4 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:

.1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a second clear 6 mil (0.15 mm) sealed polyethylene bag.

.2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.

.3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.

.5 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.

.6 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.

.7 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck.

.8 Rip-Proof Polyethylene Sheeting: Minimum requirements 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and 2 layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps. New materials only.

.9 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.

.10 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

.11 Wetting Agent: Non-sudsing surfactant added to water to reduce surface tension and increase wetting ability.

PART 3 EXECUTION

.1 Moving of equipment, tools, supplies, and stored materials that can be performed without disturbing ACM will be performed by others.

.2 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.

.3 Install one layer of 6 mil polyethylene sheeting on walls, floors, finishes, millwork, electrical equipment, equipment and furnishings remaining in the Asbestos Work Area.

.4 Install polyethylene drop sheets below areas of work.

.5 Provide amended water for wetting ACM, and adequate method of wetting (garden sprayers, airless sprayers, etc.).

3.2 Maintenance of Asbestos Work Area

.1 Inspect polyethylene sheeting and ensure it is effectively sealed and taped. Repair damage and remedy defects immediately.

.2 Maintain Asbestos Work Area in tidy condition.

.3 Remove any standing water on polyethylene/floor at the end of every 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 Tile and Mastic

.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 Scrape up adhesive remaining on floor with a hand scraper until only a thin smooth film remains.

.6 Use a hot air gun where deposits are heavy or difficult to scrape.

.7 Deposit scrapings into asbestos waste disposal bag.

.8 HEPA vacuum floor on completion of work in area.

3.5 Asbestos Removal – Caulking

.1 Wet all material to be disturbed.

.2 Use only non-powered hand-held tools to remove ACM.

.3 Scrape to remove material adhered to substrate.

.4 Place removed ACM directly into an asbestos waste container.

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

.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.

3.1 Asbestos Removal – Ceiling Tile Adhesive Materials

.1 Wet all material to be disturbed.

.2 Break material only if unavoidable, and wet material if broken during work.

.3 Use only non-powered hand-held tools to remove ACM.

.4 Scrape adhesive from the surface of drywall to remove material adhered to substrate

.5 Place removed ACM directly into an asbestos waste container

3.2 Waste and Material Handling

.1 All bins must be locked and covered when waste transfer is not being performed.

.2 Ensure redundant non-ACM, rubble, debris, etc. removed during contaminated work are treated, packaged, transported and disposed of as asbestos waste.

.3 Clean and wash equipment prior to removal from Asbestos Work Area if removed prior to completion.

.4 Place all equipment, tools and unused materials that cannot be cleaned in Asbestos Waste Containers.

.5 As work progresses, and at regular intervals, transport the sealed and labelled asbestos waste containers from the Asbestos Work Area to waste bin.

.6 Removal of waste containers and decontaminated tools and materials from the Asbestos Work Area shall be performed as follows:

.1 Remove any visible contamination from the surface of the non-porous or sealable item being removed from the Asbestos Work Area. If the item can be cleaned, remove it from the site. If it cannot be cleaned thoroughly, place it in an Asbestos Waste Container.

.2 Place waste or item in Asbestos Waste Container and seal closed.

.3 Wet wipe outside of Asbestos Waste Container.

.4 At entrance to Asbestos Work Area, place in second Asbestos Waste Container. Seal closed.

.5 Remove the item from the Asbestos Work Area.

.7 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.

PART 1 GENERAL

1.1 General and Related Work

.1 Read this section in conjunction with all other sections so as to comply with the General Conditions of the Contract.

.2 Related Work Specified Elsewhere:

Division 2,	Section 02 82 00	Contractor Instruction Documents.
Division 2,	Section 02 82 10	Asbestos Abatement - Type 1.

.3 The site conditions identify the location and condition of all known asbestos-containing materials (ACM) to be disturbed by the work of this section. The specification fulfils the requirements of the report required by Ontario Regulation 278/05.

.4 Unless otherwise shown or specified it is the intent that work performed as per this section will result in the removal and disposal or decontamination of all ACM and all materials which have been contaminated by ACM either during or prior to work of this section.

.5 Refer to drawings and specifications prepared by AECOM for Architectural, Structural, Electrical, and Mechanical drawings for asbestos work coordination and the extent of building materials to be removed under asbestos precautions.

.6 The Pinchin report "Hazardous Building Materials Assessment, Queen Elizabeth Public School, 830 Barnardo Avenue, Peterborough, Ontario" dated March 17, 2020, Pinchin File 268661.001 form part of this specification and the contract documents

.7 Refer to Pinchin Asbestos Work Area drawing by asbestos procedure as follows:

.1 AR-100 series for Type 1 asbestos work.

.2 AR-300 series for Type 3 asbestos work.

1.2 Site Conditions

.1 Refer to Section 02 82 00.

1.3 Outline of Work

.1 Refer to Section 02 82 00.

.1 Boundary of work area shown by drawing AR-300.

.2 Electrical services (lights, receptacles, heat detectors, etc.) will be made safe by others prior to work of this section.

.3 Construct 3 chamber worker decontamination facilities in Corridor 116H above access hatch into the tunnel near classroom 114.

.4 Construct 3 chamber waste transfer facilities in Corridor 116H above access hatch into the tunnel near classroom 121.

.5 Install the negative air units in the access hatch by classroom 121. Vent D.O.P tested negative air units to the building exterior or into the corridor.

.6 Remove and dispose of the following using Type 3 procedures inside the Asbestos Work Area:

.1 Parging cement insulation on fittings (40 EA).

.2 Parging cement insulation debris on the dirt floor in tunnel (40 SF).

.3 Aircell pipe insulation (300LF).

.4 Aircell debris on the dirt floor within the tunnel (250 SF).

.5 Remove all non-asbestos (100 LF) fiberglass pipe insulation and pipe insulation debris where present in the tunnel.

.6 Remove all loose visible parging cement, aircell pipe insulation debris mixed within the top ½" of dirt floor where present in the tunnel.

1.4 Schedule

.1 Refer to Section 02 82 00.

1.5 Definitions

.1 Refer to Section 02 82 00.

1.6 Submittals

.1 Refer to Section 02 82 00.

1.7 Regulations

.1 Refer to Section 02 82 00.

1.8 Supervision

.1 Refer to Section 02 82 00.

1.9 Quality Assurance

.1 Refer to Section 02 82 00.

1.10 Notification

.1 Refer to Section 02 82 00.

1.11 Personal Protection

.1 Protect all personnel at all times when possibility of disturbance of ACM exists.

.2 Provide the following respiratory protection to all personnel:

.1 Full Face Powered Air Purifying Respirators with P100 high efficiency (HEPA) cartridge filters when performing work in this section.

.2 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters for dismantling of Type 3 enclosures, using Type 2 Procedures.

.3 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 Asbestos 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. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.

.4 Provide protective clothing, to all personnel which:

.1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.

.2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.

.3 Is replaced or repaired if torn or ripped.

.4 Is disposed of as ACM.

.5 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

.6 Provide site specific instruction to workers before allowing entry to Asbestos Work Area. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.

.7 Provide soap, shampoo and towels for use by all personnel when leaving the Asbestos Work Area.

.8 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area and Decontamination Facilities.

1.12 Authorized Visitor Protection

.1 Provide clean protective clothing and equipment to Authorized Visitors.

.2 Ensure Authorized Visitors have received required training prior to granting entry into Asbestos Work Area.

1.13 Air Monitoring

.1 Air monitoring will be performed following the National Institute for Occupational Safety and Health method 7400, Asbestos and other fibres by PCM (Phase Contrast Microscopy).

.2 Co-operate with the Asbestos Abatement Consultant in collection of air samples, including providing workers to wear sampling pumps for up to full-shift periods. Asbestos Abatement Contractor to exercise care with Asbestos Abatement Consultant's equipment. The Owner reserves the right to back-charge the Asbestos Abatement Contractor for further collection of samples damaged by tampering or abuse. In addition, the Asbestos Abatement Contractor will be responsible for the cost of testing equipment repairs resulting from the actions of the Asbestos Abatement Contractor's forces.

.3 Results of air monitoring of 0.05 fibres per millilitre of air (fibre/mL) or greater, outside of Asbestos Work Area, will indicate asbestos contamination of these areas and result in the following actions:

.1 Suspend Work within the adjoining Asbestos Work Area until written authorization to resume Work has been received from the Asbestos Abatement Consultant.

.2 Isolate and clean area in the same manner applicable to the Asbestos 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 Install additional negative air units at locations specified in response to elevated fibre levels being detected in the Clean Change Room or Occupied Areas at the discretion of the Asbestos Abatement Consultant.

.4 Perform the following where results of air monitoring within the Asbestos Work Area show airborne fibre levels have exceeded the respirator protection factor:

.1 Immediately stop Work within the Asbestos Work Area.

.2 Instruct workers to exit the Asbestos Work Area via the Worker Decontamination Facility while observing specified personal decontamination procedures.

.3 Contractor's forces shall not re-enter the Asbestos Work Area until authorized by the Asbestos Abatement Consultant.

.4 Upon re-entry to the Asbestos Work Area, mist any fallen debris or exposed surfaces with amended water using an airless sprayer.

.5 If PCM monitoring shows repeated failure, change respiratory protection to suitable alternative and change unsatisfactory methods used.

.5 PCM samples will be collected from within the Asbestos Work Area, after the site has passed a visual inspection and an acceptable coat of post removal sealant has been applied. These airborne fibre levels *must not exceed* 0.01 fibre/mL, after forced air monitoring and PCM analysis (Air Monitoring Clearance Inspection). If these results show fibre levels in excess of 0.01 fibre/mL:

.1 Maintain Asbestos Work Area isolation.

.2 Re-clean entire Asbestos Work Area.

.3 Apply another acceptable coat of post removal sealant to exposed surfaces throughout the Work area.

.4 Repeat above measures until visually inspected and air monitoring results are at a level equal to that specified.

.5 Alternate to items 2-4 above, the Asbestos Abatement Contractor can pay for analysis of samples by Transmission Electron Microscopy (TEM). Laboratory performing TEM analysis is to be NVLAP accredited.

.6 Cost of additional inspection and sampling performed as a result of elevated fibre levels may be charged to the Asbestos Abatement Contractor at the Owner’s discretion.

1.14 Inspection

.1 From commencement of work until completion of clean-up operations, the Asbestos Abatement Consultant will be present periodically on site both inside and outside the Asbestos Work Area.

.2 The following Milestone Inspections will take place, at the Owner's cost:

.1 Milestone Inspection A - Clean Site Preparation

.1 Inspection of preparations and set-up prior to contaminated work in the Asbestos Work Area.

.2 Milestone Inspection C - Before Bulk Removal

.1 Inspection of Asbestos Work Area during ACM removal.

.3 Milestone Inspection D - Visual Clearance

.1 Inspection of Asbestos Work Area after removal of all asbestos, but prior to application of lock-down agent.

.4 Milestone Inspection E - Air Monitoring Clearance

.1 Inspection and air monitoring after the application of lock-down agent, but prior to removal of Polyethylene from within the Asbestos Work Area.

.3 Do not proceed with next phase of Work until written approval of each milestone is received from the Asbestos Abatement Consultant.

.4 In addition to the Milestone Inspections, inspection of the Asbestos Work Area may be performed to confirm the Asbestos Abatement Contractor's compliance with the requirements of the contract documents and governing authorities. Any deviations from these requirements that have not been approved in writing, may result in a stoppage of work, at no additional cost to the Owner.

.5 The Asbestos Abatement Consultant is empowered by the Owner to inspect for final cleanliness at completion. Additional labour or materials expended by the Asbestos Abatement Contractor to provide satisfactory performance to the level specified shall be at no additional cost.

.6 Inspection and air monitoring performed as a result of Asbestos Abatement Contractor's failure to perform satisfactorily regarding quality, safety, or schedule may be charged to the Asbestos Abatement Contractor at the Owner's discretion.

1.15 Differential Pressure Monitoring

.1 Install differential pressure monitor at a location chosen by the Asbestos Abatement Consultant.

.2 Replace damaged or non-functional equipment at the request of the Asbestos Abatement Consultant.

.3 Co-operate with the Asbestos Abatement Consultant in collection of pressure monitoring data.

.4 Maintain specified differential pressure at monitoring location. Negative air pressure is to be -0.02 inches of water, relative to the area outside the enclosed area.

.5 Record data at start and end of shift and maintain records on file.

.6 Stop contaminated work and take corrective action if pressure differential drops below the specified level. Notify Asbestos Abatement Consultant immediately.

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

.1 All materials and equipment brought to work site must be in good condition and free of asbestos, asbestos debris, and fibrous materials.

.2 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.

.3 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.

.4 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:

.1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a second clear 6 mil (0.15 mm) sealed polyethylene bag.

.2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.

.3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.

.5 Differential Pressure Monitor: a high precision instrument for measuring and controlling pressure differences in the low range, between the Asbestos Work Area and occupied area. Acceptable Product: Magnehelic gauge (Cat. No. 2000-00) manufactured by Dwyer Instruments Inc. or equivalent. Calibrate regularly to manufacturer's instructions.

.6 Discharge Ducting: Polyethylene Tubing. Reinforced with wire. Diameter equal to 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.

.8 HEPA Filtered Negative Pressure Machine: Portable air handling system which extracts air directly from the Asbestos 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: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining 0.3 micron spherical particles greater than 0.3 microns at 99.97% efficiency.

.10 Hose: Leak-proof, minimum busting strength of 200 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. New materials only.

.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 full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck.

.14 Rip-Proof Polyethylene Sheeting: Minimum requirements 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and 2 layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps. New materials only.

.15 Shower Hose: Water lines for supply of hot & cold water to shower facilities to be rated for use at 200 PSI (1380 kPa) or twice the working pressure whichever is greater. Supply lines to be continuous and free of fittings, joints or couplings.

.16 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.

.17 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

.18 Wetting Agent: Non-sudsing surfactant added to water to reduce surface tension and increase wetting ability.

2.2 Decontamination Facilities

.1 Workers' Decontamination Facility: A decontamination facility comprised of three linked rooms, Contaminated Change Room, a Shower Room, and a Clean Change Room in corridor 116H by classroom 114:

.1 Rooms, Occupied Areas and Asbestos Work Areas, shall be separated by curtained doorways at each door.

.2 Contaminated Change Room: Room between Shower Room and Asbestos Work Area:

.1 Located on contaminated side of Shower Room.

.2 Install asbestos waste container for asbestos contaminated protective clothing.

.3 Install storage facilities for any personal protective equipment to be reused in Asbestos Work Area including boots, hard hats, etc., but excluding respirators.

.4 Install hooks and shelves as required for personal protective equipment.

.5 Minimum size of generally 2 m x 2 m. Increase size accordingly to accommodate number of workers.

.3 Shower Room: Room between Clean Change Room and Contaminated Change Room:

.1 Install one walk through shower unit for every six workers.

.2 Install constant supply of hot and cold water, controllable at each shower. Water supply must be sufficient to provide water at a minimum temperature of 40 degrees Celsius (maximum 50 degrees) in a volume required for all workers to properly decontaminate:

.1 Install individual hot and cold shut-off valves on water supply located on clean side of Shower Room. Connect shower to these valves.

.2 Install individual controls inside the shower to regulate water flow and temperature.

.3 Install rigid piping or Shower Hose with watertight connections for supply and drains.

.4 Install a sealed drip pan under and around the showers, 150 mm deep.

.5 Install sump pumps, sufficient for volume of waste shower water from showers and drip pan. Direct waste shower water to sanitary drains.

.6 Install ground fault protected power switch on clean side of shower for sump pumps, or timed for shut off.

.7 Provide adequate quantity of soap, shampoo, clean towels.

Install an Asbestos Waste Container for disposal of used respirator filters, on the contaminated side of the Shower Room.

.4 Clean Change Room: A room between the Shower Room and Occupied Areas:

.1 Install hooks and shelves on clean side of shower in clean Change Room for storage of respirators.

.2 Install lockers or hangers for workers' street clothes and personal belongings.

.3 Install hose bib on domestic cold water pipe for connection on clean side of Asbestos Work Area.

.4 Install electric hot water heater/tank for showers in decontamination facility.

.5 Provide ground fault protected power supply to hot water tanks, sump pump, battery chargers.

.6 Install a fire extinguisher, mount to wall.

.7 Minimum size of generally 2 m x 2 m. Increase size accordingly to accommodate number of workers.

.5 Waste and Equipment Decontamination Facility: Waste and Equipment Decontamination Facility comprised of three linked rooms: a Container Cleaning Room, a Holding Room and a Transfer Room.

.1 Purpose of Waste and Equipment Decontamination Facility is to provide a means to decontaminate asbestos waste containers, scaffolding, vacuums, and other tools and equipment and materials required in the Abatement Work Area.

.2 Rooms, Occupied Areas and Abatement Work Areas, shall be separated by curtained doorways at each door.

.6 Container Cleaning Room: Room between Abatement Work Area and Holding Room of sufficient size to allow proper washing of equipment and waste containers or double bagging of asbestos waste. All wash water shall be treated as asbestos contaminated waste.

.7 Holding Room: Room between Container Cleaning Room and Transfer Room, of sufficient size to accommodate at least two asbestos waste containers and two workers double bagging waste, or for largest item of equipment used.

.1 Install a fire extinguisher mounted to wall.

.8 Transfer Room: Room between Holding Room and Occupied Area, acting as an air lock for the transfer of waste.

.9 Construction of Decontamination Facilities

.1 Install floor protection as follows:

.1 Install one layer of rip-proof polyethylene sheeting over two layers of 6 mil polyethylene sheeting beneath entire decontamination facility.

.2 Turn 600 mm of polyethylene up the sides of the decontamination facility and overlap with the polyethylene sheeting covering the walls.

.2 Install walls as follows:

.1 Around all rooms, between all rooms, at entrance to Asbestos Work Area and at entrance to Occupied Area.

.2 Install 38 x 89 mm wood framing at 610 mm o/c with continuous top and sill plates.

.3 Install one layer rip-proof polyethylene sheeting on walls of Decontamination Facility.

.3 Install roof as follows:

.1 Where roof is not exposed to the Asbestos Work Area, install one layer rip-proof polyethylene sheeting over joists.

.2 Turn 600 mm of polyethylene down the sides over polyethylene on the perimeter walls.

.3 Minimum interior clear height 2 m to underside of joist.

.10 Curtained Doorways

.1 Construct as follows:

.1 Install two flap doors, full width and height of door opening at all doors between chambers, facilities and Asbestos Work Area.

.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.

2.3 Signage

.1 Work Area Signs: Post signs in both official languages at access points to the Asbestos Work Area and on hoarding walls as follows:

.1 CAUTION.

.2 Asbestos Dust Hazard Area.

.3 Unauthorized Entry Prohibited.

.4 Wear Assigned Protective Equipment.

.5 Breathing Asbestos Dust May Cause Serious Bodily Harm.

.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.

PART 3 EXECUTION

3.1 Clean Site Preparation

.1 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 using Type 2 Procedures as required by O. Reg. 278/05.

.2 Maintain emergency and fire exits from Asbestos Work Area at each end of the tunnel at floor access hatches, 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 on top of the tunnel access hatches on the polyethylene walls adjacent to exterior exit doors to clearly mark exit route. Seal emergency exit doors so as not to impede use of door during emergency evacuation.

.3 Install Worker Decontamination facility:

.1 Worker Decontamination Facility to be constructed and located within the Corridor 116H outside Classroom 114 above the floor access opening.

.4 Install signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.

.5 Post Ministry of Labour Notice of Project.

.6 Seal openings in tunnel using tape, caulking, polyethylene, etc. Openings in floor are to be sealed independently.

.7 Seal openings in tunnel deck, using polyethylene, tape, caulking, etc. including diffusers, grills if present.

.8 Establish negative pressure in Asbestos Work Areas as follows:

.1 Install HEPA Filtered Negative Pressure Machines sufficient to maintain pressure differential of -0.02 inches of water between contaminated Asbestos Work Area and Occupied Areas installed within the floor access hatch inside Corridor 116H outside of classroom 121 .

.2 Arrange HEPA Filtered Negative Pressure Machines to maximize differential pressure in Asbestos Work Area.

.3 Install weighted flaps in perimeter Hoarding Walls as necessary to provide make-up air.

.4 Operate HEPA Filtered Negative Pressure Machines continuously from first disturbance of ACM until completion of dismantling.

.5 Replace prefilters frequently to maintain specified flow rate.

.6 Replace HEPA filters as required to maintain flow rate and integrity of unit.

.7 Discharge HEPA filtered negative pressure machines as follows:

.1 Into Occupied Areas. Direct so that it does not discharge at building occupants.

.8 DOP test all HEPA Filtered Negative Pressure Machines.

.9 Provide one Ground Fault Panel for each 5,000 square feet (500 square metres) of Asbestos Work Area:

.1 Ground Fault Interrupter Panel to use CSA approved equipment and be inspected by the Electrical Safety Authority.

.2 Ensure safe installation by licensed electricians.

.3 Connect to building power at electrical panel outside Asbestos Work Area.

.4 Cable to be completely jacketed with no defects. Tag/mark cable as Live.

.5 All electrical equipment used during work shall be supplied power from a Ground Fault Panel.

.10 Install temporary lighting in all work areas at levels that will provide for a safe and efficient use of the work area.

.11 Isolate, at panel, and disconnect existing power supply to Asbestos 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 Asbestos Work Area that are to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.

.12 Install hose bib on domestic cold water pipe for connection of hoses for wetting:

.1 Install hoses with watertight connections and airless sprayers to wet asbestos-containing materials.

.13 Notify Asbestos Abatement Consultant at least 24 hours prior to the need for Milestone Inspection A (Clean Site Preparation). Obtain written approval for this Milestone Inspection before proceeding.

3.2 Wet Removal

.1 Do not use compressed air to clean or remove dust or debris.

.2 Remove obstructions as required to remove the ACM:

.1 Notify asbestos abatement consultant if item is not specified to be removed and inhibits removal of ACM.

.3 Remove all visible parging cement, aircell pipe insulation debris including approximately the top 1/2” inch of dirt in wet state.

.4 All dislodged ACM shall be maintained in wet state until placed in asbestos waste containers for disposal.

.5 As work progresses, and at regular intervals, place waste in asbestos waste containers and remove from the Asbestos Work Area.

.6 After completion of gross asbestos removal work, perform the following:

.1 Wet clean surfaces from which ACM has been removed with stiff bristle brushes, vacuums, wet-sponges etc. to remove all visible residue and asbestos-containing materials.

.2 Wet clean surfaces which ACM has fallen on using stiff bristle brushes, vacuums, wet-sponges etc. to remove all visible residue and asbestos-containing materials.

.3 Wet clean other surfaces in the Asbestos Work Area, including the decontamination facilities, equipment, polyethylene sheeting on floor and walls surfaces etc., ducts and similar items not covered with polyethylene sheeting.

.4 Remove wash water as contaminated waste.

.5 Remove waste.

.6 Level of cleanliness must be acceptable to Asbestos Abatement Consultant.

.7 Remove and dispose of the pre-filters from all negative air units as asbestos-contaminated waste.

.7 Notify Asbestos Abatement Consultant at least 24 hours prior to the need for Milestone Inspection D (Visual Clearance). Obtain written approval for this Milestone Inspection before proceeding.

3.3 Waste and Material Handling

.1 All bins must be covered and locked when waste transfer is not being performed.

.2 Ensure redundant non-ACM, rubble, debris, etc. which was not cleaned and which was removed during contaminated work are treated, packaged, transported and disposed of as asbestos waste.

.3 Clean, wash and apply Post Removal Sealant to metal waste prior to removal from Asbestos Work Area:

.1 Recycle metals or dispose of metals as clean waste.

.4 Clean, wash and apply Post Removal Sealant to non-porous materials prior to disposal as clean waste:

.1 Obtain prior written approval from the Asbestos Abatement Consultant for each individual type of material.

.5 Clean and wash equipment prior to removal from Asbestos Work Area if removed prior to completion.

.6 Place all equipment, tools and unused materials that cannot be cleaned in Asbestos Waste Containers.

.7 As work progresses, and at regular intervals, transport the sealed and labelled asbestos waste containers from the Asbestos Work Area to waste bin.

.8 Place items in bins according to waste classification. Place asbestos waste, metals, non-asbestos waste, etc. in separate bins.

.9 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.

.10 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.

.11 Co-operate with 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.

3.4 Application Of Post Removal Sealant

.1 Wet Removal:

.1 Obtain Asbestos Abatement Consultant's written permission to proceed.

.2 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 Asbestos Work Area, including but not limited to polyethylene, ACM substrate, structural steel, and surfaces scheduled for demolition:

.1 Do not apply post removal sealant to materials that will be damaged by its application.

.3 Notify Asbestos Abatement Consultant at least 24 hours prior to the need for Milestone Inspection E (Air Monitoring Clearance). Obtain written approval of this Milestone Inspection before proceeding.

3.5 Air Clearance Monitoring

.1 Site must be dry prior to Air Clearance Monitoring.

.2 The number of Air Clearance Monitoring samples will be as follows:

.1 2 samples for less than 10 square metres.

.2 3 samples for 10 to 500 square metres.

.3 5 samples for more than 500 square metres.

.3 Prior to air clearance monitoring, install clean 20-inch fans for air circulation during Air Clearance Monitoring:

.1 At least one fan per 10,000 cubic feet of space in Asbestos Work Area.

.2 Install in centre of Asbestos Work Area and space evenly.

.3 The fan exhaust shall be directed upwards or toward the ceiling.

.4 The fans shall be operated on the lowest speed setting.

.4 Restrict access to Asbestos Work Area and operate negative air units for a 12 hour period prior to Milestone Inspection E.

.5 The HEPA filtered negative pressure machines shall be in operation during clearance air monitoring.

.6 In the presence of the Asbestos Abatement Consultant, immediately prior to air clearance monitoring, use a leaf blower to dislodge loose fibre:

.1 Direct leaf blower against walls and pipe surfaces.

.2 Perform this for at least five minutes per 1,000 sq. ft. of Asbestos Work Area.

.7 PCM samples will be collected as per Air Monitoring Section.

3.6 Asbestos Work Area Dismantling

.1 Use Type 2 worker precautions during dismantling.

.2 Operate negative air units during dismantling.

.3 Polyethylene, tape, cleaning material, etc. to be treated as asbestos waste.

.4 Wash remaining equipment and tools used in contaminated Asbestos Work Area to remove all asbestos contamination, or place in Asbestos Waste Containers prior to being removed from Asbestos Work Area.

.5 Clean Asbestos Work Area, Equipment and Access area, washing/Showering Room.

.6 Remove top layer of polyethylene on walls, finishes, and equipment.

.7 Remove remaining polyethylene sheeting.

.8 Remove water hoses and shut off at source.

.9 Remove Signs, Decontamination Facilities, Equipment Enclosures.

.10 Seal vacuum hoses and fittings, flexible ductwork and all tools used in contaminated work site in 6 mil polyethylene bags prior to removal from Work Area.

.11 Remove temporary lights.

.12 Remove negative air unit prefilters. Dispose of as asbestos contaminated waste.

.13 Remove HEPA filtered negative pressure machines and discharge ducting.

.14 Immediately upon shutting down negative air units, seal air inlet grill and exhaust vent with polyethylene and tape.

END OF SECTION

PINCHIN

LEGEND:

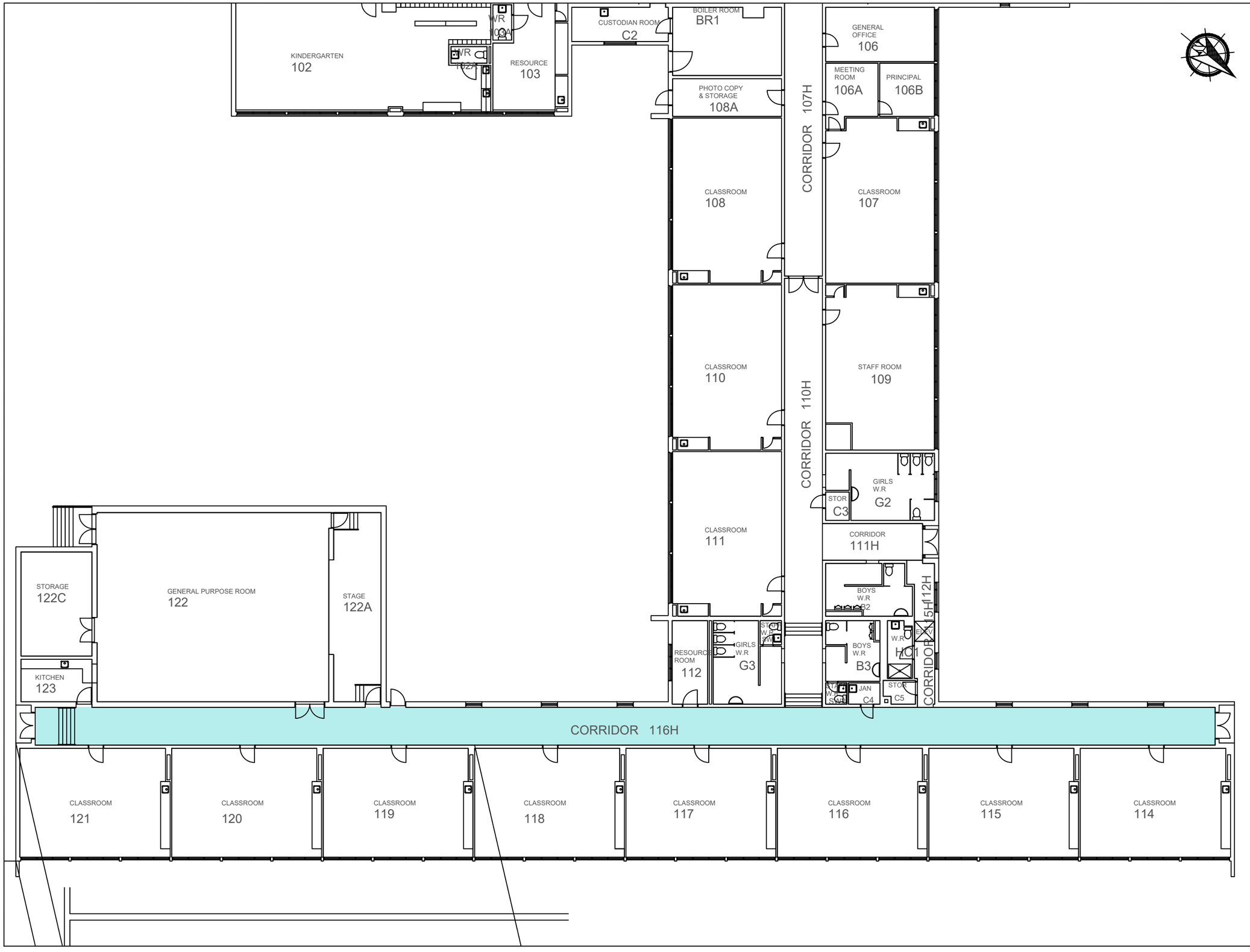
- TYPE 1 ASBESTOS WORK AREA
- TYPE 3 ASBESTOS WORK AREA IN TUNNEL

CLIENT:
KAWARTHA PINE RIDGE
DISTRICT SCHOOL BOARD

LOCATION:
QUEEN ELIZABETH PUBLIC SCHOOL
830 BARNARDO AVENUE,
PETERBOROUGH, ONTARIO

TITLE:
ASBESTOS WORK
AREA DRAWING
GROUND FLOOR

DATE:	PROJECT # :
2020/02/21	268661.001
DRAWN BY: AH	DRAWING: AR-100
CHECKED BY: BG	
SCALE: NTS	



PINCHIN

LEGEND:

- TYPE 1 ASBESTOS WORK AREA
- TYPE 3 ASBESTOS WORK AREA IN TUNNEL

CLIENT:
KAWARTHA PINE RIDGE
DISTRICT SCHOOL BOARD

LOCATION:
QUEEN ELIZABETH PUBLIC SCHOOL
830 BARNARDO AVENUE,
PETERBOROUGH, ONTARIO

TITLE:
ASBESTOS WORK
AREA DRAWING
GROUND FLOOR

DATE:	PROJECT # :
2020/02/21	268661.001
DRAWN BY: AH	DRAWING: AR-300
CHECKED BY: BG	
SCALE: NTS	

1 General

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED WORK

.1 Section 06 41 00: Architectural Wood Casework

1.3 QUALITY ASSURANCE

.1 Lumber shall bear the grading stamp of an agency certified by The Canadian Lumber Standards Administration Board.

.2 All lumber shall be sound, straight, dressed all sides and kiln dried, and moisture content at any time during shipment and storage shall not exceed 19%.

1.4 WORK SUPPLIED BUT NOT INSTALLED

.1 Supply to other Sections anchors, bolts, rough hardware and other items required to be built into work of other Sections to receive, accommodate, secure work of this Section.

.2 Provide other Sections with instructions to ensure accurate setting of built-in items.

1.5 PRODUCT HANDLING

.1 Store materials on site to prevent deterioration, loss or impairment of their structural and other essential properties. Prevent excessive moisture gain of materials.

2 Products

2.1 MATERIALS

.1 Framing Lumber:

.1 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 Treatable Species: No. 2 and better - S4S, Dry, 19%.

.2 Lumber:

.1 Except as indicated or stated otherwise, lumber to be softwood, S4S, moisture content 19% or less, in accordance with the following standards:

.1 CAN/CSA O141-05 (R2009) - “Softwood Lumber”.

.2 NLGA - “Standard Grading Rules for Canadian Lumber” (latest supplement).

.2 Blocking, Copings, Nailers, Curbs: NLGA 122c "Standard" S-P-F.

.3 Plywood:

.1 All locations except backboards: Douglas Fir to CSA 0121-M1978 Unsanded Exterior Sheathing Grade.

.2 Backboards: Douglas Fir to CSA 0121-M1978, Sanded grade, solid two sides, fire retardant pressure treated.

.3 19mm thick and/or thickness as indicated on drawings

.4 Plywood Roof Sheathing:

.1 Minimum 13mm thick, exterior grade Douglas fir plywood, veneer core, tongue and groove edges, Select Sheathing - Tight Face, unsanded with non-slip surface one side, 'B' faces and conforming to CSA 0121-08.

.5 Fasteners and Connecting Hardware:

.1 Nails: to CSA B111-1974, hot dip galvanized steel for exterior work including components located in exterior walls and roofs; bright finish steel in all other locations. Unless otherwise indicated use common spiral flathead nails.

.2 Bolts, nuts, washers: ASTM A307, hot dip galvanized steel.

.3 Connectors, anchors, brackets, spikes: hot dip galvanized structural quality steel.

.4 Screws: to CSA B35.4-1972 zinc, cadmium or chrome plated.

2.2 WOOD TREATMENT

.1 Surface cut, bore and trim components to sizes required as much as possible prior to pressure treatment.

.2 Pressure Preservative Treated Lumber:

.1 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 -08.

.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 Pressure Preservative Treated Plywood: Treated in accordance with CAN/CSA O80 Series -08 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.

.3 Fire Retardant Pressure Treated Components:

.1 Treat by pressure impregnation with fire-retardant chemicals in accordance with CAN/CSA O80 Series -08 to provide classification for flame spread of not more than 25, smoke developed of not more than 75 in accordance with CAN4 S102.

.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 CAN4 S102 for surface-burning characteristics and shall bear identification showing classification and type of fire retardant.

.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.

.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.

.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

3 Execution

3.1 GENERAL

.1 Erect work plumb, level, square and to required lines. Ensure that materials are rigidly and securely attached to each other and to adjacent building elements and will not be loosened by work of other Sections.

.2 Where other materials and components are to be applied directly over wood members recess heads of fastening devices below wood surfaces.

.3 Where work remains exposed to view, fasteners shall be uniformly and evenly spaced and neatly installed.

3.2 NAILERS, BLOCKING, COPINGS, GROUNDS, CURBS

.1 Provide wood nailers, blocking, copings, strapping, bucks, grounds and other rough carpentry components to sizes and in locations required for satisfactory support of fabricated items and other work. Provide wood blocking at steel stud framed gypsum board partitions for support of wall mounted components.

.2 Unless otherwise indicated, provide minimum 38 mm thick materials. Grounds may be 21 mm thick material unless otherwise indicated.

.3 Provide built-up wood curbs for rooftop mounted equipment. Unless otherwise detailed, provide 90 mm thick curbs extending minimum 300 mm from top of roof membrane to top of curb.

.4 Provide minimum 12 mm thick plywood back-up for fastening of curtain tracks and blinds at head of windows, where curtains or blinds are required.

3.3 ANCHORS AND FASTENERS

.1 Provide rough hardware including nails, screws, bolts, washers, brackets, hangers, and fastening devices of all types.

.2 Unless otherwise indicated, attach wood members at maximum 600 mm o.c. as follows:

.1 To concrete and solid masonry with expansion or friction type anchor bolts.

.2 To hollow masonry with toggle bolts.

.3 To heavy gauge metal with bolts.

.4 To light gauge metal with screws or bolts.

.5 To wood with nails, screws or bolts as required to ensure stability.

.3 Bucks and plates shall be anchored to masonry walls with 13 mm galvanized steel bolts or with approved type screw anchors.

.4 Fasten wood copings to supporting masonry elements with 13 mm galvanized steel bolts minimum 450 mm long spaced maximum 600 mm o.c. Where width of coping plate exceeds 100 mm, stagger bolts off centre.

3.4 PLYWOOD PANELS

.1 Provide plywood panels required for electrical/telephone mounting of equipment and in other locations as indicated on drawings.

3.5 ROOF SHEATHING

.1 Install roof sheathing with surface grain at right angles to the roof framing underneath with 3/32" gap between adjacent panels to allow for expansion.

.2 All roof sheathing panel edges that are not tongue and groove require supports of minimum 1-1/2" x 1-1/2" wood blocking securely fastened between roof framing members or use 'H' clips in conformance with O.B.C. article 9.23.15.1 and .2.

.3 Install roof sheathing to prefabricated wood trusses and framing using minimum 2" long annular or spiral type nails spaced 6" O.C. at edges and 12" O.C. along intermediate supports.

.4 Install roof sheathing to cold formed metal joist trusses and framing using minimum 6 x 1-5/8" long "bulge head" type drywall screws spaced 6" O.C. at edges and 12" O.C. along intermediate supports.

3.6 BACKBOARDS

.1 Size backboards to adequately accommodate equipment to be mounted. Secure boards with countersunk fasteners to supporting walls in manner which will carry equipment load without damaging wall.

3.7 PRESSURE PRESERVATIVE TREADED WOOD INSTALLATION

.1 Comply with AWPA M4.

.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 Remove with fine sandpaper, chemical deposits on treated wood to receive applied finish.

.4 Use only hot-dipped galvanized, corrosion resistant nail or screw fasteners. Staples are not acceptable for installation of preservative treated materials.

.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.

.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.

3.8 PRESSURE FIRE RETARDANT TREATED WOOD INSTALLATION

.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.

.2 Fire retardant treated plywood used in structural applications shall be graded or span-rated material.

.3 Use only hot-dipped galvanized, corrosion resistant nail or screw fasteners. Staples are not acceptable for installation of fire resistant treated materials.

.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.

.5 Back-prime at contact points and fasteners to prevent electrolysis when fire retardant framing members are used in metal buildings.

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED WORK

.1 Section 06 10 00: Rough Carpentry

1.3 DEFINITION

.1 "Exposed" when referred to in this Section shall mean all parts that can be viewed and shall include interiors of cupboards, cabinets and counters, backs of doors, shelving, gables, and drawers.

1.4 QUALITY ASSURANCE

.1 Reference Standards: unless otherwise specified, carry out finish carpentry work in accordance with requirements of "Quality Standards" (latest issue) of Architectural Woodwork Manufacturers' Association of Canada (AWMAC), Custom Grade.

1.5 SUBMITTALS

.1 Submit detailed shop drawings for cabinetwork showing proposed assembly, connections, anchorage, materials, dimensions, thickness and finishes.

.2 Shop drawings shall be originated and produced by fabricator and may not be copied or reproduced from Consultant's drawings. Each item shall be shown in plan, section and elevation, detailed in appropriate scale, clearly displaying all required information. Single line diagrams are not acceptable.

.3 Submit duplicate samples of each type of solid wood and plywood used in exposed work prior to fabrication of cabinetwork.

1.6 PRODUCT DELIVERY, HANDLING & STORAGE

.1 Protect cabinetwork against damage, including damage by excessive changes in moisture content. Maintain minimum storage temperature of 16ºC, and relative humidity 25% to 55%.

.2 Cover plastic laminate faces at shop with heavy kraft paper.

.3 Do not deliver finish carpentry components to site before all wet trades are completed, the building is closed in and humidity conditions on site are acceptable. Do not deliver during rain or damp weather.

.4 From time of fabrication until installation, store handle and transport materials so as to prevent deterioration or loss or impairment of essential properties. Prevent moisture gain of kiln dried materials.

1.7 PROTECTION

.1 Provide coverings as necessary to protect finish carpentry components from damage of any kind during storage and after installation.

1.8 WARRANTY

.1 At no cost to Owner remedy any defects in work of this Section due to defects in materials and workmanship, including but not necessarily limited to delamination, warping, and other defects detrimental to appearance and/or performance for a period of 2 years from date of Substantial Performance.

2 Products

2.1 MATERIALS

.1 Solid Wood:

.1 Unless otherwise indicated, provide AWMAC Premium Grade.

.2 All wood materials shall be new, straight and clean, free of sap, knots, pitch, and other defects, except as permitted by applicable grading rules.

.3 All wood shall be kiln dried to a maximum moisture content of 6% to 8%.

.4 Hardwood: White Birch Premium Grade.

.5 Softwood: to CAN/CSA-0141-05, dressed all sides used in concealed locations only except where shown otherwise. Concealed framing: No. 1 Grade White Pine.

.2 Plywood Panel Materials:

.1 Hardwood plywood: to CSA 0115-1982, Type II, veneer: AWMAC Architectural Grade Select White Birch; use veneer core, multi-core plywood or particle core.

.2 Softwood plywood: to CSA 0151-04 Sanded Grade, solid two sides. Use in concealed locations only; use veneer core or multi-core plywood only.

.3 Medium Density Fibreboard (MDF):

.1 Composed of wood fibres, medium density, FSC certified; of grade to suit application; sanded faces, formaldehyde free binder with 100% recycled and recovered fibre conforming to ANSI A208.2. Moisture resistant MDF panel to be used in all high moisture locations.

.2 Acceptable Product:

.1 Dry locations:

.1 Roseburg Forest Products ‘Medite II’

.2 Uniboard 'MDF Excel'

.3 Arauco 'Trupan'

.2 Wet locations:

.1 Roseburg Forest Products ‘Medex’

.2 Arauco 'Trupan Moisture Resistant'

.3 Uniboard 'NU Green MR-50'

.3 Plastic Laminated Components:

.1 Plastic laminate facing sheet: ANSI/NEMA LD3-2005 Grades HGS, VGS, HGP; colours, gloss and texture will be selected by Consultant from full range of products by Formica, Arborite, Nevamar, Wilsonart, Pionite.

.2 Plastic laminate backing and liner sheets: High pressure, paper based, melamine surfaced, laminated plastic backing sheets, conforming to CAN3-A172, backing grade (BK), minimum 0.5mm (0.020") thick, colour as selected later by Consultant and by manufacturer of plastic laminate face sheets.

.3 Cores: MDF or Douglas Fir veneer core plywood, Select Sheathing-Tight Face, good two sides, sanded "B" faces and conforms to CSA 0121-08, or Canadian Softwood Ply veneer core plywood, Select Sheathing-Tight Face, good two sides, sanded "B" faces and conforms to CSA 0151-09, 19mm (3/4") thick or thicknesses as indicated on drawings.

.1 Provide exterior, waterproof grade plywood veneer core for countertops to receive sinks and in "wet areas".

.2 Provide particle board veneer core for all millwork doors.

.4 Laminating adhesive: urea formaldehyde type meeting requirements of CAN3-0112 Series M1977.

.5 Core sealer: clear water resistant synthetic resin sealer.

.4 Fasteners & Adhesive:

.1 Nails and staples: CSA B111-1974, galvanized.

.2 Screws: zinc, cadmium or chrome plated steel.

.3 Adhesive: CAN3-0112 Series - M1977, waterproof type.

.5 Solid Core Doors: to CSA 0132.2-M1977, flush doors, 35 mm thick, face veneer and edge banding matching adjacent cabinetwork.

.6 Cabinet Hardware: products listed below are a standard of acceptance. Products by other manufacturers, of equal quality and similar appearance may also be provided subject to review and approval by Consultant.

.1 Hinges for 19 mm door Blum 91-650, 170^{o} with self-closing spring.

.2 Hinges for 35 mm thick doors: Hager 1279 76 x 76.

.3 Door and drawer pull: GSH 302 x 100 mm, CTC 7.5 mm o.d. brushed stainless steel.

.4 Drawer slides: KV 1429 full extension for 45 kg load.

.5 Drawer locks: Olympus 078 or National Cabinet Lock C8702 or Corbin CCL 02066, keyed as directed by Consultant.

.6 Cabinet locks: Olympus 078 or National Cabinet Lock C8702 or Corbin CCL 02067, keyed as directed by Consultant.

.7 Automatic door bolt for double doors: Hafele 245.58.754.

.8 Door locks for 35 mm doors: by Section 08 71 00.

.9 Pilaster and clips: KV 255, 256.

.10 Coat hooks: Royal Arch, model 209Z, bright zinc plated.

.11 Coat rod: As indicated on drawings.

.12 Hardware finish: Unless otherwise indicated chrome or nickel plated.

.7 Aluminum Grille Register Cover: Aluminum Sheet and Plate: In accordance with ASTM B209-10, Type 6063-T6 having clear anodized Architectural Class II Coating.

.1 Horizontal Grille Cover: 100mm wide x 1500mm long, heavy duty aluminum bar grille, complete with type “A” fastening; Finish: Brushed aluminum.

.1 Basis of Design Product: Price Industries, LBPH Series, Type 25c Core, complete with Type 750 Border.

.2 Vertical Grille Cover: Continuous mesh lattice grille, 100mm high, 14 gauge aluminum construction, complete with type “A” fastening and back paint finish.

.1 Basis of Design Product: Price Industries, LG75 Series.

.8 Reflective Insulation: As identified in Section 07 21 00 Thermal Insulation.

.1 Supplied and installed under the millwork contract, and installed within the kindergarten and classroom book shelf, as indicated on drawings.

2.2 FABRICATION

.1 General Requirements:

.1 Exposed surfaces:

.1 Provide wood members free from bruises, blemishes, mineral marks, knots, shakes and other defects, except as specifically permitted by grade rules.

.2 Select exposed surfaces in any one area for balanced overall appearance free of stark contrasts.

.3 Sand smooth all exposed surfaces to provide even and uniform finish free of defects detrimental to appearance.

.2 Exposed joints and edges:

.1 Uniformly space exposed joints unless otherwise indicated.

.2 No edge grain shall be visible; mitre external corners, house internal corners. Secure corners with corrugated metal fasteners. Glue mitred corners.

.3 All exposed edges of plywood and particle board shall have solid wood edging, pressure glued.

.3 Mechanical fasteners:

.1 Inconspicuously locate mechanical fasteners. Wherever possible conceal fastenings.

.2 Countersink nail heads.

.3 Where exposed to view, countersink screw and bolt heads and fill holes with matching wood plugs.

.4 Cutting and fitting: make cutouts in work of this Section as required to accommodate work of other Sections.

.2 Standing & Running Trim:

.1 Fabricate trim of hardwood.

.2 Length: standing trim shall be in one piece. Running trim shall be in longest practicable lengths.

.3 Thickness: unless otherwise indicated, minimum 6 mm.

.3 Plastic Laminate Components:

.1 Unless otherwise specified herein meet requirements of AWMAC “Quality Standards”.

.2 Assembly: bond plastic laminate to core with adhesive using pressure. Bond plastic laminate to both faces of core using same adhesive and same pressure.

.3 Balanced construction: plastic laminate covered components shall be of balanced construction, with plastic laminate on both faces of core. Seal core edges not covered with plastic laminate.

.4 Use largest practicable plastic laminate sheet size.

.5 Provide joints symmetrically; provide joints at corners and at changes in superficial areas; provide concealed draw bolt anchors at joints. All butt joints shall have a blind spline.

.6 Construct countertops with preformed front edge and square corner splashback. Chamfer edges uniformly at approximately 20°C; do not mitre.

.7 At L-shaped corners mitre plastic laminate to outside corner. Accurately fit members together to provide tight and flush butt joint.

.8 Apply self-edged minimum 1.1 mm thick plastic laminate to exposed ends of countertops.

.9 Construct splashbacks minimum 100 mm high or higher where indicated. Return splashback at ends except where indicated otherwise.

.10 Openings and cutouts:

.1 Radius internal corners at least 3 mm and chamfer edges.

.2 Where core edge is to remain exposed, cover with plastic laminate edging.

.3 Where core edge is to be concealed, seal with sealer.

.4 Cabinetwork:

.1 As far as practicable, assemble work in shop and deliver to site ready for installation. Leave ample allowance for fitting and scribing in place.

.2 Except where otherwise detailed use "flush overlaid" construction. Where shown or required use "exposed case" construction. Tenon, dado, dowel or rabbet interior construction with all parts well glued along full length/height. Use glue blocks where necessary. Shoulder mitre all exposed corners. Open ends or skeleton frames against walls are not permitted.

.3 Construct all cabinetwork, counters, cupboards, including tops, bottoms, backs and shelves from hardwood faced veneer core plywood or solid hardwood. Use same species of hardwood throughout, unless a specific species is called up, shown or specified for a particular unit or area. Select hardwood plywood for each cabinetwork unit so as to produce well blended uniform appearance. Avoid use of starkly contrasting veneer colours within any one unit. Replace components which in Consultant's opinion are not of satisfactory appearance.

.4 Design and fabricate work to accommodate expansion and contraction of components. All connectors and fasteners shall be concealed unless permitted by Consultant to be exposed. Fabricate work to produce tight joints. Locate prominent joints where directed. Prevent opening up of joints and glue lines in finished work.

.5 Unless otherwise indicated provide the following thicknesses:

.1 Doors: 19 mm

.2 Drawer fronts: 19 mm

.3 Gables: 19 mm

.4 Cabinet backs (floor supported): 12 mm

.5 Cabinet backs (wall hung): 19 mm

.6 Shelves: 19 mm

.7 Drawer bodies: 12 mm

.6 Rout gables for pilaster strips where adjustable shelving is required.

.7 Limit shelf span to 900 mm.

.8 Construct doors and drawer fronts of veneer faced, 19 mm particle board core.

.1 Where height of door exceeds 1200 mm provide 35 mm thick solid core doors, unless otherwise shown.

.9 Provide running members in maximum length obtainable. Provide thickness of members in maximum dressed size of standard lumber. Where width or thickness indicated is not available, use glue laminations to obtain sizes required.

.10 Install cabinet hardware in accordance with hardware manufacturer's directions. Unless otherwise indicated, provide each drawer and door with pull, each drawer with extension hardware and each door with minimum two hinges, (2 hinges for door height up to 900 mm, 3 hinges for door height up to 1350 mm and 4 hinges for door height up to 1800 mm); provide additional hinges where recommended by hinge manufacturer based on door size and weight.

.11 Unless otherwise indicated, factory finish all cabinetwork with a stain and polymerizing two component catalytic conversion varnish system; colour and sheen to be selected by Consultant. All surfaces shall be carefully prepared and sanded before and between coats to provide final finish which shall be smooth, even and uniform free of machine marks, hammer marks, depressions and imperfections.

.12 Apply moisture repellent sealer to concealed backs of cabinetwork.

3 Execution

3.1 INSTALLATION

.1 Install cabinetwork components plumb, true and level and securely fasten in place. Accurately scribe and closely fit components to irregularities of adjacent surfaces.

.2 Accurately fit joints in true plane, locate joints over bearing or supporting surfaces.

.3 Provide mechanical fastening devices such as nails, screws and bolts required for fastening wood components. Unless permitted provide concealed fastening of components.

.4 Where permitted, nail with small headed finishing nails. Countersink nail heads with nail setter.

.5 Install plastic laminate components using concealed fastening devices.

.6 Where components are fastened with screws or bolts, countersink screw and bolt heads and provide wood plugs matching surrounding wood.

.7 Where cabinetwork abuts other building elements provide wood trim matching cabinetwork except where otherwise detailed.

.8 Where access is required to valves and other mechanical and electrical components, located behind cabinetwork, provide removable plywood access panels of size required and secure with four brass screws.

.9 Install display case cork and liner in accordance with manufacturer's recommendations. Bond to substrates with adhesive free of bubbles and tears, with joints neat and tight and with exposed surfaces free of adhesive and stains.

.10 Check operation of all movable parts and, if necessary, adjust to ensure proper and smooth function.

.11 Upon completion of installation, inspect work of this Section and touch up, where required, minor or damaged surface finish to restore it to original condition. Replace damaged components which, in the opinion of the Consultant, cannot be satisfactorily repaired.

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED REQUIREMENTS

.1 Section 07 84 00: Firestopping

.2 Section 09 21 16 Gypsum Board Assemblies

1.3 QUALITY ASSURANCE

.1 Applicator of sprayed insulation shall be trained and approved by insulation manufacturer.

1.4 PRODUCT STORAGE AND HANDLING

.1 Deliver insulation to site in sealed wrappings bearing manufacturer's name, product name and RSI or KSI value.

.2 Store materials in a dry area protected from the elements.

1.5 PROTECTION

.1 Temporarily protect installed insulation from damage and action of the elements until it is permanently concealed or protected.

.2 Protect polystyrene insulation from sunlight.

2 Products

2.1 INSULATION

.1 Type 1: Extruded, expanded polystyrene with shiplapped edges: CAN/ULC-S701-05:

.1 Basis of Design Material: Styrofoam SM by Dow.

.2 Type 2: Extruded polystyrene: CAN/ULC-S701-05, RSI of 97.97 per 25mm (R 5.6 per inch):

.1 Basis of Design Material: Cavitymate Ultra by Dow.

.3 Type 3: Rigid fibrous insulation, glass fibre or mineral wool board: CAN/ULC-S702-97; density of 48 kg/m^3; minimum RSI of 0.73 per 25 mm thickness.

.1 Basis of Design Material: RXL 40 by Roxul Inc.

.4 Type 4: Reflective Insulation:

.1 Basis of Design Material: Double reflective insulation by Reflectix. (48” x 100ft roll).

.5 Type 5: Foamed-In-Place Insulation:

.1 Two component polyurethane froth/spray kit, UL Class I (flame spread of 25 or less), Great Stuff by Dow Building Solutions Inc., or approved equal.

2.2 ADHESIVES AND FASTENERS

.1 Adhesive for polystyrene insulation: Adhesive for securement of insulation to waterproofing / dampproofing membrane shall be compatible with such membranes.

.1 Basis of Design Material: 230-21 Insulation Adhesive by Henry Company

.2 Impaling clips: zinc coated Stic-Klip with perforated base and cadmium plated speed washer by Eckel Industries of Canada Ltd., or Insul-Anchors "Spindle" by Continental Studwelding Ltd.; adhesive and mechanical fasteners as recommended by clip manufacturer.

.3 Cavity insulation securement: As indicated in Section 04 20 00.

.4 Mechanical securement system:

.1 Metal securement members: 41 x 13 x 0.5 mm galvanized channels: Insulok by Reach Plastics; or 48 x 13 x 0.5 mm galvanized tee: Retainer Tee by Bailey.

.2 Concrete/masonry anchors: Tapcon anchors of length to provide minimum 25 mm embedment of anchor.

.3 Fasteners to metal framing: Self-drilling, self-tapping plated screws.

2.3 CAVITY COMPARTMENT SEALS, FIRESTOPS

.1 Sheet metal: minimum 0.9 mm thick sheet steel formed to profiles required, hot dip galvanized ASTM A653, zinc coating designation Z275.

3 Execution

3.1 PREPARATION

.1 Substrates to receive rigid board insulation, shall be sound, dry and free of dirt, oil, grease and other foreign substances.

.2 Clean substrates as required. Remove concrete surface ridges and deposits.

3.2 INSULATION INSTALLATION - GENERAL

.1 Provide under this Section all thermal insulation required except where it is specified to be part of other Sections.

.2 Provide continuous uniform thermal insulation over insulated areas.

.3 Where insulation is interrupted by construction elements, neatly fit insulation around such elements and pack spaces around elements with same insulation.

.4 Moderately butt insulation boards against each other so that there are no gaps.

.5 Stagger joints at multiple layer installations.

3.3 INSULATION TYPE 1

.1 Provide Type 1 rigid board perimeter insulation at inside or outside of foundation walls as indicated, to minimum 1220 mm below finished grade or lower where shown. Unless otherwise indicated provide 75 mm thick insulation bonded to substrate with spot adhesive application.

.2 Where indicated provide Type 1 rigid board insulation below slabs on grade. Place insulation board on prepared, level subgrade, with joints tightly butted. Unless noted, use 75 mm thick insulation.

.3 Where indicated provide Type 1 rigid board insulation below paving at building entrances/exits. Place insulation below paving base on suitably prepared level subgrade.

3.4 INSULATION TYPE 2

.1 At cavity walls and behind metal wall cladding place insulation against air barrier, tightly fitted at joints, at perimeter of insulated areas, around ties and at other penetrations; leave no gaps or voids.

.2 Butter all edges of insulation boards with adhesive.

.3 Press board against air barrier and mechanically secure at each cavity wall tie, with insulation securement. At metal cladding locations secure insulation with impale clips or screw / disk fasteners.

.4 Near wall corners, at perimeter of openings, and at other locations where cavity wall ties are not available in required location, use tapcon anchors and plastic washers for mechanical securement of insulation boards; ensure that fastener is within 150 mm of corner or jamb.

.5 Do not install insulation until air barrier and membrane flashings are complete and have been approved by Consultant.

.6 Provide vertical and horizontal cavity compartment seals at control joints and where shown where depth of cavity exceeds 25 mm install fire stops in accordance with OBC requirements.

3.5 TYPE 3 INSULATION

.1 Completely fill spaces with insulation, leaving no gaps or voids. Do not pack insulation tighter than manufactured density of materials.

3.6 TYPE 4 INSULATION

.1 Apply insulation with suitable equipment, in accordance with manufacturer's directions.

.2 Fill designated spaces completely, leaving no voids or gaps; trim excess material.

3.7 TYPE 5 INSULATION

.1 Apply foamed-in-place insulation at exterior walls, around penetrations through walls and where indicated. Apply foamed-in-place insulation with suitable equipment in accordance with the manufacturer's written instructions. Fill all joints completely, leaving no voids or gaps and trim excess material.

3.8 MECHANICAL SECUREMENT

.1 Space securement members at maximum 600 mm o.c. Provide additional members at openings, penetrations, corners, changes of directions and terminations to ensure firm securement and adequate support for gypsum board in all locations.

.2 Fasten members to supporting elements maximum 150 mm from end of furring members and at maximum 600 mm at walls and at maximum 400 mm o.c. at horizontal applications.

3.9 SCHEDULE

.1 Unless otherwise indicated provide the following:

.1 Type 1 insulation: building foundations, in contact with soil (perimeter insulation); below slabs on grade;

.2 Type 2 insulation: cavity walls; steel wall cladding.

.3 Type 3 insulation: where indicated;

.4 Type 4 insulation: at millwork that is next to wall fin heaters;

.5 Type 5 insulation: for voids between door frames and window frames.

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED REQUIREMENTS

.1 Section 07 92 00: Joint Sealants

1.3 DESCRIPTION

.1 Include in work of this Section all firestopping required except for firestopping and smoke seals within mechanical assemblies (i.e. inside ducts, dampers) and electrical assemblies (i.e. inside bus ducts). Firestopping and smoke seals around outside of such mechanical and electrical assemblies, where they penetrate fire rated separations, shall be part of work of this Section.

.2 Firestop and seal (draft-tight) gaps, control joints, expansion joints and penetrations in fire rated assemblies, including assemblies with a zero rating, against passage of fire, smoke, gasses, firefighter's hose stream and, where designated, passage of liquids. Smoke seal at angle support at fire dampers.

1.4 QUALITY ASSURANCE

.1 Work of this Section shall be carried out by a firm specialized in the type of work specified herein. Use competent installers, experienced, trained and approved by material or system manufacturer for application of materials and systems being used. Installers shall have minimum 5 years' experience in installation of firestopping materials.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to site in manufacturer's sealed and labelled containers.

.2 Store materials in protected location prior to use, in accordance with manufacturer's directions.

1.6 ENVIRONMENTAL CONDITIONS

.1 Conform to manufacturer's recommended temperatures, relative humidity and substrate moisture content for storage, mixing, application and curing of firestopping materials.

1.7 SUBMITTALS

.1 Prior to start of work submit list of proposed firestopping and smoke seal materials together with suitable documentation to verify that specified requirements will be met. Provide the following information as applicable to this Project:

- .1 ULC assembly number certification
- .2 required temperature rise and flame rating
- .3 hose stream rating (where applicable)
- .4 thickness
- .5 proposed installation methods
- .6 material of firestopping and smoke seals, primers, reinforcements, damming materials, reinforcements and anchorages/fastenings
- .7 size of opening
- .8 adjacent materials

.2 Upon Consultant's request submit samples of materials.

.3 Upon completion of work submit written certification that work of this Section has been carried out in accordance with specified requirements.

1.8 MOCK-UPS

.1 At locations directed by Consultant prepare mock-ups of each type of firestopping/smoke seal required.

.2 Provide linear firestopping/smoke seal mock-ups minimum 1 m long. Provide mock-up of each type or penetration firestopping.

.3 Mock-ups may be incorporated into finished work if approved by Consultant.

2 Products

2.1 SYSTEMS

.1 Firestopping and smoke seal systems shall be:

.1 tested in accordance with CAN/ULC-S115-05.

.2 listed by ULC or other fire testing agency approved by jurisdictional authorities.

.3 capable of providing fire resistance rating not less than that required by surrounding assembly.

.4 comply with F, T and H rating required.

.2 Firestopping and smoke seals for vertical fire separations shall meet ULC Designation PJ, JF and HW as required for respective location.

2.2 MATERIALS

.1 Firestopping and smoke seal materials:

.1 Provide materials which are:

.1 PCB and asbestos-free

.2 of easily identifiable colour, except where used in exposed location

.3 suitable for intended application

.4 compatible with adjacent materials.

.2 Provide elastomeric type materials at locations requiring future re-entry (such as cable) and at penetrations for ducts and other mechanical items requiring sound and vibration control.

.3 Sealant type materials shall be non-sagging for vertical surfaces and self-levelling for level floors.

.2 Primer: as recommended by firestopping material manufacturer for specific substrate and use.

.3 Damming and back-up materials, support and anchoring devices: non-combustible, in accordance with tested assembly and as recommended by manufacturer.

2.3 MIXING

.1 Mix materials at correct temperature and in accordance with manufacturer's directions.

3 Execution

3.1 PREPARATION

.1 Remove combustible material and loose material detrimental to bond from edges of penetration. Clean, prime or otherwise prepare substrate material to manufacturer's recommendation.

.2 Do not apply firestop material to surfaces previously painted or treated with sealer, curing compound, water repellent to other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.3 Verify openings, dimensions and surfaces conform to fire and smoke seal assembly.

.4 Protect adjacent surfaces from marring or damage.

.5 Prime surfaces in accordance with manufacturer's directions.

.6 Remove insulation from area of insulated pipe and duct where such pipes or ducts penetrate fire separation unless ULC certified assembly permits such insulation to remain within assembly.

.7 Provide temporary damming, forming, packing and bracing materials necessary to contain firestopping. Upon completion, remove forming and damming materials not required to remain as part of system.

.8 Examine sizes, anticipated movement and conditions of opening and penetration to establish correct system and depth of backup materials and of firestopping material required.

3.2 INSTALLATION

.1 Seal penetrations through and gaps in fire rated separations in accordance with ULC listing for tested system selected.

.2 Apply firestopping materials in accordance with manufacturer's instructions and tested designs. Apply with sufficient pressure to properly fill and seal openings to ensure continuity and integrity of fire separation. Tool or trowel exposed surfaces as required.

.3 Remove excess compound promptly as work progresses and upon completion.

.4 Unless otherwise indicated or permitted by Consultant recess firestopping and smoke seals in exposed locations to permit installation of decorative sealant by Section 07 92 00.

.5 Do not cover materials until full cure has taken place.

.6 Provide firestopping and smoke seal systems at following locations, without being limited to:

- .1 At all openings, voids and penetrations through all floor slabs except openings within shafts constructed with a fire resistance rating and slabs on granular fill.
- .2 At all openings, voids, control joints and penetrations through fire rated masonry, concrete and gypsum board walls, partitions and shaft walls.
- .3 At all openings, voids and penetrations installed for future use through fire rated masonry, concrete and gypsum board walls, partitions and shaft walls.
- .4 Around mechanical and electrical assemblies penetrating fire rated assemblies.
- .5 Between perimeter of all floor and roof slabs and exterior wall construction.
- .6 Between curtainwall and adjacent assemblies.
- .7 Between tops of all fire rated walls and partitions and underside of floor or roof slabs.
- .8 At building expansion joints.

.7 Curing: cure materials in accordance with manufacturer's directions.

3.3 FIELD QUALITY CONTROL

.1 Upon Consultant's request, manufacturer's representative shall inspect work of this Section and confirm in writing that it complies with specified requirements.

.2 Request Consultant's review of installed systems before they are covered by other work.

END OF SECTION

1 General

1.1 SUMMARY

.1 Read other Sections of the Specification for extent of sealant specified in those Sections. Do all other sealing indicated, specified or required.

.2 Provide all items, articles, materials, operations or methods listed, mentioned or scheduled on drawings and/or herein, including all labour, materials, equipment and incidentals necessary and required for the completion of the sealant.

1.2 RELATED REQUIREMENTS

.1 Section 06 41 00: Architectural Wood Casework

.2 Section 08 81 00: Glass and Glazing

.3 Section 09 21 16: Gypsum Board Assemblies

1.3 DEFINITION

.1 Caulking = Sealant.

1.4 SUBMITTALS

.1 Submit submittals in accordance with the General Conditions and Section 01 33 00.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Manufacturer's Data: Submit manufacturer's literature describing each material to be used in the work of this Section. Literature shall contain a statement that the material complies with the specified standard.

.2 Samples: Submit for approval and colour selection sample of each type of compound, recommended primers and joint filler or fillers proposed to be used.

.3 Safety Data Sheets: Submit WHMIS safety data sheets for inclusion with project record documents. Keep one copy of WHMIS safety data sheets on Site for reference by workers.

1.5 QUALITY ASSURANCE

.1 Sealants must be installed by qualified caulking contractor with minimum five (5) years' experience and proven record of being able to produce good quality work.

.2 Upon Consultant's request arrange for sealant manufacturer's technical representative to visit the site, investigate conditions and make recommendations in connection with work of this Section.

1.6 PRODUCT HANDLING

.1 Deliver sealants to site in sealed containers bearing manufacturer's name, brand name of sealant and reference standard to which sealant complies.

.2 Store materials in a dry area having an ambient temperature within limitations recommended by material manufacturer.

1.7 JOB CONDITIONS

.1 Unless otherwise specified, apply sealants when air temperature is between 10°C and 25°C. When air temperature is above 25°C or below 10°C follow sealant manufacturer's recommendations regarding application.

1.8 WARRANTY

.1 At no cost to Owner remedy any defects in work, including work of this and other Sections, due to faults in materials and workmanship provided under this Section appearing within a period of 2 years from date of Substantial Performance.

2 Products

2.1 MATERIALS

.1 Joint Cleaner: Non-corrosive solvents as recommended by sealant manufacturer for applicable substrate material(s).

.2 Primer: Non-staining type as recommended by sealant manufacturer, for use on substrate conditions outlined, and compatible with specified sealant being applied.

.3 Joint Back-Up – Backer Rod: Round, open cell, reticulated foam, 50% compression, compatible with sealant and primer, non-adhering to sealant.

.4 Bond Breaker: Pressure sensitive plastic tape, not bondable to sealant as recommended by sealant manufacturer.

.5 Sealants:

.1 Sealant Type "A" – Joints around Interior Door Frames, Windows and Under Exterior Thresholds:

.1 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

OR

.2 One component, low modulus, moisture curing, polyurethane joint sealant, conforming to ASTM C920-11, Type S, Grade NS, Class 25.

.1 Dymonic FC by Tremco Ltd., division of RPM Company.

.2 Sikaflex 1A by Sika Canada Inc.

.3 Sonolastic NP1 by BASF.

.2 Sealant Type "B" – Expansion / Control Joints:

.1 One-part, ultra low modulus, non-staining neutral curing 100% silicone joint sealant, conforming to ASTM C920-11, Type S, Grade NS, Class 50.

.1 DC 790 by Dow Corning.

.2 Spectrem 1 by Tremco

.3 SCS2700 SilPruf LM by GE

.4 SikaSil WS-290 by Sika

.3 Sealant Type "C" – Floor Control Joints:

.1 Multi-component, chemical curing, self-levelling, polyurethane joint sealant, conforming to ASTM C920-11, Type M, Grade P, Class 25.

.1 THC-900 by Tremco (Canada) Ltd., division of RPM Company.

.2 Sonolastic SL2 by Sonneborn Building Products, division of BASF Building Systems.

.3 Sikaflex 2c SL by Sika Canada Inc.

.4 Sealant Type "E" – Mould and Mildew Resistant:

.1 Mould and mildew resistant, Shore A Hardness 15-25, conforming to ASTM C920-11, Type S, Grade NS, Class25, use NT, G, and A:

.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

.5 Sealant Type "F" – Glazing Joints:

.1 Silicone Sealant: Butt glazing, one part, moisture curing, shore A hardness 15-25, conforming to CAN/CGSB-19.13-M, Classification C-1-40-B-N and C-1-25-B-N and ASTM C920-11, Type S, Grade NS, Class 25, use NT, G, A, O; Colour: clear (translucent):

.1 DC 795 by Dow Corning

.2 SCS2000 by GE

.3 Multiseal by Chemtron

.4 Spectrum 2 by Tremco

.5 SikaSil WS-295 by Sika

.6 Sealant Type "G" – Exterior Wall Joints:

.1 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

.7 Sealant Type "H" – Saw Cut Sealant:

.1 Multi-component, self-levelling, conforming to ASTM D2240-05(2010):

.1 Tremco Control Joint Sealant

.2 BASF Masterfill 300

.3 Sika Loadflex

.8 Sealant Type "I" – Asphalt Termination Sealant at Wall Joints:

.1 Polymer modified sealing compound having the following characteristics:

.1 Colour: Black.

.2 Solids by volume: 70%.

.3 Vapour permeance: 2.9 ng/Pa.m².s, ASTM E96.

.4 Complies with CGSB 37.29.

.5 Remains flexible with ageing.

.6 Adheres to wet surfaces.

.7 Chemical resistance: Alkalis, calcium chloride, mild acid and salt solutions.

.8 Basis of Design Materials: POLYBITUME 570-05 Polymer Modified Sealing Compound by Henry Company.

.9 Preformed Compression Seal: Compartmental open cell neoprene extrusion type conforming to ASTM C509, complete with liquid lubricant adhesive recommended by manufacturer.

3 Execution

3.1 EXAMINATION

.1 Examine joints to be caulked and report in writing to the Consultant any defects in work of other Sections which would impair installation, performance and warranty of sealants.

.2 Do not commence installation of sealants until conditions are acceptable.

.3 Start of work implies acceptance of conditions.

3.2 PREPARATION

.1 Clean and prepare joints to be caulked to produce clean sound surfaces for sealant adhesion.

.2 Remove dust, oil, grease, water, frost, loose mortar and other foreign matter. Remove loose particles by blowing joint out with compressed air.

.3 Chemically clean non-porous surfaces such as metal and glass, taking care to wipe solvents dry with a clean cloth. Use solvents recommended by sealant manufacturer.

.4 Clean porous surfaces such as masonry, concrete and stone by mechanical abrading.

.5 Surfaces adjacent to joints to be primed and which may be stained by primer shall be masked with tape before primer is applied.

.6 Prime joints in accordance with sealant manufacturer's recommendations. Apply primer before installing premoulded backup.

.7 Install premoulded backup in joints 6 mm and more in width. Roll rope type backup into joint, do not stretch or braid. Install bond breaker in joints less than 6 mm in width.

.8 Protect adjacent surfaces from stains and contamination. Make good any damage caused.

3.3 APPLICATION

.1 Apply sealants under pressure using suitable equipment. Gun nozzle shall be of proper size to fit, and seal joint.

.2 Force sealant into joints in full bead, making certain that void free contact is made with sides of joint. Tool joints to produce a slightly concave surface.

.3 Caulking must appear as a concave recessed joint, free of ridges, wrinkles and embedded foreign matter. Caulking shall not spread or bulge beyond surfaces on each of joint.

.4 Apply sealants in accordance with following table:

Joint Width	Sealant Depth
5 mm	5 mm
10 mm	5 mm
15 mm	7 mm
20 mm	10 mm
25 mm	12 mm

.5 Vent exterior joints in accordance with Consultant’s directions.

3.4 CLEANING

.1 As work progresses, remove sealant smears and stains from adjacent surfaces. Use cleaning method recommended by sealant manufacturer.

.2 Leave adjacent surfaces in neat and clean condition.

3.5 SCHEDULE

.1 Apply sealant at the following exterior locations:

- .1 Between dissimilar materials in exposed locations except where specifically indicated otherwise.
- .2 Control joints in masonry elements.
- .3 Between precast concrete elements and between precast elements and adjacent work.
- .4 Below door thresholds (double bead).
- .5 Perimeter of door, screen and louvre frames.
- .6 Penetrations through exterior building elements.
- .7 Asphalt terminations against building elements.
- .8 Where indicated.

.2 Apply sealant at the following interior locations:

- .1 Between dissimilar materials in exposed locations except where specifically indicated otherwise.
- .2 Perimeter of exterior door, louvre and screen frames.
- .3 Perimeter of interior door frame, where gap between frame and wall exceeds 2 mm, or where width of gap is inconsistent.
- .4 Control joints in masonry elements, and joints between bearing and non-bearing masonry walls.
- .5 Ceramic tile control joints.
- .6 Perimeter of firehose cabinets, access panels, and control panels.
- .7 Between vanities/countertops and wall.
- .8 Where shown.

.3 At interior locations use acrylic emulsion sealant except:

- .1 At floor control joints use polyurethane.
- .2 At vanities/countertops and at ceramic wall tile control joints use silicone sealant.
- .3 Where expected joint movement exceeds movement capability of sealant, provide sealant specified for exterior use as directed by Consultant.

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 General Conditions, Supplementary Conditions and Division 01 apply to this section.

1.2 SUMMARY

.1 This Section includes requirements for supply and installation of the following:

.1 Exterior and Interior Steel Doors

.2 Exterior and Interior Steel Door Frames

.3 Sidelight Frames

.4 Fire rated door and frame assemblies

.5 Fire rated window frames

1.3 RELATED REQUIREMENTS

.1 Section 07 92 00: Joint Sealants

.2 Section 08 71 00: Door Hardware

.3 Section 08 81 00: Glass and Glazing

.4 Section 09 91 00: Painting

1.4 DEFINITIONS

.1 Base Metal Thickness: Thickness dimensions are minimums as defined in referenced ASTM standards for both uncoated steel sheet and the uncoated base metal of metallic coated steel sheets.

.2 Opening Sizes: Standard metric door sizes indicated on Drawings are considered nominal dimensions, measured from frame rabbet width and height, with allowances for nominal clearances between head, jamb and door bottom in accordance with CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames.

1.5 REFERENCES

.1 American National Standards Institute (ANSI):

.1 ANSI/SDI A250.8-2014, Specifications for Standard Steel Doors and Frames (SDI-100)

.2 ANSI/SDI A250.11-2012, Recommended Erection Instructions for Steel Frames.

.2 American Society for Testing and Materials (ASTM):

.1 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.2 ASTM A879/A879M-12, Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface

.3 ASTM A924/A924M-14a, Standard Specification for General Requirements for Sheet Steel, Metallic-Coated by the Hot-Dip Process.

.3 Canadian General Standards Board (CGSB):

.1 CAN/CGSB 1.132-M90, Primer, Zinc Chromate, Low Moisture Sensitivity

.2 CAN/CGSB 41-GP-19Ma-78(1984), Rigid Vinyl Extrusions for Windows and Doors

.3 CAN/CGSB 82.5-M88, Insulated Steel Doors

.4 Canadian Standards Association (CSA):

.1 CSA W59-13, Welded Steel Construction (Metal Arc Welding)

.5 Canadian Steel Door Manufacturers Association (CSDMA):

.1 Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2007

.2 Fire Labelling Guide, 2009

.6 National Fire Protection Association (NFPA):

.1 NFPA 80-2016, Standard for Fire Doors and Other Opening Protectives

.2 NFPA 252-2012, Standard Methods of Fire Tests of Door Assemblies

.7 Underwriters Laboratories Canada (ULC):

.1 CAN/ULC-S104-10, Standard Method for Fire Tests of Door Assemblies

.2 CAN/ULC S105-09, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC S104

.3 CAN4 S106-1980 (R1985), Standard Method for Fire Tests of Window and Glass Block Assemblies

1.6 SUBMITTALS

.1 Provide requested information in accordance with Section 01 33 00 – Submittal Procedures.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Product Data:

.1 Submit product data for each type of door and frame indicated; include door designation, type, level and model, material description, core description, construction details, label compliance, fire resistance ratings, and finishes.

.2 Shop Drawings:

.1 Show each type of frame, door, hardware blanking, reinforcing, tapping and drilling arrangements, metal gauges, thicknesses and finishes.

.2 Show details of doors including vertical and horizontal edge details.

.3 Submit door and frame schedule identifying each unit. Each unit shall bear a legible identifying mark corresponding to that listed in the door and frame schedule.

.3 Samples:

.1 Supply for Consultant's review, if requested, sample of frame corner showing construction, workmanship and finish.

.4 Informational Submittals: Provide the following submittals when requested by the Consultant:

.1 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.

.5 Certificates: Submit the following certificates or letters of compliance:

.1 Oversize Compliance: Submit oversize construction evidence indicating compliance with fire labelling for door and frame assemblies required to be fire protection rated and exceeding size limitations of labelled assemblies.

1.7 QUALITY ASSURANCE

.1 Manufacturer: Obtain hollow metal doors and frames from single source of supply and from a single manufacturer, and as follows:

.1 Fabricate work of this Section to meet the requirements of the Canadian Steel Door and Frame Manufacturer's Association, Manufacturing Specification for Doors and Frames as a minimum, and as further modified in this section.

.2 Fabricator shall be a member in good standing of the Canadian Steel Door and Frame Manufacturer's Association.

.2 Supplier: Obtain hollow metal doors and frames from single source of supply and from a single manufacturer.

.3 Installer: Use installers who are experienced with the installation of hollow metal doors and frames of similar complexity and extent to that required for the Project.

.4 Testing Agencies: Provide doors produced under label service program of a testing agency acceptable to Authorities Having Jurisdiction, and as follows:

.1 Steel Fire Rated Doors and Frames: Labelled and listed by an organization accredited by Standards Council of Canada for ratings specified or indicated.

.2 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled:

.1 List by nationally recognized agency having factory inspection service and construct as detailed in Follow-up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

.2 Fabricate all rated doors, frames and screens to labelling authority standard.

1.8 DELIVERY, STORAGE AND HANDLING

.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.

.2 Adequately protect units against rust and damage during manufacture, delivery and storage.

.3 Store materials on planks in a dry area and cover to protect from damage. Make good immediately any damage done. Clean scratches and touch-up with rust-inhibitive primer.

1.9 SITE CONDITIONS

.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.

.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.

2 Products

2.1 MATERIALS

.1 Sheet Steel:

.1 Exterior Doors and Frames: Galvanized, AS120, steel sheets in accordance with ASTM A924/M924-14; coated to meet requirements of ASTM A653/A653M, Commercial Steel (CS), Type B; stretcher levelled standard of flatness where used for face sheets.

.2 Interior Doors and Frames (Normal Humidity): Electrolytic zinc coated steel sheets in accordance with ASTM A879/A879M-12, Commercial Steel (CS), Class B coating; mill phosphatized; suitable for unexposed applications; stretcher levelled standard of flatness.

.2 Gauges:

.1 Door and Screen Frames:

.1 Gauge: 16 msg

.2 Doors (Honeycomb or Polystyrene Core):

.1 Door Faces:

.1 Gauge: 18 msg.

.3 Top and Bottom End Channels:

.1 Gauge: 18 msg.

.4 Reinforcements:

.1 Lock and Strike Reinforcements:

.1 Gauge: 16 msg.

.2 Hinge Reinforcements:

.1 Gauge: 10 msg.

.3 Flush Bolt Reinforcements:

.1 Gauge: 16 msg.

.4 Door Closer or Holder Reinforcements:

.1 Gauge: 12 msg.

.3 Anchors:

.1 As required to suit condition.

.4 Rubber Bumpers:

.1 3 per door.

.5 Weatherstriping - Exterior Doors:

.1 Extruded aluminum with vinyl insert for head and jambs and for pairs of doors without mullions, manufactured by KN Crowder Limited, or approved alternate.

.6 Door Cores:

.1 Interior doors, except fire rated doors: Structural small cell; 1" maximum, Kraft paper honeycomb; minimum weight 36 kg/ream; minimum density 16.5 kg/m^3; sanded to required thickness.

.2 Exterior doors: Rigid extruded, closed cell insulation, fire retardant treated meeting the requirements of ULC S701-11, Type 4, minimum thermal resistance R-Value 4.5/1" thickness.

.7 Adhesives:

.1 Core Adhesive: Heat resistant, single component adhesive recommended by manufacturer.

.8 Touch-Up Primer: Rust inhibitive primer meeting CAN/CGSB 1.132, touch up zinc coatings using shop applied primer; grey or red coloured primer, clear primer not acceptable; provide additional primer for site touch-up to repair damaged zinc and shop applied coatings.

.9 Accessories:

.1 Glazing Stops:

.1 Glass mouldings: Formed steel having 1/32" metal core thickness, screw fixed.

.2 Accurately fit and butt at corners glazing trim and stops; located on secure side of door, or interior of room window frame.

.2 Sealant: As specified in Section 07 92 00.

.3 Glass and Glazing: As specified in Section 08 81 00.

.4 Door Silencers (Bumpers or Mutes): Manufacturer's standard black or grey neoprene silencers; three silencers on strike jambs of single door frames; two silencers on heads of double-door frames; stick on bumpers are not acceptable.

.10 Materials for fire rated doors shall conform to ULC or ULI requirements.

2.2 FABRICATION AND MANUFACTURE

.1 Gauges of metal shall be as specified. No deviations or substitutions will be accepted

.2 Reinforcing specified is the minimum acceptable. Provide additional reinforcement where required to ensure a permanent, rigid, trouble free installation able to withstand the stresses of heavy commercial usage.

.3 Cut, shear, straighten and work the steel in manner to prevent disfigurement of the finished work.

.4 Punch frames for rubber door bumpers.

.5 Fill seams, joints and weld depressions with epoxy metal filler, disc sand to a smooth, flat, uniform scratch-free surface, with all arrises sharp and true to line. Drilled and punches holes shall be reamed and have all burrs removed.

.6 Finished work shall be free of warp, open seams, buckles, weld and grind marks and other surface defects detrimental to the production of a good paint finish.

.7 Fastenings shall be concealed except those required for loose glazing stops.

.8 Welding shall conform to CSA W59-03 (R2008).

.9 Hardware Requirements:

.1 Blank, mortise, reinforce, drill and tap doors and frames to receive templated hinges and other hardware as required. Check hardware lists for requirements.

.10 Frames:

.1 Fabricate frames to profiles shown. Frames shall be fabricated to suite the header conditions of masonry work. Mitre corners of frames. Cut frame mitres accurately and weld continuously on inside of frame. Fabricate header frame to suit. Where site welding or splicing is required due to size of unit, the location of field joints shall be shown on the shop drawings and strictly adhered to.

.2 Protect strike and hinge reinforcements and other openings with mortar guard boxes welded to frame.

.3 Cutouts in doors for mortise lock sets shall be fitted with leaf spring clips and back limit stop to facilitate easy positioning and setting of locksets.

.4 Weld floor clip angles to inside of each jamb profile, two holes in each for anchorage to floor. Where required provide adjustable type floor clip angles.

.5 Fit frames with channel or angle spreaders, two per frame, to ensure proper frame alignment. Install stiffener plates or spreaders between frame trim where required, to prevent bending of trim and to maintain alignment when setting and during construction.

.6 Where frames occur in masonry provide and adjustable T-strap type or wire type anchor for every 2'-0" of jamb length. Special anchors for frames to be set in concrete shall be as detailed.

.7 Construct door frames of labelled fire doors as approved by ULC or ULI. Ratings for frames shall match doors. Locate label on the frame jamb midway between the top hinge and the head of door frame so that it is concealed when the door is closed.

.8 Provide continuous weatherstripping at head and jambs of exterior door frames. Properly secure in place with screws and adjust as required.

.9 Insulate exterior frames to provide continuous thermal barrier in exterior frames.

.11 Doors:

.1 Fabricate doors to present one continuous face free from joints, tool markings and abrasions.

.2 Reinforce, stiffen honeycomb doors with small cell honeycomb core laminated to the inside faces of panels. The core shall completely fill the inside hollow of the door.

.3 Reinforce around frame openings required for glazing or louvres. Provide glazing stops with countersunk oval head screws.

.4 Exterior doors shall be completely filled with polystyrene foam core.

.5 Reinforce door edges with channel reinforcing. Bevel stiles 1/8". Assemble by tack welding and fill.

.6 Provide flush top edge on exterior doors.

.7 Fabricate fire rated door assemblies in accordance with ULC or ULI requirements. Provide labels for all fire rated doors. Locate label on the door midway between the top hinge and the head of the door so that it is concealed when the door is closed.

.8 Provide cutouts in doors for glazed lites as indicated on drawings and schedules. Glazing stops shall be square formed steel in single piece lengths sized to suit. Accurately mitre corners and finish in proper plane. Secure stops in place with flush, countersunk screws.

.12 Finishing

.1 Shop apply zinc rich primer to repair damaged zinc coatings arising from fabrication; cure primer fully before shipping to site; include compatible primer for site finishing and correction of surface abrasions to zinc coatings and factory applied primer.

.2 Remove weld slag and splatter from exposed surfaces.

.3 Fill and sand smooth tool marks, abrasions and surface blemishes to present smooth uniform surfaces.

3 Execution

3.1 EXAMINATION

.1 Examine substrates, door swing arcs, areas of installation and conditions affecting installation for compliance with requirements for manufacturer’s installation tolerances and other conditions affecting performance of work of this Section.

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

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

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

3.2 INSTALLATION

.1 Install steel doors, frames, and accessories in accordance with reviewed shop drawings, ANSI A250.11, CSDMA Installation Guide, manufacturer's data, and as specified in this Section.

.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 Install glazing materials and studded door silencers.

.5 For frames over 1220mm (4’) in width, provide vertical support at the centre of head.

.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 jam 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.

.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.

.5 Install fire rated doors within clearances specified in NFPA 80-2010.

.6 Install louvers and vents.

.5 Adjusting and Cleaning

.1 Immediately after installation, sand smooth any rusted or damaged areas of prime coat and apply touch up of air-drying primer compatible with factory applied primer, and as follows:

.1 Clean exposed surfaces with soap and water to remove foreign matter before site touch-up.

.2 Finish exposed site welds to a smooth uniform surface and touch-up with site applied rust inhibitive primer.

.3 Site apply touch-up primer on exposed surfaces where zinc coating or factory applied primer has been damaged during installation or handling.

END OF SECTION

1 General

1.1 GENERAL

.1 All conditions of the contract apply to the work of this Section.

1.2 SUMMARY

.1 This Section of the contract includes all wood doors and accessories indicated on the Drawings, as required to provide a complete installation.

.2 The work includes but is not limited to the following:

.1 Interior wood doors

.2 Interior fire-rated wood doors

1.3 RELATED REQUIREMENTS

.1 Section 08 11 00: Metal Doors and Frames

.2 Section 08 71 00: Door Hardware

.3 Section 08 81 00: Glass and Glazing

.4 Section 09 91 00: Painting

1.4 REFERENCES

.1 AWMAC (Architectural Woodwork Manufacturers' Association of Canada) - Quality Standards Illustrated (QSI), latest edition.

.2 CAN/CGSB-11.3-M87, Hardboard

.3 CAN/ULC-S104-10, Standard Method for Fire Tests of Door Assemblies

.4 CAN/ULC-S113-07, Standard Specification for Wood Core Doors Meeting the performance Required by CAN/ULC-S104 for Twenty Minute Fire Rated Closure Assemblies.

.5 NFPA 252, Standard Methods of Fire Tests of Door Assemblies

1.5 SUBMITTALS

.1 Submit submittals in accordance with the General Conditions and Section 01 33 00.

.2 Shop Drawings:

.1 Submit shop drawings showing types of cores and construction details, glazing and stops, openings required, material designation and door schedules.

.3 Samples:

.1 Submit for Consultant's review, if requested, two 12" x 12" corner samples of each type of door specified herein showing construction, workmanship and finish including face veneers, core materials, edge strips and stops.

1.6 QUALITY ASSURANCE

.1 Except where otherwise specified, meet requirements of CAN/CSA-0132.2 Series and applicable provisions of AWMAC Quality Standards Illustrated (QSI), Custom Grade.

.2 Fire rated doors shall conform to NFPA for fire rated class and bear label of an approved testing agency.

1.7 REGULATORY REQUIREMENTS

.1 Submit certification that fire rated doors have been tested in conformance to CAN/ULC-S104 and NFPA 252 to ratings indicated on Door Schedule.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Coordinate deliveries to comply with construction schedule and arrange ahead for off the ground, under cover storage location.

.2 Do not permit delivery of work to job site until building is sufficiently dry, wet trades are completed and the moisture readings of surfaces in proposed storage area is less than 18%.

.3 Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Store doors flat on level surface. Protect materials with suitable non-staining waterproof coverings, but allow air circulation at sides.

.4 Label each door with manufacturers' name, product identification, door size and type.

1.9 EXTENDED WARRANTY

.1 Submit written warranty that doors will be free from defects in materials or workmanship in accordance with General Conditions but for a period of three (3) years.

.2 Make good defects promptly during warranty period by replacing defective doors.

.3 Defects shall include, but not be limited to delamination of edges, warp, twist, bow exceeding 1/4". "Replace" as used herein includes installing hardware, finishing, hanging and fitting.

2 Products

2.1 MANUFACTURERS

.1 Wood doors shall be flush, solid particle core with reinforced styles and rails to CAN/CSA 0132.2-M1990.

.2 Acceptable products and corresponding manufacturers shall be as follows:

.1 Cambridge Doors Ltd.

.2 Baillargeon Door Inc

.3 Lampton Doors

.4 Mowhawk Flush Doors

.5 VT Industries

.6 Marshfield Wood Doors

.7 JWS Manufacturing Inc.

.3 Doors of equal quality and construction are also acceptable subject to conformance to specifications and door schedule.

2.2 MATERIALS

.1 Conform to CAN/CSA-0132.2 Series for wood flush doors.

.2 All wood doors to be supplied from same manufacturer.

.3 Door Construction

.1 Solid Particleboard Wood Flush Doors

.1 Construction: 5 ply.

.2 Fire Rating: 20 or 30 minutes.

.3 Particle Board for Cores: CAN3-O188.1-M, extruded particle board having spruce particles in melamine based binder, minimum density of 480 kg/cu.m. (30 pcf).

.4 Mineral Cores (for fire-rated doors): Comply with the requirements of the label issuing authority for the scheduled fire ratings, as acceptable to the authorities having jurisdiction.

.5 Clear hardwood edges minimum 13 mm thick.

.6 Adhesive: Type I: Waterproof phenol, resorcinol and phenol - resorcinol resin adhesive.

.4 Face Veneer for Flush Wood Doors Scheduled to have Plastic Laminate Finish:

Refer to door schedule for location.

.1 0.049" thick high pressure, paper based, decorative plastic laminate conforming to CAN3-A172-M79, Grade GP, Type S.

.2 Plastic laminate finish to be Arborite W-230 F, Sliced Oak or approved equal.

2.3 FABRICATION

.1 Conform to Quality Standards for Architectural Woodwork published by Architectural Woodwork Manufacturers Association of Canada (AWMAC) for Architectural Grade Doors, except where specified otherwise.

.2 Size doors for 1.6 mm clearance of heads and jambs and 9 mm at bottom. Undercut doors for air intake where indicated on Door Schedule.

.3 Wood Stiles, Rails and Hardware Reinforcement: Low density hardwood species, kiln dried to 8% moisture content.

.4 Stiles and Rails: Hardwood. Stile thickness minimum 1-1/2" and rail thickness minimum 1-1/8".

.5 Bevel vertical edges of single acting doors 3 mm in 50 mm or lock side and 1.5 mm in 50 mm on hinge side.

.6 Radius vertical edges of double acting doors to 60 mm radius.

.7 Seal wood edges and edges of cut outs before units are placed in unheated storage areas.

.8 Fabricate doors using 5 ply hot press construction technology. Bond stiles and rails to core using Type I adhesive. Sand for uniform thickness. Laminate door facing, cross banding and assembled core in hot press.

.9 Factory cut glass light openings. Ensure openings are square with internal corners slightly rounded. Provide metal glass tops, paint finished to match face veneer for vision panels in unrated doors

.10 Factory fit doors for frame opening dimensions identified on shop drawings.

.11 Provide inner blocks at lock edge and top of door closer for hardware reinforcement.

.12 Completely seal wood top, bottom and edges and edges of cut-outs, before units are shipped from the manufacturer's mill or are placed in the open air or unheated storage areas at the mill which would allow change in the specified moisture content of the wood.

.1 Apply sealer in accordance with the manufacturer's printed instructions without dilution or alteration of any kind. Give particular attention to finish.

.2 Obtain approval of Consultant of the finishes before proceeding with sealing. Should this procedure not be followed replace all doors which have been improperly sealed.

.13 Provide blocking for closers, panic hardware, locksets and other door hardware as required.

2.4 FABRICATION - FIRE RATED FLUSH WOOD DOORS

.1 As listed by ULC, ULI or WHI, and bearing their label, as acceptable to authorities having jurisdiction.

.2 Fabricate fire-rated flush wood doors with scheduled facing material over cross banding.

.3 Fabricate fire-rated doors as required for rating indicated, with water resistant non-combustible mineral core, minimum 3/4" fire retardant treated hardwood stiles and minimum 1-1/2" fire retardant treated hardwood rails. Reinforce doors with minimum 1-1/4" solid wood blocking for finish hardware.

.4 Locate the label on the hinged edge of the door midway between the top hinge and the head of the door.

.5 Seal fire-rated doors as specified for non-rated doors.

2.5 FABRICATION - FACTORY FINISH

.1 Complete fabrication of doors before applying factory finishes including, but not limited to fitting doors for openings and machining for recessed hardware.

.2 Factory finish all four edges, edges of cut outs, and mortises the same as for faces, except that stains and fillers may be omitted on bottom edges, edges of cut outs, and mortises, and as follows:

.1 Finish doors at factory that are indicated to receive finish, other than paint finish.

.3 Steam out deep scratches and ease sharp edges by sanding before starting factory finishing; block sand using 150/180 grit in direction of grain on all surfaces to remove handling marks and fingerprints.

.4 Perform filling, sanding and finishing in horizontal position wherever possible.

3 Execution

3.1 EXAMINATION

.1 Verify that frames are in accordance with indicated requirements for type, size, location, and swing characteristics and are installed with level heads and plumb jambs.

.2 Exam all doors thoroughly before installation or finishing; reject any defective doors and obtain replacements from manufacturer at no additional cost to the Owner or Project.

.3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

.1 Install doors and hardware in accordance with manufacturer's instructions.

.2 Accurately fit doors into frames to ensure smooth operation without binding. Doors shall have 1.5 mm clearance at head and jambs and 6 mm over finished floor surfaces unless otherwise indicated.

.3 Undercut doors where shown, and as required to accommodate floor finish thickness.

.4 Install hardware in accordance with hardware supplier's instructions.

.5 Install mineral core fire doors in accordance with NFPA 80; install metal fire rating label to door, do not cover over with subsequent finishes; do not trim fire rated doors any greater than 1/8” in width from lock side only and 3/4” from bottom of door.

.6 Glaze doors at site with glass of type and thickness indicated, in accordance with Section 08 81 00 using elastomeric glazing sealant as specified in Section 07 92 00; secure glass in place with removable wood stops.

.7 Adjust operable parts to ensure proper door operation.

.8 Install louvres and glazing stops where required.

3.3 CLOSEOUT ACTIVITIES

.1 Deficient Work: Replace, rework or refinish work that does not meet AWS requirements as directed by Consultant.

.2 Adjusting and Cleaning: Readjust doors and hardware just prior to completion of building to function freely and properly and as follows:

.1 Re-hang or replace doors that do not swing or operate freely.

.2 Replace doors that are damaged or that do not comply with requirements of this Section; doors may be repaired or refinished where work complies with requirements and shows no evidence of repair or refinishing in completed work.

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED REQUIREMENTS

.1 Section 06 41 00: Architectural Wood Casework

.2 Section 08 11 00: Metal Doors and Frames

.3 Section 08 14 00 Wood Doors

1.3 QUALITY ASSURANCE

.1 Meet requirements of Ontario Building Code and other applicable regulations.

.2 Upon completion of finish hardware installation, hardware supplier's qualified representative shall inspect work and shall certify in writing that all items and their installation are in accordance with requirements of Contract Documents and are functioning properly. This document shall be included in maintenance manuals.

1.4 SUBMITTALS

.1 Upon Consultant's request submit samples of finish hardware.

.2 Prepare and submit six copies of a detailed hardware schedule and cut sheets based on the drawings

.3 Furnish other Sections with templates required for hardware preparation and installation. Issue templates when requested so as not to cause any delays but not before hardware list has received final review by Consultant.

.4 The Board will provide the keying schedule.

1.5 PRODUCT DELIVERY, HANDLING & STORAGE

.1 Deliver each hardware item packaged separately in individual containers with necessary screws, keys, instructions and installation templates.

.2 Mark each container with item number corresponding to number shown on hardware schedule with respective door number.

.3 Store hardware in dry, lockable area.

2 Products

2.1 FINISH HARDWARE - GENERAL

.1 Type: heavy duty commercial grade.

.2 Hardware shall comply with requirements of jurisdictional authorities.

.3 All door closers shall have back checking features and shall be of proper size to operate door efficiently.

.4 Confirm all kick plate and threshold sizes before ordering them.

.5 Do not use wall stops on drywall.

.6 Exposed screws for installing hardware shall have Phillips or Robertson heads.

.7 Confirm degree of swing for door holders, closers.

.8 The following products may be used. Include for preparation of doors and frames accordingly.

.1 Butt hinges: full mortise type; 4 hinges per door

.2 Locks and latch sets: Cylinder type with through-bolted trim.

.3 Exit devices: rim type, flat bar push and pad style; dead latch feature at exterior doors.

.4 Door closers: surface mounted.

.5 Overhead stop: where wall stops cannot be used, surface mounted except where door closer necessitates concealed mounting.

2.2 KEYING

.1 Locks shall be keyed by the Owner.

.2 Locks and cylinders shall be temporary construction grade only.

.3 P Locks and cylinders will be updated by owner near the end of construction

3 Execution

3.1 INSTALLATION

.1 Meet requirements of ANSI/DHI A115.1G-94 “Installation Guide for Doors and Hardware”.

.2 Confirm locations and mounting heights of finish hardware with Consultant.

.3 Install finish hardware in accordance with hardware supplier’s directions. Ensure that hardware is installed correctly. Issue instructions if required to Sections concerned.

.4 Unless otherwise directed by the Consultant, or unless otherwise dictated by glass height or rail location, install finish hardware at the following heights above finish floor:

.1	Locksets and Latchsets	1025 mm to centre of strike
.2	Deadlocks	1200 mm to centre of strike
.3	Panic Bolts	1025 mm to underside of push bar
.4	Push Plates	1025 mm to centre of plant
.5	Guard Bars	1065 mm to centre of bar
.6	Door Pulls	1065 mm to centre of pull

END OF SECTION

CONSULTANT : **KEVIN WILBUR**
CONTRACT # :

Mar 22/20
REV.#1:

RIVETT ARCHITECTURAL HARDWARE LTD.

FINISHING HARDWARE SCHEDULE

FOR

QUEEN ELIZABETH PS
830 BARNARDO AVE.
PETERBOROUGH, ONTARIO

ARCHITECT/ENGINEER/CONSULTANT

AECOM

CUSTOMER :	**SUBMITTED BY :**
	RIVETT ARCHITECTURAL HARDWARE LTD. 111 INDUSTRIAL DR., WHITBY, ONTARIO CANADA L1N 5Z9 TEL-905-668-4455 FAX-905-668-4433

kevin@rivett.com
OVER FORTY-THREE YEARS OF EXCELLENCE

HARDWARE INFORMATION AND SPECIFICATIONS

March 22, 2020

FINISH: ALL FINISHES SHALL BE AS INDICATED IN THE FINISHING HARDWARE SCHEDULE BY INTERNATIONAL CODES.

KEYING: LOCKS COME WITH KEYWAY SPECIFIC TO QUEEN ELIZABETH PS. FINAL KEYING BY SCHOOL BOARD

INSTALLATION: ALL HARDWARE SHALL BE INSTALLED AND ADJUSTED COMPLETE AS PER THE MANUFACTURERS PRINTED INSTRUCTIONS AND TEMPLATES, BY SKILLED CARPENTERS IN THE APPLICATION OF FINISHING HARDWARE.

PRODUCTS: MANUFACTURER'S PRODUCTS SHALL ALL BE AS SPECIFIED. ANY EQUALS MAYBE APPROVED IN WRITING IF THEY ARE EQUAL IN DESIGN, FUNCTION, QUALITY, AND FINISH AS LISTED HEREIN.

HINGES BY HAGER
LOCKS BY SARGENT
OVERHEAD STOPS BY GLYNN JOHNSON

TRIM HARDWARE BY HAGER

HANDLING: WHERE DOORS AND FRAMES ARE TO BE FIELD PAINTED OR FINISHED, ALL HARDWARE SHALL BE REMOVED BY THE GENERAL CONTRACTOR, PRIOR TO SAME. AFTER FINISHING HAS BEEN COMPLETED, THE GENERAL CONTRACTOR SHALL RE-INSTALL ALL THE HARDWARE TO MANUFACTURERS RECOMMENDATIONS.

PACKING: LABEL ALL FINISHING HARDWARE WITH DOOR NUMBERS AND ITEM NUMBERS. THE GENERAL CONTRACTOR SHALL RECEIVE IN A LOCKED DRY STORAGE AREA AND ADVISE WITHIN 24 HOURS OF ANY SHORTAGES.

SUBMITTAL: BEFORE MATERIAL IS ORDERED, SUBMIT (1) ONE COPY OF THE COMPLETED HARDWARE SCHEDULE FOR FINAL APPROVAL. SUPPLY ALL NECESSARY TEMPLATES REQUIRED FOR FABRICATION.

WARRANTY: THE WARRANTY PERIOD SHALL BE ONE (1) YEAR GENERALLY AND TEN (10) YEARS FOR DOOR CLOSERS, THIS SHALL BE SENT TO THE GENERAL CONTRACTOR ON COMPLETION.

OMISSIONS: ANY ITEMS OF FINISHING HARDWARE REQUIRED FOR THIS PROJECT AND NOT INCLUDED IN THIS SPECIFICATION AND/OR SCHEDULE WILL BE ADDED TO THE CONTRACT AFTER AN APPROVED CHANGE NOTICE HAS BEEN ISSUED BY THE ARCHITECT.

QUALITY: PERSONNEL WHO WILL BE RESPONSIBLE FOR SCHEDULING, ORDERING AND CO-ORDINATION HARDWARE FOR THIS PROJECT SHALL BE AN EXPERIENCED HARDWARE CONSULTANT AND WITH AN EXPERIENCED HARDWARE DISTRIBUTOR BOTH OF WHICH SHALL HAVE A MINIMUM OF FIVE YEARS EXPERIENCE. THE ARCHITECT MAY REQUEST A QUALIFICATION FORM SUBMITTED.

SYMBOLS

RIVETT ARCHITECTURAL HARDWARE LTD. March 22, 2020

FINISHES

B.H.M.A.	CANADIAN	U.S.A.	DESCRIPTION
600	CP	USP	PRIMED FOR PAINT
602	C2C	US2C	CADMIUM PLATED
603	C2G	US2G	ZINC PLATED
605	C3	US3	BRIGHT BRASS CLEAR COATED
606	C4	US4	SATIN BRASS CLEAR COATED
609	C5	US5	SATIN BRASS BLACKENED CLEAR COAT
612	C10	US10	SATIN BRONZE CLEAR COATED
613	C10B	US10B	OXIDIZED SATIN BRONZE OIL RUBBED
619	C15	US15	SATIN NICKEL PLATED CLEAR COATED
625	C26	US26	BRIGHT CHROMIUM PLATED
626	C26D	US26D	SATIN CHROMIUM PLATED
627	C27	US27	SATIN ALUMINUM CLEAR COATED
628	C28	US28	SATIN ALUMINUM CLEAR ANODIZED
629	C32	US32	BRIGHT STAINLESS STEEL
630	C32D	US32D	SATIN STAINLESS STEEL
689	SBL	USP28	ALUMINUM PAINT
690	DBL	USP20	DARK BRONZE PAINT

HANDING

LH	LEFT HAND	LHA	LEFT HAND ACTIVE
RH	RIGHT HAND	RHA	RIGHT HAND ACTIVE
LHR	LEFT HAND REVERSE	LHRA	LEFT HAND REVERSE ACTIVE
RHR	RIGHT HAND REVERSE	RHRA	RIGHT HAND REVERSE ACTIVE

WORDS

ALUM	ALUMINUM	NRP	NON REMOVABLE PIN
ASA	ASA STRIKE	PR	PAIR
BS	BACKSET	SEC	SECTION
CC	CANCELED	SGLE	SINGLE
CYL	CYLINDER	STD	STANDARD
DA	DOUBLE ACTING	TB	THRU BOLTS
DS	DEAD STOP	ULA	UNDERWRITERS LABELED 3 HOUR RATED
EA	EACH	ULB	UNDERWRITERS LABELED 1 1/2 HOUR RATED
ELEV	ELEVATION	ULC	UNDERWRITERS LABELED 3/4 HOUR RATED
HDWE	HARDWARE	ULD	UNDERWRITERS LABELED 1/3 HOUR RATED
HO	HOLD OPEN	UL	UNDERWRITERS FIRE LABELED
MM	MILLIMETERS	161	STANDARD CYLINDER LOCK CUTOUT

DOORS & FRAMES

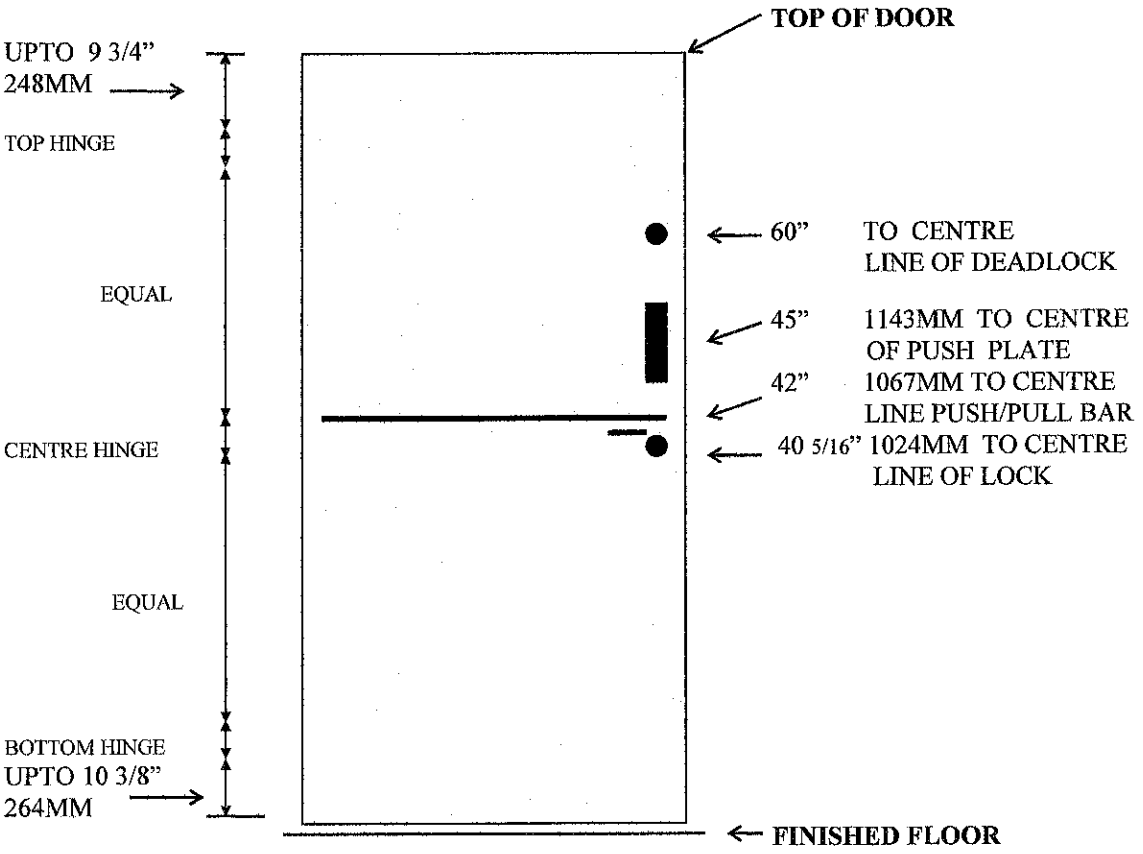
FS	FRAME SINGLE "KD"	FD	FRAME DOUBLE "KD"
FSW	FRAME SINGLE WELDED	FDW	FRAME DOUBLE WELDED
FSWTH	FRAME SINGLE WELDED THERMO	FDWTB	FRAME DOUBLE WELDED THERMO
FSTB	FRAME SINGLE THERMO "KD"	FDWDE	FRAME WELDED DOUBLE EGRESS
FSDW	FRAME SINGLE DRYWALL	FDWCS	FRAME WELDED CONTRA SWING
FSDWW	FRAME SGLE DRYWALL WELDED	FDDW	FRAME DOUBLE DRYWALL "KD"
D	DOOR "D" SERIES HONEYCOMB CORE	-14	14 GAUGE STEEL DOOR OR FRAME
H	DOOR "H" SERIES STEEL STIFFENED	-16	16 GAUGE STEEL DOOR OR FRAME
E	DOOR "E" SERIES EMBOSSED	-18	18 GAUGE STEEL DOOR OR FRAME
Z	DOOR "Z" SERIES STEEL STIFFENED	-20	20 GAUGE STEEL DOOR OR FRAME
M	FLUSH FACE DOOR		PSF PRESSED STEEL FRAME
G	HALF LITED DOOR	WF	WOOD FRAME
NL	NARROW LITED DOOR	HMD	HOLLOW METAL DOOR
L	LOUVERED DOOR	HCWD	HOLLOW CORE WOOD DOOR
2G	TWO LITED DOOR	SCWD	SOLID CORE WOOD DOOR
V	VIEW LITED DOOR	PL	PLASTIC LAMINATED DOOR
KD	KNOCK DOWN	FR	FRAME
TRR	TEMPERATURE RISE RATED	CIF	CHANNEL IRON FRAME
STC	SOUND TRANSMISSION	DR	DOOR

KEYING

GGMK	GREAT GRAND MASTER KEY	KD	KEYED DIFFERENT
GMK	GRAND MASTER KEY	KA	KEYED ALIKE
MK	MASTER KEY	CMK	CONSTRUCTION MASTER KEY
EMK	EMERGENCY MASTER KEY	SK	SEPARATE KEY NO MASTERS
BK	BLOCK-O KEYED	CC	CONSTRUCTION CORE
RM	REMOVABLE CORE	CK	CUT KEYS

HARDWARE LOCATION DIAGRAM

RIVETT ARCHITECTURAL HARDWARE LTD. March 22, 2020



ALL HARDWARE MOUNTING LOCATIONS SHALL BE AS PER LOCATIONS DIAGRAM AND HELD CONSISTENT THROUGHOUT THE PROJECT, UNLESS INDICATED ELSEWHERE IN THE ARCHITECTS DRAWINGS, FINISHING HARDWARE SCHEDULE OR AS DIRECTED BY

Rivett Architectural Hardware Ltd.

Door Listing

QUEEN ELIZABETH PS - PETERBOROUGH, ONTARIO

Schedule 90835
Date Mar 22-20

Door Number	Set Number
107	2
108A	2
108B	3
110A	2
110B	3
111A	2
111B	3
114	2
115	2
116	2
TC	1

Rivett Architectural Hardware Ltd.

Hardware Schedule

QUEEN ELIZABETH PS - PETERBOROUGH, ONTARIO

Schedule 90835
Date Mar 22-20

Set # 1

3 SINGLE DR # TC CLASSRMS 116/115/114 FROM TEACHER'S CLOSET — RHR

3 - TEACHER'S CLOSET DOORS 35mm
DOORS BY MILLWORK

Qty			
9	EA	HINGE	BB1279-88 X 88-626
3	EA	STOREROOM LOCK 1 3/8" DR	28 X 7G04 X LL X 626

Set # 2

1 SINGLE DR # 107 CORRIDOR 107H TO CLASSROOM 107 — LH
1 SINGLE DR # 108A CORRIDOR 107H TO CLASSROOM 108 — LH
1 SINGLE DR # 110A CORRIDOR 110H TO CLASSROOM 110 — LH
1 SINGLE DR # 111A CORRIDOR 110H TO CLASSROOM 111 — LH
1 SINGLE DR # 114 CORRIDOR 116H TO CLASSROOM 114 — LH
1 SINGLE DR # 115 CORRIDOR 116H TO CLASSROOM 115 — LH
1 SINGLE DR # 116 CORRIDOR 116H TO CLASSROOM 116 — LH

7 - 900 x 2070 x 45 x PLAM WD DR x PSF x 20min
gc to cionfirm size, hinge & strike locations

Qty			
21	EA	SWING CLEAR HINGES	BB1263 X 114 X 626
7	EA	OFFICE LOCKSET	28 X 11G05 X LL X 626
7	EA	SURFACE STOP	904S X 630
7	EA	KICKPLATE	190S X 152 X 863 X 630

Set # 3

1 SINGLE DR # 108B CLASSROOM 105 FROM CLOSET — LHR
1 SINGLE DR # 110B CLASSROOM 110 FROM CLOSET — LHR
1 SINGLE DR # 111B CLASSROOM 111 FROM CLOSET — LHR

3 - 680 x 2080 x 45 x PLAM WD DR

Qty			
9	EA	HINGE	BB1279-114 X 101- 626
3	EA	STOREROOM LOCKSET	28 X 11G04 X LL X 626

1 General

1.1 GENERAL REQUIREMENTS

.1 General Conditions, Supplementary Conditions and Division 01 apply to this Section.

1.2 SUMMARY

.1 Furnish glazing materials and accessories to complete the fabrication and installation of:

.1 Hollow Metal Doors, Frames and Sidelights

.2 Wood Doors

1.3 RELATED REQUIREMENTS

.1 Section 06 10 00: Rough Carpentry

.2 Section 07 92 00: Joint Sealants

.3 Section 08 11 00: Metal Doors and Frames

1.4 REFERENCES

.1 American Society for Testing and Materials (ASTM):

.1 ASTM C542-05(2011), Standard Specification for Lock-Strip Gaskets

.2 ASTM C920-11, Standard Specification for Elastomeric Joint Sealants

.3 ASTM C1172-09e1, Standard Specification for Laminated Architectural Flat Glass

.2 Canadian General Standards Board (CGSB):

.1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass

.2 CAN/CGSB-12.3-M91, Flat, Clear Float Glass

.3 CAN/CGSB-12.8-97, Insulating Glass Units

.4 CAN/CGSB-12.9-M91, Spandrel Glass

.5 CGSB-12.20-M89, Structural Design of Glass for Buildings

.3 National Fire Protection Association (NFPA):

.1 NFPA 80-2013, Standard For Fire Doors and Other Opening Protectives

1.5 SUBMITTALS

.1 Submit submittals in accordance with the requirements of Section 01 33 00 Submittal Procedures.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Product Data: Submit manufacturer's product data for each type of product specified. Data shall indicate compliance with specification and installation recommendations of manufacturer of products being used.

.2 Samples: Submit samples of materials if required by Consultant before commencing work of this section. Samples shall be clearly labeled with manufacturer's name and type.

.3 Shop Drawings: Submit shop drawings, to the Consultant for review prior to fabrication.

.4 Samples for Initial Selection: Submit samples for initial selection by Consultant:

.1 Submit samples of spandrel glass coatings for review and acceptance by Consultant prior to ordering.

.5 Samples for Verification: Submit samples for verification including sample sets showing the full range of variations expected where products involve normal colour variations.

.6 Maintenance Data: Upon completion of installation, supply instructions covering re-glazing, adjustments and other relevant maintenance data.

1.6 QUALITY ASSURANCE

.1 Conform to the requirements of the Flat Glass Marketing Association Glazing Manual, latest Edition.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: Deliver packaged materials in their original containers with manufacturer's labels and seals intact.

.2 Storage and Handling Requirements: Store vertically, blocked off the floor in a weatherproof enclosure in original containers with manufacturers labels and seals intact until read for installation, and as follows:

.1 Install glass as soon as possible after delivery to site.

.2 Handle glass carefully to its place of installation.

.3 Prevent damage to glass, adjacent materials and surfaces.

1.8 SITE CONDITIONS

.1 Ambient Conditions: Maintain temperature, humidity and solar exposure conditions of Glass Glazing materials during shipping, storage and site installation as required by manufacturer to maintain warranty and performance of installed products.

1.9 WARRANTY

.1 Provide manufacturer’s warranty for the following types of glass listed, against defects in materials and workmanship for the period indicated, commencing from the date of Substantial Performance of Work:

.1 Seal Failure: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions.

.2 Evidence of Failure: Obstruction of vision by dust, moisture, or film on interior surfaces of glass.

.3 Allowable Specific Exclusions: Breakage resulting from thermal stress will be accepted as a limitation to the warranty in accordance with CAN/CGSB 12.20.

.4 Warranty Period: Ten (10) Years.

2 Products

2.1 MATERIALS

.1 Float Glass: In accordance with CAN/CGSB-12.3, glazing quality and as follows:

.1 Clear Glass: No tint

.2 Tempered Glass:

.1 Minimum 1/4" thick, clear, conforming to CAN/CGSB-12.1, Type 2, Class 'B'. Tempering shall be performed using horizontal tong free method. Provide 1/2" where indicated on drawings.

.1 Provide Category "I" Heat Strengthened tempered glass for spandrel panel applications.

.3 Laminated Safety Glass: In accordance with CAN/CGSB-12.1 and ASTM C1172 as follows:

.1 Glass: Clear, tempered glass.

.2 Type: 1 - Laminated.

.3 Class: B - Float Glass.

.4 Category: II - Fully Tempered.

.4 Fire Rated Glass Performance:

.1 Fire Rated, Clear Glass: Material used in door and screen applications with fire rating requirements of up to 45 minutes with hose stream test; and provides protection by reducing the radiant and conductive heat transfer through the assembly in locations where aesthetics are of prime importance.

.1 Fire Rated Glass: Comprised of multiple layers of tempered glass ceramic, laminated with transparent intumescent material, providing distortion free viewing through pane and as follows:

.1 Thickness: As required by manufacturer to meet structural requirements for performance range specified

.2 Fire Rating: 45 minutes, as indicated in door schedule.

.3 Labelled: Permanent logo listing name of product, manufacturer, testing laboratory, fire rating period and safety requirements

.4 Basis-of-Design Materials:

.1 Technical Glass Products, FireLite

.2 VetroTech, Keralite Select L

.5 Gaskets:

.1 Neoprene/EPDM thermoplastic rubber type gaskets of sufficient thickness to be compressed 25% when installed, having 2,000 psi tensile strength, with 50 durometer shore A hardness plus/minus 5, maximum 30% resistance to permanent set, resistance to ozone without cracking, minimum elongation at break of 300% and conforming to ASTM C542.

.2 Colour - "Black".

.6 Sealant:

.1 One component, silicone base, solvent curing sealant conforming to ASTM C920. Colour as selected Later by Consultant.

.7 Glazing Compound:

.1 Non-hardening modified oil type glazing compound.

.8 Setting Blocks:

.1 Neoprene/EPDM rubber type, 4" long, with 40 to 50 durometer shore A hardness plus/minus 5; resistant to sunlight, weathering, oxidation and permanent deformation under load and wide enough to extend from fixed stop to opposite face of glass of thickness suitable to glazing condition to provide adequate glazing "bite".

.9 Spacer Shims:

.1 Neoprene/EPDM rubber type, with 40 to 50 durometer shore A hardness plus/minus 5; resistant to sunlight, weathering, oxidation and permanent deformation under load and of adequate thickness to provide correct glass to face clearance at least 1/8".

.10 Glazing Tape:

.1 Macro-polyisobutylene preformed glazing tape, 'Polyshim' or 'Vision Strip' by Tremco Ltd., division of RPM Company, or approved equal.

2.2 INSULATING GLASS

.1 Insulating Glass Units: Provide sealed insulating glass units in accordance with CAN/CGSB-12.8 in configurations indicated, and as specified herein.

.2 Manufacture sealed insulating glass units without edge channels or tape, that is, with bare glass edges.

.3 Use two stage seal method of manufacture, as follows:

.1 Primary Seal: polyisobutylene sealing compound between glass and metal spacer/separator.

.2 Secondary Seal: polyurethane, silicone or polysulphide base sealant, filling gap between the two lites of glass at the edge up to the spacer/separator and primary seal.

.4 Install stainless steel capillary breather tubes to equalize pressure differentials between insulating glass fabricating location and insulating glass installation location; crimp tube immediately prior to installation in accordance with glass fabricators written instructions.

.5 Sealants for Insulating Glass Units:

.1 Primary Seal: Polyisobutylene; colour black.

.2 Secondary Seal: Structural silicone based; colour black.

.6 Insulating Glass Units:

.1 Unit Composition:

.1 Exterior Lite: Clear tempered glass.

.2 Air Space: 1/2" Air Filled

.3 Interior Lite: Clear tempered glass having standard performance Low E coating on #3 surface.

.2 Low Emissivity Coating:

.1 Basis of Design Product: Solarban 60 by PPG Industries.

.7 Spandrel Insulating Glass Units: In accordance with CAN/CGSB-12.9 and as follows:

.1 Unit Composition:

.1 Exterior Lite: Type: 2 - Heat Strengthened complete with applied silicone elastomeric coating, minimum thickness 1/64”. Colour: As selected by the Consultant from the manufacturer’s standard product line.

.1 Basis of Design Materials:

.1 Opaci-Coat 300

.2 Span-Kote

.2 Insulation: Rigid glass fibre insulation held in place with manufacturer’s standard fixing system to back face of back pan.

.3 Back Pan – Concealed: Galvanized metal sheet, 1/16” thickness, formed into a pan shape to fit into glazing throat with back of pan flush with inside face of back section. If back pan is exposed to view, attach aluminum sheet to galvanized metal back pan by adhesive, finished to match mullions.

2.3 FABRICATION AND MANUFACTURE

.1 Label each light of glass with the registered name of the product and the weight and quality of the glass.

.2 Check dimensions on site before cutting materials.

.3 Minimum bite or lap of glass on stops and rabbets as recommended by glass manufacturer. Finish surfaces shall be free of tong marks.

.4 Cut glass true to dimensions, square, plumb and level. Verify all dimensions prior to fabrication.

.5 Distortion, pock marking or defects detrimental to appearance and/or performance, as determined by the Consultant, will be rejected.

2.4 GLAZING COMPOUND FOR FIRE RATED GLAZING MATERIALS

.1 Glazing Tape: Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2%, designed for compression of 25% to affect an air and vapour seal.

.2 Silicone Sealant: One-part neutral curing silicone, medium modulus sealant, Type S; Grade NS; Class 25 with additional movement capability of 50% in both extension and compression (total 100%); Use (Exposure) NT; Uses (Substrates) G, A, and O as applicable.

.1 Acceptable materials:

.1 Dow Corning Corp., Dow Corning 795

.2 General Electric Co., Silglaze-II 2800

.3 Tremco Inc., Spectrum 2

.3 Setting Blocks: Hardwood, glass width by 4”x ¼” thick.

.4 Spacers: Neoprene or other resilient blocks of 40 to 50 Shore A durometer hardness, adhesive-backed on one face only, tested for compatibility with specified glazing compound.

.5 Cleaners, Primers, and Sealers: Type recommended by manufacturer of glass and gaskets.

2.5 FABRICATION: FIRE RATED GLASS

.1 Fabricate glass and other glazing products in sizes required to glaze openings indicated for project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standards as required to comply with system performance requirements.

3 Execution

3.1 EXAMINATION

.1 Examine areas of work affecting the work of this section. Report in writing all defects, errors and discrepancies immediately to the Consultant.

.2 Commencement of work implies acceptance of surfaces and conditions.

3.2 PREPARATION

.1 Openings shall be free from moisture, frost, rust, dirt and foreign matter.

.2 Clean surface to receive sealant with a clean cloth dampened with xylol or a 50-50 mixture of acetone and xylol. Wipe dry with a clean, dry cloth.

3.3 INSTALLATION

.1 Conform to the recommendation of the glazing manual, Flat Glass Marketing Association, latest edition and as specified herein.

.2 Unless otherwise indicated on drawings otherwise, provide tempered glass at all doors, transoms, sidelights and vision lites within 2'-6" of grade and/or finished floor.

.3 Glaze doors scheduled to be glazed.

.4 Set sheet glass with draw lines horizontal.

.5 Glaze interior openings using compound or glazing tapes or gaskets.

.6 Install removable stops. Insert spacer shims between glass and stops at 24" O.C. and not less than 1/4" below "sight lines". Fill remaining voids with sealant or glazing compound to "sight lines" and trim sealant/glazing compound to produce clean, sharp, straight lines without voids or depressions.

.7 Replace loose stops in their original positions, tighten all screws.

.8 Refer to drawings and door and frame schedule for locations of each type of glass.

3.4 FIRE RATED GLASS

.1 Comply with GANA standards and instructions of manufacturers of glass, glazing sealants, and glazing compounds.

.2 Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.

.3 Place hardwood setting blocks located at quarter points of glass with edge block no more than 150mm (6") from corners.

.4 Glaze vertically into labelled fire rated metal frames or partition walls with same fire rating as glass and push against tape for full contact at perimeter of pane or unit.

.5 Place glazing tape on free perimeter of glazing in same manner described above.

.6 Do not remove protective edge tape.

.7 Install removable stop and secure without displacement of tape.

.8 Do not pressure glaze. Knife trim protruding tape.

.9 Provide minimum ¼” edge clearance.

.10 Install vision panels in fire rated doors to requirements of NFPA 80.

.11 Install so that appropriate fire rating labels and markings remain permanently visible.

3.5 CLEANING

.1 Repair all defects caused by the work of this section. Remove as work progresses, all excess or foreign materials or droppings which would set or become difficult to remove from surfaces at time of final cleaning.

.2 Immediately prior to acceptance of work of this section by Consultant, remove temporary protection, clean and polish exposed surfaces of all work of this section. Use proper cleaning materials and methods to prevent damage to surfaces, finishes, sealer or work of other trades. Make good such damage to Consultant's satisfaction.

.3 Do not use steel wool, wire brushes or steel scrapers on any finished surfaces.

.4 Replace or make good to Consultant's satisfaction, upon completion of work of this section, all defective, scratched or damaged work, at no extra cost to the Owner.

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED REQUIREMENTS

.1 Section 06 41 00: Architectural Wood Casework

.2 Section 07 21 00: Thermal insulation

.3 Section 07 84 00: Firestopping

.4 Section 07 92 00 Joint Sealants

.5 Section 08 11 00: Metal Doors and Frames

.6 Section 09 91 00: Painting

1.3 DEFINITION

.1 Drywall = gypsum board.

1.4 FIRE PROTECTION REQUIREMENTS

.1 Provide fire rated gypsum board components and assemblies as indicated.

.2 Where firehose cabinets, electrical panels or other fixtures or equipment are recessed into fire rated gypsum board partitions, provide fire rated backing to maintain required fire rating.

.3 Protect recessed fixtures in fire rated gypsum board ceilings in accordance with fire rated assembly design report and/or as indicated.

.4 Gypsum bulkheads/partitions in ceiling spaces above fire rated glazed screens, doors or other elements shall have same fire rating as screens/doors over which they occur.

.5 Fire rated bulkheads are required in first floor ceiling spaces where construction changes from fire rated floor assembly to non-fire rated roof assembly. Carefully examine Drawings to determine locations.

1.5 WORKMANSHIP STANDARDS

.1 Interior metal framing and furring: comply with applicable requirements of ASTM C754 and ASTM C840 unless otherwise shown.

.2 Gypsum board application and finishing: comply with requirements of ASTM C840, unless otherwise shown.

1.6 PRODUCT HANDLING & STORAGE

.1 Handle gypsum board panels to prevent damaged and broken edges.

.2 Store materials in dry place so as to preserve their quality and fitness for work.

1.7 JOB CONDITIONS

.1 Install and finish gypsum board when ambient temperature is between 14 and 22°C. Maintain this temperature range in areas to receive gypsum board for 24 hours before and during application and until joint cement and adhesives are fully cured.

.2 Apply gypsum board after building has been completely enclosed. Ensure that work to be concealed by gypsum board has been installed, tested, inspected and approved before starting work.

2 Products

2.1 FRAMING, FURRING AND TRIM

.1 Unless otherwise specified, provide framing members of minimum 0.5 mm core thickness steel hot dip galvanized (wipe coat) to ASTM A653.

.2 Studs, interior locations:

.1 Minimum 0.0179" (25 gauge), screwable with crimped web and returned flange. Provide knockout openings in web at 150mm (6") O.C. to accommodate (if required) horizontal mechanical and electrical service lines, and bracing. Widths as indicated on drawings. Provide structural studs where indicated.

.2 Framing behind all fire resistant gypsum board shall be minimum 0.0329" (20 gauge).

.3 Framing behind all abuse resistant gypsum board shall be minimum 0.0329" (20 gauge).

.4 Where metal stud framing forms walls are to be thermally insulated as indicated on drawings, provide metal studs with integrated fastening system for glass fibre/mineral fibre insulation.

.5 Provide special shapes indicated on drawings as part of steel stud/drywall assemblies.

.3 Top and bottom runners: channel sections, 35 mm legs. Depth to suit studs. Provide oversized top runner where required to accommodate deflection of structure.

.4 Rough framing members: 38 x 19 x 1.2 mm and 19 x 13 x 1.2 mm galvanized steel channels.

.5 Furring and strapping members to receive gypsum board: 19 mm deep channel shaped section with outstanding flanges and 35 mm wide knurled supporting face.

.6 Corner beads: beaded angle with perforated flanges.

.7 Casing beads: channel shaped; beaded corners.

.8 Hangers: minimum 3 mm galvanized steel wire.

.9 Tie wire: minimum 1.5 mm soft annealed galvanized steel.

.10 Metal control joint section: bellows shaped section with perforated flanges.

.11 Reveal mouldings: extruded aluminum, profiles as indicated, by Fry, Gordon or Pittcon Softforms.

2.2 GYPSUM BOARD

.1 Exposed gypsum board for interior use: tapered edge; ASTM C1396.

.2 Unexposed gypsum board for interior use: backing board: ASTM C1396.

.3 Fire rated gypsum board: Type 'X' board ASTM C1396.

.4 Moisture resistant gypsum board: ASTM C1396.

.5 Abuse resistant gypsum board: 16 mm thick fire rated with tapered edge: Fiberock VHI by CGC.

.6 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 Tile Backer Board: Location: Substrate for ceramic tile.

2.3 FASTENING & FINISHING MATERIALS

.1 Drywall screws: self-drilling, self-tapping, case hardened. Use zinc, nickel or cadmium plated screws for fastening of gypsum sheathing and cementitious board.

.2 Laminating adhesive: CGC Durabond 90 compound by Canadian Gypsum Co.Ltd. or similar by Westroc or Domtar.

.3 Joint tape: 50 mm perforated type.

.4 Joint filler and topping cement: vinyl or latex base, slow setting.

.5 Joint Compound for Interior Gypsum Board: Conforming to ASTM C475 and as recommended by gypsum wallboard, fire-rated gypsum wallboard and exterior wallboard manufacturers to suit conditions.

.6 Joint Compound for Tile Backing Panels: Gypsum based tile backing board: Use setting type taping and setting type, sandable topping compounds

.7 Joint Compound for Exterior Sheathing Boards: Fibreglass mesh tape.

2.4 ACOUSTICAL MATERIALS

.1 Acoustic Insulation: Acoustical Fire Batt by Roxul or equivalent product by Owens Corning.

.2 Caulking: to CAN/CGSB-19.21-M87: Acoustical Sealant by Tremco, or CGC Acoustical Sealant.

.3 Steel deck closures: Emseal 25V Expanding Foam Sealant, sized and shaped to fit flutes.

2.5 THERMAL BREAK

.1 Adhesive face rubberized cork 3 mm thick or self-adhesive closed cell neoprene sponge tape "Permastik" 122X by Jacobs and Thompson Ltd., or foamed vinyl tape "Arnofoam" by Arno Adhesive Tape Inc.

3 Execution

3.1 METAL FRAMING

.1 General:

.1 Framing and furring indicated is schematic and shall not be considered exact or complete. Location and spacing of members, bracing, supports and securement shall be in accord with referenced standards as required to provide complete and finished work.

.2 Make provision for supporting recessed and surface mounted fixtures and equipment. Provide additional framing, supports and stiffeners as required.

.3 Neatly frame around recessed fixtures and openings.

.2 Partitions:

.1 Unless specified or shown otherwise, extend steel studs to underside of structural slab or deck above. Make provisions to accommodate structural creep and deflection.

.2 All steel studs shall be spaced at 400 mm maximum, except where indicated otherwise. At curved walls/partitions space studs closer so as to maintain uniform curvature.

.3 Install runner channels at top and bottom of partition and secure to supporting building elements at maximum 610 mm o.c.

.4 At partition corners extend one runner channel to end of corner and butt other runner channel; allow clearance for gypsum board thickness; do not mitre runner channels.

.5 Install steel studs vertically; fix studs to runner channels by crimping or screwing on both sides of stud.

.6 Install additional studs as detailed and required at partition intersections, openings and terminations at dissimilar materials. Place studs not more than 50 mm from abutting walls, openings and each side of corners.

.7 Stiffen partitions over 3.6 m in height at mid-height with at least one 19 mm horizontal bracing channel extending full length of partition.

.3 Ceilings and Soffits:

.1 Erect suspension and furring system level with a maximum tolerance of ±3 mm over a 3000 mm length.

.2 Suspension system shall support ceiling assemblies, with maximum deflection of L/360, L being span between supports.

.3 Hangers for suspended ceilings shall support grillage independent of walls, columns, pipe and ducts. Space hangers at maximum 1220 mm o.c. along rough furring members and not more than 150 mm from ends. Do not suspend framing from steel roof deck.

.4 Space rough furring members at maximum 915 mm and not more than 150 mm from perimeter walls.

.5 Space furring channels transverse to runner channels at maximum 610 mm o.c. except at exterior soffits, and secure to each support with clip or saddle tie with 2 loops of tie wire. Install furring channels so as not to contact perimeter walls.

.6 Where ductwork, piping and other elements within ceiling spaces interfere with direct suspension of ceiling from structure, install additional framing securely fastened to main structure to accommodate proper hanging of ceiling.

.7 Erect exterior soffit framing in accordance with reviewed erection drawings. Suspend soffit framing with metal studs and brace system to withstand positive and negative wind pressures without detrimental effects. Fasten furring members to surrounding walls. Use minimum 1.2 mm thick framing members.

.4 Bulkheads, Coves, Furring:

.1 Frame to profiles shown, rigid, square, true to line and securely fastened to supporting building elements.

.2 Space furring members to receive gypsum board at maximum 610 mm o.c.

.3 Provide rough framing and bracing members as required to ensure stability and accuracy of work.

3.2 GYPSUM BOARD INSTALLATION

.1 Unless otherwise specified, erect gypsum board vertically or horizontally, whichever results in fewer end joints.

.2 Locate board end joints over supporting members.

.3 Cut and fit gypsum board as required to accommodate other work.

.4 Unless otherwise shown or specified, extend gypsum board on both sides of partitions to underside of structural deck above. Fasten gypsum board to studs, not to top channel. Allow for 13 mm deflection.

.5 Do not install gypsum board until wood blocking or other back-up components are installed. Remove and reinstall gypsum board at no extra cost to Contract where this requirement is not complied with.

.6 Provide corner beads at external corners.

.7 Provide casing beads around openings and where gypsum board abutts dissimilar material and construction.

.8 Fasten gypsum board to supports with screws spaced at maximum 305 mm o.c.

.9 Install gypsum sheathing horizontally at outside of exterior wall steel studs. Fasten each board at each stud with minimum 3 screws.

.10 Adhesive bonded gypsum board; apply 13 x 13 mm ribbons of laminating adhesive to back side of board, parallel to long dimension; space adhesive ribbons at max.150 mm o.c. temporarily brace boards until complete adhesive bond develops.

.11 Where double layer is required screw fasten second layer through first into steel framing. Select screws of suitable length to ensure positive fastening. Offset joints in second layer.

3.3 GYPSUM BOARD FINISHING

.1 Tape and fill exposed joints, fastener heads, edges, corners, to produce an acceptable surface ready for decoration.

.2 Conceal exposed flanges of corner beads, casing beads and other trim sections with at least 3 coats of cement, feathered out minimum 200 mm.

.3 Fill depressions at fastener head with cement, then apply 2 additional coats of cement to produce smooth, level surface.

.4 Treat joints using 3 coat method as follows:

.1 Apply thin uniform layer of cement and embed joint tape.

.2 Immediately apply thin skim coat of cement over tape and allow to dry.

.3 Apply 2 additional coats of cement. Allow first coat to dry before applying second coat.

.5 Sand each coat of topping cement with fine sandpaper as required to produce smooth surface. Do not sand paper face of gypsum board.

.6 Finish concealed fastener heads at fire rated gypsum board elements in manner specified for exposed work.

.7 Finish concealed joints at fire rated and at acoustically insulated gypsum board elements in manner specified for exposed work.

3.4 CONTROL AND RELIEF JOINTS

.1 Control Joints:

.1 Provide control joints where shown and at maximum 8 m o.c.

.2 Break continuity of gypsum board and framing system at control joints; install continuous metal control joint section.

.2 Relief Joints:

.1 Provide relief joints where shown and where gypsum board assemblies abutt dissimilar construction.

.2 Stop gypsum board 6 mm from abutting construction at dissimilar building elements, unless otherwise indicated.

.3 Where gypsum board comes into contact with window frames or exterior door/screen frames install thermal break. Adhere self-sticking tape to casing bead and compress during installation of gypsum board.

.4 Where indicated, install reveal mouldings.

3.5 SOUND CONTROL

.1 Acoustical Insulation: Provide acoustical insulation in gypsum board partitions and ceilings as indicated. Unless otherwise noted provide 50 mm thick insulation. Extend acoustical insulation over full height of partition, including portions located above ceiling.

.2 Acoustical Caulking:

.1 Provide acoustical caulking at all partitions, bulkheads and ceilings scheduled to receive acoustical insulation as follows:

.1 At perimeter of gypsum board partitions and ceilings.

.2 Around objects penetrating gypsum board elements.

.2 Provide 2 bead caulking system around horizontal and vertical perimeters of partitions. Apply continuous sealant beads at each side of horizontal runner tracks and vertical end studs, between gypsum board and adjacent construction.

.3 Caulk around objects such as electrical outlets, light switches, electrical and mechanical panels and boxes, grilles, and other objects penetrating. Caulk behind metal control joint sections.

.3 Where acoustically insulated partitions meet steel deck running perpendicularly to partition, provide steel deck closures.

3.6 DOOR FRAMES / ACCESS DOORS

.1 Install steel door frames occurring in gypsum board partitions. Follow installation requirements specified in Section 08 11 00.

3.7 GYPSUM BOARD SCHEDULE

.1 Use Type 'X' gypsum board at fire rated elements.

.2 Use moisture resistant gypsum board where indicated.

.3 Use abuse resistant gypsum board where indicated.

.4 Use glass-face gypsum board sheathing in exterior applications.

.5 Use tile backer board for substrate for ceramic tile.

.6 Unless otherwise specified or shown, provide 16 mm thick standard gypsum board.

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 SUMMARY

.1 This Section includes requirements for supply and installation of ceilings consisting of acoustic panels, complete with exposed suspension system and trim.

1.3 RELATED REQUIREMENTS

.1 Section 09 21 16: Gypsum Board Assemblies

1.4 QUALITY ASSURANCE

.1 The 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.

.2 Comply with applicable requirements of ASTM C636.

1.5 SUBMITTALS

.1 Submit submittals in accordance with the General Conditions and Section 01 33 00.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Product Data: Submit product data for each type of product specified.

.2 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.

.3 Samples for Initial Selection: Manufacturer's colour charts consisting of sections of acoustic panels, suspension systems, and trim showing the full range of colours, textures, and patterns available for each type of ceiling assembly indicated.

.4 Samples for Verification: Full size units of each type of ceiling assembly indicated; in sets for each colour, texture, and pattern specified, showing the full range of variations expected in these characteristics:

.1 150mm (6") square samples of each acoustic panel type, pattern, and colour.

.2 Set of 305mm (12") long samples of exposed suspension system members, including trim, for each colour and system type required.

.5 Maintenance and Materials:

.1 Provide five cartons (8 pieces per) of each type of acoustic ceiling panels and two percent (2%) of each suspension system and trim for future repairs. Identify cartons and place where directed by the Owner.

.2 Maintenance materials shall be of same production run as installed materials.

1.6 DELIVERY, STORAGE, HANDLING AND PROTECTION

.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.

.2 Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings.

.3 Store material in original, undamaged containers or wrappings with manufacturer's seals and labels intact.

1.7 SITE CONDITIONS

.1 Install ceiling systems after building has been completely enclosed and not before cementitious building elements are complete and cured and humidity levels are acceptable in the opinion of the Consultant.

.2 Ensure that work to be concealed by ceiling systems has been installed, tested, inspected and approved before starting work.

2 Products

2.1 MANUFACTURERS

.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 Ceilings, a USG Company

2.2 DESIGN CRITERIA

.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 MATERIALS

.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: 2; Pattern C, D

.2 Dimensions: 24" x 48" x 5/8"

.3 Edge Profile: Square Edge

.4 Colour: White.

.5 Acoustic and Visual Performance (Minimum Nominal):

.1 Noise Reduction Coefficient: 0.55

.2 Ceiling Attenuation Class: 35

.3 Light Reflectance: 0.82

.6 Basis of Design Material: Cortega #769 by Armstrong or Radar Basic #2310 by CGC or Baroque #BET-197 by CertainTeed or approved alternate, as accepted by the Consultant.

.2 Acoustic Panels (ACT-2): Provide manufacturer's fire rated 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: 2; Pattern C, E

.2 Dimensions: 24" x 48" x 5/8"

.3 Edge Profile: Square Edge

.4 Colour: White.

.5 Acoustic and Visual Performance (Minimum Nominal):

.1 Noise Reduction Coefficient: 0.55

.2 Ceiling Attenuation Class: 35

.3 Light Reflectance: 0.83

.6 Basis of Design Material: Radar Firecode 2315 by CGC Ceilings, or Cortega Fireguard 823 by Armstrong World Industries, Inc., or approved alternate, as accepted by the Consultant.

.3 Metal Suspension System - Acoustical Panel Ceilings: Manufacturer's standard direct hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C635 requirements and as supplied by same materials supplier as acoustic panels for intermediate duty, exposed tee bar and as follows:

.1 Tee Bar Grid Face Width: 15/16".

.2 Module: Sized as appropriate to acoustic panel size.

.3 Hangers, Braces and Ties: Nominal 14 ga. diameter steel wire, galvanized.

.4 Exposed Finish: Manufacturer's standard satin, white finish.

.5 Corrosion Resistance: Hot-dip galvanized or stainless steel components.

.6 Basis of Design Material: 15/16" Prelude XL by Armstrong World Industries, Inc.

.4 Tie Wire: 3/64" galvanized soft annealed steel wire.

.5 Accessories:

.1 Miscellaneous 'U' clips, splicers, screws, anchors, nails, wire, hold-down clips for complete installation.

.2 Wall moulding: prefinished exposed face galvanized steel angle.

3 Execution

3.1 CEILING LAYOUTS

.1 Lay out ceilings in accordance with reflected ceiling plans and symmetrical within each area to obtain uniform borders. Where layout is not shown install ceilings as directed by Consultant.

.2 Finished work shall be plumb, level and square with adjoining work.

3.2 SUSPENSION SYSTEM

.1 Suspend ceilings directly from structural elements. Do not suspend from ducts, pipes, conduits, steel roof deck.

.2 Erect suspension systems level with a maximum tolerance of 3 mm over 3 m length.

.3 Install main tees in accordance with module size. Suspend at maximum 1220 mm o.c.

.4 Install cross tees perpendicular to main tees in accord with module size. Interlock with main tees.

.5 Hangers for suspended ceilings shall support grillage independently of walls, columns, pipes and ducts. Space hangers at maximum 1220 mm o.c. along supporting grillage and not more than 150 mm from ends.

.6 Make provisions for carrying fixtures occurring on and in suspended ceilings. Install additional hangers and reinforcing to ensure that loads being carried do not compromise integrity of system. Frame around fixtures and openings as required.

.7 Where ductwork, piping and other elements within ceiling spaces interfere with direct suspension of ceiling from structure, install additional framing securely fastened to main structure to accommodate proper hanging of ceiling.

.8 Exposed members shall be as long in length as practical to minimize joints. Distribute joints to prevent clustering in one area. Joints shall be made square, tight and flush so that exposed faces of intersecting members are on same plane.

.9 Joints in suspension system members shall be reinforced with splines or other suitable methods.

.10 Install perimeter moulding at abutting vertical surfaces.

.11 Provide aluminum channel trim at perimeter of freefloating ceilings. Suspend trim independently. Mitre corners.

.12 Where work of other Sections is fastened to acoustical ceilings, reinforce suspension system and/or acoustical panels in manner acceptable to Consultant.

3.3 ACOUSTICAL PANELS

.1 Install panels so that work is clean and unmarked.

.2 Neatly cut and fit panels as required to suit ceiling layout and to accommodate other work.

.3 Recessed items shall replace or be centred on panel unless otherwise indicated.

3.4 CLEANING

.1 After installation, clean and touch up minor surface defects on acoustical panels and gypsum board panels.

.2 Remove damaged and badly marked units and replace with new unmarked material.

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 SUMMARY

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

.1 Resilient tile materials:

.1 Vinyl composition floor tile for classrooms

.2 Resilient sheet materials:

.1 Homogeneous sheet vinyl flooring

.3 Resilient accessories:

.1 Resilient wall bases

.2 Resilient accessories for transition strips, area dividers

1.3 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM):

.1 ASTM F1066-04(2014)e1, Standard Specification for Vinyl Composition Floor Tile

.2 ASTM F1516-13, Standard Practice for Sealing Seams of Resilient Flooring Products by the Heat Weld Method (when Recommended)

.3 ASTM F1861-08(2012)e1, Standard Specification for Resilient Wall Base

.4 ASTM F1869-11, Standard Test Method for Measuring Moisture Vapour Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

.5 ASTM F1913-04(2010), Standard Specification for Vinyl Sheet Floor Covering Without Backing

.6 ASTM F2169-15, Standard Specification for Resilient Stair Treads

.2 Canadian General Standards Board (CGSB):

.1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Close spaces to traffic during flooring installation and until time period after installation recommended in writing by manufacturer; install flooring and accessories after other finishing operations, including painting and ceiling construction have been completed.

.2 Pre-Installation Conference: Conduct conference at Project site in accordance with requirements of Section 01 31 19 Project Meetings, to verify project requirements, substrate conditions, patterns and layouts, coordination with other Sections affected by work of this Section, manufacturer’s installation instructions and manufacturer’s warranty requirements.

1.5 SUBMITTALS

.1 Provide submittals in accordance with the General Conditions and Section 01 33 00 Submittal Procedures.

.2 Action Submittals:

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

.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

.3 Samples for Selection: Submit manufacturer's colour charts and samples for initial selection consisting of full range of colours and patterns available for each type of product indicated.

.4 Samples for Verification:

.1 Resilient Flooring: Submit samples of each different specified product for verification of colour and pattern in manufacturer's standard size, but not less than 6” x 6” in size for tile or sheet material, or 6” long for resilient accessories.

.3 Informational Submittals: Provide the following submittals during the course of the work:

.1 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.

.4 Maintenance Data and Operating Instructions:

.1 Operation and Maintenance Data: Submit manufacturer’s written instructions for maintenance and cleaning procedures, include list of manufacturer recommended cleaning and maintenance products, and name of original installer and contact information in accordance with Section 01 78 00 Project Closeout.

.5 Safety Data Sheets:

.1 Submit WHMIS safety data sheets for incorporation into the Operation and Maintenance Manual. Keep one copy of WHMIS safety data sheets on site for reference by workers.

.6 Maintenance Materials:

.1 Provide 2% of each colour of vinyl composition tile and 30'-0" lineal feet coil stock of each colour of resilient base specified, boxed and labelled.

.2 Store maintenance materials on the premises as directed by the Owner.

1.6 QUALITY ASSURANCE

.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.

.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 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.

.2 Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings.

.3 Store material in original, undamaged containers or wrappings with manufacturer's seals and labels intact.

.4 Restrict traffic by other trades during installation.

.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 SITE CONDITIONS

.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.

.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.

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

1.9 WARRANTY

.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.

.2 Defects shall include, but not limited to, bond failure, and extensive colour fading.

2 Products

2.1 MANUFACTURERS

.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 in accordance with Section 01 33 00 Submittal Procedures, a minimum of five (5) days in advance of Bid Closing.

.2 Approved manufacturers:

.1 Johnsonite

.2 Armstrong Flooring

.3 Polyflor

2.2 TILE FLOORING MATERIALS

.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 match #51899 Cool White.

.3 Thickness: 1/8”

.4 Size 12” x 12”

.5 Basis of Design Material: Standard Excelon Imperial Texture by Armstrong Flooring.

2.3 SHEET FLOORING MATERIALS

.1 Unbacked Sheet Vinyl Flooring (VF): Conforming to ASTM F1913 and the following:

.1 Wear Layer: Specialty Performance Film

.2 Colour and Pattern: Selected from manufacturers standard range. Allow for two (2) colours.

.3 Total Thickness: nominal 2mm

.4 Width: 2m

.5 Roll Length: 20m

.6 Basis of Design Material: Mystique PUR by Polyflor, or approved alternate by Johnsonite Flooring, or Armstrong Flooring.

2.4 RESILIENT ACCESSORIES

.1 Resilient Wall Base (RB): Smooth, buffed exposed face and ribbed or grooved bonding surface 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: TP – Thermoplastic Rubber

.2 Group: 1 – Homogeneous

.3 Style: B – Cove

.4 Height: 4”

.5 Thickness: 1/8”

.6 Colour: Black.

.7 Length: Manufacturers standard maximum length

.8 Basis of Design Manufacturer: Johnsonite Flooring.

.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: 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.

.3 Heat Welding Bead: Solid strand product recommended by flooring manufacturer for heat welding seams, and as follows:

.1 Colour and Pattern: Match colour and pattern of resilient flooring, as approved by the Consultant.

.4 Primers, fillers, adhesives: those recommended by flooring manufacturer which will produce good and permanent bond between subfloor and flooring.

.1 Resilient Floor Tile Adhesive: Standard Tile: Waterproof, clear setting type and brands as recommended by the tile manufacturer.

.5 Cementitious Underlayment/Scratch coat: Provide product recommended by resilient flooring manufacture.

.6 Cleaning and finishing materials: as recommended by flooring material manufacturer.

.1 Sealer and Wax: Coordinated with Owners preferred long term maintenance program, sealer or wax as appropriate to flooring materials specified.

3 Execution

3.1 EXAMINATION

.1 Surfaces to receive resilient flooring shall be dry, true, even and smooth, and free of paint, grease and oil.

.2 Perform moisture tests on concrete substrates where moisture content is uncertain. Perform tests in minimum ambient temperature of 18°C. Do not install materials until test results are satisfactory.

.3 Concrete slabs shall be at least 28 days old before installation of resilient flooring.

.4 Inspect condition of concrete slabs scheduled to receive resilient flooring as soon as possible after completion and record in writing any deficiencies discovered or state, if no deficiencies are found, acceptance of floor conditions.

3.2 PREPARATION

.1 Level depressions, cracks and joints in subfloor with non-shrinking type filler compatible with bonding adhesive.

.2 If recommended by adhesive or tile manufacturer, prime substrates. Apply primer in accordance with manufacturer's directions.

3.3 UNDERLAYMENT

.1 Where resilient flooring abuts other flooring of different thickness, provide cementitious underlayment allowing for smooth and level transition between finished floor surfaces.

.2 Mix, apply and finish underlayment in accordance with latex admixture manufacturer's recommendations.

3.4 FLOORING INSTALLATION - GENERAL

.1 Install resilient flooring materials in accordance with material manufacturer's current printed directions. Keep a copy of manufacturer's installation manual on site during execution of work.

.2 Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints. Extend flooring into recesses and closets.

.3 Locate change to different floor finish or colour centred under doors.

.4 Provide reducing strip adhesive bonded to floor where floor covering terminates, exposing edge of floor. Install transition strip at junction with other types of flooring.

3.5 RESILIENT TILE

.1 Lay out each area to be tiled symmetrically square with axis of room to provide perimeter tiles at least one half tile in width.

.2 Distribute tiles having varying shades or pattern evenly over floor area to obtain uniform effect. Abrupt variations will not be permitted. Tile joints shall be flush, uniform, in moderate contact and in straight lines.

.3 Install tile with joints staggered half tile in one direction and with tile pattern running as directed by the Consultant.

.4 Immediately after installation, roll entire floor to ensure adhesion in accordance with tile and adhesive manufacturer's recommendations.

3.6 RESILIENT SHEET FLOORING

.1 Maintain uniformity of resilient flooring direction.

.2 Do not bridge building expansion joints with sheet flooring.

.3 Arrange for a minimum number of seams, where seams are necessary place them in inconspicuous and low traffic areas, and not less than 150mm (6") away from parallel joints in flooring substrates.

.4 Match edges of flooring for colour shading and pattern at seams in accordance with manufacturer's written recommendations.

.5 Obtain Consultant’s acceptance in writing before installing materials having cross seams; make adjustments to seaming plan as directed by Consultant to minimize or eliminate cross seams.

.6 Weld seams with welding rod where optional with manufacturer in accordance with written instructions for treatment of flooring adjacent to seams:

.1 Route joints of sheet flooring, leaving recommended joint profile for welding rod and permanently weld seams in accordance with ASTM F1516

.7 Install flooring flush with adjoining floor covering surfaces.

.8 Scribe sheet flooring to walls, columns, cabinets, floor outlets and other appurtenances.

.9 Roll sheet flooring in both directions in accordance with manufacturer’s instructions.

3.7 RESILIENT BASE

.1 Adhesive apply cove base to vertical surfaces so that gaps do not occur behind base, so that front lip of base cove bears firmly and uniformly on floor surfaces and so that good and permanent bond is produced between base and surface to which is it applied.

.2 Use full length pieces where practicable; accumulated short lengths not permitted. Wrap base around outside corners, mitre at inside corners; score back of coved base at outside corners. Use preformed end stops where base end is exposed. Butt joints flush without gaps.

3.8 CLEANING

.1 Cleaning, sealing and finishing of resilient tile flooring shall be performed using the cleaning, sealing and finishing materials specified of one manufacturer in accordance with the manufacturer's instructions and recommendations.

.1 Allow a minimum of four (4) days to elapse after completion of each resilient flooring installation before commencing cleaning, sealing, and finishing operations.

.2 Work shall be handed over to the Owner free of blemishes and in perfect condition.

.3 Promptly remove adhesive from surface of resilient materials as work progresses.

.4 Seal and wax floor immediately prior to turnover of building when required by flooring manufacturer. Owner reserves the right to reject resilient floors which show defects after completion of sealing and waxing.

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED REQUIREMENTS

.1 Section 06 41 00: Architectural Wood Casework

.2 Section 08 11 00: Metal Doors and Frames

.3 Section 08 14 00: Wood Doors

.4 Section 09 21 16: Gypsum Board Assemblies

1.3 SUBMITTALS

.1 List of Materials:

.1 Before ordering materials, submit written request in form acceptable to Consultant, for approval of paint materials. List each of the materials proposed and surfaces to be covered. State manufacturer's name and brand name of materials.

.2 List of materials shall be endorsed by manufacturer as being the best material for the applicable condition.

.3 Do not order material or commence work until list of materials is approved by Consultant.

.2 Samples:

.1 Submit two 200 mm x 250 mm colour drawdowns of each paint colour coated with manufacturer's paint system to confirm colour match with colour chips supplied by Consultant.

.2 Submit sample of natural and stained finishes on each species and grade of wood to receive such finishes.

.3 Prepare full size samples showing each type of door finish.

.4 Prepare sample panels of each wall and ceiling paint system specified, as directed by Consultant.

.3 Maintenance Materials:

.1 Upon completion of work provide one sealed and properly identified 1 L can of each type and colour paint used on this project.

.2 Only top coating paints used in building interior are required.

1.4 MOCK-UP ROOM

.1 Prior to start of any painting; prepare a mock-up room designated by Consultant.

.2 Paint all surfaces including but not limited to walls, ceilings, doors and frames.

1.5 PRODUCT HANDLING

.1 Deliver paint materials to site in sealed original labelled containers bearing manufacturer's name, brand name, type of paint and colour designation.

.2 Store materials in strict accordance with manufacturer's recommendations.

.3 Store paints, stains, varnishes, equipment in designated area inside building. Maintain separate workshop / storage area for duration of work by this Section.

1.6 SITE CONDITIONS

.1 Environmental Conditions:

.1 Maintain temperature in interior areas to receive coatings between 15°C and 25°C for at least 24 hours before, during application and until coatings have cured after application. Apply exterior coatings only when temperature is above 10°C.

.2 Do not apply exterior coatings during periods of precipitation or when precipitation is imminent.

.3 Do not apply coatings under direct sunlight during hot weather.

.4 Adequately ventilate areas where coatings are being applied. Maintain a reasonably dust-free atmosphere for duration of work.

.2 Protection:

.1 Protect adjacent surfaces not scheduled to receive coatings from damage.

.2 Remove electrical plates, surface hardware, fittings and fastenings prior to painting operations. These items shall be carefully stored, cleaned and replaced on completion of work in each area. No solvent shall be used to clean hardware that will remove permanent lacquer finish on these items.

.3 Mask labels and specification plates occurring on equipment to be painted.

.4 Post "wet coating" signs and "no smoking" signs while work is in progress and while coatings are curing.

.5 Keep oily rags, wastes and other combustible materials in closed metal containers and remove at end of each work day. Take every precaution to avoid spontaneous combustion.

.3 Work Schedule:

.1 Unless otherwise permitted, apply coatings only after all other Sections have completed their work.

.2 Co-ordinate work of this Section with that of Section 07 92 00 and review order of installation with Consultant where sealants are installed adjacent to painted surfaces.

.3 If it becomes necessary for the Owner to occupy areas of the building prior to their completion, schedule work of this Section to hours when occupants have vacated building.

2 Products

2.1 MANUFACTURERS

.1 Unless otherwise specified, materials shall be manufactured and supplied by one of the following:

.1 Benjamin-Moore

.2 or equal by Para Paints or PPG Canada Inc. - Architectural Finishes.

2.2 MATERIALS

.1 Materials shall be "top line quality" products and shall be supplied by a single manufacturer except for specialty products not available from paint manufacturer.

.2 Materials wherever possible shall be low odour products, free or low in VOC content.

.3 Paints shall be factory mixed unless otherwise specified, except any coating in paste or powder form, or to be field-catalyzed shall be field-mixed in accordance with manufacturer's directions.

.4 Primers shall be as specified by manufacturer and fully compatible with finish coats.

.5 The contractor shall in all cases leave on-site in the property sealed can a minimum of one gallon of each colour and or type of paint used.

.6 Metal and Glazed Surfaces Primed with: Fresh start All-Purpose 100% (K023)

.7 Classrooms & all other areas not specified: Eco-Spec WB Semi-Gloss Finish (K376)

.8 Interior Doors & Trim: Eco-Spec WB Semi-Gloss Finish (K376)

.9 Millwork: Eco-Spec WB Semi-Gloss Finish (K376)

.10 Exterior Doors & Trim: Impervo Alkyd High Gloss Enamel (K133)

.11 Ceilings: Moores Latex Ceiling Paint (K258)

.12 Natural Wood: Stays Clear Acrylic Urethane Satin Finish (K422)

.13 Hallways: Eco-Spec WB Semi-Gloss Finish (K376)

.14 Concrete floor sealer: S.C. Johnson “Securethane”, Proseal “Prothane”, Euclid “Ecuo-Thane” or Tennant “420 System”.

.15 New conc. block: Prime with block filler (K160) – by Benjamin Moore.

.16 Basketball Court Line Marking: TRU-FLEX 100% Acrylic Line Marking Paint by Benjamin Moore; Colour: White.

.17 Driveway and Parking Line Marking: Super Spec HP Safety & Zone Marking Latex P58 by Benjamin Moore.

2.3 FINISHES

.1 Paint colours and other finishes will be selected by Consultant. Do not start work until after receiving colour schedule.

.2 Colours selected by the Consultant will not necessarily be from manufacturer's standard colours.

.3 A variety of colours may be used. Consultant may select different colours for different elements such as ductwork, bulkheads, exposed decks, slabs and structural steel. Include for up to 15 colours, not including mechanical room colours listed below. Of these colours, up to 50% may be deep tones.

.4 Confirm gloss levels for all surfaces with Consultant before starting work. Unless otherwise indicated, allow:

.1 Walls: semi-gloss

.2 Ceilings: semi-gloss

.3 Frames, doors, trim: semi-gloss.

.5 Paint exposed piping, ductwork and conduits in mechanical and boiler rooms in colours directed by Consultant.

3 Execution

3.1 CONDITIONS OF SUBSTRATES

.1 Sound, non-dusting, and free of grease, oil, dirt, and other matter detrimental to adhesion and appearance of coatings.

.2 Temperature: minimum 13°C.

.3 Moisture content: maximum 12%. Test for moisture content using moisture meter.

.4 Alkalinity: test cementitious substrates for alkalinity. Use method recommended by coating manufacturer.

3.2 PREPARATION OF SUBSTRATES

.1 All substrates: clean as required to produce an acceptable surface. If wood, metal or any other surface to be finished cannot be put in proper condition for finishing by cleaning, sanding and filling as specified, notify Consultant in writing or assume responsibility for an rectify any unsatisfactory finish resulting.

.2 Wood generally: clean soiled surfaces; sand smooth and dust off; putty nail holes, splits, scratches, after prime coat has been applied and dried; colour putty to match finish; putty stained wood after stain application.

.3 Wood for paint: clean knots, pitch streaks and sappy sections of residue and seal with sealer before applying prime coat.

.4 Wood for transparent finish: clean knots, pitch streaks and sappy sections of residue and seal with white shellac; seal after applying stain. Apply filler to open grained woods, prior to application of stain unless directed otherwise by Consultant. Do not apply satin varnish coat until Consultant has inspected and approved gloss varnish coat.

.5 Bare ferrous metal: remove rust and scale; wash with solvent; chemically clean; apply coat of metal primer.

.6 Previously primed metal: remove rust, oil, grease and loose shop paint by washing or wire brushing; make good shop coat; feather out edges of touch-up.

.7 Zinc coated metal: wash and etch to dull paint receptive surface using an approved crystalline zinc phosphate or vinyl pre-treatment.

.8 Hot dip galvanized steel: light brush blast.

.9 Unit masonry & concrete: fill minor cracks, holes and fissures with Polyfilla and smooth to a flush surface. Texture filled areas to match surrounding surface.

.10 Plaster: fill minor cracks, holes and fissures with patching plaster, allow to dry, smooth to a flush surface and texture filled area to match surrounding surface.

.11 Gypsum board: fill minor cracks, holes and imperfections with patching plaster; allow to dry and sand smooth; sand taped joints and remove dust.

.12 Alkaline surfaces: wash and neutralize using proper type of solution compatible with paint to be used.

.13 Previously painted surface need to be cleaned with TSP prior to priming.

.14 Existing gloss surface shall be dulled down with wet sandpaper.

.15 Existing oil based surfaces to be primed with Fresh start by Benjamin Moore.

3.3 BACK PRIMING

.1 Back prime wood schedule for paint or enamel finish immediately on arrival at site with interior or exterior primer as applicable.

.2 Back prime wood scheduled for stain, varnish or natural finish immediately on arrival at site, with gloss varnish reduce 25% with mineral spirits.

3.4 APPLICATION OF COATINGS

.1 Apply paint by brush or roller, except on wood and metal surfaces where paint shall be applied by brush only.

.2 Spray painting may be permitted where deemed advantageous and shall be subject to Consultant's approval. When spray painting is permitted, use only airless spray guns. Consultant may prohibit use of spray painting at any time for such reasons as carelessness, poor masking or protective measures, drifting paint fog, disturbance to other trades or failure to obtain a uniform satisfactory finish.

.3 Applied and cured coatings shall be uniform in thickness, sheen, colour and texture and free of brush or roller marks, sags, crawls and other defects detrimental to appearance and performance.

.4 Regardless of the number of coats specified for any surface, apply sufficient paint to completely cover and hide substrate and to produce a solid uniform appearance.

.5 Thoroughly mix materials before application. Use same brand of paint for primer, intermediate and finish coats.

.6 Where two or more coats of same paint are to be applied, undercoats shall be tinted in lighter shades of final coat to differentiate from final coat.

.7 Touch up suction spots after application of first coat. Sand lightly between coats with fine sandpaper.

.8 Each coat of finish shall be dry and hard before succeeding coats are applied with a minimum of 24 hours between coats, unless manufacturer's instructions state otherwise. Do not proceed with any coat until the last preceding coat is approved by the Consultant.

.9 Stained woodwork shall be covered with a uniform coat of stain and wiped off if required. Wood shall have uniform shade. Match stain so that dissimilar woods have uniform finished appearance.

3.5 PATCHING / TOUCH-UP

.1 Prior to takeover of project by Owner, inspect work of this Section and touch-up or refinish damaged finishes and finishes unsatisfactory to Consultant.

3.6 SCHEDULE OF FINISHES

.1 General Requirements:

.1 Paint or otherwise finish surfaces of building materials, building services and building accessories not otherwise protected or covered, as shown on Room Finish and Door Schedule, Drawings and as specified herein.

.2 In addition to finishing required by Room Finish and Door Schedules, Drawings and these Specifications, and unless otherwise specified, all work which is exposed to view and which is not prefinished shall be finished by this Section.

.3 In areas specifically designated as "unfinished" painting is not required except for bare, primed and zinc coated metal surfaces and insulated ductwork and pipes.

.4 Where exposed to view paint bare metals, previously primed metals and zinc coated metals unless specified otherwise.

.5 Paint behind surface mounted fixtures on walls and ceilings with full coats of paint.

.6 Paint walls behind wall mounted heating units with full coats of paint.

.7 Paint inside surfaces of light coves white.

.8 Finish tops of doors, trim, projections and other work as specified for surrounding work whether above site lines or not.

.9 Finish edges of doors to match face of door. Refinish edges of doors after fitting.

.10 Finish drawers on all sides, inside and outside. Unless otherwise indicated finish drawers with two coats of varnish.

.11 Paint tops, bottoms and edges of shelves with full specified coats, whether exposed to view or not.

.12 Paint interior of ducts at grilles and diffusers with two coats of flat black paint, so that duct interior is not visible when grilles and diffusers are installed.

.13 Paint piping, ducts and conduits in colours matching background wall or ceiling colours, unless otherwise directed by the Consultant. Ducts in mechanical rooms require only one finish coat in addition to primer. Other exposed ductwork to receive two finish coats.

.14 Paint all gas piping whether exposed to view or not, with high-visibility yellow-orange paint meeting CGSB Colour Code #1-GP-12, Code 505-101 or equal.

.15 Unless specifically indicated to be painted, all finish carpentry work shall receive transparent finish.

.16 Unless specifically indicated otherwise paint all rooftop equipment and components, regardless of material and finish, including but not necessarily limited to mechanical rooftop equipment, vent stack flashings, sleeve flashings window washing anchors, but not including prefinished sheet steel flashings.

.17 Where finishing formula for surfaces requiring painting is not included hereunder, follow recommendations of Canadian Painting Contractor's Association Architectural Painting Specification Manual, latest issue.

.2 Interior Finishing, New Surfaces:

.1 Concrete and concrete block:

.1 1 coats block filler

.2 1 coat primer, latex or PVA based

.3 2 coats acrylic latex

.2 Metal, prime painted:

.1 spot prime with alkyd metal primer

.2 2 coats acrylic latex

.3 Metal, zinc coated:

.1 1 coat galvanized primer

.2 2 coats acrylic latex

.4 Woodwork, painted:

.1 1 coat alkyd enamel undercoat

.2 2 coats acrylic latex

.5 Woodwork, stained and varnished (transparent finish):

.1 1 coat stain

.2 1 coat sanding sealer, sand lightly

.3 1 coat alkyd or polyurethane varnish, gloss

.4 1 coat alkyd or polyurethane varnish, satin

.6 Gypsum board:

.1 1 coat drywall primer

.2 2 coats acrylic latex

.7 Exposed piping, wrapped:

.1 1 coat primer

.2 2 coats acrylic latex

.8 Exposed piping and conduit, unwrapped:

.1 1 coat alkyd metal primer

.2 2 coats acrylic latex

.9 Exposed ductwork, insulated:

.1 1 coat primer

.2 2 coats acrylic latex

.10 Concrete floor (sealed)

.1 1 coat primer

.2 2 coats acrylic latex

.3 Exterior Finishing:

.1 Metal, zinc coated (hot dip galvanized):

.1 1 coat epoxy primer

.2 2 coats aliphatic polyurethane

.2 Metal, zinc coated (inorganic zinc rich primer):

.1 1 coat epoxy primer

.2 2 coats aliphatic polyurethane

.3 Wood:

.1 2 coats solid colour stain

.4 Asphalt or Concrete Basketball Court:

.1 1 coat 100% acrylic emulsion.

.2 Second coat is required. Allow first coat 3-4 hours drying prior to application of second coat.

.5 Asphalt Driveway and Parking Line Marking:

.1 1 coat fast-dry latex coating.

.4 Interior Finishing, Previously Painted Existing Surfaces:

.1 Previously painted Concrete and concrete block: (same finished colour)

.1 1 coat primer, latex or PVA based

.2 1 coat acrylic latex

.2 Previously painted Concrete and concrete block: (different finished colour)

.1 1 coat primer, latex or PVA based

.2 2 coats acrylic latex

.3 Previously painted Metal:

.1 1 coat acrylic latex primer

.2 1 coat acrylic latex

.4 Previously stained and varnished Woodwork, (transparent finish):

.1 Sand lightly

.2 1 coat sanding sealer, sand lightly

.3 1 coat alkyd or polyurethane varnish, gloss

.4 1 coat alkyd or polyurethane varnish, satin

.5 Previously painted Gypsum board:

.1 1 coat primer

.2 1 coats acrylic latex

.6 Previously painted Exposed piping:

.1 1 coat acrylic latex primer

.2 1 coat acrylic latex

END OF SECTION

1 General

1.1 SUMMARY

.1 This Section includes requirements for visual display boards, tackboards, hardware, trim and accessories.

1.2 RELATED REQUIREMENTS

.1 Section 06 10 00: Rough Carpentry

.2 Section 09 21 16: Gypsum Board Assemblies

1.3 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM):

.1 ASTM E84, Test for Surface Burning Characteristics of Building Materials

.2 Underwriters Laboratories Canada (ULC):

.1 CAN/ULC S102, Standard Method of Test for Surface Burning Characteristics

.3 Porcelain Enamel Institute (PEI):

.1 PEI 501, Appearance Properties of Porcelain Enamel.

.2 PEI 502, Mechanical and Physical Properties of Porcelain Enamel

1.4 SUBMITTALS

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

.2 Action Submittals: Provide the following submittals before starting work of this section:

.1 Shop Drawings: Submit shop drawings for each type of visual display board required including, but not limited to, the following:

.1 Include dimensioned elevations.

.2 Show location of joints between individual panels where unit dimensions exceed maximum panel length.

.3 Include sections of typical trim members.

.4 Show anchors, grounds, reinforcement, accessories, layout, and installation details.

.2 Product Data: Submit product data for each type of visual display board indicated.

.3 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:

.1 Marker Boards and Tackboards: Actual sections of finish for each type of visual display surface specified in this Section.

.4 Samples for Verification: Provide samples for verification for the following products, showing colour and texture or finish selected; include sample sets showing the full range of variations expected where finishes involve normal colour and texture variations; prepare Samples from the same material to be used for the Work:

.1 Visual Display Boards: Sample panels not less than 200 mm x 300 mm, mounted on the substrate indicated for the final Work. Include a panel for each type, colour and texture required.

.2 Aluminum Trim and Accessories: Samples of each finish type and colour, on 150 mm long sections of extrusions and not less than 100 mm squares of sheet or plate. Include Sample sets showing the full range of colour variations expected.

1.5 PROJECT CLOSEOUT SUBMISSIONS

.1 Provide operations and maintenance information in accordance with Section 01 78 00.

.2 Submit data for cleaning of finishes and maintenance, and of operational hardware.

1.6 QUALITY ASSURANCE

.1 Qualifications: Provide proof of qualifications when requested by the Consultant:

.1 Source Limitations: Obtain pre-manufactured visual display boards through one source from a single manufacturer.

.2 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.

1.7 SITE CONDITIONS

.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.

.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.

1.8 WARRANTY

.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; two (2) years.

2 Products

2.1 MANUFACTURERS

.1 Basis-of-Design products are named in this Section; additional manufacturers offering similar Products may be incorporated into the work provided they meet the performance requirements established by the named products provided they submit requests for substitution a minimum of ten (10) days in advance of Bid Closing.

.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 Global School Products Inc.

.2 ASI Visual Display Products.

.3 Claridge Products and Equipment Inc.

.4 C.P. Distributors Ltd.

.5 Crestway Systems Ltd.

.6 Egan Visual Inc.

.7 Malem Architectural Specialties Ltd.

.8 Shanahan's Ltd.

2.2 MARKER BOARDS

.1 Face Sheet: Minimum 0.62 mm enamelling grade steel specifically processed for temperatures used in coating porcelain on steel to manufacturers standard process, and as follows:

.1 Coat exposed face and edges with a 3-coat process consisting of primer, ground coat, and colour cover coat.

.2 Coat concealed face with a 2-coat process consisting of primer and ground coat.

.2 Cover Coats: Provide manufacturer's standard, light coloured, special writing surface with gloss finish intended for use with erasable dry markers.

.3 Core: Use any one of the following core materials to the manufacturer’s standard:

.1 10 mm thick, particleboard core material complying with requirements of ANSI A208.1, Grade 1 M 1.

.2 6 mm thick, tempered hardboard.

.3 13 mm gypsum board.

.4 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.

.5 Laminating Adhesive: Manufacturer's standard, moisture resistant, thermoplastic type adhesive.

2.3 TACKBOARDS

.1 Natural Cork Tackboards: Mildew resistant, weighing not less than 440 g/m2, laminated to 6 mm thick cork sheet, and as follows:

.1 Cork Thickness: 6mm (1/4”)

.2 Backing: 6mm (1/4”) thick particle board

.3 Over Thickness: 13mm (1/2”)

.4 Maximum panel size: 1220mm x 2440mm (8’ x 4’)

.2 Basis of Design Materials: Natural Cork Tackboards by Global School Products Inc., or acceptable alternate as approved by the Consultant.

.3 Trim: Extruded from aluminum alloy 6063 T5. Clear anodized finish in accordance with AA M12C22A31, full length for each installation.

.4 Chalk trays: Manufacturer's standard, plate type, extruded aluminum with clear anodized anodic oxide finish in accordance with AA M12C22A31, full length for each installation.

.5 Maprails: Extruded from aluminum alloy 6063 T5. Clear anodized anodic oxide finish in accordance with AA M12C 22A31. Cork insert. Metal map hooks. Indicate as ‘tackable strips’.

2.4 FABRICATION

.1 Shop fabricated display boards in one piece for lengths 3600 mm or less, for longer sections colour match adjacent pieces.

.2 Laminate display board and backing sheet to the core in accordance with the display board manufacturer's recommendations.

.3 Apply pre-finished trim in continuous horizontal and vertical lengths, cut and mitred at corners, and as follows:

.1 Marker Boards:

.1 Provide continuous chalk trays below all marker boards.

.2 Provide continuous maprails above all marker boards.

.3 Use adhesive to secure centre portions of panels.

.2 Tackboards:

.1 Provide continuous maprails above all tackboards adjacent to marker boards, and elsewhere as indicated.

.2 Trim edges with J trim, join to adjacent boards or marker boards with H trim and provide map rails at the top edge.

3 Execution

3.1 EXAMINATION

.1 Inspect Work and conditions affecting the Work of this Section. Proceed only after deficiencies, if any, have been corrected.

.2 Ensure that all anchors and setting or installing components provided by this Section for installation are properly located and installed.

3.2 PREPARATION

.1 Obtain all dimensions from the job site.

.2 Provide data, dimensions and components, anchors and assemblies to be installed (where required) in proper time for installation.

3.3 INSTALLATION

.1 Erect Work in strict accordance with manufacturer's written instructions.

.2 Conceal all anchors and fitments. Exposed heads of fasteners not permitted. All joints in exposed work to be flush hairline butt joints.

.3 Mount display boards as indicated on drawings.

.4 Refer to schedule and details on drawings for sizes locations, confirmed on site with Owner before installation.

.5 Mount on site maprails and tackable strips, and accessories as indicated.

3.4 CLEANING

.1 At completion and continuously as Work proceeds, remove all surplus materials, debris and scrap.

.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

1 General

1.1 SUMMARY

.1 Section Includes: This Section specifies dual-use projection screens and marker boards.

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Coordinate work of this Section with work of other trades for proper time and sequence to avoid construction delays. Comply with Section 01 31 13 - Project Coordination.

.2 Scheduling: Schedule work of this Section in accordance with Section 01 32 16 – Construction Progress Schedule.

1.3 ACTION SUBMITTALS

.1 General: Submit listed submittals in accordance with Contract Conditions and Section 01 33 00 - Submittal Procedures.

.2 Product Data: Submit specified products as follows:

.1 Manufacturer's product data, including manufacturer's SpecData product sheet.

.2 Catalog pages illustrating products to be incorporated into project.

.3 Material Safety Data Sheets (MSDS).

.4 Shop Drawings: Indicate information on shop drawings as follows:

.1 Layout location of marker boards including sizes and mounting heights.

.2 Mounting details.

1.4 INFORMATION SUBMITTALS

.1 General: Submit listed submittals in accordance with Contract Conditions and Section 01 33 00 - Submittal Procedures.

.2 Manufacturer's Instructions: Submit manufacturer's storage and installation instructions.

.3 Source Quality Control: Submit documentation verifying that components and materials specified in this Section are from single manufacturer.

1.5 DELIVERY, STORAGE & HANDLING

.1 Delivery and Acceptance Requirements:

.1 Deliver material in accordance with Section 01 61 00 - Basic Product Requirements and in accordance with manufacturer's written instructions.

.2 Deliver materials in manufacturer's original packaging with identification labels intact and in sizes to suit project.

.2 Storage and Handling Requirements:

.1 Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

.3 Packaging Waste Management:

.1 Separate waste materials for recycling in accordance with Section 01 74 19 - Construction Waste Management.

.2 Remove packaging materials from site and dispose of at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate onsite bins for recycling.

.4 Fold and flatten metal and plastic banding and place in designated area for recycling.

.5 Remove: Pallets from site.

2 Products

2.1 PROJECTOR SCREEN AND MARKER BOARD

.1 Manufacturer: Milestone AV Technologies LLC.

.1 Contact: 3100 North Detroit Street, Warsaw, IN 46581-0137; Phone: 800-622-3737; Phone: 574-267-8101; Fax: 877-325-4832; E-mail: info@da-lite.com; Website: www.da-lite.com.

.2 Single Source Responsibility: Provide components and materials specified in this section from a single manufacturer.

.3 Substitution Limitations:

.1 Substitutions: No substitutions permitted.

.2 Description: Interactive Dry Erase Application (IDEA) Screen:

.1 16:10 Wide Format:

.1 Size (Height × Width): Viewing Area 53 × 84¾ inches (135 × 215 cm), Nominal Diagonal 100 inches (254 cm), Overall Frame Dimensions 53¾ × 85½ inches (137 × 217 cm).

.2 Frame Finish: Silver.

.2 Regulatory Requirements:

.1 In accordance with Section 01 41 00 - Regulatory Requirements.

.3 Compatibility:

.1 Ensure components and materials are compatible with specified accessories and adjacent materials.

.3 Materials:

.1 Board: Write/erase projection film.

.2 Frame: Aluminum with anodic finish.

.3 Marker Package: One set of markers, one cleaning cloth and spray cleaner for each unit.

.4 Mounting Bracket: Manufacturer's standard wall bracket(s) for each.

.5 Marker Tray: NOT REQUIRED.

3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: Verify that conditions of substrates previously installed under other sections or contracts are acceptable for product installation in accordance with manufacturer's instructions prior to marker board installation.

.1 Inform Consultant of unacceptable conditions immediately upon discovery.

.2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval from Consultant.

3.2 PREPARATION

.1 Ensure structure or substrate is adequate to support marker boards.

3.3 INSTALLATION

.1 Coordinate marker board work with work of other trades for proper time and sequence to avoid construction delays.

.2 Install marker boards in accordance with manufacturer's written instructions.

.3 Install marker boards plumb and level.

.4 Accurately fit, align, securely fasten and install free from distortion or defects.

3.4 CLEANING

.1 Perform cleanup in accordance with Section 01 74 19 - Construction Waste Management.

.2 Upon completion, remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 19 - Construction Waste Management.

.3 Waste Management:

.1 Coordinate recycling of waste materials with Section 01 74 19 - Construction Waste Management.

.2 Collect recyclable waste and dispose of or recycle field generated construction waste created during demolition, construction or final cleaning.

.3 Remove recycling containers and bins from site.

3.5 PROTECTION

.1 Protect installed product from damage during construction.

.2 Repair damage to adjacent materials caused by marker board installation.

END OF SECTION

1 General

1.1 GENERAL REQUIREMENTS

.1 General Conditions, Supplementary Conditions and Division 01 apply to this Section.

1.2 DELIVERY, STORAGE, AND HANDLING

.1 Package or crate, and brace products to prevent distortion in shipment and handling. Label packages and crates, and protect finish surfaces by sturdy wrappings.

1.3 SUBMITTALS

.1 Submit submittals in accordance with the General Conditions and Section 01 33 00.

.2 Shop drawings:

.1 Indicate the following: methods of anchoring, thickness and finishes of materials, relationship of work of other sections, including all required cut-outs, and all other pertinent data and information.

.3 Maintenance data: Three copies of instructions covering cleaning, replacement and other relevant maintenance data.

.4 Extended Warranty: Submit a written warranty in accordance with Section 01 33 00.

.1 Warranty period of 5 years

.2 Commencement: Substantial Performance of the Work

2 Products

2.1 MATERIALS

.1 Provide reinforcing, fastenings, and anchorage required for building in.

.2 Insulate between dissimilar metals, and metal and incompatible materials to prevent electrolysis with bituminous paint or other approved means.

.3 Do not attach manufacturer's name or trademark, plates, imprints or labels to products unless approved by Consultant.

2.2 FABRICATION

.1 Verify site dimensions prior to fabrication. Fabricate work true to dimensions and square. Finished work shall be free from distortion and defects detrimental to appearance and performance.

2.3 MISCELLANEOUS SPECIALTIES

.1 Refer to drawings and schedules for items required but not specified herein.

2.4 COAT AND HAT RACK

.1 Wall mounted coat and hat rack, adjustable height, finished with high performance electrostatically applied powder coating.

.1 Shelf: Consisting of four (4) 19mm square tubes, closed and protected with plastic end caps.

.2 Brackets and Channel Mount: 2.3mm steel brackets and channel mounting, designed for vertical adjustment of one full shelf height, complete with plastic end caps. Channel Spacing: Not to exceed 1016mm.

.3 Hanger Rod: 25mm diameter, 1.2mm thick chrome plated steel tube with plastic end caps.

.4 Mounting Hardware: Provided by manufacturer to ensure a complete installation of coat and hat racks.

.5 Colour: **Medium Gray**, unless otherwise indicated.

.2 Solid ABS hooks available in five (5) different colours, impact resistant, spaced at 150mm (6”) on center.

.1 Colour: **Black**.

.3 Basis of Design Materials:

.1 Coat and Hat Racks, Model SCR1001 by Global School Products.

.2 ASP Student Line Coat Rack by ASI Visual Display Products

3 Execution

3.1 INSTALLATION

.1 Securely fasten work level and plumb in the locations shown on the drawings and as specified herein.

.2 Co-ordinate installation with the work of Sections providing adjacent construction as required.

.3 Execute electrical work by qualified electricians and in compliance with the Canadian Electrical Code and other requirements of authorities having jurisdiction.

3.2 ADJUSTMENT

.1 Upon completion of the work or when directed, remove all traces of protective coatings or paper.

.2 Test operation, adjust, lubricate and ensure that accessories are in perfect working order.

END OF SECTION

1 General

1.1 RELATED WORK SPECIFIED ELSEWHERE

.1 Steel stud framing.

.2 Acoustic Ceilings

1.2 WORK INCLUDED

.1 Supply and install manually operated roller shades at all windows, except as noted on drawings. Provide all components as needed for a complete and proper installation.

.2 Remove and dispose of all existing window coverings and hardware.

1.3 QUALITY ASSURANCE

.1 Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specific requirements and methods needed for proper performance of the work in this Section.

1.4 SUBMITTALS

.1 Submit list of proposed materials.

.2 Submit manufacturer=s specifications, product data, and other data needed to prove compliance with the specified requirements.

.3 Shop drawings shall include sufficient detail to show fabrication, installation, anchorage, electrical and control wiring, and interface of work of this section with the work of adjacent trades. Indicate field measurements on shop drawings.

.4 Manufacturer=s recommended installation procedure. Construct one complete light proof window shade with attachments and accessories for approval by Owner which, when approved by the Owner will become the basis for accepting or rejecting actual installation procedures used on the work.

.5 Fabric to be flame retardant. Provide proof of compliance with CAN/ULC S109, Flame Tests of Flame-Resistant Fabrics and Films, small scale vertical burn requirements test.

.6 Submit fabric samples for colour selection by the Owner.

.7 Provide printed operation and maintenance instructions to Owner.

1.5 WARRANTY

.1 Provide a warranty for an extended period of **three (3) years** from date of completion against mechanical and fabric failure (including fabric fading) under normal conditions.

2 Products

2.1 WINDOW SHADES

.1 Manual shades shall be roller blind system with smooth operation chain and sprocket roller as manufactured by Shade-O-Matic Products Ltd., or pre tender approved equivalent.

.2 Provide system with easy lift (chain operated) action with infinite positioning. Left or right hand operation to be determined on site.

.3 Provide fully factory assembled shade unit consisting of two end brackets, shade tube, fascia (where specified), hem bar, drive chain and specified fabric.

.1 Mounting type: Wall mounted above frame opening, or on block opening inside but never on window frame.

.2 Removal must not require the disassembly of the shade units.

.4 End Brackets

.1 70 x 83mm end bracket shall be made of 16 gauge enameled galvanized steel capable of being mounted in any position.

.2 Clutch and bracket shall have multi-channel chain control and guide insert.

.3 The idle-end bracket shall have a means of leveling the shade after installation, the screw shall provide infinite leveling degrees.

.4 Bracket colour shall coordinate with fabric colour.

.5 Shade Tube

.1 38mm extruded anodized aluminum shade tube shall be 1.52mm thick with three internal continuous fins 4.82mm high, for strength and drive capabilities when attached to the nylon sprocket.

.2 The fins shall be spaced 120 degrees apart.

.3 The tube shall incorporate an integral channel for affixing the shade band to the tube via a spine.

.6 Fascia (Optional as noted on Drawings)

.1 Extruded anodized aluminum fascia shall be 1.7mm thick, squared design, to cover underside of assembly.

.2 Finish shall be anodized aluminum or painted baked enamel.

.7 Drive Assembly

.1 Shall be factory set for size and travel of shades.

.2 Capable of being field adjusted from the exterior of the shade unit without having to disassemble the hardware.

.3 Provide with built-in shock absorber system to prevent chain breakage, under normal usage conditions.

.8 Drive Chain

.1 No. 10 stainless steel bead chain formed in a continuous loop. Chain shall have a 90# test strength.

.9 Exterior Hembar

.1 Extruded aluminum, clear anodized, with plastic end finials. Hembar to be fully enclosed in hem and non removable.

2.2 OPAQUE FABRIC (CLASSROOMS)

.1 Sun block / duplex room darkening 12 oz fibreglass

.2 Seams, if required, shall be equally spaced vertically to form material in equal widths. Location as per drawings.

.3 Fabric shall hang flat, without buckling or distortion. Edge, when trimmed, shall hang straight, without raveling. An unguided shade cloth shall roll true and straight, without shifting sideways more than 3mm in either direction due to warp distortion or weave design.

.4 Fabric shall be woven vinyl coated polyester, dimensionally stable and flame retardant, in accordance with CAN/ULC S-109 small scale vertical burn test.

.5 Owner to choose colour when shop drawings are submitted. Colours will be selected by the Owner from the manufacturers standard collection. A minimum of 9 colour choices must be offered.

2.3 SUN SHADING FABRIC (OFFICES AND STAFF ROOMS)

.1 5% open weave flame retardant, 25% polyester / 75% vinyl on polyester.

.2 Seams, if required, shall be equally spaced vertically to form material in equal widths. Location as per drawings.

.3 Fabric shall hang flat, without buckling or distortion. Edge, when trimmed, shall hang straight, without raveling. An unguided shade cloth shall roll true and straight, without shifting sideways more than 3mm in either direction due to warp distortion or weave design.

.4 Fabric shall be woven vinyl coated polyester, dimensionally stable and flame retardant, in accordance with CAN/ULC S-109 small scale vertical burn test.

.5 Owner to choose colour when shop drawings are submitted. Colours will be selected by the Owner from the manufacturers standard collection. A minimum of 9 colour choices must be offered. (Colour to match Jackson shear weave Pebblestone)

2.4 BLACK OUT SHADES (DRAMA ROOMS AND THEATERS OR AS NOTED)

.1 Light proof shades to be 100% opaque blackout flame retardant.

.2 Seams, if required, shall be equally spaced vertically to form material in equal widths. Location as per drawings.

.3 Fabric shall hang flat, without buckling or distortion. Edge, when trimmed, shall hang straight, without raveling. An unguided shade cloth shall roll true and straight, without shifting sideways more than 3mm in either direction due to warp distortion or weave design.

.4 Fabric shall be woven vinyl coated polyester, dimensionally stable and flame retardant, in accordance with CAN/ULC S-109 small scale vertical burn test.

.5 Owner to choose colour when shop drawings are submitted. 2 Colours will be selected by the Owner from the manufacturer=s standard collection. A minimum of 9 colour choices must be offered.

3 Execution

3.1 EXISTING CONDITIONS

.1 Examine the areas and conditions under which the work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work.

.2 Remove and dispose of all existing window coverings and hardware.

3.2 INSTALLATION

.1 Co-ordinate as required with the Owner as to hours of work.

.2 Install the work of this section in strict accordance with approved Shop Drawings, pertinent requirements of Government Agencies having jurisdiction, and the manufacturer=s recommended installation procedures as approved by the Owner, anchoring all components firmly into position for long life.

.3 Install the work plumb, level and in proper operating condition.

.4 Upon completion of the installation, put each operating component through at least five complete cycles, adjust as required to achieve optimum operation.

.5 Touch up scratches and blemishes to any damaged existing finishes.

END OF SECTION

Hazardous Building Materials Assessment

Classroom Refresh
Queen Elizabeth Public School
830 Barnardo Avenue,
Peterborough, Ontario

Prepared for:

Kawartha Pine Ridge District School Board
1994 Fisher Drive, P.O. Box 719
Peterborough Ontario, K9J 7A1

March 23, 2020

Pinchin File: 268661

Issued on:	**March 23, 2020**
Pinchin File:	**268661**
Issuing Office:	**Peterborough, ON**

Author:
Bryan Guindon
Senior Project Technologist
705.313.0284
bguindon@pinchin.com

Reviewer:
Rachel Northey, EIT, B.A.Sc.
Project Manager
705.270.0720
rnorthey@pinchin.com

Reviewer:
Michael Harrett, C.E.T.
Regional Practice Leader (Ontario), Hazardous Materials
613.541.1013 ext. 1601
mharrett@pinchin.com

EXECUTIVE SUMMARY

Kawartha Pine Ridge District School Board (Client) retained Pinchin Ltd. (Pinchin) to conduct a hazardous building materials assessment at 830 Barnardo Avenue, Peterborough, Ontario. Pinchin performed the assessment on December 18, 2019.

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 and performance specification.

The assessed area was limited to Classrooms 107, 108, 110, 111, 114, 115, 116 and tunnel beneath corridor 116H, as shown on the drawing in Appendix I.

SUMMARY OF FINDINGS

Asbestos: Asbestos-containing materials (ACM) are present as follows:

- Parging cement insulation, containing chrysotile asbestos, present on fittings of hot water heating system pipes, and as debris in the tunnel below Corridor 116H.
- Aircell pipe insulation, containing chrysotile asbestos, on hot water heating system pipes, and as debris, in the tunnel below Corridor 116H.
- Adhesive securing 12” wood fibre tiles is presumed to contain asbestos, unless sampled, present in Classrooms 107, 108, 110 and 111.
- Transite 1’ x 1’ uniform hole patterned screwed-on ceiling panels, presumed to contain asbestos, present in Classrooms 107, 108, 110 and 111.
- Green chalkboards, presumed to contain asbestos, within Classrooms 110 and 111.
- Floor mastic containing asbestos adhering 12” x 12” floor tiles in classroom 115.
- Caulking, containing chrysotile asbestos, present in various colours and applications, throughout the assessed area.
- Black sink mastic, containing chrysotile asbestos, in Classrooms 114, 115 and 116 in good condition.

Lead: Lead is present as follows:

- Light beige paint on concrete block walls in Classrooms 114, 115 and 116 in good condition.
- Batteries of emergency lights.

Silica: Crystalline silica is present in concrete, mortar and masonry.

Mercury: Mercury vapour is present in light tubes.

Polychlorinated Biphenyls (PCBs): Based visual observation, the light ballasts do not contain PCBs.

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. Prepare specifications for the hazardous material removal required for the planned work.
2. Do not disturb suspected hazardous building materials discovered during the planned work, which have not been identified in this report. Notify Pinchin immediately to conduct further testing.
3. Remove and dispose of asbestos-containing materials if disturbed by the planned renovation work.
4. Recycle mercury-containing light tubes when removed from service.
5. Follow appropriate safe work procedures when handling or disturbing silica and lead.

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.

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION AND SCOPE

Kawartha Pine Ridge District School Board (Client) retained Pinchin Ltd. (Pinchin) to conduct a hazardous building materials assessment at 830 Barnardo Avenue, Peterborough, Ontario.

Adam Heizer and Bryan Guindon performed the assessment on December 18, 2019. 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. This assessment is intended to be used for pre-construction purposes only, and may not provide sufficient detail for long term management of hazardous materials as required by Health and Safety regulations. The results of this assessment are intended for use with a properly developed scope of work and performance specification.

1.1 Scope of Assessment

The assessment was performed to establish the location and type of specified hazardous building materials incorporated in the structure and its finishes. The assessed area was limited to the parts of the building within the area to be renovated. This includes Classrooms 107, 108, 110, 111, 114, 115, 116 and tunnel beneath corridor 116H. The extent of the assessed area was defined by the Client and is shown on the appended drawing.

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 BACKGROUND INFORMATION

2.1 Building Description

Description Item	Details
Use	Elementary School.
Number of Floors	Two storeys plus one below grade.
Total Area	The total area of the building is 31,240 square feet. The assessed area is 5,600 square feet.
Year of Construction	The building was constructed in 1954 with additions in 1957 and 1967. The assessed areas are located in the 1954 and 1957 phases of construction.
Structure	Structural steel and concrete.
Exterior Cladding	Brick.
HVAC	Boiler and hot water heating to radiators.
Roof	Not assessed
Flooring	Vinyl floor tiles and concrete.
Interior Walls	Concrete masonry block, 12” x 12” wood fibre ceiling tile, and wallboard.
Ceilings	12” x 12” wood fibre ceiling tile

2.2 Existing Reports

Pinchin has conducted multiple asbestos management assessments of the building as described, most recently, by the following report:

- “Asbestos Assessment, Queen Elizabeth Public School, 830 Barnardo Avenue, Peterborough, Ontario”, dated June 4, 2018, Pinchin File 217434.
- “Annual Reassessment Letter, Queen Elizabeth Public School, 830 Barnardo Avenue, Peterborough, Ontario” dated June 21, 2019, Pinchin File 228510.

3.0 FINDINGS

The following section summarizes the findings of the assessment and provides a general description of the hazardous materials identified and their locations.

3.1 Asbestos

3.1.1 Suspect Building Materials Not Found

The following types of building materials may historically contain asbestos but were not observed in the assessed area and are not discussed in the report findings:

- Spray-applied insulations (fireproofing, thermal or acoustic)
- Texture finishes (decorative)
- Acoustic ceiling tiles
- Plaster and Stucco
- Drywall joint compound
- Vinyl sheet flooring

3.1.2 Pipe Insulation

Parging cement, containing chrysotile asbestos, is present on pipe fittings on hot water heating pipes (samples 1102647.003A) in the tunnel beneath Corridor 116H. Parging cement is a friable insulation, jacketed with canvas and is in good to poor condition. Parging cement debris is present on dirt floor at various locations in the tunnel.

A white corrugated paper insulation (commonly referred to by the trade name Aircell), containing chrysotile asbestos, is present on straight sections of hot water heating system pipes (samples 1102647.007A) in the tunnel beneath Corridor 116H. Aircell is a friable insulation, jacketed with canvas and is in good to poor condition. Aircell pipe debris is present on dirt floor at various locations in the tunnel.

All remaining pipes are insulated with fibreglass, or uninsulated.

Pipe System, Type	Location Name	Asbestos Type	Total Quantity	Quantity Damaged
Hot water heating Aircell and debris	Tunnel beneath Corridor 116H	Chrysotile	300LF	250 SF of debris mixed in dirt floor within the tunnel

Pipe System, Type	Location Name	Asbestos Type	Total Quantity	Quantity Damaged
Hot water heating parging cement and debris	Tunnel beneath Corridor 116H	Chrysotile	40 EA	40 SF of debris present on floor of the tunnel

Asbestos-containing Aircell pipe insulation in the tunnel beneath corridor 116H.

Asbestos-containing parging cement pipe insulation on hot water pipe fittings in the tunnel beneath corridor 116H.

Asbestos-containing Aircell pipe insulation debris present on the dirt floor in tunnel.

Asbestos-containing parging cement and Aircell debris on the tunnel dirt floor.

View of fibreglass insulation on pipes in Classroom 107.

3.1.3 Duct Insulation and Mastic

Ducts are uninsulated.

3.1.4 Mechanical Equipment Insulation

Mechanical equipment was not found in the assessed area.

3.1.5 Vermiculite

Loose fill vermiculite debris was not observed in the spaces or areas inspected. Destructive drilling was performed in block walls in Classrooms 107; 108; 110; 114; 115 and 116.

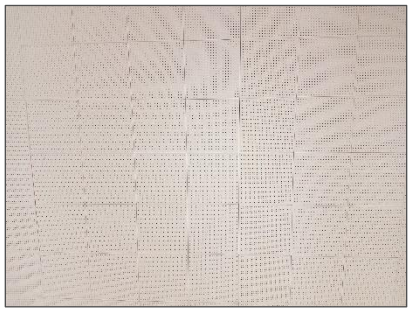
3.1.6 Acoustic Ceiling Tiles

Acoustic ceiling tiles are present in the assessed area, as follows:

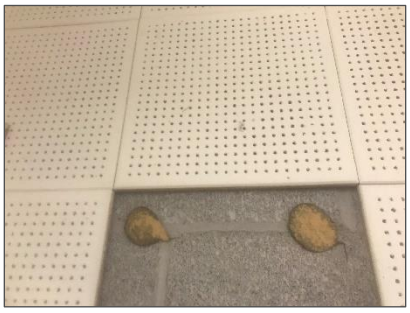
Size, Type, Pattern	Locations	Sample Number or Date Code	Asbestos Type
12” x 12”, glued-on, wood fibre, pinhole	Classrooms 107 (600 SF), 108 (600 SF), 110 (600 SF) and 111 (600 SF)	None	Tiles – None Mastic - Presumed
12” x 12”, glued-on wall mounted tiles, wood fibre, pinhole	Classrooms 114, 115 and 116	S023A-C	None detected

The adhesive present on the substrate and backside of the glued-on ceiling tiles present as wall finish in Classrooms 114, 115 and 116 does not contain asbestos (samples 0023A-C).

The adhesive securing the 12” x 12” wood fibre ceiling tiles was not accessible due to the occupancy, and was not sampled, and is presumed to contain asbestos until sampled.



Non-asbestos, 12” x 12”, glued-on, wood fibre ceiling tiles with pinholes, with presumed asbestos-containing.



Non-asbestos, brown adhesive for wall mounted 12” x 12”, glued-on, wood fibre tiles with pinholes.

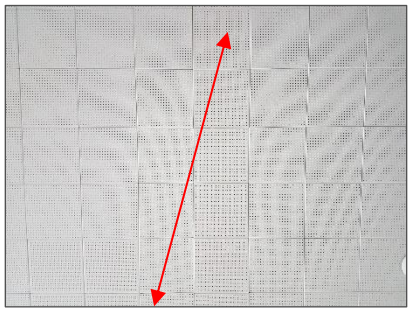
3.1.7 Drywall Joint Compound

Drywall joint compound present on the east wall of Classroom 107 does not contain asbestos (samples 0019A-C).

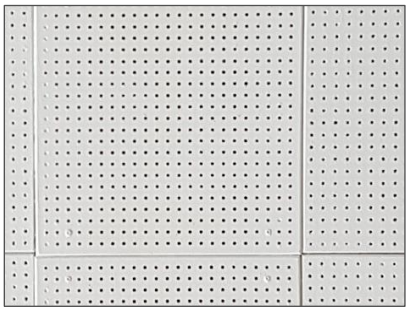
3.1.8 Asbestos Cement Products (Transite)

Transite board, presumed to contain asbestos based on visual observation, is present as screwed on 12” x 12” ceiling panels with uniform pinhole pattern in Classrooms 107, 108, 110 and 111. The Transite ceiling panels are screwed into the ceiling and run the full length of the rooms in two rows. There is approximately 100 square feet of Transite ceiling tiles in each Classroom. Transite is non-friable and is in good condition.

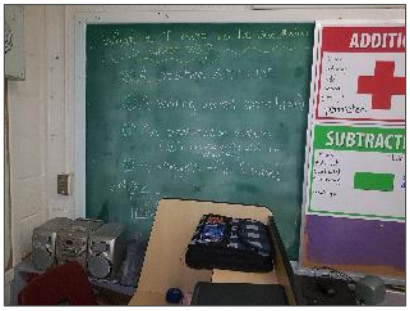
Transite board, presumed to contain asbestos based on visual observation, is present as chalkboards in Classrooms 110 and 111. There is approximately 32 square feet of chalkboard present in each Classroom.



Two rows of asbestos-containing Transite ceiling panels in Classrooms 107, 108, 110 and 111.



Presumed asbestos-containing Transite ceiling panels.



Presumed asbestos-containing Transite chalkboard.

3.1.9 Vinyl Floor Tiles

Vinyl floor tiles are present as follows:

Size, Pattern, Colour	Locations	Sample Number	Asbestos Type (tile)	Asbestos Type (mastic)
12” x 12”, white with grey splotch	Classrooms 107, 108, 110 and 111	Newly installed	None	Presumed

Size, Pattern, Colour	Locations	Sample Number	Asbestos Type (tile)	Asbestos Type (mastic)
12” x 12”, brown splotch	Classrooms 114, and 116	Newly installed	None	Presumed
12” x 12”, white with fine black streak	**Classroom 115 (800 SF)**	**1102647-10A-C**	**None***	**Chrysotile**

*The vinyl floor tiles in Classroom 115 are considered asbestos-containing due to the mastic adhering to the floor tiles. Floor tile and mastic are non-friable and are in good condition.

Vinyl floor tiles were presumed to be non-asbestos based on historical knowledge of the date of installation, post 2005.

Rubber baseboard adhesive located in Classrooms 107, 108, 110 and 111 does not contain asbestos (Samples 0016A-C).

Rubber baseboard adhesive located in Classrooms 114, 115, 110 and 116 does not contain asbestos (Samples 0025A-C).

Non-asbestos, 12” x 12” white with grey splotch vinyl floor tile.

Non-asbestos, 12” x 12” brown splotch vinyl floor tile.

12" x 12" white with fine black streak pattern, vinyl floor tile with **asbestos-containing** mastic, present in Classroom 115.

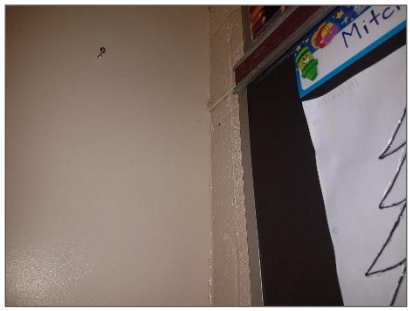
Baseboard with non-asbestos adhesive.

3.1.10 Sealants, Caulking, and Putty

The following table presents a summary of caulking, sealants and putties present:

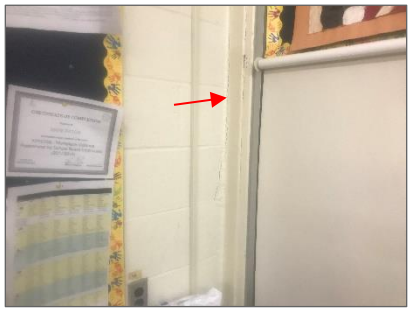
Material and Colour	Location	Quantity	Sample Number	Asbestos Type
Caulking, white	Around drywall by end sink counter of Classroom 107	60 LF	0017A-C	None detected
Caulking, brown	**Cementitious caulking around bookshelf in Classroom 110**	**20 LF**	**0020A-C**	**Chrysotile**
Caulking, grey	**Joint caulking in exterior walls of Classrooms 114, 115 and 116**	**90 LF**	**0022A-C**	**Chrysotile**
Caulking, grey	Window caulking in Classrooms 114, 115 and 116	210 LF	0024A-C	None
Caulking, dark grey	**Cementitious caulking between wood strips and exterior concrete wall column in Classrooms 114, 115 and 116**	**240 LF**	**0026 A-C**	**Chrysotile**
Caulking, grey	**Around both sides of door frames in Classrooms 114, 115 and 116**	**102 LF**	**0027A-C**	**Chrysotile**

Caulking is a non-friable material and in good condition.



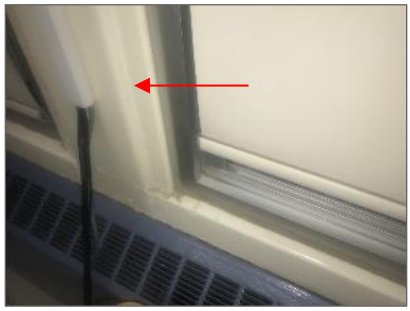
Non-asbestos white caulking on drywall in Classroom 107.

Asbestos-containing brown cementitious caulking around bookshelf Classroom 110.



Asbestos-containing grey joint caulking on exterior wall.

Non-asbestos grey caulking around windows.



Asbestos-containing dark grey cementitious caulking between wood strips and exterior concrete wall column.

Asbestos-containing grey door frame caulking.

3.1.11 Other Building Materials

Black mastic, containing chrysotile asbestos, is present on the underside of the sinks in Classrooms 114, 115 and 116 (samples 0021A-C). Mastic is non-friable and is in good condition.

Grey/white mastic on the underside of sinks in Classrooms 107, 108, 110 and 111 does not contain asbestos (samples 0018A-C).

Asbestos-containing black mastic on the underside of sinks.

Non-asbestos grey / white sink mastic.

3.1.12 Presumed Asbestos Materials

The methodology identifies a list of materials which may contain asbestos, which were not to be sampled, based on limitations of the scope. The following is a list of materials which may contain asbestos, which were not observed during the assessment, but based on site conditions may be present. If determined to be present during building renovation, these materials are presumed to contain asbestos until otherwise proven by sampling and analysis:

- Floor levelling compound
- Electrical components
- Fibre-reinforced paints and coatings
- Vibration dampers on HVAC equipment
- Materials concealed or outside the assessed area

3.2 Lead

3.2.1 Paints and Surface Coatings

The following table summarizes the analytical results for paints sampled and locations.

Sample Number	Colour, Substrate Description	Location	Lead (%)
L01	Dark beige paint on block walls	Classrooms 107, 108, 110 and 111	0.048
L02	Beige paint on wooden shelf and closet	Classroom 107	<0.0069
L03	Brown paint on steel door and doorframe	Classrooms 107, 108, 110 and 111	<0.0061
L04	Beige paint on steel radiator	Classrooms 107, 110 and 111	0.020

Sample Number	Colour, Substrate Description	Location	Lead (%)
L05	Orange paint on wooden half wall coat rack	Classroom 108	<0.0068
L06	White paint on wooden bookshelf	Classroom 108	0.018
L07	Grey paint on steel radiator	Classroom 108	0.018
L08	Grey paint on wooden bookshelf	Classroom 110	<0.0070
L09	**Light beige paint on block walls**	**Classrooms 114, 115 and 116**	**47%**
L10	Blue paint on steel radiator covers	Classrooms 114 and 116	0.011
L11	Dark brown paint on steel door and doorframes	Classrooms 114, 115 and 116	<0.0052
L12	Blue paint on steel radiator covers	Classroom 115	0.020

Results above 0.1% are considered elevated (i.e., greater than the EACO guideline of 0.1% for lead-containing paints). All paints determined to be elevated were found to be in good condition and not flaking, peeling or delaminating.

Photo 17 – Light beige paint on block wall containing elevated levels of lead.

3.2.2 Lead Products and Applications

Lead-containing batteries are present in emergency lighting.

3.2.3 Presumed Lead Materials

Lead may be present in a number of materials which were not assessed and/or sampled. The following materials, where found, should be considered to contain lead:

- Electrical components, including wiring connectors, grounding conductors, and solder

3.3 Silica

Crystalline silica is a presumed component of the following materials:

- Poured or pre-cast concrete
- Masonry and mortar

3.4 Mercury

3.4.1 Lamps

Mercury vapour is present in fluorescent lamps.

3.4.2 Mercury-Containing Devices

Mercury-containing devices were not found during the assessment.

3.5 Polychlorinated Biphenyls

3.5.1 Lighting Ballasts

Based on visual observations (evidence of T-8 fixtures) the building has been comprehensively re-lamped and will not contain PCB ballasts.

3.5.2 Transformers

Transformers were not found during the assessment.

3.6 Mould and Water Damage

Visible mould growth and water damage was not found during the assessment.

4.0 RECOMMENDATIONS

4.1 General

1. Prepare plans and performance specifications for hazardous material removal required for the planned work. The specifications should include the scope of work, 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 inform Pinchin immediately to conduct further testing.
3. Provide this report and the detailed plans and specifications to the contractor prior to bidding or commencing work.

4. Retain a qualified consultant to specify, inspect and verify the successful removal of hazardous materials.
5. Update the asbestos inventory upon completion of the abatement and removal of asbestos-containing materials.

4.2 Building Renovation Work

The following recommendations are made regarding renovation involving the hazardous materials identified.

4.2.1 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.

4.2.2 Lead

For paints identified as having elevated levels of lead (i.e., greater than the EACO guideline of 0.1% for lead-containing paints), construction disturbance may result in over-exposure to lead dust or fumes. The need for work procedures, engineering controls and personal protective equipment should be assessed on a site specific basis to comply with provincial standards or guidelines. Performing an exposure assessment during work that disturbs lead in paints and coatings may be able to reduce the use of some of these precautions.

4.2.3 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 provincial standards or guidelines.

4.2.4 Mercury

Do not break lamps or separate liquid mercury from components. 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 local regulations.

4.3.6 PCBs

When light fixtures are removed, 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.

5.0 TERMS AND LIMITATIONS

The work performed by Pinchin was conducted in accordance with generally accepted engineering or scientific practices current in this geographical area at the time the work was performed. Client acknowledges that risks arise from subsurface and hidden conditions that even comprehensive testing and analysis may fail to detect and that actual conditions may differ from those inferred from inspection, testing and analysis. Pinchin can only comment on the conditions observed on the date(s) the assessment was performed. The work is limited to those materials or areas of concern identified by the Client or outlined in our proposal. Other areas of concern may exist but were not investigated within the scope of this assignment.

Pinchin makes no representations or warranties whatsoever, either expressed or implied, as to its findings, recommendations, plans, specifications or professional advice and including concerning the legal significance of its findings, or as to other legal matters touched on in the report, including but not limited to ownership of any property or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretations and these interpretations may change over time and Pinchin undertakes no, and expressly disclaims, any obligation to advise Client of such change.

Pinchin will not be responsible for any consequential, incidental or indirect damages, including but not limited to financial losses, credit and property transactions, financing costs, property values, loss of profit or revenue, permitting/licensing issues, follow-up actions and costs. Pinchin will only be liable for direct damages resulting from negligence and/or breach of contract of Pinchin. Pinchin will not be liable for any losses or damage if Client has failed, within a period of two (2) years following the date upon which the claim is discovered, to commence legal proceedings against Pinchin to recover such losses or damage (“Claim Period”).

In the event of any claim of any nature whatsoever by Client against Pinchin, its staff, officers, directors, shareholders, agents, contractors and subcontractors (collectively “Pinchin”), including but not limited to claims based on negligence and/or breach of contract, the total aggregate liability of Pinchin shall be limited to the lesser of: (i) any actual damages incurred by the client. (ii) all fees actually paid by Client to Pinchin in connection with the specific project in respect of which the claim is being made.

Information provided by Pinchin is intended for Client use only. Pinchin will not provide results or information to any party other than Client, unless Client, in writing, requests information to be provided to a third party or unless disclosure by Pinchin is required by law. Unless consented to by Pinchin, which consent may be unreasonably and/or arbitrarily withheld, 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 by any party.

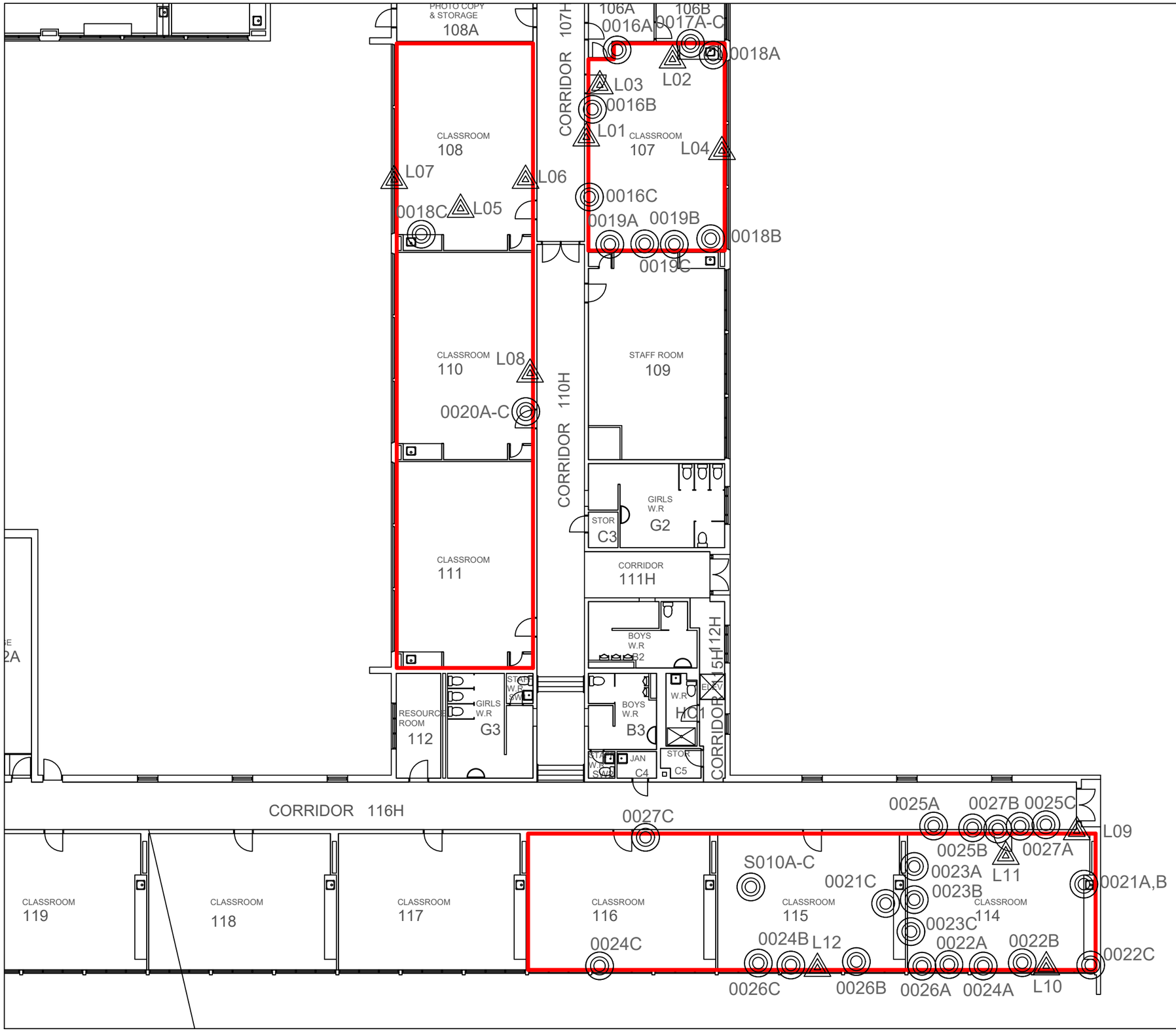
6.0 REFERENCES

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 Ontario (EACO) Lead Guideline for Construction, Renovation, Maintenance or Repair, October 2014.
5. Ministry of the Environment Regulation, R.R.O. 1990 Reg. 347 as amended.
6. Surface Coating Materials Regulations, SOR/2016-193, Hazardous Products Act.
7. Silica on Construction Projects, Ministry of Labour Guidance Document.
8. Alert – Mould in Workplace Buildings, Ontario Ministry of Labour.

APPENDIX I

Drawing



PINCHIN

LEGEND:

- SURVEY BOUNDARY/ASSESSED AREA
- ASBESTOS BULK SAMPLE
- LEAD BULK SAMPLE

CLIENT:
KAWARTHA PINE RIDGE DISTRICT SCHOOL BOARD

LOCATION:
QUEEN ELIZABETH PUBLIC SCHOOL
830 BARNARDO AVENUE,
PETERBOROUGH, ONTARIO

TITLE:
HAZARDOUS BUILDING MATERIALS ASSESSMENT
GROUND FLOOR

DATE:	PROJECT # :
2019/12/30	268661
DRAWN BY: AH	DRAWING: 1 OF 1
CHECKED BY: CF	
SCALE: NTS	

APPENDIX II-A

Asbestos Analytical Certificates

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020

NVLAP Lab Code: 200664-0

Customer: Pinchin Environmental Ltd
380 Armour Rd Suite 101
Peterborough, ON K9H 7L7

Attn: Tiffany Smith

Project: KPRDSB - Queen Elizabeth PS

Lab Order ID: 1102647
Analysis ID: 1102647PLM
Date Received: 3/3/2011
Date Reported: 3/10/2011

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes / Treatment
S001A	Texture Coat - Exterior	None Detected		100% Other	Yellow, White, Gray Non Fibrous Heterogeneous
1102647PLM_1					Crushed
S001B	Texture Coat - Exterior	None Detected		100% Other	Yellow, White, Gray Non Fibrous Heterogeneous
1102647PLM_2					Crushed
S001C	Texture Coat - Exterior	None Detected		100% Other	Yellow, White, Gray Non Fibrous Heterogeneous
1102647PLM_3					Crushed
S002A - A	Plaster - Corridor 103H	None Detected		100% Other	Yellow, White Non Fibrous Heterogeneous
1102647PLM_4	*finish*				Crushed
S002A - B	Plaster - Corridor 103H	None Detected		100% Other	Gray Non Fibrous Heterogeneous
1102647PLM_47	*base*				Crushed
S002B - A	Plaster - Corridor 204H	None Detected		100% Other	Yellow, White Non Fibrous Heterogeneous
1102647PLM_5	*finish*				Crushed
S002B - B	Plaster - Corridor 204H	None Detected		100% Other	Gray Non Fibrous Heterogeneous
1102647PLM_48	*base*				Crushed
S002C - A	Plaster - Room 206	None Detected		100% Other	White Non Fibrous Heterogeneous
1102647PLM_6	*finish*				Crushed

Sharon Donald (59)

Analyst

Nathaniel Durham, MS or Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020

NVLAP Lab Code: 200664-0

Customer: Pinchin Environmental Ltd
380 Armour Rd Suite 101
Peterborough, ON K9H 7L7

Attn: Tiffany Smith

Project: KPRDSB - Queen Elizabeth PS

Lab Order ID: 1102647
Analysis ID: 1102647PLM
Date Received: 3/3/2011
Date Reported: 3/10/2011

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes / Treatment
S002C - B	Plaster - Room 206	**None Detected**		**100%** **Other**	Gray Non Fibrous Heterogeneous
1102647PLM_49	*base*				Crushed
S002D - A	Plaster - Storage Room 108A	**None Detected**		**100%** **Other**	Yellow, White Non Fibrous Heterogeneous
1102647PLM_7	*finish*				Crushed
S002D - B	Plaster - Storage Room 108A	**None Detected**		**90%** **Other** **10%** **Perlite**	Gray Non Fibrous Heterogeneous
1102647PLM_50	*base*				Crushed
S002E - A	Plaster - Corridor 110H	**None Detected**		**100%** **Other**	Yellow, White Non Fibrous Heterogeneous
1102647PLM_8	*finish*				Crushed
S002E - B	Plaster - Corridor 110H	**None Detected**		**90%** **Other** **10%** **Perlite**	Gray Non Fibrous Heterogeneous
1102647PLM_51	*base*				Crushed
S002F - A	Plaster - Corridor 112H	**None Detected**		**100%** **Other**	Yellow, White Non Fibrous Heterogeneous
1102647PLM_9	*finish*				Crushed
S002F - B	Plaster - Corridor 112H	**None Detected**		**90%** **Other** **10%** **Perlite**	Gray Non Fibrous Heterogeneous
1102647PLM_52	*base*				Crushed
S002G - A	Plaster - Corridor 112H	**None Detected**		**100%** **Other**	Yellow, White Non Fibrous Heterogeneous
1102647PLM_10	*finish*				Crushed

Sharon Donald (59)

Analyst

Nathaniel Durham, MS or Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020

NVLAP Lab Code: 200664-0

Customer: Pinchin Environmental Ltd
380 Armour Rd Suite 101
Peterborough, ON K9H 7L7

Attn: Tiffany Smith

Lab Order ID: 1102647
Analysis ID: 1102647PLM
Date Received: 3/3/2011
Date Reported: 3/10/2011

Project: KPRDSB - Queen Elizabeth PS

Sample ID *Lab Sample ID*	Description *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes Treatment
S002G - B *1102647PLM_53*	Plaster - Corridor 112H *base*	**None Detected**		**100% Other**	Gray Non Fibrous Heterogeneous Crushed
S003A *1102647PLM_11*	Parging Cement - Custodian Room C2 (Loc. 4)	**30% Chrysotile**		**70% Other**	Gray Fibrous Heterogeneous Dissolved, Teased
S003B *1102647PLM_12*	Parging Cement - Custodian Room C2 (Loc. 4)	**Not Analyzed**			
S003C *1102647PLM_13*	Parging Cement - Custodian Room C2 (Loc. 4)	**Not Analyzed**			
S004A *1102647PLM_14*	Texture Coat - Washrooms B2	**None Detected**		**100% Other**	Yellow, White, Gray Non Fibrous Heterogeneous Crushed
S004B *1102647PLM_15*	Texture Coat - Corridor 112H	**None Detected**		**100% Other**	Yellow, White, Gray Non Fibrous Heterogeneous Crushed
S004C *1102647PLM_16*	Texture Coat - Washrooms G2	**None Detected**		**100% Other**	Yellow, White, Gray Non Fibrous Heterogeneous Crushed
S004D *1102647PLM_17*	Texture Coat - Washrooms G2	**None Detected**		**100% Other**	Yellow, White, Gray Non Fibrous Heterogeneous Crushed

Sharon Donald (59)

Analyst

Nathaniel Durham, MS or Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020

NVLAP Lab Code: 200664-0

Customer: Pinchin Environmental Ltd
380 Armour Rd Suite 101
Peterborough, ON K9H 7L7

Attn: Tiffany Smith

Lab Order ID: 1102647
Analysis ID: 1102647PLM
Date Received: 3/3/2011
Date Reported: 3/10/2011

Project: KPRDSB - Queen Elizabeth PS

Sample ID *Lab Sample ID*	Description *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes Treatment
S004E	Texture Coat - Washrooms G1	None Detected		100% Other	Yellow, White, Gray Non Fibrous Heterogeneous
1102647PLM_18					Crushed
S004F	Texture Coat - Washrooms B1	None Detected		100% Other	Yellow, White, Gray Non Fibrous Heterogeneous
1102647PLM_19					Crushed
S004G	Texture Coat - Washrooms B1	None Detected		100% Other	Yellow, White, Gray Non Fibrous Heterogeneous
1102647PLM_20					Crushed
S005A	AT01 - 2 x 4 Pinhole swirl pattern - Corridor 103H	None Detected	60% Mineral Wool 30% Cellulose	10% Other	White Fibrous Heterogeneous
1102647PLM_21					Teased
S005B	AT01 - 2 x 4 Pinhole swirl pattern - Corridor 103H	None Detected	60% Mineral Wool 30% Cellulose	10% Other	White Fibrous Heterogeneous
1102647PLM_22					Teased
S005C	AT01 - 2 x 4 Pinhole swirl pattern - Corridor 103H	None Detected	60% Mineral Wool 30% Cellulose	10% Other	White Fibrous Heterogeneous
1102647PLM_23					Teased
S006A	Drywall compound - Handicap Elevator Corridor 112H	None Detected		100% Other	White Non Fibrous Homogeneous
1102647PLM_24					Crushed
S006B	Drywall compound - Handicap Elevator Corridor 112H	None Detected		100% Other	White Non Fibrous Homogeneous
1102647PLM_25					Crushed

Sharon Donald (59)

Analyst

Nathaniel Durham, MS or Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020

NVLAP Lab Code: 200664-0

Customer: Pinchin Environmental Ltd
380 Armour Rd Suite 101
Peterborough, ON K9H 7L7

Attn: Tiffany Smith

Project: KPRDSB - Queen Elizabeth PS

Lab Order ID: 1102647
Analysis ID: 1102647PLM
Date Received: 3/3/2011
Date Reported: 3/10/2011

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes / Treatment
S006C	Drywall compound - Handicap Elevator Corridor 112H	**None Detected**		**100% Other**	White Non Fibrous Homogeneous
1102647PLM_26					Crushed
S006D	Drywall compound - Boys Washroom B2 (Loc. 43)	**None Detected**		**100% Other**	White Non Fibrous Homogeneous
1102647PLM_27					Crushed
S006E	Drywall compound - Boys Washroom B2 (Loc. 43)	**None Detected**		**100% Other**	White Non Fibrous Homogeneous
1102647PLM_28					Crushed
S007A	Aircell - Custodian Room C2 (Loc 4)	**55% Chrysotile**	**30% Cellulose**	**15% Other**	White Fibrous Heterogeneous
1102647PLM_29					Teased
S007B	Aircell - Custodian Room C2 (Loc 4)	**Not Analyzed**			
1102647PLM_30					
S007C	Aircell - Custodian Room C2 (Loc 4)	**Not Analyzed**			
1102647PLM_31					
S008A	AT04 - 2 x 4 Ridges with medium size pinhole - Library 104	**None Detected**	**50% Cellulose** **30% Mineral Wool**	**10% Perlite** **10% Other**	White, Gray Fibrous Heterogeneous
1102647PLM_32					Teased
S008B	AT04 - 2 x 4 Ridges with medium size pinhole - Library 104	**None Detected**	**50% Cellulose** **30% Mineral Wool**	**10% Perlite** **10% Other**	White, Gray Fibrous Heterogeneous
1102647PLM_33					Teased

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommended 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%.

Sharon Donald (59)

Analyst

Nathaniel Durham, MS or Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020

NVLAP Lab Code: 200664-0

Customer: Pinchin Environmental Ltd
380 Armour Rd Suite 101
Peterborough, ON K9H 7L7

Attn: Tiffany Smith

Project: KPRDSB - Queen Elizabeth PS

Lab Order ID: 1102647
Analysis ID: 1102647PLM
Date Received: 3/3/2011
Date Reported: 3/10/2011

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes / Treatment
S008C	AT04 - 2 x 4 Ridges with medium size pinhole - Library 104	**None Detected**	**50% Cellulose** **30% Mineral Wool**	**10% Perlite** **10% Other**	White, Gray Fibrous Heterogeneous
1102647PLM_34					Teased
S009A	AT07 - Pinhole - Corridor 116H (Loc 49)	**None Detected**	**50% Cellulose** **30% Mineral Wool**	**10% Perlite** **10% Other**	White, Gray Fibrous Heterogeneous
1102647PLM_35					Teased
S009B	AT07 - Pinhole - Corridor 116H (Loc 49)	**None Detected**	**50% Cellulose** **30% Mineral Wool**	**10% Perlite** **10% Other**	White, Gray Fibrous Heterogeneous
1102647PLM_36					Teased
S009C	AT07 - Pinhole - Corridor 116H (Loc 49)	**None Detected**	**50% Cellulose** **30% Mineral Wool**	**10% Perlite** **10% Other**	White, Gray Fibrous Heterogeneous
1102647PLM_37					Teased
S010A - A	Vinyl floor tile - 12 x 12 White with black streaks - Classroom 115 *tile*	**None Detected**		**100% Other**	Black, White Non Fibrous Heterogeneous
1102647PLM_38					Dissolved
S010A - B	Vinyl floor tile - 12 x 12 White with black streaks - Classroom 115 *mixed mastics*	**4% Chrysotile**		**96% Other**	Yellow, Black Non Fibrous Heterogeneous
1102647PLM_54					Dissolved
S010B - A	Vinyl floor tile - 12 x 12 White with black streaks - Classroom 115 *tile*	**None Detected**		**100% Other**	Black, White Non Fibrous Heterogeneous
1102647PLM_39					Dissolved
S010B - B	Vinyl floor tile - 12 x 12 White with black streaks - Classroom 115 *mixed mastics*	**Not Analyzed**			
1102647PLM_55					

Sharon Donald (59)

Analyst

Nathaniel Durham, MS or Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020

NVLAP Lab Code: 200664-0

Customer: Pinchin Environmental Ltd
380 Armour Rd Suite 101
Peterborough, ON K9H 7L7

Attn: Tiffany Smith

Lab Order ID: 1102647
Analysis ID: 1102647PLM
Date Received: 3/3/2011
Date Reported: 3/10/2011

Project: KPRDSB - Queen Elizabeth PS

Sample ID *Lab Sample ID*	Description *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes Treatment
S010C - A *1102647PLM_40*	Vinyl floor tile - 12 x 12 White with black streaks - Classroom 115 *tile*	**None Detected**		**100% Other**	Black, White Non Fibrous Heterogeneous Dissolved
S010C - B *1102647PLM_56*	Vinyl floor tile - 12 x 12 White with black streaks - Classroom 115 *mixed mastics*	**Not Analyzed**			
S011A - A *1102647PLM_41*	Vinyl floor tile - 12 x 12 White with navy blue streaks - Storage Room 123 *tile*	**3% Chrysotile**		**97% Other**	White Non Fibrous Heterogeneous Dissolved
S011A - B *1102647PLM_57*	Vinyl floor tile - 12 x 12 White with navy blue streaks - Storage Room 123 *mastic*	**None Detected**	**3% Cellulose**	**97% Other**	Black Non Fibrous Homogeneous Dissolved
S011B - A *1102647PLM_42*	Vinyl floor tile - 12 x 12 White with navy blue streaks - Storage Room 123 *tile*	**Not Analyzed**			
S011B - B *1102647PLM_58*	Vinyl floor tile - 12 x 12 White with navy blue streaks - Storage Room 123 *mastic*	**None Detected**	**3% Cellulose**	**97% Other**	Black Non Fibrous Homogeneous Dissolved
S011C - A *1102647PLM_43*	Vinyl floor tile - 12 x 12 White with navy blue streaks - Storage Room 123 *tile*	**Not Analyzed**			
S011C - B *1102647PLM_59*	Vinyl floor tile - 12 x 12 White with navy blue streaks - Storage Room 123 *mastic*	**None Detected**	**3% Cellulose**	**97% Other**	Black Non Fibrous Homogeneous Dissolved

Sharon Donald (59)

Analyst

Nathaniel Durham, MS or Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020

NVLAP Lab Code: 200664-0

Customer: Pinchin Environmental Ltd
380 Armour Rd Suite 101
Peterborough, ON K9H 7L7

Attn: Tiffany Smith

Project: KPRDSB - Queen Elizabeth PS

Lab Order ID: 1102647
Analysis ID: 1102647PLM
Date Received: 3/3/2011
Date Reported: 3/10/2011

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes / Treatment
S012A	AT08 - 2 x 2 Slashes with bundled pinhole - Storage Room 123 (Loc 63)	**None Detected**	**60% Mineral Wool** **30% Cellulose**	**10% Other**	White, Gray Fibrous Heterogeneous
1102647PLM_44					Teased
S012B	AT08 - 2 x 2 Slashes with bundled pinhole - Storage Room 123 (Loc 63)	**None Detected**	**60% Mineral Wool** **30% Cellulose**	**10% Other**	White, Gray Fibrous Heterogeneous
1102647PLM_45					Teased
S012C	AT08 - 2 x 2 Slashes with bundled pinhole - Storage Room 123 (Loc 63)	**None Detected**	**60% Mineral Wool** **30% Cellulose**	**10% Other**	White, Gray Fibrous Heterogeneous
1102647PLM_46					Teased

Sharon Donald (59)

Analyst

Nathaniel Durham, MS or Approved Signatory

1102647

Client:	Pinchin Environmental Ltd.
Contact:	Tiffany Smith
Address:	380 Armour Rd., Suite 101
Phone:	(7050 748-4627
Fax:	(705) 748-6927
Email:	tsmith@pinchin.com
Project:	KPRDSB - Queen Elizabeth PS
Client Notes:	Stop on positive
P.O. #:	59723
Date Submitted:	3/1/2011 0:00
Analysis:	Asbestos analysis
Turn Around Time:	144 Hours +

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"

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
<<			
S001A		Texture Coat - Exterior	
S001B		Texture Coat - Exterior	
S001C		Texture Coat - Exterior	
S002A		Plaster - Corridor 103H	
S002B		Plaster - Corridor 204H	
S002C		Plaster - Room 206	
S002D		Plaster - Storage Room 108A	
S002E		Plaster - Corridor 110H	
S002F		Plaster - Corridor 112H	
S002G		Plaster - Corridor 112H	
S003A		Parging Cement - Custodian Room C2 (Loc. 4)	
S003B		Parging Cement - Custodian Room C2 (Loc. 4)	
S003C		Parging Cement - Custodian Room C2 (Loc. 4)	
S004A		Texture Coat - Washrooms B2	
S004B		Texture Coat - Corridor 112H	
S004C		Texture Coat - Washrooms G2	
S004D		Texture Coat - Washrooms G2	
S004E		Texture Coat - Washrooms G1	

Accepted ☑

Rejected ☐

3/3@10AM

1102647

S004F	Texture Coat - Washrooms B1
S004G	Texture Coat - Washrooms B1
S005A	AT01 - 2 x 4 Pinhole swirl pattern - Corridor 103H
S005B	AT01 - 2 x 4 Pinhole swirl pattern - Corridor 103H
S005C	AT01 - 2 x 4 Pinhole swirl pattern - Corridor 103H
S006A	Drywall compound - Handicap Elevator Corridor 112H
S006B	Drywall compound - Handicap Elevator Corridor 112H
S006C	Drywall compound - Handicap Elevator Corridor 112H
S006D	Drywall compound - Boys Washroom B2 (Loc. 43)
S006E	Drywall compound - Boys Washroom B2 (Loc. 43)
S007A	Aircell - Custodian Room C2 (Loc 4)
S007B	Aircell - Custodian Room C2 (Loc 4)
S007C	Aircell - Custodian Room C2 (Loc 4)
S008A	AT04 - 2 x 4 Ridges with medium size pinhole - Library 104
S008B	AT04 - 2 x 4 Ridges with medium size pinhole - Library 104
S008C	AT04 - 2 x 4 Ridges with medium size pinhole - Library 104
S009A	AT07 - Pinhole - Corridor 116H (Loc 49)
S009B	AT07 - Pinhole - Corridor 116H (Loc 49)
S009C	AT07 - Pinhole - Corridor 116H (Loc 49)
S010A	Vinyl floor tile - 12 x 12 White with black streaks - Classroom 115
S010B	Vinyl floor tile - 12 x 12 White with black streaks - Classroom 115
S010C	Vinyl floor tile - 12 x 12 White with black streaks - Classroom 115
S011A	Vinyl floor tile - 12 x 12 White with navy blue streaks - Storage Room 123 (Loc 63)
S011B	Vinyl floor tile - 12 x 12 White with navy blue streaks - Storage Room 123 (Loc 63)
S011C	Vinyl floor tile - 12 x 12 White with navy blue streaks - Storage Room 123 (Loc 63)
S012A	AT08 - 2 x 2 Slashes with bundled pinhol - Storage Room 123 (Loc 63)
S012B	AT08 - 2 x 2 Slashes with bundled pinhol - Storage Room 123 (Loc 63)
S012C	AT08 - 2 x 2 Slashes with bundled pinhol - Storage Room 123 (Loc 63)

Pinchin Environmental Asbestos Laboratory
Certificate of Analysis

Project Name:	**Kawartha Pine Ridge District School Board Queen Elizabeth Public School 830 Barnardo Avenue, Peterborough, Ontario**		
Project No.:	**72034**		
Prepared For:	**Chris Moose**	**Date Received:**	**June 1, 2012**
Lab Reference No.:	**b89778**	**Date Analyzed:**	**June 11, 2012**
Analyst(s):	**J. Dacquel**	**# Samples submitted:**	**9**
	K. Cockburn-Swance	**# Phases analyzed:**	**14**

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. The percentage range category reported reflects the level of uncertainty of the method for estimating quantities of asbestos in bulk samples. 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 all provincial regulatory requirements (NIOSH 9002, I.R.S.S.T. 244-2). Multiple phases within a sample are analyzed separately.

Provincial Jurisdiction	Regulatory Threshold	Provincial Jurisdiction	Regulatory Threshold
Ontario, British Columbia	0.5%	Manitoba	0.1% friable 1% non-friable
Quebec	0.1%	Saskatchewan	0.1% friable 1% non-friable
Alberta, NWT, Yukon, Nunavut	1%	Atlantic Provinces	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 Environmental 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 meets all requirements of ISO/IEC 17025:2005.

This report relates only to the items tested.

PINCHIN ENVIRONMENTAL

THE PINCHIN GROUP

Pinchin Environmental Asbestos Laboratory
Certificate of Analysis

Project Name: **Kawartha Pine Ridge District School Board**
Queen Elizabeth Public School
830 Barnardo Avenue, Peterborough, Ontario
Project No.: **72034**
Prepared For: **Chris Moose**

Lab Reference No.: **b89778**
Date Analyzed: **June 11, 2012**

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
0013A Plaster - Located in the Storage Room, beneath Location 62	Homogeneous, grey, hard, cementitious, plaster material.	None Detected	Non-Fibrous Material > 75%
0013B Plaster - Located in the Storage Room, beneath Location 62	Homogeneous, grey, hard, cementitious, plaster material.	Chrysotile < 0.5%	Non-Fibrous Material > 75%
Comments:	The asbestos present in this sample appears on the surface and may be due to contamination. Cellulose and synthetic fibres are present on the surface of this sample.		
0013C Plaster - Located in the Storage Room, beneath Location 62	Homogeneous, grey, hard, cementitious, plaster material.	None Detected	Non-Fibrous Material > 75%
Comments:	Cellulose and synthetic fibres are present on the surface of this sample.		
0014A Mastic - Located on concrete in the Girl's Washroom, Location 17	Non-homogeneous, grey and white, soft, cementitious material.	None Detected	Perlite 0.5-5% Other Non-Fibrous > 75%
0014B Mastic - Located on concrete in the Boy's Washroom, Location 45	2 Phases: a) Homogeneous, grey and beige, rubbery material. b) Homogeneous, white, soft, cementitious material.	None Detected None Detected	Non-Fibrous Material > 75% Perlite 10-25% Other Non-Fibrous > 75%

ANALYST

PINCHIN ENVIRONMENTAL

THE PINCHIN GROUP

Pinchin Environmental Asbestos Laboratory
Certificate of Analysis

Project Name: **Kawartha Pine Ridge District School Board**
Queen Elizabeth Public School
830 Barnardo Avenue, Peterborough, Ontario
Project No.: **72034**
Prepared For: **Chris Moose**

Lab Reference No.: **b89778**
Date Analyzed: **June 11, 2012**

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
0014C Mastic - Located on concrete in Location 46	2 Phases: a) Homogeneous, grey, rubbery material	None Detected	Non-Fibrous Material > 75%
	b) Homogeneous, white, soft, cementitious material.	None Detected	Non-Fibrous Material 5-10%
Comments:	This sample is small in size. For more reliable results, a larger sample is required.		
0015A Plaster - Located in Room 112, Location 58	2 Phases: a) Homogeneous, grey, hard, cementitious, plaster base coat.	None Detected	Cellulose 0.5-5% Non-Fibrous Material > 75%
	b) Homogeneous, white, hard, cementitious, plaster top coat.	None Detected	Non-Fibrous Material > 75%
0015B Plaster - Located in Room 112, Location 58	2 Phases: a) Homogeneous, grey, hard, cementitious, plaster base coat.	None Detected	Cellulose 0.5-5% Non-Fibrous Material > 75%
	b) Homogeneous, white, hard, cementitious, plaster top coat.	None Detected	Non-Fibrous Material > 75%
0015C Plaster - Located in Room 112, Location 58	2 Phases: a) Homogeneous, grey, hard, cementitious, plaster base coat.	None Detected	Cellulose 0.5-5% Non-Fibrous Material > 75%
	b) Homogeneous, white, hard, cementitious, plaster top coat.	None Detected	Non-Fibrous Material > 75%

ANALYST

Pinchin Ltd. Asbestos Laboratory
Certificate of Analysis

Project Name:	**KPRDSB- Queen Elizabeth PS, 830 Barnardo Avenue**		
Project No.:	**0268661.000**		
Prepared For:	**B Guindon / A. Heizer / C. Fennell**		
Lab Reference No.:	**b224034**		
Analyst(s):	**W. Mirza / J. Raicsh-Berkoff**		
Date Received:	**December 20, 2019**	**# Samples submitted:**	**36**
Date Analyzed:	**January 2, 2020**	**# Phases analyzed:**	**37**

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%	Alberta	Undefined
Quebec	0.1%	Saskatchewan	0.5% friable 1% non-friable
PEI, NWT, Yukon, Nunavut, Newfoundland and Labrador, and New Brunswick	1%	Manitoba	0.1% friable 1% non-friable

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.

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 17025:2005.

This report relates only to the items tested.

Pinchin Ltd. Asbestos Laboratory
Certificate of Analysis

Project Name: KPRDSB- Queen Elizabeth PS, 830 Barnardo Avenue
Project No.: 0268661.000
Prepared For: B Guindon / A. Heizer / C. Fennell

Lab Reference No.: b224034
Date Analyzed: January 2, 2020

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
0016A Vinyl trim adhesive, Room 107	Non-homogeneous, yellow and off-white, adhesive material.	None Detected	Non-Fibrous Material > 75%
0016B Vinyl trim adhesive, Room 107	Homogeneous, pale yellow and grey, adhesive material.	None Detected	Non-Fibrous Material > 75%
0016C Vinyl trim adhesive, Room 107	Non-homogeneous, pale yellow and grey, adhesive material.	None Detected	Non-Fibrous Material > 75%
0017A White caulking around drywall by end sink counter, Room 107	Homogeneous, white, rubbery, caulking material.	None Detected	Non-Fibrous Material > 75%
0017B White caulking around drywall by end sink counter, Room 107	Homogeneous, white, rubbery, caulking material.	None Detected	Non-Fibrous Material > 75%
0017C White caulking around drywall by end sink counter, Room 107	Homogeneous, white, rubbery, caulking material.	None Detected	Non-Fibrous Material > 75%
0018A Sink Mastic Grey/ White, Room 107, west sink	Homogeneous, white, soft, adhesive material.	None Detected	Non-Fibrous Material > 75%
0018B Sink Mastic Grey/ White, Room 107, east sink	Homogeneous, white, soft, adhesive material.	None Detected	Non-Fibrous Material > 75%

Pinchin Ltd. Asbestos Laboratory
Certificate of Analysis

Project Name: KPRDSB- Queen Elizabeth PS, 830 Barnardo Avenue
Project No.: 0268661.000
Prepared For: B Guindon / A. Heizer / C. Fennell

Lab Reference No.: b224034
Date Analyzed: January 2, 2020

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
0018C Sink mastic, Grey, Room 108	Homogeneous, white, soft, adhesive material.	None Detected	Non-Fibrous Material > 75%
0019A DJC wall, Classroom 107	Homogeneous, white, drywall joint compound.	None Detected	Non-Fibrous Material > 75%
Comments:	Drywall is present on the surface of this sample.		
0019B DJC wall, Classroom 107	Homogeneous, white, drywall joint compound.	None Detected	Non-Fibrous Material > 75%
Comments:	Drywall is present on the surface of this sample.		
0019C DJC wall, Classroom 107	Homogeneous, white, drywall joint compound.	None Detected	Non-Fibrous Material > 75%
Comments:	Drywall is present on the surface of this sample.		
0020A Brown bookshelf caulking, Room 110	Homogeneous, beige and brown, soft, cementitious material.	Chrysotile 0.5-5%	Talc 0.5-5% Non-Fibrous Material > 75%
0020B Brown bookshelf caulking, Room 110			Not Analyzed
Comments:	Analysis was stopped due to a previous positive result.		
0020C Brown bookshelf caulking, Room 110			Not Analyzed
Comments:	Analysis was stopped due to a previous positive result.		
0021A Black sink mastic, Classroom 114	Homogeneous, black, soft, sticky material.	Chrysotile 0.5-5%	Tar and other non-fibrous > 75%

Pinchin Ltd. Asbestos Laboratory
Certificate of Analysis

Project Name: KPRDSB- Queen Elizabeth PS, 830 Barnardo Avenue
Project No.: 0268661.000
Prepared For: B Guindon / A. Heizer / C. Fennell

Lab Reference No.: b224034
Date Analyzed: January 2, 2020

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
0021B Black sink mastic, Classroom 114			Not Analyzed
Comments:	Analysis was stopped due to a previous positive result.		
0021C Black sink mastic classroom 115			Not Analyzed
Comments:	Analysis was stopped due to a previous positive result.		
0022A Expansion joint caulking on exterior wall, Classroom 114	3 Phases: a) Homogeneous, grey, hard, cementitious material.	None Detected	Non-Fibrous Material > 75%
	b) Homogeneous, grey, caulking material.	None Detected	Non-Fibrous Material > 75%
	c) Homogeneous, off-white, soft, cementitious material.	Chrysotile 0.5-5%	Non-Fibrous Material > 75%
0022B Expansion joint caulking on exterior wall, Classroom 114	2 Phases: a) Homogeneous, grey, caulking material.	None Detected	Non-Fibrous Material > 75%
	b) Homogeneous, off-white, soft, cementitious material.		Not Analyzed
Comments:	Analysis was stopped due to a previous positive result. There is no hard cementitious material present in this sample to be analyzed.		

Pinchin Ltd. Asbestos Laboratory
Certificate of Analysis

Project Name: KPRDSB- Queen Elizabeth PS, 830 Barnardo Avenue
Project No.: 0268661.000
Prepared For: B Guindon / A. Heizer / C. Fennell

Lab Reference No.: b224034
Date Analyzed: January 2, 2020

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
0022C Expansion joint caulking on exterior wall, Classroom 114	2 Phases: a) Homogeneous, grey, caulking material. b) Homogeneous, off-white, soft, cementitious material.	None Detected	Talc 0.5-5% Non-Fibrous Material > 75% Not Analyzed
Comments:	Analysis was stopped due to a previous positive result. There is no hard cementitious material present in this sample to be analyzed.		
0023A Brown adhesive for wall mounted 1' x 1' wood fibre wall tiles, Room 114	Homogeneous, brown, adhesive material.	None Detected	Non-Fibrous Material > 75%
Comments:	Cellulose is present on the surface of this sample.		
0023B Brown adhesive for wall mounted 1' x 1' tiles, Room 114	Homogeneous, brown, adhesive material.	None Detected	Non-Fibrous Material > 75%
Comments:	Cellulose is present on the surface of this sample.		
0023C Brown adhesive for wall mounted 1' x 1' wood fibre wall tiles, Room 114	Homogeneous, brown, adhesive material.	None Detected	Non-Fibrous Material > 75%
Comments:	Cellulose is present on the surface of this sample.		

Pinchin Ltd. Asbestos Laboratory
Certificate of Analysis

Project Name: KPRDSB- Queen Elizabeth PS, 830 Barnardo Avenue
Project No.: 0268661.000
Prepared For: B Guindon / A. Heizer / C. Fennell

Lab Reference No.: b224034
Date Analyzed: January 2, 2020

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
0024A Grey window caulking, Room 114	2 Phases: a) Homogeneous, grey, caulking material. b) Homogeneous, off-white, layered, caulking material.	None Detected None Detected	Cellulose 0.5-5% Non-Fibrous Material > 75% Non-Fibrous Material > 75%
0024B Grey window caulking, Room 115	2 Phases: a) Homogeneous, grey, caulking material. b) Homogeneous, off-white, layered, caulking material.	None Detected None Detected	Cellulose 0.5-5% Non-Fibrous Material > 75% Non-Fibrous Material > 75%
0024C Grey window caulking, Room 116	2 Phases: a) Homogeneous, grey, caulking material. b) Homogeneous, off-white, layered, caulking material.	None Detected None Detected	Cellulose 0.5-5% Non-Fibrous Material > 75% Non-Fibrous Material > 75%
0025A Vinyl trim adhesive on concrete block, Room 114	Non-homogeneous, yellow and grey, adhesive material.	None Detected	Non-Fibrous Material > 75%
0025B Vinyl trim adhesive on concrete block, Room 114	Non-homogeneous, yellow and grey, adhesive material.	None Detected	Non-Fibrous Material > 75%

Pinchin Ltd. Asbestos Laboratory
Certificate of Analysis

Project Name: KPRDSB- Queen Elizabeth PS, 830 Barnardo Avenue
Project No.: 0268661.000
Prepared For: B Guindon / A. Heizer / C. Fennell

Lab Reference No.: b224034
Date Analyzed: January 2, 2020

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
0025C Vinyl trim adhesive on concrete block, Room 114	Non-homogeneous, yellow and grey, adhesive material.	None Detected	Non-Fibrous Material > 75%
0026A Caulking between wooden strips and concrete wall column, Exterior window wall. Room 114	2 Phases: a) Homogeneous, off-white, soft, cementitious material. b) Homogeneous, grey, soft, cementitious material.	None Detected Chrysotile 0.5-5%	Non-Fibrous Material > 75% Non-Fibrous Material > 75%
Comments:	Phase b) is small in size.		
0026B Caulking between wooden strips and concrete wall column, Exterior window wall. Room 115	3 Phases: a) Homogeneous, off-white, soft, cementitious material. b) Homogeneous, grey, soft, cementitious material. c) Homogeneous, white, soft, consolidated material.	None Detected None Detected	Non-Fibrous Material > 75% Not Analyzed Non-Fibrous Material > 75%
Comments:	Analysis of phase b) was stopped due to a previous positive result. Phase c) is small in size. For more reliable results, a larger sample is required. Another phase is present but there was insufficient material submitted to be analyzed.		

Pinchin Ltd. Asbestos Laboratory
Certificate of Analysis

Project Name: KPRDSB- Queen Elizabeth PS, 830 Barnardo Avenue
Project No.: 0268661.000
Prepared For: B Guindon / A. Heizer / C. Fennell

Lab Reference No.: b224034
Date Analyzed: January 2, 2020

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
0026C Caulking between wooden strips and concrete wall column, Exterior window wall. Room 115	2 Phases: a) Homogeneous, off-white, soft, cementitious material. b) Homogeneous, grey, soft, cementitious material.	None Detected	Non-Fibrous Material > 75% Not Analyzed
Comments:	Analysis was stopped due to a previous positive result.		
0027A Grey door frame caulking, Room 114	Homogeneous, grey, caulking material.	Chrysotile 0.5-5%	Non-Fibrous Material > 75%
0027B Grey door frame caulking, Room 114			Not Analyzed
0027C Grey door frame caulking, Room 116			Not Analyzed

Reviewed by:

Digitally signed by John Raisch-Berkoff
Date: 2020.01.02 18:32:19 -05'00'

Reporting Analyst:

Digitally signed by John Raisch-Berkoff
Date: 2020.01.02 18:32:07 -05'00'

Analyzed by: WM Jan 2/2020

Reviewed by: JRB

Report Sent by: JRB

Pinchin Ltd. - Asbestos Laboratory
Internal Asbestos Bulk Sample Chain of Custody

Client Name:	KPRDSB- Queen Elizabeth PS			**Project Address:**	830 Barnardo Avenue			
Portfolio/Building No:				**Pinchin File:**	268661			
Submitted by:	B Guindon			**Email:**	bguindon@pinchin.com			
CC Results to:	adam Heizer Chris Fennell			**CC Email:**	aheizer@pinchin.com			
Invoice to:	Chris Fennell			**Invoice Email:**	cfennell@pinchin.com			
Date Submitted:	December	20	2019	**Required by:**	December	30	2019	
# of Samples:	36			**Priority:**	5 Day Turnaround			
Year of Building Construction (*Mandatory Field*):				1960				
Do NOT Stop on Positive (Sample Numbers):								
Pinchin Group Company (*Mandatory Field*):				Pinchin				

To be Completed by Lab Personnel Only:					
Lab Reference #:	b224034 CA		**Time:**	24 hour clock	
Received by:	DEC 20 2019		**Date:**	Month / Day	Year
Name(s) of Analyst(s):	WM / J.R-B		Jan. 2 / 2020		

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
	0016	A	Vinyl trim adhesive, Room 107 ND
	0016	B	Vinyl trim adhesive, Room 107 ND
	0016	C	Vinyl trim adhesive, Room 107 ND
	0017	A	White caulking around drywall by end sink counter, Room 107 ND
	0017	B	White caulking around drywall by end sink counter, Room 107 ND
	0017	C	White caulking around drywall by end sink counter, Room 107 ND
	0018	A	Sink Mastic Grey/ White, Room 107, west sink ND
	0018	B	Sink Mastic Grey/ White, Room 107, east sink ND

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
	0018	C	Sink mastic, Grey, Room 108 ND
	0019	A	DJC wall, Classroom 107 ND
	0019	B	DJC wall, Classroom 107 ND
	0019	C	DJC wall, Classroom 107 ND
	0020	A	Brown bookshelf caulking, Room 110 CH 0.5-5%
	0020	B	Brown bookshelf caulking, Room 110 -NA-
	0020	C	Brown bookshelf caulking, Room 110 -NA-
	0021	A	Black sink mastic, Classroom 114 CH 0.5-5%
	0021	B	Black sink mastic, Classroom 114 -NA-
	0021	C	Black sink mastic classroom 115 -NA-
	0022	A	Expansion joint caulking on exterior wall, Classroom 114 a) ND b) ND c) CH 0.5-5%
	0022	B	Expansion joint caulking on exterior wall, Classroom 114 a) ND b) -NA-
	0022	C	Expansion joint caulking on exterior wall, Classroom 114 a) ND b) -NA-
	0023	A	Brown adhesive for wall mounted 1' x 1' wood fibre wall tiles, Room 114 ND
	0023	B	n adhesive for wall mounted 1' x 1' tiles, Room 114 ND
	0023	C	Brown adhesive for wall mounted 1' x 1' wood fibre wall tiles, Room 114 ND

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
	0024	A	Grey window caulking, Room 114 a) ND b) ND
	0024	B	Grey window caulking, Room 115 a) ND b) ND
	0024	C	Grey window caulking, Room 116 a) ND b) ND
	0025	A	Vinyl trim adhesive on concrete block, Room 114 ND
	0025	B	Vinyl trim adhesive on concrete block, Room 114 ND
	0025	C	Vinyl trim adhesive on concrete block, Room 114 ND
	0026	A	Caulking between wooden strips and concrete wall column, Exterior window wall. Room 114 a) ND b) CH 0.5-5%.
	0026	B	Caulking between wooden strips and concrete wall column, Exterior window wall. Room 115 a) ND b) -NA- c) ND
	0026	C	Caulking between wooden strips and concrete wall column, Exterior window wall. Room 115 a) ND b) -NA-
	0027	A	Grey door frame caulking, Room 114 CH 0.5-5%.
	0027	B	Grey door frame caulking, Room 114 -NA-
	0027	C	Grey door frame caulking, Room 116 -NA-

J.R.B

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.
204-160 Charlotte Street
Peterborough, ON K9J 2T8

Attn: Bryan Guindon
Adam Heizer

Project: Queen Elizabeth PS

Lab Order ID: 71931879
Analysis ID: 71931879_PBP
Date Received: 12/20/2019
Date Reported: 12/31/2019

Sample ID *Lab Sample ID*	Description *Lab Notes*	Mass *(g)*	Concentration *(ppm)*	Concentration *(% by weight)*
L01 71931879PBP_1	Dark Beige Paint Block Walls, Room 107	0.0507	480	**0.048%**
L02 71931879PBP_2	Beige Wooden Shelf, Closet, Room 107	0.0579	< 69	**< 0.0069%**
L03 71931879PBP_3	Brown Steel Door and Door Frame Paint	0.0657	< 61	**< 0.0061%**
L04 71931879PBP_4	Beige Steel Radiator Cover Paint	0.0346	200	**0.020%**
L05 71931879PBP_5	Orange Paint, Wooden Half Wall Coat Rack, Room 108	0.0588	< 68	**< 0.0068%**
L06 71931879PBP_6	White Paint, Room 108 Bookshelf Wood	0.0514	180	**0.018%**
L07 71931879PBP_7	Grey Paint, Steel Radiator, Room 08	0.0421	180	**0.018%**
L08 71931879PBP_8	Grey Wood Bookshelf Paint, Room 110	0.0575	< 70.	**< 0.0070%**
L09 71931879PBP_9	Light Beige, Block Walls, Room 114	0.0612	470000	**47%**
L10 71931879PBP_10	Blue Paint, Steel Rad Covers, Room 114	0.0589	110	**0.011%**

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).

Melissa Ferrell (12)
Analyst

Laboratory Director

Analysis for Lead Concentration in Paint Chips

by Flame Atomic Absorption Spectroscopy
EPA SW-846 3050B/6010C/7000B

Customer: Pinchin Ltd.
204-160 Charlotte Street
Peterborough, ON K9J 2T8

Attn: Bryan Guindon
Adam Heizer

Project: Queen Elizabeth PS

Lab Order ID: 71931879
Analysis ID: 71931879_PBP
Date Received: 12/20/2019
Date Reported: 12/31/2019

Sample ID *Lab Sample ID*	Description *Lab Notes*	Mass *(g)*	Concentration *(ppm)*	Concentration *(% by weight)*
L11 71931879PBP_11	Dark Brown Paint Door and Frame, Room 114	0.0771	< 52	**< 0.0052%**
L12 71931879PBP_12	Blue Paint, Steel Rad Covers, Room 115	0.0752	210	**0.020%**

Melissa Ferrell (12)

Analyst | **Laboratory Director**

7193879

Client:	Pinchin Ltd.	***Instructions:***	*Version 1-15-2012*
Contact:	Bryan Guindon	*Use Column "B" for your contact info*	
Address:	160 Charlotte Street, Suite 204		**Invoice to:**
City	Peterborough, Ontario	*To See an Example Click the*	Chris Fennell
Phone:	705-748-4627	*bottom Example Tab.*	cfennell@pinchin.com
Fax:	705-748-6927		
Email:	bguindon@pinchin.com	***Enter samples between "<<" and ">>"***	
cc email	aheizer@pinchin.com	***Begin Samples with a "<< "above the first sample and end with a ">>" below the last sample.***	***Scientific Analytical Institute***
Project Name	Queen Elizabeth PS	*Only Enter your data on the first sheet "Sheet1"*	
	Queen Elizabeth PS		
Pinchin File #	268661	*Note: Data 1 and Data 2 are optional*	***4604 Dundas Dr.***
Date Submitted:	12/20/2019 0:00	*fields that do not show up on the official*	***Greensboro, NC 27407***
# of Samples	12	*report, however they will be included*	***Phone: 336.292.3888***
Analysis:	Flame AA Paint chips	*in the electronic data returned to you*	***Fax: 336.292.3313***
TurnAroundTime:	120 TAT	*to facilitate your reintegration of the report data.*	***Email: lab@sailab.com***

Sample Number	Data 1 (Lab use only)	Sample Description	Data 2 (Lab use only\)
<<			
L01	[Enter data of your choosing here]	Dark beige paint block walls, Room 107	[Enter data of your choosing here]
L02	[Enter data of your choosing here]	Beige wooden shelf, closet, Room 107	[Enter data of your choosing here]
L03	[Enter data of your choosing here]	Brown steel door and door frame paint	[Enter data of your choosing here]
L04	[Enter data of your choosing here]	Beige steel radiator cover paint	[Enter data of your choosing here]
L05	[Enter data of your choosing here]	Orange paint, wooden half wall coat rack, Room 108	[Enter data of your choosing here]
L06	[Enter data of your choosing here]	White paint, Room 108 bookshelf wood	[Enter data of your choosing here]
L07	[Enter data of your choosing here]	Grey paint, steel radiator, Room 08	[Enter data of your choosing here]
L08	[Enter data of your choosing here]	Grey wood bookshelf paint, Room 110	[Enter data of your choosing here]
L09	[Enter data of your choosing here]	Light beige, block walls, Room 114	[Enter data of your choosing here]
L10	[Enter data of your choosing here]	Blue paint, steel rad covers, Room 114	[Enter data of your choosing here]
L11	[Enter data of your choosing here]	Dark brown paint door and frame, Room 114	[Enter data of your choosing here]
L12		Blue paint, steel rad covers, Room 115	
>>			

Accepted ☑

Rejected ☐

12·20
11:30A

APPENDIX III
Methodology

1.0 GENERAL

Pinchin conducts a room-by-room survey (rooms, corridors, service areas, exterior, etc.) to identify the hazardous building materials as defined by the scope of work. All work is conducted in accordance with our own internal Standard Operating Procedures.

Information regarding the location and condition of hazardous building materials encountered and visually estimated quantities are recorded. The locations of any samples collected are recorded on small-scale plans.

As-built drawings and previous reports are referenced where provided.

1.1 Limitations on Scope

The assessment excludes the following:

- Articles belonging to the owner, tenant or occupant (e.g. stored items, furniture, appliances, etc.);
- Underground materials or equipment (e.g. vessels, drums, underground storage tanks, pipes, etc.);
- Building envelope, structural components, inaccessible or concealed materials or other items where sampling may cause consequential damage to the property;
- Energized systems (e.g. internal boiler components, elevators, mechanical or electrical components);
- Controlled products (e.g. stored chemicals, operational or process-related substances); and
- Materials not typically associated with construction (e.g. settled dust, spills, residual contamination from prior spills, etc.).

The assessment includes 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 is conducted where possible (under carpets or multiple layers of flooring). Demolition of exterior building finishes, masonry walls (chases, shafts etc.), and structural items is not conducted.

1.2 Asbestos

An inspection is conducted for the presence of 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 is 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 are determined by visual examination and available information on the phases of construction and prior renovations.

Samples are collected at a rate that is in compliance with the requirements of local regulations and guidelines. The sampling strategy is 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 are visually identified without sample confirmation.

Drywall joint compound is sampled at representative locations such as walls, ceilings, columns, bulkheads or other building components. Asbestos in drywall joint compound was banned in Canada in 1980. Drywall joint compound that is known to have been installed after 1986 (1980 plus a reasonable non-compliance period based on our experience) is presumed to non-asbestos and is not sampled.

Flooring mastic or adhesive is sampled and analyzed if present on the underside of flooring samples (vinyl floor tile and vinyl sheet flooring).

Limited demolition of masonry block walls (core holes) is conducted to investigate for loose fill vermiculite insulation. The core holes are temporarily patched with a suitable product.

The following materials (if present) are not sampled and will be presumed to contain asbestos:

- Floor levelling compound
- Ceramic tile setting compound
- Electrical components
- Adhesives and duct mastics
- Soffit and fascia boards
- Fire resistant doors
- Vibration dampers on HVAC equipment

The bulk samples are submitted to a NVLAP accredited laboratory for analysis. The analysis is 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 are compared to the following criteria:

Jurisdiction	Friable	Non-Friable
Ontario	0.5%	0.5%
Federal	1%	1%

The asbestos analysis is completed using a stop positive approach. Only one result meeting the above regulated criteria is 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 stops 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 are analyzed if no asbestos is detected. In some cases, all samples are analyzed in the sample set regardless of result.

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.

Asbestos materials are evaluated in order to make recommendations regarding remedial work. The priority for remedial action is based on several factors:

- Friability (friable or non-friable);
- Condition (good, fair, poor, debris);
- Accessibility (ranking from accessible to all building users to inaccessible); and
- Efficiency of the work (for example, if damaged ACM is being removed in an area, it may be most practical to remove all ACM in the area even if it is in good condition).

1.3 Lead

Samples of distinctive paint finishes, and surface coatings present in more than a limited application, where removal of the paint is possible is collected. The samples are collected by scraping the painted finish to include base and covering applications. Drawings included show sample locations.

Analysis for lead in paints or surface coatings is performed at an accredited laboratory in accordance with EPA Method No. 3050B/Method No. 7420; flame atomic absorption.

The Ontario Ministry of Labour (MOL) has not established a lower limit for concentrations of lead in paint, below which precautions do not need to be considered during construction projects. Pinchin follows the recommendations of the Environmental Abatement Council of Ontario (EACO) Lead Guideline for Construction, Renovation, Maintenance or Repair. The Guideline suggests that 0.1% (1,000 ppm) lead in

paint represents a de minimis concentration of lead in paint for construction hygiene purposes, that is a concentration below which the lead content is not the limiting hazard in any disturbance of leaded paint for non-aggressive disturbance of painted finishes, (hand powered demolition, chipping, scraping, light sanding, etc.). The use of aggressive methods such as power grinding, torching, welding, etc. may result in significant lead exposures even with low concentrations of lead in paints (below 0.1%). Exposure from construction disturbance of paints containing lead less than 0.009% is assumed to be insignificant. Paint and surface coatings are evaluated for condition such as flaking, chipping or spalling.

Other lead building products (e.g. batteries, lead sheeting, flashing) are identified by visual observation only.

1.4 Silica

Building materials known to contain crystalline silica (e.g. concrete, cement, tile, brick, masonry, mortar) is identified by visual inspection only. Pinchin does not perform sampling of these materials for laboratory analysis of crystalline silica content.

1.5 Mercury

Building materials/products/equipment (e.g. thermostats, barometers, pressure gauges, light tubes), suspected to contain mercury are identified by visually inspection only. Dismantling of equipment suspected of containing mercury is not performed. Sampling of these materials for laboratory analysis of mercury content is not performed.

1.6 Polychlorinated Biphenyls

The potential for light ballast and wet transformers to contain PCBs is 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 is compared to known ban dates of PCBs and Environment Canada publications.

Dry type transformers are presumed to be free of dielectric fluids and hence non-PCB.

Fluids (mineral oil, hydraulic, Aroclor or Askarel) in transformers or other equipment are not sampled for PCB content.

Non-liquid forms of PCBs (i.e. sealants or caulking) are not sampled for PCB content.

1.7 Visible Mould

The presence of mould is determined by visual inspection of exposed building surfaces. If any mould growth is concealed within building cavities it is not addressed in this assessment.