

PROJECT SPECIFICATIONS

HWDSB DUNDAS VALLEY SECONDARY SCHOOL UNIVERSAL WASHROOM RENOVATION

310 Governor's Rd, Dundas, ON, L9H 5P8

For

Hamilton-Wentworth District School Board

20 Education Court

Hamilton, Ontario

HWDSB No: 2026-118-P02209

JFA Project: 2527

April 10, 2026

Jason Fung Architect Inc.

211-675 King St W, Toronto ON, M5V 1M9

647 948 9176 www.jasonfung.ca

1 GENERAL

1.1 OWNER

- .1 Owner for the Project is:
Hamilton-Wentworth District School Board
20 Education Court
Hamilton, Ontario
L9A 0B9

1.2 CONSULTANTS

- .1 The following firms comprise the Consultant team for the Project:
 - .1 Architect
JASON FUNG ARCHITECT INC.
211-675 King St W,
Toronto ON, M5V 1M9
647 948 9176
www.jasonfung.ca
 - .2 Hazardous Building Materials Assessment (Pre-construction)
PINCHIN LTD.
151 York Blvd Suite 200
Hamilton, ON, L8R 3M2
905 577 6206
 - .3 Mechanical / Electrical Engineer
RISER ENGINEERING
115 Apple Creek Blvd Unit 208
Markham, ON, L3R 6C9
647 409 1832
www.riserengineering.ca

END OF SECTION

1 GENERAL

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1.2 APPENDIX

- .1 Appendix A, Revised Hazardous Building Materials Assessment (Preconstruction)
PINCHIN LTD.
March 30, 2026
Pinchin File: 0352293.012

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises interior renovation of new universal washroom, storage room, and janitor closet in existing staff/storage room (Room 1036) at Dundas Valley Secondary School, 310 Governor's Rd, Dundas, ON L9H 5P8, and further identified in the Contract Documents.

1.3 CONTRACT METHOD

- .1 Construct Work under contract.
- .2 Relations and responsibilities between Contractor and subcontractors assigned by HWDSB are as defined in HWDSB's RFT Document.

1.4 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit Project construction progress schedule in accordance with 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.

1.5 WORK BY OTHERS

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

1.6 FUTURE WORK

- .1 Not Used.

1.7 WORK SEQUENCE

- .1 Construct Work in stages to accommodate HWDSB's intermittent use of premises during construction.
- .2 Co-ordinate Progress Schedule and co-ordinate with HWDSB Occupancy during construction.
- .3 Construct Work in stages to provide for continuous public usage. Do not close off public usage of facilities until use of one stage of Work will provide alternate usage.
- .4 Maintain fire access/control.
- .5 Protect workers and public safety.

1.8 CONTRACTOR USE OF PREMISES

- .1 Site Superintendent MUST SIGN IN with school office, Duration of work must be described, complete with timeline of completion. Sign-in and sign-out is required daily for all subtrades. Sign-in sheets will be provided to HWDSB on a monthly basis.
- .2 Refer to Hamilton-Wentworth District School board Construction Site Specific Information Sheet for Work Hours.
- .3 Limit use of premises for Work and for access, to allow:
 - .1 HWDSB occupancy.

- .2 Partial HWDSB occupancy.
- .3 Work by other contractors.
- .4 Public usage.
- .5 The school cannot be used as a site office and site trailers are permitted
- .6 Contractor to provide hoarding, fencing, signage, etc. to facilitate the execution of the work.
- .7 Contractor is responsible for site security, including the security of materials, equipment, portable toilets, bins, vehicles, etc.
- .4 Co-ordinate use of premises under direction of HWDSB.
- .5 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .6 Coordinate with HWDSB for temporary facilities, access roads and parking areas, traffic regulations, and utilities.
- .7 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .8 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Consultant and HWDSB.
- .9 Ensure that operations conditions of exiting work at completion are still the same, equal to or better than that which existed before new work started.
- .10 Caretaking equipment and supplies are note to be used by the Contractor.

1.9 OWNER OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Co-operate with HWDSB in scheduling operations to minimize conflict and to facilitate HWDSB usage.

1.10 PARTIAL OWNER OCCUPANCY

- .1 Schedule and substantially complete designated portions of Work for HWDSB's occupancy prior to Substantial Performance of entire Work.
- .2 Designated areas for Owner's occupancy as directed on site.
- .3 Owner will occupy designated areas for purpose of storage of furnishings and equipment and installation of equipment.
- .4 Execute Certificate of Substantial Performance for each designated portion of Work prior to Owner occupancy. Contractor shall allow:
 - .1 Access for Owner personnel.
 - .2 Use of parking facilities.
 - .3 Operation of HVAC and electrical systems.
 - .4 Execute Partial Interim Certificate of Completion for each designated portion of Work prior to Owner occupancy. Contractor shall allow:
 - .1 Access for Owner personnel.
 - .2 Use of parking facilities.
 - .3 Operation of HVAC and electrical systems.
 - .4 Maintenance.
 - .5 Security.

1.11 PRE-PURCHASED EQUIPMENT

- .1 Ensure that the purpose for pre-purchasing these equipment is to ensure delivery to Site within required Project completion schedule.
- .2 Obtain necessary shop drawings and proceed to co-ordinate details for installation, expedite, receive, unload, install, connect and test specified equipment, and be responsible for warranty.
- .3 Include equipment specifications for pre-purchased items at end of project specification, printed on coloured paper for confirmation only.
- .4 Notify Consultant and HWDSB in writing at least 5 business days in advance of date on which materials and equipment are required.
 - .1 Pick up materials and equipment no later than 10 business days after such date.
- .5 Receive equipment Free on Board (F.O.B.), store and maintain equipment until installation.

1.12 OWNER FURNISHED ITEMS

- .1 Owner Responsibilities for Owner Furnished Items only:
 - .1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.
 - .2 Deliver supplier's bill of materials to Contractor.
 - .3 Arrange and pay for delivery to site in accordance with Progress Schedule.
 - .4 Inspect deliveries jointly with Contractor.
 - .5 Submit claims for transportation damage.
 - .6 Arrange for replacement of damaged, defective or missing items.
 - .7 Arrange for manufacturer's field services; arrange for and deliver manufacturer's warranties and bonds to Contractor.
- .2 Contractor Responsibilities:
 - .1 Designate submittals and delivery date for each product in progress schedule.
 - .2 Review shop drawings, product data, samples, and other submittals. Submit to Consultant notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
 - .3 Receive and unload products on Site.
 - .4 Inspect deliveries jointly with HWDSB; record shortages, and damaged or defective items.
 - .5 Handle products on Site, including uncrating and storage.
 - .6 Protect products from damage, and from exposure to elements.
 - .7 Assemble, install, connect, adjust, and finish products.
 - .8 Provide installation inspections required by public authorities.
 - .9 Repair or replace items damaged by Contractor or subcontractor on site (under their control).

1.13 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to building operations, occupants, and normal use of premises. Arrange with Consultant and HWDSB to facilitate execution of work.

1.14 EXISTING SERVICES

- .1 Notify HWDSB and utility companies of intended interruption of services and obtain required permission. Refer to HWDSB Construction Site Specific Information Sheet.
- .2 Where Work involves breaking into or connecting to existing services, give HWDSB at least 5 days of notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian, vehicular traffic and building operations.

- .3 Provide alternative routes for personnel, pedestrian and vehicular traffic.
- .4 Establish location and extent of service lines in area of work before starting Work. Notify Consultant and HWDSB of findings.
- .5 Submit schedule for approval by Consultant and HWDSB for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .6 Provide temporary services to maintain critical building and tenant services.
- .7 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .8 Where unknown services are encountered, immediately advise Consultant and HWDSB, and confirm findings in writing.
- .9 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .10 Record locations of maintained, re-routed and abandoned service lines.
- .11 Construct barriers, as required.
- .12 Refer to Construction Contact Site Information Sheet for procedures on shutdown of services.

1.15 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy of each document as follows:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed Shop Drawings.
 - .5 List of Outstanding Shop Drawings.
 - .6 Change Orders.
 - .7 Other Modifications to Contract.
 - .8 Field Test Reports.
 - .9 Copy of Approved Work Schedule.
 - .10 Health and Safety Plan and Other Safety Related Documents.
 - .11 Other documents as specified.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Refer to HWDSB RFT Document.

1.2 ACCESS AND EGRESS

- .1 Design, construct and maintain temporary “access to” and “egress from” work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.3 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with HWDSB to facilitate work as stated. All trades to follow Hamilton by-laws in terms of noise, dust and debris as required to facilitate the work.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Access to school washrooms is not permitted. Contractors to provide their own portable restroom units. Location to be provided by Contractor and reviewed and approved by HWDSB via email prior to construction.
- .5 Closures: protect work temporarily until permanent enclosures are completed.

1.4 SECURITY

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.

1.5 BUILDING SMOKING ENVIRONMENT

- .1 Smoking, vaping, drugs and alcohol are not permitted on school board property. Anyone seen doing these activities will be removed from the property and not allowed to return at no expense to the Owner and no interruption to the schedule. The Contractor is to ensure subcontractor compliance.

END OF SECTION

1 GENERAL

1.1 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2, Stipulated Price Contract, and covered in RFT Document.

1.2 CASH ALLOWANCES

- .1 Refer to CCDC 2, GC 4.1 and Supplementary Conditions.
- .2 Include in Contract Price specified Cash Allowances.
- .3 Cash Allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage, installation and other authorized expenses incurred in performing Work.
- .4 Contract Price, and not Cash Allowance, includes Contractor's overhead and profit in connection with such Cash Allowance
- .5 Contract Price will be adjusted by written order to provide for excess or deficit to each cash allowance.
- .6 Where costs under a Cash Allowance exceed amount of allowance, Contractor will be compensated for excess incurred and substantiated plus allowance for overhead and profit as set out in Contract Documents.
- .7 Include progress payments on accounts of work authorized under Cash Allowances in Consultant's monthly certificate for payment.
- .8 Prepare schedule jointly with Consultant, HWDSB and Contractor to show when items called for under Cash Allowances must be authorized by HWDSB for ordering purposes so that progress of Work will not be delayed.
- .9 Amount of each Cash Allowance includes:
 - .1 Costs to Provide the specified Products, including supply, installation, and related costs, excluding Value Added Taxes.
 - .2 Subcontractor's and sub-Subcontractor's overheads and profits related to cash allowance.

1.3 CONTINGENCY ALLOWANCE

- .1 Refer to CCDC 2, GC 4.2 and Supplementary Conditions.
- .2 Do not include in Contract Price, additional contingency allowances for products, installation, overhead or profit.
- .3 Expenditures under contingency allowance will be authorized in accordance with procedures provided in CCDC 2, GC 6.1 – Changes, GC 6.2 –Change Order, GC 6.3 – Change Directive, and Supplementary Conditions.

END OF SECTION

1 GENERAL

1.1 REFERENCE STANDARDS

- .1 HWDSB RFT Document.

1.2 APPLICATIONS FOR PROGRESS PAYMENT

- .1 Refer to CCDC 2 and HWDSB RFT Document.
- .2 Make applications for payment on account as provided in Agreement monthly as Work progresses.
- .3 Date applications for payment last day of agreed monthly payment period and ensure amount claimed is for value, proportionate to amount of Contract, of Work performed and Products delivered to Place of Work at that date.
- .4 Submit to HWDSB at least 14 days before first application for payment. Schedule of values for parts of Work, aggregating total amount of Contract Price, to facilitate evaluation of applications for payment.

1.3 SCHEDULE OF VALUES

- .1 Refer to CCDC 2 and HWDSB RFT Document.
- .2 Provide schedule of values supported by evidence as JASON FUNG ARCHITECT INC. may reasonably direct and when accepted by JASON FUNG ARCHITECT INC., be used as basis for applications for payment.
- .3 Include statement based on schedule of values with each application for payment.
- .4 Support claims for products delivered to Place of Work but not yet incorporated into Work by such evidence as JASON FUNG ARCHITECT INC. may reasonably require to establish value and delivery of products.

1.4 PROGRESS PAYMENT

- .1 Refer to CCDC 2 and HWDSB RFT Document.
- .2 JASON FUNG ARCHITECT INC. will issue to HWDSB, no later than 10 days after receipt of an application for payment, certificate for payment in amount applied for or in such other amount as Consultant determines to be due. If JASON FUNG ARCHITECT INC. amends application, JASON FUNG ARCHITECT INC. will give notification in writing giving reasons for amendment.

1.5 SUBSTANTIAL PERFORMANCE OF WORK

- .1 Refer to CCDC 2 and HWDSB RFT Document.
- .2 Prepare and submit to JASON FUNG ARCHITECT INC. comprehensive list of items to be completed or corrected and apply for a review by JASON FUNG ARCHITECT INC. to establish Substantial Performance and Interim Completion of Work or substantial performance of designated portion of Work when Work is substantially performed if permitted by lien legislation applicable to Place of Work designated portion which Owner agrees to accept separately is substantially performed. Failure to include items on list does not alter responsibility to complete Contract.
- .3 No later than 10 days after receipt of list and application, JASON FUNG ARCHITECT INC. will review Work to verify validity of application, and no later than 7 days after completing review, will notify Contractor if Work or designated portion of Work is substantially performed.
- .4 JASON FUNG ARCHITECT INC.: state date of Substantial Performance of Work or designated portion of Work in certificate.
- .5 Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Consultant, establish reasonable date for finishing Work.

1.6 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK

- .1 Refer to CCDC 2 and HWDSB RFT Document.
- .2 After issuance of certificate of Substantial Performance of Work:
 - .1 Submit application for payment of holdback amount.
 - .2 Submit sworn statement that accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred in Substantial Performance of Work and for which Owner might in be held responsible have been paid in full, except for amounts properly retained as holdback or as identified amount in dispute.
- .3 After receipt of application for payment and sworn statement, JASON FUNG ARCHITECT INC. will issue certificate for payment of holdback amount.
- .4 Release of holdback is 60 days after publication date.

1.7 FINAL PAYMENT

- .1 Refer to CCDC 2 and HWDSB RFT Document.
- .2 Submit application for final payment when Work is completed.
- .3 JASON FUNG ARCHITECT INC. will, no later than 10 days after receipt of application for final payment, review Work to verify validity of application. JASON FUNG ARCHITECT INC. will give notification that application is valid or give reasons why it is not valid, no later than 7 days after reviewing Work.
- .4 JASON FUNG ARCHITECT INC. will issue final certificate for payment when application for final payment is found valid.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

1.2 ADMINISTRATIVE

- .1 Schedule and administer project meetings throughout the progress of the work at the call of HWDSB.
- .2 Prepare agenda for meetings.
- .3 Distribute written notice of each meeting four days in advance of meeting date to HWDSB
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Reproduce and distribute copies of minutes within 3 days after meetings and transmit to meeting participants and, HWDSB, JASON FUNG ARCHITECT INC.
- .8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.3 PRECONSTRUCTION MEETING

- .1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Senior representatives of HWDSB, JASON FUNG ARCHITECT INC., major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.
 - .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
 - .5 Delivery schedule of specified equipment.
 - .6 Site security as necessary.
 - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
 - .8 Owner provided products.
 - .9 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .10 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
 - .11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
 - .12 Monthly progress claims, administrative procedures, photographs, hold backs.
 - .13 Appointment of inspection and testing agencies or firms.
 - .14 Insurances, transcript of policies.

1.4 PROGRESS MEETINGS

- .1 During course of Work and 2 weeks prior to project completion, schedule progress meetings bi-weekly.
- .2 Contractor, major Subcontractors involved in Work, HWDSB are to be in attendance.
- .3 Notify parties minimum 3 days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.
- .5 Agenda to include the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Review of off-site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period.
 - .9 Review submittal schedules: expedite as required.
 - .10 Maintenance of quality standards.
 - .11 Review proposed changes for effect on construction schedule and on completion date.
 - .12 Other business.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

1.2 DEFINITIONS

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

1.3 REQUIREMENTS

- .1 Ensure Project Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately 5 working days, to allow for progress reporting.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to HWDSB within 10 working days of Award of Contract Bar (GANTT) Chart for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to HWDSB within 10 working days of Award of Contract.

1.5 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule. Contractor and HWDSB to provide further information.

1.6 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award.

- .2 Shop Drawings, Samples.
- .3 Demolition
- .4 Interior Architecture
- .5 Lighting.
- .6 Electrical.
- .7 Controls.
- .8 Heating, Ventilating, and Air Conditioning.
- .9 Testing and Commissioning.
- .10 Supplied equipment long delivery items.
- .11 Engineer supplied equipment required dates.

1.7 PROJECT SCHEDULE REPORTING

- .1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.8 PROJECT MEETINGS

- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather related delays with their remedial measures will be discussed and negotiated.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 HWDSB RFT Document.

1.2 REFERENCE STANDARDS

- .1 Not Used.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Submit to JASON FUNG ARCHITECT INC. submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals before submission to JASON FUNG ARCHITECT INC.. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify HWDSB and JASON FUNG ARCHITECT INC., in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify site measurements and affected adjacent Work are coordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by HWDSB and JASON FUNG ARCHITECT INC review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by HWDSB and JASON FUNG ARCHITECT INC. review.
- .10 Keep one reviewed copy of each submission on site.

1.4 SHOP DRAWINGS AND PRODUCT DATA

- .1 Refer to CCDC 2 GC 3.8 and HWDSB RFT Document.
- .2 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .3 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.
- .4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to Contract drawings and specifications.
- .5 Allow 5 days for HWDSB and JASON FUNG ARCHITECT INC. review of each submission.
- .6 Adjustments made on shop drawings by HWDSB and JASON FUNG ARCHITECT INC. are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to HWDSB before to proceeding with Work.
- .7 Make changes in shop drawings as HWDSB and JASON FUNG ARCHITECT INC. may require, consistent with Contract Documents. When resubmitting, notify HWDSB and JASON FUNG ARCHITECT INC. in writing of revisions other than those requested.

- .8 Accompany submissions with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data, and sample.
 - .5 Other pertinent data.
- .9 Submissions to include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of site measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified site dimensions and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .10 After HWDSB and JASON FUNG ARCHITECT INC. review, distribute copies.
- .11 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as HWDSB and JASON FUNG ARCHITECT INC. may reasonably request.
- .12 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by HWDSB and JASON FUNG ARCHITECT INC. where shop drawings will not be prepared due to standardized manufacture of product.
- .13 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by HWDSB and JASON FUNG ARCHITECT INC.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of Contract award for project.
- .14 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by HWDSB and JASON FUNG ARCHITECT INC.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of Contract complete with project name.

- .15 Submit electronic copies of manufacturer's instructions for requirements requested in specification Sections and as requested by HWDSB and JASON FUNG ARCHITECT INC.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Safety Data Sheets concerning impedances, hazards and safety precautions.
- .16 Submit electronic copies of Manufacturer's Site Reports for requirements requested in specification Sections and as requested by HWDSB and JASON FUNG ARCHITECT INC.
- .17 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .18 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by HWDSB.
- .19 Delete information not applicable to project.
- .20 Supplement standard information to provide details applicable to project.
- .21 If upon review by HWDSB and JASON FUNG ARCHITECT INC no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.5 SAMPLES

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to HWDSB and JASON FUNG ARCHITECT INC
- .3 Notify HWDSB and JASON FUNG ARCHITECT INC. in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by HWDSB and JASON FUNG ARCHITECT INC. are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to HWDSB and JASON FUNG ARCHITECT INC. before proceeding with Work.
- .6 Make changes in samples which HWDSB and JASON FUNG ARCHITECT INC may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.6 MOCK-UPS

- .1 Erect mock-ups in accordance with section 01 43 00 - Quality Assurance.

1.7 PHOTOGRAPHIC DOCUMENTATION

- .1 Submit electronic copy of colour digital photography in jpg format, standard resolution weekly with progress statement and as directed by HWDSB.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints: 2 views per ceiling zone as specified in Architectural drawings.
 - .1 Viewpoints and their location as determined by HWDSB and JASON FUNG ARCHITECT INC.
- .4 Frequency of photographic documentation: weekly as directed by HWDSB.
 - .1 Upon completion of: demolition, framing and services before concealment, and as directed by HWDSB.

1.8 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, review RFT document for submission of necessary certificates

and transcripts.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 Refer to Hazardous Building Materials Assessment (Preconstruction) report prepared by PINCHIN LTD. before proceeding with demolition and renovation Work.

1.2 RELATED REQUIREMENTS

- .1 Section 02 82 00 – Asbestos Abatement.

1.3 REFERENCE STANDARDS

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Province of Ontario
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. as amended and O. Reg. 213/91 as amended.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .3 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to HWDSB, and authority having jurisdiction.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS Safety Data Sheets (SDS) in accordance with Section 02 81 00 - Hazardous Materials.
- .7 Consultant will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within 5 days after receipt of comments from Consultant.
- .8 Consultant review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Consultant.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.5 FILING OF NOTICE

- .1 File Notice of Project with Ontario authorities prior to beginning of Work.
- .2 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.6 SAFETY ASSESSMENT

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

1.7 MEETINGS

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

1.8 REGULATORY REQUIREMENTS

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

1.9 PROJECT/SITE CONDITIONS

1.10 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Consultant may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.11 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Contractor will be responsible and assume the role Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.
- .3 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.12 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, and Ontario Regulations for Construction Projects, O. Reg. 213.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.13 UNFORSEEN HAZARDS

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

1.14 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:
 - .1 Have site-related working experience specific to activities associated with Consultant.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .5 Be on site during execution of Work and report directly to and be under direction of Consultant.

1.15 POSTING OF DOCUMENTS

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

1.16 CORRECTION OF NON-COMPLIANCE

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

1.17 BLASTING

- .1 Blasting or other use of explosives is not permitted.

1.18 POWDER ACTUATED DEVICES

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

1.19 WORK STOPPAGE

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

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This Section references laws, bylaws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction (AHJ), and other legally enforceable requirements applicable to the Work and that are or become enforced during performance of the Work.

1.2 RELATED REQUIREMENTS

- .1 Section 02 22 10 – Existing Conditions Assessment

1.3 DEFINITIONS

- .1 Reference Standards: Means consensus standards, trade association standards, guides, and other publications expressly referenced in the Contract Documents.

1.4 REFERENCE STANDARDS AND REFERENCE DOCUMENTS

- .1 If specified referenced standards do not indicate an edition or version, the latest edition or revision issued by the publisher at the time of bid closing shall apply, except as follows:
 - .1 If a particular edition or revision date of a specified standard is referenced in an applicable code or other regulatory requirement, the edition or version in the regulatory reference shall apply.
- .2 The specified reference standards establish minimum requirements. If Contract Documents indicate requirements that conflict with a reference standard, the more stringent requirements shall apply.
- .3 If multiple reference standards are specified and the standards establish different requirements, the most stringent requirement shall apply.
- .4 In case of discrepancy or uncertainties, refer to JASON FUNG ARCHITECT INC. for interpretation or clarification.

1.5 CODES

- .1 Building Code: Perform Work in accordance with the Ontario Building Code 2024 including amendments up to the time of bid closing and other codes of provincial or local application.
- .2 Fire Code: Perform Work in accordance with the National Fire Code of Canada (NFC) including amendments up to the time of bid closing and other codes of provincial or local application.
- .3 Plumbing Code: Perform Work in accordance with National Plumbing Code of Canada (NPC) including amendments up to the time of bid closing and other codes of provincial or local application.
- .4 If there is a conflict or discrepancy between codes, the most stringent requirements shall apply.
- .5 Specific design and performance requirements listed in Specifications and indicated on Drawings may exceed minimum requirements established by referenced Codes; these requirements will govern over the minimum requirements listed in the referenced Codes.

1.6 LAWS

- .1 Not Used.

1.7 FEES

- .1 Regulatory Requirements: Except as otherwise specified, JASON FUNG ARCHITECT INC. shall apply for, obtain, and pay fees associated with permits, licenses, certificates, and approvals required by regulatory requirements and Contract Documents, based on General Conditions of Contract and the following:
 - .1 Regulatory requirements and fees in force at the time of bid closing, and
 - .2 A change in regulatory requirements or fees scheduled to become effective after the time of

bid closing and of which public notice has been given before the time of bid closing.

2 PRODUCTS

2.1 EASEMENTS AND NOTICES

- .1 Not Used.

2.2 PERMIT REQUIREMENTS

- .1 Building Permit:
 - .1 JASON FUNG ARCHITECT INC. shall apply for, obtain and pay for building permit on behalf of HWDSB, and other permits required for Work and its various parts.
 - .2 Contractor will require that specific Subcontractor(s) obtain and pay for some permits required by authorities having jurisdiction (AHJ), where their work is affected by work requiring permits including an asbestos abatement and control permit.
 - .3 Contractor shall display building permit and other permits in a conspicuous location at the Place of the Work.
- .2 Occupancy Permits:
 - .1 Contractor shall apply for, obtain, and pay for occupancy permits, including partial occupancy permits where required by AHJ.
 - .2 Contractor shall correct deficiencies in accordance with JASON FUNG ARCHITECT INC.'s instructions. If a deficiency is not corrected, HWDSB reserves the right to make correction and charge Contractor for costs incurred.
 - .3 Contractor shall turn occupancy permits over to HWDSB.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

1.2 DEFINITIONS

- .1 Mock-up: A full-size physical example that demonstrates materials, finishes, interrelationship of materials and assemblies, aesthetic effects, and execution. A mock-up may demonstrate coordination of multiple Subcontractors' work. A mock-up establishes a standard by which the Work will be judged. Mock-ups are not samples.
- .2 Quality Assurance: Procedures for preventing defects and deficiencies before and during execution of the Work.
- .3 Quality Audit: Systematic and independent examination to determine whether quality requirements have been fulfilled as planned. A quality audit will examine processes, products and services to determine if they have been implemented effectively to achieve their specified objective.

1.3 REFERENCE STANDARDS

- .1 ASTM International (ASTM):
 - .1 ASTM E329: Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
- .2 International Organization for Standardization (ISO):
 - .1 ISO 9001: Quality Management Systems – Requirements

1.4 SECTION INCLUDES

- .1 This Section describes administrative and procedural requirements for proactive Contractor activities to assure the quality of construction before and during execution of the Work.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Contractor is responsible for self-performed testing and inspections and submittal of test reports to HWDSB and JASON FUNG ARCHITECT INC.
- .2 HWDSB will employ and pay for quality audit services performed through third-party observation and testing to validate the Contractor's performance of the Work.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit a detailed testing and inspections schedule to HWDSB and JASON FUNG ARCHITECT INC. in accordance with the Contractor's Quality Management System.
- .3 Submit certificates for products, processes, and systems for approval by HWDSB and JASON FUNG ARCHITECT INC.
- .4 Submit formal testing and inspections reports per ASTM E329 to HWDSB and JASON FUNG ARCHITECT INC.
- .5 Submit one digital copy and one hardcopy of each quality assurance inspection and test report to HWDSB and JASON FUNG ARCHITECT INC., except where a technical specification Section indicates otherwise.
- .6 Submit mill test certificates as required in technical specification Sections and as indicated on Drawings.

1.7 QUALIFICATIONS

- .1 Manufacturers' Qualifications:
 - .1 Specializes in manufacturing the products specified in the technical Section of the Project's construction specification.
 - .2 Minimum 3 years documented experience with a record of successful performance
- .2 Suppliers' Qualifications:
 - .1 Authorized to distribute manufacturer's products
 - .2 Has capacity to supply required products without delaying the Project
- .3 Fabricators' Qualifications:
 - .1 Experienced in producing products required for this Project
 - .2 Successful record of in-service performance
 - .3 Sufficient production capacity to fabricate required products without delaying the Project
- .4 Installer Qualifications:
 - .1 Firm or individual experienced in design and installation, application, and erection of materials to the extent required for this Project
 - .2 Successful record of in-service performance
- .5 Testing and Inspecting Agency Qualifications:
 - .1 Accredited organizations by the Standards Council of Canada for testing and inspection
 - .2 Capable of reliably performing testing of building products and inspections of construction activities in accordance with ISO 9001 and ASTM E329.
- .6 Licensed Professionals Qualifications:
 - .1 Individual registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

1.8 CERTIFICATIONS

- .1 Ensure that certification of products, processes, and systems includes physical and examination testing as specified in ASTM E329 and ISO 900] to confirm compliance with Specifications requirements.

1.9 COORDINATION

- .1 Coordinate and schedule tests and inspections with accredited testing and inspection agencies as indicated in Contract Documents and in accordance with ASTM E329 requirements.

1.10 SITE SAMPLES

- .1 Obtain HWDSB and JASON FUNG ARCHITECT INC.'s acceptance to proceed with the sampling process.
 - .1 Testing agency is responsible for obtaining representative samples of those materials required to be tested and evaluated as directed by HWDSB and JASON FUNG ARCHITECT INC. in accordance with the Contractual Documents.
- .2 Ensure testing agency performs sampling in accordance with ASTM E329.
 - .1 When sampling collection is required by testing agency, ensure proper protection, handling and storing of samples.
- .3 Testing agency to document procedures and appropriate techniques to select samples.
- .4 Record details of environmental conditions present during the sampling, such as rain or freezing weather that may affect testing of sample or interpretation of test results

1.11 MOCK-UPS

- .1 Mock-ups can be used as a reference for assessing quality of workmanship and site-applied finishes as requested in the project's Contract Documents.
- .2 Obtain HWDSB and JASON FUNG ARCHITECT INC.'s acceptance of mock-ups installation before beginning to install those portions of the Work represented by the mock-up.
- .3 Assemble mock-ups at the Place of the Work in locations acceptable to HWDSB and JASON FUNG ARCHITECT INC. or where location is indicated in the technical specification Section.
- .4 Schedule mock-ups ready for HWDSB and JASON FUNG ARCHITECT INC.'s review and in orderly sequence, to avoid delays in Work.
 - .1 Failure to prepare mock-ups in ample time is not considered sufficient reason to request an extension of Contract Time. Claims for extension of Contract Time by reason of such default will not be considered.
- .5 If requested, HWDSB and JASON FUNG ARCHITECT INC. will assist in scheduling dates for construction of mock-ups.
- .6 Construct mock-ups using materials, finishes, colours, and methods proposed for the completed Work. Mock-ups to demonstrate proposed workmanship and range of aesthetic appearance.
- .7 Where a mock-up represents or affects multiple specification Sections, coordinate activities of these Subcontractors to ensure mock-ups are complete.
- .8 Modify or replace mock-ups when unacceptable to HWDSB and JASON FUNG ARCHITECT INC..
- .9 Maintain acceptable mock-ups in an undisturbed condition as a standard for judging the completed Work.
- .10 Mock-ups may remain as part of Work, unless indicated otherwise in a technical specification Section.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This Section describes administrative and procedural requirements for reactive activities to verify that completed Work conforms to Contract Documents requirements.
- .2 Having inspection and testing agencies by Contractor does not relieve the Contractor of their responsibility to perform Work in accordance with Contract Documents.

1.2 RELATED REQUIREMENTS

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Allow and coordinate access to Work on site, manufacturing off site, and fabrication off site with inspection and testing agencies.
- .2 Retain and pay for inspection and testing that are designated for Contractor's own quality control plan, and when testing and inspection are required by Consultant or Sub consultants.
- .3 Give advanced notice to HWDSB and to each inspection/testing agency for inspection and testing required by Contract Documents or by Consultant or Sub consultants.
- .4 In advance of each test, notify appropriate agency and HWDSB in the order that attendance arrangements can be made.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit schedule of testing and inspection activities to HWDSB, applicable Subcontractors, testing agencies, and other affected parties. Include the following:
 - .1 List each testing and inspection agency
 - .2 Identify types of tests and inspections for each agency, and cross reference to applicable specification Section number-title in Contract Documents
- .3 Description of test and inspection
- .4 Identify applicable reference standard
- .5 Identify test and inspection method
- .6 Indicate number of each test and inspection required
- .3 Submit one digital copy of each quality assurance inspection and test report to HWDSB, except where a technical specification Section indicates otherwise.
- .4 Submit reports for inspection and testing required by Contract Documents or by Consultant or Sub consultants and performed by Contractor-retained inspection and testing agencies within ten days after inspection or test is completed, except where a technical specification Section indicates a different time period.
- .5 Submit one digital copy of each quality control inspection and test report to HWDSB, except where a technical specification Section indicates otherwise.
- .6 Deliver copies of quality control reports to Subcontractor of work being inspected or tested.

1.5 SOURCE QUALITY CONTROL PROCEDURES

1.6 SITE QUALITY CONTROL PROCEDURES

- .1 Provide labour, Construction Equipment, and temporary facilities to obtain and handle test samples and materials on site. Arrange for sufficient space to store and cure test samples.
- .2 Deliver samples and materials required for testing, as requested in technical specification Sections. Submit with reasonable promptness and in an orderly sequence to avoid delays in Work.

1.7 TESTING AND INSPECTION SERVICES

- .1 Provide equipment required for executing inspection and testing by appointed agencies.
- .2 Correct defects and deficiencies when they are revealed during inspection or testing at no change to Contract Price or Contract Time. Pay costs for retesting and re-inspection. Appointed agency will request additional inspections or tests to ensure full degree of defects or deficiencies are revealed and corrected.
- .3 Quality control testing and inspection reports to include the following:
 - .1 Project name and number
 - .2 Testing/Inspection agency's name, address, telephone number, and website
 - .3 Date of issuing report
 - .4 Dates and locations of tests, inspections, or samples
 - .5 Description of the Work and test and inspection method
 - .6 Numbers and titles of associated specification Sections
 - .7 Test and inspection data and interpretation of test results (e.g., pass or fail)
 - .8 Ambient conditions at time of test, inspection, or sampling
 - .9 Recommendations on re-testing and re-inspecting, if applicable

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

1.2 REFERENCE STANDARDS

- .1 CSA Group (CSA)
 - .1 CSA-O121, Douglas Fir Plywood.

1.3 INSTALLATION AND REMOVAL

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.
- .3 See diagram of hoarding following Section 01 56 00.
- .4 Exterior staging area, if deemed necessary by Contractor, is to reasonably protect exterior areas, including grasses, façade material, etc.
- .5 Removal of hoarding (interior and exterior) must include the clean-up of the area, to be made good to the condition at the start of the project.
- .6 Existing areas outside of hoarding is to be maintained tidy, clean, and free of debris from construction.

1.4 HOARDING

- .1 Erect temporary site enclosures using 38 x 89 mm construction grade lumber framing at 600 mm centres and 1200 x 2400 x 13 mm exterior grade fir plywood to CSA O121.
- .2 Apply plywood panels vertically flush and butt jointed.
- .3 Provide at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
- .4 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
- .5 Paint public side of site enclosure in selected colours with one coat primer to CAN/CGSB 1.189 and one coat exterior paint to CGSB 1.59. Maintain public side of enclosure in clean condition.
- .6 If exterior enclosure required, then erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4m on centre. Provide one lockable truck gate. Maintain fence in good repair.
- .7 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.
- .8 Provide 1 set of phasing hoarding during the summer construction, and showing Phase 2 adjustments to hoarding to accommodate school usage starting August 15th.

1.5 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.
- .2 Provide as required by governing authorities.

1.6 WEATHER ENCLOSURES

- .1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.
- .2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.
- .3 Design exterior enclosures to withstand wind pressure and snow loading.

1.7 DUST TIGHT SCREENS

- .1 Provide dust tight screens or insulated partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.
- .2 Maintain and relocate protection until such work is complete.

1.8 ACCESS TO SITE

- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.9 SCHOOL AND BUILDING USAGE

- .1 Provide access for staff, teachers and students when school is in operation.
- .2 Notify HWDSB of an expected interruptions to HVAC, Electrical and Water supply. Most notably in relation to the Daycare Operations which will occur during the summer months.
- .3 Interruptions to HVAC, Electrical and Water supply may not occur during school operations from 7:30am to 6pm. Owner's to receive 5 days business notice prior to service shut down.

1.10 FIRE ROUTES

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.11 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

1.12 PROTECTION OF BUILDING FINISHES

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Confirm with HWDSB and JFA locations and installation schedule 3 days prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.

1.13 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This section includes, but is not limited to, related requirements, reference standards, quality, availability, storage, handling and protection, transportation, manufacturer's instructions, quality of work, coordination, concealment, remedial work, location of fixtures, fastenings (including equipment), protection of work in progress and existing utilities

1.2 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2, Stipulated Price Contract.

1.3 QUALITY

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4 Should disputes arise as to quality or fitness of products, decision rests strictly with HWDSB and JASON FUNG ARCHITECT INC. based upon requirements of Contract Documents.
- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.4 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify HWDSB and JASON FUNG ARCHITECT INC. of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify HWDSB and JASON FUNG ARCHITECT INC. at commencement of Work and should it subsequently appear that Work may be delayed for such reason, HWDSB and JASON FUNG ARCHITECT INC. reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden

platforms and cover with waterproof tarpaulins during inclement weather.

- .6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of HWDSB and JASON FUNG ARCHITECT INC..
- .9 Touch-up damaged factory finished surfaces to HWDSB and JASON FUNG ARCHITECT INC. satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.6 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation cost of products supplied by Owner will be paid for by HWDSB. Unload, handle and store such products.

1.7 MANUFACTURER'S INSTRUCTION

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify HWDSB and JASON FUNG ARCHITECT INC. in writing, of conflicts between specifications and manufacturer's instructions, so that HWDSB and JASON FUNG ARCHITECT INC. will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes HWDSB and JASON FUNG ARCHITECT INC. to require removal and re-installation at no increase in Contract Price or Contract Time.

1.8 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify HWDSB and JASON FUNG ARCHITECT INC. if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. HWDSB and JASON FUNG ARCHITECT INC. reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with HWDSB and JASON FUNG ARCHITECT INC., whose decision is final.

1.9 COORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.10 CONCEALMENT

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

1.11 REMEDIAL WORK

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to

neither damage nor put at risk any portion of Work.

1.12 LOCATION OF FIXTURES

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform HWDSB and JASON FUNG ARCHITECT INC. of conflicting installation. Install as directed.

1.13 FASTENINGS

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

1.14 FASTENINGS – EQUIPMENT

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

1.15 PROTECTION OF WORK IN PROGRESS

- .1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Consultant.

1.16 EXISTING UTILITIES

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

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 09 21 16 – Gypsum Board Assemblies
- .3 Section 09 51 13 – Acoustical Panel Ceilings

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit the following before work begins at the Place of the Work:
 - .1 Service locations: Document locations and extents of service lines in the work area.
- .3 Submit the following informational submittals as work progresses:
 - .1 Test reports: For manufacturer-recommended pre-installation site tests.
 - .1 Indicate test results meet manufacturer's requirements and recommendations.
 - .2 When manufacturer's requirements are not met, submit manufacturer's corrective recommendations for review.
- .4 Submit the following when requested by the HWDSB:
 - .1 Site quality control submittals: Documentation to verify accuracy of engineering work.

1.3 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 – Closeout Submittals.

1.4 QUALIFICATION ASSURANCE

- .1 Not Used.

2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

3 EXECUTION

3.1 EXAMINATION

- .1 Existing Services:
 - .1 Confirm locations and extent of service lines in work area before beginning work on site. Submit findings.
 - .2 Immediately notify the HWDSB if unknown services are encountered. Confirm findings in writing.
 - .3 Record locations of maintained, re-routed, and abandoned service lines after completion of the Work. Submit findings.
- .2 Verify substrate and other conditions are acceptable for installation of materials, assemblies, and systems in accordance with required tolerances and manufacturer's instructions and recommendations.
 - .1 Examine conditions, with installers, for defects affecting performance of the Work. Where work of one Section depends on work of other Sections being properly completed, verify that work is complete and suitable to receive the subsequent work.
 - .2 Verify substrate surfaces are clean, dimensionally-stable, cured, and free of contaminants.

- .3 Proceed with installation after unacceptable conditions are remedied.
- .4 Starting to cut, patch, or install work will be considered Contractor's acceptance of existing conditions.
- .5 Monitor conditions as Work proceeds, including items subject to damage or movement during cutting and patching.
- .3 Perform manufacturer-recommended pre-installation site tests.

3.2 PREPARATION

- .1 Protection of In-Place Conditions:
 - .1 Protect Work and items to remain from damage.
 - .2 Do not load, or permit to be loaded, anything with a weight or force that may endanger the safety or integrity of the Work or items to remain.
 - .3 Support structural integrity of surroundings.
 - .4 Protect exposed work from weather and other potentially damaging conditions. Keep excavations free of water.
 - .5 Promptly remove, replace, clean, or repair elements damaged due to inadequate protection, as acceptable to the HWDSB, and at no change to the Contract Price or Contract Time.
- .2 Surface Preparation:
 - .1 Clean surfaces thoroughly before installation.
 - .2 Prepare surfaces using manufacturer-recommended methods to achieve acceptable substrates under project conditions.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

1.2 SECTION INCLUDES

- .1 Common requirements for installing, applying, and erecting products. Includes procedures and submittals for cutting and patching to existing conditions, and required repairs arising from tests and destructive inspections.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit proof of anchor and fastener load carrying capacity for a work result, when requested.
- .3 Submit written request before cutting or altering to existing conditions which may affect the following:
 - .1 Structural integrity of existing elements: Submit structural details and calculations performed by a professional structural engineer registered or licensed in Ontario, Canada. Include evidence of unsatisfactory structural integrity of the elements according HWDSB.
 - .2 Integrity of weather-exposed and moisture-resistant elements
 - .3 Efficiency, maintenance, safety, or accessibility of operational elements
 - .4 Visual qualities of sight-exposed elements.
 - .5 Work of HWDSB and other Contractors
- .4 Submit a request for cutting or altering which includes:
 - .1 Identification of the Project; and
 - .2 Location and description of affected existing conditions including changes to structural elements, function of elements, and visual appearance of existing elements; and the location and identification of utilities that will be temporarily out of service during cutting and patching activities.
- .5 Submit site plan drawings indicating relative location of various services and equipment upon the request of HWDSB
- .6 Submit a work plan including:
 - .1 A statement why cutting or altering is unavoidable and describe alternatives to cutting and patching if available;
 - .2 A description of proposed work and proposed Products;
 - .3 The effect of cutting or altering on work by Owner or other contractors;
 - .4 Written acknowledgement by other contractors affected by cutting or altering, if applicable;
 - .5 Proposed date(s) and time(s) work will be executed.

1.4 QUALIFICATIONS

- .1 Licensed Professionals: Engage a structural engineer licensed at the Place of the Work, to submit details and calculations when altering existing structural elements.

2 PRODUCTS

2.1 MATERIALS

- .1 Patching Materials: If possible, use the same materials found in the existing conditions, except in fire-resistance rated materials and assemblies.

- .2 Materials Visible from the Floor Area: Use materials that visually match existing adjacent surfaces, and match existing functional performance.

3 EXECUTION

3.1 COMMON INSTALLATION/APPLICATION/ERECTION REQUIREMENTS

- .1 Fit several parts together, to integrate with other Work.
- .2 Remove and replace defective and non-conforming Work.
- .3 Unless otherwise indicated in specifications, install, or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .4 Notify HWDSB in writing, of conflicts between specifications and manufacturer's instructions, so that HWDSB will establish course of action.
- .5 Improper installation or erection of products, due to failure in complying with these requirements, authorizes HWDSB to require removal and re-installation at no increase in Contract Price or Contract Time.
- .6 Provide openings in non-structural elements for penetrations of mechanical and electrical work.
- .7 Conceal pipes, ducts and wiring in floor, wall, partition, and ceiling assemblies in finished areas, except where indicated otherwise.
- .8 In addition to the manufacturer's recommendations for safety, access, accessibility, and maintenance, locate equipment, fixtures, and distribution systems where it shall provide minimal interference and shall maximize on usable space.
 - .1 Location of equipment, fixtures, and outlets indicated on Drawings and specifications are approximate.
 - .2 Notify HWDSB of impending installation and obtain approval for actual locations.

3.2 BRACING AND ANCHORING

- .1 Anchors and Fasteners: Unless otherwise indicated elsewhere:
 - .1 Provide any necessary anchors and fasteners to fasten each component securely for its intended purpose. Allow for building movement, including from thermal expansion and contraction of materials and assemblies;
 - .2 Prevent electrolytic reaction between dissimilar metals and materials;
 - .3 Provide hot-dip galvanized or stainless steel anchors and fasteners for securing exterior work;
 - .4 Locate anchors and fasteners within individual load limit or shear capacity. Ensure anchors and fasteners are permanently secured;
 - .5 Where exposed to view, evenly distribute anchors and fasteners in a single area; and
 - .6 Where exposed to view, provide metal anchors, fasteners, and related accessories with the same texture, colour, and finish as adjacent materials.
- .2 Non-Conforming Work: Anchors and fasteners installed which cause substrate cracks or spalling is not acceptable.

3.3 CUTTING AND PATCHING

- .1 Proceed with cutting and patching after the review and acceptance by the HWDSB of all submittals.
- .2 Perform cutting, fitting, and patching to complete Work in accordance with related technical specification Sections.
- .3 Use special techniques to avoid damaging existing conditions that will remain, and which will result

in proper surfaces to receive patching and finishing.

- .4 Employ original installer to perform cutting and patching for weather-exposed elements, moisture-resistant elements, and surfaces exposed to view.
- .5 Cut rigid materials using masonry saw, core drill, or other tool recommended by the product manufacturer or applicable industry association. Pneumatic or impact tools are not allowed on masonry work without the approval of HWDSB.
- .6 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .7 Refinish surfaces to match adjacent finishes. Refinish continuous surfaces to nearest intersection (e.g., edges of partition). Refinish assemblies by refinishing entire unit. Provide entire surface with uniform finish, colour, and texture.

3.4 ADJUSTING

- .1 Remove and replace patching that is visually unsatisfactory to HWDSB and JASON FUNG ARCHITECT INC.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 02 80 00 – Hazardous Materials.

1.2 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2, Stipulated Price Contract.

1.3 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by HWDSB. Do not burn waste materials on site, unless approved by HWDSB.
- .3 Clear snow and ice from access to building, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site 40 yard bin containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 19 - Waste Management and Disposal.
- .7 Dispose of waste materials and debris off site.
- .8 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .11 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.4 FINAL CLEANING

- .1 Refer to CCDC 2 and HWDSB RFT Document.
- .2 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .3 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .4 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .5 Remove waste products and debris including that caused by Owner or other Contractors.
- .6 Remove waste materials from site at regularly scheduled times or dispose of as directed by HWDSB. Do not burn waste materials on site, unless approved by HWDSB.
- .7 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .8 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

- .9 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.
- .10 Clean lighting reflectors, lenses, and other lighting surfaces.
- .11 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .14 Remove dirt and other disfiguration from exterior surfaces.
- .15 Sweep and wash clean paved areas.
- .16 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
- .17 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .18 Remove snow and ice from access to building.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This Section includes requirements for management of construction waste and disposal, which forms the Contractor's commitment to reduce and divert waste materials from landfill and includes the following:
 - .1 Preparation of a Draft Construction Waste Management Plan that will be used to track the success of the Construction Waste Management Plan against actual waste diversion from landfill.
 - .2 Preparation of a Construction Waste Management Plan that provides guidance on a logical progression of tasks and procedures to be followed in a pollution prevention program to reduce or eliminate the generation of waste, the loss of natural resources, and process emissions through source reduction, reuse, recycling, and reclamation.
- .2 Owner has established that this Project shall generate the least amount of waste possible and that processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors be employed by the Contractor.

1.2 RELATED REQUIREMENTS

1.3 DEFINITIONS

- .1 Clean Waste: Untreated and unpainted; not contaminated with oils, solvents, sealants or similar materials.
- .2 Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, re-modeling, repair and demolition operations.
- .3 Hazardous: Exhibiting the characteristics of hazardous substances including properties such as ignitability, corrosiveness, toxicity, or reactivity.
- .4 Non-hazardous: Exhibiting none of the characteristics of hazardous substances, including properties such as ignitability, corrosiveness, toxicity, or reactivity.
- .5 Non-toxic: Not poisonous to humans either immediately or after a long period of exposure.
- .6 Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- .7 Recycle: To remove a waste material from the Project site to another site for remanufacture into a new product for reuse by others.
- .8 Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form; recycling does not include burning, incinerating, or thermally destroying waste.
- .9 Return: To give back reusable items or unused products to vendors for credit.
- .10 Reuse: To reuse a construction waste material in some manner on the Project site.
- .11 Salvage: To remove a waste material from the Project site to another site for resale or reuse by others.
- .12 Sediment: Soil and other debris that has been eroded and transported by storm or well production run off water.
- .13 Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- .14 Toxic: Poisonous to humans either immediately or after a long period of exposure.
- .15 Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

- .16 Volatile Organic Compounds (VOC's): Chemical compounds common in and emitted by many building products over time through outgassing:
 - .1 Solvents in paints and other coatings;
 - .2 Wood preservatives; strippers and household cleaners;
 - .3 Adhesives in particleboard, fiberboard, and some plywood; and foam insulation.
 - .4 When released, VOC's can contribute to the formation of smog and can cause respiratory tract problems, headaches, eye irritations, nausea, damage to the liver, kidneys, and central nervous system, and possibly cancer.
- .17 Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.
- .18 Construction Waste Management Plan: A project related plan for the collection, transportation, and disposal of the waste generated at the construction site; the purpose of the plan is to ultimately reduce the amount of material being landfilled.

1.4 REFERENCE STANDARDS

- .1 ASTM International (ASTM)
 - .1 ASTM E1609 01, Standard Guide for Development and Implementation of a Pollution Prevention Program – Note, the standard was withdrawn in 2010, however contains relevant information to aid Contractor with preparation of waste diversion plans.
- .2 Recycling Certification Institute (RCI)
 - .1 RCI Certification Construction and Demolition Materials Recycling

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate waste management requirements with all Divisions of the Work for the Project, and ensure that requirements of the Construction Waste Management Plan are followed.
- .2 Preconstruction Meeting: Arrange a pre-construction meeting in accordance with Section 01 31 19 - Project Meetings before starting any Work of the Contract attended by the Owner, Contractor, and affected Subcontractor's to discuss the Contractor's Construction Waste Management Plan and to develop mutual understanding of the requirements for a consistent policy towards waste reduction and recycling.

1.6 QUALITY ASSURANCE

- .1 Resources for Development of Construction Waste Management Report (CWM Report): The following sources may be useful in developing the Draft Construction Waste Management Plan:
 - .1 Recycling Haulers and Markets: Investigate local haulers and markets for recyclable materials, and incorporate into CWM Plan.
 - .2 Waste-to-Energy Systems: Investigate local waste-to-energy incentives where systems for diverting materials from landfill for reuse or recycling are not available.
- .2 Certifications: Provide proof of the following during the course of the Work:
 - .1 Compliance Certification: Provide proof that recycling center is third party verified and is listed as a Certified Facility through the registration and certification requirements of the Recycling Certification Institute.

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Storage Requirements: Implement a recycling/reuse program that includes separate collection of waste materials as appropriate to the Project waste and the available recycling and reuse programs in the Project area.

- .2 Handling Requirements: Clean materials that are contaminated before placing in collection containers and ensure that waste destined for landfill does not get mixed in with recycled materials:
 - .1 Deliver materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to recycling process.
 - .2 Arrange for collection by or delivery to the appropriate recycling or reuse facility.
- .3 Hazardous Waste and Hazardous Materials: Handle in accordance with applicable regulations.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 HWDSB RFT Document.

1.2 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2, Stipulated Price Contract.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify HWDSB in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request HWDSB and JASON FUNG ARCHITECT INC. inspection.
 - .2 HWDSB and JASON FUNG ARCHITECT INC. Inspection:
 - .1 HWDSB, JASON FUNG ARCHITECT INC. and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Equipment and systems: tested, adjusted and balanced and fully operational.
 - .4 Certificates required by Boiler Inspection Branch, Fire Commissioner, Utility companies: submitted.
 - .5 Operation of systems: demonstrated to Owner's personnel.
 - .6 Commissioning of mechanical systems: completed and copies of final Commissioning Report submitted to HWDSB and JASON FUNG ARCHITECT INC.
 - .7 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by HWDSB and JASON FUNG ARCHITECT INC., and Contractor.
 - .2 When Work incomplete according to HWDSB and JASON FUNG ARCHITECT INC., complete outstanding items and request re-inspection.
 - .5 Declaration of Substantial Performance: when HWDSB and JASON FUNG ARCHITECT INC. considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
 - .1 Refer to CCDC 2 and HWDSB RFT Documents for requirements to determine Substantial Performance.
 - .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
 - .7 Final Payment:
 - .1 When HWDSB and JASON FUNG ARCHITECT INC. considers final deficiencies and

- defects corrected and requirements of Contract met, make application for final payment.
- .2 Refer to CCDC 2: when Work deemed incomplete by HWDSB and JASON FUNG ARCHITECT INC., complete outstanding items and request re-inspection.
- .8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with HWDSB front end document.

1.4 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 HWDSB RFT Document.

1.2 REFERENCE STANDARDS

- .1 Not Used.

1.3 ADMINISTRATIVE REQUIREMENTS

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

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

1.5 FORMAT

- .1 Organize data as instructional manual.
- .2 PDF: Letter size, flattened, Black & White.
- .3 When multiple PDFs are used correlate data into related consistent groupings.
 - .1 Identify contents of each PDF in file name.
- .4 Cover: Identify each PDF with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems under Section numbers and sequence of Table of Contents.
- .6 Text: manufacturer's printed data, or typewritten data.
- .7 Drawings: Provide PDF copy.
 - .1 Size: 24x36 in., ARCH D, flattened, B&W.

1.6 CONTENTS - PROJECT RECORD DOCUMENTS

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

1.7 AS-BUILT DOCUMENTS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for HWDSB one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Site test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in site office apart from documents used for construction.
 - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by HWDSB.

1.8 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of black line opaque drawings, and provide reline as-built drawings in PDF format.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.

- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Site changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 Referenced Standards to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .6 Other Documents: Maintain manufacturer's certifications, inspection certifications, site test records, required by individual specifications Sections.
- .7 Provide digital photos, if requested, for site records.

1.9 FINAL SURVEY

- .1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.10 EQUIPMENT AND SYSTEMS

- .1 For each item of equipment and each system include description of unit or system, and component parts.
 - .1 Give function, normal operation characteristics and limiting conditions.
 - .2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.
 - .1 Include regulation, control, stopping, shut-down, and emergency instructions.
 - .2 Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.

- .11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control.
- .15 Additional requirements: As specified in individual specification Sections.

1.11 MATERIALS AND FINISHES

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

1.12 MAINTENANCE MATERIALS

- .1 Spare Parts:
 - .1 Provide spare parts, in quantities specified in individual specification Sections.
 - .2 Provide items of same manufacture and quality as items in Work.
 - .3 Deliver to site; place and store.
 - .4 Receive and catalogue items.
 - .1 Submit inventory listing to HWDSB.
 - .2 Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit before final payment.
- .2 Extra Stock Materials:
 - .1 Provide maintenance and extra materials, in quantities specified in individual specification Sections.
 - .2 Provide items of same manufacture and quality as items in Work.
 - .3 Deliver to site; place and store.
 - .4 Receive and catalogue items.
 - .1 Submit inventory listing to HWDSB.
 - .2 Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit before to final payment.
- .3 Special Tools:
 - .1 Provide special tools, in quantities specified in individual specification Section.
 - .2 Provide items with tags identifying their associated function and equipment.
 - .3 Deliver to site; place and store.
 - .4 Receive and catalogue items.
 - .1 Submit inventory listing to HWDSB.
 - .2 Include approved listings in Maintenance Manual.

1.13 DELIVERY, STORAGE, AND HANDLING

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and for review by HWDSB.

1.14 WARRANTIES AND BONDS

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 30 days before planned pre-warranty conference, to HWDSB approval.
- .3 Warranty management plan to include required actions and documents to assure that HWDSB receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Submit, warranty information made available during construction phase, to HWDSB for approval before each monthly pay estimate.
- .6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by Subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
 - .4 Verify that documents are in proper form, contain full information, and are notarized.
 - .5 Co-execute submittals when required.
 - .6 Retain warranties and bonds until time specified for submittal.
- .7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Conduct joint 11 month warranty inspection, measured from time of acceptance, by HWDSB.
- .9 Include information contained in warranty management plan as follows:
 - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, Subcontractors, manufacturers, or suppliers involved.
 - .2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include HVAC balancing, motors, and commissioned systems such as fire protection, alarm systems, sprinkler systems.
 - .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
 - .1 Name of item.
 - .2 Model and serial numbers.
 - .3 Location where installed.
 - .4 Name and phone numbers of manufacturers or suppliers.
 - .5 Names, addresses and telephone numbers of sources of spare parts.

- .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
- .7 Cross-reference to warranty certificates as applicable.
- .8 Starting point and duration of warranty period.
- .9 Summary of maintenance procedures required to continue warranty in force.
- .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
- .11 Organization, names and phone numbers of persons to call for warranty service.
- .12 Typical response time and repair time expected for various warranted equipment.
- .4 Contractor's plans for attendance at 9 month post-construction warranty inspections.
- .5 Procedure and status of tagging of equipment covered by extended warranties.
- .6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .10 Respond in timely manner to oral or written notification of required construction warranty repair work.
- .11 Written verification to follow oral instructions.
 - .1 Failure to respond will be cause for the HWDSB to proceed with action against Contractor.

1.15 WARRANTY TAGS

- .1 Tag, at time of installation, each warranted item. Provide durable, oil- and water-resistant tag approved by HWDSB.
- .2 Attach tags with copper wire and spray with waterproof silicone coating.
- .3 Leave date of acceptance until project is accepted for occupancy.
- .4 Indicate the following information on tag:
 - .1 Type of product/material.
 - .2 Model number.
 - .3 Serial number.
 - .4 Contract number.
 - .5 Warranty period.
 - .6 Inspector's signature.
 - .7 Construction Contractor.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Not Used.

1.2 ABBREVIATIONS AND ACRONYMS

- .1 Not Used.

1.3 DEFINITIONS

- .1 Refer to ASTM E631 for terms definitions as they are applicable to this Project.

1.4 REFERENCE STANDARDS

- .1 ASTM International (ASTM):
 - .1 ASTM E631, Standard Terminology of Building Constructions
 - .2 ASTM E2018, Standard Guide for Property Condition Assessments: Baseline Property Condition Assessment Process
- .2 National Research Council of Canada (NRC):
 - .1 National Building Code of Canada (NBC)
 - .2 National Fire Code of Canada (NFC)

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Arrange for a pre-construction meeting in accordance with Section 01 31 19 - Project Meetings. Meeting to be attended by HWDSB and JASON FUNG ARCHITECT INC. to discuss project's requirements before Work starts.

1.6 RESPONSIBILITY

- .1 Contractor shall exercise every reasonable precaution for the protection of each worker on Site.
- .2 Contractor shall furnish all existing building information to all subcontractors who will be performing work on Site.

1.7 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.
- .2 Refer to laws, by laws, ordinances, rules, regulations, and orders of authority having jurisdictions, and other legally enforceable requirements applicable to Work at that area; or become in force during performance or work.

1.8 QUALIFICATIONS

- .1 Provide proof of qualifications when requested by HWDSB.

1.10 SITE INFORMATION

- .1 Site located at Dundas Valley Secondary School, 310 Governor's Rd, Dundas, Ontario, L9H 5P8, features one existing building.

1.11 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit Site specific Health and Safety Plan, within 7 days after date of Notice to proceed and before mobilization to Site. List any relevant hazards present on Site and need to be included in the Contractor's Site specific Health and Safety plan as required by authority having jurisdiction.

- .1 Prepare Site specific Health and Safety Plan in accordance with Section 01 35 29.06 - Health and Safety Requirements, refer to any findings of Site specific Designated Substance Reports (DSR), overhead protection and hoarding requirements, roof anchorage testing reports, and building fire evacuation plans.

2 PRODUCTS

2.1 Not Used

- .1 Not Used.

3 EXECUTION

3.1 EXAMINATION

- .1 Conduct a site visit to examine existing site conditions in accordance with Section 01 71 00 - Examination and Preparation.
- .2 Before Work starts verify existing Site and building(s) conditions.

3.2 VERIFICATION OF CONDITIONS

- .1 Assess any on-Site unknown conditions observed through Site walk-through and discuss with HWDSB should any extra work be required beyond the Contract scope of work.
- .2 Notify HWDSB should any extra work beyond the scope of work under this Contract be required, due to hidden and unknown conditions observed upon Contractor Site observation.
 - .1 Do not proceed with any extra work without obtaining HWDSB written approval.
- .3 Contractor to verify and compare the current conditions of each of the following Site components:
 - .1 Current Site conditions, including: driveways, parking lots, sidewalks, fencing, handrails, exterior stairs, retaining walls, planting and landscaping.
 - .2 Building Structure: walls, columns, floor slabs.
 - .3 Building Exteriors: exterior walls, windows, cladding, caulking, sealants.
 - .4 Building Interior: walls, floors, ceilings, equipment, painting.
 - .5 Electrical Systems: distribution panels, transformers, door systems, fans.
 - .6 Lighting Systems: emergency lighting, exterior lighting system, interior lighting systems.
 - .7 Mechanical Systems: heating and cooling, ventilation, exhaust, air-conditioning.
 - .8 Plumbing Systems: plumbing fixtures, domestic water supply and distribution, sanitary waste sewer, stormwater sewer, roof drains.
 - .9 Fire Protection Systems: fire alarm, sprinklers.

3.3 PROTECTION OF IN-PLACE CONDITIONS

- .1 Provide in-place protection should the current verified Site conditions be considered unsafe in accordance with the requirements of the Site specific Health and Safety Plan, and to protect on-Site personnel and ensure Site safety during all times of work execution.
- .2 Handle, store and dispose flammable materials on site in a safe manner in accordance with NFC requirements
- .3 Notify HWDSB of any identified potential risks due to onsite obstacles.
 - .1 Do not remove any obstacles before obtaining HWDSB written approval.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 Section Includes:
 - .1 Demolition and disposal of select building items.
 - .2 Removal and reinstallation of select building items.
 - .3 Removal and turning over to the HWDSB, of select building.
 - .4 Repair and restoration work after completion of work of this Section.
- .2 Refer to Hazardous Building Materials Assessment (Preconstruction) prepared by PINCHIN LTD. before proceeding with demolition and renovation Work.

1.2 RELATED REQUIREMENTS

- .1 Section 02 82 00 – Asbestos Abatement.

1.3 DEFINITIONS

- .1 Hazardous Materials: Products, mixtures, materials, or substances classified as physical hazards or health hazards in accordance with Schedule 2 of the Hazardous Products Act.

1.4 REFERENCE STANDARDS

- .1 CSA Group (CSA):
 - .1 CSA Z783, Deconstruction of Buildings and Their Related Parts
- .2 Department of Justice Canada:
 - .1 Hazardous Products Act

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Coordinate work of this Section with:
 - .1 Hazardous Building Materials Assessment (Preconstruction) prepared by PINCHIN LTD.
 - .2 Division 25 – Mechanical
 - .3 Division 26 – Electrical
- .2 Pre-Demolition Meetings: Conduct site meeting in accordance with Section 01 31 19 – Project Meetings and attended by the HWDSB and related Subcontractors to:
 - .1 Verify project requirements, including existing construction conditions affected by work of this Section, scope of selective demolition work, demolition sequencing, and protection of in-place conditions.
 - .2 Review scheduling of utility disruptions that may affect building occupants.
 - .3 Coordinate with other Subcontractors.
- .3 Scheduling:
 - .1 Maintain project schedule without compromising specified minimum material diversion rates.
 - .2 Notify the HWDSB of unforeseen delays, in writing.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures. Refer to HWDSB front end document.
- .2 Submit the following action submittals before starting work of this Section:
 - .1 Schedule of Demolition Activities: in accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.

- .3 Submit the following when requested by the HWDSB:
 - .1 Qualification statements: Information about companies and personnel indicating their experience and capabilities to perform demolition work; include lists of completed projects with project names and addresses, and names and addresses of consultants for work of similar complexity and extent.
- .4 Submit soft copies of the following, when required by the authority having jurisdiction:
 - .1 Reviewed shop drawings;
 - .2 Reviewed demolition procedures.

1.7 QUALITY ASSURANCE

- .1 Licensed Professional Qualifications: In accordance with Section 01 43 00 – Quality Assurance.

1.8 SITE CONDITIONS

- .1 Hazardous Materials are listed in HBMA report completed by PINCHIN LTD.. Contractor to review report and account to remediation.
- .2 Review the hazardous materials assessment in accordance with Section 00 31 00 – Available Project Information.
- .3 Stop work immediately and take preventative measures if material resembling spray- or trowel-applied asbestos or other Hazardous Materials are encountered.
 - .1 Notify the HWDSB immediately.
 - .2 Proceed with Work after receipt of written instructions from the HWDSB.

2 PRODUCTS

2.1 MATERIAL OWNERSHIP

- .1 Coordinate material ownership with the HWDSB
 - .1 The Owner will retain ownership of:
 - .1 Items to remain;
 - .2 Items to be re-used;
 - .3 Items to be re-installed;
 - .4 Items to be removed and turned over to the HWDSB
 - .5 Historic items, relics, and similar objects;
 - .6 Cornerstones and their contents;
 - .7 Commemorative plaques and tablets;
 - .8 Antiques;
 - .9 Other items of interest or value to the Owner that may be encountered during demolition.
- .2 Take possession of demolished materials and remove from site.

2.2 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 as closely as possible.
 - .2 Use materials whose installed performance equals or surpasses that of existing materials.

3 EXECUTION

3.1 EXAMINATION

- .1 Review existing conditions and coordinate with indicated requirements to determine extent of demolition required.
- .2 Review record documents of existing facility available from the HWDSB.
- .3 The HWDSB does not guarantee record documents are accurate, complete, or appropriate.
- .4 Inventory and record the condition of items being removed and turned over to HWDSB. Promptly submit a written report to the HWDSB.
- .5 When unforeseen structural, mechanical, electrical, or other issues are encountered that interfere with demolition or removal, investigate and measure the nature and extent of the interference.
- .6 Promptly submit a written report to the HWDSB.
- .7 Perform an engineering review of building conditions to determine whether removing any element might result in structural deficiency, deformation, or unplanned collapse of any portion of the building or structure, or adjacent buildings or structures, during demolition operations.
- .8 Verify Hazardous Materials have been abated or remediated before proceeding with work of this Section.

3.2 PREPARATION

- .1 Protection of In-Place Conditions:
 - .1 Use methods, certified by a qualified licensed professional to prevent movement, settlement, or damage to adjacent properties and buildings, landscaping to remain in place. Provide temporary bracing and shoring as required.
 - .2 Minimize noise, dust, vibration, and inconvenience to occupants in accordance with Section 01 14 00 – Work Restrictions. Provide temporary negative air pressure in demolition areas relative to adjacent occupied areas.
 - .3 Protect building systems, utilities, equipment, landscaping, and other items to remain.
 - .4 Provide temporary dust screens, covers, railings, supports, and other protection in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.
 - .5 Protect interior items exposed to the weather.
 - .6 Maintain access to egress, walkways, corridors, exits, and other adjacent occupied or partially-occupied facilities, unless approved, in writing.
 - .1 Submit copy of written approval.

3.3 DEMOLITION AND REMOVAL REQUIREMENTS

- .1 Demolish or remove select building items in accordance with CSA Z783.

3.4 DEMOLITION

- .1 Demolish items as indicated on the Drawings.
- .2 Contractor to confirm what washroom accessories are to be handed over to HWDSB.

3.5 REMOVE AND REINSTALL

- .1 Remove items indicated on the Drawings.
- .2 Examine removed items. HWDSB's acceptance required for reinstallation if removed items appear in poor condition.
- .3 Temporarily store, protect, and prepare removed items for re-use.
- .4 Reinstall removed items as indicated on the Drawings.

3.6 REMOVE AND SALVAGE

- .1 Remove items indicated on the Drawings.
- .2 Store and protect removed items where acceptable to HWDSB.

3.7 REPAIRS AND RESTORATION

- .1 Promptly repair damage to adjacent construction caused by work of this Section. Patch existing surfaces to make suitable for new materials.
- .2 Restore exposed finishes on patched surfaces. Extend restoration to adjoining construction to eliminate evidence of patching and refinishing.

END OF SECTION

PART 1 GENERAL

1.1 General and Related Work

- .1 Read this Section in conjunction with all drawings and all other Sections so as to comply with the requirements of the General Conditions of the Contract.
- .2 Related work specified elsewhere:
 - .1 Section 02 82 00.01 Asbestos Abatement – Type 1 Procedures
 - .2 Section 02 82 00.02 Asbestos Abatement – Type 2 Procedures
 - .3 Section 02 82 00.04 Asbestos Abatement – Type 2 Glove Bag Method
 - .4 Section 02 83 10 Lead Abatement – Class 1 Procedures
 - .5 Section 02 83 11 Lead Abatement – Class 2 Procedures
- .3 Site Conditions identifies all known hazardous building materials within the Project Area. The information provided is for general reference only. It is recommended each contractor confirm existing conditions on site prior to tender close.
 - .1 The specification fulfils the requirements of Section 30 of the Ontario Occupational Health and Safety Act.
 - .2 The specification fulfils the requirements of the Section 10 of Ontario Regulation 278/05.
- .4 The Outline of Work identifies the location, condition and quantities of hazardous building materials to be removed as part of this project.
 - .1 It is the intent that work prescribed this Section will result in the removal of all hazardous materials as outlined and the decontamination of all surfaces or materials which may have been or become contaminated by hazardous materials either during or prior to work of this Contract.

1.2 Site Conditions

- .1 Refer to the report entitled “Revised Hazardous building Materials Assessment (Preconstruction), Accessibility Washroom Renovation, Dundas Valley Secondary School, 310 Governors Road, Dundas, Ontario”, dated March 30, 2026, prepared by Pinchin Ltd., file number 352293.012.

1.3 Outline of Work

- .1 Coordinate the following items with the Owner’s Project Manager and the Construction Manager, which are to be included in the abatement contractor’s scope of work, including but not limited to: electrical isolations, GFI connection, water connections, HVAC and exhaust ventilation system isolation, bin placement, schedule, disconnects, etc.

- .2 Refer to the Contract Drawings for the extent of construction work and the Work Areas.
- .3 Install Hoarding Walls between Abatement Work Areas and Occupied Areas as required.
- .4 Using Type 1 procedures prescribed in the Section identified in Related Work, remove and dispose of the following:
 - .1 Two layers of non-asbestos vinyl floor tiles with asbestos-containing mastic in Location 2379.
 - .2 Asbestos-containing duct mastic where present on ducting scheduled for removal.
 - .1 Completely remove mastic from substrate.
 - .3 Roofing materials in location of new duct penetration. Removal is to be completed using non powered hand tools.
 - .1 Use Type 2 asbestos procedures, as outlined in Section 02 82 00.02, if removal is done using power tools equipped with HEPA filtered dust collection devices.
- .5 Using Type 2 procedures, with full enclosure, prescribed in the Section identified in Related Work, remove and dispose of asbestos-containing vinyl floor tile mastic using a grinding machine equipped with an efficient HEPA filtered dust collection device in Location 2379.
 - .1 Remove mastic to bare concrete. Chemical strippers are not allowed.
- .6 Using Type 2 procedures prescribed in the Section identified in Related Work, remove and dispose of the following:
 - .1 Drywall walls/bulkheads with asbestos-containing joint compound.
 - .1 Include to remove all wood panelling where present on drywall walls and all drywall walls if present behind wood panelling.
 - .2 Asbestos-containing ceiling tiles.
- .7 Using Glove Bag procedures prescribed in the Section identified in Related Work, remove and dispose of asbestos-containing pipe insulation from the Pipe Chase/Mechanical Room (include for 5 fittings).
 - .1 If for reasons of pipe geometry or access, Glove Bag procedures cannot be used, remove and dispose of asbestos-containing insulations as per Section 02 82 11 for less than 1 square meter, or following Type 3 procedures in accordance with Ontario Regulation 278/05 for greater than 1 square meter.
- .8 Follow lead procedures prescribed in the Section identified in Related Work to remove lead-containing paint/primer from structural steel in locations where structural reinforcement is required.

- .9 Follow mercury procedures when removing all light fixtures and fluorescent light tubes. Place all light fixtures into containers to avoid breakage.
- .10 Refer to Specification Sections identified in the Related Work for specified personnel protective measures for the safe handling, removal, clean-up, enclosure, or repair of hazardous materials in each phase or work area.
- .11 Protect surfaces, building fabrics and items remaining within the Abatement Work Area.
- .12 Without disturbing hazardous materials, perform removals where required, prior to abatement work.
 - .1 Maximize waste diversion by use of resale of building materials, or recycling.
- .13 Isolate the Abatement Work Area from adjoining Occupied and Non-Occupied Areas whether present at an interior or exterior location.
- .14 Maintain emergency and fire exits from Abatement Work Area, or establish alternative exits satisfactory to Provincial Fire Marshall and local authorities having jurisdiction. Maintain extra routes from occupied areas. Place emergency exit signs at locations to clearly mark exit route. Seal emergency exit doors so as not to impede use of door during emergency evacuation.
- .15 Remove, clean, store and replace at completion of work, non-operating mechanical and electrical equipment, ducts, building components, materials or items removed to accommodate asbestos removal.
- .16 Remove and dispose of as appropriate waste, building components, materials and items contaminated by hazardous materials that cannot be effectively cleaned.
- .17 Encapsulate remaining hazardous materials at locations where removal is deemed impractical by the Abatement Consultant.
- .18 Encapsulation will not be permitted where removal of building materials or structures scheduled for demolition will facilitate access to the asbestos materials in question.
- .19 Final clean work area to remove visible signs of asbestos and other hazardous materials, other debris or settled dust.
- .20 Apply lock-down agent to exposed surfaces throughout the work area and to surfaces from which any hazardous materials have been removed.
 - .1 Do not apply lock-down to materials which would be damaged by its application.
- .21 Unless otherwise specified, the handling, removal, clean-up or repair of hazardous materials or surfaces contaminated with hazardous materials is to be performed following wet removal techniques.

1.4 Schedule

- .1 Provide necessary manpower, supervision, equipment and materials to maintain and complete the project on schedule.
- .2 Work Hours:
 - .1 Coordinate all work, scheduling and phasing with the Owner.
 - .2 Duration for which HVAC systems may remain shutdown to accommodate quiet hours work will vary in accordance with outside weather conditions and internal demand. Duration of quiet hours work will have to be scheduled accordingly and in consultation with the Abatement Consultant and Owner.
- .3 Provide 48 hours written notice to the Abatement Consultant of any request to work outside normal working hours. Obtain written approval before proceeding.

1.5 Definitions

- .1 Abatement Consultant: Owner's Representative providing inspection and air monitoring.
- .2 Abatement Contractor: Contractor or sub-contractor performing work of this section.
- .3 Abatement Work Area: Area where work takes place which will, or may, disturb hazardous materials.
- .4 Amended Water: Water with wetting agent added for the purpose of reducing surface tension to allow thorough wetting of materials.
- .5 Asbestos: Any of the fibrous silicates defined in Regulation 278/05 including: actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite.
- .6 Asbestos-Containing Material (ACM): Material identified under Site Conditions including any debris, overspray, fallen material and settled dust.
- .7 Authorized Visitors: Building Owner, Abatement Consultant, or designated representative, and persons representing regulatory agencies.
- .8 Competent Worker: A worker who is qualified because of knowledge, training and experience to perform the work, is familiar with Regulation 278/05 and the Occupational Health and Safety Act, and has knowledge of the potential or actual danger to health and safety in the work.
- .9 Contaminated Waste: Material identified under Site Conditions, including fallen material, settled dust, other debris and materials or equipment deemed to be contaminated by the Abatement Consultant.
- .10 Curtained Doorway: Doorway consisting of two (2) overlapping flaps of rip-proof polyethylene arranged to permit ingress and egress from one room to another while permitting minimal air movement between rooms.

- .11 DOP Test: A testing method used to determine the integrity of the Negative Pressure unit or vacuum using a Dispersed Oil Particulate (DOP) or Poly Alpha Olefin (PAO) HEPA filter leak test. This test is to be conducted on site where units are to be installed. Refer to the Environmental Abatement Council of Canada (EAC) DOP/PAO Testing Guideline 2013 or ANSI/ASME N510-2007.
- .12 Fitting: Individual segments or pieces of a mechanical service line which may include but is not limited to the hangers, tees, elbows, joints, valves, unions, etc.
- .13 Friable Material: Material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- .14 HEPA: High Efficiency Particulate Aerosol filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.
- .15 Lead-Containing: 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.).
- .16 Lead-containing: Paints containing lead at a concentration of 0.009% (90 ppm) or greater.
- .17 Lead Waste: Waste generated from removal of lead-containing materials, or the substrate and paint finish where left intact.
- .18 Mercury Waste: Equipment, materials or items containing mercury or contaminated with mercury.
- .19 Milestone Inspection: Inspection of the Abatement Work Area at a defined point in the abatement operation.
- .20 Negative Pressure: A reduced pressure within the Abatement Work Area (> 0.02 inches of water column) established by extracting air directly from Abatement Work Area and discharging it to exterior of building.
- .21 Non-Friable Material: Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .22 Occupied Area: Any area of the building or adjoining space outside the Abatement Work Area.
- .23 Personnel: All Contractor's employees, sub-contractors employees, supervisors.
- .24 PCM: Phase Contrast Microscopy.

.25 Remove: Remove means remove and dispose of (as applicable type of waste) unless followed by other instruction (e.g. remove and turn over to Owner).

.26 TEM: Transmission Electron Microscopy.

1.6 Regulations and Guidelines

.1 Comply with Federal, Provincial, and local requirements, provided that in any case of conflict among those requirements or with these Specifications, the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed.

.2 Where regulations are not present, follow accepted industry standards and applicable Guideline documents.

.3 Regulations and Guidelines include but are not limited to the following:

- .1 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
- .2 Ministry of the Environment and Climate Change Regulation for the disposal of waste, including R.R.O. 1990, Reg. 347 as amended.
- .3 PCB Regulations, SOR 2008-273 and R.R.O. 1990, Reg 362.
- .4 Regulation 490/09 Designated Substances.
- .5 Environmental Abatement Council of Canada (EACC), Lead Guideline For Construction, Renovation, Maintenance or Repair, October 2014.
- .6 Ministry of Labour, Guideline, Silica on Construction Projects, 2011.

1.7 Quality Assurance

.1 Removal and handling of hazardous materials is to be performed by persons trained in the methods, procedures and industry practices for Abatement.

.2 Ensure work proceeds to schedule, meeting all requirements of this Specification.

.3 Complete work so that at no time airborne dust, visible debris, or water runoff contaminate areas outside the Abatement Work Area.

.4 Any contamination of surrounding area (indicated by visual inspection or air monitoring) shall necessitate the clean-up of affected area, and in the same manner applicable to an Abatement Work Area at no cost to the Owner.

.5 All work involving electrical, mechanical, carpentry, glazing, etc., shall be performed by licensed persons experienced and qualified for the work required.

1.8 Supervision

- .1 Provide on site for each work shift, a Shift Superintendent(s), who has authority regarding all aspects related to manpower, equipment and production.
- .2 At all times during work, the Shift Superintendent(s) must be on site. Failure to comply with this requirement will result in a stoppage of all work, at no cost to the Owner.
- .3 Replace supervisory personnel, with approved replacements, within three (3) working days of a written request from the Owner. Owner reserves the right to request replacement of supervisory personnel without explanation.
- .4 Do not replace supervisory personnel without written approval from the Owner.

1.9 Instruction and Training

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

1.10 Notification

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

1.11 Submittals

- .1 Submit prior to starting work:
 - .1 Provincial Workers' Compensation Board Clearance Certificate.
 - .2 Insurance certificates.
 - .3 Copy of Company Health and Safety Policy and applicable programs.
 - .4 Ministry of Labour Notice of Project form.
 - .5 Copy of Certificate of Approval for disposal of hazardous materials waste and location of landfill.

- .6 Pre-removal damage survey of the Abatement Work Area(s), waste transport routes, and bin storage areas
- .2 Submit the following information regarding personnel prior to starting work:
 - .1 Proof in the form of a certificate that supervisory personnel have attended a training course on asbestos removal or are certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.
 - .2 Written statement that personnel have had instruction on hazards of exposure to hazardous materials identified within this scope, the use of respirator, protective clothing, worker and waste decontamination procedures, and all aspects of work procedures and protective measures.
 - .3 WHMIS training certificates for all personnel.
 - .4 Certificate proving that each worker on site has been fit tested for the respirator appropriate for the work being performed.
- .3 Submit the following information regarding HEPA filtered devices prior to construction of enclosure or asbestos abatement:
 - .1 Performance data on HEPA filtered vacuums including DOP tests no more than 3 months old.
 - .2 Performance data on negative air units including DOP tests which must be no more than 3 months old if the unit is vented outdoors or which must be performed on site immediately prior to initial usage and when HEPA filters are changed if the unit is vented indoors.
 - .3 DOP tests to be performed by an independent testing company.
 - .1 DOP testing company is required to submit a detailed technical report of testing protocol, including Introduction, Methodology, Results, Conclusions, and Recommendations, including results of the Air-Aerosol Mixing Uniformity test as per ASME N510-1989 (1995).
 - .2 DOP testing company must also provide calibration certificates from an independent calibration firm or from the manufacturer of the testing equipment for both the aerosol photometer and the pressure gauge on the aerosol generator dated within 1 calendar year from the on-site testing date.
 - .3 DOP testing company must also provide the National Sanitation Foundation (NSF) certification name and number of the on-site technician performing the testing.
 - .4 Proof of calibration of DOP testing equipment.
- .4 Submit the following prior to isolating the work area:
 - .1 Safety Data Sheets for chemicals or material used in the course of the Abatement Project.

- .5 Submit the following upon completion of the work.
 - .1 Manifests, waybills, bills of lading etc. as applicable for each type of waste.

1.12 Inspection

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

- .10 Refer to the Sections identified in Related Work for specified milestone inspections which are to take place at defined points throughout the abatement operation specific to each phase or work area.
- .11 Do not proceed with next phase of work until written approval of each milestone is received from the Abatement Consultant.

1.13 Air Monitoring - Asbestos

- .1 Air monitoring will be performed using Phase Contrast Microscopy (PCM) following the National Institute for Occupational Safety and Health Method 7400.
- .2 Co-operate in the collection of air samples, including providing workers to wear sample pumps for up to full-shift periods. Contractor will be responsible for the cost of testing equipment repairs or resampling resulting from the actions of the Contractor's forces.
- .3 Results of PCM samples at or exceeding 0.05 fibres per cubic centimeter of air (fibre/cc) or greater, outside an Abatement Work Area, or from within the Abatement Work Area during or following Glove Bag Work, will indicate asbestos contamination of these areas. Respond as follows:
 - .1 Suspend work within the adjoining Abatement Work Area until written authorization to resume work has been received from the Abatement Consultant.
 - .2 Isolate and clean area in the same manner applicable to the Abatement Work Area.
 - .3 Maintain work area isolation, and repeat clean-up operations until visual inspection and air monitoring results are at a level equal to that specified.
 - .4 At the discretion of the Abatement Consultant provide additional negative air units at locations specified in response to elevated fibre levels being detected in the Clean Change Room or Occupied Areas.
- .4 Results of PCM samples at or greater than 0.01 fibres per cubic centimeter of air (fibre/cc), collected within the Abatement Work Area enclosure after the site has passed a visual inspection, and an acceptable coat of lock-down agent has been applied, will indicate asbestos contamination of these areas. Respond as follows:
 - .1 Maintain work area isolation and re-clean entire work area. Then apply another acceptable coat of lock-down agent to exposed surfaces throughout the work area.
 - .2 Repeat above measures until visually inspected and air monitoring results are at a level equal to that specified
 - .3 Alternate to items above, the Asbestos Abatement Contractor can pay for analysis of PCM samples by Transmission Electron Microscopy (TEM) at NVLAP accredited laboratory.
 - .1 Enclosure to remain sealed, with negative pressure maintained, and

subject to required daily inspections until TEM results are received.

- .5 Additional labour or materials expended by the Contractor to rectify unsatisfactory conditions and to provide performance to the level specified shall be at no additional cost to the Owner.
- .6 Cost of additional inspection and sampling performed as a result of elevated fibre levels in areas outside the Abatement Work Area or from within the work area following completion of work, will be back-charged to the Contractor.

1.14 Worker Protection

- .1 Instruct workers before allowing entry to the Abatement Work Area. Instruction shall include training in use of respirators, dress, showering, entry and exiting from an Abatement Work Area, and all other aspects of work procedures and protective measures.
- .2 Workers shall not eat, drink, chew gum or tobacco, vape or smoke in the Abatement Work Area.
- .3 Workers shall be fully protected at all times when possibility of disturbance of hazardous materials exists.
- .4 Provide soap, towels and facilities for washing of hands and face, which shall be used by all personnel when leaving the Abatement Work Area.
- .5 Respiratory Protection
 - .1 Refer to each particular Section of the Specification for specified type of respiratory equipment specific to each phase or work area.
 - .2 Respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Abatement Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.
 - .8 Provided with new filters as necessary, according to manufacturer's instructions.
 - .9 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing.
 - .10 Instruction on proper use of respirators must be provided by a competent person as defined by the Occupational Health and Safety Act.
 - .3 Provide protective clothing, to all personnel which:

- .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres or lead/silica dust.
- .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
- .3 Once coveralls are worn, treat and dispose of as contaminated waste.
- .4 Is replaced or repaired if torn or ripped.
- .4 Use hard hats, safety footwear and other protective equipment and apparel required by applicable construction safety regulations.

1.15 Visitor Protection

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

1.16 Signage

- .1 Asbestos Abatement Signs: Post signs at access points to the Abatement Work Area, stating at minimum, the following:
 - .1 There is an asbestos dust hazard.
 - .2 Access to the work area is restricted to persons wearing protective clothing and equipment.
- .2 Lead Abatement Signs: Post signs at access points to the Abatement Work Area, stating at minimum, the following:
 - .1 There is a lead dust, fume or mist hazard.
 - .2 Access to the work area is restricted to authorized persons.
 - .3 Respirators must be worn in the work area.
- .3 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.

.4 Place placards in accordance with Transportation of Dangerous Goods Act.

1.17 Waste and Material Handling

.1 Waste bins must be placed on grade or in receiving.

.2 All bins for hazardous materials must be covered and locked when waste transfer is not being performed.

.3 Ensure redundant non-ACM, rubble, debris, etc. removed during contaminated work are treated, packaged, transported and disposed of as appropriate waste.

.4 Clean, wash and apply Post Removal Sealant to metal waste prior to removal from Abatement Work Area. Recycle metals.

.5 Clean, wash and apply Post Removal Sealant to non-porous materials prior to disposal as clean waste. Obtain prior written approval from the Abatement Consultant for each individual type of material.

.6 Clean and wash equipment prior to removal from Abatement Work Area if removed prior to completion.

.7 Place all equipment, tools and unused materials that cannot be cleaned in Abatement Waste Containers.

.8 As work progresses, and at regular intervals, transport the sealed and labelled waste containers from the Abatement Work Area to waste bin.

.9 Place items in bins according to waste classification. Place asbestos waste, lead waste, metals, non-asbestos waste, etc. in separate bins.

.10 Removal of waste containers and decontaminated tools and materials from the Abatement Work Area shall be performed as follows:

.1 Remove any visible contamination from the surface of non-porous or cleanable waste being removed from the Abatement Work Area. If the item can be cleaned, remove it from the site as clean waste.

.2 Place waste or item in Waste Container and seal closed.

.3 Wet wipe outside of Waste Container.

.4 Within Decontamination Facility, Transfer Room or at the perimeter of the Abatement Work Area, place in second Waste Container. Seal closed.

.5 Remove waste containers and transport to appropriate bin.

- .11 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.
- .12 Provide workers transporting waste with means to access full personal protective equipment and all tools required to properly clean up spilled material in the case of a rupture of a Waste Container.
- .13 Pick-up and drop off of garbage bin shall be at pre-approved times, and must not interfere with the Owners operations.
- .14 Transport hazardous waste to landfill or waste transfer station licensed by the provincial Ministry of the Environment.
- .15 Cooperate with the provincial Ministry of the Environment inspectors and immediately carry out instructions for remedial work at dump to maintain environment, at no additional cost to the Owner.

1.18 Re-establishment of Objects and Systems

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

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

- .1 Refer to the Sections identified in Related Work for specified materials, equipment or facilities specific to each phase or work area.
- .2 Materials and equipment must be in good condition and free of debris and fibrous materials. Disposable items must be of new materials only.
- .3 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.
- .4 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of materials.
- .5 Asbestos Waste Container: A container acceptable to disposal site, Ministry of the Environment, and Ministry of Labour, comprised of the following:
 - .1 Dust tight.
 - .2 Suitable for the type of waste.
 - .3 Impervious to asbestos.

- .4 Identified as asbestos waste.
- .6 Discharge Ducting: Polyethylene Tubing. Reinforced with wire. Diameter to equal negative pressure machine discharge. Not to be longer than required, or so long that negative pressure is compromised.
- .7 Ground Fault Panel: Electrical panel as follows:
 - .1 Ground fault circuit interrupters of sufficient capacity to power temporary electrical equipment and lights in Asbestos Work Area.
 - .2 Interrupters to have a 5 mA ground fault protection.
 - .3 Necessary accessories including main switch disconnect, ground fault interrupter lights, test switch to ensure unit is working, and reset switch.
 - .4 Openings sealed to prevent moisture or dust penetration.
 - .5 Inspected by the Electrical Safety Authority.
 - .6 Panel uses CSA approved parts and been constructed, inspected and installed by a licensed electrician.
 - .7 Provide one Ground Fault Panel for each 5,000 square feet (500 square metres) of Abatement Work Area.
- .8 HEPA Filtered Negative Pressure Machine: Portable air handling system which extracts air directly from the Abatement Work Area and discharges the air to the exterior of the building. Equipped as follows:
 - .1 Prefilter and HEPA filter. Air must pass HEPA filter before discharge.
 - .2 Pressure differential gauge to monitor filter loading.
 - .3 Auto shut off and warning system for HEPA filter failure.
 - .4 Separate hold down clamps to retain HEPA filter in place during change of prefilter.
- .9 HEPA Vacuum: Vacuum with necessary fittings, tools and attachments. Discharged air must pass through a HEPA filter.
- .10 Hose: Leak-proof, minimum bursting strength of 500 PSI or greater if required, abrasion resistant covering, reinforcing, and machined-brass couplings. Maintained and tested. Hose to be temperature resistant if it is to carry domestic hot water.
- .11 Lead Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment, that is:
 - .1 Dust tight.

- .2 Suitable for the type of waste.
- .3 Evaluated for leachable lead content, and disposed of in accordance with applicable regulations.
 - .1 Where lead waste exceeds 5.0 mg/L of lead in the TCLP analysis, label as lead waste and dispose of as leachate toxic hazardous waste.
 - .2 Where lead waste is below 5.0 mg/L of lead in the TCLP analysis, disposed of as construction waste.
- .12 OSB: Oriented Strand Board.
- .13 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints.: 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints.
- .14 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.
- .15 Protective Clothing: Disposable coveralls complete with head covering and full body covering that fits snugly at the ankles, wrists and neck.
- .16 Rip-Proof Polyethylene Sheeting: 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and two (2) layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps.
- .17 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.
- .18 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.
- .19 Wetting Agent: Non-sudsing surfactant added to water to reduce surface tension and increase wetting ability.

PART 3 EXECUTION

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

END OF SECTION

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PART 1 GENERAL

1.1 General and Related Work

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

1.2 Outline of Work

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

1.3 Personal Protection

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

1.4 Inspections

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

PART 2 PRODUCTS AND FACILITIES

- .1 Refer to Section 02 81 00.

PART 3 EXECUTION

3.1 Site Preparation

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

furnishings remaining in the Abatement Work Area.

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

3.2 Maintenance of Abatement Work Area

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

3.3 Asbestos Removal - General

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

vacuums and/or wet sweeping or mopping.

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

3.4 Asbestos Removal - Vinyl Asbestos Tile

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

3.5 Asbestos Removal - Removal of Other Non-Friable Asbestos Materials – Duct Mastic, Roofing 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.

3.6 Abatement Work Area Dismantling

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

3.7 Waste and Material Handling

- .1 Refer to Section 02 81 00.

END OF SECTION

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PART 1 GENERAL

1.1 General and Related Work

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

1.2 Outline of Work

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

1.3 Personal Protection

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

1.4 Inspections

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

PART 2 PRODUCTS AND FACILITIES

- .1 Refer to Section 02 81 00.

2.2 Hoarding Walls

- .1 Type A Hoarding Wall: One layer of rip-proof polyethylene sheeting installed floor to ceiling, secured with telescopic poles, clips, or other suitable methods.

2.3 Transfer Room

- .1 Transfer Room to be generally 2000 mm x 2000 mm x 2200 mm high. Increase size

accordingly to accommodate number of workers.

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

2.4 Curtained Doorways

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

PART 3 EXECUTION

3.1 Site Preparation - General

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

- .4 Perform work at scheduled times after shutting down HVAC systems affecting the Abatement Work Area.

- .7 Provide amended water for wetting ACM, and adequate method of wetting (garden sprayers, airless sprayers, etc).

3.2 Site Preparation –Enclosure Required

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

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

3.3 Maintenance of Abatement Work Area

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

3.4 Asbestos Removal - General

- .1 Do not use compressed air to clean or remove dust or debris.

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

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

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

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

- .1 Use the procedures described above under *Site Preparation – Enclosure Required*.
- .2 Lift tile vertically, and while keeping level, slide tile over to adjacent tile.
- .3 HEPA vacuum back of all tiles within reach.
- .4 Mist surface of ceiling tiles with amended water.
- .5 Remove ceiling tiles intact. Do not break or pulverize.
- .6 Place directly into asbestos waste container.
- .7 Repeat items .3 to .6, until all required ceiling tiles are removed.
- .8 Place ACM directly into waste containers.
- .9 Remove visible dust and debris including at grid.
- .10 Remove ceiling grid and support system and dispose of as clean waste where specified to be removed.
- .11 Wet clean or HEPA vacuum the entire Abatement Work Area, including surfaces not covered with polyethylene sheeting (i.e. ceiling grid).
- .12 Any materials or equipment removed to access ACM that are to be reused, must be wet cleaned or vacuumed prior to reinstatement.

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

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

3.3 Asbestos Removal - Flooring Mastic with HEPA Filtered Power Tools and Machines

- .1 Use the procedures described above under *Site Preparation – Enclosure Required*.
- .2 Wet all material to be disturbed.
- .3 Turn on power tool/machine and HEPA dust collection device. HEPA dust collection device to remain operational throughout work.
- .4 Use the power tool/machine to remove all ACM.
- .5 Place removed ACM directly into an asbestos waste container.
- .6 Wet clean or HEPA vacuum the entire Abatement Work Area, including surfaces not covered with polyethylene sheeting. Any materials or equipment removed to access ACM that are to be reused, must be wet cleaned or vacuumed prior to reinstatement.

3.4 Application of Post Removal Sealant

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

3.5 Abatement Work Area Dismantling

- .1 Wash or HEPA vacuum equipment and tools used in contaminated Abatement Work Area to remove all asbestos contamination, or place in Asbestos Waste Containers prior to being removed from Abatement Work Area.
- .2 Place tools and equipment used in contaminated work site but not cleaned in polyethylene bags prior to removal from Abatement Work Area.
- .3 Clean polyethylene sheeting and drop sheets which with HEPA vacuum or wet cleaning methods at completion of work.
- .4 Wet drop sheets and polyethylene sheeting.
- .5 Carefully roll polyethylene sheeting and drop sheets toward the centre of enclosure. As polyethylene is rolled away, immediately remove visible debris beneath with a HEPA vacuum.

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

3.6 Waste and Material Handling

- .1 Refer to Section 02 81 00.

3.7 Re-Establishment of Items

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

END OF SECTION

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PART 1 GENERAL

1.1 General and Related Work

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

1.2 Outline of Work

- .1 Refer to Section 02 81 00 Hazardous Materials – General Provisions for the Outline of Work.
- .2 The intent of this Section is to provide safe work practices and procedures to govern the handling, removal, clean-up and disposal of asbestos-containing materials following Glove Bag procedures, and Pinchin and Owner specific requirements.
- .3 If for reasons of pipe temperature, geometry or access, Glove Bag procedures cannot be used, remove and dispose of asbestos-containing insulations following Type 2 procedures outlined in Section 02 82 00.02 for less than 1 square meter, or following Type 3 procedures outlined in O.Reg. 278/05 for quantities greater than 1 square meter.

1.3 Personal Protection

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

1.4 Inspections

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

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

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

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

PART 3 EXECUTION

3.1 Site Preparation - General

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

3.2 Maintenance of Abatement Work Area

- .1 Maintain Abatement Work Area in tidy condition.

3.3 Glove Bag Removal

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

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

Type 2 Procedures.

3.4 Clean-Up and Dismantling

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

3.5 Waste and Material Handling

- .1 Refer to Section 02 81 00.

3.6 Re-Establishment of Items

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

END OF SECTION

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HWDSB,DundasValleySS,Access,HAZ,ASSMT\Deliverables\Specs\352293.012 02 82 00.04 Glove Bag DVSS HWDSB Mar 30 2026.docx

PART 1 GENERAL

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

1.2 Outline of Work

- .1 Refer to Section 02 81 00 Hazardous Materials – General Provisions for the Outline of Work.
- .2 The intent of this Section is to provide safe work practices and procedures to govern the handling, removal, clean-up and disposal of lead-containing materials following Class 1 or Low Risk procedures, and Pinchin and Owner specific requirements.
- .3 Comply with requirements of this Section when performing following Work:
 - .1 Removal of lead-containing surface coatings with a chemical gel, stripper or paste.

1.3 Instruction and Training

- .1 Provide instruction and training to all workers including the following:
 - .1 Hazards of lead.
 - .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 including decontamination of the worker.
 - .5 Instruction and training must be provided by a competent person.

1.4 Personal Protection

- .1 Provide non-powered half-face respirators with P100 high efficiency cartridge filters when requested by personnel.
- .2 Provide protective clothing, when requested by personnel, entering the Abatement Work Area, including:
 - .1 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.
- .3 Provide protective clothing, to all personnel entering the Abatement Work Area, including:

- .1 Dust impermeable gloves appropriate for the work being completed.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.
- .5 Lead-specific soaps and hygiene indicators are recommended to be provided for shower and hand-wash stations.

1.5 Inspections

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

PART 2 PRODUCTS AND FACILITIES

- .1 Refer to Section 02 81 00.

2.2 Hoarding Walls

- .1 Type A Hoarding Wall: One layer of rip-proof polyethylene sheeting installed floor to ceiling, secured with telescopic poles, clips, or other suitable methods.
- .2

2.3 Curtained Doorways

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

PART 3 EXECUTION

3.1 Site Preparation - General

- .1 Provide washing facilities consisting of a wash basin, clean water, soap and towels.
 - .1 Workers are to use washing facilities each time leaving the Abatement Work Area.
- .2 Stored or non-fixed items, including but not limited to equipment, furniture, waste etc., shall be removed from the Abatement Work Area prior to abatement work.
- .3 Isolate, at panel, and disconnect existing power supply to Abatement Work Area. Power supply to remaining areas of building must not be disrupted during work of this section.
 - .1 Lock-out/tag-out power at electrical panels.
 - .2 Mark/tag any items within or passing through the Abatement Work Area that are

to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.

- .4 Shut down HVAC systems serving the Abatement Work Area.
 - .1 Install polyethylene sheeting over openings in ducts and diffusers and seal.
 - .2 HVAC to remaining areas of building must not be disrupted during work of this section.
 - .3 System shall remain inoperative until completion of work, unless ducts can be effectively capped.
 - .4 Perform work at scheduled times after shutting down HVAC systems affecting the Abatement Work Area.
- .5 Remove visible dust from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping.
- .6 Provide amended water for wetting materials, and adequate method of wetting (garden sprayers, airless sprayers, etc.).
- .7 Provide electrical power and shut off for operation of powered tools and equipment. Provide ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard.
 - .1 Ensure safe installation of electrical lines and equipment.
- .8 Do not use compressed air to clean or remove dust or debris.
- .9 Frequently and at regular intervals during the work, clean up dust and waste using HEPA vacuums and/or wet sweeping or mopping.
- .10 Frequently and at regular intervals, place all waste in waste containers.
- .11 Immediately upon completion of work, clean area with HEPA vacuum and/or wet sweeping or mopping.

3.2 Site Preparation – No Enclosure Required

- .1 Isolate Abatement Work Area with barrier tape.
- .2 Protect floor surfaces covered from wall to wall with polyethylene sheets.
- .3 Maintain Abatement Work Area in tidy condition.
- .4 Remove waste and debris frequently.
- .5 Remove standing water on polyethylene/floor at the end of every shift.
- .6 Turn off water supply to hoses and reduce pressure in hose, prior to leaving the Abatement Work Area at end of shift.

3.3 Lead-Containing Paint Abatement

- .1 Removal methods minimizing dust generation should be used wherever possible.
 - .1 Wet methods are to be used to reduce dust generation.
 - .2 Wetting agents should be used where possible.
 - .3 Wet methods are not to be used if it creates a hazard or cause damage to equipment or to project.

- .2 Provide drop sheets below all lead operations that may produce dust, chips or debris containing lead.
- .3 Waste water from cleaning or removal operations must be contained, for treatment or disposal.
- .4 Remove lead-containing paint in small sections and pack as it is being removed in sealable lead waste containers.
- .5 Follow manufacturer's instructions for all use of chemical gels, strippers and pastes.
 - .1 Ensure agent neutralizers, where required, are applied.
 - .2 Do not use chemical gels, strippers or pastes on surfaces where they are scheduled to be repainted, and the material affect the new paint application.
- .6 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.
- .7 After wire brushing and wet sponging to remove visible lead-containing paint, wet clean entire work area, and equipment used in process.
 - .1 Compressed air or dry sweeping not be used to clean up lead-containing dust or waste.
 - .2 Ensure all waste is cleaned and packaged.
- .8 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to staging area. Clean external surfaces thoroughly again by wet sponging. Wash containers thoroughly pending removal to outside.

3.4 Waste Management and Disposal

- .1 Per Section 02 81 00.

3.5 Final Cleaning

- .1 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.
- .2 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .3 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

END OF SECTION

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PART 1 GENERAL

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

1.2 Outline of Work

- .1 Refer to Section 02 81 00 Hazardous Materials – General Provisions for the Outline of Work.
- .2 The intent of this Section is to provide safe work practices and procedures to govern the handling, removal, clean-up and disposal of lead-containing materials following Class 2 or Moderate Risk procedures, and Pinchin and Owner specific requirements.
- .3 Comply with requirements of this Section when performing following Work:
 - .1 Removal of lead containing paint using power tools with an effective dust collection system equipped with HEPA filter.
 - .2 Welding, torching or high temperature cutting of lead-containing surface coatings or materials indoors, with use of an effective fume collector or smoke eater.

1.3 Instruction and Training

- .1 Provide instruction and training to all workers including the following:
 - .1 Hazards of lead.
 - .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 including decontamination of the worker.
 - .5 Instruction and training must be provided by a competent person.

1.4 Personal Protection

- .1 Provide the following respiratory protection to all personnel, at minimum:
 - .1 Non-powered half-face respirators with P100 high efficiency cartridge filters.
- .2 Provide protective clothing, to all personnel entering the Abatement Work Area, including:
 - .1 Dust impermeable gloves appropriate for the work being completed.

- .2 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.
- .3 Provide protective clothing, to all personnel entering the Abatement Work Area.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.
- .5 Lead-specific soaps and hygiene indicators are recommended to be provided for shower and hand-wash stations.

1.5 Inspections

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

PART 2 PRODUCTS AND FACILITIES

- .1 Refer to Section 02 81 00.

2.2 Hoarding Walls

- .1 Type A Hoarding Wall: One layer of rip-proof polyethylene sheeting installed floor to ceiling, secured with telescopic poles, clips, or other suitable methods.

2.3 Transfer Room

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

2.4 Curtained Doorways

- .1 Construct as follows:
 - .1 Install two flap doors, full width and height of door opening at all doors to Abatement Work Area and both ends of Transfer Room.
 - .2 Construct each flap door of two layers of polyethylene sheeting with all edges reinforced with tape. Use wood strapping to securely fasten flap doors to head

and alternate jambs.

.3 Install weights attached to bottom edge of each door flap.

.4 Provide direction arrows on flaps to indicate opening.

PART 3 EXECUTION

3.1 Site Preparation - General

.1 Provide washing facilities consisting of a wash basin, clean water, soap and towels.

.1 Workers are to use washing facilities each time leaving the Abatement Work Area.

.2 Stored or non-fixed items, including but not limited to equipment, furniture, waste etc., shall be removed from the Abatement Work Area prior to abatement work.

.3 Isolate, at panel, and disconnect existing power supply to Abatement Work Area. Power supply to remaining areas of building must not be disrupted during work of this section.

.1 Lock-out/tag-out power at electrical panels.

.2 Mark/tag any items within or passing through the Abatement Work Area that are to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.

.4 Shut down HVAC systems serving the Abatement Work Area.

.1 Install polyethylene sheeting over openings in ducts and diffusers and seal.

.2 HVAC to remaining areas of building must not be disrupted during work of this section.

.3 System shall remain inoperative until completion of work, unless ducts can be effectively capped.

.4 Perform work at scheduled times after shutting down HVAC systems affecting the Abatement Work Area.

.5 Remove visible dust from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping.

.6 Provide amended water for wetting materials, and adequate method of wetting (garden sprayers, airless sprayers, etc.).

.7 Provide electrical power and shut off for operation of powered tools and equipment. Provide ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard.

.1 Ensure safe installation of electrical lines and equipment.

.8 Do not use compressed air to clean or remove dust or debris.

.9 Frequently and at regular intervals during the work, clean up dust and waste using HEPA vacuums and/or wet sweeping or mopping.

.10 Frequently and at regular intervals, place all waste in waste containers.

.11 Immediately upon completion of work, clean area with HEPA vacuum and/or wet sweeping or mopping.

3.2 Site Preparation – No Enclosure Required

- .1 Cover materials to remain in the Abatement Work Area with polyethylene sheeting before disturbing lead-containing materials to control the spread of dust.
- .2 Install caution tape around work area where existing walls are not present.
- .3 Install temporary lighting in enclosure to a level that will provide for safe and efficient use of work area - minimum 550 LUX.
- .4 Place HEPA vacuum in Abatement Work Area.
- .5 Place required tools to complete the abatement within the Abatement Work Area.
- .6 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of a lead dust hazard.

3.3 Maintenance of Abatement Work Area

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

3.4 Lead Abatement

- .1 Use the procedures described above under *Site Preparation – No Enclosure Required*.
 - .1 Removal of lead containing paint using power tools with an effective dust collection system equipped with HEPA filter.
 - .2 Welding, torching or high temperature cutting of lead-containing surface coatings or materials indoors, with use of an effective fume collector or smoke eater.
- .2 Provide washing facilities consisting of a wash basin, clean water, soap and towels.
 - .1 Workers are to use washing facilities each time leaving the Abatement Work Area.
- .3 Removal methods minimizing dust generation should be used wherever possible.
 - .1 Wet methods are to be used to reduce dust generation.
 - .1 Wetting agents should be used where possible.
 - .2 Wet method not be used if it creates a hazard or cause damage to equipment or to project.
- .4 Provide drop sheets below all lead operations that may produce dust, chips or debris containing lead.
- .5 Waste water from cleaning or removal operations must be contained, for treatment or disposal.

- .6 Remove lead containing paint in small sections and pack as it is being removed in sealable waste containers.
- .7 Waste generated should be maintained wet until cleaned and packaged.
- .8 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.
- .9 After wire brushing and wet sponging to remove visible lead containing paint, wet clean entire work area, and equipment used in process.
 - .1 Compressed air or dry sweeping not be used to clean up lead-containing dust or waste.
 - .2 Ensure all waste is cleaned and packaged.
- .10 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to staging area. Clean external surfaces thoroughly again by wet sponging. Wash containers thoroughly pending removal to outside. Ensure containers are removed by workers who have entered from uncontaminated areas dressed in clean coveralls.

3.5 Waste Management and Disposal

- .1 Per Section 02 82 00.

3.6 Final Cleaning

- .1 Following specified cleaning procedures, and when lead wipe sampling is below acceptable concentrations proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Clean visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.
- .3 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and seal. Dispose of in accordance with waste materials generated.
- .4 Clean Work areas and Transfer Room, where present.
- .5 Remove sealed waste containers and equipment used in Work and remove from work areas at appropriate time in cleaning sequence.
- .6 Conduct final check to ensure no dust or debris remain on surfaces as result of dismantling operations.

END OF SECTION

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1 GENERAL

1.1 SUMMARY

- .1 This section includes, but is not limited to, supply and installation of concrete curing agents and colour additives, Various other types of concrete finishing could be included.

1.2 RELATED REQUIREMENTS

- .1 Section 09 65 00 – Resilient Flooring and Accessories

1.3 REFERENCE STANDARDS

- .1 ASTM International (ASTM):
 - .1 ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
 - .2 ASTM C979/C979M, Standard Specification for Pigments for Integrally Colored Concrete
- .2 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-25.20, Surface Sealer for Floors
- .3 CSA Group (CSA):
 - .1 CSA A23.1 /A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete
- .4 South Coast Air Quality Management District (SCAQMD), California State:
 - .1 SCAQMD Rule 1113, Architectural Coatings

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with Section 09 65 00 – Resilient Flooring and Accessories for existing slab refinishing as necessary.
- .2 Pre-Installation Meetings: Conduct a meeting in accordance with Section 01 31 19 - Project Meetings attended by Contractor, HWDSB, and JASON FUNG ARCHITECT INC.:
 - .1 Verify Project requirements.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's product literature and data sheets for concrete finishing products. Include product characteristics, performance criteria, physical sizes, finishes, and limitations.
 - .2 Submit WHMIS Safety Data Sheet (SDS).
- .3 Manufacturer's Instructions: Submit application instructions for each concrete floor treatment.
- .4 Qualification Statements: Submit written declaration that concrete floor finishing products used on this Project are compatible with subsequently installed finish flooring products and adhesives.

1.6 QUALITY ASSURANCE

- .1 Perform in accordance with Section 01 43 00 - Quality Assurance.
- .2 Submit proposed quality control procedures a minimum four weeks before starting concrete finishing work, for review by HWDSB and JASON FUNG ARCHITECT INC..

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with Section 01 61 00 - Common Product Requirements.

- .2 Packaging Waste Management: Remove packaging materials for reuse in accordance with Section 01 74 19 - Waste Management and Disposal.

1.8 SITE CONDITIONS

- .1 Temporary lighting: Minimum 1200 W light source, placed 2.5 m above floor surface for each 40 m² of floor being treated.
- .2 Make work area watertight and protected against rain and detrimental weather conditions.
- .3 Temperature: Maintain a minimum 10C ambient temperature for seven days before installation and a minimum 48 hours after completion of work. Maintain relative humidity at a maximum 40% during both periods.
- .4 Moisture: Ensure concrete substrate is within moisture limits prescribed by manufacturer.
- .5 Ventilation:
 - .1 Coordinate with Owner for operation of existing building ventilation system during application of concrete floor finish. Ventilate area of work as recommended by concrete floor finish manufacturer with temporary supply and exhaust fans.
 - .2 Provide continuous ventilation during and after application of finish.

2 PRODUCTS

2.1 MATERIALS

- .1 Curing Compounds:
 - .1 To ASTM C309, waterborne, wax-free, penetrating, non-film forming, dries clear, and does not prevent adhesion with subsequently applied coatings, treatments, or other floor finishes.
 - .2 Waterborne, membrane-forming curing membrane: To ASTM C309, Type 1 Clear, Class B.

3 EXECUTION

3.1 EXAMINATION

- .1 Verify that concrete slabs are ready to receive work and elevations as indicated on Drawings.

3.2 APPLICATION

- .1 Finish concrete floor slab surfaces to CSA A23.1/CSA A23.2, Table 21.

3.6 PROTECTION

- .1 Protect finished surfaces in accordance with manufacturer's recommendations.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This section includes, but is not limited to, supply and installation of self levelling materials to be used under finish flooring.

1.2 RELATED REQUIREMENTS

- .1 Section 09 30 00 – Porcelain & Ceramic Tiling
- .2 Section 09 65 00 – Resilient Flooring & Accessories

1.3 REFERENCE STANDARDS

- .1 ASTM International (ASTM):
 - .1 ASTM C472M, Compressive Strength of Gypsum Concrete.
 - .2 ASTM F2170, Standard Test Method for Determining Relative Humidity in Concrete Floor Slab
 - .3 ASTM F2419, Standard Test Method for Installation of Thick Poured Gypsum Concrete and Preparation of Surface to Receive Resilient Flooring
 - .4 ASTM F2678, Standard Practice for Preparing Panel Underlayments, Thick Poured Gypsum Concrete Underlayments, Thick Poured Lightweight Cellular Concrete Underlayments, and Concrete Subfloors with Underlayment Patching Compounds to Receive Resilient Flooring
- .2 Tile Council of North America (TCNA)
 - .1 TCNA F180, Tile Council of North America Installation Handbook

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with Section 09 30 00 – Porcelain & Ceramic Tile for surface installation preparation.
- .2 Pre-Installation Meetings: Conduct a meeting in accordance with Section 01 31 19 - Project Meetings attended by Contractor, HWDSB, and JASON FUNG ARCHITECT INC.:
 - .1 Verify Project requirements.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's product literature and data sheets. Include product characteristics, performance criteria, physical sizes, finishes, and limitations.
 - .2 Submit WHMIS Safety Data Sheet (SDS).
- .3 Manufacturer's Instructions: Submit application instructions for each Product used.
- .4 Qualification Statements: Submit written declaration that Products used on this Project are compatible with subsequently installed finish flooring products and adhesives.

1.6 QUALITY ASSURANCE

- .1 Perform in accordance with Section 01 43 00 - Quality Assurance.
- .2 Installer's Qualification: Perform work of this Section by a company that is approved for the purposes of all warranty requirements.
- .3 Underlayment shall be self-levelling; free of shrinkage, cracks and spalling; with a minimum compressive strength of 24 MPa at 28 days.

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver materials in their original unopened packages and protect from freezing, direct sun exposure and exposure to moisture.
- .3 Packaging Waste Management: Remove packaging materials for reuse in accordance with Section 01 74 19 - Waste Management and Disposal.

1.8 SITE CONDITIONS

- .1 Make work area watertight and protected against rain and detrimental weather conditions.
- .2 Temperature: Maintain a minimum 16C to maximum 30C ambient temperature for 48 hours before installation and a minimum 48 hours after completion of work.
- .3 Substrate: Ensure concrete substrate temperature is minimum 10C.
- .4 Moisture: Ensure concrete substrate is within moisture limits prescribed by manufacturer.
- .5 Refer to manufacturer's written acceptances for additional ambient site condition requirements.

2 PRODUCTS

2.1 MATERIALS

- .1 Primer for self-levelling underlayment acceptable manufacturers:
 - .1 Ardex P-51 by Ardex Inc.
 - .2 Top X Primer by Ultratex.
 - .3 Other products approved by Consultant.
- .2 Underlayment, cement based, self levelling:
 - .1 Compressive Strength: to ASTM C109, 28 day 4100 psi.
 - .2 Flexural Strength: to ASTM C109: 28 day 1000 psi.
 - .3 Primer: Type as recommended by topping manufacturer to suit intended condition.
 - .4 Acceptable Manufacturers:
 - .1 Ardex K-15 by Ardex Engineered Cements.
 - .2 Top X by Ultratex.
- .3 Water: Clean and potable
- .4 Substitutions: Permitted, subject to review by HWDSB and JASON FUNG ARCHITECT INC.
- .5 Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

2.2 MIXING

- .1 Mix materials as per manufacturer's written instructions.
- .2 Mix thoroughly for a sufficient time to obtain a lump-free mixture.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions:
 - .1 Verify substrate tolerances are within manufacturer's recommendations.
 - .2 Verify concrete surface profile is within manufacturer's recommendations.

- .3 Verify that work by other Subcontractors affecting the flooring installation is acceptable.
- .4 Report defective conditions affecting installation to HWDSB and JASON FUNG ARCHITECT INC. in writing immediately upon discovery and before beginning installation.
- .5 Proceed with installation only after defective surfaces and conditions have been remedied.
- .2 Pre-installation Testing: Perform tests to verify concrete floors are dry, with moisture vapour emission rate, and alkalinity within the manufacturer's recommendations.

3.2 PREPARATION

- .1 All surfaces shall be solid, thoroughly clean and properly primed.
- .2 Concrete subfloors shall be free of oil, grease, dirt, curing compound and any other substance which might act as a bond breaker. Mechanically clean if necessary by shot blasting or other suitable method. Acid etching is not acceptable.
- .3 Prime substrates with primer. Apply evenly with soft push broom.

3.3 INSTALLATION

- .1 Install topping in accordance with manufacturer's written instructions.
- .2 Let cure in accordance with manufacturer's written instructions.
- .3 Pour underlayment so as to achieve level and smooth top surface. Apply multiple layers if necessary. Provide forms where required to retain underlayment.
- .4 Provide protection to allow underlayment to cure for length of time recommended by manufacturer before allowing installation of finish flooring.

3.4 CLEANING

- .1 Progress Cleaning: In accordance with Section 01 74 00 - Cleaning. Remove excess adhesive before cured.
- .2 Final Cleaning: In accordance with Section 01 74 00 – Cleaning.
- .3 Waste Management: Perform in accordance with Section 01 74 19 – Waste Management and Disposal.

3.5 PROTECTION

- .1 Protect temporary protection for surfaces subjected to concentrated loads before they have cured sufficiently to carry them without damage.
- .2 Prevent traffic over completed areas, and protect work of this Section from precipitation, freezing, and debris after final installation.
- .3 Refer to manufacturer's written instructions.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 04 05 13 – Masonry Mortaring and Grouting
- .2 Section 04 05 19 – Masonry Anchorage and Reinforcing
- .3 Section 04 05 23 – Masonry Accessories
- .4 Section 04 20 00 – Unit Masonry
- .5 Section 07 84 00 – Firestopping
- .6 Section 07 92 00 – Joint Sealants

1.2 REFERENCE STANDARDS

- .1 CSA Group (CSA):
 - .1 CSA A165 Series, CSA Standards on concrete masonry units
 - .2 CAN/CSA-A179, Mortar and Grout for Unit Masonry
 - .3 CAN/CSA-A371, Masonry Construction for Buildings

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with Section 04 05 13 – Masonry Mortaring and Grouting
 - .2 Coordinate with Section 04 05 19 – Masonry Anchorage and Reinforcing
 - .3 Coordinate with Section 07 84 00 – Firestopping for through penetration firestopping systems
 - .4 Coordinate with the Sections described in Part 2.
- .2 Pre-Installation Meetings: Conduct a meeting in accordance with Section 01 31 19 - Project Meetings a minimum one week before beginning masonry installation to:
 - .1 Verify Project requirements, including mock-up requirements and mock-up location.
 - .2 Verify minimum acceptable substrate conditions, established during review of mock-up, required for performance of work.
 - .3 Coordinate products and installation methods.
 - .4 Coordinate mortar and grout testing.
 - .5 Sequence work of related Sections.
 - .6 Coordinate lines, levels, and coursing with other affected Subcontractors
 - .7 Obtain items to be built-in before beginning masonry work.
 - .8 Review manufacturer's installation instructions.
 - .9 Review masonry cutting tools, methods, and temporary barriers and review Owner's safety and protection requirements from dust during cutting operations.
 - .10 Review methods to prevent excess mortar from entering cavity space, and method for removing excess mortar from cavity space.
 - .11 Review methods for controlling efflorescence during construction.
 - .12 Review warranty requirements.
- .3 Scheduling: Schedule with other work in accordance with 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

- .2 Shop Drawings:
 - .1 Masonry sizes. Details of reinforcing bars, including wall elevations. Locations of weep holes and vents.
 - .2 Components in fire-rated masonry assemblies, including ULC listings.
 - .3 Submit the following information submittals as work progresses:
 - .1 Test and Evaluation Reports:
 - .1 Submit certified test reports.
 - .2 Test reports to certify compliance of masonry units with specified performance characteristics and physical properties.
 - .3 Submit data for masonry units, in addition to requirements set out in referenced CSA and ASTM Standards, indicating initial rates of absorption.
 - .2 Manufacturers' Instructions: Indicate special storage and handling requirements, installation instructions and sequence, and cleaning procedures. Keep a copy onsite during installation.

1.5 QUALITY ASSURANCE

- .1 Mock-ups:
 - .1 Assemble mock-up in accordance with Section 01 43 00 - Quality Assurance.
- .2 Assemble panel of exterior masonry wall construction 1200 x 1800 mm, demonstrating masonry unit colours, colour blending of masonry units where units are subject to colour variations and textures, use of reinforcement, connectors, ties, through-wall flashing, weep holes, tooling of joints, coursing, pointing, mortar, joint sealant, and installation tolerances.
 - .1 Irregularity in mortar joints: Not visible when viewed from a distance of 6 m or more.
- .3 HWDSB and JASON FUNG ARCHITECT INC. will require a minimum 48 hours to review the mock-up.
- .4 After initial review of mock-up, clean half of mock-up with proposed efflorescence cleaning method(s).

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with CAN/CSA-A179, and CAN/CSA-A371.
- .2 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors in a clean area, and in accordance with manufacturer's recommendations.
 - .2 Keep materials dry until use, except where wetting of bricks or blocks is specified.
- .3 Deliver and handle masonry units to avoid chipping and staining.
- .4 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

1.7 SITE CONDITIONS

- .1 Ambient Conditions: Assemble and install components when temperatures are above 4°C.
 - .1 Cold weather protection and construction requirements: To CAN/CSA-A371 and:
 - .1 Maintain temperature of mortar between 4°C and 50°C until batch is used or becomes stable.
- .2 Maintain ambient temperature of masonry work and its constituent materials between 4°C and 50°C and protect area of work from windchill.

- .3 Maintain temperature of masonry above 0°C for a minimum of 28 days after mortar is installed.
- .4 Preheat unheated wall sections in enclosure to above 10°C for a minimum 72 hours before applying mortar.

1.8 WARRANTY

- .1 For work in this Section, 12 months warranty period is extended to 24 months.

2 PRODUCTS

2.1 MATERIALS

- .1 Masonry materials are specified in the following Sections:
 - .1 Section 04 05 13 – Masonry Mortaring and Grouting
 - .2 Section 04 21 13 – Brick Masonry
 - .3 Section 07 92 00 – Joint Sealants

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: Perform in accordance with Section 01 71 00 – Examination and Preparation.
 - .1 Site conditions are acceptable, can be maintained, and areas are ready to receive work.
 - .2 Built-in items are in proper location, and ready for roughing into masonry work.
 - .3 Examine openings to receive masonry infill units. Verify opening sizes, locations, and that openings are square, plumb, and ready to receive work.
 - .4 Commencing installation means acceptance of in place substrates.

3.2 PREPARATION

- .1 Surface Preparation: Prepare surface in accordance with Section 01 71 00 - Examination and Preparation and manufacturer's written recommendations.
- .2 Establish and protect lines, levels, and coursing.
- .3 Protect adjacent materials from damage and disfiguration.

3.3 INSTALLATION

- .1 Perform masonry work in accordance with CAN/CSA-A371 except where specified otherwise.
- .2 Build masonry plumb, level, and true to line, with vertical joints in alignment, respecting construction tolerances permitted by CAN/CSA-A371.
- .3 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.
- .4 Exposed Masonry:
 - .1 Remove chipped, cracked, and otherwise damaged units in exposed masonry in accordance with CSA A165 series and replace with undamaged units.
- .5 Installation - Joints:
 - .1 Allow joints to set just enough to remove excess water or "thumbprint" hard, then tool with round jointer to provide smooth, compressed, uniformly concave joints true-to-line where concave joints are indicated.

- .2 Allow joints to set just enough to remove excess water or "thumbprint" hard, then rake joints uniformly to 6-mm depth and compress with square tool to provide smooth, compressed, raked joints of uniform depth where raked joints are indicated.
- .3 Strike flush joints concealed in walls and joints in walls to receive plaster, tile, insulation, or other applied material, except paint or similar thin finish coating.
- .6 Cutting:
 - .1 Cut-out for electrical switches, outlet boxes, and other recessed or built-in objects.
 - .2 Make cuts straight, clean, and free from uneven edges.
- .7 Building-In:
 - .1 Build-in items required to be built into masonry.
 - .2 Prevent displacement of built-in items during construction. Check plumb, location, and alignment frequently, as work progresses.
 - .3 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar.
- .8 Wetting of Bricks:
 - .1 Except in cold weather, wet bricks having initial rate of absorption exceeding 1 g/minute/1000 mm²: wet to uniform degree of saturation, 3 to 24 hours before laying, and do not lay until surface dry.
 - .2 Wet tops of brick walls qualifying for wetting when recommencing work on such walls.
- .9 Support of Loads:
 - .1 Install building paper below voids to be filled with concrete grout. Keep paper 25 mm back from faces of units.
- .10 Provision for Movement:
 - .1 Leave 3 mm space below shelf angles.
 - .2 Leave 6-mm space between top of non-loadbearing walls and partitions and structural elements. Do not use wedges.
 - .3 Built masonry to tie in with stabilizers, with provision for vertical movement.
- .11 Installation - Loose Steel Lintels: Install loose steel lintels. Centre over opening width.
- .12 Installation - Control Joints:
 - .1 Construct continuous control joints as indicated on Drawings.
- .13 Installation - Movement Joints:
 - .1 Build-in continuous movement joints as indicated on Drawings.
- .14 Interface with Other Work:
 - .1 Cut openings in existing work as indicated on Drawings.
 - .2 Openings in walls: Reviewed by JASON FUNG ARCHITECT INC..

3.4 TOLERANCES

- .1 Install masonry to tolerances in CAN/CSA-A371 except:
 - .1 Vertical alignment at external corners and door jambs should not vary from plumb by more than 3 mm in 3 000.

3.5 PROTECTION

- .1 Temporary Bracing:
 - .1 Provide temporary bracing and support of masonry work during and after erection until permanent lateral support is in place.

- .2 Brace and support masonry walls as necessary to resist wind pressures, lateral forces, and temporary construction loads during construction.
- .2 Moisture Protection:
 - .1 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain until completed and protected by flashing or other permanent construction.
 - .2 Cover completed and partially completed masonry work not otherwise enclosed or sheltered with waterproof covering at end of each Work Day. Secure coverings in position.
- .3 Air Temperature Protection: Protect completed masonry in accordance with CAN/CSA-A371.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 04 05 00 - Common Work Results for Masonry

1.2 REFERENCE STANDARDS

- .1 CSA Group (CSA)
 - .1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A179, Mortar and Grout for Unit Masonry.
 - .3 CAN/CSA-A371, Masonry Construction for Buildings.
 - .4 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .2 International Masonry Industry All-Weather Council (IMIAC)
 - .1 Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
- .3 South Coast Air Quality Management District (SCAQMD)
 - .1 SCAQMD Rule 1168, Adhesive and Sealant Applications.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for masonry mortar and grout and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements. Indicate VOC's mortar, grout, parging, colour additives and admixtures. Expressed as grams per litre (g/L).
- .3 Manufacturers' Instructions: submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports including sand gradation tests in accordance with CAN/CSA-A179 showing compliance with specified performance characteristics and physical properties, and in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Mock-ups:
 - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and requirements of Section 04 05 00 - Common Work Results for Masonry.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect masonry mortar and grout packages from nicks, scratches, and blemishes.

- .3 Replace defective or damaged materials with new.

1.6 SITE CONDITIONS

- .1 Ambient Conditions: maintain materials and surrounding air temperature to:
 - .1 Minimum 5 degrees C prior to, during, and 48 hours after completion of masonry work.
 - .2 Maximum 32 degrees C prior to, during, and 48 hours after completion of masonry work.
- .2 Weather Requirements: CAN/CSA-A371 International Masonry Industry All-Weather Council (IMIAC) - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

2 PRODUCTS

2.1 MATERIALS

- .1 Use same brands of materials and source of aggregate for entire project.
- .2 Cement:
 - .1 Portland Cement: to CAN/CSA-A3000, Type GU - General use hydraulic cement (Type 10) MS - Moderate sulphate-resistant hydraulic cement (Type 20) HE - High-early-strength hydraulic cement (Type 30) HS - High-sulphate-resistant hydraulic cement (Type 50) MH-Moderate heat of hydration hydraulic cement (Type 40) gray white colour.
 - .1 Use low VOC products in compliance with SCAQMD Rule 1168.
 - .2 Masonry Cement: to CAN/CSA-A3002 and CAN/CSA-A179, Type N S.
 - .3 Mortar Cement: to CAN/CSA-A3002 and CAN/CSA-A179, Type N S integral water repellents.
 - .1 Use low VOC products in compliance with SCAQMD Rule 1168.
 - .4 Packaged Dry Combined Materials for mortar: to CAN/CSA-A179, Type N S, using gray white colour cement.
- .3 Aggregate: supplied by one supplier.
 - .1 Fine Aggregate: to CAN/CSA-A179, natural sand, manufactured sand, or silica sand.
 - .2 Course Aggregate: to CAN/CSA-A179
- .4 Water: clean and potable.
- .5 Lime:
 - .1 Quick Lime: to CAN/CSA-A179, Type N.
 - .2 Hydrated Lime: to CAN/CSA-A179, Type S.
- .6 Bonding Agent: epoxy type.
- .7 Polymer Latex: organic polymer latex admixture of butadiene-styrene type non-emulsifiable bonding admixture.

2.2 COLOUR ADDITIVES

- .1 Use colouring admixture not exceeding 10% of cement content by mass, or integrally coloured masonry cement, to produce coloured mortar to match approved sample. Admixtures approved prior to use. Use in accordance with specific manufacturer's recommendations.
- .2 White mortar: use white Portland cement, and lime to produce mortar type specified.

2.3 ADMIXTURES

- .1 Water Repellent Agents: powdered, liquid, or polymeric.
 - .1 Use low VOC products in compliance with SCAQMD Rule 1168.

- .2 Air Entrainment Agents: acceptable percent added to mix 15.
 - .1 Use low VOC products in compliance with SCAQMD Rule 1168.
- .3 Plasticizer Agents:
 - .1 Use low VOC products in compliance with SCAQMD Rule 1168.
- .4 Accelerator Agents:
 - .1 Use low VOC products in compliance with SCAQMD Rule 1168.
- .5 Extended life mortar: to CAN/CSA-A179, factory and batch mixed, set controlling admixtures, type RM RS RN or RO.
 - .1 Use low VOC products in compliance with SCAQMD Rule 1168.

2.4 MORTAR MIXES

- .1 Mortar for exterior masonry above grade:
 - .1 Load Bearing: type N based on property specifications.
 - .2 Non-Load Bearing: N based on property specifications.
- .2 Mortar for interior masonry:
 - .1 Load Bearing: type N based on property specifications.
 - .2 Non-Load Bearing: O based on property specifications.
- .3 Mortar for Parapet walls, chimneys, unprotected walls: type N based on property specifications, CAN/CSA-A179.
- .4 Pointing Mortar: CAN/CSA-A179, Type N using property specification with maximum 2 percent ammonium stearate or calcium stearate per cement weight.
- .5 Stain Resistant Pointing Mortar: one part Portland cement, 1/8 part hydrated lime, and two parts graded (80 mesh) aggregate, proportioned by volume. Add aluminum tristearate, calcium stearate, or ammonium stearate to 2 percent of Portland cement by weight.
- .6 Mortar For Glass Block Masonry: CAN/CSA-A179, Type N, using property specification.
- .7 Pointing Mortar For Glass Block Masonry: CAN/CSA-A179, Type N, using property specification; with maximum 2 percent ammonium stearate or calcium stearate per cement weight.
- .8 Parging Mortar: to CAN/CSA-A179
- .9 Mortar for foundation walls, manholes, sewers, pavements, walks, patios and other exterior masonry at or below grade: type M based on property specifications, CAN/CSA-A179.
- .10 Following applies regardless of mortar types and uses specified above:
 - .1 Mortar for calcium silicate brick and concrete brick: type O based on proportion specifications.
 - .2 Mortar for stonework: type N based on property specifications.
 - .3 Mortar for grouted reinforced masonry: type S based on property specifications.

2.5 MORTAR MIXING

- .1 Use pre-blended, pre-coloured mortar prepackaged under controlled factory conditions. Ingredients batching limitations to within 1% accuracy.
- .2 Mix mortar ingredients in accordance with CAN/CSA-A179 in quantities needed for immediate use
- .3 Maintain sand uniformly damp immediately before mixing process.
- .4 Add mortar colour and admixtures in accordance with manufacturer's instructions. Provide uniformity of mix and colouration.
- .5 Using anti-freeze compounds including calcium chloride or chloride based compounds is prohibited.

- .6 Adding air entraining admixture to mortar mix is prohibited.
- .7 Use a batch type mixer in accordance with CAN/CSA-A179
- .8 Pointing mortar: prehydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp unworkable mix that will retain its form when pressed into ball. Allow to stand for not less than 1 hour no more than 2 hours then remix with sufficient water to produce mortar of proper consistency for pointing.
- .9 Re-temper mortar only within two hours of mixing, when water is lost by evaporation.
- .10 Use mortar within 2 hours after mixing at temperatures of 32 degrees C, or 2-1/2 hours at temperatures under 10 degrees C.

2.6 GROUT MIXES

- .1 Bond Beams: grout mix 10 to 12.5 MPa strength at 28 days; 200-250 mm slump; premixed type in accordance with CSA A23.1/A23.2 mixed in accordance with CAN/CSA-A179 coarse grout.
- .2 Lintels: grout mix 10 to 12.5 MPa strength at 28 days; 200-250 mm slump; premixed type in accordance with CSA A23.1/A23.2 mixed in accordance with CAN/CSA-A179 coarse grout.
- .3 Grout: Minimum compressive strength of 12.5 MPa at 28 days. Maximum aggregate size and grout slump: CAN/CSA-A179

2.7 GROUT MIXING

- .1 Mix batched and delivered grout in accordance with CSA A23.1/A23.2 transit mixed
- .2 Mix grout ingredients in quantities needed for immediate use in accordance with CAN/CSA-A179 coarse grout.
- .3 Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- .4 Using calcium chloride or chloride based admixtures is prohibited.

2.8 MIX TESTS

- .1 Testing Mortar Mix:
 - .1 Test mortar to requirements of Section 01 45 00 - Quality Control, and in accordance with CAN/CSA-A179, for mortar based on property specification. Test prior to construction and during construction for:
 - .1 Compressive strength.
 - .2 Consistency.
 - .3 Mortar aggregate ratio.
 - .4 Sand/cement ratio.
 - .5 Water content and water/cement ratio.
 - .6 Air content.
 - .7 Splitting tensile strength.
- .2 Testing Grout Mix:
 - .1 Test grout to requirements of Section 01 45 00 - Quality Control, and in accordance with CAN/CSA-A179, for grout based on property specification. Test prior to construction and during construction for:
 - .1 Compressive strength.
 - .2 Sand/cement ratio.
 - .3 Water content and water/cement ratio.
 - .4 Slump.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for masonry installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform HWDSB and JASON FUNG ARCHITECT INC. of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from JASON FUNG ARCHITECT INC..

3.2 PREPARATION

- .1 Apply bonding agent to existing concrete surfaces.
- .2 Plug clean-out holes with block masonry units. Brace masonry for wet grout pressure.

3.3 CONSTRUCTION

- .1 Do masonry mortar and grout work in accordance with CAN/CSA-A179 except where specified otherwise
- .2 Apply parging in uniform coating not less than total 10 mm thick , where indicated.

3.4 MIXING

- .1 Pointing mortar can be mixed using a regular paddle mixer. Only electric motor mixers are permissible. Mixers run on hydrocarbons are not permitted, due to fumes.
- .2 Clean mixing boards and mechanical mixing machine between batches.
- .3 Mortar: weaker than units it is binding.
- .4 Contractor to appoint one individual to mix mortar, for duration of project. In event that this individual is changed, mortar mixing must cease until new individual is trained, and mortar mix is tested.

3.5 MORTAR PLACEMENT

- .1 Install mortar to manufacturer's instructions.
- .2 Install mortar to requirements of CAN/CSA-A179
- .3 Install mortar and grout to requirements.
- .4 Remove excess mortar from grout spaces.

3.6 GROUT PLACEMENT

- .1 Install grout in accordance with manufacturer's instructions.
- .2 Install grout in accordance with CAN/CSA-A179
- .3 Work grout into masonry cores and cavities to eliminate voids.
- .4 Installing grout in lifts greater than 400 mm, without consolidating grout by rodding is prohibited.
- .5 Displacing reinforcement while placing grout is prohibited.

3.7 FIELD QUALITY CONTROL

- .1 Site Tests, Inspection: in accordance with Section 04 05 00 - Common Work Results for Masonry supplemented as follows:

- .1 Test and evaluate mortar prior to construction and during construction in accordance with CAN/CSA-A179
- .2 Test and evaluate grout prior to construction and during construction to CAN/CSA-A179; test in conjunction with masonry unit sections specified
- .2 Manufacturer's Field Services: in accordance with Section 04 05 00 - Common Work Results for Masonry.

3.8 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Remove droppings and splashings using clean sponge and water.
- .3 Clean masonry with low pressure clean water and soft natural bristle brush.
- .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

3.9 PROTECTION

- .1 Cover completed and partially completed work not enclosed or sheltered with waterproof covering at end of each work day. Anchor securely in position.

3.10 SCHEDULE

- .1 Not used.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 04 05 00 – Common Work Results for Masonry
- .2 Section 04 05 13 – Masonry Mortaring and Grouting
- .3 Section 04 05 23 – Masonry Accessories
- .4 Section 04 20 00 – Unit Masonry

1.2 REFERENCE STANDARDS

- .1 CSA Group (CSA)
 - .1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete
 - .2 CAN/CSA-A179, Mortar and Grout for Unit Masonry
 - .3 CAN/CSA-A370, Connectors for Masonry
 - .4 CAN/CSA-A371, Masonry Construction for Buildings
 - .5 CSA G30.18, Carbon Steel Bars for Concrete Reinforcement
 - .6 CSA S304, Design of Masonry Structures
 - .7 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction
- .2 Reinforcing Steel Institute of Canada (RSIC):
 - .1 Reinforcing Steel Manual of Standard Practice

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for anchorage and reinforcing materials and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS SDS in accordance with Section 01 35 29.06 – Health and Safety Requirements.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada
 - .2 Submit drawings detailing bar bending details, anchorage details, lists and placement drawings.
 - .3 On placement drawings, indicate sizes, spacing, location and quantities of reinforcement and connectors.
- .4 Manufacturers' Instructions: submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports including sand gradation tests in accordance with CAN/CSA-A179 showing compliance with specified performance characteristics and physical properties, and in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect anchorage and reinforcing materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.6 SITE MEASUREMENTS

- .1 Make site measurements necessary to ensure proper fits of members

2 PRODUCTS

2.1 MATERIALS

- .1 Bar reinforcement: Steel to CAN/CSA-A371 and CSA G30.18.
- .2 Connectors: to CAN/CSA-A370 and CSA S304.1.
- .3 Corrosion Protection: to CSA S304.1 and CAN/CSA-A370.
- .4 Fasteners: installed post-construction:
 - .1 Screw Shields and Plugs: size and type to suit application, locate where indicated.
 - .2 Bolts and Screws: size and type to suit application, locate where indicated.
 - .3 Nails: case-hardened cut or spiral nails, size and type to suit fastening application.
 - .4 Powder-Driven Fasteners: pin styles and lengths to suit fastening application in accordance with manufacturers use, load and hold recommendations.
 - .5 Adhesives: epoxies, mastics and contact cements for fastening applications, use in accordance with manufacturers' recommendations.
- .5 Ties: hot dip galvanized to CAN/CSA-A370 Table 5.2, steel finish.
- .6 Anchors: to CAN/CSA-A370.
- .7 Conventional Bolts:
 - .1 Bolts: to ASTM A36
 - .2 Plate anchors: steel to ASTM A36, weld square of circular steel plate perpendicular to axis of steel bar threaded on opposite end.
 - .3 Through bolt rods: to ASTM A307 threaded rod or threaded ASTM A36 bar stock.

2.2 FABRICATION

- .1 Fabricate reinforcing in accordance with CSA A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by Reinforcing Steel Institute of Canada.
- .2 Fabricate connectors in accordance with CAN/CSA-A370.
- .3 Obtain HWDSB and JASON FUNG ARCHITECT INC. approval for locations of reinforcement splices other than shown on placing drawings.
- .4 Upon approval of HWDSB and JASON FUNG ARCHITECT INC., weld reinforcement in accordance with CSA W186.
- .5 Ship reinforcement and connectors, clearly identified in accordance with drawings.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for anchorage and reinforcing materials installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform HWDSB and JASON FUNG ARCHITECT INC. of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from JASON FUNG ARCHITECT INC..

3.2 PREPARATION

- .1 Direct and coordinate placement of metal anchors for masonry supplied to other Sections.

3.3 INSTALLATION

- .1 Supply and install masonry connectors and reinforcement in accordance with CAN/CSA-A370, CAN/CSA-A371, CSA A23.1/A23.2 and CSA S304.1 unless indicated otherwise.

3.4 BONDING AND TYING

- .1 Bond walls of two or more wythes using connectors in accordance with CSA S304.1, CAN/CSA-A371 and as indicated.
- .2 Tie masonry veneer to backing in accordance with National Building Code of Canada (NBC), CSA S304.1, CAN/CSA-A371 and as indicated.
- .3 Install unit, adjustable, single wythe and multiple wythe joint reinforcement where indicated and in accordance with CAN/CSA-A370 and CAN/CSA-A371.
 - .1 Bond walls of two or more wythes using connectors in accordance with CAN/CSA-A371 and as indicated.
 - .2 Install horizontal joint reinforcement 400 mm on centre.
 - .3 Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 400 mm each side of opening.
 - .4 Place joint reinforcement continuous in first and second joint below top of walls.
 - .5 Lap joint reinforcement ends minimum 150 mm.
 - .6 Connect stack bonded unit joint corners and intersections with strap anchor 400 mm on centre.

3.5 GROUTING

- .1 Grout masonry in accordance with CSA S304.1, CAN/CSA-A371 and CAN/CSA-A179 and as indicated.

3.6 ANCHORS

- .1 Supply and install metal anchors in accordance with CAN/CSA-A370 and CAN/CSA-A371.

3.7 LATERAL SUPPORT AND ANCHORAGE

- .1 Supply and install lateral support and anchorage in accordance with CSA S304.1 and as indicated.

3.8 MOVEMENT JOINTS

- .1 Reinforcement not continuous across movement joints unless otherwise indicated.

3.9 FIELD BENDING

- .1 Do not field bend reinforcement and connectors except where indicated or authorized by Consultant.
- .2 When field bending authorized, bend without heat, applying slow and steady pressure.

3.10 SITE QUALITY CONTROL

- .1 Site inspections in accordance with Section 04 05 00 - Common Work Results for Masonry.

3.11 FIELD TOUCH-UP

- .1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcement steel and connectors with compatible finish to provide continuous coating.

3.12 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 04 05 00 - Common Work Results for Masonry
- .2 Section 04 05 13 – Masonry Mortaring and Grouting
- .3 Section 04 05 19 – Masonry Anchorage and Reinforcing
- .4 Section 04 21 13 – Brick Masonry

1.2 REFERENCE STANDARDS

- .1 CSA Group (CSA)
 - .1 CAN/CSA-A371, Masonry Construction for Buildings.
- .2 South Coast Air Quality Management District (SCAQMD)
 - .1 SCAQMD Rule 1168, Adhesive and Sealant Applications.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for masonry accessories and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada
 - .2 Indicate on drawings:
 - .1 Flashing, installation details, sizes, spacing, location and quantities of fasteners.
- .4 Samples:
 - .1 Submit 2 samples of masonry accessories as follows:
 - .1 Materials: samples, illustrating colour and colour range. Include:
 - .1 Movement joint filler.
 - .2 Lap adhesive.
 - .3 Mechanical fasteners.
 - .4 Reglets.
 - .5 Brick vents.
 - .2 Moisture control material samples, illustrating colour and colour range, size, and shape. Include:
 - .1 Weep hole vents.
 - .2 Mortar Diverters.
 - .3 Grout screens.
 - .3 Flashing material samples, illustrating colour and colour range, size, shape, and profile. Include as specified:
 - .1 Sheet metal flashings.
 - .2 Composite flashings.
 - .3 Plastic and rubber flashings.

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports including sand gradation tests in accordance with CAN/CSA-A179 showing compliance with specified performance characteristics and physical properties, and in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Manufacturer's Instructions: submit manufacturer's instructions as follows:
 - .1 Submit installation instructions for fillers, adhesives, reglets, brick vents, weeps, vents, diverters, screens, and flashings.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect masonry accessories from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.6 SITE MEASUREMENTS

- .1 Make site measurements necessary to ensure proper fits of members

2 PRODUCTS

2.1 MATERIALS

- .1 Movement joint filler: sealant and backer rod in accordance with Section 07 92 00
 - .1 Use low VOC products in compliance with SCAQMD Rule 1168.
 - .2 Full height of masonry unit, designed to keep weep holes open for passage of air and water, UV stabilized polypropylene.
- .2 Lap adhesive: recommended by masonry flashing manufacturer.
 - .1 Use low VOC products in compliance with SCAQMD Rule 1168.
- .3 Weep hole vents:
 - .1 Weep vents designed to keep weep hole open for passage of air and water, UV stabilized polypropylene.
 - .2 Size: Height of head joint x depth of masonry unit x thickness of mortar joint.
 - .3 Colour: Grey.
 - .4 Acceptable Product: Cell-Vent D/A 1006 by Dur-O-Wal
- .4 Mechanical fasteners: recommended by flashing manufacturer.

2.2 MOISTURE CONTROL

- .1 Weep hole vents: UV stabilized polypropylene.
 - .1 Size: Height of head joint x depth of masonry unit x thickness of mortar joint.
- .2 Cell Vents: UV stabilized polypropylene
 - .1 Size: Height of head joint x depth of masonry unit x thickness of mortar joint.

- .3 Colour: gray.
- .4 Mortar diverters: shaped and sized to suite cavity spaces.
- .5 Grout screens: 6 mm square monofilament screen fabricated from high-strength, non-corrosive polypropylene polymers to isolate flow of grout in designated areas.

2.3 FLASHINGS

- .1 Sheet metal flashing: Refer to Section 07 62 00.
- .2 Masonry through wall flashing:
 - .1 Sheet Membrane
 - .1 Acceptable products:
 - 1) Blueskin TWF by Hentry
 - 2) ExoAir TWF by Tremco.
 - .2 Primer: As per manufacturer's installation instructions.
 - .3 SBS rubberized asphalt compound integrally laminated to cross laminated polyethylene film.
 - .1 Overall thickness: 1 mm (40 mils).
 - .2 Film thickness: 0.204 mm (8 mils).
 - .3 Service temperature: -40 degrees C to 70 degrees C.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for masonry installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform HWDSB and JASON FUNG ARCHITECT INC. of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from JASON FUNG ARCHITECT INC..

3.2 INSTALLATION: MATERIALS

- .1 Install continuous movement joint fillers in movement joints at locations indicated on drawings.
- .2 Lap adhesive: apply adhesive to flashing lap joints.
- .3 Mechanical fasteners: install fasteners to suit application and in accordance with manufacturer's written installation instructions.
- .4 Reglets: install reglets at locations indicated on drawings.

3.3 INSTALLATION: MOISTURE CONTROL

- .1 Install weep hole vents in vertical joints immediately over flashings, in exterior wythes of cavity wall and masonry veneer wall construction, at maximum horizontal spacing of 600 mm on centre.
- .2 Mortar diverters: install purpose made diverters in cavities where indicated and as directed, size and shape to suit purpose and function.
- .3 Grout screens: install purpose made screens in cavities where indicated and as directed, size and shape to suit purpose and function.

3.4 INSTALLATION: FLASHINGS

- .1 Build in flashings in masonry in accordance with CAN/CSA-A371
 - .1 Install flashings under exterior masonry bearing on foundation walls, slabs, shelf angles, and steel angles over openings, and at base of cavity wall and where cavity interrupted by horizontal members or supports and as shown on drawings. Install flashings under weep hole courses and as indicated.
 - .2 In cavity walls and veneered walls, carry flashings from front edge of exterior masonry, under outer wythe, then up backing minimum 150 mm, and as follows:
 - .1 For masonry backing embed or bond flashing 25 mm in joint.
 - .2 For concrete backing, insert or bond flashing into reglets.
 - .3 For wood frame backing, staple flashing to walls behind water resistive paper, and lap joints.
 - .4 For gypsum board and glass fibre faced sheathing backing, bond to wall using manufacturer's recommended adhesive.
 - .3 Lap joints 150 mm and seal with adhesive.
- .2 Form flashing (end dams) at lintels, sills and wall ends to prevent water from travelling horizontally past flashing ends.
- .3 Install vertical flashing where outer veneer returns at window or door jambs, to prevent contact of veneer with inner wall.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 04 05 00 – Common Work Results for Masonry
- .2 Section 04 05 13 – Masonry Mortaring and Grouting
- .3 Section 04 05 19 – Masonry Anchorage and Reinforcing
- .4 Section 04 05 23 – Masonry Accessories

1.2 REFERENCE STANDARDS

- .1 ASTM International (ASTM):
 - .1 ASTM C73, Standard Specification for Calcium Silicate Brick (Sand-Lime Brick)
 - .2 ASTM C216, Standard Specification for, Facing Brick (Solid Masonry Units Made of Clay or Shale)
 - .3 ASTM E336, Standard Test Method for Measurement of Airborne Sound Attenuation Between Rooms in Buildings
- .2 CSA Group (CSA)
 - .1 CAN/CSA-A82, Fired Masonry Brick Made From Clay or Shale
 - .2 CAN/CSA-A165 Series-14, CSA Standards on Concrete Masonry Units
 - .3 CAN/CSA-A371, Masonry Construction for Buildings
- .3 National Research Council Canada (NRC):
 - .1 National Building Code of Canada (NBC)
- .4 South Coast Air Quality Management District (SCAQMD):
 - .1 SCAQMD Rule 1168, Adhesive and Sealant Applications
- .5 ULC Standards (ULC):
 - .1 CAN/ULC-S101, Standard Methods of Fire Endurance Tests of Building Construction and Materials

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for all unit masonry products and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 QUALITY ASSURANCE

- .1 Test Reports: Submit certified test reports including sand gradation tests in accordance with CAN/CSA-A179 showing compliance with specified performance characteristics and physical properties, and in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .2 Certificates: Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Mock-ups:
 - .1 Construct mock-ups in accordance with Section 01 43 00 - Quality Assurance and requirements of Section 04 05 00 - Common Work Results for Masonry supplemented as follows:

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Do not double stack cubes of unit masonry.
 - .3 Cover masonry units with non-staining waterproof membrane covering.
 - .4 Allow air circulation around units.
 - .5 Installation of wet or stained masonry units is prohibited.
 - .6 Keep concrete unit masonry in individual cardboard packaging provided by manufacturer until units are ready to be installed.
 - .7 Store and protect unit masonry from nicks, scratches, and blemishes.
 - .8 Replace defective or damaged materials with new.

2 PRODUCTS

2.1 MATERIALS

- .1 Concrete Block: to CAN/CSA-A165 Series (CAN/CSA-A165.1).
 - .1 Classification: S/15/A/M, 75% solid for all locations where structural members bear on concrete block.
 - .2 H/15/A/M, for all other block work.
 - .3 Fire Resistant Concrete Masonry Units: Manufactured in accordance with CSA A165
 - .1 2 Hour Fire Rating: H/15/C/O
 - .2 1 Hour Fire Rating: H/15/A/O
 - .4 Size: Modular imperial, or match existing where indicated on Drawings.
 - .5 Special shapes:
 - .1 Provide square units for exposed corners.
 - .2 Provide bullnose units for interior walls and partition corners.
 - .3 Provide purpose made shapes for lintels and bond beams.
 - .4 Provide additional special shapes required for project.
 - .5 Manufacture special shapes at same time and with the same batch as standard concrete block to be used.
- .2 Reinforcement:
 - .1 Reinforcement in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.
- .3 Connectors:
 - .1 Connectors in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.
- .4 Flashings:
 - .1 Flashings in accordance with Section 04 05 23 - Masonry Accessories.
- .5 Mortar Mixes:
 - .1 Mortar and mortar mixes in accordance with Section 04 05 13 - Masonry Mortar and Grouting.
- .6 Grout Mixes:
 - .1 Grout and grout mixes in accordance with Section 04 05 13 - Masonry Mortar and Grouting.

- .7 Cleaning Compounds:
 - .1 Use low VOC products in compliance with SCAQMD Rule 1168.
 - .2 Compatible with substrate and acceptable to masonry manufacturer for use on products.
 - .3 Cleaning compounds compatible with brick masonry units and in accordance with manufacturer's written recommendations and instructions.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for anchorage and reinforcing materials installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform HWDSB and JASON FUNG ARCHITECT INC. of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from JASON FUNG ARCHITECT INC..

3.2 PREPARATION

- .1 Protect adjacent finished materials from damage due to masonry work.

3.3 INSTALLATION

- .1 Construction to conform to CAN/CSA-A371.
- .2 Bond: stretcher, or match existing where indicated.
- .3 Jointing: concave where exposed or where paint or similar thin finish coating is specified.

3.4 REINFORCEMENT

- .1 Install reinforcing in accordance with Section 04 05 19 – Masonry Anchorage and Reinforcing.

3.5 CONNECTORS

- .1 Install connectors in accordance with Section 04 05 19 – Masonry Anchorage and Reinforcing.

3.6 FLASHINGS

- .1 Install flashings in accordance with Section 04 05 23 – Masonry Accessories.

3.7 MORTAR PLACEMENT

- .1 Place mortar in accordance with Section 04 05 13 – Masonry Mortar and Grouting.

3.8 GROUT PLACEMENT

- .1 Place grout in accordance with Section 04 05 13 – Masonry Mortar and Grouting.

3.9 REPAIR/RESTORATION

- .1 Upon completion of masonry, fill holes and cracks, remove loose mortar and repair defective work.

3.10 SITE QUALITY CONTROL

- .1 Site inspections in accordance with Section 04 05 00 - Common Work Results for Masonry.

3.11 TOLERANCES

- .1 To CAN/CSA-A371.

3.12 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .3 Clean unglazed clay masonry: 10 m² area of mock up panel specified in Section 04 05 00 - Common Work Results for Masonry as directed below and leave for one week. If no harmful effects appear and after mortar has set and cured, protect windows, sills, doors, trim and other work, and clean brick masonry as follows.
 - .1 Remove large particles with wood paddles without damaging surface. Saturate masonry with clean water and flush off loose mortar and dirt.
 - .2 Scrub with solution of 25 ml trisodium phosphate and 25 ml household detergent dissolved in 1 L of clean water using stiff fibre brushes, then clean off immediately with clean water using hose. Alternatively, use proprietary compound recommended by brick masonry manufacturer in accordance with manufacturer's directions.
 - .3 Repeat cleaning process as often as necessary to remove mortar and other stains.
 - .4 Use acid solution treatment for difficult to clean masonry as described in Technical Note No.20 by the Brick Industry Association.
- .4 Clean concrete brick masonry as work progresses.
 - .1 Allow mortar droppings on masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of brick and finally by brushing.
- .5 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .6 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.11 PROTECTION

- .1 Brace and protect brick masonry in accordance with Section 04 05 00 - Common Work Results for Masonry.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This section includes, but is not limited to, supply and install of rough carpentry work in accordance with the Drawings.

1.2 RELATED REQUIREMENTS

- .1 Section 06 20 00 – Finish Carpentry
- .2 Section 06 40 00 – Architectural Woodwork
- .3 Section 07 62 00 – Sheet Metal Flashing and Trim

1.3 REFERENCE STANDARDS

- .1 ASTM International (ASTM):
 - .1 ASTM A307, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength.
 - .2 ASTM C954, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
 - .3 ASTM D7612, Standard Practice for Categorizing Wood and Wood-Based Products According to their Fiber Sources
 - .4 ASTM F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws and Studs.
 - .5 ASTM F594, Standard Specification for Stainless Steel Nuts
 - .6 ASTM F1482, Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
 - .5 ASTM F1667, Standard Specification for Driven Fasteners: Nails, Spikes and Staples
- .2 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-11.3, Hardboard.
 - .2 CAN/CGSB-51.32, Sheathing, Membrane, Breather Type.
 - .3 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .4 CAN/CGSB-71.26, Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems
- .3 CSA Group (CSA)
 - .1 CSA O86, Engineered Design in Wood
 - .2 CSA O112.9, Evaluation of Adhesives for Structural Wood Products (Exterior Exposure)
 - .3 CSA O121, Douglas Fir Plywood
 - .4 CSA O141, Softwood Lumber
 - .5 CSA O151, Canadian Softwood Plywood
 - .6 CSA O153, Poplar Plywood
 - .7 CSA O325, Construction Sheathing
- .4 Canadian Wood Council
 - .1 Wood Design Manual
 - .2 Engineering Guide for Wood Frame Construction
- .5 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber [2017]
 - .2 NLGA SPS-1, Fingerjoined Structural Lumber
 - .3 NLGA SPS-2, Machine Graded Lumber
 - .4 NLGA SPS-4, Fingerjoined Machine Graded Lumber

- .6 ULC Standards/UL Canada (ULC)
 - .1 CAN/ULC-S101, Standard Methods for Fire Endurance Tests of Building Construction and Materials
 - .2 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, product literature and data sheets for wood products and accessories and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Include manufacturer's pre-engineered installation details and pre-engineered floor, ceiling and roof joist span charts.
 - .3 Submit certified test reports for prefabricated structural members from an approved independent laboratory indicating compliance with specifications for specified performance characteristics and physical properties.
 - .4 Submit Canadian Construction Materials Centre (CCMC) Product Evaluation Report and/or Certificate number for engineered wood products.
 - .5 Submit manufacturer's installation instructions
- .3 Shop Drawings:
 - .1 For structural applications or conditions beyond the scope of the manufacturer's pre-engineered design information, submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.
 - .2 Include on drawings:
 - .1 Design data in accordance with CSA O86 and CWC Engineering Guide for Wood Frame Construction.
 - .2 Indicate configuration and spacing of pre-engineered timber members, hanger and connector types, fasteners, locations and design values; bearing details.
 - .3 Indicate allowable load and stress increase.
 - .4 Indicate arrangement of webs or other members to accommodate ducts and other specialties.
 - .3 Provide a comprehensive set of engineering calculations or computer analysis and design outputs demonstrating the adequacy of the proposed system when requested by the Owner and Consultant.
- .4 Informational Submittals (to be submitted during the course of Work):
 - .1 Material Certificates: Submit certificates for machine-graded and fingerjoined dimensional lumber indicating species and grade selected for each use and design values approved by the NLGA.

1.5 QUALITY ASSURANCE

- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.
- .3 Lumber quality: Carefully select individual pieces so that knots and obvious defects will not interfere with placing bolts, proper nailing or making proper connections.
- .4 Moisture Content of wood at time of construction shall be 19% maximum.

- .5 Each piece of fire retardant treated lumber shall be shop marked with the ULC monogram, in accordance with CAN/CSA O80-M.
- .6 Dimensions of lumber shall conform to dressed sizes specified in CAN/CSA-0141 unless actual dimensions are otherwise indicated or specified.
- .7 Dimensional references to lumber on Drawings and in Specifications are to nominal sizes unless actual dimensions are indicated. Such actual dimensions shall be dry size.
- .8 Lumber defects: Discard wood with defects which will render a piece unable to serve its intended function. Lumber will be rejected by Consultant for excessive warp, twist, bow, crook, mildew, fungus, or mould, as well as for improper cutting and fitting, whether or not it has been installed.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials using pallets or blocking a minimum of 150 mm from the ground and covered with protective waterproof sheets allowing for air circulation and ventilation under the covering.
 - .2 Protect edges and corners of sheet materials from damage during handling and storage.
 - .3 Protect kiln-dried and seasoned wood materials from conditions that will cause an increase to moisture content.
 - .4 Store engineered lumber on its edge.
 - .5 Stack, lift, brace, cut and notch engineered lumber products in accordance with manufacturer's instructions and recommendations.
 - .6 Store separated reusable wood waste convenient to cutting station and work areas.
- .3 Packaging Waste Management: Perform In accordance with Section 01 74 19 - Waste Management and Disposal.

2 PRODUCTS

2.1 PERFORMANCE CRITERIA

- .1 Plywood Grades: Provide plywood products in nominal dimensions required for the project; grade-marked by accredited agencies of the APA and that conform to the Canadian Plywood Grading Guide, and tolerances described for specific plywood Products below, and identified as follows:
 - .1 Name of Standard CSA O121 or CSA O151;
 - .2 Manufacturer's Mill Identification;
 - .3 Bond Quality (Exterior or Interior);
 - .4 Commercial Species Grouping (DFP, CSP, ASP or HEM-FIR);
 - .5 Product Grade (SHG, SEL, SEL TF, G1S or G2S);
 - .6 Nominal Thickness; and
 - .7 Additional Grade or Product Designations (if applicable).
- .2 Lumber Grades: Provide lumber products that are all sides finished (S4S) in nominal dimensions required for the project; grade marked by accredited agencies of the Canadian Lumber Standards Accreditation Board and conform to National Grading Rules published by the National Lumber Grades Authority, and as follows:

- .1 Grading: Machine Grading, Visual Grading, or Both.
- .2 Moisture Content: 19% or less.
- .3 Structural Design Properties: Strength and related properties in accordance with CSA O86 and NLGA SPS 2.
- .4 Sizes: Nominal dressed dimensions described in CSA O141 for surfaced dry conditions and wood species.
- .5 Acceptable Alternative Products: Lumber products meeting requirements of the American Lumber Standards Committee designated ALS Program Lumber and that are accepted by the Canadian Lumber Standards Accreditation Board, may be acceptable for the Project when proof of compliance with strength and related properties meeting CSA O86 are submitted before purchasing any lumber products.

2.2 MATERIALS

- .1 Dimensional Lumber: to CSA O141, S4S.
 - .1 Grading: As indicated on Drawings
 - .2 Sizes: As indicated on Drawings.
 - .3 Species Group: Spruce-Pine-Fir (SPF), Douglas Fir-Larch (D.FIR-L), Hemlock-Douglas Fir (HEM-FIR).
 - .4 Strapping: Provide 19 mm deep x 38 mm wide materials as described above for stud framing and stud grade.
 - .5 Miscellaneous Framing: Provide furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers, and other materials matching lumber used within framed construction; or use Light Framing, No.2 Grade or better materials where lumber grade is not indicated.
- .2 Panel Materials:
 - .1 Structural Shear Walls and Floor Diaphragm Panels: Provide design rated plywood panels meeting requirements of CSA O86, thickness as indicated on drawings.
 - .1 Design Rated Plywood: Exterior rated, sheathing grade Douglas Fir or Canadian Softwood Plywood meeting requirements of CSA O121 or CSA O151.
 - .2 Design Rated OSB: Structural 1, exterior rated OSB panels meeting requirements of CSA O452.
 - .1 CSA O437 Design Rated Grade O 2 may be used when accepted by Consultant, submit engineering information indicating proposed thickness and manufacturer's proprietary usage information before ordering materials.
 - .2 Wall Sheathing: Provide plywood wall sheathing or OSB having End Use Mark W (Walls); at choice of Constructor, thickness as required by span rating and meeting requirements of CSA O325 and as follows:
 - .1 Plywood: Exterior rated, sheathing grade square edged Douglas Fir or Canadian Softwood Plywood meeting requirements of CSA O121 or CSA O151.
 - .2 Span Rated OSB:
 - .1 Exterior rated, sheathing grade, OSB or waferboard meeting requirements of CSA O437 SR.
 - .2 Use products with fire-resistant treatment or intumescent coating for sheathing panels facing adjacent wall construction that meets requirements of the NBC.
 - .3 Fire-Endurance Rating: No burn through (stay in place) for a minimum 15 minutes or more in accordance with CAN/ULC S101.
 - .4 Maximum Flame Spread (FS): Clearly labelled on face of sheathing indicating maximum FS 25 or less in accordance with CAN/ULC S102.

- .3 Roof Sheathing: Provide plywood roof sheathing, thickness as required by span rating and meeting requirements of CSA O325 and as follows:
 - .1 Span Rated Plywood: Exterior rated, sheathing grade Douglas Fir or Canadian Softwood Plywood meeting requirements of CSA O121 or CSA O151.
 - .2 Span Rated OSB: Exposure 1 Rated, sheathing grade OSB or waferboard meeting requirements of CSA O437.
 - .3 H-Clips: Galvanized steel or extruded aluminum; 38-mm x 38-mm blocking securely nailed between framing members will be considered as an acceptable alternative to tongue and groove material and H-Clip materials.
- .4 Floor Sheathing: Provide plywood subfloor, thickness as required by span rating and meeting requirements of CSA O325 and as follows:
 - .1 Span Rated Plywood: Exterior rated, sheathing grade tongue and groove edged Douglas Fir or Canadian Softwood Plywood meeting requirements of CSA O121 or CSA O151.
 - .2 Span Rated OSB: Exterior rated, sheathing grade tongue and groove edged OSB, faces and edges sealed to prevent swelling when wet and meeting requirements of CSA O437.
- .5 Floor Underlayment: Provide plywood or OSB, G1S with no knot fillers or adhesives detrimental to finished flooring products; minimum thickness 10 mm and meeting requirements of CSA O325 and ASTM F1482, and as follows:
 - .1 Plywood Underlayment: Exterior rated, sheathing grade square edged Poplar plywood meeting requirements of CSA O153.
 - .2 OSB Underlayment: Exterior rated, sheathing grade square edged OSB or waferboard, Grade O 1.
- .6 Plywood Blocking and Backing Panels: Douglas Fir and Canadian Softwood Plywood using exterior grade adhesives meeting requirements of CSA O121 or CSA O151; kiln dry plywood to moisture content of 15% or less, and as follows:
 - .1 Concealed Blocking: Select Grade (SEL) Canadian Softwood Plywood).
 - .2 Exposed Panels and Panel Boards: Good One Side (G1S) Douglas Fir Plywood.
 - .3 Fire Rated Intumescent Coating: Refer to Section 07 84 00 – Fire Stopping.

2.3 ACCESSORIES

- .1 Driven Fasteners: Steel nails, spikes, brads and staples meeting requirements of ASTM F1667. Ensure length is sufficient to penetrate connecting solid wood materials.
 - .1 Exterior Work: Hot-dipped galvanized.
 - .2 Interior High Humidity Work: Hot-dipped galvanized.
 - .3 Interior Work: Electroplated zinc plated, or cadmium plated.
- .2 Rough Hardware (Bolts, Nuts and Washers): Provide manufacturer recommended fastening devices and anchors meeting requirements of ASTM A307 and as follows:
 - .1 Ground Contact Materials: Stainless steel.
 - .2 Exterior Work: Hot-dipped galvanized.
 - .3 Interior High Humidity Work: Hot-dipped galvanized.
 - .4 Interior Work: Electroplated zinc plated, or cadmium plated.
- .3 Wood Screws: Steel screws meeting requirements of ASME B18.6.1 and as follows:
 - .1 Exterior Work: Galvanized, ceramic coated or stainless steel.
 - .2 Interior Work: Galvanized.
- .4 Screws for Fastening to Cold-Formed Metal Framing: Steel screws meeting requirements of ASTM

- C954, except for wafer heads and reamer wings whose length should be as recommended by screw manufacturer for material being fastened.
- .5 Prefabricated Metal Anchoring Systems, Framing Connectors and Hangers: Prefabricated products tested or designed in accordance with CSA O86; types and configurations as indicated on drawings.
 - .6 Sill Gaskets: Flexible, self-adhering closed-cell foam membrane that bridges gaps and irregularities between top of concrete foundation and sill components; nominal 10-mm thickness x width indicated on Drawings x manufacturer's maximum length.
 - .7 Subflooring Adhesive: CAN/CGSB-71.26, cartridge loaded.
 - .8 General Purpose Adhesive: CSA O112.9.
 - .9 Joist Hangers, Connectors and Fasteners: In accordance with accepted shop drawings, minimum 1-mm thick steel sheet, galvanized to a minimum ZF001 coating designation.
 - .10 Nailing Discs: Flat caps, minimum 25-mm diameter, minimum 0.4 mm thick formed to prevent dishing. Bell or cup shapes not acceptable.
 - .11 Roof Sheathing H-Clips: Formed "H" shape, thickness to suit panel material.

3 EXECUTION

3.1 VERIFICATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform HWDSB and JASON FUNG ARCHITECT INC. of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from JASON FUNG ARCHITECT INC..

3.2 INSTALLATION

- .1 Requirements:
 - .1 Accurately frame and properly assemble rough carpentry work
 - .2 Securely attach rough carpentry work to substrate by anchoring and fastening
 - .3 Include required nails, fastenings and other connectors
 - .4 Set rough carpentry to required levels and lines with members plumb, true to line, cut, and fitted
 - .5 Fit rough carpentry to other construction
 - .6 Scribe and cope as needed for accurate fit
 - .7 Locate furring, nailers, blocking, grounds, and similar supports as required when attaching to other construction.
 - .8 Do not use materials with defects that impair the quality of the rough carpentry or use pieces that are too small to use with a minimum number of joints or optimum joint arrangement.
- .2 Sill Plate Construction: Install sill gasket material between pressure treated sill plate and concrete foundation wall in accordance with manufacturer's instructions.
- .3 Wood Frame Construction: Space framing members at maximum 406 mm on centre using continuous pieces of the longest possible length and as follows:
 - .1 Fabricate wood frame construction to the requirements of Part 9 of the NBC, except where more stringent requirements are indicated on the drawings.

- .2 Make allowance for erection stresses.
- .3 Securely brace members in place to maintain plumb and true until permanently fixed and held to structure.
- .4 Minimize cutting of framing members for pipes and other penetrations by coordinating with other parts of the Work before starting work of this Section; limit cutting and hole drilling to limitations listed in Part 9 of the NBC.
- .4 Sheathing Installation: Install sheathing in accordance with Part 9 of the NBC and as follows:
 - .1 Wall Sheathing: Install wall sheathing horizontally to wood framing using minimum 50-mm long coated nails at 150 mm along edges and 305 mm along vertical members in the middle of the sheets; leave 2 mm to 3 mm between sheets to allow for shrinkage of wood framing.
 - .2 Shear Wall Sheathing: Refer to drawings for nailing patterns and installation details; install blocking behind all shear wall sheathing joints; adhere and nail sheathing to wall framing.
 - .3 Roof Sheathing: Install roof sheathing with length perpendicular to roof framing using 50-mm coated nails at 150 mm along edges and 305 mm along roof framing in the middle of the sheets and as follows:
 - .1 Nail size and pattern noted above is a minimum requirement; increase number and decrease spacing, or increase size as required to meet site conditions.
 - .2 Butt joints tightly together, support all edges of non tongue and grooved sheathing with 38-mm x 89-mm framing, H Clips or other acceptable method for square edge sheathing.
 - .4 Floor Sheathing:
 - .1 Install subfloor sheathing with the length in the direction of face orientation at right angles to floor framing.
 - .2 Offset joints parallel to the floor joists.
 - .3 Make panels continuous over two or more supports.
 - .4 Use a continuous bead of adhesive along each floor framing member and screw fasten at 150 mm along edges and 305 mm along floor framing in middle of sheathing.
 - .5 Nail size and pattern noted above is a minimum requirement; increase number and decrease spacing, or increase size as required to meet site conditions.
 - .6 Butt joints tightly together, use only tongue and grooved floor sheathing materials to maintain edge support.
 - .7 Support all edges of tongue and grooved plywood with 38-mm x 89-mm framing where indicated for diaphragm construction.
 - .8 Leave a minimum 3-mm gap between subfloor sheathing panels where panels will be covered with underlayment. Butt panels into light contact for combined subfloor and underlayment sheathing.
 - .9 Drill holes in subfloor sheathing in ponded areas where flooding has occurred to allow standing water to drain from floor; repair holes in combined subfloor and underlayment sheathing prior to installation of floor finish materials.
- .5 Floor Underlayment:
 - .1 Install underlayment using adhesive and nails fastened at 150 mm on centre throughout the entire piece of underlayment.
 - .2 Run sheets perpendicular to subfloor underlayment sheathing.
 - .3 Offset underlayment joints by a minimum of one joist space from sheathing joints, stagger end joints of underlayment.
 - .4 Butt end and edge joints into light contact to form a smooth and uniform surface ready for installation of floor finish materials.
 - .5 Maintain a minimum 6-mm space around room perimeters.

- .6 Install underlayment immediately prior to installation of flooring materials; coordinate with Section 09 65 00 - Resilient Flooring and Accessories and Section 09 65 66 – Resilient Athletic Flooring.
- .5 Roof Framing, Parapets, Cant Strips, and Plates:
 - .1 Construct wooden roof curbs around openings in the roof for vents, ducts, and other penetrations.
 - .2 Make curbs a minimum height of 200 mm above roof membrane; make base of curbs same thickness as insulation.
 - .3 Form sloped tops to wood parapet plates and wood up stands more than 38 mm wide to roofs that receive metal flashings; sloped not less than 2:12.
 - .4 Provide continuous wood backing for flashings.
 - .5 Provide solid wood or plywood sheathing and backing to receive membrane and metal flashings, conforming to CRCA Manual; fasten plywood sheathing securely to walls of parapets using mechanical fasteners; nails are not acceptable.
 - .6 Construct framing and blocking for membrane control joints conforming to CRCA Manual.
- .6 Telecommunications and Data Panel Boards:
 - .1 Install 19-mm DFP G1S plywood on all walls in telephone [and data] rooms receiving wiring and equipment
 - .2 Minimum 1220-mm x 2440-mm panels on periphery walls over 300 mm wide, mounted 150 mm off of finished floor
 - .3 Coordinate installation and locations with Section 26 05 00 - Common Work Results for Electrical.
- .7 Provide electrical equipment backboards for mounting electrical equipment as indicated. Use 19-mm thick plywood on 19 x 38 mm furring around spacing, perimeter and at maximum 305 mm intermediate.

3.3 CLEANING

- .1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .2 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
- .5 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This section includes, but is not limited to, supply and install of wood based finishing products purchase ready-made and installed by finish carpenter with minimal fabrication. Includes, but is not limited to, standard pattern wood trim, mouldings and millwork; standard paneling, shelving and related products; standard profile board paneling; fasteners, adhesives, wood treatment, and accessory hardware.

1.2 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 09 91 23 – Interior Painting

1.3 REFERENCE STANDARDS

- .1 American National Standards Institute (ANSI)
 - .1 ANSI A208.1, Particleboard.
 - .2 ANSI A208.2, Medium Density Fibreboard (MDF) for Interior Applications
 - .3 ANSI/HPVA HP-1, American National Standard for Hardwood and Decorative Plywood
 - .4 ANSI/BHMA A156, Auxiliary Hardware
 - .5 ANSI/ASME 18.6.1, Wood Screws (Inch Series)
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
 - .1 Architectural Woodwork Quality Standards
- .3 ASTM International (ASTM):
 - .1 ASTM A153/A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - .2 ASTM E1333, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber.
 - .3 ASTM F1667, Standard Specification for Driven Fasteners: Nails, Spikes and Staples
- .4 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-11.3, Hardboard.
- .5 CSA Group (CSA)
 - .1 CSA O121, Douglas Fir Plywood.
 - .2 CSA O151, Canadian Softwood Plywood.
 - .3 CSA O153, Poplar Plywood.
- .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS)
- .7 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1168, Adhesives and Sealants Applications
- .8 ULC Standards/UL Canada (ULC)
 - .1 CAN/ULC-S104, Standard Method for Fire Tests of Door Assemblies.
 - .2 CAN/ULC-S105, Standard Specification for Fire Door Frames

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:

- .1 Submit manufacturer's instructions, printed product literature, data sheets and catalogue pages for specified products. Include product characteristics, performance criteria, dimensions and profiles, finish and limitations on use.
- .2 Submit two copies of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements
- .3 Shop Drawings:
 - .1 Prepare and submit shop drawings in general accordance with AWMAC AWS manual.
 - .2 Indicate profiles and dimensions, assembly techniques, jointing, methods of fastening, terminations and other related details.
 - .3 Indicate materials, thicknesses, finishes and hardware.
 - .4 Include schedule or key plan.
 - .5 Show profiles, elevations and details at scales recommended by AWMAC AWS.
 - .6 Where necessary, show location and type of blocking and backing required within supporting assemblies.
- .4 Samples:
 - .1 Submit triplicate 300 mm long representative samples of each typical item of finish carpentry.
 - .1 Standing and running trim: 300 mm long.
 - .2 Panel materials: 300 mm x 300 mm.
 - .2 Shop applied coating samples:
 - .1 For transparent finish, submit triplicate samples of each species and cut of wood veneer to be used, finished to match project sample.
 - .2 For opaque finish, submit triplicate samples for each colour selection, finished to match project sample.
 - .3 Decorative overlaid composite panels, complete with applied edge treatment and corner treatment, minimum 300 mm x 300 mm.
 - .4 Samples for site applied finish:
 - .1 Furnish four samples of each finish carpentry item and composite panel material to Contractor for preparation of site applied finish samples.
 - .5 Submit duplicate samples of each hardware item to be left exposed in final construction. Samples will not be returned for incorporation into the work
- .5 Certifications: Submit certificates signed by manufacturer certifying materials comply with specified performance characteristics, physical properties and requirements of referenced standards

1.5 QUALITY ASSURANCE

- .1 Perform Work of this Section by finish carpentry contractor with minimum 5 years of current experience and having completed minimum one project in the past 5 years with value within 20% of the cost of the work of this Section

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Deliver finish carpentry materials only when area of work is enclosed, plaster and concrete work is dry, area is broom clean and site environmental conditions are acceptable for installation.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Maintain indoor temperature and humidity within range recommended by AWS for location of

the Work.

- .3 Store products on site as specified for minimum 72 hours before installation.
- .4 Store and protect finish carpentry products from moisture, nicks, scratches, and blemishes.
- .5 Replace defective or damaged materials with new.
- .4 Waste Management: Perform in accordance with Section 01 74 19 - Waste Management and Disposal.

2 PRODUCTS

2.1 PERFORMANCE CRITERIA

- .1 Wood fire rated frames and panels: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 or NFPA 252 for ratings specified or indicated.
- .2 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104 or NFPA 252 and listed by nationally recognized agency having factory inspection services.

2.2 MATERIALS

- .1 Lumber Material:
 - .1 Softwood lumber: unless specified otherwise, S4S, moisture content 19% or less by following standards:
 - .1 CAN/CSA-O141.-05
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
 - .3 AWMAC custom grade, moisture content as specified.
 - .2 Machine stress-rated lumber is acceptable.
 - .3 Hardwood lumber: moisture content 7 % or less in accordance with the following standards:
 - .1 National Hardwood Lumber Association (NHLA).
 - .2 AWMAC custom grade, moisture content as specified.
 - .4 Concealed framing lumber and plywood:
 - .1 Eastern Spruce, Balsam Fir, or Jack Pine, to CAN/CSA O141, NLGA, and NAAWS Custom Grade, S4S, average moisture content 7% +/- 2% at installation.
 - .2 Softwood plywood: CSA O151-M; in thickness as indicated on drawings, (G2S)
- .2 Veneer Core Plywood:
 - .1 Hardwood plywood conforming to ANSI/HPVA HP-1.
 - .2 Plywood grade: APA plywood, Grade A-D, in sizes, thickness and shapes as indicated.
 - .3 Laminate types:
 - .1 PLAM on 12.7 mm and 19 mm plywood as indicated.
 - .2 PLAM on 19 mm fire retardant treated plywood as indicated
- .3 Wood veneer:
 - .1 White Oak, conforming to ANSI/HPVA HP-1 having finishes and meeting grades as follows:
 - .1 Opaque finish, Grade B.
 - .2 Transparent finish, Grade AA. .2 Face veneer cut: Rift cut.
 - .3 Sizes, thickness, and shapes as indicated.
- .4 High Pressure Decorative Laminate
 - .1 Refer to Section 06 24 00 – High Pressure Decorative Laminate.

- .5 Miscellaneous metals: In accordance with Section 05 50 00 – Metal Fabrication.
- .6 Glass and glazing materials: In accordance with Section 08 80 00 - Glazing.
- .7 Finishing: In accordance with Section 09 91 23 – Interior Painting

2.3 ACCESSORIES

- .1 Provide screws, bolts, expansion shields and other fastening devices required for satisfactory installation.
- .2 Exposed fasteners to match finish of hardware.
- .3 Nails and staples: to ASTM F1677, galvanized to ASTM A 153/A 153M for exterior work, interior humid areas; plain finish elsewhere.
- .4 Wood screws: to ANSI/ASME 18.6.1, countersunk flush type unless indicated otherwise, in sizes to suit application, galvanized to ASTM A 153/A 153M for exterior work, interior humid areas.
- .5 Panel adhesive: Type to suit application.
 - .1 Low VOC limit to SCAQMD Rule 1168.

3 EXECUTION

3.1 VERIFICATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform HWDSB and JASON FUNG ARCHITECT INC. of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from JASON FUNG ARCHITECT INC..

3.2 PREPARATION

- .1 Back prime woodwork before installation, to AWS.

3.3 INSTALLATION

- .1 Install items of finish carpentry in accordance with AWMAC AWS grade specified for respective items
- .2 In case of conflict between Contract Documents and AWS grade requirements, Contract Documents govern.
- .3 Install items of finish carpentry at locations shown on drawings.
 - .1 Position accurately, level, plumb straight.
 - .2 Fasten and anchor securely.
- .4 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.
- .5 Form joints to conceal shrinkage

3.4 CONSTRUCTION

- .1 Fastening:
 - .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor

- securely.
- .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
- .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
- .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.
- .2 Standing and running trim:
 - .1 Butt and cope internal joints of baseboards to make snug, tight, joint. Cut right angle joints of casing and base with mitred joints.
 - .2 Fit backs of baseboards and casing snugly to wall surfaces to eliminate cracks at junction of base and casing with walls.
 - .3 Make joints in baseboard, where necessary using a 45 degrees scarf type joint.
 - .4 Install door and window trim in single lengths without splicing.
- .3 Interior and exterior frames:
 - .1 Set frames with plumb sides and level heads and sills and secure.
- .4 Panelling:
 - .1 Secure panelling and perimeter trim using adhesive recommended for purpose by manufacturer. Fill nail holes caused by temporary fixing with filler matching wood in colour.
 - .2 Secure panelling and perimeter trim using concealed fasteners.
 - .3 Secure panelling and perimeter trim using counter sunk screws plugged with matching wood plugs.
- .5 Stairs:
 - .1 Install stairs to location and details as indicated.
- .6 Handrails, wall rails and bumper rails.
 - .1 Install handrails, wall rails and bumper rails in locations indicated.
 - .2 Make joints hair line, dowelled and glued.
 - .3 Install support brackets as indicated.
 - .4 Install brackets at ends and at 1220 mm o.c. minimum at intermediate spacings.
 - .5 Secure using counter sunk screws plugged with matching wood plugs.
- .7 Shelving:
 - .1 Install shelving on as indicated.

3.5 CLEANING

- .1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .2 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

3.6 PROTECTION

- .1 Fill and retouch all nicks, chips and scratches in factory finishes and substrate materials to AWS

- standards. Replace damaged items that cannot be repaired to AWS standards
- .2 Protect installed products and components from damage during construction.
 - .3 Repair damage to adjacent materials caused by finish carpentry installation.
 - .4 Leave work to be site finished ready for finishing by Section 09 91 23 - Interior Painting.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This section includes, but is not limited to, supply and install of high pressure decorative laminate.

1.2 RELATED REQUIREMENTS

- .1 Section 06 20 00 – Finish Carpentry
- .2 Section 06 47 00 – Plastic Laminate Finishing
- .3 Section 09 91 23 – Interior Painting

1.3 REFERENCE STANDARDS

- .1 American National Standards Institute (ANSI)
 - .1 ANSI/NEMA LD 3, High Pressure Decorative Laminates
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
 - .1 Architectural Woodwork Quality Standards
 - .2 AWMAC NAAWS 3.1, North American Architectural Woodwork Standards
- .3 ASTM International (ASTM):
 - .1 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials
- .4 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-71, Adhesive, Contact, Brushable
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS)
- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1168, Adhesives and Sealants Applications

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature, data sheets and catalogue pages for specified products. Include product characteristics, performance criteria, dimensions and profiles, finish and limitations on use.
 - .2 Submit two copies of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements
- .3 Samples:
 - .1 Submit two copies of laminate samples for selection, illustrating available colours and surface textures.

1.5 QUALITY ASSURANCE

- .1 Installer Qualifications: Company specializing in fabricating and installing decorative plastic laminate finished work.
- .2 Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful service performance.
- .3 Mock-Ups: Build mockups to verify selections made under submittals and to demonstrate aesthetic effects, set quality for materials and construction, set quality standard for fabrication and installation

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Deliver decorative laminate with heavy kraft paper protection and store in cartons during shipping.
- .3 Protect decorative laminate surfaces during fabrication and installation stages. Do not remove protective covering until final clean-up prior to final inspection.
- .4 Do not store or install Products in areas where relative humidity is less than 25% or greater than 60% at 22C
- .5 Waste Management: Perform in accordance with Section 01 74 19 - Waste Management and Disposal.

2 PRODUCTS

2.1 MANUFACTURERS

- .1 Acceptable Manufacturers:
 - .1 Formica
 - .2 Abet Laminaati
 - .3 Trespa
 - .4 Wilsonart
- .2 Substitutions: Permitted, subject to review by HWDSB and JASON FUNG ARCHITECT INC.
- .3 Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

2.2 MATERIALS

- .1 High Pressure Decorative Laminate (HDPL):
 - .1 Basis-of-Design Product: Formica Laminate – Commercial (0.69 mm thickness).
 - .2 Colour: to be selected by HWDSB and JASON FUNG ARCHITECT INC. from manufacturer's standard range.
 - .3 Finish: Matte.
 - .4 Grade: Grade 20 – vertical postforming grade.
 - .5 Dimensions: Largest allowed with minimal seams.

2.3 ACCESSORIES

- .1 Core Materials: as per section 06 20 00 – Finish Carpentry and as indicated on Drawings.
- .2 Sealer: Water-resistant type.
- .3 Draw Bolts and Splines: Suitable for new core bases, and acceptable to fabricator.
- .4 Contact Adhesive: to CAN/CGSB-71.20-M and low VOC content

3 EXECUTION

3.1 VERIFICATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.

- .2 Inform HWDSB and JASON FUNG ARCHITECT INC. of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from JASON FUNG ARCHITECT INC..
- .2 Verify cutouts in core materials are prepared for fixtures and other penetrating components.

3.2 PREPARATION

- .1 Follow all manufacturer instructions.
- .2 Make joints in core materials tight, flush, and hairline, using draw bolts and splines.
- .3 Round internal corners, chamfer edges and seal exposed edges in core materials.

3.3 INSTALLATION

- .1 Comply with ANSI/NEMA LD 3, Annex A and AWMAC NAAWS 3.1., and Manufacturer's instructions.
- .2 Install Products plumb, true and square, neatly scribed and fitted to adjoining surfaces.
- .3 Ensure adjacent laminate sheets match in colour, texture, and pattern.
- .4 Ensure decorative laminate and core profiles coincide to ensure full continuous support and bond over entire surface.
- .5 Use continuous lengths to minimize joints. Maintain joints a minimum of 600 mm from sink cutouts.
- .6 Offset joints in decorative laminate from joints in core material.
- .7 Apply decorative laminate to exposed edges of core material for straight self-edging strips flat work.
- .8 Chamfer exposed edges of decorative laminate uniformly at 20 degrees.
- .9 Do not mitre decorative laminate edges.
- .10 Apply backing sheets where required to conceal and balance core material.
- .11 Apply cabinet liner sheets to interior of cabinets where indicated on Drawings.

3.4 FIELD QUALITY CONTROL

- .1 Gaps at corners, or between trim and core materials will be rejected by HWDSB and JASON FUNG ARCHITECT INC..

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

3.6 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Provide temporary protective covering until approval by HWDSB and JASON FUNG ARCHITECT INC.. Keep in place until Project Handover.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This section includes, but is not limited to, supply and install of plastic laminate finishing.

1.2 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 06 20 00 – Finish Carpentry
- .3 Section 06 24 00 – High Pressure Decorative Laminate
- .4 Section 09 91 23 – Interior Painting

1.3 REFERENCE STANDARDS

- .1 American National Standards Institute (ANSI)
 - .1 ANSI 208.1, Particleboard
 - .2 ANSI A208.2, Medium Density Fibreboard (MDF) for Interior Applications
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
 - .1 Architectural Woodwork Quality Standards
 - .2 AWMAC NAAWS 3.1, North American Architectural Woodwork Standards
- .3 ASTM International (ASTM):
 - .1 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-71, Adhesive, Contact, Brushable
- .5 CSA Group (CSA)
 - .1 CAN3-A172, High Pressure Paper Base, Decorative Laminates
 - .2 CSA O112, CSA Standards for Wood Adhesives
 - .3 CSA O121, Douglas Fir Plywood
 - .4 CSA O151, Canadian Softwood Plywood
- .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS)
- .7 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1168, Adhesives and Sealants Applications

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature, data sheets and catalogue pages for specified products. Include product characteristics, performance criteria, dimensions and profiles, finish and limitations on use.
 - .2 Submit two copies of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements
- .3 Samples:
 - .1 Submit two copies of laminate samples for selection, illustrating available colours and surface textures.

1.5 QUALITY ASSURANCE

- .1 Installer Qualifications: Company specializing in fabricating and installing decorative plastic laminate finished work.
- .2 Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful service performance.
- .3 Mock-Ups: Build mockups to verify selections made under submittals and to demonstrate aesthetic effects, set quality for materials and construction, set quality standard for fabrication and installation

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Deliver laminated plastic finished surfaces with heavy kraft paper protection and store in cartons during shipping.
- .3 Protect laminated plastic surfaces during fabrication and installation stages. Do not remove protective covering until final clean-up prior to final inspection.
- .4 Do not store or install Products in areas where relative humidity is less than 25% or greater than 60% at 22C
- .5 Waste Management: Perform in accordance with Section 01 74 19 - Waste Management and Disposal.

1.7 WARRANTY

- .1 Manufacturer Warranty: 2-year warranty, including coverage against warping, splitting, or delaminating, subject to normal usage, excluding excessive moisture or heat.
- .2 Installer Warranty: 1-year warranty, including coverage for the installation of the Work.

2 PRODUCTS

2.1 MANUFACTURERS

- .1 Acceptable Manufacturers:
 - .1 Formica
 - .2 Abet Laminati
 - .3 Wilsonart
- .2 Substitutions: Permitted, subject to review by HWDSB and JASON FUNG ARCHITECT INC.
- .3 Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

2.2 MATERIALS

- .1 Laminated Plastic for Flatwork: to CAN3-A172, Grade GP, Type SD, 1.25 mm thick. Based on full colour range with velour finish.
 - .1 Type: General purpose.
 - .2 Grade: HGS.
 - .3 Colour: integral colour throughout
 - .4 Pattern: to be determined by HWDSB and JASON FUNG ARCHITECT INC. selected from manufacturer's standard range of colour and finish.
 - .5 Finish: Velour

- .2 Laminated Plastic for Postforming Work: to CAN3-A172, Grade PF, Type S, 1.07 mm thick. Based on full colour range with velour finish.
 - .1 Type: Postforming.
 - .2 Grade: HGP.
 - .3 Colour: integral colour throughout
 - .4 Pattern: to be determined by HWDSB and JASON FUNG ARCHITECT INC. selected from manufacturer's standard range of colour and finish.
 - .5 Finish: Velour
- .3 Laminated Plastic Backing Sheet: Supplied by same manufacturer as facing sheet. Not less than 0.508 mm thick and same colour as face laminate. Sanded one side.
- .4 Laminated Plastic Liner Sheet: Supplied by same manufacturer as facing sheet. Not less than 0.760 mm thick and white colour.
- .5 Laminated Plastic Fire Retardant: to NEMA LD 3
 - .1 Type: Flame retardant.
 - .2 Grade: HGF.
 - .3 Size: 1.27 mm thick.
 - .4 Colour: Integral colour throughout
 - .5 Pattern: to be determined by HWDSB and JASON FUNG ARCHITECT INC. selected from manufacturer's standard range of colour and finish.
 - .6 Finish: to be determined by HWDSB and JASON FUNG ARCHITECT INC. selected from manufacturer's standard range of colour and finish
- .6 Plywood Core: Douglas Fir Plywood to CSA-O121 or Canadian Softwood Plywood to CSA-O151 solid two sides, 19 mm thick.
- .7 Particleboard Core: to CAN3-0188.1, Grade R, sanded faces, of thickness indicated.
- .8 Adhesive for Laminated Plastic: to be CSA approved and one of the following types as selected by the laminate manufacturer as being suitable for the application.
 - .1 Urea resin adhesive to CSA-O112.
 - .2 Contact adhesive to CAN/CGSB-71.20.
 - .3 Resorcinol resin adhesive to CSA-O112.
 - .4 Polyvinyl adhesive to CSA-O112.
 - .5 Two component epoxy thermosetting adhesive.
- .9 Sealer: Water-resistant sealer or glue acceptable to laminate manufacturer.
- .10 Sealant: as recommended by the laminate manufacturer and in accordance with Section 07 92 00 – Joint Sealants. Colour to be selected by the Consultant.
- .11 Draw Bolts and Splines: Suitable for new core bases, and acceptable to fabricator.
- .12 Apply laminate backing sheet to reverse side of core of plastic laminate work.
- .13 Apply laminated plastic liner sheet to interior of cabinetry, including all exposed surfaces such as gable ends, doors and drawers, and where otherwise indicated.

2.3 FABRICATION

- .1 Comply with NEMA LD3, Annex A.
- .2 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .3 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .4 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions.

Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 2400 mm. Keep joints 600 mm from sink cutouts.

- .5 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.
- .6 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .7 Apply laminate backing sheet to reverse side of core of plastic laminate work.
- .8 Apply laminated plastic liner sheet to interior of cabinetry.

3 EXECUTION

3.1 VERIFICATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform HWDSB and JASON FUNG ARCHITECT INC. of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from JASON FUNG ARCHITECT INC..
- .2 Surfaces to be adhesively bonded shall be clean, dry and free of any dust, loose paint, wax, moisture, dirt, grease, oil, rust, or other contaminants.

3.2 PREPARATION

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

3.3 INSTALLATION

- .1 Comply with ANSI/NEMA LD 3, Annex A and AWMAC NAAWS 3.1., and Manufacturer's instructions.
- .2 Install Products plumb, true and square, neatly scribed and fitted to adjoining surfaces.
- .3 Make allowances around perimeter where fixed objects pass through or project into laminated plastic work to permit normal movement without restriction.
- .4 Use draw bolts and splines in countertop joints. Maximum spacing 450 mm o.c., 75 mm from edge. Make flush hairline joints.
- .5 At junction of laminated plastic counter backsplash and adjacent wall finish, apply small bead of sealant.
- .6 Where applicable, site apply laminated plastic to units as indicated. Adhere laminated plastic over entire surface. Make corners with hairline joints. Use full sized laminate sheets. Make joints only where indicated and approved. Slightly bevel edges.
- .7 For site application, offset joints in plastic laminate facing from joints in core.

3.4 ADHESIVE SPRAY APPLICATIONS

- .1 Comply with adhesive manufacturer's printed installation instructions.
- .2 Apply contact adhesive uniformly to both surfaces and with a minimum of 80% coverage for each surface. Apply PVA adhesive to one side with a minimum of 80% coverage.
- .3 Apply two coats of adhesive to porous surfaces. Provide 100% coverage for edges.

- .4 Apply uniform downward pressure (30 to 40 psi minimum) across the entire bonded surface.

3.5 ADHESIVE BRUSH APPLICATIONS

- .1 Comply with adhesive manufacturer's printed installation instructions.
- .2 Apply contact adhesive uniformly to both surfaces with a brush or solvent-resistant medium nap roller; cover each surface 100%. Apply PVA adhesive to one side, for 100%.
- .3 Provide two coats of adhesive on porous surfaces. Double coat edges.
- .4 Apply uniform downward pressure (30 to 40 psi minimum) across the entire bonded surface

3.6 FIELD QUALITY CONTROL

- .1 Gaps at corners, or between trim and core materials will be rejected by HWDSB and JASON FUNG ARCHITECT INC..

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

3.8 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Provide temporary protective covering until approval by HWDSB and JASON FUNG ARCHITECT INC.. Keep in place until Project Handover.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This Section specifies fire stop and smoke seal systems and materials intended to fill gaps between fire separations, between fire separations and other construction assemblies, or used in or around items which fully or partially penetrate a fire separation, to restrict the spread of fire and smoke thus maintaining the integrity of a fire separation.
- .2 This Section includes requirements for:
 - .1 Through-penetration fire stops:
 - .1 For openings created to allow a penetrating item such as piping, conduits, raceways, ducts, cable trays, cables, tubing or structural components to pass completely through a fire separation or fire-resistance rated assembly.
 - .2 Membrane penetration fire stops:
 - .1 For openings where penetrating items such as piping, conduits, raceways, ducts, cable trays, cables, tubing, recessed components (e.g., panels, electric boxes, devices) or structural components pass through only one membrane of a fire separation or fire-resistance rated assembly.
 - .3 Blank opening fire stops:
 - .1 For openings created in a fire separation where the penetrating item has not yet been installed or has been removed.
 - .4 Construction joint fire stops:
 - .1 For locations where adjacent fire separations or components of fire separations meet. Locations include: ceiling/wall and roof/wall joints, wall/wall joints at corners or in the same plane, wall/floor joints, floor/floor joints and ceiling/ceiling joints.
 - .2 Includes fire stops for seismic joints, vertical control joints, expansion joints, and joints which occur at the tops and bottoms of fire separation walls.
 - .3 Includes fire stops for head-of-wall to non-rated roof or floor assemblies.
 - .5 Building perimeter fire stops:
 - .1 For the space between a fire-resistance rated floor assembly and the curtain wall (e.g.: safing slot gaps).
- .3 This Section includes fire stopping and smoke seal work for the entire Project including selection, installation and inspection of all required fire stops.

1.2 RELATED REQUIREMENTS

1.3 DEFINITIONS

- .1 Fire Blocking: materials, components or system installed in a concealed space in the building to restrict the spread of fire and smoke in that concealed space or from that concealed space to an adjacent space.
- .2 Fire Compartment: spaces within a building that are enclosed by exterior walls or separated from other parts of the building by enclosing Fire Separations having a Fire-Resistance Rating.
- .3 Fire-Resistance Rating: time in minutes or hours that a material or assembly of materials will withstand the passage of flame and transmission of heat when exposed to fire, meeting the requirements of CAN/ULC-S101 or as determined by formal testing of material or assembly of materials, meeting requirements of CAN/ULC-S115, or an interpretation of information derived from formal testing in accordance with requirements of the Building Code.
- .4 Fire Separation: assembly that acts as a barrier against the spread of fire, smoke and noxious gases resulting from combustion as defined by the Building Code and includes the following assemblies having a Fire-Resistance Rating requiring Fire Stopping as follows:

- .1 Penetration-Type Fire Stop systems located within loadbearing walls and partitions.
- .2 Penetration-Type Fire Stop systems located within non-loadbearing walls and partitions.
- .3 Penetration-Type located within floor assemblies.
- .4 Building Perimeter-Type located between floor assemblies and exterior wall and roof construction.
- .5 Construction Joint-Type and other assemblies having a Fire-Resistance Rating indicated on Drawings or Schedules.
- .5 Fire Stop: material, component or system, and its means of support, used to protect gaps between fire separations, between fire separations and other construction assemblies, or used in openings where penetrating items wholly or partially penetrate fire separations, to restrict the spread of fire and smoke thus maintaining the fire-resistance continuity of a fire separation.
- .6 Fire Stop System: a specific site erected construction consisting of the assembly, fire stop materials, any penetrating items and their means of support which have met the requirements for an F, FT, FH, FTH and/or L rating when tested in a fire-resistance rated assembly in accordance with CAN/ULC-S115.
 - .1 F-Rating: the amount of time a fire stop system can remain in place without the passage of flame through the opening or the occurrence of flaming on the unexposed face of the fire stop.
 - .2 FT-Rating: a fire stop system with an F-Rating for the required time period which can also resists the transmission of heat through the fire stop during the same period and limit the rise in temperature on the unexposed face and/or penetrating item of the fire stop.
 - .3 FH-Rating: a fire stop system with an F-Rating for the required time period which can also resist the force of a hose stream without developing openings for a prescribed period.
 - .4 FTH-Rating: a fire stop system with an FT-Rating for the required time period which also passes the hose stream test for a prescribed period.
 - .5 L-Rating: largest test sample leakage rate, determined in accordance with the optional air leakage test in CAN/ULC-S115.
- .7 Multi-penetration: two or more service penetrations through an opening in the fire separation.
- .8 Non-rated Fire Separation: fire separation acting as a barrier to the spread of smoke until a response is initiated such as the activation of a fire suppression system.
- .9 Single-penetration: single service penetration through an opening in the fire separation.
- .10 System Design Listing: document providing proof of testing with technical details, specifications and requirements that leads to the application of a specific listed fire stop system.

1.4 REFERENCE STANDARDS

- .1 Firestop Contractors International Association (FCIA):
 - .1 FCIA Firestop Manual of Practice
- .2 Factory Mutual Approvals (FM):
 - .1 FM 4990, Approval Standard for Fire stopping
 - .2 FM 4991, Approval Standard for Firestop Contractors
- .3 International Accreditation Service (IAS):
 - .1 IAS AC291, Accreditation Criteria for Special Inspection Agencies
- .4 International Firestop Council (IFC)
 - .1 IFC Guidelines for Evaluating Engineering Judgments
 - .2 IFC Guidelines for Evaluating Engineering Judgments - Perimeter Fire Barrier Systems
 - .3 IFC Inspection Guidelines for Penetration Firestop Systems and Fire Resistive Joint Systems in Fire Resistance Rated Construction

- .5 National Fire Protection Agency (NFPA):
 - .1 NFPA 251, Standard Methods of Tests of Fire Endurance of Building Construction and Materials
- .6 National Research Council Canada (NRC):
 - .1 National Building Code of Canada (NBC)
 - .2 Best Practice Guide on Fire Stops and Fire Blocks and Their Impact on Sound Transmission
- .7 ULC Standards (ULC):
 - .1 CAN/ULC-S101, Standard Method of Fire Endurance Tests of Building Construction and Materials
 - .2 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
 - .3 CAN/ULC-S114, Standard Method of Test for Determination of Non-Combustibility in Building Materials
 - .4 CAN/ULC-S115, Standard Method of Fire Tests of Firestop Systems
- .8 Underwriters Laboratories Inc. (UL):
 - .1 UL 1479, Fire Tests of Penetration Firestops
 - .2 UL Qualified Firestop Contractor Program

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Hold pre-installation meeting one week before beginning Work of this Section, with Contractor, Subcontractor and HWDSB in accordance with Section 01 31 19 - Project Meetings to:
 - .1 Verify Project requirements.
 - .2 Review sustainable requirements.
 - .3 Review installation and substrate conditions.
 - .4 Discuss coordination with other Subcontractors.
 - .5 Review system design listings, manufacturer's installation instructions and warranty requirements.
 - .6 Review quantity and location of mock-ups.
 - .2 Hold pre-installation meetings with other trades to review:
 - .1 Installation procedures and precautions.
 - .2 Location, scheduling and sequencing of other work around fire stops that can affect the outcome of the installation.
 - .3 Requirements for annular opening sizes.
 - .4 Requirements and preparations for wall/floor single and multi-penetrations.
 - .5 Requirements for construction and perimeter joints.
 - .6 Mock-up requirements.
 - .3 Submit copies of applicable listed fire stop system details to each trade for opening preparation. Include installation details required for the listed system.
 - .4 Meeting minutes: Contractor to take minutes of pre-installation meetings and distribute to HWDSB and each affected trade.
- .2 Sequencing:
 - .1 Proceed with installation only when submittals have been reviewed by HWDSB.
 - .2 Install fire stops located in floor assemblies before interior partition erections.

- .3 Metal deck bonding: Unless otherwise noted on system design listing and manufacturer's installation instructions, fire stopping to precede spray-applied fireproofing to ensure required bonding.
- .4 Pipe and duct insulation: Certified fire stop system component.
 - .1 Ensure pipe and duct insulation installation precedes fire stopping.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Qualification Statement:
 - .1 Submit contractor qualification statements and certificates demonstrating compliance with the qualification requirements of this Section, within ten working days after award of contract and before starting Work.
- .3 Product Data:
 - .1 Submit manufacturer's product data for each type of fire stopping and smoke seal. Submit complete product data for each individual component and include:
 - .1 Product name and product number
 - .2 Product characteristics and performance criteria
 - .3 Physical size, finish and limitations
 - .4 Technical data on out-gassing, off-gassing and age testing
 - .5 Curing time
 - .6 Chemical compatibility to other construction materials
 - .7 Shelf life
 - .8 Life expectancy
 - .9 Temperature range for installation
 - .10 Humidity range for installation
 - .11 Sound attenuation STC-Rating
 - .2 Manufacture Product Certification:
 - .1 Submit manufacturer certification certifying products supplied comply with local regulations controlling use of Volatile Organic Compounds (VOC's) and are non-toxic to building occupants.
 - .2 Submit test reports showing compliance to ASTM E595.
 - .3 Submit one copy of WHMIS Safety Data Sheets (SDS) for each individual component in accordance with Section 02 81 00 - Hazardous Materials
 - .4 Submit a comprehensive list of all products and components included in submittal.
- .4 Shop Drawings:
 - .1 Submit shop drawings showing system design listings for Project including proposed materials, reinforcement, anchorage, fastenings and method of installation.
 - .2 Construction details to accurately reflect actual job conditions for each product and assembly.
 - .3 Submit details for materials and prefabricated devices.
 - .4 Submit electronic copy of shop drawings and include:
 - .1 Title page, labelled "Fire and Smoke Stop System Listings". Include project name, date and the names of the installation company and the manufacturer of proposed products.
 - .2 Table of Contents.
 - .3 List of each proposed listed fire stop system and corresponding service penetration type or

- joint type in a matrix spreadsheet schedule, indicating floor and wall system, including rating for each.
- .4 Location of penetrations:
 - .1 Drawings showing the location of each penetration with a unique penetration identification number and associated listing number.
 - .2 Schedules listing each penetration with a unique identification number, their associated listing number, organized by floor, wall and ceiling area and indicating each room number.
- .5 System Design Listings:
 - .1 Submit design listings for each listed fire stop system and each application identified in accordance with CAN/ULC-S115
 - .2 When more than one product is specified for the listed fire stop system or more than one packing/damming material is indicated, identify the item that will be used on this Project.
- .6 Certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .5 Manufacturer's Instructions: Submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.
- .6 Samples: Submit to HWDSB and JASON FUNG ARCHITECT INC. a minimum one week before beginning site work:
 - .1 Submit two 300 x 300-mm samples of each system showing actual fire stop materials proposed for Project including anchors/fasteners and damming materials.
 - .2 Submit two samples of each type of label proposed for the identification of fire stops.
- .7 Quality Assurance Submittals: Submit the following in accordance with Section 01 43 00 - Quality Assurance:
 - .1 Test reports in accordance with CAN/ULC-S101, CAN/ULC-S102, and CAN/ULC-S115.
 - .1 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.
 - .2 Document from Engineer of Record showing compliance of alternative fire stopping solution with CAN/ULC-S115 provided by the National Research Council, Best Practice Guide on Fire Stops and Fire Blocks and Their Impact on Sound Transmission.
 - .3 Certificates: Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .4 Manufacturer's Instructions: Submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.
 - .5 Manufacturer's Site Reports: Submit manufacturer's reports within three days of review, verifying compliance of Work, as described in SITE QUALITY CONTROL in Part 3 of this Section.
- .8 Closeout Submittals:
 - .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .9 Operation and Maintenance Data: Submit maintenance data for incorporation into manual, including:
 - .1 WHMIS Safety Data Sheets (SDS),
 - .2 Product data and manufacturer's installation and maintenance instructions for each product/system used on this project,
 - .3 Approved system design listings, and

- .4 Matrix schedule listing all system design listings with a description of their penetration or joint type.
- .5 Certifications:
 - .1 Provide proof of training for each worker that performed installation on the Project.
 - .2 Provide proof of company installing fire stopping and smoke seals is a Member in Good Standing with FCIA.
 - .3 Certification of company as a ULC Qualified or FM 4991 Approved Firestop Contractor, including the Designated Responsible Individual (DRI) certificate.
 - .4 Accreditation of third-party inspection firm.
 - .6 Manufacturer's field reports.
 - .7 Warranty information on fire stop installations.
 - .8 Life expectancy of each product installed as part of Project. For each system, list the installation date of products and the expected expiration date (month/year).
- .10 Record Documentation:
 - .1 Maintain a daily log of all activities on site during the course of construction. Submit a copy of all daily logs after completion of fire stopping work.
 - .2 As-built Drawings:
 - .1 Submit a marked-up set of Drawings to provide referencing system identifying the location of each fire stop.
 - .2 Identify each penetration type fire stop with their penetration identification number.
 - .3 Provide detailed Drawings of system design listings for each type of fire stop (i.e., through-penetration, membrane penetration, blank opening, construction joint, building perimeter).
 - .4 Fire Stop Schedules:
 - .1 Submit complete fire stop schedules for floors, walls and ceilings.
 - .2 Indicate all penetration fire stops and joint fire stops through each reference wall, floor and ceiling in the schedules.
 - .3 Cross-reference firestop schedules with as-built drawings and indicate design listing numbers associated to each penetration fire stop and joint fire stop.

1.7 QUALITY ASSURANCE

- .1 Regulatory Requirements: Use materials and methods of determining required thickness of application that are tested in accordance with CAN/ULC-S115, and form a part of a ULC or cUL listed system or Equivalent Fire Resistance Rated Assembly.
- .2 Provide systems selection and analysis, installation and inspection of fire stop systems in accordance with the recommended practices detailed in the following guides:
 - .1 FCIA Firestop Manual of Practice (MOP).
- .3 Qualifications:
 - .1 Contractor specializing in selection and installation of fire stops with five years documented experience. Submit a list of five successfully completed projects of similar scale and type.
 - .2 The installers are recognized as a Member in Good Standing with the Firestop Contractors International Association (FCIA). Submit proof of current membership.
 - .3 Training: Workers, including site supervisor, to complete:
 - .1 Manufacturer training on the products/systems installed as part of this Section.
 - .2 Training under the FCIA Firestop Containment Worker Education Program.

- .4 Certified Firestop Contractor: company certified with one of the following programs:
 - .1 ULC Qualified Firestop Contractor Program. Submit signed copy of certificate.
 - .2 FM 4991 Approved Firestop Contractor. Submit signed copy of FM Approval certificate.
- .5 Third-Party Inspection Firm: IAS AC291 Accredited inspection agency with inspectors who have passed the ULC Firestop Exam or FM Firestop Exam.
- .4 Mock-ups:
 - .1 Construct mock-up of fire stop systems in accordance with Section 01 43 00 - Quality Assurance.
 - .2 Before beginning construction, provide mock-up of each proposed listed fire stop system for review by HWDSB. Mock-up shall include work by other trades to demonstrate the required finish work, such as steel stud/gypsum board trade framing out multi-penetration openings.
 - .3 Install proposed identification labels for each penetration.
 - .4 Locations for mock-ups as directed by the HWDSB.
 - .5 After mock-up completion and adequate curing time for materials, provide a minimum of 48 hours notification to HWDSB to conduct review.
 - .6 Manufacturer's representative and inspection firm shall be present during review of mock-ups.
 - .7 Correct mock-up deficiencies as directed by HWDSB. Mock-up may not remain as part of finished work.
 - .8 HWDSB may perform destructive tests to each mock-up to ensure the system meets or exceeds the approved system design listing.
- .5 Manufacturer Site Visits:
 - .1 Conducted after delivery and storage of products, and when preparatory Work is complete, but before installation begins.
 - .2 During progress of work at 75% completion.
 - .3 Conducted again upon completion of Work and after final cleaning is complete.

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, ULC markings, manufacturing date, shelf life expiry date.
- .2 Storage and Protection:
 - .1 Store materials in a well-ventilated, dry indoor location and in accordance with manufacturer's instructions.
 - .2 Coordinate delivery of materials with scheduled installation dates to allow minimum storage time on site.
 - .3 Comply with recommended procedures, precautions and measures described in WHMIS Safety Data Sheets (SDS).
- .3 Waste Management and Disposal:
 - .1 Perform in accordance with Section 01 74 19 - Waste Management and Disposal.

1.9 AMBIENT CONDITIONS

- .1 Ambient Conditions:
 - .1 Install fire stops and smoke seals when ambient and substrate temperatures are within the limits prescribed by the manufacturer and when the substrate is dry and without risk of

condensation.

- .2 Maintain manufacturer's recommended ambient and substrate temperatures for 48 hours before and 72 hours after installation.
- .2 Ventilate fire stops and smoke seals in accordance with manufacturers' instructions by natural means or, where this is inadequate or not available, use forced air circulation.

1.10 WARRANTY

- .1 Extend 12 month warranty period to 24 months for Work of this Section.
- .2 Manufacturers shall warrant work of this Section against defects and deficiencies in the product material for a period of 24 months. Promptly correct any defects or deficiencies which become apparent within warranty period at no expense.
- .3 Contractor warrants workmanship on materials and installation for a period of 24 months. Promptly correct any defects or deficiencies which become apparent within warranty period at no expense.

2 PRODUCTS

2.1 MANUFACTURERS

- .1 Provide products from a single manufacturer, to the greatest extent possible, to perform all fire stopping work. Materials of different manufacturers will not be permitted without authorization from HWDSB.
- .2 Provide a listed system from an alternative where there is no specific tested listed fire stop system available from the manufacturer for a particular fire stopping application to avoid providing an Engineering Judgment.

2.2 SUSTAINABILITY CHARACTERISTICS

- .1 Not Used.

2.3 PERFORMANCE/DESIGN CRITERIA

- .1 Fire stop and smoke seal systems consisting of a material or combination of materials installed to maintain the integrity of the fire-resistance rating of a fire separation in accordance with the requirements of the NBC.
- .2 Performance Requirements: Manufacturer shall design proprietary assemblies to withstand the listed ratings in accordance with the NBC, ULC Standards, and as follows:
 - .1 Non-rated fire separations: Provide L-Rated smoke protection fire stop system for application on both sides of separation.
 - .2 Provide through-penetration fire stop and joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of penetrated assembly, such as:
 - .1 Fire-resistance rated loadbearing walls, including partitions, with fire protection rated openings.
 - .2 Fire-resistance rated non-loadbearing walls, including partitions with fire protection rated openings.
 - .3 Fire-resistance rated floor assemblies.
 - .3 "F" Rated Systems: Provide through-penetration fire stop systems with F-ratings indicated, as determined by CAN/ULC-S115 or ASTM E814, and equal to or exceeding the fire-resistance rating of the penetrations created during construction.
 - .4 "T" Rated Systems: Where fire stop systems protect penetrating items from potential contact

with adjacent materials, provide through-penetration fire stop systems with T-ratings and F-ratings indicated, as determined by CAN/ULC-S115 or ASTM E814, for the following conditions:

- .1 Penetrations located outside wall cavities.
- .2 Penetrations located outside fire resistive shaft enclosures.
- .3 Penetrations located in a construction containing fire protection rated openings.
- .4 Penetrating items larger than a 100-mm-diameter nominal pipe or 100 cm² in overall cross-sectional area.
- .5 Fire stopping and Smoke Seal Systems Exposed to View: Provide products that after curing do not deteriorate when exposed to view, traffic, moisture, and physical damage both during and after construction, and as follows:
 - .1 Provide moisture resistant through-penetration fire stop systems for piping penetrations for plumbing and wet pipe sprinkler systems.
 - .2 Provide fire stopping and smoke seal systems capable of supporting anticipated floor loads either by installing floor plates or by other means for floor penetrations with annular spaces exceeding 100 mm in width and exposed to possible loading and traffic.
 - .3 Provide fire stopping and smoke seal systems not requiring removal of insulation for penetrations involving insulated piping.
 - .4 Provide products with flame-spread ratings of less than 25 and smoke-developed ratings of less than 50 for fire stopping, smoke seal, and joint systems exposed to view.
 - .5 Architectural considerations: When fire stop system is exposed to view, consider architectural finish, potential traffic, and exposure to moisture and heat.
- .6 Fire Resistance of Joint Systems: Assembly ratings and movement capabilities shall be as indicated with assembly ratings equal to or exceeding the fire-resistance rating of constructions in which joints are located.
- .3 Dynamic Joints: Where required, design fire stop and smoke seal systems to accommodate a defined amount of movement in structural elements, construction joints and mechanical piping caused by expansion or contraction. Systems should also accommodate movement and sound and vibration control in mechanical installations.
- .4 Insulated Pipes and Ducts: Design and test listed fire stop system with the actual insulation materials penetrating the fire separation, as indicated on the system design listing.
- .5 Use in Wet Areas: water-based products are unacceptable in wet areas or areas that may be subject to occasional water exposure or flooding during and after construction.
- .6 Environment Considerations: Select materials taking into consideration the environment in which they will be used during and after curing, as well as the intended use of the space. Confirm compatibility of the proposed materials/products with fire stop manufacturer for the following situations:
 - .1 Spaces requiring resistance to infection and biological spread through assemblies.
 - .2 Spaces containing sensitive electronic equipment.
 - .3 Preventing contamination of laboratory and manufacturing environments.

2.4 MATERIALS

- .1 Compatibility: Under conditions of service and application, provide fire stopping and smoke seal systems that are compatible with one another, with the substrates forming openings, and with the items, if any, penetrating the systems, as demonstrated by fire stopping and smoke seal system manufacturer based on testing and site experience, and as follows:
 - .1 Asbestos-free materials and systems capable of maintaining an effective barrier against the

passage of flame, smoke and water and the transmission of heat in compliance with requirements of CAN-ULC-S115 and not to exceed opening sizes for which they are intended, as indicated on System Design Listing.

- .2 Fire Stop System Rating: To match fire-resistance rating of fire separation as indicated on Drawings.
- .3 Service penetration assemblies and fire stop components: Certified by testing laboratory to CAN/ULC-S115.
- .4 Provide elastomeric seal or non-shrink foam cement mortar for fire and smoke stop systems at openings intended for re-entry, such as cables. Do not use cementitious or rigid seal at such locations.
- .5 Provide elastomeric protection for fire and smoke stop systems at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control. Do not use a cementitious or rigid seal at such locations. Exemption for fire dampers.
- .6 Provide elastomeric seal for fire and smoke seals behind and around mechanical and electrical boxes within wall, floor, and ceiling assemblies.

2.5 FILL MATERIALS

- .1 General:
 - .1 Provide fire stopping and smoke seal systems containing the types of fill materials indicated in SCHEDULE in Part 3 of this Section by reference to the types of materials described in this Article. Fill materials are those referred to in directories of the referenced testing and inspecting agencies as fill, void, or cavity materials.
 - .2 Fire stopping and smoke seal systems shall be tested in accordance with CAN/ULC-S115 and be comprised of asbestos free materials and systems capable of maintaining an effective barrier against flame, smoke and gases. Fire stopping and smoke seal systems not to exceed opening sizes for which they are intended for the ratings as indicated on Drawings.
- .2 Cast-in-Place Fire Stopping and Smoke Seal Devices: Factory assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- .3 Latex Sealants: Single component latex formulations that after curing do not re-emulsify during exposure to moisture.
- .4 Fire Stopping and Smoke Seal Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrating item.
- .5 Cable Penetration Devices:
 - .1 Pre-manufactured intumescent blocks
 - .2 Pre-manufactured sleeves, consisting of an adjustable core
 - .3 Pre-manufactured cable management system, consisting of a system of intumescent inserts and adjustable cores
- .6 Intumescent Composite Sheets: Rigid panels consisting of aluminum foil faced elastomeric sheet bonded to galvanized steel sheet.
- .7 Intumescent Putties: Non-hardening dielectric, water resistant putties containing no solvents, inorganic fibres, or silicone compounds.
- .8 Intumescent Spray Foam: Expanding spray-in-place intumescent foam sealant.
- .9 Intumescent Wrap Strips: Single component intumescent elastomeric sheets with aluminum foil on one side.
- .10 Intumescent, Latex Sealant: Single-component, intumescent, latex formulation.
- .11 Job-Mixed Vinyl Compound: Prepackaged vinyl-based powder product for mixing with water at Project site to produce a paintable compound, passing ASTM E136, with flame-spread and

smoke-developed ratings of zero per ASTM E84.

- .12 Solvent-Release-Curing Intumescent Sealant: Solvent-release-curing, single-component, synthetic-polymer-based sealant of grade indicated below:
 - .1 Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces. Non-sag formulation for openings in vertical and other surfaces requiring a non-slumping/gunnable sealant, unless indicated fire stop system limits use non-sag grade.
- .13 Mortars: Pre-packaged, dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogeneous mortar.
- .14 Pillows/Bags: Reusable, heat-expanding pillows/bags consisting of glass fibre cloth cases filled with a combination of mineral fibre, water insoluble expansion agents and fire-retardant additives.
- .15 Silicone Foams: Multi-component, silicone based liquid elastomers that, when mixed, expand and cure in-place to produce a flexible, non-shrinking foam.
- .16 Silicone Sealants: Moisture curing, single component, silicone based, neutral curing elastomeric sealants of grade indicated below:
 - .1 Grade for Horizontal Surfaces: Pourable (self-levelling) formulation for openings in floors and other horizontal surfaces.
 - .2 Grade for Vertical Surfaces: Non-sag formulation for openings in vertical and other surfaces.
- .17 Ceramic-Fibre and Mastic Coating: Ceramic fibres in bulk form formulated for use with mastic coating, and ceramic fibre manufacturer's mastic coating.
- .18 Ceramic-Fibre Sealant: Single-component formulation of ceramic fibres and inorganic binders.

2.6 MIXING

- .1 For those products requiring mixing before application, comply with fire stopping and smoke seal system manufacturer's instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

2.7 FIRE-RESISTIVE ELASTOMERIC JOINT SEALANTS

- .1 Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer that comply with ASTM C920 requirements, including those referenced for Type, Grade, Class, and Uses, and requirements specified in this Section applicable to fire-resistive joint sealants.
- .2 Single-Component, Neutral-Curing Silicone Sealant: Type S; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, G, A, and (as applicable to joint substrates indicated) O.
 - .1 Additional Movement Capability: When tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, provide sealant with the capability to withstand the changes in joint width existing at the time of installation, and remain in compliance with other requirements of ASTM C920.
- .3 Multicomponent, Non-sag, Urethane Sealant: Type M; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, A, and (as applicable to joint substrates indicated) O.
 - .1 Additional Movement Capability: When tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, provide sealant with the capability to withstand the change in joint width existing at the time of installation, and remain in compliance with other requirements of ASTM C920.
- .4 Single-Component, Non-sag, Urethane Sealant: Type S; Grade NS; Class 25; and Uses NT, M, A, and (as applicable to joint substrates indicated) O.

2.8 FIRE STOP IDENTIFICATION

- .1 Identification Labels and Markings: Permanent for the expected service life of the installation.
- .2 Fire Stopped Penetrations:
 - .1 Provide identification labels at each penetration.
 - .2 Identification labels: adhesive plastic stickers, tamper-evident frangible stickers, embossed, metal tags, ceramic fiber tags with metal fastening device with the following information:
 - .1 penetration number
 - .2 floor number
 - .3 room number
 - .4 product name and number
 - .5 system design number
 - .6 fire rating required in hours.
 - .7 fire stop contractor's name and phone number
 - .8 installer's name
 - .9 date of installation
 - .10 re-penetrated by: company, installer and date
 - .3 Indicate on label that fill material around the penetration is a fire stop system and shall not be disturbed except by authorized personnel.
- .3 Fire Separation (Barrier) Markings:
 - .1 Provide identification for all vertical fire separations.
 - .2 Identification markings: adhesive, tamper evident, stickers, stencil painted with lettering at least 75 mm in height with a minimum 10mm stroke in contrasting colour.
 - .3 Incorporate assembly's fire-resistance rating and the following suggested wording, "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS", or other accepted wording.
 - .4 Include horizontal red painted line, 75 mm in width, between identification markings.
 - .5 For occupied areas with exposed ceilings: Use 50mm red dot adhesive stickers or stencil painted red dots without horizontal painted lines.

2.9 ACCESSORIES

- .1 Provide components for each fire stopping and smoke seal system needed to install fill materials. Use only components specified by fire stopping and smoke seal system manufacturer and approved by the qualified testing and inspecting agency for fire stopping and smoke seal systems indicated on Drawings.
- .2 Primers: To manufacturer's recommendation for specific material, substrate, and end use.
- .3 Water (if applicable): Potable, clean and free from harmful amounts of deleterious substances.
- .4 Metal Fire Stop: Commercial galvanized steel, to ASTM A1008/A1008M, zinc coating 260 g/m², minimum metal core thickness 0.912 mm.
- .5 Steel Deck Moulded Flute Inserts: One-piece moulded mineral fibre flute inserts, sized for steel deck profiles, for placement at top of fire-rated wall assemblies
- .6 Packing/Damming Materials, Supports and Anchoring Devices: To manufacturer's recommendations, and in accordance with tested assembly.
- .7 Fire Stop Insulation: Pre-formed, semi-rigid, non-combustible mineral wool, pre-cut in 1220-mm lengths to required depth and width.
- .8 Junction Box/Outlet Sealing Putty: Intumescent putty, pre-formed in pads.
- .9 Sealants: Good adhesion without use of primer, high visibility safety colours.

- .1 Flame-spread rating: Maximum 25
- .2 Smoke development classification: Maximum 50
- .3 For vertical joints: Non-sagging
- .4 For horizontal joints: Single component, self-levelling

3 EXECUTION

3.1 EXAMINATION

- .1 Verify that conditions of substrates previously installed are acceptable for product installation in accordance with manufacturer's instructions and approved system design listings for each condition.
- .2 Verify each opening/annular space to ensure it does not exceed the maximum and minimum dimensions indicated on the approved system design listing.
- .3 Verify that all joints, service penetrating elements and supporting devices/hangers have been properly installed as indicated on approved system design listings. Remove all temporary lines and markings to meet the approved system design listings.
- .4 Verify that proposed fire stop system consists of components that are compatible with each other, with substrates forming the openings, and with items, if any, penetrating the fire stop under conditions of application and service, as demonstrated by the fire stop manufacturer based on testing and site experience.
- .5 Pipe and Duct Insulation: Confirm that proposed fire stop system has been tested with the actual insulation penetrating the fire separation on site, as indicated in the approved system design listing. Maintain insulation around pipes and ducts penetrating the fire separation.
- .6 Ensure no additional items have been installed through opening that does not appear on the approved system design listing.
- .7 Ensure fire stopped areas are accessible for proper application and that conditions are suitable for installation of the fire stop system. Areas to remain accessible for inspection.
- .8 Report in writing to HWDSB any defective surfaces or conditions affecting the fire stop system installation immediately and before commencing any installations.
- .9 Proceed only once defected surfaces or conditions have been corrected.
- .10 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PREPARATION

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.
 - .1 Ensure that substrates and surfaces are clean, dry and frost free.
 - .2 Ensure substrates and surfaces are free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
- .2 Prepare surfaces in contact with fire stop and smoke stop materials to manufacturer's instructions.
- .3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.
- .4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.
- .5 Protect adjacent work areas and finish surfaces from damage during product installation.
- .6 Prime surfaces as required.
- .7 Ensure multi-penetration openings have been framed and boarded out around annular openings, as indicated in the system design listing before prepping the opening.

3.3 INSTALLATION

- .1 Install fire stop and smoke seal materials and components in accordance with manufacturer's certified tested system listing.
- .2 Coordinate with other sub-trades to ensure that all pipes, conduits, cables, and other items, which penetrate fire separations, have been permanently installed before installation of fire stop systems.
- .3 Schedule work to ensure that fire separations and all other construction that conceals penetrations are not erected before installation of fire and smoke seal systems
- .4 Seal holes or voids made by through-penetrations, poke-through termination devices, and un-penetrated openings or joints to ensure that both continuity and integrity of fire separation are maintained.
- .5 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing per manufacturer's instructions.
- .6 Tool or trowel exposed surfaces to neat finish.
- .7 Remove excess compound promptly as work progresses and upon completion.
- .8 Protect gaps around recessed components (e.g., panels, electrical boxes, outlets) with sealing putty in accordance with manufacturer's instructions.
- .9 Do not use damaged or expired material.

3.4 INSTALLATION - JOINT FIRE STOPS

- .1 For sealant applications, install joint fillers to support fire stop materials during application. Position joint fillers to ensure fire stop material cross-sectional shape and thickness relative to the joint width allows for optimum sealant movement, while developing the required fire-resistance rating.
- .2 Install fire stops using techniques recommended by the manufacturer:
 - .1 Fully wetting joint substrates to optimize adhesion.
 - .2 Completely filling recesses provided for each joint configuration.
 - .3 Tool non-sag fire stop materials immediately after their application and before the time skinning begins. Form smooth, uniform beads of configuration indicated or required to
 - .1 Provide required fire-resistance rating,
 - .2 Eliminate air pockets, and
 - .3 Ensure contact and adhesion with sides of joint.
- .4 Joint Systems and Perimeter Fire Containment Systems:
 - .1 For systems with dynamic joints, ensure movement capabilities of the installation meet or exceed the movement expectations of the system design listing and manufacturer's installation instructions.

3.5 INSTALLATION – THROUGH PENETRATION JOINT SEALANTS

- .1 Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position required to achieve fire ratings of designated through-penetration fire stop systems.
- .2 Install fill materials for through-penetration fire stop systems by techniques recommended by the manufacturer to produce the following results:
 - .1 Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
 - .2 Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - .3 For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

- .3 Remove combustible forming materials and other accessories not indicated as permanent components of fire stop systems.

3.6 IDENTIFICATION

- .1 General:
 - .1 Clean substrate before applying identification.
 - .2 Determine final location of identification on site.
 - .3 Identification is not required on both sides of the fire separation.
 - .4 Refer to Drawings for locations of fire separations and rating required.
- .2 Fire Stopped Penetrations:
 - .1 Install identification label adjacent to each fire stopped wall/floor service penetration. Provide one identification label per single opening or per grouping cluster.
 - .2 Securely apply identification to substrate by providing adequate adhesive
 - .3 Secure tags with metal fasteners or hang with metal chain or wire.
 - .4 Identification shall be completely filled out and installed before requesting substantial performance.
- .3 Fire Separations (Barriers):
 - .1 Position identification at least 4500 mm from end of each wall and at intervals not exceeding 9000 mm along wall/floor joint fire stops.
 - .2 Install markings within ceiling spaces, 600 mm below horizontal fire separation or roof structure unless otherwise indicated on Drawings.
 - .3 Review location of identification with HWDSB for occupied areas with exposed ceilings before proceeding.

3.7 REPAIRS AND MODIFICATIONS

- .1 Identify damaged or re-entered seals requiring repair or modification.
- .2 Remove loose or damaged materials. If adding penetrating items, remove sufficient material to insert new elements and to avoid damaging the balance of the seal.
- .3 Ensure sealed surfaces are clean and dry.
- .4 Use only materials that are suitable for repair of original seal, as approved by manufacturer. Do not mix products from different manufacturers.

3.8 SITE QUALITY CONTROL

- .1 Inspections: Notify HWDSB when ready for inspection and before concealing or enclosing fire stop materials and service penetration assemblies.
- .2 Manufacturer's Field Services:
 - .1 Mock-ups: Manufacturer to provide confirmation that the fire stop system installed meets or exceeds the system design listing requirements for each mock-up application.
 - .2 Obtain report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Site Reports as described in SUBMITTALS in Part 1 of this Section.
 - .3 Provide manufacturer's site services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.9 INSPECTIONS

- .1 Third-Party Inspection Firm: Provide the services of a third-party inspection firm to conduct random

inspections and direct exploratory review (i.e., destructive testing) during the course of construction and before closing off any concealed areas. Perform inspections and destructive testing in compliance with ASTM E2174 and ASTM E2393.

- .2 HWDSB to conduct random inspections and direct exploratory review (i.e., destructive testing) during the course of construction and before closing off any concealed areas. Perform inspections and destructive testing in compliance with ASTM E2174 and ASTM E2393.
 - .1 Include a minimum of 2% of each 900-m2 area for exploratory reviews for each approved system design listing and each trade involved. Perform cut tests at perimeter joints every 15 meters. Perform cut test at bottom and top of wall joints and wall-to-wall joints and building expansion joints every 15 meters.
 - .2 Perform exploratory review as directed by HWDSB and Third-Party Inspection Firm. Cut out fire stop and remove to ensure fire stop system installation meets or exceeds the system design listing as identified.
- .3 Upon completion of construction and before requesting substantial performance review, fire stop contractor and manufacturer's representative shall inspect all fire stopping work and prepare a deficiency list. Submit deficiency list to HWDSB for review. Repair any deficiencies and re-inspect work to ensure that all deficiencies have been completed.
- .4 Submit formal request for substantial performance review of work once all work is completed, quality control has been performed and all fire stop installations have been inspected and identified with the approved fire stop identification labels.
- .5 HWDSB and Third-Party Inspection Firm will conduct the substantial performance review in the presence of the fire stop Contractor and the manufacturer's representative.

3.10 CLEANING

- .1 Perform cleaning in accordance with Section 01 74 00 - Cleaning.
- .2 Remove equipment, excess materials and debris and clean adjacent surfaces immediately after application. Use methods and cleaning materials approved by manufacturer.
- .3 Protect fire stops during and after curing period from contact with contaminating substances
- .4 Remove temporary dams after initial set of fire stop and smoke seal materials.

3.11 SCHEDULE

- .1 Provide fire stop and L-Rated smoke-resistant fire stop systems at locations shown on Drawings and details.
- .2 Design and provide through-penetration fire stopping and smoke seals as follows:
 - .1 Systems with no penetrating items, select one or more of the following fill materials:
 - .1 latex sealant
 - .2 silicone sealant
 - .3 intumescent putty
 - .4 intumescent foam blocks or boards
 - .5 intumescent spray foam
 - .2 Systems for metallic pipes, conduit, or tubing, select one or more of the following fill materials:
 - .1 latex sealant
 - .2 silicone sealant
 - .3 intumescent putty
 - .4 intumescent foam blocks or boards
 - .5 intumescent spray foam

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- .3 Systems for non-metallic pipe, conduit, or tubing, select one or more of the following fill materials:
 - .1 latex sealant
 - .2 silicone sealant
 - .3 intumescent putty
 - .4 intumescent foam blocks or boards
 - .5 intumescent spray foam
 - .4 Re-enterable and cable managed systems for electrical, and data and communications cables:
 - .1 prefabricated fire stop sleeve cp653 (hilti)
 - .2 preformed intumescent blocks cfs-bl (hilti)
 - .3 preformed intumescent blocks (roxtec)
 - .4 prefabricated cable pathways (ez-path)
 - .5 Systems for electrical, and data and communications cables, select one or more of the following fill materials:
 - .1 latex sealant
 - .2 silicone sealant
 - .3 intumescent putty
 - .4 silicone foam
 - .5 prefabricated fire stop sleeve cp 653 (hilti)
 - .6 preformed intumescent blocks cfs-bl (hilti)
 - .7 preformed intumescent blocks (roxtec)
 - .8 prefabricated cable pathways (ez-path)
 - .9 intumescent foam blocks or boards
 - .10 intumescent spray foam
 - .6 Systems for cable trays, select one or more of the following fill materials:
 - .1 latex sealant
 - .2 intumescent putty
 - .3 silicone foam
 - .4 pillows/bags
 - .5 intumescent foam blocks or boards
 - .7 Systems for insulated pipes, select one or more of the following fill materials:
 - .1 latex sealant
 - .2 intumescent putty
 - .3 silicone foam
 - .4 intumescent wrap strips
 - .5 intumescent foam blocks or boards
 - .6 intumescent spray foam
 - .8 Systems for miscellaneous electrical penetrations, select one or more of the following fill materials:
 - .1 latex sealant
 - .2 intumescent putty
 - .3 intumescent foam blocks or boards

- .4 intumescent spray foam
- .9 Systems for miscellaneous mechanical penetrations, select one or more of the following fill materials:
 - .1 latex sealant
 - .2 intumescent foam blocks or boards
 - .3 intumescent spray foam
- .10 Systems for groupings of penetrations, select one or more of the following fill materials:
 - .1 latex sealant
 - .2 intumescent wrap strips
 - .3 fire stopping and smoke seal device
 - .4 intumescent composite sheet
 - .5 intumescent foam blocks or boards
 - .6 intumescent spray foam
- .3 Design and provide joint fire stopping and smoke seals as follows for:
 - .1 Floor-to-Floor, Fire-Resistive Joint System: Provide materials to meet the following criteria:
 - .1 assembly rating: as indicated
 - .2 nominal joint width: as indicated
 - .3 movement capabilities: compression and extension
 - .2 Floor-to-Wall, Fire-Resistive Joint System: Provide materials to meet the following criteria:
 - .1 assembly rating: as indicated
 - .2 nominal joint width: as indicated
 - .3 movement capabilities: to be confirmed, compression, extension, or horizontal shear
 - .3 Head-of-Wall, Fire-Resistive Joint System: Provide materials to meet the following criteria:
 - .1 assembly rating: as indicated
 - .2 nominal joint width: as indicated
 - .3 movement capabilities: compression and extension
 - .4 Wall-to-Wall, Fire-Resistive Joint System: Provide materials to meet the following criteria:
 - .1 assembly rating: as indicated
 - .2 nominal joint width: as indicated
 - .3 movement capabilities: compression and extension
- .4 Design and provide perimeter fire containment fire stopping and smoke seals as follows for:
 - .1 Perimeter Fire Containment System: Provide materials to meet the following criteria:
 - .1 integrity rating: as indicated
 - .2 insulation rating: as indicated
 - .3 linear opening width: as indicated

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 04 05 00 – Common Work Results for Masonry.
- .2 07 84 00 – Fire Stopping.
- .3 09 21 16 – Gypsum Board Assemblies.

1.2 DEFINITIONS

- .1 Environmental Product Declaration (EPD): Submit an Industry-wide EPD for each metal product outlined in the specification. Provide EPD with at least a cradle to gate scope, identifying the following impact categories (minimum):
 - .1 Global Warming Potential (GWP): Submit GWP information in the form of kgCO₂ eq.
 - .2 Ozone Depletion Potential (ODP): Submit ODP information in the form of kgCFC-11 eq.
 - .3 Acidification Potential (AP): Submit AP information in the form of kgSO₂ eq.
 - .4 Eutrophication Potential (EP): Submit EP information in the form of kgN eq.
 - .5 Smog Formation Potential (SFP): Submit SFP information in the form of kgO₃ eq. Also referred to as Photochemical ozone creation potential (POCP).

1.3 REFERENCE STANDARDS

- .1 Canadian General Standards Board (CGSB) 1330:
 - .1 CAN/CGSB-19.24, Multi-component, Chemical Curing Sealing Compound
- .2 Department of Justice Canada (Jus):
 - .1 Canadian Environmental Protection Act (CEPA)
- .3 General Services Administration (GSA) - Federal Specifications (FS):
 - .1 FS-SS-S-200, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS):
 - .1 Safety Data Sheets (SDS)
- .5 Sealant, Waterproofing, and Restoration Institute (SWRI):
 - .1 Sealants: The Professionals' Guide
- .6 Transport Canada (TC):
 - .1 Transportation of Dangerous Goods Act (TDGA)
- .7 ULC Standards/ UL Canada (ULC):
 - .1 CAN/ULC 115, Standard Method of Fire Tests of Firestop Systems

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's product data for each type of primer, backer rod, and sealants and include product characteristics, performance criteria, available colours, compatibility warnings, compliance standards and limitations.
 - .2 Manufacturer's product to describe:
 - .3 Submit one electronic copy of WHMIS SDS.
- .3 Samples:
 - .1 Submit two samples of each type of joint sealant material and colour.

- .2 Submit two cured samples of exposed sealants of each colour to match adjacent material.
- .4 Certificates: When requested by HWDSB, submit manufacturer's product certificates indicating proposed sealant is appropriate for each application on this Project.
- .5 Manufacturer's Instructions:
 - .1 Submit instructions for each type of product.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: Submit maintenance data for incorporation into manual.

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacturer: Obtain each type of joint sealant from a single manufacturer.
 - .2 Minimum three years successful experience in Work of similar size and complexity.
- .2 Compatibility: Ensure sealants are compatible with adjacent materials and are approved by manufacture for use with adjacent materials.
- .3 Mock-Ups:
 - .1 Construct mock up in accordance with Section 01 43 00 - Quality Assurance.
 - .2 Before performing sealant work do sample applications of each type of sealant for review.
 - .3 Site locations for sample applications shall be designated by HWDSB.
 - .4 Construct joint sealant mock-ups in assemblies of other Sections with joint sealants, which are referenced in this Section.
- .4 Comply with requirements of WHMIS regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Safety Data Sheets (SDS) acceptable to Health Canada.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging, with manufacturer's label.
- .2 Storage and Handling Requirements:
 - .1 Store materials in a ventilated dry indoor location and in accordance with manufacturer's recommendations.
 - .2 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
 - .3 Do not dispose of unused sealant material into sewer system, streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
 - .4 Divert unused joint sealing material from landfill to official hazardous material collections site approved by HWDSB.

1.8 AMBIENT CONDITIONS

- .1 Proceed with installation of joint sealants only when:
 - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.
 - .2 Joint substrates are dry.
 - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing

use.

- .2 HWDSB will arrange for ventilation system to be operated on maximum outdoor air and exhaust during installation of sealants. Ventilate area of work as directed by HWDSB by use of approved portable supply and exhaust fans.

1.9 WARRANTY

- .1 Manufacturer's warranty: Provide manufacturer's standard warranty documentation.
- .2 Warrant that sealant work will not leak, crack, crumble, melt, shrink, run, lose adhesion or stain adjacent surfaces in accordance with General Conditions, except for five years.
- .3 Installer's Warranty: Provide an installation warranty, installer agrees to repair or replace joint sealants that do not comply with requirements of this Section for two years from Substantial Performance.

2 PRODUCTS

2.1 SUSTAINABILITY CHARACTERISTICS

- .1 When low toxicity sealants are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.
- .2 VOC emissions limits shall be as follows:
 - .1 Sealant Primers:
 - .1 for non-porous surfaces: 250 g/L
 - .2 for porous surfaces: 775 g/L
 - .3 for modified bituminous membranes: 500 g/L
 - .4 for marine deck: 760 g/L
 - .5 for other conditions: 420 g/L
 - .2 Sealants:
 - .1 architectural: 250 g/L
 - .2 marine deck: 760 g/L
 - .3 non-membrane roof: 300 g/L
 - .4 roadway: 250 g/L
 - .5 single-ply roof membrane: 450 g/L
 - .6 other conditions: 420 g/L

2.2 PERFORMANCE REQUIREMENTS

- .1 Each sealant system shall meet the following requirements for warranty period:
 - .1 Waterproof, flexible, and compatible with substrate under applicable service conditions.
 - .2 Provide a weather-tight seal that does not allow moisture penetration.
 - .3 Shall not de-bond, crack, or craze.
 - .4 Shall not leak.

2.3 SEALANT MATERIALS

- .1 In air handling units and supply air system, use sealants without strong odours, without toxic chemicals, and are mould-resistant. When low toxicity sealants are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

- .2 Provide primers in accordance with manufacturer recommendation.

2.04 SEALANT MATERIAL DESIGNATIONS

- .1 Type S-1: Acrylic Latex One Part, Shore A Hardness 20,
- .2 Type S-2: Silicone Sealant; mould and mildew resistant.
 - .1 To ASTM C920 CAN/CGSB-19.13; type S; grade NS; class 50; use NT, G, and A.
 - .2 To ASTM C920 CAN/CGSB-19.13; type S; grade NS; class 25; use NT, G, and A.
- .3 Type S-3: Silicone Sealant; general construction and air-seal sealant.
 - .1 To ASTM C920: type S; grade NS; class 25; use NT, M, G, A, O.
- .4 Type S-4: Silicone Sealant; structural glazing.
 - .1 To ASTM C920 CAN/CGSB-19.13: type S; grade NS; class 25; use NT, A, G, O.
- .5 Type S-5: Acoustical Sealant; interior, non-skimming, non-hardening, simple component synthetic rubber sealant, to ASTM C919.
- .6 Type S-6: Multi-component polyurethane sealant; chemical curing, exterior wall sealant.
 - .1 To ASTM C920 CAN/CGSB-19.24: type M; grade NS; class 50; use T, NT, M, A, O.
- .7 Type S-7: One-component polyurethane sealant; non-sag, for general construction.
 - .1 To ASTM C920 CAN/CGSB-19.24: type S; grade NS; class 25; use NT, M, A, O.
- .8 Type S-8: Horizontal joint sealant; two component, self-levelling.
 - .1 To ASTM C920 CAN/CGSB-19.13: type M; grade P; class 25; use T, M, O.
- .9 Type S-9: One part moisture curing, low modulus polyurethane sealant for sealing joints in level and slightly slope surfaces conforming to ASTM C920 CAN/CGSB-19.24, type S, grade P, class 50, use T, M, A, O, MC-1-25-B-N.
- .10 Type S-10: Control joint sealant: two-component, epoxy-urethane, self-levelling, load bearing saw cut or preformed control joints.
- .11 Type S-11 Control Joint Sealant: Two component, polyurea based, load bearing, self levelling sealant.
- .12 Type S-12 Control Joint Sealant: Two component, semi-rigid epoxy, load bearing, self levelling sealant.
- .13 Type S-13: One-component polyurethane sealant; medium-modulus, non-sag, low-VOC, UV stable, to CAN/CGSB-19.24.
- .14 Type S-14: Polysulfide two part:
 - .1 Self-levelling to CAN/CGSB-19.24, Type 1, Class B.
 - .2 Non-sag: to CAN/CGSB-19.24, Type 2, Class B.
- .15 Type S-15: Polysulfide one part:
 - .1 Self-levelling: to GRADE P, Class 35 25. Use MC-1-40-B-N MC-1-25-B-N.
 - .2 Non-sag: Grade NS, Class 35 25 use M, A.
- .16 Type S16: To ASTM C920, Two-component, Type M, Grade P, Class 25 FS-SS-S-200E, Type 2, aviation fuel-resistant; polyurethane elastomeric, chemical cured.

2.5 SEALANT SELECTION

- .1 Where no specific type of sealant is scheduled, provide one of the sealants indicated in this Section appropriate for its application and consistent with manufacturer's recommendations and the recommendations of SWRI, Sealants: The Professionals' Guide.
- .2 Make sealant selections consistent with manufacturer's recommendations.
- .3 Use acrylic sealant Type S-1 only on the interior and only in situations where little or no movement

can occur.

- .4 Use mould & mildew resistant silicone sealant Type S-2 for nonmoving joints in washrooms and kitchens. Do not use on floors.
- .5 Use silicone general construction sealant Type S-3 or Type S-6 and S-7 for all joints, interior and exterior, where no other specific sealant type specified.
- .6 Use structural glazing silicone Type S-4 for sealing glass, interior and exterior.
- .7 Use acoustical sealant Type S-5 and air seal sealant Type S-3 only where they will be fully concealed and only where no constant or consistent air pressure difference will exist across the joint.
- .8 Use multi component sealant type S-6, primed penetration element surfaces other than concrete, for mechanical and electrical service penetrations in concrete foundation walls.
- .9 Use multi component sealant Type S-8 for horizontal joint sealant of plaza, floors and decks, exterior areas only, subject to pedestrian and vehicular traffic.
- .10 Use polyurethane, semi-self levelling sealant Type S-9 for in expansion joints in sidewalks, plazas, floors and other pedestrian and vehicular horizontal surfaces with slopes up to 6%.
- .11 Use control joint sealant S-10 as filler for interior, horizontal saw cut or preformed control joints where joints are subject to load bearing conditions.
- .12 Use control joint sealant S-10 as filler for interior only, horizontal saw cut or preformed control joints where joints are subject to load bearing conditions.
- .13 Use control joint sealant S-11 as filler for interior, horizontal saw cut or preformed control joints, where joints are subject to low temperatures (freezer floors) and where joints require nosing support.
- .14 Use control joint sealant S-12 as filler for interior, horizontal saw cut or preformed control joints where joints are subject to thermal shock conditions, traffic loops, and where a high bond strength is required.
- .15 Use sealant S-13 for sealing exterior holes and penetrations around pipes and other services passing through concrete foundations and requiring greater movement capability.

2.6 ACCESSORIES

- .1 Preformed compressible and non-compressible back-up materials that are non-staining, compatible with joint substrate, sealants, primers, and other joint fillers, and are approved for applications indicated by sealant manufacturer based on site experience and laboratory testing:
 - .1 Rod Type Sealant Backings:
 - .1 ASTM C1330, Type C (closed cell material with a surface skin), Type O (open cell material) or Type B (bi cellular material with a surface skin).
 - .2 Provide any of the preceding types, as approved in writing by joint sealant manufacturer for joint application indicated.
 - .3 Size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - .4 Non adhering to sealant, to maintain two sided adhesion across joint.
 - .2 High Density Foam:
 - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m³ density, or neoprene foam backer, size as recommended by manufacturer.
 - .3 Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056, non absorbent to water and gas, capable of remaining resilient at temperatures down to 15 deg C. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth and otherwise contribute to optimum sealant performance.

- .4 Bond Breaker Tape:
 - .1 Polyethylene bond breaker tape or other tape recommended by sealant manufacturer which will not bond to sealant.
- .2 Preformed Sealants:
 - .1 Preformed Silicone Sealant System: Manufacturer's standard system consisting of pre-cured low modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral curing silicone sealant for bonding extrusions to substrates.
 - .2 Preformed Hollow Neoprene Gasket: Manufacturer's standard preformed polychloroprene elastomeric joint seal of the open cell compression type complying with ASTM D2628 and with requirements for size, profile and cross sectional design.
- .3 Bond Breaker: Pressure-sensitive plastic tape that will not bond to sealants.
- .4 Joint Cleaner: Provide a non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's recommendations
- .5 Primer: Provide in accordance with sealant manufacturer's recommendations.
- .6 Masking Tape: Non-absorbent type, non-staining, compatible with joint sealant and joint substrates.

2.7 COLOURS

- .1 Sealant Colours: Match colour of adjacent materials where visible, as selected by HWDSB and JASON FUNG ARCHITECT INC., from manufacturer's complete colour range.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed are acceptable for joint sealants installation in accordance with manufacturer's instructions.
 - .1 Visually inspect substrate.
 - .2 Verify joint surfaces are dry and frost free.
 - .3 Verify substrates are without contaminants capable of interfering with sealant adhesion. Remove contaminants where occurring.
 - .4 Examine joint sizes and conditions to establish acceptable depth to width ratio for installation of backup materials and application of sealants.
 - .5 Verify joint widths are within the limits recommended by joint sealant manufacturer for applications indicated.
 - .6 Inform HWDSB of unacceptable conditions immediately upon discovery.
 - .7 Proceed with installation only after unacceptable conditions have been remedied.

3.2 SURFACE PREPARATION

- .1 Clean bonding joint surfaces of harmful contaminants including dust, rust, oil grease, and other matter which may impair adhesion.
- .2 Do not apply sealants to joint substrates treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .3 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

- .1 Mask adjacent surfaces prior to priming and sealing where necessary to prevent staining.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately applying

sealant, except when manufacturer's instructions explicitly state priming is not required.

- .3 Prime all porous material (e.g. wood, masonry, concrete, ceramic or paver tile, etc).

3.4 BACKUP MATERIAL

- .1 Provide backer rod as specified, to limit depth of sealant and to act as bond breaker at back of joint.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.
- .3 Apply paper masking tape to back of joint to act as bond break where depth of joint does not permit the use of backer rod.
- .4 Ensure that no joints are formed which are bonded on adjacent sides where there is any possibility of movement.

3.5 MIXING

- .1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 APPLICATION

- .1 Sealant: Application: Apply sealants to recommendations of ASTM C1193, and of ASTM C1481 for EIFS systems, and in accordance with manufacturer's instructions, and as follows:
 - .1 Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature range.
 - .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
 - .3 For joints where movement is possible, apply backer rod to achieve a joint depth of one half the joint width but not less than 9 mm; for joints larger than 25 mm use a depth of 13 mm
 - .4 Apply sealant in a continuous beads.
 - .5 Apply sealant using gun with proper size nozzle.
 - .6 Fill voids and joints solid.
 - .7 Form sealant surface with a smooth full bead, without from ridges, wrinkles, sags, air pockets, embedded impurities.
 - .8 Tool exposed surfaces before skinning begins to give slightly concave shape.
 - .9 Ensure bead is solid, filling entire space between sides and bedding material, exerting sufficient pressure to obtain maximum bond, by allowing sealant to bulge out in advance of nozzle.
 - .10 Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature range.
 - .11 Seal at all locations where dissimilar material meet.
- .2 Sealant Curing:
 - .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until after curing has completed.

3.7 CLEANING

- .1 Progress Cleaning: Clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Clean adjacent surfaces immediately of excess primers and sealants.
 - .2 Remove excess and droppings, using recommended cleaners as work progresses.
 - .3 Remove masking tape after initial set of sealant.
- .2 Final Cleaning: Perform in accordance with Section 01 74 00 - Cleaning upon completion.
- .3 Waste Management: Perform in accordance with Section 01 74 19 - Waste Management and

Disposal.

- .1 Do not dispose of unused sealant materials into sewer system, streams, lakes, onto ground, or other location where it might pose a health or environmental hazard.
- .2 Divert unused sealants from landfill to a hazardous material collection site.
- .3 Place materials defined as hazardous or toxic in designated containers.
- .4 Dispose of hazardous materials in accordance with the CEPA, TDGA, regional and municipal regulations.

3.8 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by joint sealants installation.

3.9 SCHEDULE

- .1 Use acrylic sealant Type S-1 only on the interior and only where little or no movement can occur.
- .2 Use silicone general construction sealant Type S-3 or Type S-6 and S-7 for all joints, interior and exterior, where no other specific sealant type is specified.
- .3 Use acoustical sealant Type S-5 only where they will be fully concealed and only where no constant or consistent air pressure difference will exist across the joint.
- .4 Use multicomponent sealant type S-6, primed penetration element surfaces other than concrete, for mechanical and electrical service penetrations in concrete foundation walls.
- .5 Use control joint sealant S-10 as filler for interior, horizontal saw cut or preformed control joints where joints are subject to load bearing conditions.
- .6 Use control joint sealant S-11 as filler for interior, horizontal saw cut or preformed control joints, where joints are subject to low temperatures (freezer room floors) and where joints require nosing support.
- .7 Use control joint sealant S-12 as filler for interior, horizontal saw cut, or preformed control joints where joints are subject to thermal shock conditions, traffic loops, and where a high bond strength is required.
- .8 Seal control joints in gypsum board, except where prefabricated control joints are specified.
- .9 Seal junctures between interior partitions with exterior walls.
- .10 Seal joints in floors and walls and around service and mechanical and electrical fixture penetrations.
- .11 Expansion and control joints in exterior surfaces of poured-in-place concrete walls.
- .12 Expansion and control joints in exterior surfaces of precast architectural wall panels.
- .13 Cornice and wash (or horizontal surface joints).
- .14 Control and expansion joints on the interior of exterior cast-in place concrete walls.
- .15 Joints of underside of precast beams or planks.
- .16 Interior control and expansion joints in floor surfaces.
- .17 Perimeters of interior frames and exterior frames.
- .18 Joints at tops of non-load bearing masonry walls at the underside of poured concrete.
- .19 Exposed interior control joints in gypsum board.
- .20 Seal joint edges of washroom fixtures with silicone at walls and floors.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 07 92 00 – Joint Sealants
- .2 Section 08 71 00 – Door Hardware
- .3 Section 08 90 00 – Louvres and Vents

1.2 REFERENCE STANDARDS

- .1 American National Standards Institute/Steel Door Institute (ANSI/SDI):
 - .1 ANSI/SDI A250.7, Nomenclature for Standard Steel Doors and Steel Frames
 - .2 ANSI/SDI A250.11, Recommended Erection Instructions for Steel Frames
- .2 ASTM International (ASTM):
 - .1 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - .2 ASTM A780/A780M, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
 - .3 ASTM A879/A879M, Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface
 - .4 ASTM A924/A924M, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
 - .5 ASTM B29, Standard Specification for Refined Lead
 - .6 ASTM B749, Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products
 - .7 ASTM D4726, Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Exterior-Profile Extrusions Used for Assembled Windows and Doors
 - .8 ASTM E90, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
 - .9 ASTM E413, Classification for Rating Sound Insulation
 - .10 ASTM E1425, Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems
 - .11 ASTM F2247, Standard Test Method for Metal Doors Used in Blast Resistant Applications (Equivalent Static Load Method)
- .3 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-1.132, Zinc Chromate Primer, Low Moisture Sensitivity
 - .2 CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating
 - .3 CGSB 41-GP-19Ma, Rigid Vinyl Extrusions for Windows and Doors
 - .4 CAN/CGSB 82.5, Insulated Steel Doors
- .4 CSA Group (CSA):
 - .1 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel
 - .2 CSA W59, Welded Steel Construction
- .5 Canadian Steel Door Manufacturers Association (CSDMA):
 - .1 Recommended Dimensional Standards for Commercial Steel Doors and Frames
 - .2 Recommended Specifications for Commercial Steel Doors and Frames
 - .3 Recommended Selection and Usage Guide for Commercial Steel Door and Frame Products

- .4 Storage and Installation Guide
- .6 Fenestration & Glazing Industry Alliance (FGIA) (formerly American Architectural Manufacturers Association (AAMA)):
 - .1 AAMA 812, Voluntary Practice for Assessment of Frame Deflection When Using One Component Polyurethane Foams for Air-Sealing Rough Openings of Fenestration Installations
- .7 National Council on Radiation Protection and Measurements (NCRP):
 - .1 Report No. 049, Structural Shielding Design and Evaluation for Medical Use of X-Rays and Gamma Rays of Energies up to 10 MeV
- .8 National Fire Protection Association (NFPA):
 - .1 NFPA 80, Standard for Fire Doors and Other Opening Protectives
 - .2 NFPA 252, Standard Methods of Fire Tests of Door Assemblies
- .9 Steel Door Institute (SDI):
 - .1 SDI-108, Recommended Selection and Usage Guide for Standard Steel Doors
 - .2 SDI-111, Recommended Details for Standard Steel Doors, Frames, Accessories and Related Components
 - .3 SDI-122, Installation Troubleshooting Guide for Standard Steel Doors and Frames
- .10 Underwriters Laboratories (UL):
 - .1 UL 2985, Sustainability Standard for Thermal Insulation
- .11 ULC Standards (ULC):
 - .1 CAN/ULC-S104, Standard Method for Fire Tests of Door Assemblies
 - .2 CAN/ULC-S105, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104
 - .3 CAN/ULC S106, Standard Method for Fire Tests of Window and Glass Block Assemblies
 - .4 CAN/ULC-S701.1, Standard for Thermal Insulation, Polystyrene Boards
 - .5 CAN/ULC-S702, Standard for Mineral Fibre Thermal Insulation for Buildings
 - .6 CAN/ULC-S704, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate primers for doors and frames with site-applied paint as indicated in Section 09 91 23 - Interior Painting.
 - .2 Coordinate throat dimensions based on actual material used for wall and partition construction assemblies.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's product data for each type of door and frame. Indicate door designation, type and model, product characteristics, core description, fabrication details, dimensions, fire-protection rating, finishes, and limitations.
 - .2 Submit WHMIS Safety Data Sheet (SDS).
- .3 Shop Drawings:
 - .1 For each type of door, indicate material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, louvred, arrangement of hardware,

- fire-protection rating, and finishes.
- .2 For each type of frame, indicate material, core metal thickness, reinforcements, glazing stops, location of anchors and exposed fastenings, reinforcing, fire-protection rating, sound transmission classification rating, and finishes.
- .3 Include a schedule identifying each unit with door marks and numbers matching numbering on Drawings and door schedule.
- .4 Samples:
 - .1 Submit one 305 x 305mm door section for each door type, showing corner detail, glazing detail and butt reinforcements.
 - .2 Submit one 305 x 305-mm corner sample of each frame type, illustrating corner detail and welding quality.
 - .3 Show butt cut-out, glazing stops, 305mm long removable mullion connection or snap-on trim with clips.
 - .4 Samples will not be returned for inclusion into work.
- .5 Certificates:
 - .1 Where fire-protection rated door and frame exceeds size limitations of fire labelled assemblies, submit evidence indicating compliance with fire labelling for door and frame assembly.
 - .2 Radiation Protection Compliance: For radiation protection assemblies, submit evidence of compliance in accordance with the requirements of the Cancer Agency, the Ontario or Hamilton Occupational Health and Safety, Radiation Safety and Protection Branch, and the National Council on Radiation Protection and Measurement.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Warranty Documentation: Submit manufacturer's material and fabrication warranty.

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacturer: A member in good standing of the Canadian Steel Door Manufacturers Association.
 - .2 Installers: Experienced with installation of hollow metal doors and frames of similar complexity and scope to that required for the Project.
 - .3 Testing Agencies: Provide doors and frames under label service program of a testing agency acceptable to authorities having jurisdiction (AHJ).
- .2 Manufacturer: Obtain doors and frames from a single manufacturer.
- .3 Mock-Ups:
 - .1 Provide site mock-up for work of this Section indicating methods and materials, and proposed procedures to achieve design intent in accordance with Section 01 43 00 - Quality Assurance, and to comply with the following requirements, using materials indicated for completed work:
 - .1 Build mock-ups in location and size as directed by HWDSB and JASON FUNG ARCHITECT INC.
 - .2 Obtain HWDSB and JASON FUNG ARCHITECT INC.'s acceptance of mock-ups before starting construction.
 - .3 Use mock-up throughout construction period as a standard of acceptance for work of this Section.
 - .4 Accepted mock-up may not form part of Work.

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.
- .2 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging with manufacturer's labels.
 - .1 Provide temporary protection during delivery and site storage to prevent distortion, surface damage, and rust.
 - .2 After arrival on site, remove wet wrapping materials, inspect doors and frames for damage, and notify delivery company and supplier if damage is found.
 - .3 Minor damage may be repaired if refinished products match new work, and are acceptable to HWDSB.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, in a dry, well-ventilated indoor location, in a manner that prevents sagging, bowing, or twisting, and in accordance with manufacturer's recommendations, and CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.
 - .2 Store with space between stacked doors to allow air circulation.
 - .3 Store and protect steel doors and frames from nicks, scratches, and distortion.

1.8 SITE CONDITIONS

- .1 Site Measurements: Before fabrication, verify actual dimensions of openings by measuring on site, and indicate actual measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- .2 Established Dimensions: When site measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating doors and frames without site measurements. Coordinate site construction to ensure that actual site dimensions correspond to established dimensions.

1.9 WARRANTY

- .1 Manufacturer's Warranty: Submit manufacturer's standard warranty.

2 PRODUCTS

2.1 REGULATORY REQUIREMENTS

- .1 Steel Fire-Protection Rated Doors, Frames, and Screens: Labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN/ULC-S104 and CAN/ULC-S105 for ratings indicated.
- .2 Affix appropriate label to each opening indicating the labelling requirement, as follows:
 - .1 At standard size openings: Fire endurance rating; radiation protection
 - .2 At oversized openings: Unclassified as to fire rating; radiation protection

2.3 PERFORMANCE REQUIREMENTS

- .1 Steel Fire-Rated Doors and Frames: Labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN/ULC-S104 or NFPA 252 for ratings specified or indicated.
- .2 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN/ULC-S104, CAN/ULC-S106 or NFPA 252 and listed by a nationally recognized agency having factory inspection services.

2.4 MATERIALS

- .1 Interior Doors and Frames: Metallic coated steel sheets in accordance with ASTM A924/A924M, coated to ASTM A653/A653M, Commercial Steel (CS), Type B, ZF75 galvanized, stretcher levelled standard of flatness where used for face sheets.
- .2 Metallic Coated Steel Sheet Thickness: Minimum thickness in accordance with CSDMA, Recommended Specifications for Commercial Steel Door and Frame Products, Table 1 and Appendix 1 SDI-111.
- .3 Reinforcement Channels: To CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653/653M, ZF75.
- .4 Cast or Rolled Pure Sheet Lead: To ASTM B29, ASTM B749, weight: 14.6 kg/m², thickness 1.2mm.
- .5 Composites: Balance of core materials used in conjunction with lead, in accordance with manufacturer's proprietary design.

2.5 DOOR CORE MATERIALS

- .1 Honeycomb: Structural small cell, maximum 25mm kraft paper, minimum 36kg weight per ream, minimum 16.5kg/m³ density, and sanded to required thickness.
- .2 Fibreglass with Vertical Steel Stiffeners: To CAN/ULC-S702, loose batt, semi-rigid type, density 24 kg/m³, face sheets laminated, spot welded to each face sheet at 150 mm on centre.
- .3 Expanded Polystyrene: To CAN/ULC-S701.1 type 4, rigid extruded board, closed cell, fire retardant treated, density 16 to 32 kg/m³, RSI 0.8/25 mm, to UL 2985: Thermal Insulation Materials

2.6 ADHESIVES

- .1 Honeycomb Core and Steel Component Adhesive: Heat resistant, spray grade, polyurethane, resin reinforced polychloroprene.

2.7 ACCESSORIES

- .1 Touch-up Primer: To CAN/CGSB-1.181 or CAN/CGSB 1.132
- .2 Interior Top Caps: Steel
- .6 Door Bottom Seal: Undercut
- .7 Door Silencers/Bumpers: Single stud neoprene type, black colour. Self-adhesive type silencers are not acceptable.
- .8 Metallic Paste Filler: To manufacturer's standard.
- .9 Fire Labels: Metal riveted
- .10 Site-Applied Sealant at Frame Perimeter: as indicated in Section 07 92 00 – Joint Sealants.
- .11 Glazing Stops: Formed steel having 1.0 mm metal core thickness, screw attached. Accurately fit and butt at corners, glazing trim and stops, locate on secure side of door or facing interior of room.
- .12 Glazing: as indicated in Section 08 80 00 – Glazing.
- .13 Floor Anchors and Channel Spreaders: 1.60-mm nominal tee anchors, 1.19-mm wall stud anchors, and provide anchors appropriate to site conditions, as follows:
 - .1 Exterior Locations: Hot-dipped, zinc-coated
 - .2 Interior Locations: Wipe coat galvanized
 - .3 At Masonry: Corrugated, galvanized tee anchors or heavy gauge galvanized wire ties
 - .4 Drilled stud anchors for wire tie to studs
 - .5 At Existing Concrete Openings: Lag bolts, shields and bushing
- .14 Exposed Fasteners: Type 316 stainless steel to ASTM A167.

2.8 FABRICATION - FRAMES

- .1 Fabricate frames in accordance with CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames SDI-111.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Interior Frames: 1.6 mm welded type construction.
 - .1 Provide minimum 16mm stop height for factory-sealed double-glazed units.
- .4 Blank, reinforce, drill, and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface-mounted hardware.
- .6 Protect mortised cut-outs with steel guard boxes.
- .7 Reinforce frames for surface-mounted hardware.
- .8 Prepare door openings for door silencers:
 - .1 Three silencers on strike jamb for single door openings.
 - .2 Two silencers on heads for double door openings.
- .9 Provide fire labelled frame products for openings requiring fire protection ratings, as scheduled. Test products in conformance with CAN/ULC-S104, CAN/ULC-S106, NFPA 252 and list by a nationally recognized agency having factory inspection services and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

2.9 FRAME ANCHORAGE

- .1 Provide anchorage to floor and wall construction.
- .2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .3 Provide 2 anchors for rebate opening heights up to 1520 mm, and one additional anchor for each additional 760 mm of height or fraction thereof.
- .4 Locate anchors for frames in previously placed concrete, masonry or structural steel a maximum 150mm from top and bottom of each jamb and intermediate anchors at a maximum 660 mm on centre.

2.10 FRAMES - WELDED TYPE

- .1 Perform welding to CSA W59.
- .2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
- .3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails, and sills.
- .4 Grind welded joints and corners to flat plane, fill with metallic paste, and sand to uniform smooth finish.
- .5 Securely attach floor anchors to inside of each jamb profile.
- .6 Weld in two temporary jamb spreaders per frame to maintain proper alignment during shipment.

2.11 FABRICATION – FRAMES, KNOCKED-DOWN TYPE

- .1 Ship knocked-down type frames unassembled.
- .2 Provide frames with mechanical joints which interlock securely and provide functionally satisfactory performance when assembled and installed in accordance with CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames SDI-122.
- .3 Securely attach floor anchors to inside of each jamb profile.

2.12 FABRICATION - FRAMES, SLIP-ON TYPE

- .1 Ship slip-on type frames unassembled.
- .2 Provide frames in accordance with SDI-122 and manufacturer's instructions.
- .3 Provide slip-on frames with manufacturer's proprietary design of wall anchorage comprising single, adjustable tension type per jamb, and provision for a secure attachment of each jamb base to stud runners.

2.13 FABRICATION – DOORS, GENERAL

- .1 Doors: Swing type, flush, with provision for glass and louvred openings as indicated.
- .2 Interior doors: Honeycomb or laminated core construction.
- .3 Laminated Core Doors:
 - .1 Form both face sheets from a sheet of 16 gauge steel.
- .4 Factory-prepare 12.7-mm diameter holes and larger on-site at time of hardware installation, except for mounting and through-bolt holes.
- .5 Prepare doors for semi-mortised mounting of automatic door bottoms where scheduled in Section 08 71 00 – Door Hardware.
- .6 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .7 Provide fire labelled doors for openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN/ULC-S104 or NFPA 252, listed by a nationally recognized agency having factory inspection services, and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
- .13 Manufacturer's nameplates on doors are not permitted. Nameplates on hinge edge are acceptable.

2.14 FABRICATION – DOORS, HONEYCOMB AND INSULATED CORE

- .1 Form face sheets for interior doors from 1.2mm sheet steel with honeycomb core laminated under pressure to face sheets.

2.15 FABRICATION – DOORS, REINFORCED STEEL

- .1 Form face sheets for interior doors from 1.2mm sheet steel.
- .2 Reinforce doors with vertical stiffeners, securely welded to face sheets at a maximum 150 mm on centre.
- .3 Fill voids between stiffeners of exterior doors with fibreglass core.
- .4 Fill voids between stiffeners of interior doors with fiberglass or honeycomb core.

2.17 FABRICATION - GLAZING STOPS FOR DOORS AND FRAMES

- .1 Make provisions for louvres and glazing as indicated and provide necessary glazing stops.
 - .1 Provide stainless steel glazing stops for use with glazing tapes and compounds and secured with countersunk stainless steel screws dry glazing of snap-on type.
 - .2 Fabricate glazing stops as a formed channel that is a minimum 16mm high, accurately fitted, butted at corners and fastened to frame sections with countersunk oval head tamperproof sheet metal stainless steel screws.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: Verify conditions of substrates previously installed under other Sections or Contracts are acceptable for steel doors and frames installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of HWDSB
 - .2 Inform HWDSB of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from HWDSB.

3.2 INSTALLATION - GENERAL

- .1 Install doors and frames to CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames SDI-122.
- .2 Install fire-rated doors and frames in accordance with NFPA 80.
- .3 Isolate steel from direct contact with dissimilar metals, concrete, and masonry.

3.3 INSTALLATION - FRAMES

- .1 Set frames plumb, square, level, and at correct elevation.
- .2 Secure anchorages and connections to adjacent construction.
- .3 Brace frames rigidly in position until built-in:
 - .1 Remove temporary jamb spreaders.
 - .2 Provide temporary wood spreaders at third points of frame rebate height to maintain frame width until adjacent building-in work completed.
 - .3 Provide vertical support at centre of head for openings exceeding 1200 mm in width.
 - .4 Remove wood spreaders after frames have been built-in.
- .4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- .5 Install door silencers.
- .6 Install louvres supplied under Section 08 90 00 - Louvres and Vents in accordance with manufacturer's instructions.

3.4 INSTALLATION – DOOR HARDWARE

- .1 Install hardware in accordance with manufacturer's instructions and Section 08 71 00 - Door Hardware, using manufacturer's door hardware templates.

3.5 INSTALLATION - GLAZING

- .1 Install glazing in doors and frames in accordance with Section 08 80 00 – Glazing.

3.6 SITE QUALITY CONTROL

- .1 Tolerances: Provide even margins between doors and jambs, and doors and finished floor and thresholds as follows.
 - .1 Hinge Side: 1.0 mm
 - .2 Latch Side and Head: 1.5 mm
 - .3 Finished floor, non-combustible sill and thresholds: Maximum 19 mm

3.7 ADJUSTING

- .1 Use primer to touch-up finishes damaged during installation.
- .2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to uniform, smooth finish.
- .3 Repair damage to zinc coatings in accordance with ASTM A780/A780M.
- .4 Repair damage to adjacent materials caused by metal doors and frames installation.
- .5 Adjust operable parts for correct function.

3.8 CLEANING

- .1 Progress Cleaning: Perform in accordance with Section 01 74 00 - Cleaning, and as follows:
 - .1 Remove traces of primer, sealants, epoxy, and filler materials. Clean doors and frames.
 - .2 Clean glass and glazing materials with approved non-abrasive cleaner.
- .2 Final Cleaning: Perform in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: Perform in accordance with Section 01 74 19 - Waste Management and Disposal.

3.9 PROTECTION

- .1 Protect installed products and components from damage during construction. Install temporary protective covering to exposed components.
- .2 Protect thresholds, hardware, frames, doors, and glass from damage. Lock operative door bottom in up position.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 08 11 13 – Hollow Metal Doors and Frames

1.2 REFERENCE STANDARDS

- .1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA):
 - .1 ANSI/BHMA A156.1, Butts and Hinges
 - .2 ANSI/BHMA A156.2, Bored and Preamsembled Locks and Latches
 - .3 ANSI/BHMA A156.3 Exit Devices
 - .4 ANSI/BHMA A156.4 Door Controls - Closers
 - .5 ANSI/BHMA A156.5, Cylinders and Input Devices for Locks
 - .6 ANSI/BHMA A156.6, Architectural Door Trim
 - .7 ANSI/BHMA A156.8, Door Controls - Overhead Stops and Holders
 - .8 ANSI/BHMA A156.10, Power Operated Pedestrian Doors
 - .9 ANSI/BHMA A156.12, Interconnected Locks
 - .10 ANSI/BHMA A156.13, Mortise Locks and Latches
 - .11 ANSI/BHMA A156.14, Sliding and Folding Door Hardware
 - .12 ANSI/BHMA A156.15, Release Devices - Closer Holder, Electromagnetic and Electromechanical
 - .13 ANSI/BHMA A156.16, Auxiliary Hardware
 - .14 ANSI/BHMA A156.17, Self Closing Hinges and Pivots
 - .15 ANSI/BHMA A156.18, Materials and Finishes
 - .16 ANSI/BHMA A156.19, Power Assist and Low Energy Power Operated Doors
 - .17 ANSI/BHMA A156.20, Strap and Tee Hinges and Hasps
 - .18 ANSI/BHMA A156.21, Thresholds
 - .19 ANSI/BHMA A156.22, Gasketing
 - .20 ANSI/BHMA A156.26, Continuous Hinges
 - .21 ANSI/BHMA A156.28, Recommended Practices for Mechanical Keying Systems
 - .22 ANSI/BHMA A156.29, Exit Locks, Exit Alarms, Alarms for Exit Devices
 - .23 ANSI/BHMA A156.30, High Security Cylinders
 - .24 ANSI/BHMA A156.34, Bored Locks and Mortise Locks with Ligature Resistant Trim
 - .25 ANSI/BHMA A156.36, Auxiliary Locks
- .2 Canadian Steel Door Manufacturers' Association (CSDMA):
 - .1 Recommended Dimensional Standards for Commercial Steel Doors and Frames,
- .3 CSA Group (CSA):
 - .1 CSA B651, Accessible Design for the Built Environment
- .4 Door and Hardware Institute (DHI):
 - .1 Sequence and Format for the Hardware Schedule,
- .5 National Fire Protection Association (NFPA):
 - .1 NFPA 80, Standard for Fire Doors and Other Opening Protectives

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Obtain and distribute templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Coordinate with shop drawings or other Sections. Confirm that adequate provisions are made for locating and installing door hardware in accordance with indicated requirements, and as follows:
 - .1 Coordinate for type of wire required for electrified hardware, schedule for installation, and connection to electrified door hardware.
 - .2 Coordinate layout and installation of recessed pivots and closers, and cast-in anchoring inserts into floor construction with Section 03 30 00 – Cast-in-Place Concrete.
 - .3 Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices, access control system, security system, and, building management system..
 - .4 Coordinate with electrical Subcontractor for provision of service to each electrical door operator.
 - .5 Coordinate with electrical Subcontractor for electrical conduit and wiring from specified electrical door controls to door operators.
 - .6 Coordinate door hardware and electrified operators with Section 08 11 13 - Hollow Metal Doors and Frames.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's product data for each type of door hardware. Include product characteristics, performance criteria, profiles, dimensions, finishes, and limitations.
- .3 Shop Drawings: Submit shop drawings indicating details of electrified door hardware including the following:
 - .1 Detailed interface between electrified door hardware and fire alarm, access control, security, building management system.
 - .2 Theory of operation for electrified door hardware groups.
 - .3 Wiring diagrams for power, signal, and control systems. Identify manufacturer-installed wiring and site-installed wiring.
 - .1 System schematic
 - .2 Point-to-point wiring diagram
 - .3 Riser diagram
 - .4 Elevation of each electrified door.
- .4 Samples:
 - .1 Submit samples of the following hardware items for verification:
 - .1 Cylinders, keys, door gasket, door sweeps, locks and latches, operating trim.
 - .2 Identify each sample with a label indicating applicable specification paragraph number, brand name, model number, finish, and hardware schedule group/number.
 - .3 After approval, samples will not be returned for inclusion into Work.
- .5 Source Quality Control Submittals: When requested, submit proof of door hardware schedule consultant's participation in Door and Hardware Institute® (DHI) Continuing Education Program.
- .6 Contract Door Hardware Schedule: Submit schedule prepared by or under the supervision of a qualified hardware consultant detailing fabrication and assembly of door hardware.
 - .1 Comply with DHI Sequence and Format for the Hardware Schedule.

- .2 Organize the door hardware schedule into door hardware groups indicating a complete description of every item required for each door (or opening).
- .3 Indicate hardware make, model, material, function, handing, size, fastening, and finish using codes in BHMA A156.18, and other pertinent information.
- .4 Include keying schedule describing how each locking device is keyed in accordance with ANSI/BHMA A156.28. Index each key type to a specific door number.
- .5 Indicate location of each door hardware set, cross-referencing door numbers indicated in the Contract Documents.
- .6 Include an explanation of abbreviations, symbols, and alphanumeric codes in contract hardware schedule, where applicable.
- .7 Include description of each electrified door hardware function, sequence of operation, and coordinating interface with other systems (e.g., fire alarm).
- .8 Include DHI certification stamp on contract door hardware schedule.
- .7 Test Reports: When requested, submit certified test reports showing a product's compliance to a specified referenced standard.
- .8 Manufacturer's Instructions: Submit manufacturer's installation instructions.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: Submit operation and maintenance data for door hardware and incorporate into manual.
- .3 Warranty Documentation: Submit manufacturer's material and fabrication warranty.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- .1 Extra Stock Materials: Supply maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
 - .1 Tools: Supply two sets of wrenches for door closers, locksets and fire exit hardware.

1.7 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Door Hardware Consultant: DHI-certified, including any of the following: Door + Hardware Consultant (DHC), Door + Hardware Specification Consultant (DHSC), or Access Control System Consultant (ACSC), or an Architectural Hardware Consultant.
 - .2 Installer: Completed door hardware projects similar in scope to this Project with a record of successful in-service performance in the past five years.
- .2 Regulatory Requirements:
 - .1 Hardware for doors in fire separations and exit doors: To ANSI/BHMA A156.29, certified by a Canadian Certification Organization accredited by the Standards Council of Canada.
 - .2 Fire-Rated Door Assemblies: Where fire-rated doors are indicated, provide door hardware complying with NFPA 80 that is listed and labelled by a qualified testing agency for fire-protection ratings indicated.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging and with manufacturer's labels.
- .3 Package hardware items, including fasteners, separately or in groups of related hardware. Protect prefinished surfaces with wrapping, strippable coating, or other protective packaging. Label each

package with their contents and location in building.

- .4 Storage and Handling Requirements:
 - .1 Store materials off ground in a dry, well-ventilated indoor location, and in accordance with manufacturer's recommendations.
 - .2 Store and protect door hardware from scratches and other damages.

2 PRODUCTS

2.1 DOOR HARDWARE

- .1 Use products from only one manufacturer for similar items.
- .2 Locks and Latches:
 - .1 Bored and preassembled locks and latches: To ANSI/BHMA A156.2, series 2000 preassembled lock, grade 1 series 4000 bored lock, grade 1 2 3, designed for function and keyed as stated in hardware schedule.
 - .2 Interconnected locks and latches: To ANSI/BHMA A156.12, series 5000 interconnected lock, grade 1 2 3, designed for function and keyed as stated in hardware schedule.
 - .3 Mortise Locks and Latches: To ANSI/BHMA A156.13 ANSI/BHMA A156.34, series 1000 mortise lock, grade 1 2 3 4, designed for function and keyed as stated in Hardware Schedule.
 - .4 Lever Handles: Plain designed with antimicrobial coating.
 - .5 Cylinder Collar (rose, escutcheon): Round.
 - .6 Normal strikes: Box type, lip projection not beyond jamb.
 - .7 Cylinders: To ANSI/BHMA A156.5 ANSI/BHMA A156.30, key into keying system as directed.
 - .8 Finishes: To ANSI/BHMA A156.18
- .3 Butts and hinges:
 - .1 Butts and Hinges: To ANSI/BHMA A156.1, designated by letter A and numeral identifiers, followed by size and finish, listed in hardware schedule.
 - .2 Self-closing hinges and pivots: To ANSI/BHMA A156.17, designated by letter K and numeral identifiers listed in hardware schedule, with suffix letter F indicating listed for use on fire doors.
 - .3 Strap and tee hinges and hasps: To ANSI/BHMA A156.20, designated by letter A and numeral identifiers listed in hardware schedule, size listed in hardware schedule
 - .4 Continuous Hinges: To ANSI/BHMA A156.26.
- .4 Exit Devices: To ANSI/BHMA A156.3, Provide ULC-labelled devices at fire-protection rated closures.
 - .1 Auxiliary items: door coordinator, type 21, for pairs of doors with overlapping astragals.
- .5 Door Closers and Accessories:
 - .1 Door controls (closers): To ANSI/BHMA A156.4, designated by letter C and numeral identifiers listed in hardware schedule.
 - .2 Door controls - overhead holders: To ANSI/BHMA A156.8, designated by letter C and numeral identifiers listed in hardware schedule.
 - .3 Closer/holder release devices: To ANSI/BHMA A156.15, designated by letter C and numeral identifiers listed in hardware schedule.
 - .4 Door coordinator: Surface for pairs of doors with overlapping astragal.
- .6 Door Operators:
 - .1 Power-operated pedestrian doors: To ANSI/BHMA A156.10

- .2 Power assist and low energy power-operated doors: To ANSI/BHMA A156.19
- .7 Auxiliary locks and associated products: To ANSI/BHMA A156.36 and ANSI/BHMA A156.31, designated by letter E and numeral identifiers listed in hardware schedule
 - .1 Latch bolt and Dead bolt, Key into keying system as directed.
 - .2 Cylinders: for installation in deadlocks provided with special doors as listed in hardware schedule. Key into keying system as directed.
- .8 Door bottom seal: Heavy duty, door seal of extruded aluminum frame and solid closed cell neoprene weather seal, surface mounted with drip cap recessed in door face, closed ends, adjustable, clear anodized finish.
- .9 Thresholds: To ANSI/BHMA A156.21 extruded aluminum, bronze, stainless steel mill finish, plain serrated surface, with thermal break of rigid PVC, with lip and vinyl door seal insert.
- .13 Weatherstripping: To ANSI/BHMA A156.22, and as follows:
 - .1 Head and jamb seal:
 - .1 Extruded aluminum frame and solid closed-cell neoprene insert, clear anodized finish.
 - .2 Adhesive backed neoprene material.
 - .2 Door bottom seal:
 - .1 Extruded aluminum frame and closed-cell neoprene sweep, clear anodized finish.
- .14 Astragal: Adjustable, extruded aluminum frame with vinyl insert, finish to match door.
- .15 Barrier-Free Pneumatic Door Operator:
 - .1 Heavy duty pneumatically-assisted door closer, capable of multi-door operation, complete with actuators, control boxes, pneumatic tubing and compressed air source.
 - .2 Self-contained control box/compressor combination for independent operation of two door leaves.
 - .3 Control boxes: Complete with electric strike relay.
 - .4 Mount operators on either push or pull sides of doors as required to place them inside rooms.
 - .5 Actuation of operators by card readers.
 - .6 Electrical box and actuator: Hardwired low voltage actuator with stainless steel 114-mm round plate, engraved blue and filled with International Symbol of Access (ISA). 51-mm-wide x 102-mm-high x 50-mm-deep single gang electrical box, flush-mounted in wall at indicated locations.
 - .7 Supply switched line voltage to control box. Locate switch adjacent to box.
 - .8 Supply low voltage wiring to each actuator and a 6mm diameter air tubing to each operator.
 - .9 Mount control box in location as directed by HWDSB.

2.2 MISCELLANEOUS HARDWARE

- .1 Indexed Key Control System: To ANSI/BHMA A156.5, designated by letter E and numeral identifiers, wall mounted, colour enamel paint finish.

2.3 FASTENINGS

- .1 Use only fasteners provided by the manufacturer. Failure to comply may void warranties and applicable licensed labels.
- .2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .3 Match exposed fastening devices to finish of hardware.
- .4 Where pull is positioned on one side of the door and push plate on the other side, supply fastening

devices, and install to secure pull through the door from the reverse side. Install push plate to cover fasteners.

- .5 Use fasteners compatible with the material they are used in.

2.4 KEYING

- .1 Doors, padlocks and cabinet locks to be keyed alike in groups, master keyed as noted in hardware schedule. Prepare detailed keying schedule in conjunction with HWDSB.
- .2 Provide keys in duplicates for every lock of the Work.
- .3 Provide 3 master keys for each master key.
- .4 Stamp keying code numbers on keys and cylinders.

3 EXECUTION

3.1 INSTALLATION

- .1 Manufacturer's Instructions: Comply with manufacturer's recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Provide metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Provide manufacturers' instructions for proper installation of each hardware component.
- .4 Install hardware to standard hardware location dimensions in accordance with CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames and CSA B651.
- .5 Where door stop comes into contact with door pull, mount stop to strike bottom of pull.
- .6 Install key control cabinet.
- .7 Use only manufacturer's supplied fasteners.
 - .1 Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .8 Remove construction cores, locks when directed by HWDSB.
 - .1 Install permanent cores and confirm locks operate correctly.

3.2 ADJUSTING

- .1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.
- .2 Lubricate hardware, operating equipment and other moving parts.
- .3 Adjust door hardware to ensure tight fit at contact points with frames.

3.3 CLEANING

- .1 Progress Cleaning: Perform in accordance with Section 01 74 00 - Cleaning and as follows:
 - .1 Remove protective coatings and wrappings from hardware items.
 - .2 Final Cleaning: Perform in accordance with Section 01 74 00 - Cleaning.

3.4 DEMONSTRATION

- .1 Keying System Setup and Cabinet:
 - .1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index, key change index, label shields, control book and key receipt cards.
 - .2 Place file keys and duplicate keys in key cabinet on their respective hooks.

- .3 Lock key cabinet and provide key to HWDSB.
- .2 Maintenance Staff Briefing: Brief maintenance staff regarding the following:
 - .1 Proper care, cleaning, disinfecting, and general maintenance of hardware.
 - .2 Description, use, handling, and storage of keys.
 - .3 Use, application and storage of wrenches for door closers, locksets, and fire exit hardware.
- .3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.

3.6 DOOR HARDWARE SCHEDULE

- .1 Refer to Drawings.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

1.2 REFERENCE STANDARDS

- .1 The Aluminum Association Inc. (AA):
 - .1 AA DAF-45, Designation System for Aluminum Finishes
- .2 Air Movement and Control Association International (AMCA):
 - .1 AMCA 500-D, Laboratory Methods of Testing Dampers for Rating
 - .2 AMCA 500-L, Laboratory Methods of Testing Louvers for Rating
 - .3 AMCA 501, Application Manual for Air Louvers
 - .4 AMCA 511, Certified Ratings Program for Air Control Devices
- .3 American National Standards Institute (ANSI):
 - .1 ANSI H35.1/H35.1M, Alloy and Temper Designation Systems for Aluminum
- .4 ASTM International (ASTM):
 - .1 ASTM A240/A240M, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
 - .2 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - .3 ASTM A1008/A1008M, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened and Bake Hardenable
 - .4 ASTM B32, Standard Specification for Solder Metal
 - .5 ASTM B209/B209M, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
 - .6 ASTM B221M, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
 - .7 ASTM B370, Standard Specification for Copper Sheet and Strip for Building Construction
 - .8 ASTM D523, Standard Test Method for Specular Gloss
 - .9 ASTM D822/D822M, Standard Practice for Filtered Open-Flame Carbon-Arc Exposure of Paint and Related Coatings
 - .10 ASTM E2886/E2886M, Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingement
- .5 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-1.213, Etch Primer (Pretreatment Coating of Tie Coat) for Steel and Aluminum
 - .2 CAN/CGSB-93.1, Sheet Aluminum Alloy, Prefinished, Residential
- .6 Public Services and Procurement Canada (PSPC)/ Public Works and Government Services Canada (PWGSC):
 - .1 MD 15000, Mechanical Environmental Standard for Federal Office Buildings

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finishes, and limitations.
 - .2 Submit WHMIS SDS - Safety Data Sheets.

- .3 Shop Drawings: Indicate fabrication and erection details, including anchorage, accessories, and finishes.
- .4 Samples:
 - .1 Submit duplicate samples of each type of louvre and vent showing colour and finish.
 - .2 Show frame detail, screening and finish.
 - .3 Where colour is not indicated, submit manufacturer's standard colours on actual metal substrate for HWDSB's selection.
- .5 Manufacturer Instructions: Submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.
- .6 Closeout Submittals: Submit operation and maintenance data for manually operated or motorized louvres and incorporate into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Protect louvres from nicks, scratches, and blemishes.

2 PRODUCTS

2.1 MATERIALS

- .1 Weather resistant louvres, with bird screens made to withstand a wind load of not less than 1.44 kilopascals.
- .2 Wall louvers: complete with AMCA certified ratings program seal for air performance and water penetration in accordance with AMCA 500-D, AMCA 500-L and AMCA 511.
- .3 Ratings to indicate water penetration of 0.06 kilograms or less per square metre of free area at free velocity of 244 meters per minute.
- .4 Galvanized steel sheet: commercial quality to ASTM A653/A653M with Z275 zinc coating.
- .5 Steel sheet: commercial quality to ASTM A1008/A1008M with Class I matte finish.
- .6 Aluminum sheet: to ASTM B209/B209M, 3003-H14 alloy for painted applications and 5005-H32 alloy for anodized applications
- .7 Aluminum extrusions: to ASTM B221M alloy 6063-T5 or T52.
- .13 Nails and fasteners: same material as fabricated items.
- .14 Gaskets: vinyl.
- .15 Primer: to CAN/CGSB-1.213 for steel and aluminum surfaces.
- .18 Screens:
 - .1 Insect screens: fibreglass 18 x 14 mesh, minimum 60% free area, secured to aluminum frame.
 - .2 Birdscreens: intercrimped aluminum wire cloth secured to minimum 1.4 mm thick extruded aluminum frame mitered at corners and secured with corner locks, 16 x 16 mm size mesh, minimum 1.27 mm diameter wire with minimum 60% free area.
- .22 Door louvres:
 - .1 Construct door louvres from aluminum extrusions
 - .1 Minimum free area of 35%.
 - .2 Provide fasteners to suit louvre material.
 - .2 Use standard operating blades.

- .3 Provide separate adjustable trim member for clamping louvre in opening.
- .4 Miter frame and trim members at corners and secure rigidly with corner brackets.
- .5 Secure interior frame with countersunk tamperproof screws.
- .23 Louvred penthouses:
 - .1 Construct penthouse louvres from extruded aluminum stormproof blades of minimum 3 mm thickness.
 - .2 Continuously Heliarc weld at corners sills, blades and head members: support by structural aluminum angles on interior as indicated.
 - .3 Provide one piece weatherproof roof of 2 mm thick aluminum sheet reinforced with 50 x 50 x 6 mm aluminum angles at 1200 mm on centre.
 - .1 Insulate underside of roof with minimum 6 mm thick sound deadening and anti-condensation coating.

2.2 FINISHES

- .1 Finish exposed surfaces of aluminum components in accordance with AA DAF-45 and ANSI H35.1/H35.1M for Aluminum Finishes.
 - .1 As fabricated or mill finish: To AA DAF-45
 - .2 Clear anodic finish: To AA DAF-45
 - .3 Integral colour anodic finish: To AA DAF-45, colour to match HWDSB sample.
 - .4 Impregnated colour anodic finish: designation AA DAF-, colour to match HWDSB sample.
 - .5 Electrolytically deposited colour anodic finish: designation AA DAF-45, colour to match HWDSB sample.
- .2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.

3 EXECUTION

3.1 INSTALLATION

- .1 Install louvres and vents where indicated.
- .2 Set adjustable louvre blades for uniform alignment in open and closed positions.
- .3 Adjust louvres so moving parts operate smoothly.
- .4 Attach bird and insect screen to inside face of louvre or vent.
- .5 Repair damage to louvres and vents to match original finish.
- .6 Install wall louvers using stops, mouldings, flanges, strap anchors, jamb fasteners as appropriate for wall construction and in accordance with manufacturer's recommendations.

3.2 CLEANING

- .1 Proceed in accordance with Section 01 74 00 - Cleaning.

3.3 PROTECTION

- .1 Paint copper or copper-bearing alloys in contact with dissimilar metal with heavy-bodied bituminous paint or separate with inert membrane.
- .2 Where aluminum contacts metal other than zinc, paint dissimilar metal with primer and two coats of aluminum paint.
- .3 Paint metal in contact with mortar, concrete, or other masonry materials with alkali-resistant

coatings such as heavy-bodied bituminous paint.

- .4 Paint wood or other absorptive materials that may become repeatedly wet and in contact with metal with two coats of aluminum paint or coat of heavy-bodied bituminous paint.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 07 92 00 - Joint Sealants.

1.2 REFERENCE STANDARDS

- .1 Association of the Wall and Ceilings Industries International (AWCI)
 - .1 AWCI Levels of Gypsum Board Finish-GA-214.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .2 CAN/CGSB-71.25, Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.
- .3 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit gypsum board assembly drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.
 - .2 Indicate components such as fastener type, dimensions, spacing and locations at gypsum board edges, ends and in field of board as well as installation methods. Components and work to confirm to ASTM C840 standard specification for application and finishing of gypsum board.
 - .3 Indicate type of joint compound, and number of joint compound layers.
 - .4 Indicate number and location of electrical boxes for wall and ceiling.
- .4 Samples:
 - .1 Submit for review and acceptance of each component specified or necessary for complete installation. Include technical descriptive data.
 - .2 Submit samples of gypsum board and 300 mm long samples of corner and casing beads.
 - .3 Samples will be returned for inclusion into work.
- .5 Certifications:
 - .1 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .6 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
- .7 Low-Emitting Materials:
 - .1 Submit listing of adhesives and sealants and paints and coatings used in building, showing compliance with VOC and chemical component limits.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address and applicable standard designation.
- .3 Exercise care in unloading gypsum board materials shipment to prevent damage.
- .4 Storage and Handling Requirements in accordance with ASTM C 840-16:
 - .1 Store gypsum board assemblies materials level flat off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect gypsum board assemblies from nicks, scratches, and blemishes.
 - .3 Protect gypsum board from direct exposure to rain, snow, sunlight, or other excessive weather conditions.
 - .4 Protect ready mix joint compounds from freezing, exposure to extreme heat and direct sunlight.
 - .5 Protect from weather, elements and damage from construction operations.
 - .6 Handle gypsum boards to prevent damage to edges, ends or surfaces.
 - .7 Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
 - .8 Replace defective or damaged materials with new.
- .5 Develop Construction Waste Management Plan related to Work of this Section.

1.5 AMBIENT CONDITIONS

- .1 Maintain temperature 10 °C minimum, 21 °C maximum for 48 hours prior to and during application of gypsum boards and joint treatment, and for 48 hours minimum after completion of joint treatment.
- .2 Apply board and joint treatment to dry, clean, frost free surfaces.
- .3 Ventilation: ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

2 PRODUCTS

2.1 MATERIALS

- .1 Standard board: to ASTM C1396/C1396M, regular 12.7 mm thick and Type X, 15.9mm thick, 1200 mm wide x maximum practical length, ends square cut, edges squared.
- .2 Gypsum sheathing board: to ASTM C1396/C1396M, regular, 12.7 mm thick and Type X, 15.9 mm thick, 1200 mm wide x maximum practical length.
- .3 Backing board and coreboard: to ASTM C1396/C1396M, regular, 12.7 mm thick squared edges.
- .4 Water-resistant board: to ASTM C1396/C1396M, regular, 12.7 mm thick and Type X, 15.9 mm thick, 1200 mm wide x maximum practical length.
- .5 Nails: to ASTM C514
- .6 Steel drill screws: to ASTM C1002
- .7 Stud adhesive: to CAN/CGSB-71.25, ASTM C557.
- .8 Laminating compound: as recommended by manufacturer, asbestos-free.
- .9 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, PVC, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .10 Shadow mould: 35 mm high, snap-on trim, of 0.6 mm base steel thickness galvanized sheet pre-finished in satin enamel, white colour.
- .11 Vinyl mouldings: mouldings for joint treatment of vinyl-faced gypsum board, as supplied by gypsum board manufacturer.

- .12 Sealants: in accordance with Section 07 92 00 - Joint Sealants.
 - .1 VOC limit 250 g/L maximum.
 - .2 Acoustic sealant: in accordance with Section 07 92 00 - Joint Sealants.
- .13 Polyethylene: to CAN/CGSB-51.34, Type 2
- .14 Joint compound: to ASTM C475, asbestos-free

2.2 FINISHES

- .1 Texture finish: asbestos-free standard white texture coating and primer-sealer, recommended by gypsum board manufacturer.
 - .1 Primer: VOC limit 200 g/L maximum to GS-11.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for gypsum board assemblies installation in accordance with manufacturer's written instructions.
 - .1 Inform HWDSB and JASON FUNG ARCHITECT INC. of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from JASON FUNG ARCHITECT INC..

3.2 ERECTION

- .1 Do application and finishing of gypsum board to ASTM C840 except where specified otherwise
- .2 Do application of gypsum sheathing to ASTM C1280
- .3 Erect hangers and runner channels for suspended gypsum board ceilings to ASTM C840 except where specified otherwise
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .5 Install work level to tolerance of 1:1200.
- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.
- .7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes to ASTM C840, except where specified otherwise
- .11 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .13 Erect drywall resilient furring transversely between layers of gypsum board, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.
- .14 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

3.3 APPLICATION

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work have been approved.
- .2 Apply single layer gypsum board to metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.
 - .1 Single-Layer Application:
 - .1 Apply gypsum board on ceilings prior to application of walls to ASTM C840
 - .2 Apply gypsum board on walls vertically or horizontally, providing sheet lengths that will minimize number of board edges or end joints.
- .3 Apply single layer gypsum board to concrete surfaces, where indicated, using laminating adhesive.
 - .1 Comply with gypsum board manufacturer's recommendations.
 - .2 Brace or fasten gypsum board until fastening adhesive has set.
 - .3 Mechanically fasten gypsum board at top and bottom of each sheet.
- .4 Apply water-resistant gypsum board where wall tiles to be applied and adjacent to slop sinks and janitor closets. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish.
- .5 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, in partitions where perimeter sealed with acoustic sealant.
- .6 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.
- .7 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.
- .8 Install gypsum board with face side out.
- .9 Do not install damaged or damp boards.
- .10 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

3.4 INSTALLATION

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm on centre using contact adhesive for full length.
- .2 Install casing beads around perimeter of suspended ceilings.
- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .5 Install shadow mould at gypsum board/ceiling juncture. Minimize joints; use corner pieces and splicers.
- .6 Construct control joints of two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint.
- .7 Provide continuous polyethylene dust barrier behind and across control joints.
- .8 Install control joints straight and true.
- .9 Ensure that screws or nails are properly applied in process of attaching gypsum board to framing without damaging of gypsum board edges and ends.

- .10 Construct expansion joints, at building expansion and construction joints. Provide continuous dust barrier.
- .11 Install expansion joint straight and true.
- .12 Splice corners and intersections together and secure to each member with 3 screws.
- .13 Install access doors to electrical and mechanical fixtures specified in respective sections.
 - .1 Rigidly secure frames to furring or framing systems.
- .14 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.
- .15 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with AWCI Levels of Gypsum Board Finish:
 - .1 Levels of finish:
 - .1 Level 0: no tapping, finishing or accessories required.
 - .2 Level 1: embed tape for joints and interior angles in joint compound. Surfaces free of excess joint compound; tool marks and ridges are acceptable.
 - .3 Level 2: embed tape for joints and interior angles in joint compound and apply one separate coat of joint compound over joints, angles, fastener heads and accessories; surfaces free of excess joint compound; tool marks and ridges are acceptable.
 - .4 Level 3: embed tape for joints and interior angles in joint compound and apply two separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
 - .5 Level 4: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
 - .6 Level 5: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.
- .16 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .17 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board, invisible after surface finish is completed.
- .18 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .19 Completed installation smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .20 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.
- .21 Mix joint compound slightly thinner than for joint taping.
- .22 Apply thin coat to entire surface using trowel or drywall broad knife to fill surface texture differences, variations or tool marks.
- .23 Allow skim coat to dry completely.
- .24 Remove ridges by light sanding or wiping with damp cloth.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.

- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by gypsum board assemblies installation.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 09 21 16 – Gypsum Board Assemblies

1.2 REFERENCE STANDARDS

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .2 CAN/CGSB-7.1, Lightweight Steel Wall Framing Components.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for furring and lathing and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect furring and lathing application from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan Waste Reduction Workplan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse as specified in Construction Waste Management Plan and Waste Reduction Workplan in accordance with Section 01 74 19 - Waste Management and Disposal.

2 PRODUCTS

2.1 MATERIALS

- .1 Metal furring members: channels, inserts, and fasteners: ASTM C841
- .2 Metal lath: ASTM C847 of type and weight to suit plaster system and support spacing, galvanized treated with rust inhibitive coating.
- .3 Gypsum lath: ASTM C847 Type X. Thickness to suit plaster system and support spacing.
- .4 Polyethylene film: CAN/CGSB-51.34, Type 2, 0.15 mm thick.
- .5 Metal accessories (corner beads, base screeds, cornerite, casing beads): ASTM C1047
- .6 Expansion joint assemblies: back-to-back casing beads to ASTM C1047 plus polyethylene film looped to form continuous air seal.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for furring and lathing application in accordance with manufacturer's written instructions.
- .2 Inform HWDSB and JASON FUNG ARCHITECT INC. of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from JASON FUNG ARCHITECT INC..

3.2 PREPARATION

- .1 Do not lath over bucks, anchors, blocking, electrical and mechanical work until they are inspected and approved by JASON FUNG ARCHITECT INC..
- .2 Leave finished work rigid, secure, square, level, plumb, and erected to maintain finish plaster line dimensions and contours.
 - .1 Make allowance for thermal movement.
- .3 Provide clearance under beams and structural slabs to prevent transmission of structural loads to vertical furring.

3.3 INSTALLATION

- .1 Furring and lathing work: in accordance with ASTM C841 ASTM C1063 except as specified otherwise.
- .2 Ceiling Furring:
 - .1 Install runners level to tolerance of 3 mm over 3.5 m. Provide runners at interruptions of continuity and change in direction.
 - .2 Frame with furring channels, perimeter of openings to accommodate access panels, light fixtures, diffusers, grilles.
 - .3 Furr for vertical bulkheads within or at termination of ceilings.
 - .4 Furr above suspended ceilings for fire and sound stops and to form plenum areas indicated.
 - .5 In concrete, place anchors hangers by attachment to reinforcing steel by loops embedded at least 50 mm or by approved inserts.
- .3 Wall Furring:
 - .1 Install steel furring as indicated.
 - .2 Frame openings and around built-in equipment, cabinets, access panels, on four sides, with channels. Extend furring into reveals.
 - .1 Check clearances with equipment suppliers.
 - .3 Construct bulkheads and boxed-in duct shafts, for beams, columns, pipes and around exposed services where indicated.
 - .1 Install 19 mm channels at corners and at 300 mm on centre.
 - .4 Fir ends and edges closely, but not forced together, stagger end joints in succeeding courses.
 - .5 Build in hollow metal frames in plastered furred walls.
 - .6 On exterior walls, install asphalt felt protection strip between furring channel and wall.
- .4 Gypsum Lathing:
 - .1 Install gypsum lath only on straight flat surfaces of partitions and walls using drywall screws or lathing clips to metal framing.

- .2 Apply gypsum lath to ceilings first, then walls.
- .3 Butt lath together to moderate contact. Neatly cut around outlets, pipes and openings.
- .4 Erect gypsum lath proprietary ceiling system in accordance with manufacturer's instructions.
- .5 Metal Lathing:
 - .1 Install ribbed lath over chases and openings.
 - .1 Extend 450 mm each side of opening.
 - .2 Secure lath to furring channels with 18 gauge tie wire at intervals not exceeding 150 mm.
- .6 Expansion/Control Joints:
 - .1 Back to back plaster stops 6 mm apart, over 0.150 mm sheet polyethylene looped continuous air seal, continuously supported along both sides of joint.
 - .2 Install 150 x 450 mm metal lath strips diagonally at each corner of openings exceeding 0.1 m², in masonry, gypsum lath and rigid insulation substrates.
 - .3 Apply cornerite to internal angles to be plastered except at suspended ceilings.
 - .1 Fasten to retain position during plastering.
 - .2 Do not secure to framing members.
 - .4 Lath across junctures of dissimilar materials to be plastered with strip of metal lath at least 200 mm wide.
 - .5 Erect accessories straight, plumb or level, rigid and at proper plane.
 - .1 Use full length pieces where practical.
 - .2 Make joints tight, accurately aligned and rigidly secured.
 - .3 Mitre and fit corners accurately, free from rough edges.
 - .4 Secure at 220 mm on centre.
 - .6 Install corner beads on external angles with fasteners at 300 mm on centre.
 - .7 Install casing beads at perimeter of suspended plaster ceilings; wherever plaster abuts or joins a dissimilar exposed surface such as masonry, concrete, wood, metal; where edges of plaster are exposed; where plaster on a non-structural member butts plaster on a structural member; and elsewhere as indicated.
 - .8 Install metal screeds at top of bases and dados.
 - .9 Construct expansion joints of two back-to-back casing beads set in plaster supported independently on both sides of joint.
 - .10 Provide continuous polyethylene air seal behind and across expansion/contraction joints.
 - .11 Locate expansion joints at dissimilar walls and ceilings, at changes in substrate construction, at line of door jambs from top of door frame to ceiling, at approximate 9 m spacing on long corridor runs, at maximum 7.5 m spacing in each direction on ceilings, at building expansion and construction joints.
 - .12 Install expansion joints straight and true.
 - .13 Install rings and frames for electrical and mechanical fixtures.
 - .14 Rigidly secure rings and frames to furring and lathing systems.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by furring and lathing application.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 07 92 00 - Joint Sealants

1.2 REFERENCE STANDARDS

- .1 Underwriter's Laboratories (UL)
 - .1 UL-2768, Architectural Surface Coatings.
- .2 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
 - .1 MPI #26, Primer, Galvanized Metal, Cementitious.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for metal framing and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS SDS
- .3 Samples:
 - .1 Submit duplicate 300 mm long samples of non-structural metal framing.

1.4 QUALITY ASSURANCE

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

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements: deliver materials to Site in original factory packaging, labelled with manufacturer's name and address.
- .2 Storage and Handling Requirements:
 - .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect metal framing from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .3 Develop Construction Waste Management Plan related to Work of this Section.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19 - Waste Management and Disposal.

2 PRODUCTS

2.1 MATERIALS

- .1 Non-load bearing channel stud framing: to ASTM C645, roll formed from 0.53 mm thickness hot dipped zinc-coated (galvanized) steel sheet in accordance with ASTM A653, Z180, for screw attachment of gypsum board or lath.

- .1 Knock-out service holes at 460mm centres.
- .2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, and as follows:
 - .1 Slotted Deflection Track for Fire Separations: Premanufactured slotted top runner with 63 mm down standing legs and having 6 mm wide x 38 mm high slots spaced at 25 mm on centre along length of runner; tested and certified for use in fire rated wall construction.
 - .2 Double Runner Deflection Track: Outside runner using 50 mm flanges; inner runner 33 mm; maintaining 25 mm minimum deflection space.
 - .3 Deep Leg Deflection Track: Top runner having 50 mm down standing legs; maintaining 13 mm minimum deflection space.
 - .4 Base Runner: Bottom track with 33 mm upstanding legs.
- .3 Furring Channels: Commercial steel sheet in accordance with ASTM A653, Z180, hot dipped zinc-coated (galvanized), as follows:
 - .1 Hat Shaped, Rigid Furring Channels: ASTM C645, 0.75 mm thickness x 22 mm deep
 - .2 Resilient Furring Channels: 0.46 mm thickness x 13 mm deep members designed to reduce sound transmission having asymmetrical face attached to single flange by a slotted leg (web).
- .4 Metal channel stiffener: 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.
- .5 Acoustical sealant: in accordance with Section 07 92 00 - Joint Sealants.
- .6 Sealants: VOC limit 30g/L maximum.
- .7 Insulating strip: rubberized, moisture resistant 3 mm thick cork strip, 12 mm wide, with self sticking adhesive on one face, lengths as required.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for non-structural metal framing application in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of HWDSB.
 - .2 Inform HWDSB of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation after unacceptable conditions have been remedied and after receipt of written approval to proceed from HWDSB.

3.2 ERECTION

- .1 Erect partitions in accordance with framing requirements of ASTM C754
- .2 Align partition tracks at floor and ceiling and secure at 610mm on centre maximum.
- .3 Install damp proof course under stud shoe tracks of partitions on slabs on grade.
- .4 Place studs vertically not more than 50 mm from abutting walls, and at each side of openings and corners.
 - .1 Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.
- .5 Erect metal studding to tolerance of 1:1000.
- .6 Attach studs to bottom or ceiling track using screws or pop rivets.
- .7 Co-ordinate simultaneous erection of studs with installation of service lines. Align web openings when erecting studs.

- .8 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
- .9 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified.
 - .1 Secure studs together, 50mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
- .10 Install heavy gauge single jamb studs at openings.
- .11 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs.
 - .1 Secure track to studs at each end, in accordance with manufacturer's instructions.
 - .2 Install intermediate studs above and below openings in same manner and spacing as wall studs.
- .12 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
- .13 Provide 40mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.
- .14 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .15 Extend partitions to ceiling height except where noted otherwise on drawings.
- .16 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.
 - .1 Use 50mm leg ceiling tracks. Use double track slip joint as indicated.
- .17 Install continuous insulating strips to isolate studs from uninsulated surfaces.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by non-structural metal framing application.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This section describes interior porcelain and ceramic tiling and associated materials, including installation methods for floor, wall, ceiling, and base tiles.

1.2 RELATED REQUIREMENTS

- .1 Section 03 54 00 – Cementitious Underlayment
- .2 Section 06 10 00 – Rough Carpentry
- .3 Section 07 92 00 – Joint Sealants
- .4 Section 09 21 16 – Gypsum Board Assemblies

1.3 REFERENCE STANDARDS

- .1 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-25.20, Surface Sealer for Floors
 - .2 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction
 - .3 CAN/CGSB 71-GP-22M, Adhesive, Organic, for Installation of Ceramic Wall Tile
 - .4 CAN/CGSB-75.1, Tile, Ceramic
- .2 CSA Group (CSA):
 - .1 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005)
 - .2 CSA O121, Douglas Fir Plywood
- .3 International Standards Organization (ISO):
 - .1 ISO 10545, Ceramic Tiles
 - .2 ISO 13006, Ceramic Tiles - Definitions, Classification, Characteristics and Marking
 - .3 ISO 13007-1, Ceramic Tiles - Grouts and Adhesives - Part 1: Terms, Definitions and Specifications for Adhesives
 - .4 ISO 13007-2, Ceramic Tiles — Grouts and Adhesives – Part 2: Test Methods for Adhesives
 - .5 ISO 13007-3, Ceramic Tiles - Grouts and Adhesives - Part 3: Terms, Definitions and Specifications for Grouts
 - .6 ISO 13007-4, Ceramic Tiles — Grouts and Adhesives – Part 4: Test Methods for Grouts
 - .7 ISO 13007-5, Ceramic Tiles - Grouts and Adhesives - Part 5: Requirements, Test Methods, Evaluation of Conformity, Classification and Designation of Liquid-Applied Waterproofing Membranes for Use Beneath Ceramic Tiling Bonded with Adhesives
 - .8 ISO 13007-6, Ceramic Tiles - Grouts and Adhesives - Part 6: Requirements, Test Methods, Evaluation of Conformity, Classification and Designation for Waterproof Membranes Used With the Installation of Ceramic Tiles
- .4 Terrazzo Tile and Marble Association of Canada (TTMAC):
 - .1 Tile Specification Guide 09 30 00, Tile Installation Manual
 - .2 Hard Surface Maintenance Guide
 - .3 Tile Installer Technical Manual,
- .5 Tile Council of North America (TCNA):
 - .1 TCNA Handbook for Ceramic, Glass, and Stone Tile Installation

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Preconstruction Meetings: Arrange a preconstruction meeting in accordance with Section 01 31 19

– Project Meetings attended by Contractor, HWDSB and JASON FUNG ARCHITECT INC., tile installer to discuss the following:

- .1 Substrate and backing surfaces flatness requirements.
 - .2 Installation techniques associated with specified materials.
 - .3 Compatibility between specified materials and between adjacent materials.
 - .4 Other concerns associated with site conditions.
 - .5 Installer's or manufacturer's representative's concerns associated with as-constructed conditions.
 - .6 Substrate joints and cracks that require adjusting tile joint locations or additional tile joint locations.
- .2 Coordination: Where finished tile surfaces are installed flush with adjacent floor finishes coordinate the following:
- .1 Coordinate requirements for recessed concrete floor slabs. Coordinate the depth of required slab depressions with Section 03 30 00 – Cast-in-Place Concrete before placement of concrete taking into account mortar bed, bond coat, and tile thickness.

104 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit product data for each type of product and accessory specified. Indicate compliance with this Section.
- .3 Samples for Initial Selection: Submit samples of the following:
 - .1 Actual tiles or sections of tiles showing the full range of colours, textures, and patterns available for each type of tile indicated.
 - .2 Edging and trim accessories showing the full range of colours available.
 - .3 Actual sections of grout showing the full range of colours available for each type of grout indicated.
- .4 Samples for Verification: Submit samples of the following:
 - .1 Submit porcelain wall tile for each colour, pattern, texture, and size.
 - .2 Submit tile trim shapes for each type, colour, pattern, texture, and size.
 - .3 Submit sample panel of porcelain tile adhered to 19-mm-thick plywood illustrating grout colour and joint width. Panel to include three horizontal and three vertical tiles.
- .5 Certificates: Where products from more than one manufacturer are used for part of a single tile assembly, submit a statement from setting material manufacturer indicating compatibility of other manufacturer's materials.
- .6 Site Quality Control Submittals: Submit manufacturer's site inspection report(s).
- .7 Environmental Control Submittals:
 - .1 Low Emitting Materials:
 - .1 Submit manufacturer's information indicating VOC emission limit in grams per litre (g/L).
 - .2 Provide low VOC emitting Products (within the building waterproofing membrane), in compliance with VOC emission limits referenced in LEED sustainability program standards, for the following categories:
 - .1 Interior adhesives and sealants applied on site.

1.5 CLOSEOUT SUBMITTALS

- .1 Operations and Maintenance Data: Submit TTMAC Hard Surface Maintenance Guide, in digital format, including the following:

- .1 Indicate specific warnings for maintenance materials or practices that might damage tile work
- .2 Warranty Documentation: Submit manufacturers' warranties.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- .1 Extra Stock Materials: Supply maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
 - .1 Submit extra tile amounting to 5% of gross area covered, allowing proportionately for each pattern and type specified and which are part of the same Production run as installed products. Store maintenance products as directed by HWDSB.
 - .2 Supply maintenance materials from the same production run as installed materials.

1.7 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installers: Skilled in ceramic tile installation with five years of experience completing tile installations similar in material and scope as this Project, and member in good standing with TTMAC.
- .2 Mock-Ups: Assemble mock-up in accordance with Section 01 43 00 - Quality Assurance, and as follows:
 - .1 Assemble one typical washroom indicating wall tile pattern(s), grout, one floor movement joint, transition strips, and reducer strips.
 - .2 Acceptable mock-up may not remain as part of the completed work.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with Section 01 61 00 - Common Product Requirements, and as follows:
 - .1 Deliver materials in adequate crates or containers with manufacturer's name and product description clearly marked.
 - .2 Examine materials upon delivery. Open boxes and confirm that materials match accepted samples, are free from defects and damage detrimental to final appearance and installation. Tile materials that are factory marked as seconds or that are not consistent with materials submitted for review are not acceptable.
 - .3 Verify that tiles with colour/pattern variations have been blended at the factory, so that tile units taken from one package show the same range of colours/patterns as those taken from other packages. If tiles are packaged without factory blending, blend tiles on site before installation.
 - .4 Store cementitious materials indoors, in dry location, protected from foreign materials.
 - .5 Protect adhesives, fillers, and sealants from freezing.
 - .6 Handle and store tiles in a manner to avoid chipping, breakage or the instruction of foreign matter. Take precautions to protect the mortar and grout admixtures from freezing or from excessive heat.
 - .7 Restrict traffic by other trades during installation.
 - .8 Provide adequate protection of completed tiled surfaces to prevent damage by other trades until final completion of this project.

1.9 AMBIENT CONDITIONS

- .1 Maintain air temperature and substrate temperature at tile installation area above 12C for 48 hours before, during, and 48 hours after installation, unless otherwise indicated by manufacturer's written instructions.
- .2 Do not install tiles at temperatures less than 12C or above 38C.

- .3 Do not install epoxy mortar and grouts at temperatures below 15C or above 25C.
- .4 Provide additional heat when there is a risk that surface temperatures may drop below manufacturer's recommended temperatures.
- .5 Maintain adequate ventilation where Work of this Section generates toxic gases or where there is a risk of raising relative humidity to levels that could damage building finishes and assemblies.

2 PRODUCTS

2.1 MANUFACTURERS

- .1 Acceptable Manufacturers:
 - .1 Olympia Tile
 - .2 Stone Tile
 - .3 Centura Tile
- .2 Substitutions: Permitted, subject to review by HWDSB and JASON FUNG ARCHITECT INC.
- .3 Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 MATERIAL

- .1 General: All materials under work of this Section, including but not limited to, sealants, adhesives, and sealers are to have low VOC content limits.

2.3 PERFORMANCE CRITERIA

- .1 Perform work of this Section in accordance with TTMAC Tile Installer Technical Handbook as a minimum requirement.
- .2 Provide tile products manufactured and tested in accordance with ANSI A108, ANSI A137.1, and ISO 13006.
- .3 Tile Slip Resistance:
 - .1 Minimum Dynamic Coefficient of Friction (DCOF) of 0.42 wet in accordance with ANSI A137.1 when tested in wet environments.
- .4 Tile Frost Resistance: Maximum water absorption rating of 0.5% to ISO 10545-3 or ASTM C373 for ceramic tile.

2.4 WALL TILE

- .1 Porcelain Tile: Olympia Tile – Colour and Dimensions Series or similar.
 - .1 Size: 100 mm x 400 mm (nominal)
 - .2 Appearance: Solid
 - .3 Finish: Bright
 - .4 Water Absorption Class: In accordance with ASTM C373
 - .5 Stain Resistance: To ISO 10545-14, Class 5-Stain Removed with Hot Water
 - .6 Colour: As selected by HWDSB and JASON FUNG ARCHITECT INC. from manufacturer's standard colour range.

2.5 FLOOR TILE

- .1 Porcelain Tile: Stone Tile – Moonstone or similar
 - .1 Size: 300 mm x 300 mm (nominal)
 - .2 Finish: Matte

- .3 Water Absorption Class: In accordance with ASTM C373
- .4 Stain Resistance: To ISO 10545-14, Class 5-Stain Removed with Hot Water
- .5 Colour: As selected by HWDSB and JASON FUNG ARCHITECT INC. from manufacturer's standard colour range

2.6 TILE TRIMS

- .1 Wall edge protection and tile cap: Aluminum edge protection with trapezoid perforated anchoring leg and an anodized finish, continuous at all exposed tile edges, depth as required to suit tile thickness. 'Jolly' by Schluter Systems or approved alternative by HWDSB and JASON FUNG ARCHITECT INC.

2.7 ACCESSORIES

- .1 Cement: CAN/CSA A3000, Type GU.
- .2 Sand: ASTM C144, CSA-A82.56-M
- .3 Water: Potable and free of minerals and other contaminants which are detrimental to mortar and grout mixes.
- .4 Polymer additive: Keralastic by Mapei Inc or approved alternative by Ardex, Flextile Ltd. or Laticrete International.
- .5 Thin-set mortar: 2 component to ANSI A108/A118/A136.1:
 - .1 'Kerabond with Keralastic Latex Additive' by Mapei Inc., 'Ardex X77 Microtec' by Ardex, '56SR/51 w/44' by Flextile Ltd., or '254/255' by Laticrete International.
- .6 Primer: To meet specified requirements of adhesive manufacturer.
- .7 Cleaner: In accordance with TTMAC's requirements and as recommended by tile manufacturer.
- .8 Crack-isolation system: Flexible, thin, fabric-reinforced, peel and stick membrane meeting ANSI A118.12 cut into strips to suit joints. 'Mapeguard 2' by Mapei Inc., or approved alternative by Ardex or Laticrete International Inc. Provide manufacturer approved primer.
- .9 Waterproof Membrane: Waterproof Membrane System made from black, coldapplied, self-curing, liquid rubber polymer and an integral reinforcing fabric. '9235Waterproofing' by Laticrete International Inc. or approved alternative by Mapei Inc.
- .10 Organic adhesive (walls): CGSB 71-GP-22M, Type 1.
- .11 Grout:
 - .1 Walls (1.5 mm to 3 mm joint width): 'Keracolor U' by Mapei Inc. or approved alternative by Ardex, Flextile Ltd. or Laticrete International.
 - .2 Walls (over 3 mm joint width): 'Ultracolor Plus' by Mapei Inc. or approved alternative by Ardex, Flextile Ltd. or Laticrete International.
 - .3 Grout colour: To be selected by JASON FUNG ARCHITECT INC. from the manufacturer's full colour range.
- .12 Sealer: CAN/CGSB-25.20, penetrating, type as recommended by tile manufacturer.
- .13 Tile sealant: In accordance with Section 07 92 00.

2.8 MIXES

- .1 Levelling bed mix:
 - .1 1 part Portland cement.
 - .2 4 parts sand.
 - .3 1 part water (including polymer additive), adjusted for water content of sand.
 - .4 1/10 part polymer additive.

- .2 Where allowed in material manufacturer's instructions, adjust water volume depending on moisture content of sand to obtain consistency and workability.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions:
 - .1 Verify substrate and backing surface flatness tolerances.
 - .1 Standard Format Floor Tile: Tiles from 100 mm x 100 mm and with all sides less than 380 mm require floor flatness measured to a minimum of FF35; equivalent to 5 mm with no more than 2 gaps under a 3000 mm straightedge measurement.
 - .2 Wall Tiles: Provide wall levelling similar to that specified for floors for tiles having similar sizes listed above
- .2 Examine substrates and conditions where tile will be installed for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - .1 Verify that substrates for bonding tile are firm, dry, clean, and free from oil, waxy films, and curing compounds.
 - .2 Verify substrates are within starting flatness tolerances as specified in Section 03 30 00 – Cast-in-Place Concrete, and are ready for application of levelling materials specified in this Section.
 - .3 Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar products located in, behind, or through tiling is complete.
 - .4 Verify that joints and cracks in substrates align with tile movement joint locations indicated on Drawings. Adjust joints in consultation with HWDSB and JASON FUNG ARCHITECT INC. to align.

3.2 PREPARATION

- .1 Thoroughly clean substrate surfaces. Remove oil, wax, grease, dust, dirt, paint, tar, primers, form release agents, curing compound, and other foreign material from substrate surfaces which may prevent or reduce adhesion, and as follows:
 - .1 Clean the back of each tile before installation to remove surface contaminants and cutting residue, firing release dust, and other debris detrimental to bond and final surface appearance.
- .2 Surface Levelling: Apply Levelling Bed Mortar to make backing surfaces flat and true to tolerances in plane listed for performance requirements, with additional requirements as follows:
 - .1 Install levelling materials at slight substrate irregularities.
 - .2 Provide self-levelling materials for thicknesses less than 8 mm where thin-set tile methods are used.
 - .3 Provide mortar bed levelling materials for thicknesses 8 mm and greater.

3.3 INSTALLATION - GENERAL

- .1 Perform tile work in accordance with TTMAC Tile Installer Technical Manual, parts of ANSI A108 Series of tile installation standards that apply to types of bonding and grouting materials, and to methods required for complete tile installation as minimum requirements.
- .2 Extend tile work into recesses and under equipment and fixtures, to create a complete uninterrupted wall covering.
 - .1 Terminate Work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

- .2 Do not split tile.
- .3 Make cut edges smooth, even, and free from chips.
- .3 Fit tile around corners, fitments, fixtures, drains, and other built-in objects.
- .4 Accurately form intersections and returns. Cut and drill tile without marring visible surfaces:
 - .1 Cut, drill, and fit tile to accommodate work of other Subcontractors penetrating and abutting work of this Section.
 - .2 Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints.
- .5 Lay tile in pattern indicated on Drawings and as follows:
 - .1 Align joints when adjoining tiles on floor, base, walls, and trim are the same size.
 - .2 Lay out tile Work and centre tile sites in both directions in each space or on each wall area.
 - .3 Centre tile patterns between control and movement joints; notify HWDSB and JASON FUNG ARCHITECT INC. for further instructions where tile patterns do not align with control or movement joints.
- .6 Cut tile accurately and without damage.
- .7 Smooth exposed cut edges with abrasive stone, where visible.
- .8 Minimum tile width is half unit size unless specifically indicated otherwise on Drawings.
- .9 Adjust tile layout to minimize tile cutting.
- .10 Provide uniform joint widths.
- .11 Make joints between tile sheets the same width as joints within tile sheets so joints between sheets are not apparent in finished Work. Align tile sheet patterns.
- .12 Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so that plates, collars, and covers overlap tile.
- .13 Make joints between tile uniform, plumb, straight, true, and flush with adjacent tile.
- .14 Maximum Surface Tolerance: 1:800.
- .15 Lay out tiles so perimeter tiles are at least 1/2 of a full size.
- .16 Sound tiles after setting and replace hollow-sounding units to obtain full bond.
- .17 At termination of wall tile, provide aluminum edge protection, Jolly' by Schluter Systems or approved alternative by HWDSB and JASON FUNG ARCHITECT INC.
- .18 Install transition strips at junction of tile flooring and dissimilar floor finishes.
- .19 Wait a minimum of 24 hours after installation of tiles, before grouting.

3.4 INSTALLATION - CONTROL AND MOVEMENT JOINTS

- .1 Provide control, expansion and isolation joints in accordance with TTMAC specification 301MJ and as indicated on drawings. Install in locations indicated on drawings and specified herein.
- .2 Continue control, construction, and cold joints in the structural substrate up through the tile finish, and align with mortar joints where possible. Review joint locations on site with JASON FUNG ARCHITECT INC.
- .3 Install joint widths to match grout joint widths, except where a minimum width is indicated.
- .4 Install control joints in the following typical locations:
 - .1 Aligned over changes in type of substrate.
 - .2 At the restraining perimeters such as walls and columns.
 - .3 Interior areas (not subject to sunlight): 6 mm minimum width, at 7320 mm o.c. maximum.
 - .4 Interior areas (subject to sunlight): 6 mm minimum width, at 3660 mm o.c maximum.
 - .5 As indicated on the Contract Drawings.

- .5 Seal control joints in accordance with Section 07 92 00.

3.5 INSTALLATION – GROUT

- .1 Grouting: Install grout in accordance with manufacturer's written instructions, the requirements of TTMAC Tile Installer Technical Manual, and as follows:
 - .1 Allow proper setting time before application of grout.
 - .2 Pre-seal or wax tiles that require protection from grout staining.
 - .3 Force grout into the joints with a rubber grout float. Make sure all joints are well-compacted and free of voids and gaps.
 - .4 Remove excess grout in accordance with manufacturer's instructions and polish tile with clean cloths.

3.6 INSTALLATION – LEVELLING BED

- .1 Install a levelling bed on uneven substrate surfaces, level and plumb substrates in accordance with the following tolerances:
 - .1 Vertical surfaces: 3 mm in 2.4 m maximum
 - .2 Horizontal surfaces: 6 mm in 3 m from finished levels of the surface, or better.
- .2 Clean structural substrate control joints and blow-clean with compressed air. Grout fill control joints flush to slab with levelling bed.

3.7 SITE QUALITY CONTROL

- .1 Manufacturer Services:
 - .1 Provide manufacturer's site services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .2 Site Tests and Inspections: HWDSB will pay cost of inspection of installed Work from the Cash Allowance in accordance with Section 01 21 00 – Allowances. Subcontractor to cooperate with HWDSB inspector and correct deficiencies identified. Inspection will consist of the following as a minimum:
 - .1 Arrange for mortar and grout manufacturer's representative to review delivered materials and confirm in writing that materials and mixes specified for the Project are in accordance with manufacturer's requirements.
 - .2 Confirm that tile is set flush and level with adjacent tiles.
 - .3 Identify broken, cracked, hollow sounding, and damaged tiles.
 - .4 Confirm that accessories are installed correctly.
 - .5 Confirm that flexible grouting and joint sealants have been installed correctly.
 - .6 Confirm that installation is complete and in accordance with the requirements of this Section.

3.8 CLEANING

- .1 Perform cleaning in accordance with Section 01 74 00 - Cleaning. Clean tile surfaces so they are free of foreign matter using manufacturer recommended cleaning products and methods after completing grouting, and as follows:
 - .1 Clean off excess grout with soft burlap or sponge moistened with clean water as soon as possible.
 - .2 Polish wall tile after grout has cured in accordance with TTMAC recommendations in the Maintenance Guide; do not use acid for cleaning.
 - .3 Re-point joints after cleaning as required to eliminate imperfections, then re-clean as necessary. Avoid scratching tile surfaces.

- .2 Waste Management and Disposal: Perform in accordance with Section 01 74 19 - Waste Management and Disposal.

3.9 JOINT BACKING AND TILE SEALANT

- .1 Install joint backing under sealant as necessary.
- .2 Install tile sealant around piping and fittings extending through tiled surfaces.
- .3 Seal tile control joints.
- .4 Seal internal tile to tile junctions. Tool to a smooth, flush surface, free from air bubbles and contamination.

3.10 PROTECTION

- .1 Prevent traffic over tiled areas, and protect tiled assemblies from weather, freezing, and water immersion, for 72 hours minimum, after final installation.
- .2 Prevent direct impact, vibration and heavy hammering on adjacent and opposite walls for 24 hours minimum, after final installation.
- .3 Cover work temporarily with building paper properly lapped and taped at joints until work has been approved by JASON FUNG ARCHITECT INC.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This Section includes, but is not limited to, supply and install of ceilings consisting of acoustical ceiling panels; exposed grid suspension system; wire hangers, fasteners, main runners, cross tees, and wall angel moldings; and perimeter trim

1.2 RELATED REQUIREMENTS

- .1 Section 09 21 16 – Gypsum Board Assemblies
- .2 Section 09 22 16 – Non-Structural Metal Assemblies
- .3 Division 25 – Mechanical
- .4 Division 26 - Electrical

1.3 REFERENCE STANDARDS

- .1 ASTM International (ASTM):
 - .1 ASTM A1008, Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
 - .2 ASTM A641, Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
 - .3 ASTM A653, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
 - .4 ASTM C423, Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
 - .5 ASTM C635, Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
 - .6 ASTM C636, Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
 - .7 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials
 - .8 ASTM E1264, Classification for Acoustical Ceiling Products
 - .9 ASTM E1414, Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
 - .10 ASTM E1477, Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers
- .2 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-1.132, Zinc Chromate Primer, Low Moisture Sensitivity
- .3 Ceilings & Interior Systems Construction Association (CISCA):
 - .1 Ceiling Systems Handbook
 - .2 Seismic Construction Handbook
- .4 Government of Canada:
 - .1 Workplace Fit-Up Standards
- .5 ULC Standards (ULC):
 - .1 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
 - .2 CAN/ULC-S702.1, Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Do not begin installation of ceiling suspension system until work above ceiling has been reviewed by HWDSB and JASON FUNG ARCHITECT INC.
 - .2 Commence installation after dust and moisture producing activities are complete, and paint is dry.
 - .3 Coordinate ceiling work to accommodate components of other Sections built into acoustical ceilings.
- .2 Conduct pre-installation meeting in accordance with Section 01 31 19 – Project Meetings at Project site one week before beginning work of this Section, with Contractor, applicable Subcontractors, and HWDSB and JASON FUNG ARCHITECT INC. to:
 - .1 Verify Project requirements,
 - .2 Discuss coordination with work of other Sections,
 - .3 Review manufacturer's installation instructions [and warranty conditions],
 - .4 Discuss and coordinate exact locations of ceiling-mounted components,
 - .5 Discuss accepted shop drawings for special installation details, and
 - .6 Review existing substrate conditions.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's product data for each type of door and frame. Indicate door designation, type and model, product characteristics, core description, fabrication details, dimensions, fire-protection rating, finishes, and limitations.
 - .2 Submit WHMIS Safety Data Sheet (SDS).
- .3 Samples for initial selection: Submit 150 mm x 150 mm sample of acoustical panel showing full range of colours, textures, and patterns available.
- .4 Shop Drawings: Layout and details of acoustical ceilings to show locations of items that are to be coordinate with or supported by the ceilings.
- .5 Acoustical Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification, such as Underwriter's Laboratory (UL), of NRC, CAC, and AC.
 - .1 If the material supplied by the acoustical subcontractor does not have an independent laboratory classification of acoustical performance on every carton, subcontractor shall be required to send material from every production run appearing on the job to an independent or NVLAP approved laboratory for testing, at the architect's or owner's discretion. All products not conforming to manufacturer's current published values must be removed, disposed of, and replaced with complying product at the expense of the Contractor performing the work.

1.6 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Submit maintenance information for acoustical ceiling systems and incorporate into manual. Include warnings of cleaning methods that may damage finished surfaces.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- .1 Supply extra acoustical units in accordance with Section 01 78 00 - Closeout Submittals.

- .2 Supply extra materials from same production run as installed materials.
- .3 Supply acoustical units amounting to 5% of gross ceiling area for each pattern and type of acoustical panel, ceiling suspension system and trim required for Project - minimum one complete factory-sealed package of each.

1.8 QUALITY ASSURANCE

- .1 Manufacturers: Obtain materials for each type of acoustical panel ceiling system (panels and suspension system) from a single manufacturer. Provide products exposed to view from the same production run for each room, with consistent appearance.
- .2 Certifications:
 - .1 Fire-Resistance Rated Suspension System: Certified by a Canadian Certification Organization accredited by the Standards Council of Canada

1.9 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Storage and Handling Requirements:
 - .1 Store materials flat, off ground, indoors, and in a clean, dry, and well-ventilated area.
 - .2 Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
 - .3 Protect acoustical ceiling components from nicks, scratches, and other damage.

1.10 AMBIENT CONDITIONS

- .1 Unless manufacturer's recommendations are more restrictive, maintain uniform temperature of 15 to 29 degrees C and relative humidity of 20 to 40% for 48 hours before and during installation.
- .2 Store materials in work area 48 hours before beginning installation.

1.11 WARRANTY

- .1 Manufacturer Warranty:
 - .1 Coverage of manufacturing defects in materials and workmanship resulting in failure of suspension system for 30 years from date of Substantial Performance.

2 PRODUCTS

2.1 MANUFACTURERS

- .1 Acceptable Manufacturers:
 - .1 Armstrong World Industries, Inc.
 - .2 Chicago Metallic
 - .3 CertainTeed
 - .4 CGC Interiors, a USG Company
- .2 Substitutions: Permitted, subject to review by HWDSB and JASON FUNG ARCHITECT INC.
- .3 Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 ACOUSTICAL PANELS

- .1 Acoustical Panel: to ASTM E1264, Type III, Form 2,
- .2 Dimensions: 610 mm x 610 mm
- .3 Colour: White

- .4 Edge Profile: Square Lay-in
- .5 Noise Reduction Coefficient (NRC): 0.70
- .6 Ceiling Attenuation Class (CAC): 35
- .7 Light Reflectance: 0.82
- .8 Fire Performance: to CAN /ULC S102 and ASTM E84
 - .1 Flame Spread Index: Less than 25, ASTM E1264; Class A
 - .2 Smoke Developed Index: Less than 50
 - .3 Fire Guard: Class A
- .9 Humidity and Sag Resistant
- .10 Mold and Mildew Resistant

2.3 METAL SUSPENSION SYSTEMS

- .1 Components: To ASTM C635/C635M
 - .1 Colour: White
 - .2 Basis-of-Design Product:
 - .1 Prelude XL 15/16" Exposed Tee as manufactured by Armstrong World Industries, Inc. or approved equivalent by HWDSB and JASON FUNG ARCHITECT INC.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: Verify conditions of substrates previously installed under other Sections or Contracts are acceptable for acoustical panel ceiling installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform HWDSB and JASON FUNG ARCHITECT INC. of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from HWDSB.

3.2 PREPARATION

- .1 Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

3.3 INSTALLATION – SUSPENSION SYSTEM

- .1 Comply with manufacturer's installation instructions and recommendations, including product technical bulletins, installation instructions, and data sheets.
- .2 Install suspension system in accordance with ASTM C636/C636M except where specified otherwise.
- .3 Install suspension system by suspending ceiling hangers from building's structural members, and as follows:
 - .1 Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - .2 Attach hangers to structural members or intermediate structural supports.
 - .3 Fasten hangers to cast-in-place hanger inserts, powder actuated fasteners, or drilled in

- anchors that extend through forms into concrete.
- .4 Splay hangers only where required to miss obstructions. Offset resulting horizontal forces by bracing or counter-splaying.
- .4 Lay out centre line of ceiling both ways, to provide balanced borders at room perimeter with system according to reflected ceiling plan.
- .5 Installation Tolerances: Finished ceiling system square with adjacent walls and level within 1:1000.
- .6 Secure hangers to overhead structure using attachment methods as indicated acceptable to HWDSB and JASON FUNG ARCHITECT INC..
- .7 Install hangers spaced at a maximum 1200 mm on centre and within 150 mm from ends of main tees.
- .8 Coordinate suspension system with location of related components. Provide carrying channels as necessary to bridge at unavoidable interference between suspension system and other work above ceiling.
- .9 Install wall moulding to provide correct ceiling height.
- .10 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, and grilles.
- .11 Support light fixtures diffusers with additional ceiling suspension hangers within 150 mm of each corner and at a maximum 610 mm around perimeter of fixture.
- .12 Interlock or attach cross member to main runner to provide rigid assembly.
- .13 Frame at openings for light fixtures, air diffusers, speakers, and at changes in ceiling heights.
- .14 Expansion Joints:
 - .1 Provide Z-shaped metal trim pieces at each side of expansion joint. Design to accommodate plus or minus 25-mm movement and maintain visual closure. Finish metal components to match adjacent exposed metal trim. Provide backing plates behind butt joints.
- .15 Install perimeter trim at floating installations securely anchored to suspension system, in accurate alignment with adjacent assemblies. Install curved trim members in smooth curves to radius indicated.

3.4 INSTALLATION – ACOUSTICAL CEILING PANEL SYSTEM

- .1 Install lay-in acoustical panels in ceiling suspension system in accordance with manufacturer's instructions and as indicated.
- .2 Install panels with edges fully hidden from view by flanges of suspension system runners and mouldings.
- .3 In fire-rated ceiling systems, secure lay-in panels with hold-down clips and protect over light fixtures, diffusers, air return grilles and other appurtenances according to Certification Organizations design requirements.

3.5 SITE QUALITY CONTROL

- .1 Site Tests and Inspections: Arrange for periodic site visits by design professional responsible for delegated ceiling design work to review installed work for conformity to design.
- .2 Manufacturer Services: Arrange for periodic site visits by manufacturer's representative to review installed work for conformity to manufacturer's installation instructions and recommendations.
 - .1 Submit written site reports within 3 days of visit.
- .3 Non-Conforming Work:
 - .1 Do not support ceilings directly from permanent metal forms, floor deck, or other non-structural framing.
 - .2 Do not attach hangers to steel roof deck or steel deck tabs.

- .3 Do not level ceilings by putting kinks in suspension wires. Kinks in suspension wires are not acceptable.
- .4 Conceal fasteners including pop rivets on mouldings and trims.

3.6 CLEANING

- .1 Progress Cleaning: Perform in accordance with Section 01 74 00 - Cleaning, and as follows:
- .2 Final Cleaning: Perform in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: Perform in accordance with Section 01 74 19 - Waste Management and Disposal.

3.7 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by acoustical suspension installation.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This section includes, but is not limited to, vinyl composition floor tile, static, dissipative floor tile, rubber tile flooring, resilient wall bases, and resilient accessories for transition strips and area dividers.

1.1 RELATED REQUIREMENTS

- .1 Section 03 30 00 - Cast-in-Place Concrete
- .2 Section 06 08 99 – Rough Carpentry for Minor Works
- .3 Section 06 10 53 – Miscellaneous Rough Carpentry
- .4 Section 07 92 00 - Joint Sealants
- .5 Section 08 71 00 – Door Hardware
- .6 Section 09 21 16 – Gypsum Board Assemblies

1.2 REFERENCE STANDARDS

- .1 ASTM International (ASTM):
 - .1 ASTM F710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
 - .2 ASTM F1066, Standard Specification for Vinyl Composition Floor Tile
 - .3 ASTM F1344, Standard Specification for Rubber Floor Tiles
 - .4 ASTM F1482, Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
 - .5 ASTM F1516, Standard Practice for Sealing Seams of Resilient Flooring Products by the Heat Weld Method (when Recommended)
 - .6 ASTM F1700, Standard Specification for Solid Vinyl Floor Tile
 - .7 ASTM F1861, Standard Specification for Resilient Wall Base
 - .8 ASTM F1869-, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
 - .9 ASTM F2169, Standard Specification for Resilient Stair Treads
 - .10 ASTM F2873, Standard Practice for the Installation of Self-Leveling Underlayment and the Preparation of Surface to Receive Resilient Flooring
- .2 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-25.20, Surface Sealer for Floors
 - .2 CAN/CGSB-25.21, Detergent-Resistant Floor Polish
- .3 CSA Group (CSA):
 - .1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete
 - .2 CSA A126.5, Resilient Wall Base
 - .3 CSA B651, Accessible Design for the Built Environment

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Preconstruction Meetings: Arrange a preconstruction meeting in accordance with Section 01 31 19 – Project Meetings attended by Subcontractor, Contractor, HWDSB and JASON FUNG ARCHITECT INC.
 - .1 Substrate and backing surfaces flatness requirements.
 - .2 Installation techniques associated with specified materials.

- .3 Compatibility between specified materials and between adjacent materials.
- .4 Other concerns associated with site conditions.
- .5 Installer's or manufacturer's representative's concerns associated with as-constructed conditions.
- .6 Substrate joints and cracks that require adjusting tile joint locations or additional tile joint locations.
- .2 Coordination: Where finished resilient floor surfaces are installed flush with adjacent floor finishes coordinate the following:
 - .1 Coordinate type and style of resilient transition strips to be used between adjacent floor finishes.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit product data for each type of product and accessory specified. Indicate compliance with this Section.
- .3 Shop Drawings; Submit shop drawings indicating the following:
 - .1 Each resilient floor tile type, installation method, locations of building movement joints.
 - .2 Drawing details of stair treads, risers, and landings.
 - .3 Locations and types of edge strips and reducer strips at flooring penetrations.
- .4 Samples for Initial Selection: Submit samples of the following:
 - .1 Full-size samples of each type of resilient tile flooring.
 - .2 Small samples of resilient base.
 - .3 Small samples of stair nosing.
 - .4 Small samples of stair treads and risers.
 - .5 Samples of accessories where exposed to view.
- .5 Samples for Verification: Submit duplicate full-size samples of resilient tile flooring, and 300 mm long base, nosing, treads, risers, reducer strips and edge strips.
- .6 Test and Evaluation Reports: Submit floor substrate test results before beginning resilient tile flooring installation. Include a comparison to the resilient flooring manufacturer's minimum acceptable conditions.
- .7 Manufacturer's Instructions: Submit manufacturer's storage, handling, and installation instructions.
- .6 Site Quality Control Submittals: Submit manufacturer's site inspection report(s).
 - .1 Low Emitting Materials:
 - .1 Submit manufacturer's information indicating VOC emission limit in grams per litre (g/L).
 - .2 Provide low VOC emitting Products (within the building waterproofing membrane), in compliance with VOC emission limits referenced in LEED sustainability program standards, for the following categories:
 - .1 Interior adhesives and sealants applied on site.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 – Closeout Submittals.
- .2 Operation and Maintenance Data: Submit maintenance, repair, and cleaning recommendations for resilient tile flooring and incorporate into manual.
- .3 Record Documentation: Submit list of materials installed, including adhesives, wall base, and accessories. Indicate manufacturers, products, types, patterns, and colour names and numbers.

Indicate room/area where installed.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- .1 Operations and Maintenance Data: Submit manufacturer's cleaning and repair recommendations in accordance with Section 01 78 00 – Closeout Submittals.
- .2 Submit Subcontractor's maintenance bond.
- .3 Warranty Documentation: Submit manufacturer's warranties.
- .4 Extra Materials: Supply extra materials for maintenance use in accordance with Section 01 78 00 – Closeout Submittals.
 - .1 Supply a minimum of one box of each resilient tile type, pattern, and colour installed, or an area equal to 5% of the area installed, or a minimum 4 m² of each resilient tile, whichever is greater.
 - .2 Supply a minimum 10 m of the length installed of the resilient base in a continuous roll for each type, colour, and height. Manufacturer's standard maximum lengths are acceptable instead of rolls.
 - .3 Supply a sufficient amount of each adhesive to install maintenance materials in manufacturer's standard containers.
 - .4 Supply extra materials from same production run as installed materials.
 - .6 Label each box of resilient floor tile, each base, and each container of adhesive with manufacturer's name, product name, and room/area where installed.

1.7 QUALITY ASSURANCE

- .1 Installer Qualifications:
 - .1 Five years of experience and successful completion of similarly installed area, materials, and complexity.
 - .2 Member in good standing throughout the performance of the Work of Resilient Flooring Contractor's Association of Ontario (RFCAO).
- .2 Mock-Ups: Assemble mock-up in accordance with Section 01 43 00 - Quality Assurance, and as follows:
 - .1 Mock-Up Size: 1000 mm x 1000 mm of each resilient tile type flooring. Mock-up to demonstrate:
 - .1 Installation pattern.
 - .2 Installation workmanship at walls and doorways.
 - .3 Inside corner and outside corner of wall base.
 - .4 Edge strips and reducer strips.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with Section 01 61 00 - Common Product Requirements, and as follows:
 - .1 Deliver materials in adequate crates or containers with manufacturer's name and product description clearly marked.
 - .2 Examine materials upon delivery. Open boxes and confirm that materials match accepted samples, are free from defects and damage detrimental to final appearance and installation. Tile materials that are factory marked as seconds or that are not consistent with materials submitted for review are not acceptable.
 - .3 Verify that tiles with colour/pattern variations have been blended at the factory, so that tile units taken from one package show the same range of colours/patterns as those taken from

other packages. If tiles are packaged without factory blending, blend tiles on site before installation.

- .4 Protect adhesives, fillers, and sealants from freezing.
- .2 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location and in clean, temperature controlled, well-ventilated area.
 - .2 Store and protect specified materials from nicks, scratches, and blemishes.
 - .3 Coordinate delivery of materials with scheduled installation to allow minimum conditioning time on site.
- .3 Packaging Waste Management: Perform in accordance with Section 01 74 19 – Waste Management and Disposal.

1.9 AMBIENT CONDITIONS

- .1 Unless otherwise stated in manufacturer's instructions, maintain site conditions to occupancy service conditions for a minimum 48 hours before installation, during installation, and a minimum 48 hours after installation. Site conditions include:
 - .1 Ambient, substrate and material temperatures between 18C and 29C. Temperatures may be reduced to 13C 72 hours after installation.
 - .2 Subfloor surface temperature for adhesive application between 16C and 29C.
 - .3 Relative humidity (RH) between 40% and 60% with temperature at 18C and 29C.
- .2 Ventilation: Provide temporary ventilation where existing systems are not available or are inadequate to meet minimum requirements as follows:
 - .1 Provide high ventilation rate with maximum outside air 24 to 48 hours before, during installation, and 48 to 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through air distribution system. Continue high ventilation rate for at least four weeks after building occupation.
 - .2 Coordinate operation of existing ventilation system with HWDSB.

2 PRODUCTS

2.1 MANUFACTURERS

- .1 Acceptable Manufacturers:
 - .1 Johnsonite
 - .2 Armstrong Flooring
 - .3 Altro Flooring
- .2 Substitutions: Permitted, subject to review by HWDSB and JASON FUNG ARCHITECT INC.
- .3 Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

2.2 MATERIAL

- .1 All materials under work of this Section, including but not limited to, sealants, adhesives, and sealers are to have low VOC content limits.

2.3 RESILIENT TILE FLOORING MATERIALS

- .1 Vinyl Composition Floor Tile (VCT): To ASTM F1066, Composition 1 – non-asbestos, straight, sharp, and square edges, and as follows:
 - .1 Class: Class 2 – through pattern tile

- .2 Surface: Plain
- .3 Thickness: 3 mm
- .4 Size: 305 x 305 mm nominal
- .5 Colour: As selected by HWDSB and JASON FUNG ARCHITECT INC. from manufacturer's standard range

2.4 RESILIENT WALL BASE

- .1 Resilient Base (RB): To ASTM F1861, same dye lot for entire Project, and as follows:
 - .1 Type: TS – Rubber, vulcanized thermoset
 - .2 Group: 1 – Homogeneous
 - .3 Style: B – Coved
 - .4 Thickness: 3 mm
 - .5 Height: 100 mm
 - .6 Lengths: 120 foot continuous coiled or 4 foot straight lengths
 - .7 Colour: As selected by HWDSB and JASON FUNG ARCHITECT INC. from manufacturer's standard range to match existing .

2.5 RESILIENT TRANSITION AND EDGE STRIPS

- .1 Resilient Transition and Edge Strips: Meeting CAN/CSA B651 for height and slope.
 - .1 Extruded vinyl shapes meeting or exceeding ADA Recommendations for change of level transitions for transition between floor finishes having different levels.
 - .2 Colour: As selected by HWDSB and JASON FUNG ARCHITECT INC. from manufacturer's standard range

2.6 RESILIENT STAIR ACCESSORIES

- .1 Resilient Stair Covering: To ASTM F2169, and as follows:
 - .1 Type: TS – Thermoset
 - .2 Stair Nosing: Square nose profile, 3 mm thickness, 50 mm vertical face, 70 mm horizontal surface, double lock for butting to resilient flooring, ribbed, slip resistant profile
 - .3 Stair Tread: Square nose profile, 4mm overall thickness, 50 mm vertical face, width and depth to suite tread, ribbed profile with colour contrasting strip at nosing, complete with integral riser
 - .4 Colour: As selected by HWDSB and JASON FUNG ARCHITECT INC. from manufacturer's standard range.

2.7 ACCESSORIES

- .1 Primer: Where recommended by resilient tile floor manufacturer for site conditions and application.
- .2 Concrete Moisture Emission Reducer Coating: Moisture insensitive, epoxy modified, forming a permanent moisture barrier, water vapour permeability less than 6 ng/Pa•s•m when tested to ASTM E96/96M (wet method). Other test methods will be considered.
- .3 Adhesives: Waterproof, where recommended by flooring manufacturer for substrate; above, on, or below grade.
- .4 Sub-floor filler and leveler: White pre-mix latex requiring water only to produce cementitious paste and leveler as recommended by sheet flooring manufacturer for use with their product.
- .5 Metal Transition and Edge Strips: Meeting CAN/CSA B651 for height and slope, extruded aluminum with lip to extend under sheet flooring, shoulder flush with top of adjacent floor finish.

- .1 Colour: As selected by HWDSB and JASON FUNG ARCHITECT INC. from manufacturer's standard range
- .6 Edging to Floor Penetrations: Aluminum, profile recommended by resilient tile floor manufacturer.
- .7 Sealer and wax: As recommended by resilient tile floor manufacturer

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions:
 - .1 Verify concrete floors are free of cracks, ridges, depressions, scale, foreign materials, paint, varnish, dust, oils, release agents, waxes, and sealers, and that curing and hardening compounds have been removed.
 - .2 Verify substrate tolerances are within resilient tile flooring manufacturer's recommendations.
 - .3 Verify concrete surface profile is within resilient tile flooring manufacturer's recommendations.
 - .4 Verify that work by other Subcontractors affecting the flooring installation is acceptable.
 - .5 Report defective conditions affecting installation to HWDSB and JASON FUNG ARCHITECT INC. in writing immediately upon discovery and before beginning installation.
 - .6 Proceed with installation only after defective surfaces and conditions have been remedied.
- .2 Pre-installation Testing: Perform tests to verify concrete floors are dry, with moisture vapour emission rate, and alkalinity within the manufacturer's recommendations.

3.2 PREPARATION

- .1 Protection of In-Place Conditions: Protect face of doors, door frames, and walls from marring due to installation of resilient tile flooring.
- .2 Surface Preparation:
 - .1 Remove or treat old adhesives to prevent residual, old flooring adhesives from bleeding through to new flooring and interfering with the bonding of new adhesives.
 - .2 Remove pen and marker lines completely from concrete surfaces.
 - .3 Prepare substrate in accordance with ASTM F3010.
 - .4 Clean floor of dust, mould, mildew, alkaline salts, laitance, concrete film-forming curing compounds, paint, solvents, wax, oil, grease, residual adhesive, adhesive removing compounds, sealants, soap, and other foreign material.
 - .5 Apply filler as required, prohibit traffic until filler is cured.
 - .6 Prime concrete slab to resilient tile flooring manufacturer's recommendations.

3.3 INSTALLATION – RESILIENT TILE

- .1 Install resilient tile flooring and accessories using tools, materials, methods, and sequence of work to manufacturer's recommendations.
- .2 Mix and apply adhesive uniformly in accordance with manufacturer's instructions, using manufacturer-recommended trowel notching, spread, coverage rate, open times, and safety precautions. Do not spread more adhesive than can be covered by flooring before initial set.
- .3 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern. Border tiles minimum half tile width, but not less than 150 mm wide.
- .4 Install flooring to square grid pattern.
- .5 Cut resilient tile and fit neatly around fixed objects.

- .6 Cut resilient tile to fit tightly in pan type floor access covers and to frames, using hardware cut-outs.
- .7 Install resilient tile flooring in areas which will be under built-in furniture.
- .8 Install resilient tile flooring through areas to receive movable type partitions without interrupting floor pattern.
- .9 Install resilient tile flooring through doorways and scribed to fit projections and vertical surfaces.
- .10 Terminate flooring under centreline of door, in openings where adjacent floor finish material or colour are dissimilar.
- .11 During and after installation, roll flooring in two directions with minimum weighted roller to achieve full adhesion and prevent visible adhesive or trowel marks, unless otherwise indicated by flooring manufacturer.
- .12 Install edge strips at floor penetrations, and edge strips at unprotected and exposed edges where flooring terminates to suit conditions. Securely bond to substrate and in a straight line.
- .13 When necessitated by material size, locate cross seams and seams at doors and pivot points in accordance with accepted shop drawings.
- .14 Apply waterproof sealant at edge of linoleum abutting walls, millwork bases, and other projections in wet areas.

3.4 INSTALLATION – WALL BASE

- .1 Lay out resilient base with minimum number of joints.
- .2 Clean substrate and prime with one coat of adhesive.
- .3 Set resilient base against wall and floor surfaces tightly by using 3-kg hand roller.
- .4 Install straight and level to variation of 1:1000.
- .5 Scribe, cut, and fit wall base to door frames and other obstructions.
- .6 Cope wall base at internal corners. Install formed straight wall base for external corners. Install formed straight wall base for non-90 degree corners.

3.5 INSTALLATION – STAIR COVERINGS

- .1 Scribe and tightly fit to stair profile and wall surfaces. Cut to align with base on landings. Securely bond stringer to substrate in a straight line.
- .2 Apply adhesive evenly to back of stair coverings at a rate sufficient to bond and to completely fill gaps between treads and risers. Set firmly in position tight to nosing and roll.
- .3 Install stair nosings in one piece for full width of stair. Fully adhered to tread edge with adhesive.
- .4 Install tactile warning strips at stair landings where indicated on Drawings, width of stair x 750 mm deep, set back from front edge of stair one tread depth.
- .5 Install stair treads and nosings flush with surfaces of floor covering

3.6 SITE QUALITY CONTROL

- .1 Manufacturer Services:
 - .1 Provide manufacturer's site services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .2 Site Tests and Inspections: HWDSB will pay cost of inspection of installed Work from the Cash Allowance in accordance with Section 01 21 00 – Allowances. Subcontractor to cooperate with HWDSB inspector and correct deficiencies identified. Inspection will consist of the following as a minimum:

3.7 CLEANING

- .1 Progress Cleaning: In accordance with Section 01 74 00 - Cleaning. Remove excess adhesive before cured.
- .2 Final Cleaning: In accordance with Section 01 74 00 – Cleaning.
- .3 Waste Management: Perform in accordance with Section 01 74 19 – Waste Management and Disposal.

3.8 PROTECTION

- .1 Protect flooring with non-marring temporary coverings until Work has been approved by JASON FUNG ARCHITECT INC.
- .2 Prohibit traffic on resilient tile flooring for a minimum 48 hours after installation.
- .3 Protect resilient tile flooring from heavy rolling loads during construction with plywood, hardboard, or other protection method recommended by resilient tile flooring manufacturer.
- .4 Allow a minimum 24 hours for site-applied finishes to dry before permitting foot traffic and a minimum 7 days before placing furniture and similar heavy objects.

END OF SECTION

1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Not Used.

1.2 REFERENCE STANDARDS

- .1 Environmental Protection Agency (EPA)
 - .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, EPA Method 24 - Surface Coatings.
 - .2 SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS).
- .3 Master Painters Institute (MPI)
 - .1 The Master Painters Institute (MPI)/Architectural Painting Specification Manual (ASM) - current edition.
 - .2 Standard GPS-1, MPI Green Performance Standard.
 - .3 Standard GPS-2, MPI Green Performance Standard.
- .4 National Research Council Canada (NRC)
 - .1 National Fire Code of Canada (NFC).
- .5 Society for Protective Coatings (SSPC)
 - .1 SSPC Painting Manual, Systems and Specifications Manual.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Scheduling:
 - .1 Submit work schedule for various stages of painting to HWDSB for review. Provide schedule minimum of 48 hours in advance of proposed operations.
 - .2 Obtain written authorization from HWDSB for changes in work schedule.
 - .3 Schedule new additions to existing building coordinate painting operations with other trades.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's instructions, printed product literature and data sheets for paint and paint products and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
 - .3 Confirm products to be used are in MPI's approved product list.
- .3 Upon completion, provide records of products used. List products in relation to finish system and include the following:
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour numbers.
 - .4 MPI Environmentally Friendly classification system rating.
 - .5 Manufacturer's Safety Data Sheets (SDS).

- .4 Samples:
 - .1 Submit full range colour sample chips to indicate where colour availability is restricted.
 - .2 Submit duplicate 200 x 300mm sample panels of each paint, stain, clear coating, special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
 - .1 3 mm plate steel for finishes over metal surfaces.
 - .2 13 mm plywood for finishes over wood surfaces.
 - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
 - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
 - .5 10 mm plywood for finishes over wood surfaces.
 - .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
- .5 Certificates: Provide certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties. MPI Gateway #.
- .6 Manufacturer's Instructions:
 - .1 Provide manufacturer's installation and application instructions.

1.5 CLOSEOUT SUBMITTALS

- .1 Provide in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: Provide operation and maintenance data for painting materials for incorporation into manual.
- .3 Include:
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour numbers.
 - .4 MPI Environmentally Friendly classification system rating.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- .1 Extra Stock Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Submit one four litre can of each type and colour of primer, stain, finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

1.7 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Contractor: to have a minimum of 5 years proven satisfactory experience. When requested, provide list of last 3 comparable jobs including, job name and location, specifying authority, and project manager.
 - .2 Conform to latest MPI requirements for exterior painting work including preparation and priming.
 - .3 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
 - .4 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by HWDSB.
 - .5 Standard of Acceptance:

- .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
- .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
- .2 Mock-Ups:
 - .1 When requested by HWDSB or Paint Inspection Agency, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and quality of work to MPI Painting Specification Manual standards for review and approval.
 - .2 Construct mock-ups in accordance with Section 01 43 00 - Quality Assurance.
 - .1 Provide 300mm x 300mm mock-up. Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen, textures.
 - .2 Mock-up will be used:
 - .1 To judge quality of work, substrate preparation, operation of equipment and material application and skill to MPI Architectural Painting Specification Manual standards.
 - .3 Locate where directed.
 - .4 Allow 24 hours for inspection of mock-up before proceeding with Work.
 - .5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may not remain as part of finished work. Remove mock-up and dispose of materials when no longer required and when directed by HWDSB.

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .1 Labels: to indicate:
 - .1 Type of paint or coating.
 - .2 Compliance with applicable standard.
 - .3 Colour number in accordance with established colour schedule.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Observe manufacturer's recommendations for storage and handling.
 - .3 Store materials and supplies away from heat generating devices.
 - .4 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
 - .5 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of HWDSB. After completion of operations, return areas to clean condition to approval of HWDSB.
 - .6 Remove paint materials from storage only in quantities required for same day use.
 - .7 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

- .8 Fire Safety Requirements:
 - .1 Provide one Type ABC fire extinguisher adjacent to storage area.
 - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada (NFC).
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19 - Waste Management and Disposal.

1.9 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces.
 - .2 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
 - .3 Provide continuous ventilation for 7 days after completion of application of paint.
 - .4 Coordinate use of existing ventilation system with HWDSB and ensure its operation during and after application of paint as required.
 - .5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
 - .6 Provide minimum lighting level of 323 Lux on surfaces to be painted.
 - .7 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Unless pre-approved written approval by Specifying body and product manufacturer, perform no painting when:
 - .1 Ambient air and substrate temperatures are below 10 degrees C.
 - .2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
 - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
 - .4 The relative humidity is under 85 % or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
 - .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
 - .6 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
 - .2 Perform painting work when maximum moisture content of the substrate is below:
 - .1 12 % for concrete and masonry (clay and concrete brick/block). Allow new concrete and masonry to cure minimum of 28 days.
 - .2 15 % for hard wood.

- .3 17 % for soft wood.
- .4 12 % for plaster and gypsum board.
- .3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
- .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .8 Surface and Environmental Conditions:
 - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
 - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
 - .3 Apply paint when previous coat of paint is dry or adequately cured.
- .9 Additional interior application requirements:
 - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.
 - .2 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of HWDSB such that painted surfaces will have dried and cured sufficiently before occupants are affected.

2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- .1 Environmental Performance Requirements:
 - .1 Provide paint products meeting MPI "Environmentally Friendly" E3 ratings based on VOC (EPA Method 24) content levels
 - .2 Green Performance in accordance with MPI Standard GPS-2.

2.2 MATERIALS

- .1 Only Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project
- .2 Provide paint materials for paint systems from single manufacturer. Acceptable Products:
 - .1 Benjamin Moore.
 - .2 Sherwin Williams.
 - .3 Dulux-Giddien.
 - .4 Para Paints and Coatings.
- .3 Only qualified products with E3 "Environmentally Friendly" rating are acceptable for use on this project.
- .4 Conform to latest MPI requirements for interior painting work including preparation and priming
- .5 Provide paint products meeting MPI "Environmentally Friendly" E3 ratings based on VOC (EPA Method 24) content levels.
- .6 Use MPI listed materials having minimum E3 rating where indoor air quality (odour) requirements exist.
- .7 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids to be:
 - .1 Be Water-based.
 - .2 Be non-flammable.

- .3 Be manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
- .4 Be manufactured without compounds which contribute to smog in the lower atmosphere.
- .5 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
- .8 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne surface coatings does not release:
 - .1 Matter in undiluted production plant effluent generating 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.
 - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.
- .9 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.
- .10 Recycled water-borne surface coatings to contain 50% post-consumer material by volume.
- .11 Recycled water-borne surface coatings must not contain:
 - .1 Lead in excess of 600.0 ppm weight/weight total solids.
 - .2 Mercury in excess of 50.0 ppm weight/weight total product.
 - .3 Cadmium in excess of 1.0 ppm weight/weight total product.
 - .4 Hexavalent chromium in excess of 3.0 ppm weight/weight total product.
 - .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

2.3 COLOURS

- .1 HWDSB and JASON FUNG ARCHITECT INC. will provide Colour Schedule after Contract award. Submit proposed Colour Schedule to HWDSB for review.
- .2 Colour schedule will be based upon selection of 5 colours
- .3 Where specific products are available in restricted range of colours, selection based on limited range.
- .4 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats, if requested by HWDSB.
- .5 For deep and ultra deep colours; 4 coats may be required.

2.4 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from HWDSB for tinting of painting materials.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.
- .4 Thin paint for spraying in accordance with paint manufacturer's instructions.
- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity. Strain as necessary.

2.5 GLOSS/SHEEN RATINGS

- .1 Paint gloss is defined as sheen rating of applied paint, in accordance with following values:

Gloss Level	Description	Gloss @ 60 degrees	Sheen @ 85 degrees
G1	Matte Finish (flat)	Max. 5	Max. 10
G2	Velvet-Like Finish	Max.10	10 to 35
G3	Eggshell Finish	10 to 25	10 to 35
G4	Satin-Like Finish	20 to 35	min. 35
G5	Traditional Semi-Gloss Finish	35 to 70	
G6	Traditional Gloss	70 to 85	
G7	High Gloss Finish	More than 85	

.2 Gloss level ratings of painted surfaces as indicated.

2.6 INTERIOR PAINTING SYSTEMS

- .1 Paint interior surfaces in accordance with MPI Architectural Painting Specification Manual requirements.
- .2 Concrete vertical surfaces: including horizontal soffits:
 - .1 INT 3.1M - Institutional low odour/ VOC G3 (over W.B. primer sealer) finish.
- .3 Concrete horizontal surfaces: floors and stairs:
 - .1 INT 3.2F – Concrete floor sealer.
- .4 Clay masonry units: pressed and extruded brick:
 - .1 INT 4.1M - Institutional low odour/ VOC G3 (over W.B. primer sealer) finish.
- .5 Concrete masonry units: smooth and split face block and brick:
 - .1 INT 4.2E - Institutional low odour/ VOC G3 (over latex block filler) finish.
- .6 Structural steel and metal fabrications: columns, beams, joists:
 - .1 INT 5.1S - Institutional low odour/ VOC G3, G6 (over W.B. rust-inhibitive primer) finish.
- .7 Galvanized metal: doors, frames, railings, misc. steel, pipes, overhead decking, and ducts.
 - .1 INT 5.3M – High performance architectural latex G6 (over W.B. galvanized primer) finish.
 - .2 INT 5.3N - Institutional low odour/ VOC G3 (over W.B. galvanized primer) finish.
- .8 Dressed lumber: including doors, door and window frames, casings, mouldings:
 - .1 INT 6.3A – High performance architectural latex G6 (over latex primer) finish.
- .9 Wood paneling and casework: partitions, panels, shelving, millwork:
 - .1 INT 6.4C – Semi-Transparent stain, S.B. finish.
- .10 Wood floors and stairs: including hardwood flooring:
 - .1 INT 6.5B – Polyurethane varnish G4 (over S.B. stain).
- .11 Plaster and gypsum board: gypsum wallboard, drywall, “sheet rock type material”, and textured finishes):
 - .1 INT 9.2B – High performance architectural latex G3 (over latex primer/sealer) finish.

3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 GENERAL

- .1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable to be painted in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of HWDSB.
 - .2 Inform HWDSB of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from HWDSB.
- .2 Interior repainting work: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor to notify Paint Inspection Agency minimum of one week prior to commencement of work and provide copy of project repainting specification and Finish Schedule.
- .3 Interior surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify HWDSB in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.
- .4 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .5 Maximum moisture content as follows:
 - .1 Stucco, plaster and gypsum board: 12 %.
 - .2 Concrete: 12 %.
 - .3 Clay and Concrete Block/Brick: 12 %.
 - .4 Hard Wood: 15 %.
 - .5 Soft Wood: 17%.

3.4 PREPARATION

- .1 Protection (not applicable to new painting work):
 - .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by HWDSB.
 - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
 - .3 Protect factory finished products and equipment.
 - .4 Protect passing pedestrians, building occupants and general public in and about the building.
- .2 Surface Preparation (not applicable to new painting work):
 - .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting

- operations. Identify and store items in secure location and re-installed after painting is completed.
- .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of HWDSB.
- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
 - .1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
 - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
 - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - .4 Allow surfaces to drain completely and allow to dry thoroughly.
 - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
 - .6 Use trigger operated spray nozzles for water hoses.
 - .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .4 Clean following surfaces with high pressure water washing.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .6 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
 - .1 Apply sealer to MPI #36 over knots, pitch, sap and resinous areas
 - .2 Apply wood filler to nail holes and cracks.
 - .3 Tint filler to match stains for stained woodwork.
- .7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
- .8 Carried out during shop priming: clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes, blowing with clean dry compressed air or vacuum cleaning.
- .9 Touch up of shop primers with primer as specified.
- .10 Do not apply paint until prepared surfaces have been accepted by HWDSB

3.5 EXISTING CONDITIONS

- .1 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test" and report findings to HWDSB. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .2 Maximum moisture content as follows:
 - .1 Stucco: 12 %.
 - .2 Concrete: 12 %.
 - .3 Clay and Concrete Block/Brick: 12 %.

- .4 Hard Wood: 15 %.
- .5 Soft Wood: 17%.

3.6 APPLICATION

- .1 Method of application to be as approved by JASON FUNG ARCHITECT INC.. Apply paint by brush and roller. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
 - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
 - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
- .4 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .6 Sand and dust between coats to remove visible defects.
- .7 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
- .8 Finish inside of cupboards and cabinets as specified for outside surfaces.
- .9 Finish closets and alcoves as specified for adjoining rooms.
- .10 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.
- .11 Metal grid, drywall, plaster, concrete, and concrete masonry units; if sprayed, must be back rolled.

3.7 MECHANICAL/ELECTRICAL EQUIPMENT

- .1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as indicated.
- .2 Boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.
- .3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.
- .4 Do not paint over nameplates.
- .5 Keep sprinkler heads free of paint.
- .6 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .7 Paint fire protection piping red.
- .8 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .9 Paint natural gas piping yellow.
- .10 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.
- .11 Do not paint interior transformers and substation equipment.

3.8 SITE TOLERANCES

- .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
- .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.9 SITE QUALITY CONTROL

- .1 Interior painting and decorating work to be inspected by a MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor will notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project painting specification, plans and elevation drawings (including pertinent details) as well as a Finish Schedule.
- .2 Interior surfaces requiring painting to be inspected by Paint Inspection Agency who will notify HWDSB and General Contractor in writing of defects or problems, prior to commencing painting work, or after prime coat shows defects in substrate.
- .3 Where "special" painting, coating or decorating system applications (i.e. elastomeric coatings) or non- MPI listed products or systems are to be used, paint or coating manufacturer will provide as part of this work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to HWDSB.
- .4 Standard of Acceptance:
 - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Ceilings: no defects visible from floor at 45 degrees degrees to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
- .5 Advise HWDSB when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .6 Cooperate with inspection firm and provide access to areas of work.
- .7 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by HWDSB.

3.10 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .3 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.11 RESTORATION

- .1 Clean and re-install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of HWDSB. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by HWDSB.

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This section includes, but is not limited to, supply and installation of washroom accessories work in accordance with the Contract Documents.

1.2 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 06 20 00 – Finish Carpentry
- .3 Section 09 21 16 – Gypsum Board Assemblies
- .4 Section 09 30 00 – Tiling

1.3 REFERENCE STANDARDS

- .1 ASTM International (ASTM)
 - .1 ASTM A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A153/A153M, Standard Specification for Zinc (Hot-Dip) Coating on Iron and Steel Hardware.
 - .3 ASTM A167, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .4 ASTM A240/240M, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
 - .5 ASTM A269/A269M, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .6 ASTM A276/A276M, Standard Specification for Stainless Steel Bars and Shapes.
 - .7 ASTM A312, Specification for Seamless and Welded Austenitic Stainless Steel Pipes.
 - .8 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .9 ASTM A924/A924M, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - .10 ASTM A1008/A1008M, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution hardened, and Bake Hardenable.
 - .11 ASTM B456, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
 - .12 ASTM F2285, Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.81, Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
 - .2 CAN/CGSB-1.88, Gloss Alkyd Enamel, Air Drying and Baking.
 - .3 CAN/CGSB-12.5, Mirrors, Silvered.
 - .4 CAN/CGSB 31-GP-107MA, Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
- .3 CSA Group (CSA)
 - .1 CAN/CSA-B651, Accessible Design for the Built Environment.
 - .2 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Preconstruction Meetings: Arrange a preconstruction meeting in accordance with Section 01 31 19 – Project Meetings attended by Subcontractor, Contractor, HWDSB and JASON FUNG ARCHITECT INC.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: Submit manufacturer's promotional brochures, specifications and installation instructions.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada as necessary.
 - .2 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.
- .4 Samples for Initial Selection:
 - .1 Submit samples to HWDSB.
 - .2 Samples will be returned for inclusion into work.

1.6 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 – Closeout Submittals.
- .2 Operation and Maintenance Data: Submit three copies of the manufacturer's maintenance instructions.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- .1 Operations and Maintenance Data: Submit manufacturer's cleaning and repair recommendations in accordance with Section 01 78 00 – Closeout Submittals.
- .2 Tools:
 - .1 Provide special tools required for assembly, disassembly or removal for washroom accessories in accordance with requirements specified in Section 01 78 00 - Closeout Submittals.
 - .2 Deliver special tools to HWDSB

1.8 WARRANTY

- .1 Submit an extended warranty for washroom accessories work in accordance with the General Conditions, except that the warranty period is extended to 10 year.
- .1 Against cracked or scratched mirrors, spoiling or deterioration of silvering or backing, loosening of fastenings or adhesive.
- .2 Coverage: complete replacement including affected adjacent work.

1.9 DELIVERY, STORAGE, AND HANDLING

- .1 Perform in accordance with Section 01 61 00 - Common Product Requirements:
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

- .2 Store and protect washroom accessories from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials.

2 PRODUCTS

2.1 MANUFACTURERS

- .1 Approved Manufacturers:
 - .1 ASI Group Canada.
 - .2 Bobrick Washroom Equipment Inc.
 - .3 Bradley.
 - .4 Frost Products Limited
- .2 Substitutions: Permitted, subject to review by HWDSB and JASON FUNG ARCHITECT INC.
- .3 Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

2.2 MATERIALS

- .1 Steel Sheet: To ASTM 1008/A1008M, Commercial Steel (CS) Types A, B, C; cold-rolled steel sheet in thicknesses as specified.
- .2 Stainless Steel Plate, Strip and Sheet: To ASTM 240/A240M, Type 304; sizes and thicknesses as specified.
- .3 Stainless Steel Tubing: To ASTM A276/A276M, Grade TP316; thicknesses, diameters, and sizes as specified.
- .4 Stainless Steel Bars and Shapes: To ASTM A276/A276M, Type 304; sizes and profiles as indicated.
- .5 Mirrored Glass: Type GL-2, as specified in Section 08 80 00 – Glazing.
- .6 Adhesive: Two-component epoxy type, waterproof
 - .1 Urea Formaldehyde Free
- .7 Fasteners, Screws, and Bolts: Galvanized steel, tamper-proof, security type. Exposed fasteners to match face of unit, Sizes to suit application.
- .8 Expansion Shields: Fibre, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.3 COMPONENTS

- .1 Refer to Drawings for quantity and location of washroom accessories and fixture schedule on drawings.
- .2 Toilet Tissue Dispenser: double roll type, surface mounted, chrome plated steel frame, capacity of 500 double ply roll, roll under spring tension for controlled delivery.
- .3 Soap Dispenser: lather push-in valve 64 mm spout, self contained 340 mL translucent polyethylene 1.14 L tank, stainless steel piston and valve assembly, tamper proof filler lock, surface mounted, exposed metal components chrome plated.
- .4 Sanitary Napkin Disposal: stainless steel surface unit including rough-in frame, continuous hinged door, self closing, embossed with "napkin disposal" universally accepted symbol, removable stainless steel receptacles fitted with spring clip for deodorizer block. Acceptable product: Frost #326 Stainless Steel Wall Mount Receptacle.
- .5 Grab bars: 30/32 mm diameter x 1.6 mm wall, tubing of stainless steel, 76mm diameter wall

flanges, concealed screw attachment, flanges welded to tubular bar, provided with steel back plates and all accessories. Knurl bar at area of hand grips. Grab bar material and anchorage to withstand downward pull of 2.2 kN.

- .6 Combination Paper Towel Dispenser Waste Receptacle: Recessed or semi-recessed, stainless steel. Coordinate with school requirements.
- .7 Tilt mirror: wall mounted unit, fixed framed mirror 6 mm, stainless steel frame.

2.4 FABRICATION

- .1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.
- .2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.
- .3 Brake form sheet metal work with 1.5 mm radius bends.
- .4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- .5 Back paint components where contact is made with building finishes to prevent electrolysis.
- .6 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CAN/CSA-G164
- .7 Shop assemble components and package complete with anchors and fittings.
- .8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.
- .9 Provide steel anchor plates and components for installation on studding and building framing.

2.5 FINISHES

- .1 Chrome/Nickel Plating: to ASTM B456, satin finish.
- .2 Shop Primed Coating: Pretreat and clean, spray apply one coat primer, and bake.
- .3 Galvanized Coating on Steel Components: TO ASTM A123/A123M, Z275 hot dipped zinc alloy coating.
- .4 Galvanized Coating on Steel Hardware: To ASTM A153/A153M, Class B2 hot dipped zinc alloy coating.
- .5 Stainless Steel Plate and Sheet: To ASTM A240/A240M, No. 4 – Brushed.
- .6 Stainless Steel Tubing: To ASTM A269/A269M, No.4 – Brushed.
- .7 Stainless Steel Bars and Shapes: To ASTM A276/A276M, No.4 – Brushed.
- .8 Baked Enamel Coating: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by HWDSB.
- .9 Manufacturer's or brand names on face of units not acceptable.

3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrates and surfaces to receive washroom accessories previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's instructions prior to toilet and bathroom accessories installation.
- .2 Inform HWDSB and JASON FUNG ARCHITECT INC. of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval from HWDSB and JASON FUNG ARCHITECT INC.

3.2 PREPARATION

- .1 Provide templates, inserts, and rough-in frames and verify exact location of washroom accessories for installation.
- .2 Verify and provide adequate supports and/or blocking in wall assemblies prior to installation of washroom accessories.
- .3 Provide fastening and mounting kits for washroom accessories.
- .4 Provide exposed tamper-proof screws of stainless steel to match units.

3.3 INSTALLATION

- .1 Install and secure accessories rigidly in place as follows:
 - .1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.
 - .2 Hollow masonry units, existing plaster or drywall: use toggle bolts drilled into cell or wall cavity.
 - .3 Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.
 - .4 Toilet and shower compartments: use male to female through bolts.
- .2 Install grab bars on built-in anchors provided by bar manufacturer.
- .3 Use tamper proof screws/bolts for fasteners.
- .4 Install washroom accessories in accordance with reviewed shop drawings, manufacturer's written instructions, AODA requirements and CAN/CSA B651-M. Where a contradiction occurs, the most stringent requirements shall apply.
- .5 Install washroom accessories plumb, level, and securely and rigidly anchored to substrate surfaces and framing. Adjust accessories for proper operation and verify mechanisms function smoothly.
- .6 Lubricate moving parts to operate smoothly and fit accurately.
- .7 Fill units with necessary supplies shortly before final acceptance of building.

3.4 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
 - .1 Clean and polish exposed surfaces and fill accessories with necessary supplies prior to acceptance by HWDSB and JASON FUNG ARCHITECT INC..
- .3 Waste Management: separate waste materials for reuse and recycling.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility

3.8 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by toilet and bathroom accessories installation

END OF SECTION

1 GENERAL

1.1 SUMMARY

- .1 This section includes supply and install of fire alarm systems and associated devices, facilities, and panels.

1.2 REFERENCE STANDARDS

- .1 Underwriters Laboratories, Inc. (UL):
 - .1 UL924, Standard for Safety of Emergency Lighting and Power Equipment
- .2 National Fire Prevention Association (NFPA):
 - .1 NFPA 72, National Fire Alarm Code
 - .2 NFPA 90A, Installation of Air Conditioning and Ventilation Systems.
- .3 National Research Council Canada (NRC)
 - .1 National Building Code of Canada (NBC)
- .4 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN/ULC-S524, Standard for the Installation of Fire Alarm Systems.
 - .2 CAN/ULC-S525, Audible Signal Device for Fire Alarm Systems.
 - .3 CAN/ULC-S526, Visual Signal Devices for Fire Alarm Systems.
 - .4 CAN/ULC-S527, Control Units.
 - .5 CAN/ULC-S528, Manual Pull Stations for Fire Alarm Systems.
 - .6 CAN/ULC-S529, Smoke Detectors for Fire Alarm Systems.
 - .7 CAN/ULC-S530, Heat Actuated Fire Detectors for Fire Alarm Systems.
 - .8 CAN/ULC-S531, Standard for Smoke Alarms.
 - .9 CAN/ULC-S536-S537, Burglar and Fire Alarm Systems and Components.

1.3 SUBMITTALS

- .1 Comply with Section 01 33 00 – Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's descriptive literature and product specifications for each product.
 - .2 Manufacturer's product drawings.
 - .3 Manufacturer's installation instructions
- .3 Certification:
 - .1 Submit final system testing and verification reports and certificates of approval from local governing inspection authority.

1.4 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Products shall be free of defects in material and workmanship.
- .2 Furnished products are listed and/or certified by third party agencies as suitable for the intended purpose.
- .3 All units will be certified that they have been tested prior to shipping.

1.05 WARRANTY

- .1 Product is warranted free of defects in material and workmanship.
- .2 Product is warranted to perform the intended function within design limits.

2 PRODUCTS

2.1 EXISTING FIRE ALARM SYSTEM

- .1 Provide additional devices and work to extend existing system to serve additional and renovated areas. Additional devices to be 100% compatible with existing system. Include provision of necessary control panel and annunciator work of existing system to accommodate integration of additional devices.
- .2 Include for and engage Owner existing system manufacturer authorized technicians to provide and perform required system products and work.
- .3 Verify with existing fire alarm system manufacturer during Bid period, exact requirements needed to provide renovation work. Confirm and coordinate exact work responsibilities with system vendor. Items of clarification or proposed revisions to Bid Documents must be reviewed with Consultant during Bid Period.

2.2 ADDITIONAL FIRE ALARM SYSTEM WORK

- .1 System work to include, but not limited to, provision of following:
 - .1 Removal and relocation of existing head end equipment including provisions of additional device connection modules, zone modules, amplifiers and system reprogramming.
 - .2 Additional initiating devices (pull stations, heat/smoke/flame detectors).
 - .3 Additional alarm indicating devices (speakers, horns, strobes).
 - .1 All new horns sound patterns shall match sound pattern of existing-to-remain horns throughout the existing school.
 - .4 Additional interfaces and interconnections to auxiliary building systems.
 - .5 Review of existing battery backup capacity and amplifiers (as applicable) and increasing capacities to accommodate additional device loading and to meet applicable governing local code requirements.
 - .6 Additional wiring in conduit and/or fire rated cables.

2.3 MODIFICATIONS AND DEVICES

- .1 Modify control panels and annunciators to supervise and annunciate additional and relocated devices. Additional initiating devices shall be devices that are 100% compatible with existing controls and be ULC listed and labelled for connecting to respective control units. Include costs for manufacturer authorized representative to perform control panel/transponder work and to reprogram system software to accommodate renovation work. Provide additional zone modules as required and additional batteries as required to supply back-up battery capacity to the additional components.
- .2 Additional devices to be ULC listed and labelled devices suitable for fire alarm applications. Power supplies and other components to be CSA approved where required by local governing authorities and codes.
- .3 Exact type of device to be used in each area of installation to be as recommended by system manufacturer to suit specific applications and to be approved for such use as per ULC standards. Devices in non-climatic controlled areas to be weatherproof, corrosion resistant and ULC listed for use in below freezing temperatures. System manufacturer to be responsible for ensuring compliance with these requirements.
- .4 Devices:
 - .1 Smoke and Heat Detectors: To be of type and rating to suit specific application as per existing system manufacturer recommendations.
 - .2 Audible Devices: of type to match existing system standards.

- .3 Strobes and combinations strobes/audible devices: of type to match existing system standards; include additional strobes to meet latest governing building code requirements.
- .4 Addressable modules as required for connection of additional devices.
- .5 Ancillary devices as required to complete system.
- .6 Refer to drawings for additional device requirements.
- .5 End-Of-Line Resistors and Isolators:
 - .1 End-of-line resistors for standard alarm and signalling circuits to be sized to ensure correct supervisory current flows in each circuit.
 - .2 End-of-line resistors to be mounted on a stainless steel plate for mounting on a standard single gang box and bear ULC label.
- .6 Wiring:
 - .1 CSA approved and ULC listed wire and cable, approved for fire alarm circuits; with colour coded, insulated solid copper conductors; of type as per local governing electrical code and local governing fire authority requirements.
 - .2 Sized and installed in accordance with system Manufacturer instructions and local governing electrical code.
 - .3 Fire rated MI for wiring as required by local governing building code, local governing authorities and as noted on drawings, for connections and interconnections to equipment for life safety applications.
 - .4 To be mechanically protected to satisfaction of local fire authority.
 - .5 Pentair "Pyrotenax" type "MI" ULC listed and labelled, 2 hour fire rated, mineral insulated, copper sheathed, copper conductors for power, control and signal wiring to and between each transponder/control panel, and for other local code required or local governing authority required applications with regards to life safety equipment.

3 EXECUTION

3.1 INSTALLATION – GENERAL

- .1 Prior to start of Work as part of shop drawing submission process, review with system manufacturer the following:
 - .1 Device types to ensure that selected type is suitable for intended application on project;
 - .2 Locations of devices to ensure proper operation and coverage are in compliance with requirements of local fire authorities;
 - .3 Device mounting heights to ensure proper operation and coverage are in compliance with requirements of local fire authorities;
 - .4 Device back box requirements to ensure size and depth suit system manufacturer recommendations for specific devices;
 - .5 Types of system wiring and required sizing taking into consideration applications and voltage drop;
 - .6 System circuiting and device quantities per circuit while maintaining limitations in Specifications;
 - .7 Proposed revisions required to existing system sequence of operation.
- .2 Immediately advise Consultant of any requirements of above that may necessitate revisions to design documents.
- .3 Install fire alarm system components and connect complete.
- .4 Perform Work in conjunction with this installation to meet requirements of latest editions of local

governing building code, local governing electrical code, ULC Standards including Installation Standard CAN/ULC-S524, and any applicable local governing codes. If any requirements of these specifications are different, omitted or contrary to ULCS524 Standard, then ULC Standard governs and overrides these specifications, but in no instance will standards established by drawings and specifications be reduced by any of Codes referred to previously. Control units and annunciators to be in accordance to latest requirements of ULC Standard CAN/ULC-S527 "Control Units for Fire Alarm Systems.

- .5 In addition, work to meet Owner's standards, and recommendations and instructions from system manufacturer.
- .6 During work to existing fire alarm system, proposed time and duration of interruption to be approved by Consultant. At any time due to emergency situations, Owner may request by-passed zone(s) to be re-instated immediately. In all areas where renovation work requires shutdown of any part of fire alarm protection system, provide manual fire alarm protection (Fire Warden) by means of supervising area as approved by local governing authorities. At no time allow fire alarm system or any one (1) zone to be left inoperative overnight. Provide required bypass wiring and temporary wiring to maintain all parts of fire alarm system operative during construction and alterations.
- .7 Fire alarm system Manufacturer authorized technician to supervise control panel, transponder, and annunciator work.
- .8 Provide sequence of operation for fire alarm system as approved by local fire authority and reviewed by Consultant. Refer to additional requirements on drawings.
- .9 Demonstrate system to local Fire Department and obtain their approval for complete system.

3.2 INSTALLATION – CONTROL UNITS

- .1 Install required additional transponders, and make modifications to existing controls, panels, and annunciator.
- .2 Re-programme system to accommodate system modifications and to accommodate additional devices and zones, as required. Submit proposed software programming revisions to Consultant and local fire authority for review and approval prior to start of work.
- .3 Install units in accordance with Manufacturer instructions.
- .4 Connect transponders to dedicated 15A breakers in nearest emergency panel as shown or as scheduled. Ensure that room housing panels have fire rating to local governing code requirements. Provide fire rated conductors as required.
- .5 Properly ground and bond transponders to building ground. Conduit ground will not be acceptable. Provide green coloured grounding loop, a minimum #10 AWG insulated copper conductor run in conduit. Connect ground loop to main building ground system source. Do not run ground wire in same conduit as fire alarm and communication wiring.

3.3 INSTALLATION – DEVICES

- .1 Install required devices. Do not install devices in locations that may hamper proper operation of devices including adjacent devices.
- .2 Obtain required training from manufacturer representative on any special installation procedures. Install devices and perform work in accordance with Manufacturer instructions and requirements and in accordance to applicable codes of local governing authorities having jurisdiction.
- .3 Review device finishes with Consultant prior to ordering.
- .4 Install manual pull stations in boxes as required, recessed outlet boxes with plaster rings, except in unfinished areas where pull stations are surface mounted, in which case, install stations in surface mounted boxes. Comply with mounting height requirements for local governing building code barrier free access.

- .5 Install mounting plate of thermal detectors to ceiling mounted boxes as required. Secure detectors to plates. Refer to floor plans and drawing symbol list to determine rating of detectors in any given area. Generally, do not install rate-of-rise type detectors in areas subject to sudden changes in temperatures, such as entrance vestibules. Confirm application requirements with system manufacturer and ensure that devices are ULC listed for such applications and are approved by local fire authority for such use.
- .6 Secure base of each ceiling mounted products of combustion detectors to boxes as required, either flush or surface mounted as required. Secure detector heads to bases.
- .7 Install cross zoned connection of detectors and remote indicating devices for areas of raised floors or within accessible ceiling spaces or for applications detailed on drawings.
- .8 In application with hold open devices on doors, ensure compliance with NFPA regarding smoke detectors tied to hold open devices such that a signal received directly from smoke detector to cause release of door. Where electromagnetic locks are used on doors of egress, provide required automatic release of locks upon activation of fire alarm (i.e. via connection to auxiliary contact of adjacent pull station). Provide required conductors and connections to fire alarm system and to electromagnetic locks.
- .9 Wire speakers in Class B, 2 wire circuit configuration, terminating in end of line devices. Wire alternate speakers in same circuits with a minimum of 2 circuits per floor.
- .10 Generally, audible device locations are indicated on drawings, however, exact audible device quantities and locations to be in accordance with results of audibility device coverage site tests. Provide suitable sound detection metering and personnel to make necessary tests. Relocate audible devices and/or provide additional audible devices as required.
- .11 Install amplifiers sized as required to power additional speakers and include spare capacity as specified.
- .12 Typically, Install visual notification appliances 2400 mm (8') above floor or 300 mm (12") below finished ceiling line. Provide visual notification devices in areas subject to high ambient noise levels, such as mechanical equipment rooms, computer equipment rooms, parking garage, etc., and areas designated for hearing impaired as per local building code requirements. Provide minimum 2 circuits per floor and connect devices in alternating scheme.
- .13 Provide required additional devices and install existing devices as required. Circuit devices to existing standards and in compliance with local governing codes and authorities. Determine exact quantities of circuits based on requirements of governing codes and standards, and recommendations of system manufacturer.
- .14 Unless otherwise noted in Contract Documents, do not load device circuits more than 80% capacity.
- .15 Devices in non-climate controlled areas to be weatherproof, corrosion resistant, ULC listed for operation in below freezing temperatures, and as recommended by system manufacturer for use for each specific application. Where electronics are not recommended for cold temperature applications, include for Manufacturer recommendations and directions in remotely locating addressable modules in closest heated areas and connecting to respective device in non-climate controlled areas.

3.4 REQUIREMENTS FOR INTEGRATED SYSTEMS & EQUIPMENT

- .1 Perform required fire alarm system wiring connections to mechanical equipment and other building systems to perform required interrelated functions. Provide required wiring, relays and/or contactors between fire alarm system and various equipment to achieve automatic or manual control of equipment, to perform required integrated to fire alarm system functions. Provide shunt trip breakers as required. Provide fire rated conductors where required by local codes and local authorities.

- .2 Provision of fire alarm supervisory wiring connections to include but not be limited to following (where applicable):
 - .1 Fan equipment starters;
 - .2 Pumps;
 - .3 Door holders/releases and electromagnetic locks;
 - .4 Devices as shown on drawings

3.5 ADDITIONAL REQUIREMENTS

- .1 Provide required system wiring in accordance to requirements of applicable governing electrical code, other local governing code and standards requirements, system manufacturer's recommendations and based on specific applications and consideration of voltage drop.
- .2 Install wiring in conduit unless otherwise directed by Consultant. Perform wiring connections associated with fire alarm system on terminal strips in junction boxes and colour coded. Provide wiring colour coding consistent for entire length of each run. When pulling wires into conduit, use lubricant and run wires straight and not twisted or abraded. Neatly secure exposed wires in apparatus enclosures with approved supports or ties. Clearly identify wiring at each termination point. In addition, number wiring with Brady Ltd. or Electrovert Ltd. Z-type markers. Colour conductors for each part of system in accordance with system equipment Manufacturer recommendations. Paint conduit couplings red of paint type suitable for application to standards of Division 09.
- .3 Where existing devices are relocated and existing wiring is of insufficient length to connect to relocated position, provide replacement wiring and conduit of sufficient length.
- .4 Where required by local governing codes and/or local governing authorities, provide ULC listed, fire rated conductors (MI) for connections to and interconnections between equipment for life safety applications requiring fire rating. Install MI type conductors in accordance with manufacturer's instructions and requirements in Specification.
- .5 Run alarm indicating circuits (speakers) and alarm receiving circuits (pull stations, detectors) in separate conduits from each other.
- .6 Provide engraved Lamacoid identification nameplates for each equipment or wiring housing and secure to front of housing. Confirm exact wording designations and sizes to with Consultant prior to manufacture.
- .7 Review nomenclature of annunciator identification with Consultant prior to ordering.
- .8 Install end-of-line resistors to electrically supervise wiring. Generally, locate end-of-line resistors at ceiling lines above a pull station location. Provide isolators and install in accordance with ULC standards. Properly label and identify. Do not locate end-of-line resistors and isolators in concealed locations. Generally install in equipment rooms.
- .9 Refer to drawing riser diagram. Riser drawings are diagrammatic and are not to be used for determining quantities or lengths. Quantities of components to be as per floor plans. Determine exact quantities of circuits based on drawings information, connected devices, requirements of governing codes and standards, and recommendations of system manufacturer.
- .10 Review exact location of components prior to roughing-in.
- .11 Ground and bond system as required by local governing electrical code and authority and system manufacturer.

3.6 SYSTEM TESTING, VERIFICATION & CERTIFICATION

- .1 Include for fire alarm system manufacturer to inspect, test, verify and certify system components and wiring, individually and as a complete system, in accordance with requirements of CAN/ULC S537. Work to include but not be limited to provision of following:
 - .1 To ensure that type of equipment installed is that designated by Contract Documents;

- .2 To ensure that wiring connections to equipment components show that installer observed ULC and CSA requirements;
 - .3 To ensure that equipment was installed in accordance manufacturer recommendations, and that signalling devices of whatever manufacture were operated or tested to verify their operation;
 - .4 To ensure that supervisory wiring of those items of equipment connected to a supervised circuit is operating and that governmental regulations, if any, concerning such supervisory wiring, have been met to satisfaction of inspecting officials;
 - .5 To ensure that sequence of operation is in accordance with existing sequence of operation and any modifications identified on documents and are approved by local fire authority;
 - .6 To ensure that devices are commissioned and operable.
- .2 System manufacturer to also be responsible for, but not be limited to, provision of following additional work to existing systems:
- .1 Coordinate with local fire authority inspector and Electrical Division Contractor, required testing and verification work in order to obtain certification and meet local fire code and local fire authority requirements;
 - .2 Test system battery power supplies and demonstrate compliance with local governing building code and local fire authority requirements that battery supplies are capable of providing required 24 hours of supervisory power followed by local governing building code required time (or time directed by local fire authority) of full load power; exact method of testing to be approved by local fire authority, Consultant and Owner; confirm exact procedures with previously named parties prior to testing; include for sufficient sound measurement devices and personnel in order to successfully comply with this requirement;
 - .3 Full review, testing, and verification of operation of building ventilation and smoke exhaust system and its integrated operation with fire alarm system and various pieces of air handling equipment;
 - .4 Full review, testing and verification of operation of integrated systems such as elevators and their emergency sequence of operation, supervisory annunciation of sprinkler/standpipe monitor switches, pressure switches and flow switches, diesel genset alarms, security alarms, BAS alarms, release of door holders and electromagnetic locks, and any other integrated components; coordinate requirements with trades responsible for integrated components and systems who will be present at time of testing and verification work;
 - .5 Test that system audible devices provide alarm sound levels in areas as per local governing building code and local fire authority requirements; site adjust tap settings of audible devices as required to achieve required audibility levels; also test that emergency voice communication system meets or exceed intelligibility requirements of local governing building code and is approved by local fire authority;
 - .6 Assist in testing and verification of electromagnetic door locks to meet requirements of authorities having jurisdiction and to obtain overall approval of installation;
 - .7 Coordination with Electrical Divisions and local fire authority to provide requirements to obtain certificates of approvals from local fire authority;
 - .8 Provide full detailed test sheets of tested components and provide certification that system work has been fully tested, that devices have passed testing and that system is in proper work order in compliance to local governing code requirements and project documents; testing report documents to be additionally provided in electronic format as confirmed with Owner and Consultant.
- .3 Where project work is phased and Owner requires occupancy at various stages, include for providing system testing, verification and certification after completion of each phase of work, to approval of local governing authorities. Upon Substantial Performance of the Work, include for providing system testing, verification and certification of entire system work.
- .4 Contact local fire authority inspector and coordinate and arrange for Fire Inspector to perform

required inspections. Integrate local fire authority inspection requirements with testing and verification work to extent as per Fire Inspector's directions. Obtain full approval and certification by local fire authority.

- .5 Local fire authority inspector, Consultant and Commissioning Agent to at their discretion test system or parts of system in their review of test reports. Correct/repair any failures or deficiencies found in system, whether or not identified in test reports of manufacturer. Re-test and re-verify until successfully passed, at no extra cost to Owner.
- .6 Obtain from local fire authority required certificate of approval of system and forward to Consultant.
- .7 Arrange for manufacturers to supply reasonable amounts of technical assistance with respect to any changes required to conform to paragraphs above. During period of inspection, testing and verification, make Electricians available to do any required correction work and to assist during this Work. Include for trades responsible for integrated components (i.e. exhaust fans, sprinklers, elevators, gensets, etc.) and systems to be present at time of testing and verification work.
- .8 On completion of verification, inspection and testing of system, obtain from manufacturer and forward to Consultant, a verification certificate together with detailed inspection reports listing each and every system component, its location in building and its acceptability. Verification certificate and inspection reports to be prepared and signed by certified testing technicians of manufacturer. Signed test reports to confirm that systems are installed and perform in accordance with requirements specified above.
- .9 Obtain from system manufacturer and testing agency and forward to Consultant a certificate of liability insurance of minimum amount of Two Million Dollars (\$2,000,000.00) that is to be registered for this project to show satisfactory proof of manufacturer liability coverage for both their product and personnel.
- .10 Include for re-verification of any failed device repaired or replaced, until successful testing and verification.
- .11 Unless approved in writing by Consultant and Owner, do not use open flame and/or smoke for testing.
- .12 Testing technician to be certified and approved for fire alarm system testing by Canadian Fire Alarm Association (CFAA) and or be a Certified Fire Alarm Electrician (CFAE) with Electrical Contractors Association of Ontario (ECAO) as deemed acceptable to Ontario Fire Marshall.
- .13 Additionally, refer to testing, coordination and verification requirements in Section titled Electrical Work Analysis and Testing and include applicable requirements.
- .14 The Electrical Contractor shall warrant that the components of the fire alarm system installed as part of this work shall remain in good working order for a period of one year from the date of verification. Should components of the system fail to perform as intended under normal operating conditions at any time during this one year period, the Client shall notify the Electrical Contractor in writing. The Electrical Contractor shall repair or replace the failed equipment/devices to maintain a fully operational fire alarm system.

3.7 MONITORING OF SYSTEMS

- .1 In areas that remain occupied and used by Owner during Work, daily monitor and supervise existing fire alarm system serving renovation/working areas. Ensure that system is left in proper operating condition at end of each working day. Include for but not be limited to performing following:
 - .1 Under presence of Owner representative, check each morning and evening (start and end of work) of each day, system to ensure that it is in proper working condition;
 - .2 If portions of system are not in proper working order, provide temporary bypass wiring (if fire alarm system, must be subject to approval of local fire authority), and/or provide supervisory personnel to monitor systems for area affected;
 - .3 Document and sign off with Owner representative signing off also, each respective daily check condition;

- .4 Ensure that work to system does not affect portion of system serving areas outside of renovation/working areas.
- .2 Maintain fire protection of areas which may include fire watch during temporary shutdowns of existing systems, in accordance with requirements of local governing code and local governing authorities.

3.8 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: in accordance with Section 01 74 19 - Waste Management and Disposal.

END OF SECTION



March 30, 2026

Hamilton-Wentworth District School Board
20 Education Court
Hamilton, ON

Re: **Revised Hazardous Building Materials Assessment (Preconstruction)**
Accessibility Washroom Renovation
Dundas Valley Secondary School, 310 Governors Road, Dundas, ON
Pinchin File: 352293.012

Hamilton-Wentworth District School Board (Client) retained Pinchin Ltd. (Pinchin) to conduct a hazardous building materials assessment of Dundas Valley Secondary School located at 310 Governors Road, Dundas, ON.

Pinchin performed the assessment on December 23, 2025 and March 2, 2026. The assessor was unaccompanied during the assessment. The assessed area was unoccupied at the time of the assessment.

The objective of the assessment was to identify specified hazardous building materials in preparation for building renovation activities. The proposed work as identified by the Client includes renovations to repurpose storage spaces into an accessible washroom, including the installation of ventilation ductwork extending throughout the vertical pipe chase to the mechanical penthouse.

The results of this assessment are intended for use with a properly developed scope of work or performance specification.

The **assessed area** is limited to the portion(s) of the building to be renovated, as described by the Client, and identified in the drawings in Appendix I.

1.0 SUMMARY OF FINDINGS

- The following items are asbestos-containing;
 - Drywall joint compound
 - Duct mastic
 - Vinyl floor tile and mastic
 - Ceiling tiles
 - Parging Cement

- Terrazzo (presumed)
- Thin-set (presumed)
- Roofing materials (presumed)
- Lead is present in paints and coatings.
- Solid lead is present in batteries of emergency lights, and caulking on cast-iron pipe joints
- Crystalline silica is present in concrete and other materials such as masonry, ceramic tiles, and plaster.
- Mercury vapour is present in lamp tubes.
- No PCB-containing items were identified.
- No mould or water damage was identified.

2.0 RECOMMENDATIONS

2.1 General

Prepare scope of work or performance specifications for hazardous material removal required for the planned work. The specifications should include safe work practices, personal protective equipment, respiratory protection, and disposal of waste materials.

If suspected hazardous building materials are discovered during the planned work, which are not identified in this report, do not disturb, and arrange for further testing and evaluation.

Provide this report and the detailed plans and specifications to the contractor prior to bidding or commencing work.

Retain a qualified consultant to specify, observe and document the successful removal of hazardous materials.

Update the asbestos inventory upon completion of the abatement and removal of asbestos-containing materials and any other relevant findings.

2.2 Remedial Work

Remedial work is not required.

2.3 Project Work

The following recommendations are made regarding renovation involving the hazardous materials identified.

2.3.1 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.

2.3.2 Lead

For lead-containing or lead-based paints (i.e., greater than the EACC guideline of 0.1% (1,000 mg/kg) for lead-containing paints, and 0.5% (5,000 mg/kg) for lead-based), 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 applicable regulations, and/or guidelines.

For paints identified as having low levels of lead (i.e., equal to or above 0.009% (90 mg/kg) but less than or equal to the EACC guideline of 0.1% (1,000 mg/kg) for lead-containing paints) special precautions are not recommended unless aggressive disturbance (grinding, blasting, torching) is planned.

Exposure from construction disturbance of paints containing lead less than 0.009% (90 mg/kg) is assumed to be insignificant.

Items painted with paints containing elevated levels of lead may be a hazardous waste. Test lead-painted materials for leachable lead and other metals prior to disposal. Metallic components coated with lead paint do not require leachate testing and can be disposed of as non-hazardous construction and demolition (C&D) waste.

Lead-containing items should be recycled when taken out of service.

2.3.3 Silica

Construction disturbance of silica-containing products may result in excessive exposures to airborne silica, especially if performed indoors and dry. Cutting, grinding, drilling or demolition of materials containing silica should be completed only with proper respiratory protection and other worker safety precautions that comply with applicable regulations and guidelines.

2.3.4 Mercury

Do not break lamps. Recycle and reclaim mercury from fluorescent lamps when taken out of service. Mercury is classified as a hazardous waste and must be disposed of in accordance with applicable regulations.



3.0 BACKGROUND INFORMATION

3.1 Assessed Area Description Summary

Description Item	Details
Building Use	School
Number of Floors	The building is two storeys, plus one level below grade.
Total Area (square feet)	The assessed area is 6,250 square feet
Year of Construction	1964
Structure	Concrete, and structural steel
Exterior Cladding	Brick veneer, concrete, and stone
HVAC	Forced air
Roof	Built-up roofing
Flooring	Carpet, vinyl floor tiles, poured concrete, rubber, and ceramic tile
Wall and Ceiling Finishes	Concrete block, poured concrete, drywall, and acoustic ceiling tiles

3.2 Existing Reports

3.2.1 Review of Previous Reports

Pinchin reviewed the following reports and included relevant results as appropriate:

- “Dundas Valley (Formerly Highland) Secondary School Asbestos Inventory” dated March 2021. Prepared by Hamilton-Wentworth District School Board.
- “Hazardous Building Materials Assessment, Fitness Room Renovations, Dundas Valley Secondary School, 310 Governors Road, Dundas, Ontario” dated June 5, 2020. Prepared by Pinchin Ltd. Pinchin File No. 269536.008.
- “Hazardous Building Materials Assessment, Black Box Theatre, Dundas Valley Secondary School, 310 Governors Road, Dundas, Ontario” dated March 24, 2021. Prepared by Pinchin Ltd. Pinchin File No. 286531.003.

4.0 FINDINGS

Any quantities listed in this report or data tables are estimated based on visual approximations only and are subject to variation.

4.1 Asbestos

The following table summarizes the materials evaluated for asbestos in the assessed area. For details on approximate quantities, condition, friability, accessibility, and locations of hazardous building materials; refer to the Hazardous Material Summary / Sample Log and All Data Report in Appendices V and VI.



Revised Hazardous Building Materials Assessment (Preconstruction)

Dundas Valley Secondary School, 310 Governors Road, Dundas, ON

Hamilton-Wentworth District School Board

March 30, 2026

Pinchin File: 352293.012

REVISED

Sample Number	Material Description	Type of Asbestos	Confirmed Hazard	Total Quantity Present	Material Specific Notes
V0014	Piping Parging Cement	Chrysotile	Yes	3 EA	
S0058 ABC	Duct Mastic, Red	Chrysotile	Yes	50 LF	
S0059 ABC	Piping Tar Paper	None Detected	No	60 LF	
S0060 ABC	Wall Paint Paint on block	None Detected	No	300 SF	
S0061 ABC	Other Mastic, White	None Detected	No	1 EA	
S0062 ABC	Floor Vinyl Floor Tile and Mastic 12x12 grey with grey and white fleck, on top of 9x9 Grey with white streaks	Tiles – None Mastic - Chrysotile	Yes	450 SF	Asbestos-containing mastic below 9x9 grey with white streaks
S0063 ABC	Wall Paint Paint on block	None Detected	No	900 SF	
S0064 ABC	Wall Mastic, Brown Baseboard mastic	None Detected	No	80 LF	
S0065 ABC	Wall Cement Product	None Detected	No	700 SF	
S0066 ABC	Wall Paint Paint on block	None Detected	No	400 SF	
S0067 ABC	Ceiling Ceiling Tiles (lay-in) 24x24 pinhole and deep fissure	Amosite / Chrysotile	Yes	120 SF	
S0068 ABC	Wall Drywall and joint compound	None Detected	No	2400 SF	
S0069 ABC	Wall Drywall and joint compound	Chrysotile	Yes	40 SF	1
S0070 ABC	Floor Vinyl Floor Tile and Mastic 20x20 grey with black specks	None Detected	No	1600 SF	
S0071 ABC	Wall Paint paint on block	None Detected	No		
S0072 ABC	Duct Mastic, Grey	None Detected	No		



S0073 ABC	Ceiling Drywall and joint compound	None Detected	No		
V9500	Floor Terrazzo	Presumed Asbestos	Yes	100 %	
V9500	Floor Thin-set	Presumed Asbestos	Yes	100 %	
V9500	Other Roofing Material	Presumed Asbestos	Yes	100 %	
V0000	Ceiling Ceiling Tiles (lay-in) 24x24 pinhole and small fissures, date stamped 08/17/15, 24x24 pinhole and large fissures, date stamped 09/07/03, 24x48 pinhole and fissure, date stamped 07/24/15	None	No	100 %	
V0000	Ceiling Drywall (no compound) Gypsum ceiling tile	None	No	100 %	
V0000	Piping Fibreglass	None	No	92 LF	
V0000	Duct Fibreglass	None	No		
V0000	Floor Rubber	None	No		

Material Specific Notes:

1. Asbestos-containing drywall joint compound is presumed to be present behind the wood wall finishes.

General Notes:

Materials identified as Sample Number V9500 were either observed to be present or based on the construction of the building/equipment are likely present in concealed locations. These materials have not been sampled and are presumed to contain asbestos based on historical known use of asbestos. Sampling of these materials may be completed prior to disturbance.

Materials identified as Sample Number V0000 were determined to be non-asbestos based on the manufacture date and known end of use of asbestos in these products.

4.1.1 Excluded Asbestos Materials

The following is a list of materials which may contain asbestos and were excluded from the assessment. These materials are presumed to contain asbestos until otherwise proven to be non-asbestos by sampling and analysis:

- Floor levelling compound
- Electrical components
- Mechanical packing, ropes, and gaskets
- Vermiculite
- Adhesives and duct mastics (where not sampled)
- Caulking and putties (where not sampled)
- Paper products
- Fire resistant doors
- Vibration dampers on HVAC equipment
- Ropes and gaskets in cast-iron bell and spigot joints
- Sealants on pipe threads

4.2 Lead

Refer to the Hazardous Material Summary / Sample Log and All Data Report in Appendices V and VI for details on locations, condition and approximate quantities on paints sampled and their locations.

The following table summarizes the analytical results of paints sampled.

Sample Number	Material Description	Concentration	Confirmed Hazard	Total Quantity Present	Material Specific Notes
L0029	Structure Metal	0.43%	Yes	100 %	
L0030	Wall Concrete (precast) Yellow on block	0.017%	Yes	300 SF	
L0031	Wall Concrete (precast) Grey on block	0.0076%	No	900 SF	
L0032	Structure Metal Red on structure	0.11%	Yes	100 %	
L0033	Wall Drywall and joint compound White on walls	<0.00052%	No	500 SF	
L0034	Wall Concrete (precast) Green on block	0.0021%	No	400 SF	
L0035	Wall Drywall and joint compound Paint on drywall	0.00061%	No		
L0036	Structure Concrete (poured) Paint on concrete structure	0.0021%	No		



General Notes:

Results above 0.1% (1,000 mg/kg) are considered lead-containing, and over 0.5% (5,000 mg/kg) are considered lead-based.

Results less than or equal to 0.1% (1,000 mg/kg), but equal to or greater than 0.009% (90 mg/kg), are considered low-level lead paints or surface coatings in accordance with the EACC guideline.

Paints containing lead less than 0.009% (90 mg/kg) are assumed to be insignificant relating to potential exposure from construction disturbance.

4.2.1 Lead Products and Applications

Refer to the Hazardous Material Summary / Sample Log and All Data Report in Appendices V and VI for details on lead-products including their locations and quantities.

Sample Number	Material Description	Confirmed Hazard	Total Quantity Present	Material Specific Notes
V9500	Batteries In Emer. Lights	Yes	1EA	
V9500	Bell And Spigot Fittings	Yes	3EA	

General Notes:

Items identified as Sample Number V9500 were observed to be present but could not be definitively determined to contain lead (e.g., inaccessible batteries).

4.2.2 Excluded 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
- Solder on pipe connections
- Lead shielding

4.3 Silica

Crystalline silica is a presumed component of the following materials:

- Poured and pre-cast concrete
- Masonry and mortar
- Ceramic tiles and grout
- Terrazzo

4.4 Mercury

Refer to the Hazardous Material Summary / Sample Log and All Data Report in Appendices V and VI for details on mercury-containing products including their locations and quantities.

Sample Number	Material Description	Confirmed Hazard	Total Quantity Present	Material Specific Notes
V9000	Light Fixture	Yes	6 EA	
V9500	Light Fixture	Yes	46 EA	
V0000	Light Fixture	No	24 EA	

General Notes:

Items identified as Sample Number V9500 were observed to be present but could not be definitively determined to contain mercury (e.g., inaccessible lamps and thermostats).

Items identified as Sample Number V9000 were observed to be present and were determined to contain mercury based on visual observation (e.g., labelled lamps and ampules in thermostats).

Items identified as Sample Number V0000 are items that historically may have contained mercury; however, have been visually identified as non-mercury types (e.g., LED lamps, digital or electric thermostats).

4.5 Polychlorinated Biphenyls

Refer to the Hazardous Material Summary / Sample Log and All Data Report in Appendices V and VI for details on PCB-products including their locations and quantities.

Sample Number	Material Description	Concentration	Confirmed Hazard	Total Quantity Present	Material Specific Notes
V0000	Light Ballasts		No	34 EA	

General Notes:

PCBs were banned in 1980; however, are found to be present in caulking and sealants until 1985.

Materials identified as Sample Number V0000 were determined to be non-PCB based on previous analytical results, the manufacture date and regulated restrictions of PCBs. It can also include items that historically may have contained PCBs; however, have been visually identified as non-PCB types (e.g., fluorescent fixtures with T5 or T8 tubes, LED light fixtures).

4.5.1 *Excluded PCB Materials*

PCBs are known to be present in several materials and equipment which were not assessed or sampled. The following materials, where found, should be presumed to contain PCBs until sampling proves otherwise.

- Capacitors within or associated with electrical equipment
- Caulking

4.6 Mould and Water Damage

Visible mould growth and water damage was not found during the assessment.

5.0 METHODOLOGY

For the purpose of the assessment and this report, hazardous building materials are defined as follows:

- Asbestos
- Lead
- Silica
- Mercury
- Polychlorinated Biphenyls (PCBs)
- Mould and Water Damage

Arsenic, acrylonitrile, benzene, coke oven emissions, ethylene oxide, isocyanates and vinyl chloride monomer are not typically found in building materials in a composition/state that is hazardous and were not included in this assessment.

Pinchin conducted a room-by-room assessment to identify the hazardous building materials as defined in the scope.

The assessment was performed to establish the type of specified hazardous building materials, locations and approximate quantities incorporated in the structure(s) and its finishes.

The assessment included limited demolition of wall and ceiling finishes (drywall or plaster) to view concealed conditions at representative areas as permitted by the current building use. Limited destructive testing of flooring was conducted where possible (under ceramic tiles, carpets, or multiple layers of flooring). Demolition of exterior building finishes, masonry walls (chases, shafts etc.), and structural surrounds was not conducted.

For further details on the methodology including test methods and evaluation criteria, refer to Appendix III.

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 Canada (EACC) Lead Guideline for Construction, Renovation, Maintenance or Repair.
5. Ministry of the Environment Regulation, R.R.O. 1990 Reg. 347 as amended.
6. Ministry of the Environment Regulation, R.R.O. 1990 Reg. 362 as amended.
7. Silica on Construction Projects, Ministry of Labour Guidance Document.
8. Alert – Mould in Workplace Buildings, Ontario Ministry of Labour.
1. PCB Regulations, SOR/2008-273, Canadian Environmental Protection Act.
2. Surface Coating Materials Regulations, SOR/2016-193, Canada Consumer Product Safety Act.
3. Consolidated Transportation of Dangerous Goods Regulations, including Amendment SOR/2019-101, Transportation of Dangerous Goods Act.
4. Mould Guidelines for the Canadian Construction Industry, Standard Construction Document CCA 82 – 2004 (Revised 2018), Canadian Construction Association.
5. Ozone-depleting Substances and Halocarbon Alternatives Regulations, SOR/2016-137.

7.0 LIMITATIONS

This work was performed subject to the Terms and Limitations presented or referenced in the proposal for this project.

Information provided by Pinchin is intended for Client use only. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law. Any use by a third party of reports or documents authored by Pinchin or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.



8.0 CLOSURE

The data presented in the appendices is prepared by Pinchin's Hazardous Materials Inventory System (HMIS). The information can be made available for your real-time access through our secure web-based platform. Please contact your Pinchin representative to discuss HMIS solutions for management of your asbestos (and other hazardous materials) inventory.

Contact the Project Manager, Jessica Cozzitorto at 905.577.6206 or jcozzitorto@pinchin.com should you have any questions.

Sincerely,

Pinchin Ltd.

Prepared by:

Adam Altena
Project Technologist

Reviewed by:

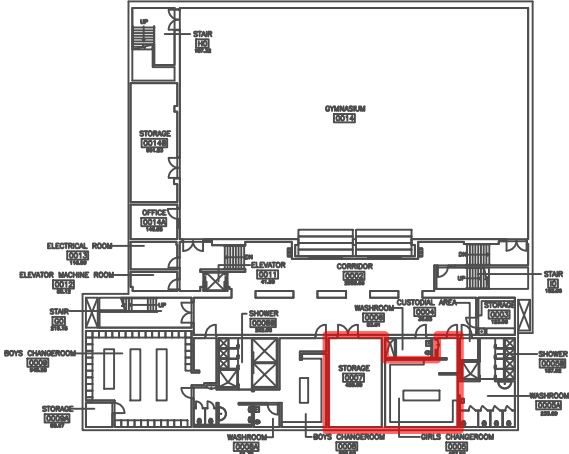
Leslie Heywood, BEng Mgt
Senior Project Manager

Project Managed by:

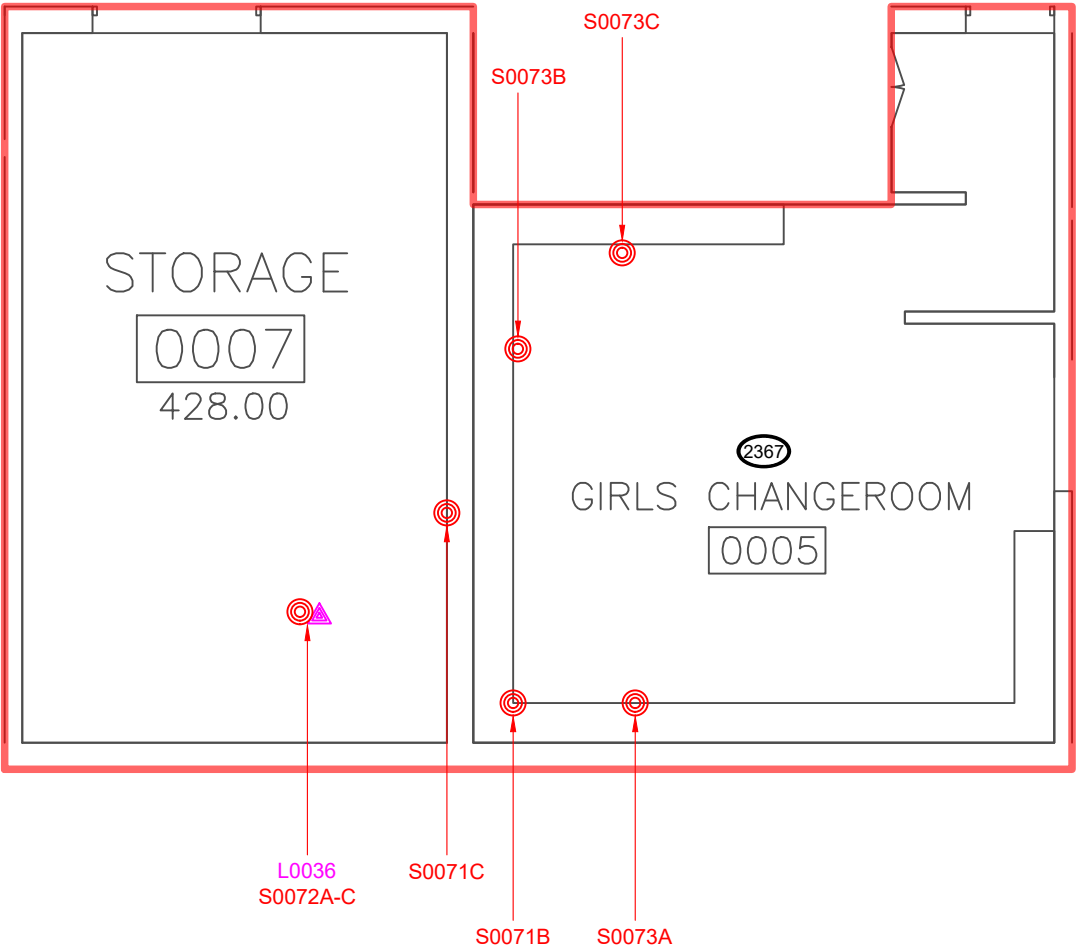
Jessica Cozzitorto, C. Tech.
Team Leader

Encl:	APPENDIX I	Drawings
	APPENDIX II-A	Asbestos Analytical Certificates
	APPENDIX II-B	Lead Analytical Certificates
	APPENDIX III	Methodology
	APPENDIX IV	Location Summary Report
	APPENDIX V	Hazardous Materials Summary Report / Sample Log
	APPENDIX VI	All Data Report
	APPENDIX VII	Photographs

APPENDIX I
Drawings



KEY PLAN



- LEGEND**
- PINCHIN LOCATION NUMBER
 - SURVEY BOUNDARY/ASSESSED AREA
 - ASBESTOS BULK SAMPLE
 - LEAD BULK SAMPLE
 - ASBESTOS-CONTAINING MATERIALS:
 - FLOOR MASTIC
 - CEILING TILE
 - ROOFING MATERIAL (PRESUMED)
 - DRYWALL JOINT COMPOUND
 - PIPE INSULATION
 - MASTIC

FOR CLARITY, THE FOLLOWING ASBESTOS-CONTAINING MATERIALS, ARE PRESENT IN THE ASSESSED AREA, BUT HAVE NOT BEEN HATCHED ON THE DRAWING:

- TERRAZZO (PRESUMED)
- THINSET (PRESUMED)

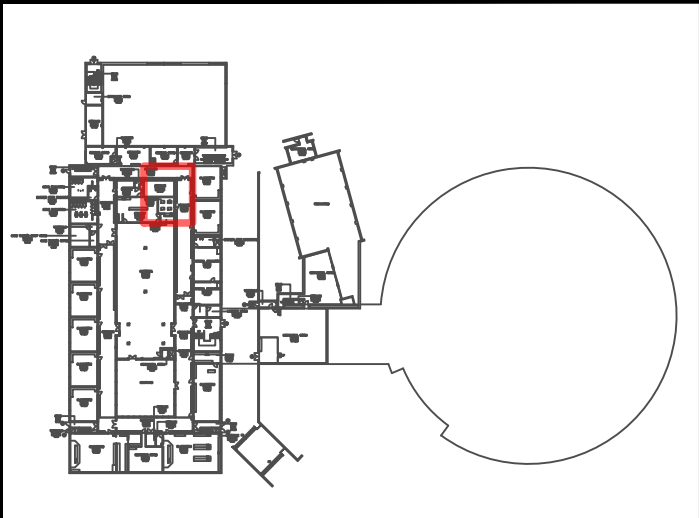
NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

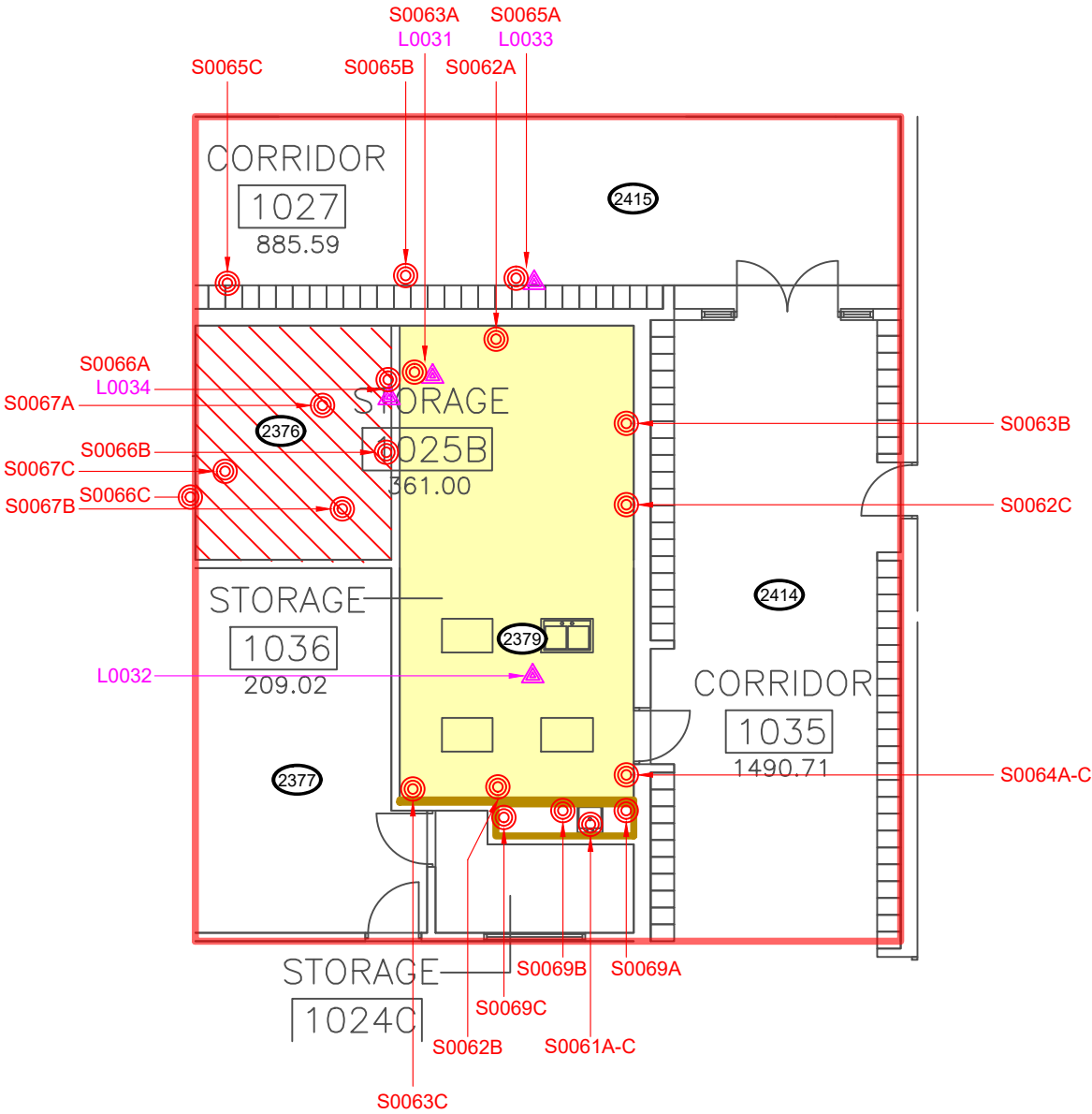
BASE PLAN PROVIDED BY CLIENT.



PROJECT NAME: HAZARDOUS BUILDING MATERIALS ASSESSMENT	
CLIENT NAME: HAMILTON-WENTWORTH DISTRICT SCHOOL BOARD	
PROJECT LOCATION: DUNDAS VALLEY SS 310 GOVERNORS ROAD DUNDAS, ONTARIO	
FIGURE NAME: BASEMENT	
PROJECT NUMBER: 352293.012	SCALE: NOT TO SCALE
DRAWN BY: KU	REVIEWED BY: AA
DATE: MARCH 2026	FIGURE NUMBER: 1 OF 4



KEY PLAN



- LEGEND**
- PINCHIN LOCATION NUMBER
 - SURVEY BOUNDARY/ASSESSED AREA
 - ASBESTOS BULK SAMPLE
 - LEAD BULK SAMPLE
 - ASBESTOS-CONTAINING MATERIALS:
 - FLOOR MASTIC
 - CEILING TILE
 - ROOFING MATERIAL (PRESUMED)
 - DRYWALL JOINT COMPOUND
 - PIPE INSULATION
 - MASTIC

FOR CLARITY, THE FOLLOWING ASBESTOS-CONTAINING MATERIALS, ARE PRESENT IN THE ASSESSED AREA, BUT HAVE NOT BEEN HATCHED ON THE DRAWING:

- TERRAZZO (PRESUMED)
- THINSET (PRESUMED)

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.

PROJECT NAME:

HAZARDOUS BUILDING MATERIALS ASSESSMENT

CLIENT NAME:

HAMILTON-WENTWORTH DISTRICT SCHOOL BOARD

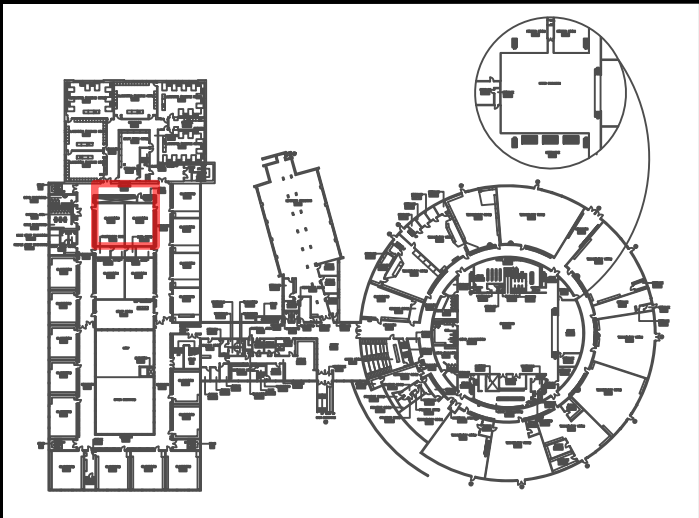
PROJECT LOCATION:

DUNDAS VALLEY SS
310 GOVERNORS ROAD
DUNDAS, ONTARIO

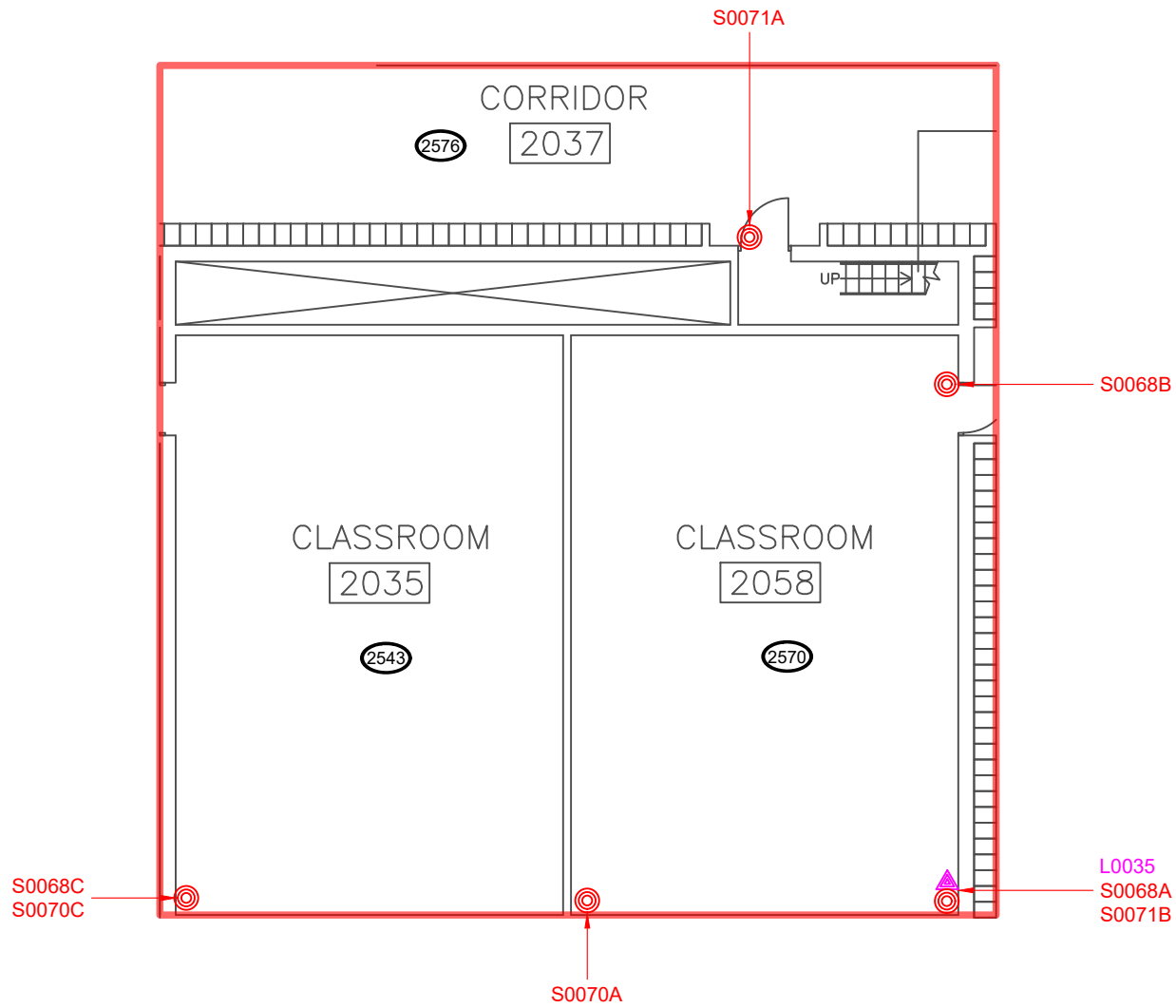
FIGURE NAME:

GROUND FLOOR

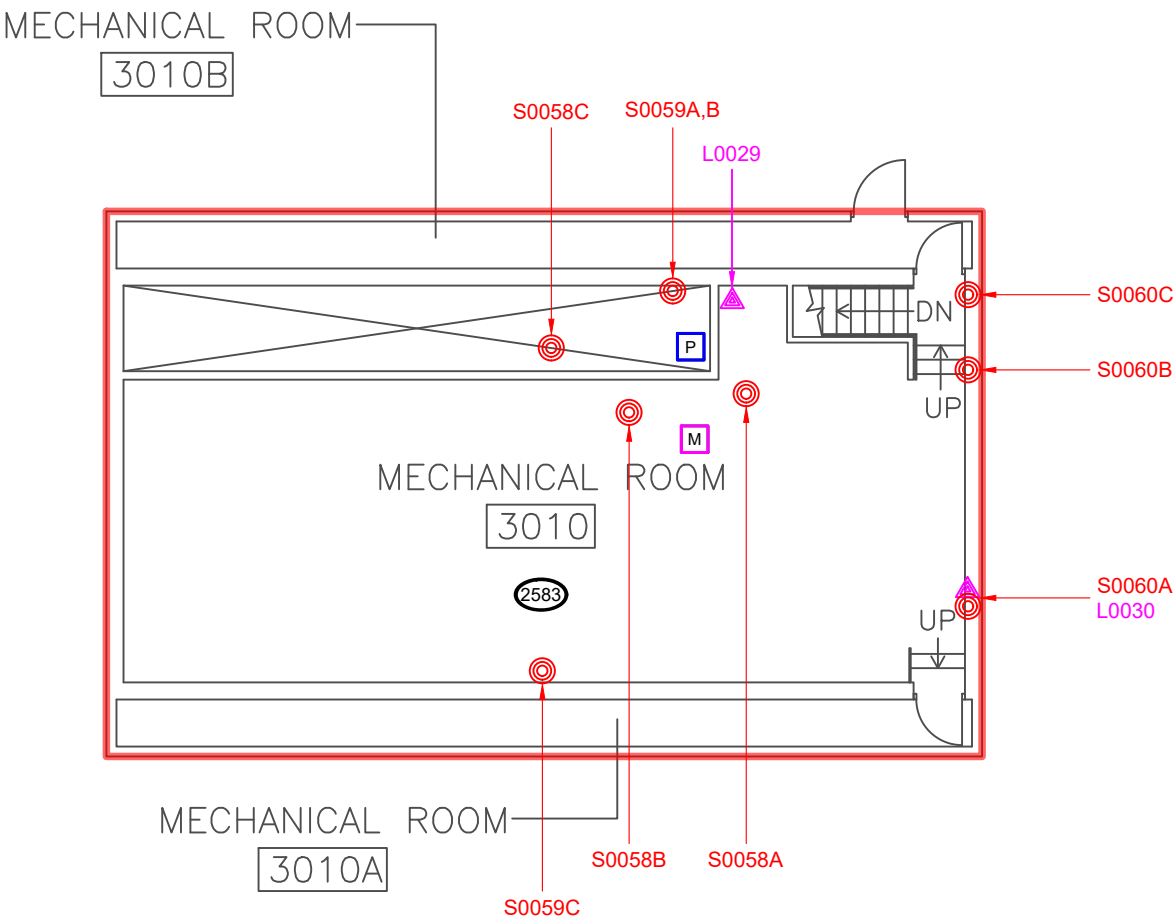
PROJECT NUMBER: 352293.012	SCALE: NOT TO SCALE
DRAWN BY: KU	REVIEWED BY: AA
DATE: MARCH 2026	FIGURE NUMBER: 2 OF 4



KEY PLAN



SECOND FLOOR



THIRD FLOOR

N

LEGEND

X

PINCHIN LOCATION NUMBER

SURVEY BOUNDARY/ASSESSED AREA

ASBESTOS BULK SAMPLE

LEAD BULK SAMPLE

ASBESTOS-CONTAINING MATERIALS:

FLOOR MASTIC

CEILING TILE

ROOFING MATERIAL (PRESUMED)

DRYWALL JOINT COMPOUND

P

PIPE INSULATION

M

MASTIC

FOR CLARITY, THE FOLLOWING ASBESTOS-CONTAINING MATERIALS, ARE PRESENT IN THE ASSESSED AREA, BUT HAVE NOT BEEN HATCHED ON THE DRAWING:

TERRAZZO (PRESUMED)

THINSET (PRESUMED)

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.

PINCHIN

PROJECT NAME:

HAZARDOUS BUILDING MATERIALS ASSESSMENT

CLIENT NAME:

HAMILTON-WENTWORTH DISTRICT SCHOOL BOARD

PROJECT LOCATION:

DUNDAS VALLEY SS
310 GOVERNORS ROAD
DUNDAS, ONTARIO

FIGURE NAME:

SECOND & THIRD FLOOR

PROJECT NUMBER:
352293.012

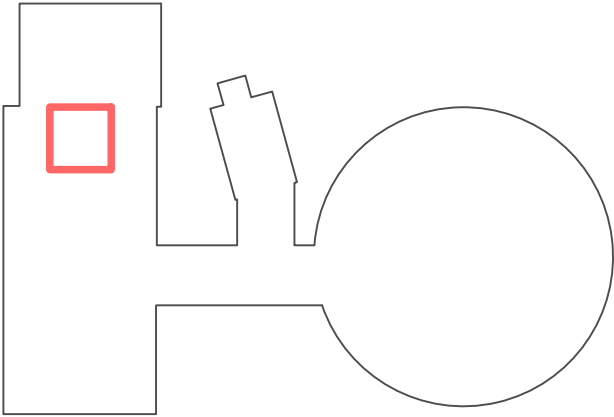
SCALE:
NOT TO SCALE

DRAWN BY:
KU

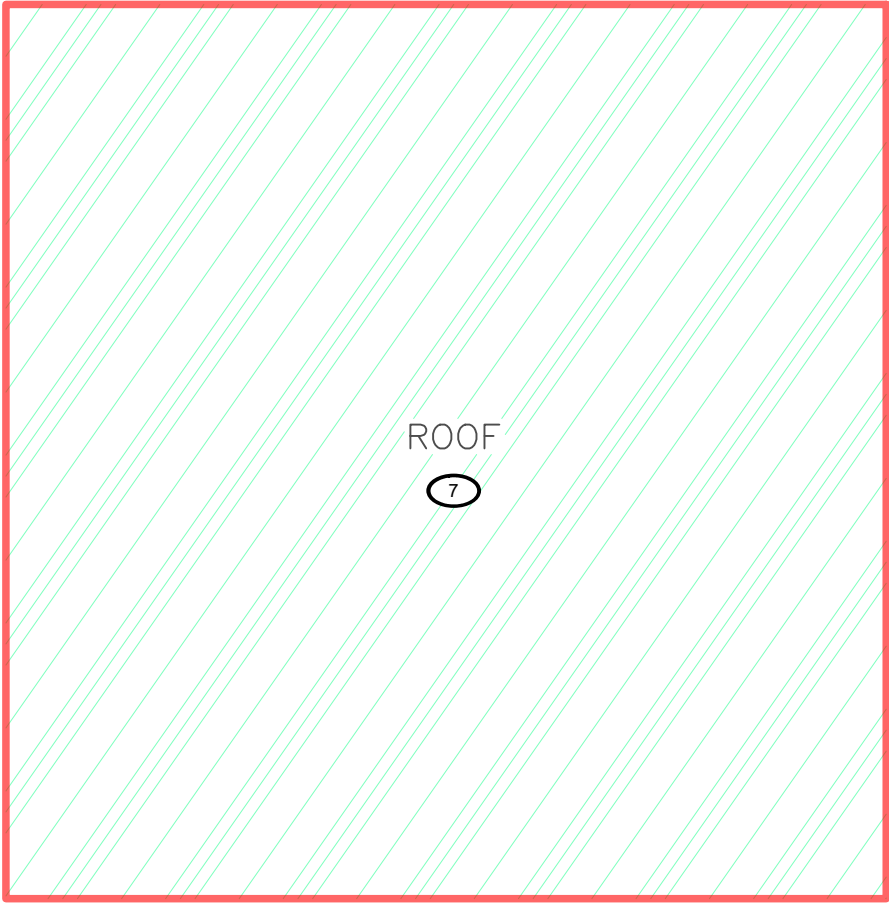
REVIEWED BY:
AA

DATE:
MARCH 2026

FIGURE NUMBER:
3 OF 4



KEY PLAN



- LEGEND**
- PINCHIN LOCATION NUMBER
 - SURVEY BOUNDARY/ASSESSED AREA
 - ASBESTOS BULK SAMPLE
 - LEAD BULK SAMPLE
 - ASBESTOS-CONTAINING MATERIALS:
 - FLOOR MASTIC
 - CEILING TILE
 - ROOFING MATERIAL (PRESUMED)
 - DRYWALL JOINT COMPOUND
 - PIPE INSULATION
 - MASTIC

FOR CLARITY, THE FOLLOWING ASBESTOS-CONTAINING MATERIALS, ARE PRESENT IN THE ASSESSED AREA, BUT HAVE NOT BEEN HATCHED ON THE DRAWING:

- TERRAZZO (PRESUMED)
- THINSET (PRESUMED)

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.



PROJECT NAME: HAZARDOUS BUILDING MATERIALS ASSESSMENT	
CLIENT NAME: HAMILTON-WENTWORTH DISTRICT SCHOOL BOARD	
PROJECT LOCATION: DUNDAS VALLEY SS 310 GOVERNORS ROAD DUNDAS, ONTARIO	
FIGURE NAME: ROOF	
PROJECT NUMBER: 352293.012	SCALE: NOT TO SCALE
DRAWN BY: KU	REVIEWED BY: AA
DATE: MARCH 2026	FIGURE NUMBER: 4 OF 4

APPENDIX II-A
Asbestos Analytical Certificates



Your Project #: 352293.012
Your C.O.C. #: N/A

Attention: Adam Altena

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2025/12/31
Report #: R8676205
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C5G2119

Received: 2025/12/24, 13:00

Sample Matrix: Solid
Samples Received: 30

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Asbestos by PLM - 0.5 RDL (1)	30	N/A	2025/12/31	COR3SOP-00002	EPA 600R-93/116

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Bureau Veritas' Asbestos Laboratory is accredited by NVLAP for bulk asbestos analysis by polarized light microscopy, NVLAP Code 600136-0.

This report may not be reproduced, except in full, without the written approval of Bureau Veritas. This report may not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Bureau Veritas' scope of accreditation includes EPA -- 40 CFR Appendix E to Subpart E of Part 763, "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" and EPA-600/R-93/116: "Method for the Determination of Asbestos in Bulk Building Materials".

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) P.O.B. - Percent of Bulk

When Asbestos data is reported with other data, this report contains data that are not covered by the NVLAP accreditation.



Your Project #: 352293.012
Your C.O.C. #: N/A

Attention: Adam Altena

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2025/12/31
Report #: R8676205
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C5G2119

Received: 2025/12/24, 13:00

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Elora Di Bratto, Project Manager
Email: Elora.Di-Bratto@bureauveritas.com
Phone# (905) 817-5700

=====

This report has been generated and distributed using a secure automated process.

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.



Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0058A DUCT,ALL,MASTIC, RED,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE					
Bureau Veritas ID: AYRU95		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos		Particulate
Layer 1	100	Homogeneous brown mastic	Chrysotile	1%	Non-Fibrous

S0058B DUCT,ALL,MASTIC, RED,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE					
Bureau Veritas ID:		AYRU96		Date Analyzed:	2025/12/31
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1			N/A		
	Comment: Not Analyzed - Positive Stop				

S0058C DUCT,ALL,MASTIC, RED,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE					
Bureau Veritas ID:		AYRU97		Date Analyzed:	2025/12/31
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1			N/A		
	Comment: Not Analyzed - Positive Stop				

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0059A PIPING,TAR PAPER,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE						
Bureau Veritas ID: AYRU98		Date Analyzed: 2025/12/31				
	P.O.B	Sample Morphology	Asbestos	Other Fibres		Particulate
Layer 1	100	Homogeneous brown tar paper	Not Detected	Cellulose	35%	Non-Fibrous

S0059B PIPING,TAR PAPER,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE						
Bureau Veritas ID: AYRU99		Date Analyzed: 2025/12/31				
	P.O.B	Sample Morphology	Asbestos	Other Fibres		Particulate
Layer 1	100	Homogeneous brown tar paper	Not Detected	Cellulose	35%	Non-Fibrous

S0059C PIPING,TAR PAPER,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE						
Bureau Veritas ID: AYRV00		Date Analyzed: 2025/12/31				
	P.O.B	Sample Morphology	Asbestos	Other Fibres		Particulate
Layer 1	100	Homogeneous brown tar paper	Not Detected	Cellulose	35%	Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0060A WALL,PAINT,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE					
Bureau Veritas ID: AYRV01		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous yellow/off -white paint/block filler	Not Detected		Non-Fibrous

S0060B WALL,PAINT,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE					
Bureau Veritas ID: AYRV02		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous yellow/off -white paint/block filler	Not Detected		Non-Fibrous

S0060C WALL,PAINT,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE					
Bureau Veritas ID: AYRV03		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous yellow/off -white paint/block filler	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0061A SINK,MASTIC, WHITE,LOC:2379,TEACHER WORKSTATION					
Bureau Veritas ID: AYRV04		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous beige mastic	Not Detected		Non-Fibrous

S0061B SINK,MASTIC, WHITE,LOC:2379,TEACHER WORKSTATION					
Bureau Veritas ID: AYRV05		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous beige mastic	Not Detected		Non-Fibrous

S0061C SINK,MASTIC, WHITE,LOC:2379,TEACHER WORKSTATION					
Bureau Veritas ID: AYRV06		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous beige mastic	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0062A FLOOR,VINYL FLOOR TILE AND MASTIC,12X12 GREY WITH GREYAND WHITE FLECK, ONTOP OF 9X9 GREY WITH WHITE STREAKS,LOC:2379,TEACHER WORKSTATION					
Bureau Veritas ID: AYRV07		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	50	Homogeneous light grey vinyl floor tile	Not Detected		Non-Fibrous
Layer 2	5	Homogeneous beige mastic	Not Detected		Non-Fibrous
Layer 3	40	Homogeneous grey vinyl floor tile	Not Detected		Non-Fibrous
Layer 4	5	Homogeneous black mastic	Chrysotile 2%		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0062B FLOOR,VINYL FLOOR TILE AND MASTIC,12X12 GREY WITH GREYAND WHITE FLECK, ONTOP OF 9X9 GREY WITH WHITE STREAKS,LOC:2379,TEACHER WORKSTATION					
Bureau Veritas ID: AYRV08		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	40	Homogeneous light grey vinyl floor tile	Not Detected		Non-Fibrous
Layer 2	5	Homogeneous beige mastic	Not Detected		Non-Fibrous
Layer 3	50	Homogeneous grey vinyl floor tile	Not Detected		Non-Fibrous
Layer 4	5	Homogeneous black mastic	N/A		
Comment: Not Analyzed - Positive Stop					

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, “<0.50%”. “Not Detected” indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0062C FLOOR,VINYL FLOOR TILE AND MASTIC,12X12 GREY WITH GREYAND WHITE FLECK, ONTOP OF 9X9 GREY WITH WHITE STREAKS,LOC:2379,TEACHER WORKSTATION					
Bureau Veritas ID: AYRV09		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	22	Homogeneous light grey vinyl floor tile	Not Detected		Non-Fibrous
Layer 2	3	Homogeneous beige mastic	Not Detected		Non-Fibrous
Layer 3	70	Homogeneous grey vinyl floor tile	Not Detected		Non-Fibrous
Layer 4	5	Homogeneous black mastic	N/A		
Comment: Not Analyzed - Positive Stop					

S0063A WALL,PAINT,PAINT ON BLOCK,LOC:2379,TEACHER WORKSTATION					
Bureau Veritas ID: AYRV10		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey/green/off white paint/block filler	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0063B WALL,PAINT,PAINT ON BLOCK,LOC:2379,TEACHER WORKSTATION					
Bureau Veritas ID: AYRV11		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey/green/off white paint/block filler	Not Detected		Non-Fibrous

S0063C WALL,PAINT,PAINT ON BLOCK,LOC:2379,TEACHER WORKSTATION					
Bureau Veritas ID: AYRV12		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey/green/off white paint/block filler	Not Detected		Non-Fibrous

S0064A WALL,MASTIC, BROWN,BASEBOARD MASTIC,LOC:2379,TEACHER WORKSTATION					
Bureau Veritas ID: AYRV13		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous brown mastic	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0064B WALL,MASTIC, BROWN,BASEBOARD MASTIC,LOC:2379,TEACHER WORKSTATION					
Bureau Veritas ID: AYRV14		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous brown mastic	Not Detected		Non-Fibrous

S0064C WALL,MASTIC, BROWN,BASEBOARD MASTIC,LOC:2379,TEACHER WORKSTATION					
Bureau Veritas ID: AYRV15		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous brown mastic	Not Detected		Non-Fibrous

S0065A WALL,CEMENT PRODUCT,LOC:2415,CORRIDOR					
Bureau Veritas ID: AYRV16		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous beige cementitious material with fibres	Not Detected	Cellulose 30%	Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0065B WALL,CEMENT PRODUCT,LOC:2415,CORRIDOR						
Bureau Veritas ID: AYRV17		Date Analyzed: 2025/12/31				
	P.O.B	Sample Morphology	Asbestos	Other Fibres		Particulate
Layer 1	60	Homogeneous beige cementitious material with fibres	Not Detected	Cellulose	30%	Non-Fibrous
Layer 2	40	Homogeneous off-white cementitious material	Not Detected			Non-Fibrous Perlite

S0065C WALL,CEMENT PRODUCT,LOC:2415,CORRIDOR						
Bureau Veritas ID: AYRV18		Date Analyzed: 2025/12/31				
	P.O.B	Sample Morphology	Asbestos	Other Fibres		Particulate
Layer 1	80	Homogeneous beige cementitious material with fibres	Not Detected	Cellulose	30%	Non-Fibrous
Layer 2	20	Homogeneous off-white cementitious material	Not Detected			Non-Fibrous Perlite

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0066A WALL,PAINT,LOC:2376,STORAGE					
Bureau Veritas ID: AYRV19		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous green paint	Not Detected		Non-Fibrous

S0066B WALL,PAINT,LOC:2376,STORAGE					
Bureau Veritas ID: AYRV20		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous green paint	Not Detected		Non-Fibrous

S0066C WALL,PAINT,LOC:2376,STORAGE					
Bureau Veritas ID: AYRV21		Date Analyzed: 2025/12/31			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous green paint	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0067A CEILING,CEILING TILES (LAY-IN),24X24 PINHOLE AND DEEP FISSURE,LOC:2376,STORAGE							
Bureau Veritas ID:		AYRV22				Date Analyzed:	2025/12/31
	P.O.B	Sample Morphology	Asbestos		Other Fibres		Particulate
Layer 1	100	Homogeneous light grey ceiling tile	Amosite	2%	Cellulose	45%	Non-Fibrous
			Chrysotile	1%	Mineral Wool	25%	

S0067B CEILING,CEILING TILES (LAY-IN),24X24 PINHOLE AND DEEP FISSURE,LOC:2376,STORAGE						
Bureau Veritas ID: AYRV23		Date Analyzed: 2025/12/31				
	P.O.B	Sample Morphology	Asbestos		Other Fibres	Particulate
Layer 1			N/A			
			Comment: Not Analyzed - Positive Stop			

S0067C CEILING,CEILING TILES (LAY-IN),24X24 PINHOLE AND DEEP FISSURE,LOC:2376,STORAGE						
Bureau Veritas ID: AYRV24		Date Analyzed: 2025/12/31				
	P.O.B	Sample Morphology	Asbestos		Other Fibres	Particulate
Layer 1			N/A			
			Comment: Not Analyzed - Positive Stop			

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



TEST SUMMARY

Bureau Veritas ID: AYRU95
Sample ID: S0058A DUCT,ALL,MASTIC, RED,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRU95 Dup
Sample ID: S0058A DUCT,ALL,MASTIC, RED,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRU96
Sample ID: S0058B DUCT,ALL,MASTIC, RED,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRU97
Sample ID: S0058C DUCT,ALL,MASTIC, RED,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRU98
Sample ID: S0059A PIPING,TAR PAPER,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRU99
Sample ID: S0059B PIPING,TAR PAPER,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV00
Sample ID: S0059C PIPING,TAR PAPER,LOC:2583,PIPE CHASE AND MECHANICAL PENTHOUSE
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy



BUREAU
VERITAS

Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

TEST SUMMARY

Bureau Veritas ID: AYRV01
Sample ID: S0060A WALL, PAINT, LOC:2583, PIPE CHASE AND MECHANICAL PENTHOUSE
Matrix: Solid

Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV02
Sample ID: S0060B WALL, PAINT, LOC:2583, PIPE CHASE AND MECHANICAL PENTHOUSE
Matrix: Solid

Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV03
Sample ID: S0060C WALL, PAINT, LOC:2583, PIPE CHASE AND MECHANICAL PENTHOUSE
Matrix: Solid

Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV04
Sample ID: S0061A SINK, MASTIC, WHITE, LOC:2379, TEACHER WORKSTATION
Matrix: Solid

Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV05
Sample ID: S0061B SINK, MASTIC, WHITE, LOC:2379, TEACHER WORKSTATION
Matrix: Solid

Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV05 Dup
Sample ID: S0061B SINK, MASTIC, WHITE, LOC:2379, TEACHER WORKSTATION
Matrix: Solid

Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV06
Sample ID: S0061C SINK, MASTIC, WHITE, LOC:2379, TEACHER WORKSTATION
Matrix: Solid

Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy



TEST SUMMARY

Bureau Veritas ID: AYRV07
Sample ID: S0062A FLOOR,VINYL FLOOR TILE AND MASTIC,12X12 GREY WITH GREYAND WHITE FLECK, SHIPPED OF 9X9 GREY WITH WHITE STRE
Matrix: Solid
Collected: 2025/12/23
Shipped: 2025/12/23
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV08
Sample ID: S0062B FLOOR,VINYL FLOOR TILE AND MASTIC,12X12 GREY WITH GREYAND WHITE FLECK, SHIPPED OF 9X9 GREY WITH WHITE STRE
Matrix: Solid
Collected: 2025/12/23
Shipped: 2025/12/23
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV09
Sample ID: S0062C FLOOR,VINYL FLOOR TILE AND MASTIC,12X12 GREY WITH GREYAND WHITE FLECK, SHIPPED OF 9X9 GREY WITH WHITE STRE
Matrix: Solid
Collected: 2025/12/23
Shipped: 2025/12/23
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV10
Sample ID: S0063A WALL,PAINT,PAINT ON BLOCK,LOC:2379,TEACHER WORKSTATION
Matrix: Solid
Collected: 2025/12/23
Shipped: 2025/12/23
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV11
Sample ID: S0063B WALL,PAINT,PAINT ON BLOCK,LOC:2379,TEACHER WORKSTATION
Matrix: Solid
Collected: 2025/12/23
Shipped: 2025/12/23
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV12
Sample ID: S0063C WALL,PAINT,PAINT ON BLOCK,LOC:2379,TEACHER WORKSTATION
Matrix: Solid
Collected: 2025/12/23
Shipped: 2025/12/23
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV13
Sample ID: S0064A WALL,MASTIC, BROWN,BASEBOARD MASTIC,LOC:2379,TEACHER WORKSTATION
Matrix: Solid
Collected: 2025/12/23
Shipped: 2025/12/23
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

:AKS,LOC:2379,TEACHER WORKSTATION

:AKS,LOC:2379,TEACHER WORKSTATION

:AKS,LOC:2379,TEACHER WORKSTATION



BUREAU
VERITAS

Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

TEST SUMMARY

Bureau Veritas ID: AYRV14
Sample ID: S0064B WALL,MASTIC, BROWN,BASEBOARD MASTIC,LOC:2379,TEACHER WORKSTATION
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV15
Sample ID: S0064C WALL,MASTIC, BROWN,BASEBOARD MASTIC,LOC:2379,TEACHER WORKSTATION
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV15 Dup
Sample ID: S0064C WALL,MASTIC, BROWN,BASEBOARD MASTIC,LOC:2379,TEACHER WORKSTATION
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV16
Sample ID: S0065A WALL,CEMENT PRODUCT,LOC:2415,CORRIDOR
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV17
Sample ID: S0065B WALL,CEMENT PRODUCT,LOC:2415,CORRIDOR
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV18
Sample ID: S0065C WALL,CEMENT PRODUCT,LOC:2415,CORRIDOR
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV19
Sample ID: S0066A WALL,PAINT,LOC:2376,STORAGE
Matrix: Solid
Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy



BUREAU
VERITAS

Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

TEST SUMMARY

Bureau Veritas ID: AYRV20
Sample ID: S0066B WALL,PAINT,LOC:2376,STORAGE
Matrix: Solid

Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV21
Sample ID: S0066C WALL,PAINT,LOC:2376,STORAGE
Matrix: Solid

Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV22
Sample ID: S0067A CEILING,CEILING TILES (LAY-IN),24X24 PINHOLE AND DEEP FISSURE,LOC:2376,STORAGE
Matrix: Solid

Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV23
Sample ID: S0067B CEILING,CEILING TILES (LAY-IN),24X24 PINHOLE AND DEEP FISSURE,LOC:2376,STORAGE
Matrix: Solid

Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy

Bureau Veritas ID: AYRV24
Sample ID: S0067C CEILING,CEILING TILES (LAY-IN),24X24 PINHOLE AND DEEP FISSURE,LOC:2376,STORAGE
Matrix: Solid

Collected: 2025/12/23
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A081946	N/A	2025/12/31	Rodel Ligoyligoy



**BUREAU
VERITAS**

Bureau Veritas Job #: C5G2119
Report Date: 2025/12/31

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: JC

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C5G2119

Report Date: 2025/12/31

Pinchin Ltd

Client Project #: 352293.012

Sampler Initials: JC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Jon Delos Santos, Laboratory Supervisor

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.



Pinchin Ltd. - Asbestos Laboratory Internal Asbestos Bulk Sample Chain of Custody

Special Instructions:

Client Name:		Project Address:	ON
Portfolio/Building No:	DVSS	Pinchin File:	352293.012
Submitted by:	Adam Altena	Email:	aaltena@pinchin.com
CC Email:		CC Email:	jcozzitorto@pinchin.com
Date Submitted:	December 23 2025	Required by:	January 2 2026
# of Samples:	30	Priority:	5 Day Turnaround
Year of Building Construction (Mandatory, Years ONLY):			
Do NOT Stop on Positive (Sample Numbers):			
Pinchin Group Company (Mandatory Field):	Pinchin		
HMIS2 Building Reference #:	158246/2025112314880034		

To be Completed by Lab Personnel Only:

Lab Reference #:		Time:	13:00	24 hour clock
Received by:	DEC 24 2025	Date:	2025/12/24	Month Day Year
Name(s) of Analyst(s):	G. S. S. S. S.			

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0058	A	Duct, All, Mastic, Red, Loc: 2583, Pipe Chase And Mechanical Penthouse
S	0058	B	Duct, All, Mastic, Red, Loc: 2583, Pipe Chase And Mechanical Penthouse
S	0058	C	Duct, All, Mastic, Red, Loc: 2583, Pipe Chase And Mechanical Penthouse
S	0059	A	Piping, Tar Paper, Loc: 2583, Pipe Chase And Mechanical Penthouse
S	0059	B	Piping, Tar Paper, Loc: 2583, Pipe Chase And Mechanical Penthouse
S	0059	C	Piping, Tar Paper, Loc: 2583, Pipe Chase And Mechanical Penthouse

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0060	A	Wall,Paint,Loc:2583,Pipe Chase And Mechanical Penthouse
S	0060	B	Wall,Paint,Loc:2583,Pipe Chase And Mechanical Penthouse
S	0060	C	Wall,Paint,Loc:2583,Pipe Chase And Mechanical Penthouse
S	0061	A	Sink,Mastic, White,Loc:2379,Teacher Workstation
S	0061	B	Sink,Mastic, White,Loc:2379,Teacher Workstation
S	0061	C	Sink,Mastic, White,Loc:2379,Teacher Workstation
S	0062	A	Floor,Vinyl Floor Tile And Mastic,12x12 Grey With Greyand White Fleck, Ontop Of 9x9 Grey With White Streaks,Loc:2379,Teacher Workstation
S	0062	B	Floor,Vinyl Floor Tile And Mastic,12x12 Grey With Greyand White Fleck, Ontop Of 9x9 Grey With White Streaks,Loc:2379,Teacher Workstation
S	0062	C	Floor,Vinyl Floor Tile And Mastic,12x12 Grey With Greyand White Fleck, Ontop Of 9x9 Grey With White Streaks,Loc:2379,Teacher Workstation
S	0063	A	Wall,Paint,Paint On Block,Loc:2379,Teacher Workstation
S	0063	B	Wall,Paint,Paint On Block,Loc:2379,Teacher Workstation
S	0063	C	Wall,Paint,Paint On Block,Loc:2379,Teacher Workstation
S	0064	A	Wall,Mastic, Brown,Baseboard Mastic,Loc:2379,Teacher Workstation
S	0064	B	Wall,Mastic, Brown,Baseboard Mastic,Loc:2379,Teacher Workstation
S	0064	C	Wall,Mastic, Brown,Baseboard Mastic,Loc:2379,Teacher Workstation

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0065	A	Wall,Cement Product,Loc:2415,Corridor
S	0065	B	Wall,Cement Product,Loc:2415,Corridor
S	0065	C	Wall,Cement Product,Loc:2415,Corridor
S	0066	A	Wall,Paint,Loc:2376,Storage
S	0066	B	Wall,Paint,Loc:2376,Storage
S	0066	C	Wall,Paint,Loc:2376,Storage
S	0067	A	Ceiling,Ceiling Tiles (lay-in),24x24 Pinhole And Deep Fissure,Loc:2376,Storage
S	0067	B	Ceiling,Ceiling Tiles (lay-in),24x24 Pinhole And Deep Fissure,Loc:2376,Storage
S	0067	C	Ceiling,Ceiling Tiles (lay-in),24x24 Pinhole And Deep Fissure,Loc:2376,Storage



Your Project #: 352293.012
Your C.O.C. #: NA

Attention: Jessica Cozzitorto

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2026/03/11
Report #: R8706387
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C622734

Received: 2026/03/05, 14:35

Sample Matrix: Solid
Samples Received: 18

Analyses	Date		Laboratory Method	Analytical Method
	Quantity	Extracted		
Asbestos by PLM - 0.5 RDL (1)	15	N/A	2026/03/10 COR3SOP-00002	EPA 600R-93/116
Asbestos by PLM - 0.5 RDL (1)	3	N/A	2026/03/11 COR3SOP-00002	EPA 600R-93/116

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Bureau Veritas' Asbestos Laboratory is accredited by NVLAP for bulk asbestos analysis by polarized light microscopy, NVLAP Code 600136-0.

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Bureau Veritas' scope of accreditation includes EPA -- 40 CFR Appendix E to Subpart E of Part 763, "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" and EPA-600/R-93/116: "Method for the Determination of Asbestos in Bulk Building Materials".

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) P.O.B. - Percent of Bulk



Your Project #: 352293.012
Your C.O.C. #: NA

Attention: Jessica Cozzitorto

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2026/03/11
Report #: R8706387
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C622734

Received: 2026/03/05, 14:35

When Asbestos data is reported with other data, this report contains data that are not covered by the NVLAP accreditation.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:

Elora Di Bratto, Project Manager

Email: Elora.Di-Bratto@bureauveritas.com

Phone# (905) 817-5700

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.



BUREAU
VERITAS

Bureau Veritas Job #: C622734
Report Date: 2026/03/11

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: AA

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0068A WALL, DRYWALL AND JOINT COMPOUND, LOC: 2570, CLASSROOM

Bureau Veritas
ID: BAMU46

Date Analyzed: 2026/03/10

	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	100	Homogeneous white drywall joint compound	Not Detected		Non-Fibrous

S0068B WALL, DRYWALL AND JOINT COMPOUND, LOC: 2570, CLASSROOM

Bureau Veritas
ID: BAMU47

Date Analyzed: 2026/03/10

	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	100	Homogeneous white drywall joint compound	Not Detected		Non-Fibrous

S0068C WALL, DRYWALL AND JOINT COMPOUND, LOC: 2543, CLASSROOM

Bureau Veritas
ID: BAMU48

Date Analyzed: 2026/03/10

	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	100	Homogeneous white drywall joint compound	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C622734
Report Date: 2026/03/11

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: AA

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0069A WALL, BULKHEAD, DRYWALL AND JOINT COMPOUND, LOC: 2379, TEACHER WORKSTATION					
Bureau Veritas ID: BAMU49		Date Analyzed: 2026/03/10			
	P.O.B	Sample Morphology	Asbestos		Particulate
Layer 1	100	Homogeneous off-white drywall joint compound	Chrysotile	2%	Non-Fibrous

S0069B WALL, BULKHEAD, DRYWALL AND JOINT COMPOUND, LOC: 2379, TEACHER WORKSTATION					
Bureau Veritas ID:		BAMU50		Date Analyzed:	2026/03/10
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1			N/A		
	Comment: Not Analyzed - Positive Stop				

S0069C WALL, BULKHEAD, DRYWALL AND JOINT COMPOUND, LOC: 2379, TEACHER WORKSTATION					
Bureau Veritas ID:		BAMU51		Date Analyzed:	2026/03/10
	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1			N/A		
	Comment: Not Analyzed - Positive Stop				

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



BUREAU
VERITAS

Bureau Veritas Job #: C622734
Report Date: 2026/03/11

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: AA

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0070A FLOOR, VINYL FLOOR TILE AND MASTIC, 20X20 GREY WITH BLACK SPECKS, LOC:2570, CLASSROOM

Bureau Veritas
ID:

BAMU52

Date Analyzed: 2026/03/10

	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	80	Homogeneous white drywall joint compound	Not Detected		Non-Fibrous
Layer 2	10	Homogeneous yellow mastic	Not Detected		Non-Fibrous
Layer 3	10	Homogeneous grey levelling compound	Not Detected	Cellulose 1%	Non-Fibrous

S0070B FLOOR, VINYL FLOOR TILE AND MASTIC, 20X20 GREY WITH BLACK SPECKS, LOC:2570, CLASSROOM

Bureau Veritas
ID:

BAMU53

Date Analyzed: 2026/03/10

	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	85	Homogeneous white drywall joint compound	Not Detected		Non-Fibrous
Layer 2	15	Non-homogeneous yellow/grey mastic/levelling compound	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



BUREAU
VERITAS

Bureau Veritas Job #: C622734

Report Date: 2026/03/11

Pinchin Ltd

Client Project #: 352293.012

Sampler Initials: AA

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0070C FLOOR, VINYL FLOOR TILE AND MASTIC, 20X20 GREY WITH BLACK SPECKS, LOC:2570, CLASSROOM

Bureau Veritas
ID:

BAMU54

Date Analyzed: 2026/03/10

	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	85	Homogeneous white drywall joint compound	Not Detected		Non-Fibrous
Layer 2	15	Non-homogeneous yellow/grey mastic/levelling compound	Not Detected		Non-Fibrous

S0071A WALL, PAINT, PAINT ON BLOCK, LOC: 2576, CORRIDOR

Bureau Veritas
ID:

BAMU55

Date Analyzed: 2026/03/10

	<u>P.O.B</u>	<u>Sample Morphology</u>	<u>Asbestos</u>	<u>Other Fibres</u>	<u>Particulate</u>
Layer 1	100	Non-homogeneous white/light grey paint/cementitious material	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)

Date Format : yyyy/mm/dd



Bureau Veritas Job #: C622734
Report Date: 2026/03/11

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: AA

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0071B WALL, PAINT, PAINT ON BLOCK, LOC: 2367, GIRLS CHANGEROOM					
Bureau Veritas ID: BAMU56		Date Analyzed: 2026/03/10			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Non-homogeneous white/yellow paint/cementitious material	Not Detected		Non-Fibrous

S0071C WALL, PAINT, PAINT ON BLOCK, LOC: 2364, STORAGE					
Bureau Veritas ID: BAMU57		Date Analyzed: 2026/03/10			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Non-homogeneous white/yellow paint/cementitious material	Not Detected		Non-Fibrous

S0072A DUCT, MASTIC, GREY, LOC: 2364, STORAGE					
Bureau Veritas ID: BAMU58		Date Analyzed: 2026/03/10			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mastic	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C622734
Report Date: 2026/03/11

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: AA

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0072B DUCT, MASTIC, GREY, LOC: 2364, STORAGE					
Bureau Veritas ID: BAMU59		Date Analyzed: 2026/03/10			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mastic	Not Detected		Non-Fibrous

S0072C DUCT, MASTIC, GREY, LOC: 2364, STORAGE					
Bureau Veritas ID: BAMU60		Date Analyzed: 2026/03/10			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey mastic	Not Detected		Non-Fibrous

S0073A CEILING, DRYWALL AND JOINT COMPOUND, LOC: 2367, GIRLS CHANGEROOM					
Bureau Veritas ID: BAMU61		Date Analyzed: 2026/03/11			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous white drywall joint compound	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



Bureau Veritas Job #: C622734
Report Date: 2026/03/11

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: AA

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

S0073B CEILING, DRYWALL AND JOINT COMPOUND, LOC: 2367, GIRLS CHANGEROOM					
Bureau Veritas ID: BAMU62		Date Analyzed: 2026/03/11			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous white drywall joint compound	Not Detected		Non-Fibrous

S0073C CEILING, DRYWALL AND JOINT COMPOUND, LOC: 2367, GIRLS CHANGEROOM					
Bureau Veritas ID: BAMU63		Date Analyzed: 2026/03/11			
	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous white drywall joint compound	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, "<0.50%". "Not Detected" indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd



BUREAU
VERITAS

Bureau Veritas Job #: C622734
Report Date: 2026/03/11

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: AA

TEST SUMMARY

Bureau Veritas ID: BAMU46
Sample ID: S0068A WALL, DRYWALL AND JOINT COMPOUND, LOC: 2570, CLASSROOM
Matrix: Solid

Collected: 2026/03/03
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A	2026/03/10	Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU47
Sample ID: S0068B WALL, DRYWALL AND JOINT COMPOUND, LOC: 2570, CLASSROOM
Matrix: Solid

Collected: 2026/03/03
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A	2026/03/10	Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU48
Sample ID: S0068C WALL, DRYWALL AND JOINT COMPOUND, LOC: 2543, CLASSROOM
Matrix: Solid

Collected: 2026/03/03
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A	2026/03/10	Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU49
Sample ID: S0069A WALL, BULKHEAD, DRYWALL AND JOINT COMPOUND, LOC: 2379, TEACHER WORKS
Matrix: Solid

Collected: 2026/03/03
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A	2026/03/10	Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU49 Dup
Sample ID: S0069A WALL, BULKHEAD, DRYWALL AND JOINT COMPOUND, LOC: 2379, TEACHER WORKS
Matrix: Solid

Collected: 2026/03/03
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU50
Sample ID: S0069B WALL, BULKHEAD, DRYWALL AND JOINT COMPOUND, LOC: 2379, TEACHER WORKS
Matrix: Solid

Collected: 2026/03/03
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU51
Sample ID: S0069C WALL, BULKHEAD, DRYWALL AND JOINT COMPOUND, LOC: 2379, TEACHER WORKS
Matrix: Solid

Collected: 2026/03/03
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso



TEST SUMMARY

Bureau Veritas ID: BAMU52
Sample ID: S0070A FLOOR, VINYL FLOOR TILE AND MASTIC, 20X20 GREY WITH BLACK SPECKS, LOC: 2576, GIRLS CHANGEROOM
Matrix: Solid
Collected: 2026/03/03
Shipped: 2026/03/03
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU53
Sample ID: S0070B FLOOR, VINYL FLOOR TILE AND MASTIC, 20X20 GREY WITH BLACK SPECKS, LOC: 2576, GIRLS CHANGEROOM
Matrix: Solid
Collected: 2026/03/03
Shipped: 2026/03/03
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU54
Sample ID: S0070C FLOOR, VINYL FLOOR TILE AND MASTIC, 20X20 GREY WITH BLACK SPECKS, LOC: 2576, GIRLS CHANGEROOM
Matrix: Solid
Collected: 2026/03/03
Shipped: 2026/03/03
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU55
Sample ID: S0071A WALL, PAINT, PAINT ON BLOCK, LOC: 2576, CORRIDOR
Matrix: Solid
Collected: 2026/03/03
Shipped: 2026/03/03
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU56
Sample ID: S0071B WALL, PAINT, PAINT ON BLOCK, LOC: 2367, GIRLS CHANGEROOM
Matrix: Solid
Collected: 2026/03/03
Shipped: 2026/03/03
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU57
Sample ID: S0071C WALL, PAINT, PAINT ON BLOCK, LOC: 2364, STORAGE
Matrix: Solid
Collected: 2026/03/03
Shipped: 2026/03/03
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU58
Sample ID: S0072A DUCT, MASTIC, GREY, LOC: 2364, STORAGE
Matrix: Solid
Collected: 2026/03/03
Shipped: 2026/03/03
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso



BUREAU
VERITAS

Bureau Veritas Job #: C622734
Report Date: 2026/03/11

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: AA

TEST SUMMARY

Bureau Veritas ID: BAMU59
Sample ID: S0072B DUCT, MASTIC, GREY, LOC: 2364, STORAGE
Matrix: Solid

Collected: 2026/03/03
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU60
Sample ID: S0072C DUCT, MASTIC, GREY, LOC: 2364, STORAGE
Matrix: Solid

Collected: 2026/03/03
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU61
Sample ID: S0073A CEILING, DRYWALL AND JOINT COMPOUND, LOC: 2367, GIRLS CHANGEROOM
Matrix: Solid

Collected: 2026/03/03
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU62
Sample ID: S0073B CEILING, DRYWALL AND JOINT COMPOUND, LOC: 2367, GIRLS CHANGEROOM
Matrix: Solid

Collected: 2026/03/03
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso

Bureau Veritas ID: BAMU63
Sample ID: S0073C CEILING, DRYWALL AND JOINT COMPOUND, LOC: 2367, GIRLS CHANGEROOM
Matrix: Solid

Collected: 2026/03/03
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Asbestos by PLM - 0.5 RDL	MIC	A113049	N/A		Rayana De Oliveira Cardoso



**BUREAU
VERITAS**

Bureau Veritas Job #: C622734

Report Date: 2026/03/11

Pinchin Ltd

Client Project #: 352293.012

Sampler Initials: AA

GENERAL COMMENTS

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C622734

Report Date: 2026/03/11

Pinchin Ltd

Client Project #: 352293.012

Sampler Initials: AA

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

A handwritten signature in black ink, appearing to read 'JDSantos', written over a horizontal line.

Jon Delos Santos, Laboratory Supervisor

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.



NONT-2026-03-852

Pinchin Ltd. - Asbestos Laboratory
Internal Asbestos Bulk Sample Chain of Custody

Special Instructions:

Client Name:		Project Address:	ON
Portfolio/Building No:		Pinchin File:	352293.012
Submitted by:	Adam Altena	Email:	aaltena@pinchin.com
CC Email:		CC Email:	jcozzitorto@pinchin.com
Date Submitted:	March 03 2026	Required by:	March 11 2026
# of Samples:	18	Priority:	5 Day Turnaround
Year of Building Construction (Mandatory, Years ONLY):			
Do NOT Stop on Positive (Sample Numbers):			
Pinchin Group Company (Mandatory Field):	Pinchin		
HMIS2 Building Reference #:	160960/20262228876142		

To be Completed by Lab Personnel Only:

Lab Reference #:		Time:	24 hour clock		
Received by:	MAR 05 2026 Cu.	Date:	Month	Day	Year
Name(s) of Analyst(s):					

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0068	A	Wall,Drywall And Joint Compound,Loc:2570,Classroom
S	0068	B	Wall,Drywall And Joint Compound,Loc:2570,Classroom
S	0068	C	Wall,Drywall And Joint Compound,Loc:2543,Classroom
S	0069	A	Wall,Bulkhead,Drywall And Joint Compound,Loc:2379,Teacher Workstation
S	0069	B	Wall,Bulkhead,Drywall And Joint Compound,Loc:2379,Teacher Workstation
S	0069	C	Wall,Bulkhead,Drywall And Joint Compound,Loc:2379,Teacher Workstation

Ad AmourPREP SIMU
20260305 14:35

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0070	A	Floor, Vinyl Floor Tile And Mastic, 20x20 Grey With Black Specks, Loc:2570, Classroom
S	0070	B	Floor, Vinyl Floor Tile And Mastic, 20x20 Grey With Black Specks, Loc:2570, Classroom
S	0070	C	Floor, Vinyl Floor Tile And Mastic, 20x20 Grey With Black Specks, Loc:2543, Classroom
S	0071	A	Wall, Paint, Paint On Block, Loc:2576, Corridor
S	0071	B	Wall, Paint, Paint On Block, Loc:2367, Girls Changeroom
S	0071	C	Wall, Paint, Paint On Block, Loc:2364, Storage
S	0072	A	Duct, Mastic, Grey, Loc:2364, Storage
S	0072	B	Duct, Mastic, Grey, Loc:2364, Storage
S	0072	C	Duct, Mastic, Grey, Loc:2364, Storage
S	0073	A	Ceiling, Drywall And Joint Compound, Loc:2367, Girls Changeroom
S	0073	B	Ceiling, Drywall And Joint Compound, Loc:2367, Girls Changeroom
S	0073	C	Ceiling, Drywall And Joint Compound, Loc:2367, Girls Changeroom

APPENDIX II-B
Lead Analytical Certificates



Your P.O. #: DVSS
Your Project #: 352293.012
Your C.O.C. #: N/A

Attention: Jessica Cozzitorto

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2026/01/02
Report #: R8677091
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C5G2145

Received: 2025/12/24, 13:00

Sample Matrix: Bulk
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Metals in Paint	6	2025/12/31	2025/12/31	CAM SOP-00408	EPA 6010D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



Your P.O. #: DVSS
Your Project #: 352293.012
Your C.O.C. #: N/A

Attention: Jessica Cozzitorto

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2026/01/02
Report #: R8677091
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C5G2145

Received: 2025/12/24, 13:00

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Elora Di Bratto, Project Manager
Email: Elora.Di-Bratto@bureauveritas.com
Phone# (905) 817-5700

=====

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BUREAU
VERITAS

Bureau Veritas Job #: C5G2145

Report Date: 2026/01/02

Pinchin Ltd

Client Project #: 352293.012

Your P.O. #: DVSS

Sampler Initials: AA

ELEMENTS BY ATOMIC SPECTROSCOPY (BULK)

Bureau Veritas ID		AYRW49			AYRW50			
Sampling Date								
COC Number		N/A			N/A			
	UNITS	L0029, STRUCTURE, METAL, ,LOC:2583,PIPE CHASE AND MECHANIC	RDL	MDL	L0030, WALL, CONCRETE (PRECAST), YELLOW ON BLOCK,LOC:2583,P	RDL	MDL	QC Batch

Metals

Lead (Pb)	%	0.43	0.0037	0.0011	0.017	0.00010	0.000030	A082058

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		AYRW51			AYRW52			
Sampling Date								
COC Number		N/A			N/A			
	UNITS	L0031, WALL, CONCRETE (PRECAST), GREY ON BLOCK,LOC:2379,TEA	RDL	MDL	L0032, STRUCTURE, METAL, RED ON STRUCTURE, LOC: 2379, TEACHER	RDL	MDL	QC Batch

Metals

Lead (Pb)	%	0.0076	0.00010	0.000030	0.11	0.0060	0.0018	A082058

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Bureau Veritas ID		AYRW53			AYRW54			
Sampling Date								
COC Number		N/A			N/A			
	UNITS	L0033, WALL, DRYWALL AND JOINT COMPOUND, , LOC: 2415, CORRIDO	RDL	MDL	L0034, WALL, CONCRETE (PRECAST), , LOC: 2376, STORAGE	RDL	MDL	QC Batch

Metals

Lead (Pb)	%	<0.00052	0.00052	0.00016	0.0021	0.00010	0.000030	A082058

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

Bureau Veritas Job #: C5G2145
Report Date: 2026/01/02

Pinchin Ltd
Client Project #: 352293.012
Your P.O. #: DVSS
Sampler Initials: AA

TEST SUMMARY

Bureau Veritas ID: AYRW49
Sample ID: L0029, STRUCTURE, METAL, ,LOC:2583,PIPE CHASE AND MECHANIC
Matrix: Bulk

Collected:
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A082058	2025/12/31	2025/12/31	Medhat Nasr

Bureau Veritas ID: AYRW50
Sample ID: L0030, WALL, CONCRETE (PRECAST), YELLOW ON BLOCK,LOC:2583,P
Matrix: Bulk

Collected:
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A082058	2025/12/31	2025/12/31	Medhat Nasr

Bureau Veritas ID: AYRW51
Sample ID: L0031, WALL, CONCRETE (PRECAST), GREY ON BLOCK,LOC:2379,TEA
Matrix: Bulk

Collected:
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A082058	2025/12/31	2025/12/31	Medhat Nasr

Bureau Veritas ID: AYRW52
Sample ID: L0032, STRUCTURE, METAL, RED ON STRUCTURE, LOC: 2379, TEACHER
Matrix: Bulk

Collected:
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A082058	2025/12/31	2025/12/31	Medhat Nasr

Bureau Veritas ID: AYRW53
Sample ID: L0033, WALL, DRYWALL AND JOINT COMPOUND, , LOC: 2415, CORRIDO
Matrix: Bulk

Collected:
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A082058	2025/12/31	2025/12/31	Medhat Nasr

Bureau Veritas ID: AYRW54
Sample ID: L0034, WALL, CONCRETE (PRECAST), , LOC: 2376, STORAGE
Matrix: Bulk

Collected:
Shipped:
Received: 2025/12/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A082058	2025/12/31	2025/12/31	Medhat Nasr



GENERAL COMMENTS

Sample AYRW49 [L0029, STRUCTURE, METAL, ,LOC:2583,PIPE CHASE AND MECHANIC] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Metals Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample AYRW52 [L0032, STRUCTURE, METAL, RED ON STRUCTURE, LOC: 2379, TEACHER] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Metals Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample AYRW53 [L0033, WALL, DRYWALL AND JOINT COMPOUND, , LOC: 2415, CORRIDO] : Metals Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C5G2145

Report Date: 2026/01/02

QUALITY ASSURANCE REPORT

Pinchin Ltd

Client Project #: 352293.012

Your P.O. #: DVSS

Sampler Initials: AA

QC Batch	Parameter	Date	Matrix Spike		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A082058	Lead (Pb)	2025/12/31	88	75 - 125	<0.00010	%	0.78	35	99	75 - 125

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



BUREAU
VERITAS

Bureau Veritas Job #: C5G2145

Report Date: 2026/01/02

Pinchin Ltd

Client Project #: 352293.012

Your P.O. #: DVSS

Sampler Initials: AA

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere, Senior Scientific Specialist

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C5G2145

2025/12/24 13:00

BUREAU
VERITAS

6740 Campobello Road, Mississauga, Ontario L5N 2L8

Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266

CAM FCD-01191/6

CHAIN OF CUSTODY RECORD

Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)		Turnaround Time (TAT) Required													
Company Name: Pinchin Ltd.		Company Name:		Quotation #:		☒ Regular TAT (5-7 days) Most analyses													
Contact Name: Adam Altana		Contact Name:		P.O. #/ AFE#: DVSS		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS													
Address:		Address:		Project #: 352293.012		Rush TAT (Surcharges will be applied)													
Phone:	Fax:	Phone:	Fax:	Site Location:		☐ 1 Day ☐ 2 Days ☐ 3-4 Days													
Email: aaltana@pinchin.com lcozzitorto@pinchin.com		Email:		Site #:		Date Required: January 2 2026													
MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY				Site Location Province: ON		Rush Confirmation #:													
				Sampled By: Adam Altana															
Regulation 153		Other Regulations		Analysis Requested												LABORATORY USE ONLY			
☐ Table 1	☐ Res/Park	☐ Med/ Fine	☐ CCME	☐ Sanitary Sewer Bylaw													CUSTODY SEAL Y / N		
☐ Table 2	☐ Ind/Comm	☐ Coarse	☐ MISA	☐ Storm Sewer Bylaw													Present Intact		
☐ Table 3	☐ Agri/ Other		☐ PWQO	Region															
☐ Table			☐ Other (Specify)																
FOR RSC (PLEASE CIRCLE) Y / N																			
Include Criteria on Certificate of Analysis: Y / N																			
SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS																			
SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE) Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B)	Lead (Pb) in Paints	PCBs	HOLD- DO NOT ANALYZE				COOLING MEDIA PRESENT: Y / N	
L0029, Structure, Metal, ,Loc:2583,Pipe Chase And Mechanic			BULK									X							
L0030, Wall, Concrete (precast), Yellow On Block,Loc:2583,P			BULK									X							
L0031, Wall, Concrete (precast), Grey On Block,Loc:2379,Tea			BULK									X							
L0032, Structure, Metal, Red On Structure,Loc:2379,Teacher			BULK									X							
L0033, Wall, Drywall and joint compound, ,Loc:2415,Corrido			BULK									X							
L0034, Wall, Concrete (precast), ,Loc:2376,Storage			BULK									X							
RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)		DATE: (YYYY/MM/DD)		TIME: (HH:MM)		BV JOB #										
Adam Altana	2025-12-23	15:00	<i>Susan SAWAN</i>		2025/12/24 13:00														



NONT-2025-12-4448

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Your Project #: 352293.012
Your C.O.C. #: NA

Attention: Jessica Cozzitorto

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2026/03/11
Report #: R8706741
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C623164

Received: 2026/03/05, 14:35

Sample Matrix: Bulk
Samples Received: 2

Analyses	Date		Date Analyzed	Laboratory Method	Analytical Method
	Quantity	Extracted			
Metals in Paint	2	2026/03/11	2026/03/11	CAM SOP-00408	EPA 6010D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



Your Project #: 352293.012
Your C.O.C. #: NA

Attention: Jessica Cozzitorto

Pinchin Ltd
2360 Meadowpine Blvd
Unit # 2
Mississauga, ON
CANADA L5N 6S2

Report Date: 2026/03/11
Report #: R8706741
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C623164

Received: 2026/03/05, 14:35

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:

Elora Di Bratto, Project Manager
Email: Elora.Di-Bratto@bureauveritas.com
Phone# (905) 817-5700

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ELEMENTS BY ATOMIC SPECTROSCOPY (BULK)

Bureau Veritas ID		BANO14			BANO15			
Sampling Date								
COC Number		NA			NA			
	UNITS	L0035, WALL, DRYWALL AND JOINT COMPOUND, PAINT ON DRYWALL	RDL	MDL	L0036, STRUCTURE, CONCRETE (POURED), PAINT ON CONCRETE	RDL	MDL	QC Batch

Metals								
Lead (Pb)	%	0.00061	0.00019	0.000057	0.0021	0.00015	0.000045	A113158
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								



BUREAU
VERITAS

Bureau Veritas Job #: C623164
Report Date: 2026/03/11

Pinchin Ltd
Client Project #: 352293.012
Sampler Initials: AA

TEST SUMMARY

Bureau Veritas ID: BANO14
Sample ID: L0035, WALL, DRYWALL AND JOINT COMPOUND, PAINT ON DRYWALL
Matrix: Bulk
Collected:
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A113158	2026/03/11	2026/03/11	Japneet Gill

Bureau Veritas ID: BANO15
Sample ID: L0036, STRUCTURE, CONCRETE (POURED), PAINT ON CONCRETE
Matrix: Bulk
Collected:
Shipped:
Received: 2026/03/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	A113158	2026/03/11	2026/03/11	Japneet Gill



BUREAU
VERITAS

Bureau Veritas Job #: C623164

Report Date: 2026/03/11

Pinchin Ltd

Client Project #: 352293.012

Sampler Initials: AA

GENERAL COMMENTS

Sample BANO14 [L0035, WALL, DRYWALL AND JOINT COMPOUND, PAINT ON DRYWALL] : Metals Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample BANO15 [L0036, STRUCTURE, CONCRETE (POURED), PAINT ON CONCRETE] : Metals Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C623164

Report Date: 2026/03/11

QUALITY ASSURANCE REPORT

Pinchin Ltd

Client Project #: 352293.012

Sampler Initials: AA

QC Batch	Parameter	Date	Matrix Spike		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A113158	Lead (Pb)	2026/03/11	94	75 - 125	<0.00010	%	4.4	35	105	75 - 125

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



BUREAU
VERITAS

Bureau Veritas Job #: C623164

Report Date: 2026/03/11

Pinchin Ltd

Client Project #: 352293.012

Sampler Initials: AA

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

A handwritten signature in cursive script that reads 'Cristina Carriere'.

Cristina Carriere, Senior Scientific Specialist

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6740 Campobello Road, Mississauga, Ontario L5N 2L8
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266
CAM FCD-01191/6



NONT-2026-03-843

Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)		Turnaround Time (TAT) Required	
Company Name: Pinchin Ltd.		Company Name:		Quotation #:		☒ Regular TAT (5-7 days) Most analyses	
Contact Name: Adam Altena		Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS	
Address:		Address:		Project #: 352293.012		Rush TAT (Surcharges will be applied)	
Phone: Fax:		Phone: Fax:		Site Location:		☐ 1 Day ☐ 2 Days ☐ 3-4 Days	
Email: aaltena@pinchin.com jcozzitorto@pinchin.com		Email:		Site #:		Date Required: March 11 2026	
MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY				Site Location Province: ON		Rush Confirmation #:	
Regulation 153		Other Regulations		Analysis Requested		LABORATORY USE ONLY	
☐ Table 1 ☐ Res/Park ☐ Med/ Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/ Other ☐ Table _____ FOR RSC (PLEASE CIRCLE) Y / N		☐ CCME ☐ Sanitary Sewer Bylaw ☐ MISA ☐ Storm Sewer Bylaw ☐ PWQO Region _____ ☐ Other (Specify) _____ ☐ REG 558 (MIN. 3 DAY TAT REQUIRED) ☐ REG 406 Table _____		# OF CONTAINERS SUBMITTED HOLD FILTERED (CIRCLE) Metals / Hg / CrVI BTEX/ PHC F1 PHCs F2 - F4 VOCs REG 153 METALS & INORGANICS REG 153 ICPMS METALS REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B) Lead (Pb) in Paints PCBs HOLD- DO NOT ANALYZE		CUSTODY SEAL Y / N Present Intact COOLER TEMPERATURES COOLING MEDIA PRESENT: Y / N COMMENTS	
Include Criteria on Certificate of Analysis: Y / N		SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS					
SAMPLE IDENTIFICATION		DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX			
L0035, Wall, Drywall and joint compound, Paint On Drywall, L				BULK			
L0036, Structure, Concrete (poured), Paint On Concrete Struc				BULK			
RELINQUISHED BY: (Signature/Print)		DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	BV JOB #
Adam Altena		2026-03-03	15:00	<i>Adam Altena</i>	2026/03/05	14:35	

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APPENDIX III

Methodology



1.0 GENERAL

An investigation was conducted to identify the type of Hazardous Building Materials incorporated in the structure and its finishes.

Information regarding the location and condition of hazardous building materials encountered and visually estimated quantities were recorded. The locations of any samples collected were recorded on small-scale plans. As-built drawings and previous reports were referenced where provided.

Sample collection was conducted in accordance with our Standard Operating Procedures.

1.1 Asbestos

The investigation for asbestos included friable and non-friable asbestos-containing materials (ACM). A friable material is a material that when dry can be crumbled, pulverized or powdered by hand pressure, or a material that has already become crushed, pulverized, or powdered.

A separate set of samples was collected of each type of homogenous material suspected to contain asbestos. A homogenous material is defined by the US EPA as material that is uniform in texture and appearance, was installed at one time, and is unlikely to consist of more than one type or formulation of material. The homogeneous materials were determined by visual examination and available information on the phases of construction and prior renovations.

Samples were collected at a rate that is in compliance with the requirements of local regulations and guidelines. The sampling strategy was also based on known ban dates and phase out dates of the use of asbestos; sampling of certain building materials is not conducted after specific construction dates. In addition, to be conservative, several years past these dates are added to account for some uncertainty in the exact start / finish date of construction and associated usage of ACM. In some cases, manufactured products such as asbestos cement pipe were visually identified without sample confirmation.

The asbestos analysis of select materials was completed using a stop-positive approach. Only one result meeting the regulated criteria was required to determine that a material is asbestos-containing, but all samples must be analyzed to conclusively determine that a material is non-asbestos. The laboratory stopped analyzing samples from a homogeneous material once a result equal to or greater than the regulated criteria is detected in any of the samples of that material. All samples of a homogeneous material were analyzed if no asbestos is detected. In some cases, all samples were analyzed in the sample set regardless of result.

The analysis was performed in accordance with Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, July 1993.

Analytical results were compared to the following criteria:

Jurisdiction*	Friable	Non-Friable
BC	0.5% ¹	0.5%
Alberta	Any Amount ²	Any Amount ²
Saskatchewan	>0.5% ¹	>1%
Manitoba	0.1% ¹	1%
Ontario	0.5%	0.5%
Nova Scotia	0.5% ¹	0.5%
New Brunswick	1%	1%
Prince Edward Island	1%	1%
Newfoundland and Labrador	1%	1%
Yukon	1%	1%
Nunavut	1%	1%
Northwest Territories	1%	1%
Federal	1%	1%

* If there is a conflict between federal and provincial criteria, the more stringent will apply.

Where building materials are described in the report as “non-asbestos” or “does not contain asbestos”, this means that either no asbestos was detected by the analytical method utilized in any of the multiple samples or, if detected, it is below the lower limit of an asbestos-containing material in the applicable regulation. Additionally, these terms are used for materials which historically are known to not include asbestos in their manufacturing.

Asbestos materials were evaluated in order to make recommendations regarding any remedial work. The priority for remedial action was based on several factors:

- Friability (friable or non-friable)
- Condition (good, fair, poor, debris)
- Accessibility (ranking from accessible to all building users to inaccessible)
- Visibility (whether the material is obscured by other building components)
- 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 Or any amount if vermiculite

² The Government of Alberta in their guideline document entitled the “Alberta Asbestos Abatement Manual” (August 2019), defines an Asbestos-Containing Material as a product or building material that contains asbestos in any quantity or percentage.

1.2 Lead

Samples of distinctive paint finishes, and surface coatings present in more than a limited application, where removal of the paint is possible were collected. The samples were collected by scraping the painted finish to include base and covering applications.

Analytical results were compared to the following criteria.

Jurisdiction*	Units (%)	Units (ppm) / (mg/kg)
British Columbia**	0.009	90
Alberta	0.009	90
Saskatchewan	0.009	90
Manitoba	0.009	90
Ontario	0.009	90
Nova Scotia	0.009	90
New Brunswick	0.009	90
Prince Edward Island	0.009	90
Newfoundland	0.009	90
Yukon	0.009	90
Nunavut	0.1	1,000
Northwest Territories	0.1	1,000
Federal	0.009	90

* If there is a conflict between federal and provincial criteria, the more stringent will apply.

** WorkSafe BC health and safety regulations do not numerically define what would be considered a lead-containing paint or coating. In general, paints containing lead >0.009% may require work procedures if disturbed.

Other lead building products (e.g. batteries, lead sheeting, flashing) were identified by visual observation only.

1.3 Silica

Building materials known to contain crystalline silica (e.g. concrete, cement, tile, brick, masonry, mortar) were identified by visual inspection only. Pinchin did not perform sampling of these materials for laboratory analysis of crystalline silica content.

1.4 Mercury

Building materials, products or equipment (e.g. thermostats, barometers, pressure gauges, lamp tubes), suspected to contain mercury were identified by visual inspection only. Dismantling of equipment suspected of containing mercury was not performed. Sampling of these materials for laboratory analysis of mercury content was not performed.

1.5 Polychlorinated Biphenyls

The potential for light ballast and oil filled transformers to contain PCBs was based on the age of the building, a review of maintenance records, and examination of labels or nameplates on equipment, where present and accessible. The information was compared to known ban dates of PCBs and Environment Canada publications.

Dry type transformers were presumed to be free of dielectric fluids and hence non-PCB.

1.6 Visible Mould

The presence of mould or water damage was determined by visual inspection of exposed building surfaces. If any mould growth or water damage was concealed within building cavities it was not addressed in this assessment.

Template: Methodology for Hazardous Building Materials Assessment, HAZ, November 13 2024

APPENDIX IV
Location Summary Report

Client:Hamilton-Wentworth District School Board

Site: 310 Governors Road, Dundas, ON

Building Name: Dundas Valley Secondary School

Survey Date:

Last Re-Assessment:

Building Phases: A: 1964

Location No.	Name or Description	Area ft ²	Floor No.	Bldg. Phase	Notes
7	Roof (Square)	0	R	A	
2364	Storage, room no. 0007	600	B	A	
2367	Girls Changeroom, room no. 0005	800	B	A	
2376	Storage	120	1	A	
2377	Storage	400	1	A	
2379	Teacher Workstation	450	1	A	Includes part of 2376
2414	Corridor	400	1	A	
2415	Corridor	400	1	A	
2543	Classroom, room no. 2035	800	2	A	
2570	Classroom, room no. 2058	800	2	A	
2576	Corridor, room no. 2037	400	2	A	
2583	Pipe Chase And Mechanical Penthouse	1000	2/3	A	

APPENDIX V
Hazardous Materials Summary Report / Sample Log

Client: Hamilton-Wentworth District School Board

Site: 310 Governors Road, Dundas, ON

Building Name: Dundas Valley Secondary School

Survey Date:

HAZMAT	Sample No	System/Component/Material/Sample Description	Locations	Bldg. Phase	LF	SF	EA	%	Type	Positive	Friability
Asbestos	V0014	Piping All Parging Cement	2583	A	0	0	3	0	Chrysotile	Yes	F
Asbestos	S0058 ABC	Duct All Mastic, Red	2583	A	50	0	0	0	Chrysotile	Yes	NF
Asbestos	S0059 ABC	Piping Tar Paper	2583	A	60	0	0	0	None Detected	No	
Asbestos	S0060 ABC	Wall Paint	2583	A	0	300	0	0	None Detected	No	
Asbestos	S0061 ABC	Other Sink Mastic, White	2379	A	0	0	1	0	None Detected	No	
Asbestos	S0062 ABC	Floor Vinyl Floor Tile And Mastic 12x12 Grey With Grey and White Fleck, Ontop Of 9x9 Grey With White Streaks	2379	A	0	450	0	0	Chrysotile	Yes	NF
Asbestos	S0063 ABC	Wall Paint Paint On Block	2379	A	0	900	0	0	None Detected	No	
Asbestos	S0064 ABC	Wall Mastic, Brown Baseboard Mastic	2379	A	80	0	0	0	None Detected	No	
Asbestos	S0065 ABC	Wall Cement Product	2414,2415,2576	A	0	700	0	0	None Detected	No	
Asbestos	S0066 ABC	Wall Paint	2376	A	0	400	0	0	None Detected	No	
Asbestos	S0067 ABC	Ceiling Ceiling Tiles (lay-in) 24x24 Pinhole And Deep Fissure	2376	A	0	120	0	0	Amosite	Yes	PF
Asbestos	S0068 ABC	Wall Drywall And Joint Compound	2543,2570	A	0	2400	0	0	None Detected	No	
Asbestos	S0069 ABC	Wall Bulkhead Drywall And Joint Compound	2379	A	0	40	0	0	Chrysotile	Yes	NF
Asbestos	S0070 ABC	Floor Vinyl Floor Tile And Mastic 20x20 Grey With Black Specks	2543,2570	A	0	1600	0	0	None Detected	No	
Asbestos	S0071 ABC	Wall Paint Paint On Block	2364,2367,2576	A	0	0	0	0	None Detected	No	
Asbestos	S0072 ABC	Duct Mastic, Grey	2364,2367	A	0	0	0	0	None Detected	No	
Asbestos	S0073 ABC	Ceiling Drywall And Joint Compound	2367	A	0	0	0	0	None Detected	No	
Asbestos	V9500	Floor All Terrazzo	2414,2415,2576	A	0	0	0	100	Presumed Asbestos	Yes	NF
Asbestos	V9500	Floor Thin-set	2377	A	0	0	0	100	Presumed Asbestos	Yes	PF
Asbestos	V9500	Other Roof Roofing Material	7	A	0	0	0	100	Presumed Asbestos	Yes	NF
Asbestos	V0000	Ceiling All Ceiling Tiles (lay-in) 24x24 Pinhole And Large Fissures, Date Stamped 09/07/03	2379	A	0	350	0	0	Non Asbestos	No	
Asbestos	V0000	Ceiling All Ceiling Tiles (lay-in) 24x24 Pinhole And Small Fissures, Date Stamped 08/17/15	2379	A	0	100	0	0	Non Asbestos	No	
Asbestos	V0000	Ceiling Ceiling Tiles (lay-in) 24x48 Pinhole And Fissure, Date Stamped 04/02/15	2543,2570	A	0	1600	0	0	Non Asbestos	No	
Asbestos	V0000	Ceiling All Ceiling Tiles (lay-in) 24x48 Pinhole And Fissure, Date Stamped 07/24/15	2414,2415,2576	A	0	0	0	100	Non Asbestos	No	
Asbestos	V0000	Ceiling Acoustic Tile Drywall (no Compound) Gypsum Ceiling Tile	2377	A	0	0	0	100	Non Asbestos	No	
Asbestos	V0000	Duct Fibreglass	2543,2570	A	0	0	0	0	Non Asbestos	No	
Asbestos	V0000	Floor Rubber	2367	A	0	0	0	0	Non Asbestos	No	

HAZMAT	Sample No	System/Component/Material/Sample Description	Locations	Bldg. Phase	LF	SF	EA	%	Type	Positive	Friability
Asbestos	V0000	Piping All Fibreglass	2364,2376,2379	A	92	0	0	0	Non Asbestos	No	
Paint	L0029	Structure Metal	2583	A	0	0	0	100		Lead (High)	-
Paint	L0030	Wall Concrete (precast) Yellow On Block	2583	A	0	300	0	0		Lead (Low)	-
Paint	L0031	Wall Concrete (precast) Grey On Block	2379	A	0	900	0	0		No	-
Paint	L0032	Structure Metal Red On Structure	2376,2379	A	0	0	0	100		Lead (High)	-
Paint	L0033	Wall Cement Product White On Walls	2414,2415,2576	A	0	700	0	0		No	-
Paint	L0034	Wall Concrete (precast) Green On Block	2376	A	0	400	0	0		No	-
Paint	L0035	Wall Drywall And Joint Compound Paint On Drywall	2543,2570	A	0	0	0	0		No	-
Paint	L0036	Structure Concrete (poured) Paint On Concrete Structure	2364,2367	A	0	0	0	0		No	-
Lead Product	V9500	Batteries In Emer. Lights	2583	A	0	0	1	0	Presumed Lead Product	Yes	-
Lead Product	V9500	Bell And Spigot Fittings	2576	A	0	0	3	0	Presumed Lead Product	Yes	-
PCB	V0000	Light Ballasts	2376,2379,2414,2415,2583	A	0	0	34	0	-	No	-
Hg	V9000	Light Fixture	2367	A	0	0	6	0	Hg	Yes	-
Hg	V9500	Light Fixture	2376,2379,2414,2415,2576,2583	A	0	0	46	0	Presumed Hg	Yes	-
Hg	V0000	Light Fixture	2543,2570	A	0	0	24	0	-	No	-

Legend:

Sample number		Units		
S####	Asbestos sample collected	SF	Square feet	NF Non Friable material.
L####	Paint sample collected	LF	Linear feet	F Friable material
P####	PCB sample collected	EA	Each	PF Potentially Friable material
M####	Mould sample collected	%	Percentage	
V####	Material visually similar to numbered sample collected			
V0000	Known non Hazardous Material			
V9000	Material is visually identified as Hazardous Material			
V9500	Material is presumed to be Hazardous Material			
[Loc. No.]	Abated Material			

APPENDIX VI
All Data Report

ALL DATA REPORT

Client: Hamilton-Wentworth District School Board
Location: #7 : Roof (Square)
Survey Date:

Site: Schools
Floor: R

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 0

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Other	Roof	Roofing material			C	Y		100(7)			%	V9500	Presumed Asbestos		Presumed Asbestos	NF

Client: Hamilton-Wentworth District School Board
Location: #2364 : Storage
Survey Date: 2026-03-02

Site: Schools
Floor: B

Building Name: Dundas Valley Secondary School
Room #: 0007
Last Re-Assessment: 0000-00-00

Area (sqft): 600

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Duct		Not Insulated														
Duct		Mastic, Grey			C	Y						S0072ABC	None Detected	N.D.	None	
Floor		Concrete (poured)			A	Y										
Mechanical Equipment		Not Insulated						1			EA					
Piping		Fibreglass			C	Y						V0000	Non-Asbestos		None	
Structure		Concrete (poured)			C	N										
Wall		Concrete (poured)														
Wall		Paint, paint on block			A	Y						S0071C	None Detected	N.D.	None	
Wall		Concrete Block			A	Y										

Client: Hamilton-Wentworth District School Board
Location: #2364 : Storage
Survey Date: 2026-03-02

Site: Schools
Floor: B

Building Name: Dundas Valley Secondary School
Room #: 0007
Last Re-Assessment: 0000-00-00

Area (sqft): 600

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall								[No]
Structure	Concrete (poured)				L0036	Paint on concrete structure	Pb: 0.0021 %	No

Client: Hamilton-Wentworth District School Board
Location: #2364 : Storage
Survey Date: 2026-03-02

Site: Schools
Floor: B

Building Name: Dundas Valley Secondary School
Room #: 0007
Last Re-Assessment: 0000-00-00

Area (sqft): 600

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture				

Client: Hamilton-Wentworth District School Board
Location: #2364 : Storage
Survey Date: 2026-03-02

Site: Schools
Floor: B

Building Name: Dundas Valley Secondary School
Room #: 0007
Last Re-Assessment: 0000-00-00

Area (sqft): 600

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts							No

Client: Hamilton-Wentworth District School Board
Location: #2367 : Girls Changeroom
Survey Date: 2026-03-02

Site: Schools
Floor: B

Building Name: Dundas Valley Secondary School
Room #: 0005
Last Re-Assessment: 0000-00-00

Area (sqft): 800

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Drywall and joint compound			A	Y						S0073ABC	None Detected	N.D.	None	
Duct		Not Insulated														
Duct		Mastic, Grey			C	Y						V0072	None Detected	N.D.	None	
Floor		Rubber			A	Y						V0000	Non-Asbestos		None	
Mechanical Equipment		None Found														
Piping		Fibreglass														
Structure		Concrete (poured)			C	N										
Wall		Paint, Paint on block			A	Y						S0071B	None Detected	N.D.	None	
Wall		Concrete Block			A	Y										

Client: Hamilton-Wentworth District School Board
Location: #2367 : Girls Changeroom
Survey Date: 2026-03-02

Site: Schools
Floor: B

Building Name: Dundas Valley Secondary School
Room #: 0005
Last Re-Assessment: 0000-00-00

Area (sqft): 800

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Structure	Concrete (poured)				V0036	Paint on concrete structure		Pb: 0.0021 %	No

Client: Hamilton-Wentworth District School Board
Location: #2367 : Girls Changeroom
Survey Date: 2026-03-02

Site: Schools
Floor: B

Building Name: Dundas Valley Secondary School
Room #: 0005
Last Re-Assessment: 0000-00-00

Area (sqft): 800

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	6	EA	V9000	Confirmed Mercury

ALL DATA REPORT

Client: Hamilton-Wentworth District School Board
Location: #2376 : Storage
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 120

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Ceiling Tiles (lay-in), 24x24 pinhole and deep fissure			C	Y		120(7)			SF	S0067ABC	Chrysotile	0.5-5%	Confirmed Asbestos	PF
Duct	All	Not Insulated														
Floor	All	Concrete (poured)			A	Y										
Mechanical Equipment	All	None Found														
Piping	All	Fibreglass			C	N		12			LF	V0000	Non-Asbestos		None	
Wall		Paint, Paint on block			A	Y		400			SF	S0066ABC	None Detected	N.D.	None	
Wall		Concrete Block		Paint	A	Y		400			SF					

Client: Hamilton-Wentworth District School Board
Location: #2376 : Storage
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 120

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Concrete (precast)	400		SF	L0034	Green on block	Pb: 0.0021 %	No	
Structure	Metal	100		%	V0032	Red on structure	Pb: 0.11 %	Lead (High)	

Client: Hamilton-Wentworth District School Board
Location: #2376 : Storage
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 120

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	4	EA	V9500	Presumed Mercury

Client: Hamilton-Wentworth District School Board
Location: #2376 : Storage
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 120

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	4		EA	V0000			No

ALL DATA REPORT

Client: Hamilton-Wentworth District School Board
Location: #2377 : Storage
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 400

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	Acoustic tile	Drywall (no compound), Gypsum ceiling tile			C	Y		100			%	V0000	Non-Asbestos		None	
Floor		Ceramic Tiles, 6x6 Yellow			A	Y		100			%					
Floor		Thin-set			D	N		100(7)			%	V9500	Presumed Asbestos		Presumed Asbestos	PF
Wall		Concrete Block														

Client: Hamilton-Wentworth District School Board
Location: #2379 : Teacher Workstation
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 450

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Ceiling Tiles (lay-in), 24x24 pinhole and small fissures, date stamped 08/17/15			C	Y		100			SF	V0000	Non-Asbestos		None	
Ceiling	All	Ceiling Tiles (lay-in), 24x24 pinhole and large fissures, date stamped 09/07/03			C	Y		350			SF	V0000	Non-Asbestos		None	
Duct	All	None Found														
Floor		Vinyl Floor Tile and Mastic, 12x12 grey with grey and white fleck, on top of 9x9 Grey with white streaks			A	Y		450(7)			SF	S0062ABC	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Mechanical Equipment	All	None Found														
Other	Sink	Mastic, White			A	Y		1			EA	S0061ABC	None Detected	N.D.	None	
Piping	All	Fibreglass			C	N		80			LF	V0000	Non-Asbestos		None	
Structure	All	Steel			C	N		450			SF					
Structure	Deck	Concrete (poured)			C	N										
Wall		Paint, Paint on block			A	Y		900			SF	S0063ABC	None Detected	N.D.	None	
Wall		Mastic, Brown, Baseboard mastic			D	N		80			LF	S0064ABC	None Detected	N.D.	None	
Wall	All	Concrete Block			A	Y		900			SF					
Wall	Bulkhead	Drywall and joint compound			C	Y		40(7)			SF	S0069ABC	Chrysotile	0.5-5%	Confirmed Asbestos	NF

Includes part of 2376

Client: Hamilton-Wentworth District School Board
Location: #2379 : Teacher Workstation
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 450

PAINT								
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard
Wall	Concrete (precast)	900		SF	L0031	Grey on block	Pb: 0.0076 %	No
Structure	Metal	100		%	L0032	Red on structure	Pb: 0.11 %	Lead (High)

Includes part of 2376

ALL DATA REPORT

Client: Hamilton-Wentworth District School Board
Location: #2379 : Teacher Workstation
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00
Area (sqft): 450

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	6	EA	V9500	Presumed Mercury

Includes part of 2376

Client: Hamilton-Wentworth District School Board
Location: #2379 : Teacher Workstation
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00
Area (sqft): 450

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	6		EA	V0000			No

Includes part of 2376

ALL DATA REPORT

Client: Hamilton-Wentworth District School Board
Location: #2414 : Corridor
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 400

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Ceiling Tiles (lay-in), 24x48 pinhole and fissure, date stamped 07/24/15			C	Y		100			%	V0000	Non-Asbestos		None	
Duct	All	Not Insulated														
Floor	All	Terrazzo			A	Y		100(7)			%	V9500	Presumed Asbestos		Presumed Asbestos	NF
Mechanical Equipment	All	None Found														
Piping	All	Fibreglass														
Piping	All	Not Insulated														
Structure	All	Concrete Block			A	Y										
Structure	Deck	Concrete (poured)			C	N										
Wall ¹		Cement Product			B	Y		200			SF	V0065	None Detected	N.D.	None	

1 - Above lockers

Client: Hamilton-Wentworth District School Board
Location: #2414 : Corridor
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 400

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Cement Product	200		SF	V0033	White on walls	Pb: <0.00052 %	No	

Client: Hamilton-Wentworth District School Board
Location: #2414 : Corridor
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 400

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	8	EA	V9500	Presumed Mercury

Client: Hamilton-Wentworth District School Board
Location: #2414 : Corridor
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 400

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	8		EA	V0000			No

ALL DATA REPORT

Client: Hamilton-Wentworth District School Board
Location: #2415 : Corridor
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 400

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Ceiling Tiles (lay-in), 24x48 pinhole and fissure, date stamped 07/24/15			C	Y		100			%	V0000	Non-Asbestos		None	
Duct	All	Not Insulated														
Floor	All	Terrazzo			A	Y		100(7)			%	V9500	Presumed Asbestos		Presumed Asbestos	NF
Mechanical Equipment	All	None Found														
Piping	All	Fibreglass														
Piping	All	Not Insulated														
Structure	All	Concrete Block			A	Y										
Structure	Deck	Concrete (poured)			C	N										
Wall ¹		Cement Product			B	Y		300			SF	S0065ABC	None Detected	N.D.	None	

1 - Above lockers

Client: Hamilton-Wentworth District School Board
Location: #2415 : Corridor
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 400

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Cement Product	300		SF	L0033	White on walls	Pb: <0.00052 %	No	

Client: Hamilton-Wentworth District School Board
Location: #2415 : Corridor
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 400

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	8	EA	V9500	Presumed Mercury

Client: Hamilton-Wentworth District School Board
Location: #2415 : Corridor
Survey Date: 2026-03-02

Site: Schools
Floor: 1

Building Name: Dundas Valley Secondary School
Room #:
Last Re-Assessment: 0000-00-00

Area (sqft): 400

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	8		EA	V0000			No

Client: Hamilton-Wentworth District School Board **Site:** Schools
Location: #2543 : Classroom **Floor:** 2
Survey Date: 2026-03-02

Building Name: Dundas Valley Secondary School
Room #: 2035 **Area (sqft):** 800
Last Re-Assessment: 0000-00-00

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Ceiling Tiles (lay-in), 24x48 pinhole and fissure, date stamped 04/02/15			C	Y		800			SF	V0000	Non-Asbestos		None	
Duct		Fibreglass			C	N						V0000	Non-Asbestos		None	
Floor		Vinyl Floor Tile and Mastic, 20x20 grey with black specks			A	Y		800			SF	S0070C	None Detected	N.D.	None	
Mechanical Equipment		None Found														
Piping		Horsehair, Horse hair			C	N										
Structure		Concrete (poured)			C	N										
Wall		Drywall and joint compound			A	Y		1200			SF	S0068C	None Detected	N.D.	None	

Client: Hamilton-Wentworth District School Board **Site:** Schools
Location: #2543 : Classroom **Floor:** 2
Survey Date: 2026-03-02

Building Name: Dundas Valley Secondary School
Room #: 2035 **Area (sqft):** 800
Last Re-Assessment: 0000-00-00

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Drywall and joint compound				V0035	Paint on drywall	Pb: 0.00061 %	No	

Client: Hamilton-Wentworth District School Board **Site:** Schools
Location: #2543 : Classroom **Floor:** 2
Survey Date: 2026-03-02

Building Name: Dundas Valley Secondary School
Room #: 2035 **Area (sqft):** 800
Last Re-Assessment: 0000-00-00

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹	12	EA	V0000	None

1 - Led

Client: Hamilton-Wentworth District School Board **Site:** Schools
Location: #2570 : Classroom **Floor:** 2
Survey Date: 2026-03-02

Building Name: Dundas Valley Secondary School
Room #: 2058 **Area (sqft):** 800
Last Re-Assessment: 0000-00-00

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		Ceiling Tiles (lay-in), 24x48 pinhole and fissure, date stamped 04/02/15			C	Y		800			SF	V0000	Non-Asbestos		None	
Duct		Fibreglass			C	N						V0000	Non-Asbestos		None	
Floor		Vinyl Floor Tile and Mastic, 20x20 grey with black specks			A	Y		800			SF	S0070AB	None Detected	N.D.	None	
Mechanical Equipment		None Found														
Piping		Horsehair, Horse hair			C	N										
Structure		Concrete (poured)			C	N										
Wall		Drywall and joint compound			A	Y		1200			SF	S0068AB	None Detected	N.D.	None	

Client: Hamilton-Wentworth District School Board **Site:** Schools
Location: #2570 : Classroom **Floor:** 2
Survey Date: 2026-03-02

Building Name: Dundas Valley Secondary School
Room #: 2058 **Area (sqft):** 800
Last Re-Assessment: 0000-00-00

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Drywall and joint compound				L0035	Paint on drywall	Pb: 0.00061 %	No	

Client: Hamilton-Wentworth District School Board **Site:** Schools
Location: #2570 : Classroom **Floor:** 2
Survey Date: 2026-03-02

Building Name: Dundas Valley Secondary School
Room #: 2058 **Area (sqft):** 800
Last Re-Assessment: 0000-00-00

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture ¹	12	EA	V0000	None

1 - Led

ALL DATA REPORT

Client: Hamilton-Wentworth District School Board
Location: #2576 : Corridor
Survey Date: 2026-03-02

Site: Schools
Floor: 2

Building Name: Dundas Valley Secondary School
Room #: 2037
Last Re-Assessment: 0000-00-00

Area (sqft): 400

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	Ceiling Tiles (lay-in), 24x48 pinhole and fissure, date stamped 07/24/15			C	Y		100			%	V0000	Non-Asbestos		None	
Duct	All	Not Insulated														
Floor	All	Terrazzo			A	Y		100(7)			%	V9500	Presumed Asbestos		Presumed Asbestos	NF
Mechanical Equipment	All	None Found														
Piping	All	Fibreglass														
Piping	All	Not Insulated														
Structure	All	Concrete Block			A	Y										
Structure	Deck	Concrete (poured)			C	N										
Wall ¹		Cement Product			B	Y		200			SF	V0065	None Detected	N.D.	None	
Wall		Paint, paint on block			A	Y						S0071A	None Detected	N.D.	None	
Wall		Concrete Block			A	Y										

1 - Above lockers

Client: Hamilton-Wentworth District School Board
Location: #2576 : Corridor
Survey Date: 2026-03-02

Site: Schools
Floor: 2

Building Name: Dundas Valley Secondary School
Room #: 2037
Last Re-Assessment: 0000-00-00

Area (sqft): 400

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Wall	Cement Product	200		SF	V0033	White on walls	Pb: <0.00052 %	No	

Client: Hamilton-Wentworth District School Board
Location: #2576 : Corridor
Survey Date: 2026-03-02

Site: Schools
Floor: 2

Building Name: Dundas Valley Secondary School
Room #: 2037
Last Re-Assessment: 0000-00-00

Area (sqft): 400

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Bell And Spigot Fittings ¹	3	EA	V9500	Presumed

1 - Rain water leader

Client: Hamilton-Wentworth District School Board
Location: #2576 : Corridor
Survey Date: 2026-03-02

Site: Schools
Floor: 2

Building Name: Dundas Valley Secondary School
Room #: 2037
Last Re-Assessment: 0000-00-00

Area (sqft): 400

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	12	EA	V9500	Presumed Mercury

ALL DATA REPORT

Client: Hamilton-Wentworth District School Board
Location: #2583 : Pipe Chase And Mechanical Penthouse
Survey Date: 2026-03-02

Site: Schools
Floor: 2/3

Building Name: Dundas Valley Secondary School
Room #:
Area (sqft): 1000
Last Re-Assessment: 0000-00-00

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling	All	None Found			C	Y										
Duct	All	Mastic, Red			B	Y		50(7)			LF	S0058ABC	Chrysotile	0.5-5%	Confirmed Asbestos	NF
Duct	All	Not Insulated														
Floor	All	Concrete (poured)			A	Y										
Piping		Tar Paper			B	Y		60			LF	S0059ABC	None Detected	N.D.	None	
Piping	All	Fibreglass			B	Y										
Piping	All	Parging Cement			B	Y		3(7)			EA	V0014	Chrysotile	50-75%	Confirmed Asbestos	F
Piping	Rain water leader	Horse hair														
Structure	All	Steel			C	N										
Wall		Paint, Paint on block			B	Y		300			SF	S0060ABC	None Detected	N.D.	None	
Wall		Concrete Block		Paint	B	Y										

Client: Hamilton-Wentworth District School Board
Location: #2583 : Pipe Chase And Mechanical Penthouse
Survey Date: 2026-03-02

Site: Schools
Floor: 2/3

Building Name: Dundas Valley Secondary School
Room #:
Area (sqft): 1000
Last Re-Assessment: 0000-00-00

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description		Amount	Hazard
Structure	Metal	100		%	L0029			Pb: 0.43 %	Lead (High)
Wall	Concrete (precast)	300		SF	L0030	Yellow on block		Pb: 0.017 %	Lead (Low)

Client: Hamilton-Wentworth District School Board
Location: #2583 : Pipe Chase And Mechanical Penthouse
Survey Date: 2026-03-02

Site: Schools
Floor: 2/3

Building Name: Dundas Valley Secondary School
Room #:
Area (sqft): 1000
Last Re-Assessment: 0000-00-00

PB PRODUCTS				
Component	Quantity	Unit	Sample	Hazard
Batteries In Emer. Lights	1	EA	V9500	Presumed

Client: Hamilton-Wentworth District School Board
Location: #2583 : Pipe Chase And Mechanical Penthouse
Survey Date: 2026-03-02

Site: Schools
Floor: 2/3

Building Name: Dundas Valley Secondary School
Room #:
Area (sqft): 1000
Last Re-Assessment: 0000-00-00

MERCURY				
Component	Quantity	Unit	Sample	Hazard
Light Fixture	8	EA	V9500	Presumed Mercury

Client: Hamilton-Wentworth District School Board

Site: Schools

Building Name: Dundas Valley Secondary School

Location: #2583 : Pipe Chase And Mechanical
Penthouse

Floor: 2/3

Room #:

Area (sqft): 1000

Survey Date: 2026-03-02

Last Re-Assessment: 0000-00-00

PCB							
Component	Good	Poor	Unit	Sample	Sample Description	Amount	PCB
Light Ballasts	8		EA	V0000			No

Legend:

Sample number	Units	Other
S#### Asbestos sample collected	SF Square feet	A Access
L#### Paint sample collected	LF Linear feet	V Visible
P#### PCB sample collected	EA Each	AP Air Plenum
M#### Mould sample collected	% Percentage	F Friable material
V#### Material is visually identified to be identical to S####	LF Linear feet	NF Non Friable material
V0000 Known non hazardous material		PF Potentially Friable material
V9000 Material visually identified as a Hazardous Material		Pb Lead
V9500 Material is presumed to be a hazardous material		Hg Mercury
		As Arsenic
		Cr Chromium

Access
A Accessible to all building occupants
B Accessible to maintenance and operations staff without a ladder
C Accessible to maintenance and operations staff with a ladder. Also rarely entered, locked areas
D Not normally accessible

Condition
Good No visible damage or deterioration
Fair Minor, repairable damage, cracking, delamination or deterioration
Poor Irreparable damage or deterioration with exposed and missing material

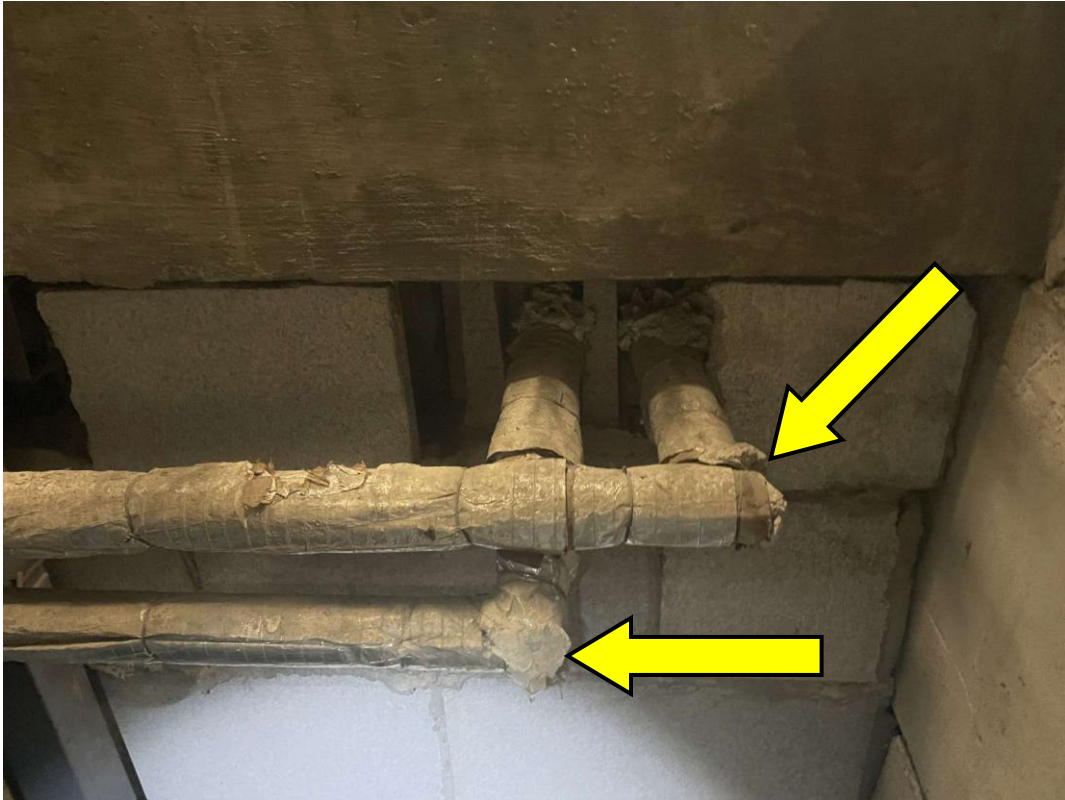
Visible
Y The material is visible when standing on the floor of the room, without the removal or opening of other building components (e.g. ceiling tiles or access panels).
N The material is not visible to view when standing on the floor of the room and requires the removal of a building component (e.g. ceilings tiles or access panels) to view and access. Includes rarely entered crawlspaces, attic spaces, etc. Observations will be limited to the extent visible from the access points.
L The material is partially visible to view when standing on the floor of the room and requires the removal of a building component (e.g. ceiling system or access panels) to view completely and access. Includes partially viewed access points to crawlspaces, attic spaces, etc. without entering. Observations are limited to the extent visible from the access points.

Air Plenum
Yes or No The material is in a return air plenum or in a direct airstream or there is evidence of air erosion (e.g. duct for heating or cooling blowing directly on or across an ACM). This field is only completed where Air Plenum consideration is required by regulation.

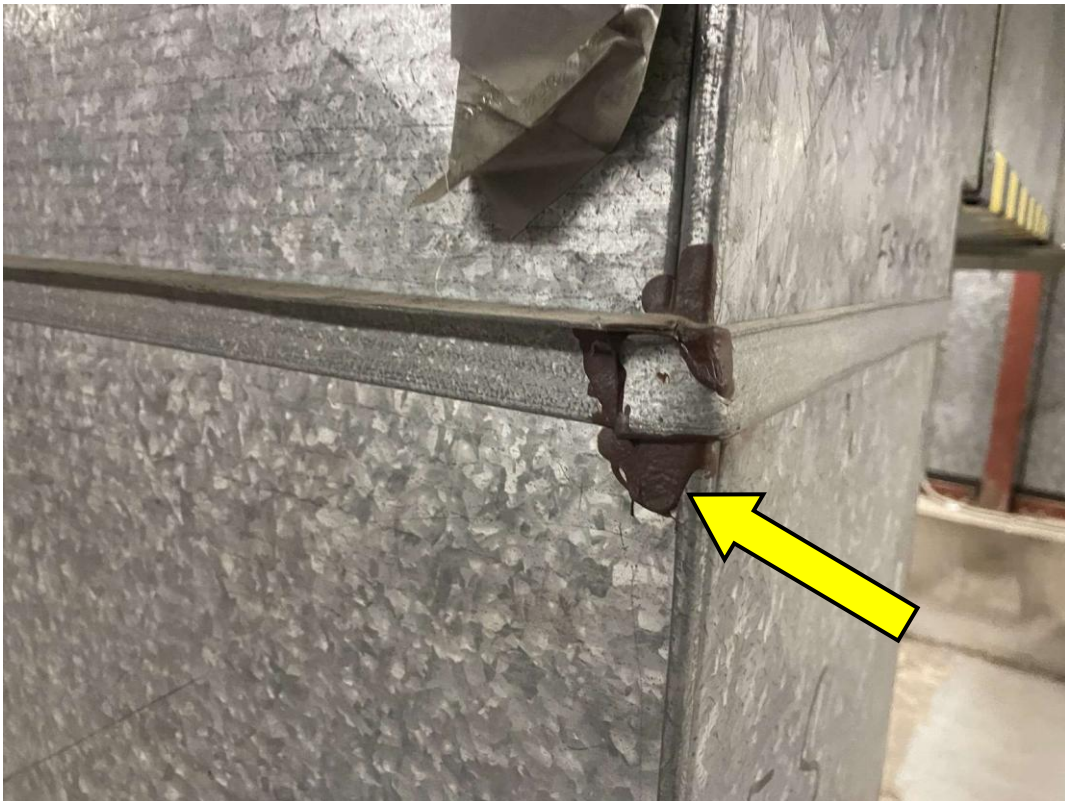
Colour Coding
The material is a hazardous material, either by analytical results or by visible identification.
The material is presumed to be a hazardous material, based on visual appearance, and was not sampled due to limited access or the non-destructive nature of sampling.

Action					
(1)	Clean up of ACM Debris	(2)	Precautions for Access Which may Disturb ACM Debris	(3)	ACM removal
(4)	Precautions for Work Which may Disturb ACM in Poor Condition	(5)	Proactive ACM removal (Minimum repair required for fair condition)	(6)	ACM repair
(7)	Management program and surveillance				

APPENDIX VII
Photographs



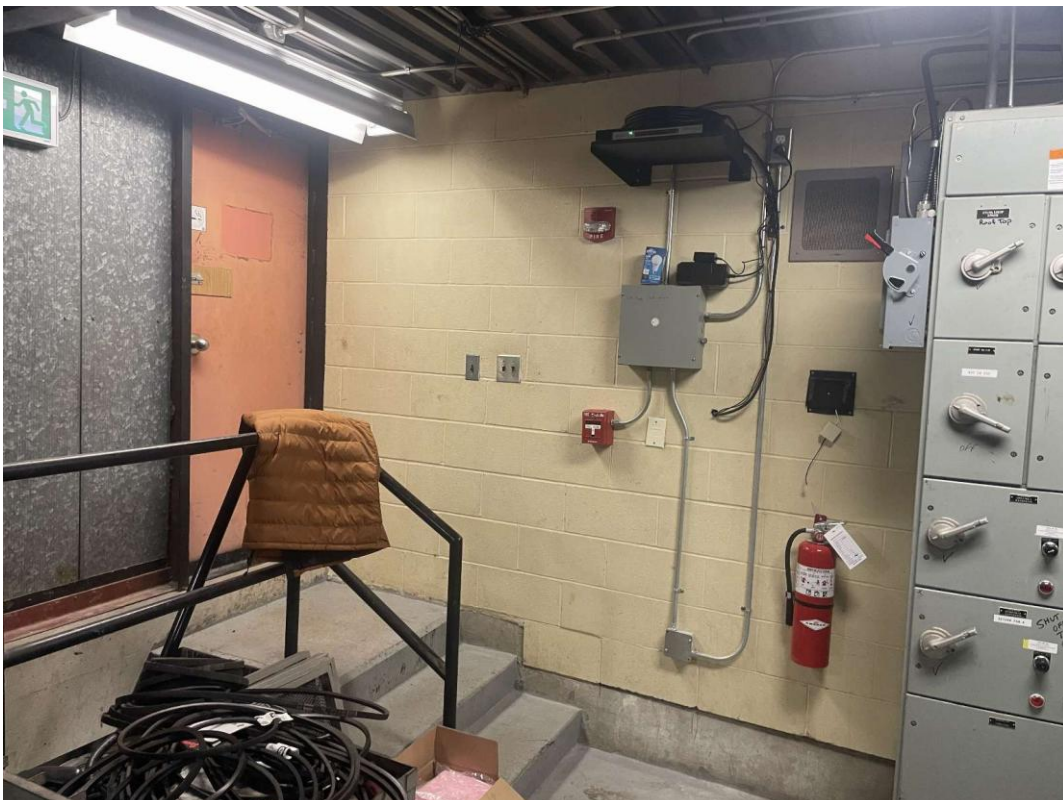
V0014 (Confirmed Asbestos), Piping, All, Parging Cement, Pipe Chase And Mechanical Penthouse (Location #: 2583)



S0058A (Confirmed Asbestos), Duct, All, Mastic, Red, Pipe Chase And Mechanical Penthouse (Location #: 2583)



S0059A (None), Piping, Tar Paper, Pipe Chase And Mechanical Penthouse (Location #: 2583)



S0060A (None), Paint on block, Wall, Paint, Pipe Chase And Mechanical Penthouse (Location #: 2583)



S0061A (None), Other, Sink, Mastic, White, Teacher Workstation (Location #: 2379)



S0062A (Confirmed Asbestos), 12x12 grey with grey and white fleck, on top of 9x9 Grey with white streaks, Floor, Vinyl Floor Tile and Mastic, Teacher Workstation (Location #: 2379)



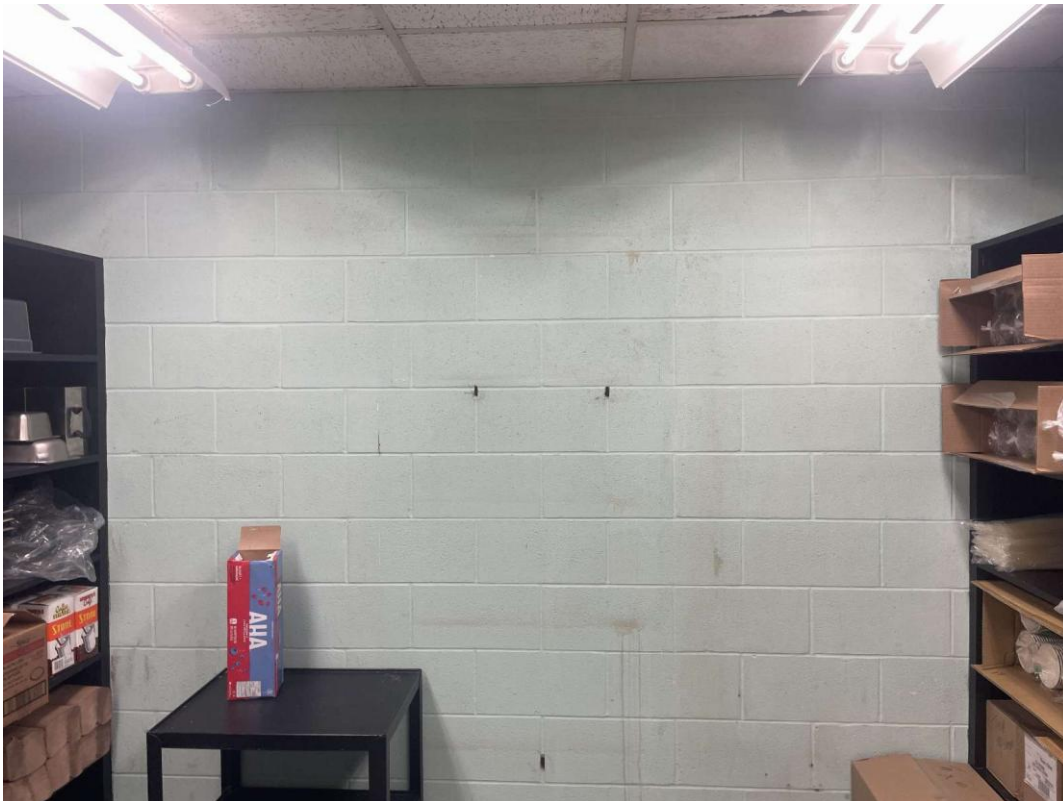
S0063A (None), Paint on block, Wall, Paint, Teacher Workstation (Location #: 2379)



S0064A (None), Baseboard mastic, Wall, Mastic, Brown, Teacher Workstation (Location #: 2379)



S0065A (None), Wall, Cement Product, Corridor (Location #: 2415)
Above lockers



S0066A (None), Paint on block, Wall, Paint, Storage (Location #: 2376)



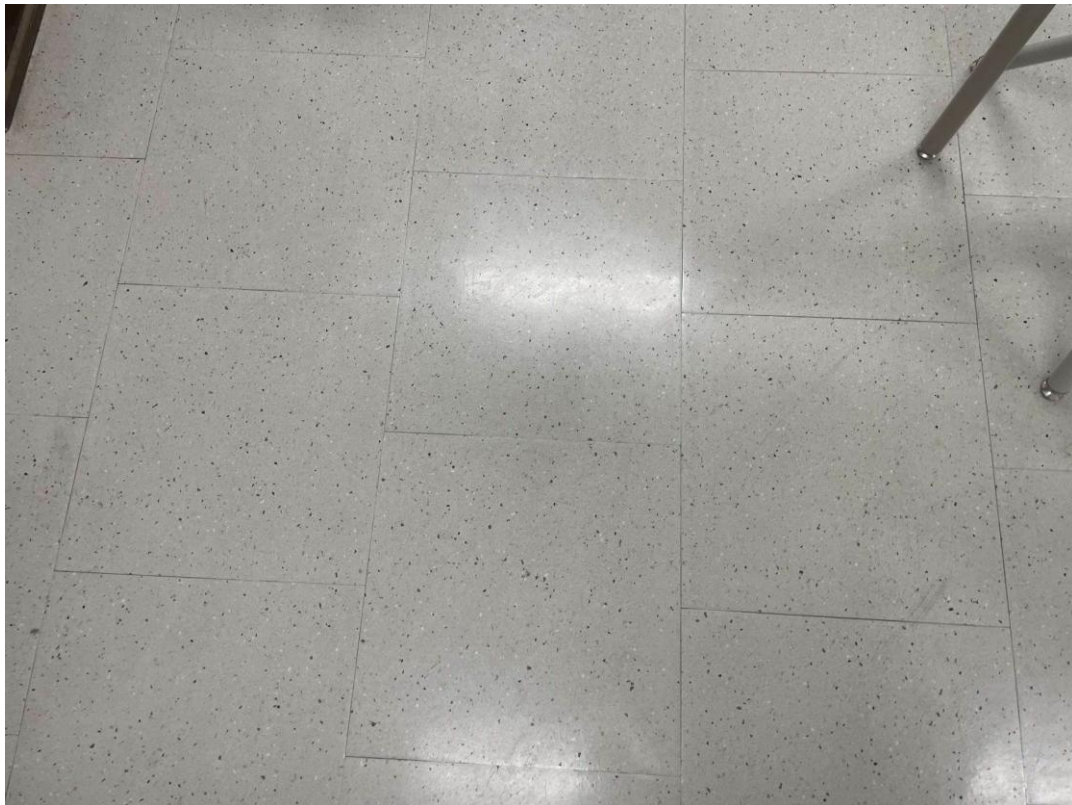
S0067A (Confirmed Asbestos), 24x24 pinhole and deep fissure, Ceiling, Ceiling Tiles (lay-in), Storage (Location #: 2376)



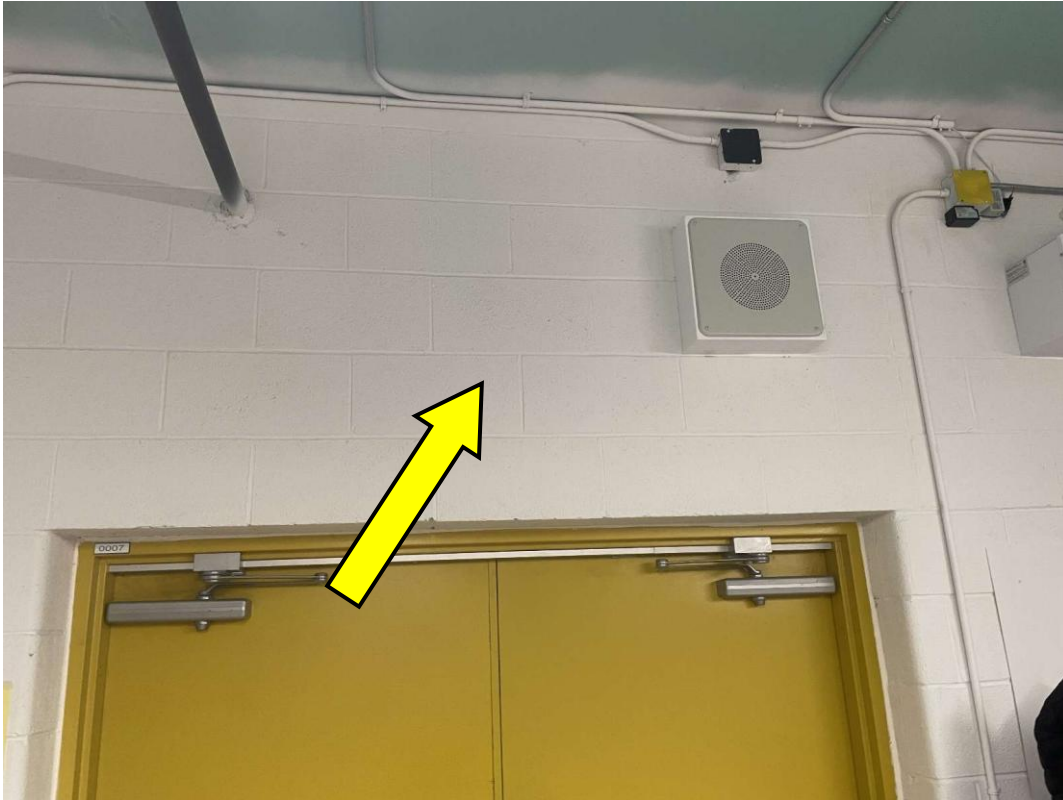
S0068A (None), Wall, Drywall and joint compound, Classroom (Location #: 2570)



S0069A (Confirmed Asbestos), Wall, Bulkhead, Drywall and joint compound, Teacher Workstation (Location #: 2379)



S0070A (None), 20x20 grey with black specks, Floor, Vinyl Floor Tile and Mastic, Classroom (Location #: 2570)



S0071C (None), paint on block, Wall, Paint, Storage (Location #: 2364)



S0071B (None), Paint on block, Wall, Paint, Girls Changeroom (Location #: 2367)



S0071A (None), paint on block, Wall, Paint, Corridor (Location #: 2576)



S0072A (None), Duct, Mastic, Grey, Storage (Location #: 2364)



S0073A (None), Ceiling, Drywall and joint compound, Girls Changeroom (Location #: 2367)



V9500 (Presumed Asbestos), Floor, Thin-set, Storage (Location #: 2377)



V9500 (Presumed Asbestos), Floor, All, Terrazzo, Corridor (Location #: 2415)



V9500 (Presumed Asbestos), Floor, All, Terrazzo, Corridor (Location #: 2576)



V0000 (None), Gypsum ceiling tile, Ceiling, ACOUSTIC TILE, Drywall (no compound), Storage (Location #: 2377)



V0000 (None), Piping, All, Fibreglass, Teacher Workstation (Location #: 2379)



V0000 (None), 24x24 pinhole and large fissures, date stamped 09/07/03, Ceiling, All, Ceiling Tiles (lay-in), Teacher Workstation (Location #: 2379)



V0000 (None), 24x48 pinhole and fissure, date stamped 07/24/15, Ceiling, All, Ceiling Tiles (lay-in), Corridor (Location #: 2415)



V0000 (None), 24x48 pinhole and fissure, date stamped 04/02/15, Ceiling, Ceiling Tiles (lay-in), Classroom (Location #: 2570)



Piping, Fibreglass, Girls Changeroom (Location #: 2367)



Duct, All, Not Insulated, Corridor (Location #: 2414)



Piping, All, Fibreglass, Corridor (Location #: 2414)



Horse hair, Piping, Horsehair, Classroom (Location #: 2570)



Duct, All, Not Insulated, Pipe Chase And Mechanical Penthouse (Location #: 2583)



L0029(Lead, High), Structure, Pipe Chase And Mechanical Penthouse (Location #: 2583)



L0030(Lead, Low), Yellow on block, Wall, Pipe Chase And Mechanical Penthouse (Location #: 2583)



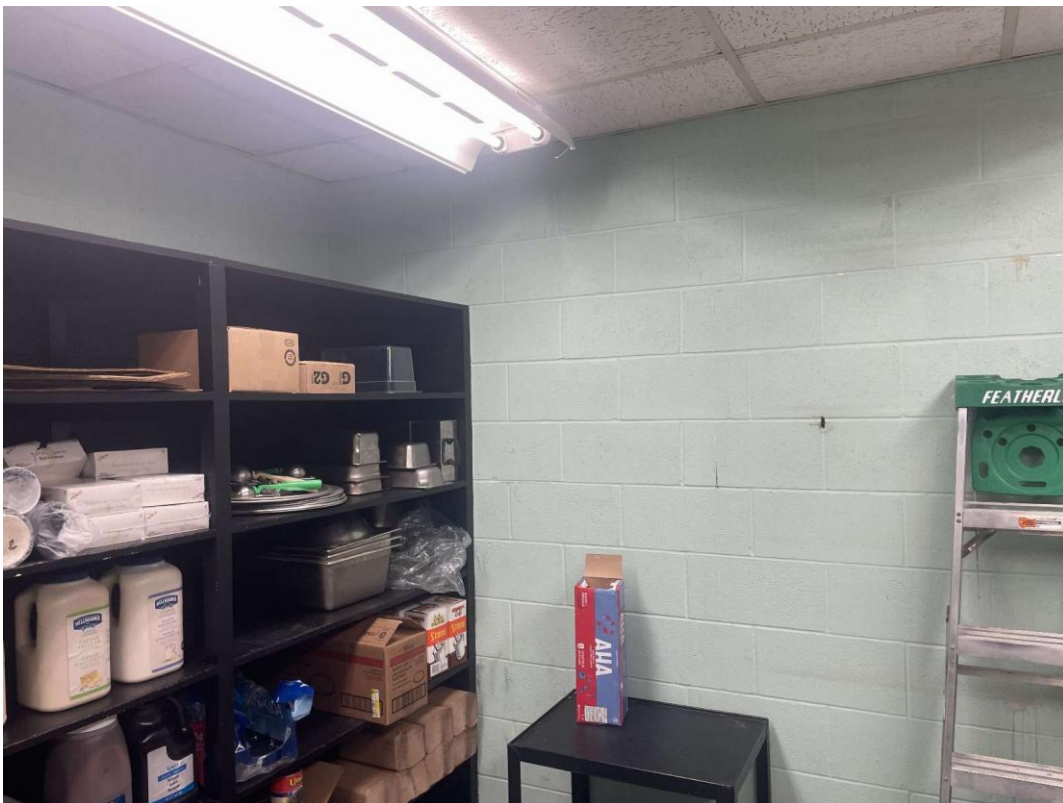
L0031(Lead, None), Grey on block, Wall, Teacher Workstation (Location #: 2379)



L0032(Lead, High), Red on structure, Structure, Teacher Workstation (Location #: 2379)



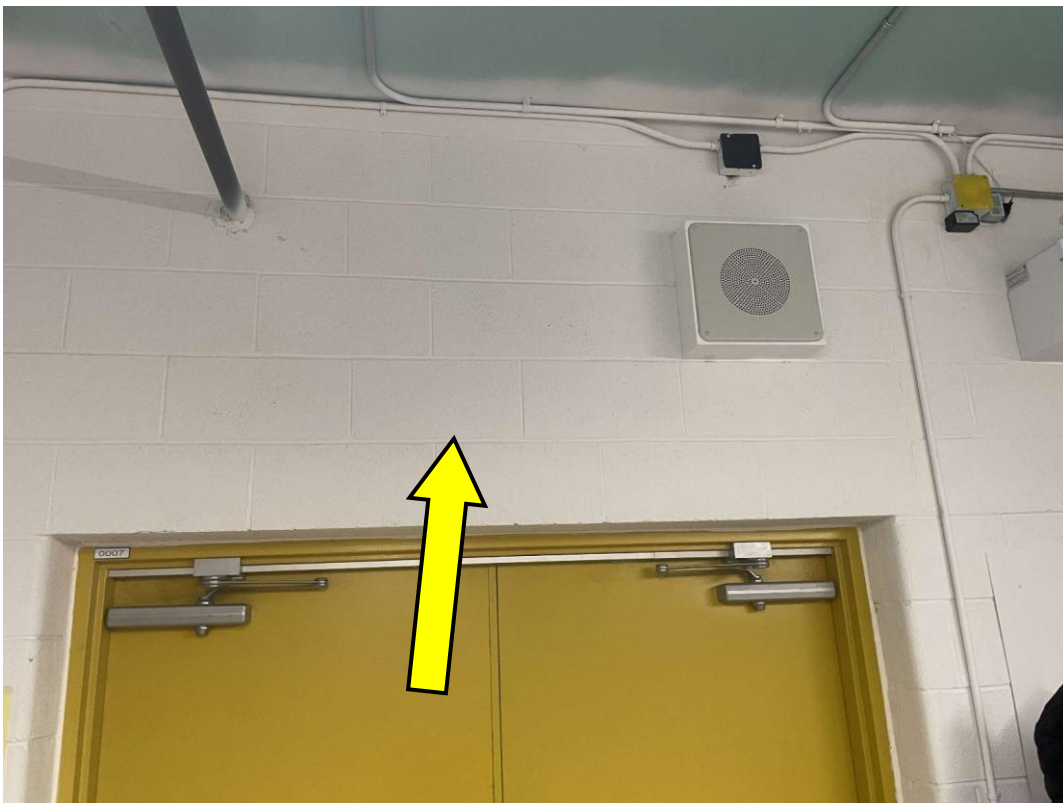
L0033(Lead, None), White on walls, Wall, Corridor (Location #: 2415)



L0034(Lead, None), Green on block, Wall, Storage (Location #: 2376)



L0035(Lead, None), Paint on drywall, Wall, Classroom (Location #: 2570)



L0036(Lead, None), Paint on concrete structure, Structure, Storage (Location #: 2364)



Pb Products, V9500(Presumed), BELL AND SPIGOT FITTINGS, Rain water leader, Corridor (Location #: 2576)



Pb Products, V9500(Presumed), BATTERIES IN EMER. LIGHTS, Pipe Chase And Mechanical Penthouse (Location #: 2583)



Mercury, V9500(Presumed), LIGHT FIXTURE, Pipe Chase And Mechanical Penthouse (Location #: 2583)