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ENGINEERING LINK INCORPORATED

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 11 13 – Work Covered by Contract Documents

1.1 GENERAL

.1 Bids shall be based on the materials and methods as outlined in the bid documents. If the contractor cannot meet the requirements, no bid shall be entered.

.2 Refer to the technical specifications and drawings sections for products, and technical requirements.

1.2 SCOPE OF WORK

The work outlined herein is a general description. The specific requirements for the execution of the Work shall be as described in the bid documents. The itemized tasks of work outlined below correspond with the items outlined in the Schedule of Items, which shall be submitted by the winning bidder upon award of the Contract.

1.3 PURPOSE OF WORK

.1 The purpose of this project is to replace all punched windows at the north elevation of the original 1954 building, 1959 addition and 1966 addition at Ajax High School.

1.4 BASE BID

Mobilization

.1 Mobilize on site all plant, tools, equipment and labour required to carry out this Work.

.2 Bonds and Permits

.1 Provide specified bonds to the Owner following the contract award. Work must not commence without the submission of the Performance Bond, and the Material and Labour Bond.

.2 Obtain and pay for all Federal, Provincial and Municipal permits necessary for this work, with the exception of the building permit, which will be obtained by the Owner if necessary.

.3 General Requirements

.1 Provide all the necessary labour, plant, equipment, and materials necessary to conform to all requirements as specified in the Contract Documents. This includes, but is not limited to temporary lighting, access (interior and exterior as required to facilitate work), shoring, etc. Install all necessary fencing, hoarding, barriers and signage to protect staff, building elements, vehicular and pedestrian traffic in accordance with the Occupational Health and Safety Act. Include all necessary construction signage and coordination. Signage is to be properly lettered and visible. In addition to preventing injury, all work areas must be protected from damage due to equipment. Provide temporary support to existing structural loads, where required, to ensure the building is maintained in a safe condition and damage is not caused to building elements. Any damage as a result

of inadequate shoring or support shall be rectified at no additional cost to the Owner.

.2 Make allowances during construction for down time made necessary for access to and review of the Work by Consultant.

.3 Include the manufacture and installation of all necessary material and performance of site mock-ups that will be required to the satisfaction of the Owner and Consultant.

.4 Maintain all building entrances as fire exits from the building at all times during construction. Post all necessary signage to indicate construction and erect all barricades/hoarding protection necessary to direct pedestrians through the construction area.

.5 If the Contractor deems it necessary to temporarily remove any permanent exterior furnishings such as fencing, benches, bollards, etc. in order to facilitate façade access, the cost to remove and reinstate or replace such elements shall be borne by the Contractor.

.6 Any part of the exterior façade (sills, brick, decorative stonework, doors, windows, etc.) that are damaged or removed during work or mobilization shall be replaced or repairs.

.7 If the Contractor deems it necessary to temporarily remove any permanent interior furnishings such as drywall, vent covers, shelving, etc. in order to facilitate access, the cost to remove and reinstate or replace such elements shall be borne by the Contractor.

.1 DDSB will coordinate the removal of desks, chairs, interior decorations, etc. away from the windows and walls to facilitate the work.

.8 A Designated Substances Report (DSR) is provided as part of this package. Carry out work in accordance with any recommendations. The following designated substances were detected:

.1 **0.5% chrysotile asbestos and 'low-level' lead concentrations were found to be present in the brick mortar of the 1966 building addition.**

.2 **'Low-level' lead concentrations were found to be present in the brick mortar of the 1954 building addition.**

.3 1% chrysotile asbestos was found to be present in the black caulking on basement window frames of the 1966 building addition.

.4 0.15% lead was found to be present in the off-white paint in classroom #2202 of the 1966 building addition.

.5 Crystalline silica is suspected to be present within masonry, mortar and concrete.

Disturbance of the above materials is anticipated as part of this work. Complete all removals in accordance with recommendations in the DSR and in accordance with EACO and Ministry of Labour guidelines.

.9 Include the supply, installation, maintenance, removal and disposal of full height interior dust protection enclosures within 6 feet of the exterior wall such that no construction dust penetrates into the interior of the building. Dust protection is to consist of 6 mil polyethylene sheeting with all seams and edges taped for a full seal.

.10 Include the supply, installation, maintenance, removal and disposal of ¾" plywood over rough openings secured with tamperproof screws. The plywood is to act as a security barrier to prevent unauthorized access to the school. Repair any holes in masonry upon installation of new windows.

.11 Should the construction schedule extend into the heating season, the Contractor shall at no cost to the DDSB insulate barriers at the Consultant's direction and modify the hoarding to allow the heat into the classroom without affecting the continuity of the dust barrier.

.12 The enclosures are to provide adequate control that meets DDSB requirements and the following:

.1 Under all circumstances:

.1 Security to prevent unlawful entry.

.2 Classroom thermal comfort when construction extends into October and beyond: If replacing the function of the original opaque wall assembly, the protection enclosure is to be constructed outboard of the classroom heat supply with a minimum R-Value of R13.

.3 Air barrier that is continuous to prevent the uncontrolled airflow between the interior and exterior.

.4 Dust/debris control.

.2 When classrooms are occupied by students, requirements are to achieve those as outlined in item 1.4.3.12.1 above, plus:

.1 Security – meet guard loads as outlined in current OBC.

.2 Interior surface flame spread that meet current OBC requirements.

.3 Lighting to meet DDSB classroom requirements and/or modification of the enclosures to provide adequate lighting.

.4 Demobilization and Site Cleanup

.1 Demobilize all plant, tools, equipment and labour for this Work from site. Upon completion of Work, and immediately before the Consultant's final review for Total Performance of the work, all areas of the building affected by this Contract shall be thoroughly cleaned. Include the dismantling and removal of the scaffolding (if any) at the completion of the project. Remove all temporary protection, equipment, waste and surplus materials from site and leave in neat, tidy condition to the satisfaction of the Owner.

.2 Make good any landscaping and landscaping elements (asphalt, concrete sidewalk, sod, bushes, fencing, fence posts, artificial grass etc.) damaged or removed during repairs. Replace damaged asphalt with hot-mix asphalt and replace damaged grass with new sod. This includes the play area located within the fenced area at the north elevation.

.5 Window Replacement

.1 Submit shop drawings depicting the new window systems, prepared and sealed by a Professional Engineer licensed to practice in the Province of Ontario. Engineered shop drawings indicating anchorage for wood bucks at the sill and head shall also be submitted. Show clearances and dimensions for interior conditions, including window sills and blinds. Window replacement work shall not commence until the shop drawings are marked as reviewed by the Consultant.

.2 The Contractor shall provide all means as required to field measure the existing windows in a timely manner so as to avoid window manufacturing delays and ensure that construction can occur during the allotted period. All costs associated with measurement shall be borne by the Contractor.

.3 Supply and install a window mock-up, as per Specifications, to be reviewed and accepted by Consultant, prior to the start of window installation. The mock-up must convey the wood blocking, self-adhered membrane, new window, and metal flashings.

.4 All windows must be installed during summer months, or outside of regular school hours.

.5 Install new wood blocking and framing at the head and sill of window openings as indicated on the Drawings.

.6 At window jambs at the sides of window openings, include for patching existing masonry where existing fasteners were removed with the specified patching mortar. At window sills, include for patching the existing masonry to allow for a level surface to install new wood blocking. Loose concrete blocks are to be replaced on a unit rate basis.

.7 Allow for removal and reinstallation of all interior finishes, interior ceiling panels and framing, equipment, etc. for a minimum distance of 2 feet around the perimeter of the window openings.

.8 Any furniture that is not removed shall be protected by the Contractor. The Contractor must document the pre-construction condition of the furniture and ensure it is returned to the school in the same condition.

.9 The contractor shall remove all existing window coverings and either store in a location designated by the Owner or dispose from site. Supply and install new roller shades as per Section 12 24 00 for all windows.

.10 Supply and install new windows as shown on the plans, elevations and window schedule. The Contractor shall be responsible for removal and disposal of existing windows, and supply and installation of all new windows and their components

to the standards and details described in the Drawings and Specifications provided.

.11 The contractor shall supply and install new stainless steel insect screens at all operable windows with tamperproof screws.

.12 The Contractor shall also be responsible for providing all other items and materials required in the Drawings and Specifications, including all exterior and interior sealant, aluminum trims, pre-finished aluminum flashing, laminated sills, and miscellaneous components etc., to the full extent of the work.

.13 **Contractor shall also be responsible for removal and reinstatement of all existing electrical and mechanical equipment requiring removal or relocation, as required to complete the window work.** Contractor shall provide cut-outs for all openings required with any new metal supports for the mechanical pipe penetrations.

.14 Contractor shall also be responsible for the localized removal and reinstatement of drywall and any other interior finishes (ie ceiling tiles, lights, plaster, etc.) to accommodate for the window replacement at localized areas, where required. Reinstate to match existing. Painting colour to match existing upon reinstatement (coordinate with DDSB for specific paint colour, which may vary between rooms).

.6 Door Restoration

.1 Repair main entrance door as indicated on the Drawings (Refer to 1/R602 to 3/R602).

.2 Prepare corroded surfaces and apply a corrosion inhibiting coating over the entire main entrance door.

.3 Replace the push-button activation system for the accessible door and include repairs to the door latch to accommodate the existing door.

.4 Replace the existing weather stripping and gaskets at four doors.

.5 Remove the existing corrosion and install a stainless steel post guard at two locations at the door bases. Include for sealing post guard edges.

.7 Sealant

.1 Install new single-stage sealant joints (including closed-cell backer rod and sealant) at all panel joints where the cladding returns are reinstated.

.2 Include submitting colour samples and install a mock-up for review by Consultant/Owner prior to proceeding with installation.

.3 Supply and install new sealants at all new metal to masonry joints and all metal-to-metal joints throughout the work area that were not previously sealed including at all new systems.

.4 Clean all surfaces and install new sealant complete with backer rod (where required).

.8 Main Entrance Door Repairs

.1 (fill this in) – corrosion to rust, hardware replacement for automatic door opening mechanism – brief verbiage from what you've flagged in R602

.9 Mechanical and Electrical Allowance

.1 This includes a contingency for mechanical and electrical system repairs not specified in the Contract Documents that are made necessary by the Work, due to conditions that were not visible upon, or reasonably inferable from an examination of the site as determined by the Consultant. Unexpended portions of this allowance will be deducted from the Contract Price. Increase in allowance beyond the stipulated amount shall be authorized by a Change Order.

.2 Any electrical work completed on the project must be completed by one of the pre-qualified electrical contractors (refer to Front End Documents).

.10 Abatement Allowance

.1 This includes a contingency for abatement not included in the Contract Documents that are made necessary by the Work, due to conditions that were not visible upon, or reasonably inferable from an examination of the site as determined by the Consultant. Unexpended portions of this allowance will be deducted from the Contract Price. Increase in allowance beyond the stipulated amount shall be authorized by a Change Order.

.11 Testing Allowance

.1 Carry out independent window field testing to confirm that the window installation meets or exceeds the air and water infiltration performance requirements of the specifications. The first test at each location will be paid for through the testing allowance. Administer this allowance and do not arrange for testing beyond the stipulated amount without approval. No payment shall be made for costs incurred as a result of re-testing necessitated by work that has failed a previous test. Unexpended portions of the testing allowance will be deducted from the Contract Price. Increase in allowance beyond the stipulated amount shall be authorized by a Change Order

1.5 UNIT PRICES

.1 Provide a unit rate price (linear foot) for localized sealant replacement.

1.6 ALTERNATIVE PRICES

.1 There are no alternative price items.

1.7 SEPARATE PRICES

.1 Replace existing window with W5, as indicated on the Drawings (Refer to 5/R400, 4/R601 and 5/R601). Details are similar to W4 replacement (Refer to R412 to R414). Include for removal and reinstatement of interior furniture and exterior access to the window.

.2 Replace existing window with W6, as indicated on the Drawings (Refer to 6/R400, 4/R601 and 6/R601). Details are similar to W4 replacement (Refer to R412 to R414). Include for removal and reinstatement of interior furniture and exterior access to the window.

.3 Replace existing window with W7, as indicated on the Drawings (Refer to 7/R400). Details are similar to W4 replacement (Refer to R412 to R414). Include for removal and reinstatement of interior furniture and exterior access to the window.

END OF SECTION 01 11 13

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 35 23 – Health and Safety

1.1 SECTION INCLUDES

.1 Safety requirements and adherence.

1.2 RELATED SECTIONS

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

1.3 SAFETY PLAN

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to commencing any site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

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

1.4 RESPONSIBILITY

.1 The Prime Contractor according the Act, is responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 For purposes of the installation, the masonry shall act as the Constructor (as that role is defined in the health and safety legislation of Ontario, and as such is fully responsible for directing and controlling all roofing installation work and the safety of the work on the jobsite.

.3 As Constructor/Prime Contractor, the masonry installer shall be fully and solely responsible for ensuring that all applicable occupational health and safety laws, regulations, rules and orders are complied with in the course of the installation. Entry of manufacturer personnel to ensure quality installation in accordance with the manufacturer's specifications and to perform warranty inspections shall not be for purposes of monitoring the safety of the work at the job site.

.4 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.

.5 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of the Province of Ontario. Advise Consultant verbally and in writing.

1.5 SUBMITTALS

.1 Submit site-specific Health and Safety Plan: Within seven (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.

.2 Submit copies of reports or directions issued by Federal or Provincial health and safety inspectors.

.3 Submit copies of incident and accident reports.

.4 Submit Material Safety Data Sheets (MSDS) to Consultant.

.5 Consultant will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within ten (10) days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within seven (7) days after receipt of comments from Consultant.

.6 Consultant's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.7 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.

.8 On-site Contingency and Emergency Response Plan: Address standard operating procedures to be implemented during emergency situations.

1.6 SAFETY ACTIVITIES

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

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

1.7 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 the Province of Ontario and in consultation with Consultant.

1.8 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 The Owner may stop the Work if non-compliance of health and safety regulations is not corrected.

1.9 WORK STOPPAGE

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

1.10 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

1.11 VEHICLE MOVEMENTS

.1 A flagman must be present to direct vehicular and pedestrian traffic at all times when a construction vehicle is operating both within and beyond the limits of the Contractor's compound.

END OF SECTION 01 35 23

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 35 26 – Environment Protection

1.1 SECTION INCLUDES

.1 Site fires.

.2 Disposal of wastes.

.3 Drainage.

.4 Site cleaning and plant protection.

.5 Work adjacent to waterways.

.6 Pollution control.

1.2 RELATED SECTIONS

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

1.3 FIRES

.1 Fires and burning of rubbish on site not permitted.

.2 Provide supervision, attendance and fire protection measures as directed.

1.4 DRAINAGE

.1 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

.2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.5 ASBESTOS CONTENT

.1 Refer to General Condition Section, Asbestos Management Plan and Owner's instructions.

1.6 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this contract.

.2 Control emissions from equipment and plant to local authority's emission requirements.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

END OF SECTION 01 35 26

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 45 24 – Glazing Testing

1.1 Scope and Purpose:

.1 These specifications establish the requirements for test specimens, apparatus, sampling, test procedures and test reports to be used in evaluating the performance of newly installed windows, storefronts, curtain walls and sloped glazing systems and their installation during construction; ("Test Area" hereafter referred to as "specimen").

.1 The purpose of this specification is to provide a method which can be used to evaluate the installed performance of windows, storefronts, curtain walls and sloped glazing systems for air leakage and resistance to water penetration under controllable and reproducible test conditions intended to simulate wind driven rain events. Field air leakage testing is not recommended for a portion of continuous framing systems (spanning multiple floors) due to the complexity of compartmentalizing air chambers and cavities within these systems

1.2 REFERENCE STANDARDS

.1 American Architectural Manufacturers Association (AAMA)

.1 AAMA 503-14, Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems.

.2 AAMA 511-08, Voluntary Specifications for Forensic Water Penetration Testing of Fenestration Products.

.2 ASTM International (ASTM)

.1 ASTM E783-02 (2018), Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.

.2 ASTM E1105-15, Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.

.3 CSA Group (CSA)

.1 CSA A440/A440.1 (R2005), Windows/Special Publication, User Selection Guide to CSA Standard CAN/CSA-A440-00

Part 2 Test Methods

2.1 GENERAL

.1 Field testing procedure and test apparatus shall meet the requirements of the following referenced ASTM test method. The most current revision of the ASTM method shall be identified in the specifications. If a revision number is not referenced, then the version current during the bidding stage of the project shall be used.

.2 Resistance to air infiltration using static air pressure difference: ASTM E 783, "Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors."

.3 Resistance to water penetration using static air pressure difference: ASTM E 1105, "Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors and Curtain Walls and by Uniform or Cyclic Static Air Pressure Difference."

.4 Testing is to be conducted only where temperatures above 4C are maintained throughout the 24 hour period prior to testing. Where temperatures are lower, heat protection from the exterior is required to keep the test sample(s) above 4C.

2.2 TEST CHAMBER ARRANGEMENT

.1 Joints (i.e. transition seals) between the specimen and the adjacent wall, curb or roof shall be permitted to be included in the test specimen for water penetration testing only. The test chamber shall be applied to the interior or exterior of the wall, curb or roof construction in such a manner as to create a pressure differential across the specimen assembly, including perimeter frame intersections and perimeter seals, subframes, receptors and flashing.

.2 Testing shall be performed immediately after the first units have been installed and regularly thereafter. All testing is to be performed prior to the installation of drywall or interior finish wall/roof materials if the transition seal from the glazing system to the adjacent wall system is to be tested for water penetration. If interior finish wall/roof materials have been installed, they shall be removed at the test area to allow visual access to these areas to check for water penetration, or other means of visual access shall be provided

Part 3 Sampling

3.1 GENERAL

.1 As soon as practical after installation has begun, and after the test specimen has been completely installed, adjusted, cleaned and perimeter sealed (including adequate time for the sealant to cure), the specimen shall be tested for air leakage and water penetration resistance as specified in Section 4.0.

.1 All trades and contractors involved and responsible for the test specimen performance (i.e. manufacturer, erector, glazier, perimeter caulking contractor, etc.) shall be made aware of the test date and invited to witness the testing.

.2 If any of the specimen(s) do not conform to the prescribed air leakage and water penetration resistance requirements, the manufacturer and/or the installer shall be afforded the opportunity to perform a site inspection and determine the reason for non-compliance. Non-compliant specimen(s) shall be repaired as required and retested as soon as practical. The remedial work shall be recorded and approved by the specifying authority, architect and/or owner. Upon satisfactorily passing a retest, the remedial work

performed shall become punch list items to randomly check for similar conditions on the remainder of the project.

.3 If water leakage is observed and the source of the leakage cannot be determined, a forensic evaluation using the procedures outlined in AAMA 511 shall be performed while maintaining the test pressures defined in the field testing specifications, and employing the test methods defined in AAMA 503.

.4 The initial testing shall be paid for through the project inspection and testing allowance. The contractor will be responsible for all costs associated with any retesting or additional testing that is the result of failures of initial testing; these costs are to include all construction, testing agency, and owner representative consulting fees associated with the retesting.

.5 Testing shall be performed by a qualified independent testing agency.

.6 The following testing schedule shall be followed:

.1 Test #1: Mock-up Sample, which is considered to be the first assembly installed on the project; installation of the project glazing assemblies is not to progress until the mock-up assembly testing is deemed a pass by the owner's representative or the owner provides instruction to continue with the glazing assembly installation irrespective of the mock-up results.

.2 Test three (3) glazing assemblies for the first 100 assemblies installed; test no less than 3 assemblies. Test 1% of the remaining glazing assemblies.

.3 For every failure other than the mock-up assembly, test an additional 3 assemblies.

Part 4 TEST PROCEDURES

4.1 General

.1 Air leakage resistance and water penetration resistance tests shall be performed at pressures specified in Sections 4.1.2 and 4.1.3.

.1 Where both tests are to be conducted in sequence, the test for air leakage resistance shall be conducted before the test for water penetration resistance. If there is reason to believe that residual water from rain or other sources may be located in the specimen, a two-minute negative (outward) pressure test followed by a two-minute positive (inward) pressure test shall be conducted at the same pressure differential used for the performance test to purge the specimen of any residual water. The specimen gaskets or weatherstrips shall be examined and shall be dry before proceeding with the air leakage resistance test.

.2 An air leakage resistance test shall be conducted at a minimum uniform static test pressure of 75 Pa (for windows) or 300 Pa (for curtain wall) or as specified for the project. Air leakage resistance shall be determined per ASTM E 783.

.1 The maximum allowable rates of air leakage for field testing shall meet the rating of A3 as defined in CSA-A440/A440.1. for operable units and "fixed" for non operable units.

.1 A3 (operable): 0.55(m^3/h)/m

.2 Fixed: 0.25(m^3/h)/m

.3 Water penetration resistance performance shall be determined per ASTM E 1105 using Procedure A, "Uniform Static Air Pressure Difference."

.1 The field water penetration resistance tests shall be conducted [500] Pa. The glazing product is to meet the following requirements:

.1 With all operable portions of the specimen closed and locked, the specimen shall be subjected to a water penetration test in accordance with ASTM E 1105 with continuous pressure and water application. Observe and note all points of water penetration, if any, that occur during the test. If the origin of the water leakage cannot be definitively attributed to either the product specimen or the joint between the product specimen and the surrounding condition, a forensic evaluation shall be performed using the procedures outlined in AAMA 511 while maintaining the test pressures defined in the field testing specifications and employing the test methods defined in AAMA 503.

.4 Water penetration

.1 Attributable to the surrounding condition shall be defined as the presence of uncontrolled water which did not originate from the product specimen or the joint between the product specimen and the wall/roof.

.2 Water penetration attributable to the product specimen shall be defined as the penetration of water beyond the primary seal/plane of water resistance.

.3 Water penetration attributable to the perimeter joint shall be defined as uncontrolled water that indisputably originates at the joint.

Part 5 TEST REPORTS

5.1 General

The report shall include enough information to reproduce the test. At a minimum, the following information shall be included:

.1 General:

.1 The testing agency, name of the individual(s) performing the tests, test witnesses, date and time of test, date of report, identification and location of the building shall be identified. The date of the last equipment calibration and the location of calibration records shall also be included in the report.

.2 Glazing Product Description

.1 The manufacturer, model, operation type (if applicable), dimensions, materials, etc.; identification and location of specimen(s) within the building; physical condition of specimen; description of any modifications made to the specimen; number of retests, etc. The test agency shall report the plumb, level and square condition of the tested specimen.

.3 Sampling Procedures

.1 If applicable, describe or list the procedures established from Section 3.0.

.4 Test Parameters

.1 List or describe the specified static pressure differential(s) used in the test, whether the chamber was affixed to the interior or exterior of the wall/roof, and provide a detailed description (include sketches showing location, if appropriate) of the chamber attachment to the specimen. Provide a written description of any measures that were taken to control ambient conditions. Clearly identify any elements of the specimen that were not tested. Verify in a statement that the sample was inspected immediately prior to the test or installation of the chamber if it conceals portions of the specimen, that the original conditions were observed and documented, and that all surfaces were dry, such that water observed during or after testing was produced by the test itself and no other possible source.

.5 Test Results

.1 Record the following:

.1 Actual and allowable air leakage for the product specimen.

.2 Actual and allowable water penetration for the product specimen.

.3 Actual and allowable water penetration for the perimeter condition.

.4 Environmental conditions as measured at the time of the test: wind speed, wind direction, precipitation, barometric pressure and ambient temperature.

.6 Additional Observations

.1 If problems with a specimen installation are observed, they shall be brought to the responsible contractor's and/or manufacturer representative's attention.

.1 The observations to be recorded shall include but not be limited to the following:

.2 Deterioration of building elements due to water penetration

.3 Deviations of the installation from the drawings of record

.4 Staining or discoloration of building components

.5 Evidence of damage to either the installed product or the surrounding building elements

.6 Unusual or unexpected evidence of water penetration or air leakage which would require remediation

.7 Any observed performance or installation details which might be deemed of importance to a subsequent forensic investigation.

.7 Compliance Statement

.1 Make a statement that the tests were conducted in accordance with this specification or completely describe any deviation. Also, state whether or not the results indicate compliance with the field testing specification requirements.

Part 6 COST

6.1 General

.1 Base Project Testing: All costs associated with execution of the mock-up testing and the construction progress testing shall be taken from the project cash allowance.

.2 Additional Testing or Retesting: Any testing that is required as a result of failure of the base project sample testing, shall be borne by the contractor and cannot be reimbursed from the project cash allowance.

Part 7 CONTRACTOR RESPONSIBILTIES

7.1 General

.1 The following shall be provided by the Contractor:

.1 Adequate water supply (standard garden-hose bib with minimum 7 gpm water flow at 45 psi pressure) within 15 m (50’) of test area. A booster pump may be required if water flow and pressure cannot be maintained for the entire duration of test.

.2 Contractor shall conduct a bucket-and-stopwatch check prior to test date to ensure adequate water supply

Test Requirement	Maximum time allowed to fill a 5-gallon pail
8’x8’ Spray Rack, A440 Water Test	50 seconds
10’x10’ Spray Rack, A440 Water Test	30 seconds

.3 Electrical outlet, standard 115V, 15A within 3 m (10’) of test area.

.4 Free and un-encumbered access to both the interior and exterior side of test area, such as removal of curtains and blinds, furniture, etc.

.5 Free access to the wall cavity immediately beneath the window/door sill in order to inspect for any water penetration (as required by the A440 Window Standard). If such access was not provided, and if the window passes the water penetration test, the window would receive a “qualified Pass” with a note indicating that the area under the sill was not inspected.

.6 Chamber installation requires installation of attachments and sealing to interior and exterior framing members and wall surfaces. This may result in unavoidable damage or staining of finished surfaces. Testing Agency will not responsible for cleaning/repairing such damage or staining.

.7 The Contractor shall be responsible to ensure that all areas of the jobsite affected by window testing are protected from unsafe conditions.

.2 If testing is carried out during the colder months, the contractor is to provide an exterior enclosure assembled with heating sources to maintain the exterior surfaces at or above 4°C.

.1 The enclosure should be constructed in a manner that does not obstruct mounting of the water spray rack and should leave a minimum of 2ft of clearance on all sides of the sample.

.2 If scaffolding is used, it should be installed 18” to 24” off of the wall. This will allow for mounting of the spray rack to the scaffold, and proper distance of the water spray from the sample.

.3 Temperature within the enclosure is to be maintained prior to the test such that the surface temperature of the windows and surrounding wall are above 0 degrees.

.4 Temperatures are to be maintained in the enclosure for a minimum of 24 hours after the test.

PART 8 TESTING COMPANIES

8.1 General

.1 The following testing companies are acceptable to perform the on site air leakage and water penetration testing:

.1 Blue Green Consulting Group Inc.

.2 CAN-BEST Building Sciences Corporation (CANadian Building Envelope Science and Technology)

.3 Terraprobe

.4 Engineering Link Incorporated

END OF SECTION 01 45 24

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 52 00 – Construction Facilities

1.1 SECTION INCLUDES

.1 Construction aids.

.2 Office and sheds.

.3 Parking.

.4 Project identification.

1.2 RELATED SECTIONS

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

1.3 REFERENCES

.1 CAN/CSA-Z321- 96: Signs and Symbols for the Occupational Environment.

.2 Ontario Regulation 213/91 – Construction Projects.

1.4 INSTALLATION AND REMOVAL

.1 Provide construction facilities in accordance with O. Reg. 213/91 – Construction Projects.

.2 Provide construction facilities in order to execute work expeditiously.

.3 Remove from site all such work after use.

1.5 SCAFFOLDING

.1 Provide and maintain scaffolding and pedestrian protection as required to complete the project in a safe manner.

1.6 HOISTING

.1 Provide, operate and maintain hoists or cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.

.2 Hoists or cranes shall be operated by qualified operator.

.3 Provide protective coverings for finish surfaces of cars and entrances.

1.7 USE OF THE WORK

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with Products.

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

1.8 CONSTRUCTION PARKING

.1 Parking will be permitted on site per DDSB instructions.

.2 Provide and maintain adequate access to project site.

.3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.

.4 Clean runways where used by Contractor's equipment.

1.9 SECURITY

.1 Provide and pay for responsible security personnel as required to guard site and contents of site after working hours and during holidays.

1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

1.11 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take such precautions as required by local health authorities.

.3 Keep sanitary facilities clean and fully stocked with the necessary supplies at all times.

END OF SECTION 01 52 00

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 61 00 – Product Requirements

1.1 SECTION INCLUDES

.1 Product quality, availability, storage, handling, protection, and transportation.

.2 Manufacturer's instructions.

.3 Quality of Work, coordination and fastenings.

.4 Existing facilities.

1.2 RELATED SECTIONS

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

1.3 TERMINOLOGY

.1 New: Produced from new materials.

.2 Re-newed: Produced or rejuvenated from an existing material to like-new condition to serve a new or existing service.

.3 Defective: A condition determined exclusively by the Consultant.

1.4 PRODUCT QUALITY

.1 Products, materials, equipment, parts or assemblies (referred to as Products) incorporated in Work: New or Re-newed, not damaged or defective, of best quality (compatible with specification requirements) for purpose intended. If requested, provide evidence as to type, source and quality of Products provided.

.2 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.

.3 Should any dispute arise as to quality or fitness of Products, decision rests strictly with Consultant.

.4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.5 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.

1.5 AVAILABILITY

.1 Immediately upon signing Contract, review Product delivery requirements and anticipate foreseeable supply delays for any items.

.2 If delays in supply of Products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

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

1.6 STORAGE AND PROTECTION

.1 Store and protect Products in accordance with manufacturers' written instructions.

.2 Store with seals and labels intact and legible.

.3 Store sensitive Products in weather tight, climate controlled, enclosures in an environment favourable to Product.

.4 For exterior storage of fabricated Products, place on sloped supports above ground.

.5 Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of Products.

.6 Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

.7 Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

.8 Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.7 TRANSPORTATION AND HANDLING

.1 Transport and handle Products in accordance with manufacturer's written instructions.

.2 Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.

.3 Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.8 MANUFACTURER'S WRITTEN INSTRUCTIONS

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

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

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

1.9 QUALITY OF WORK

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

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

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

1.10 COORDINATION

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

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

1.11 CONCEALMENT

.1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation, inform Consultant if there is interference. Install as directed by Consultant.

1.12 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.13 FASTENERS

.1 Provide metal fasteners 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 stainless-steel fasteners and anchors for securing exterior work.

.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 Fasteners which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.14 FASTENERS - EQUIPMENT

.1 Use fasteners of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use Type 304 or 316 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.15 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of any part of the Project.

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

END OF SECTION 01 61 00

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 62 00 – Product Exchange Procedures

1.1 SECTION INCLUDES

.1 Substitutions.

.2 Alternatives.

.3 Separate prices.

1.2 RELATED SECTIONS

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

1.3 SUBSTITUTIONS

.1 Instructions to Bidders specify time restrictions for submitting requests for Substitutions during the bidding period to requirements specified in this section.

.2 Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.

.3 Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

.4 A request constitutes a representation that the Bidder:

.1 Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.

.2 Will provide the same warranty for the Substitution as for the specified Product.

.3 Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.

.4 Waives claims for additional costs or time extension which may subsequently become apparent.

.5 Will reimburse Owner for review or redesign services associated with re-approval by authorities.

.5 Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

.6 Substitution Submittal Procedure:

.1 Submit three (3) copies of request for Substitution for consideration. Limit each request to one (1) proposed Substitution.

.2 Submit shop drawings, product data, and certified test results attesting to the proposed Product equivalence. Burden of proof is on proposer.

.3 Submit the above mentioned information a minimum of ten days prior to the tender closing time.

.4 The Consultant and/or Owner will notify Contractor in writing of decision to accept or reject request.

1.4 ALTERNATIVES

.1 Accepted Alternatives will be identified in Owner-Contractor Agreement.

.2 Submit alternatives identifying the effect on adjacent or related components.

.3 Alternatives quoted on Bid Forms will be reviewed and accepted or rejected at the Owner's option. Accepted alternatives will be identified in the Owner-Contractor Agreement.

.4 Coordinate related work and modify surrounding work to integrate the Work of each alternative.

1.5 SEPARATE PRICES

.1 Separate Price items do NOT replace or substitute items already in the Bid Documents. Accepted Separate Prices will be:

.1 Identified in the Construction Agreement as an increase to the Bid Price; or

.2 In a subsequent Change Order.

.2 Submit Separate Prices to identify items that may be added to the Contract, at the Owner's option. Include in the quoted Separate Price, overhead and profit, the effect on adjacent or related components already in the Work described in the Bid Documents.

.3 Coordinate related Work and modify surrounding Work to integrate the work of each Separate Price.

.4 Schedule of Separate Prices: Refer to Bid Form or Supplementary Bid Information Form.

END OF SECTION 01 62 00

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

Section 07 20 00 – Air Barrier/ Vapour Retarder

1. GENERAL

1.1 SECTION INCLUDES

.1 Self Adhering Membrane

.2 Trowel Applied Membranes

1.2 RELATED SECTIONS

.1 Section 01 11 13 – Work Covered by the Contract Documents

.2 Section 07 62 00 – Sheet Metal Flashing And Trim

.3 Section 07 90 00 – Sealant

1.3 REFERENCES

.1 CAN/CGSB 51.32-M77: Sheathing, Membrane, Breather Type.

.2 CAN/CGSB 51.33-M89: Vapour Barrier Sheet, Excluding Polyethylene, for use in Building Construction.

.3 CAN/CGSB 51.34-M86: Vapour Barrier, Polyethylene Sheet, for use in building construction.

1.4 SCOPE OF WORK

.1 Refer to Section 01 11 13 – Work Covered by the Contract Documents.

.2 All work necessary for completion of work of this section, including but not limited to setting up of scaffolding, permits, authorization from utilities, protection of adjacent wall and roof areas, etc. The cost associated with these items will not be paid for separately, but will be considered incidental to work of this section.

.3 This section shall include all accessories necessary to complete the work, tie-ins to adjacent systems, and modifications to existing systems.

.4 Where conflict exists in the scope of work, requirements, standards, or codes, the most stringent criteria shall apply.

1.5 SUBMITTALS

.1 Submit manufacturer's Product data in accordance indicating the products characteristics, performance criteria, and limitations. Indicate surface preparation requirements, installation requirements and techniques, product storage, and handling criteria.

.2 Submit the information directly to the Consultant.

1.6 QUALITY ASSURANCE

.1 Perform Work in accordance with product manufactures instructions. Maintain Manufacturer’s installation guides on-site.

.2 Pre-installation meeting: Arrange with manufacturer's representative to inspect substrates and review installation procedures 48 hours in advance of installation.

1.7 QUALIFICATIONS

.1 The installer shall be a company specializing in performing the work of this section with a minimum of five (5) years proven experience for projects of similar size and complexity.

.2 Use single Contractor for all air barrier/vapour retarder membrane installation.

1.8 MOCK-UP

.1 Construct a typical mock-up two (2) weeks prior to commencing with the work at a location agreed with the Consultant to show surface preparation, priming, air barrier/vapour retarder installation and bond and interfaces with adjacent walls, roofs and the like. The mock-up shall be at least 1m by 1m.

.2 Upon receipt of written confirmation from the Consultant, the mock-up may remain as part of the finished work.

.3 The Contractor must receive written confirmation of the mock-up acceptance prior to commencing with the work.

.4 Approved mock-up shall serve as the standard to which all related work shall be evaluated.

.5 Rejected mock-ups will be removed and disposed of at the expense of the Contractor.

.6 The mock-up shall be completed using the products.

1.9 DELIVERY, STORAGE AND PROTECTION

.1 Provide weather protection and construction protection in accordance with CAN3-S304.

.2 Keep the materials dry and protected from the weather, freezing and contamination.

.3 Ensure that the labels and seals on all materials are intact upon delivery.

.4 Remove rejected or contaminated materials from the site.

1.10 WARRANTY

.1 Defective work shall include, but is not limited to loss of adhesion, loss of cohesion, discolouration, and premature deterioration.

1.11 ENVIRONMENTAL REQUIREMENTS

.1 All work shall be performed in strict accordance with manufacturer’s written requirements for all products specified in the specification.

.2 Should a conflict arise between the requirements of this section and the manufacturer’s requirements, the more stringent requirements shall govern.

1.12 EXISTING CONDITIONS

.1 The Contractor shall provide all required support to safely support all the loads.

.2 Report, in writing to the Consultant, any conditions which will adversely affect the work of this section.

1.13 ALTERNATIVES

.1 Alternatives to manufacturer's brands or supply sources of materials will not be accepted.

2. PRODUCTS

2.1 SELF ADHERING AIR BARRIER / VAPOUR RETARDER MEMBRANE

.1 Modified bitumen membrane reinforced with non-woven polyester mat, self adhesive type membrane covered with plastic film on one side, self adhesive polyethylene protective film on the other. Minimum thickness 1.0 mm (41 mils)

.1 Acceptable Products: Blueskin SA as manufactured by Henry

.2 Primer: as per the manufacturer.

.2 Flashing Sealant: BES 925 by Henry.

2.2 TROWEL APPLIED AIR BARRIER/VAROUR RETARDER MEMBRANE

.1 For laps, seams, end dams, breaches and penetrations:

.1 Liquid air/vapour barrier; synthetic, trowel applied to a wet film thickness of 3mm, rubber based adhesive type. Maximum Air Leakage: 0.013 L/s/m² @ 100 Pa.; 0.027 L/s/m² @ 500 Pa., 0.075 L/s/m² @ 3000 Pa. Maximum Water vapour permeance: 1.7 ng/Pa.m^2.s. (0.03 perms).

.2 Acceptable Product: Air-Bloc 21 as manufactured by Henry.

2.3 TRANSITION (TIE-IN) MEMBRANE

.1 SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film. Minimum thickness 1.0 mm.

.1 Acceptable Product: Blueskin SA as manufactured by Henry

.2 Transition Sealant: BES 925 by Henry. All transition seams to receive flashing sealant.

2.4 METAL SUPPORT

.1 24 gauge galvanized sheet metal. Profile as per the details.

2.5 FASTENERS

.1 Concrete Substrate: Stainless steel concrete screw, 3/16" diameter, 1-1/4" length - flat head.

3. EXECUTION

3.1 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept the work of this section.

.2 Commencing with the installation means acceptance of the existing substrates by the Contractor.

.3 Work is not to proceed without a letter from membrane manufacturer outlining site specific recommendations.

3.2 PREPARATION

.1 Protect adjacent finished materials from marking or damage due to the work.

.2 All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar, corrosion by-product or other contaminants. Fill spalled areas in substrate to provide an even plane. Strike masonry joints flush.

.3 Newly placed materials containing moisture (I.e. concrete, mortar etc.) should be cured for a minimum of 14 days and must be dry before membranes are applied.

.4 Install temporary shoring, bracing or other supports as necessary to support loading in the area of work.

.5 Incomplete areas of work shall be completely covered and protected with non-staining waterproofing covers when the construction is not in process. Joints between panels of exterior grade gypsum, plywood and other panel type substrates shall be sealed with a self-adhering membrane lapped a minimum of 75 mm on both sides of the joint prior to the application of liquid membrane. Cracks in masonry and concrete shall be sealed with a strip of self-adhered membrane lapped a minimum of 75 mm on both sides of the crack applied to the substrate prior to the application of liquid membrane.

.6 Remove the existing self-adhered membrane where no longer adhered, where wrinkles, air pockets, etc. exist, where there is water behind the membrane, and where directed by the Consultant. The remaining existing self-adhered membrane must be well adhered.

3.3 PRIMER FOR ALL SELF-ADHERING MEMBRANE

.1 Obtain from the manufacturer a letter regarding whether primer is required on an existing self-adhered membrane.

.2 All substrate surfaces are to be primed unless directed by the manufactuer.

.3 Apply primer for self-adhering membrane and through-wall flashing membrane at the rate recommended by manufacturer.

.4 Apply primer by either roller or spray and allow minimum 30 minute open time. Primed surfaces not covered with membrane during the same working day must be re-primed.

3.4 SELF-ADHERING MEMBRANE INSTALLATION

.1 Apply the membrane to the prepared and primed substrate in an overlapping shingle fashion, and in accordance with manufacturer's recommendations and written instructions. Stagger all vertical joints.

.2 Align and position the membrane, remove protective film and press firmly in place. Ensure a minimum of 75 mm overlap at all end and side laps. Promptly roll all laps and membrane with a counter top roller to promote adhesion.

.3 At the end of each day’s work, seal the top edge of the membrane where it meets the substrate using the flashing sealant or as recommended by the manufacturer.

.4 At all such locations provide membrane end dams with metal support.

.5 Terminate the membrane at the toe of the shelf angle and 38 mm beyond the edge of the metal support.

.6 Ensure all projections, breaches and penetrations, including wall ties, seams, joints, end, etc. are properly sealed with an application of a trowel applied air barrier.

.7 Provide a flashing sealant bead between the underside of the membrane and the support (shelf angle or metal support).

3.5 TRANSITION (TIE-IN) MEMBRANE

.1 Fully remove the existing sealants and transition membranes. Clean the substrate with MEK and prepare to receive new transition membrane.

.2 Align and position transition membrane, remove protective film and press firmly into place. Ensure minimum 75mm overlap at all end and side laps. No wrinkles will be tolerated. Seal seam with lap sealant.

.3 Tie-in to window frames, aluminum screens, hollow metal doorframes, spandrel panels, roofing system and at the interface of dissimilar materials.

.4 Promptly roll all laps and membrane with a counter top roller to affect seal.

3.6 Ensure all preparatory work is complete prior to applying primary liquid/trowel applied air vapour barrier membrane.

3.7 THROUGH-WALL FLASHING MEMBRANE INSTALLATION

.1 Refer to Section 07 20 10 – Through Wall Flashing Membrane Installation.

3.8 TROWEL APPLIED MEMBRANE INSTALLATION

.1 Apply by flat trowel a complete and continuous unbroken film of membrane to the specified thickness.

.2 Overlap transition membrane a minimum of 25 mm.

.3 Trowel around all projections ensuring a complete and continuous air seal. Ensure protrusions such as brick ties are properly sealed with membrane at the point of contact with the wall.

3.9 PROTECTION

.1 The membranes specified in this section are not designed for permanent exposure. Ensure that membranes are covered promptly after completing the work.

.2 Contractor must maintain the exterior walls watertight at all times to prevent moisture penetration into the wall fabric. The Contractor shall be responsible for all costs associated with damage associated with moisture penetration resulting from inadequate protection as determined by the Consultant.

END OF SECTION 07 20 00

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

Section 07 62 00 – Sheet Metal Flashing and Trim

1.0 GENERAL

1.1 SECTION INCLUDES

.1 Sheet Metal

1.2 RELATED SECTIONS

.1 Section 01 11 13 – Work Covered by Contract Documents

.2 Section 07 90 00 - Sealant

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A 591/A 591 - Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications.

.2 ASTM A 606 - Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.

.3 ASTM A 653/A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.4 ASTM A 792/A 792 - Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.2 Canadian Roofing Contractors Association (CRCA).

.1 Roofing Specifications Manual.

.3 CSA B111 - Wire Nails, Spikes and Staples.

.4 SMACNA (Sheet Metal and Air Conditioning Contractors' National Association) - Architectural Sheet Metal Manual.

1.4 SUBMITTALS

.1 Submit duplicate 300 x 300 mm samples of each type of sheet metal material, colour and finish.

1.5 QUALIFICATIONS

.1 The sheet metal work shall be performed by a recognized specialized fabricator and installer, having at least five (5) years of experience, with skilled mechanics, thoroughly trained and competent in all phases of the work.

1.6 WARRANTY

.1 Contractor shall provide a warranty by the sheet metal installer covering a period of two (2) years for all labour and materials from the date of Substantial Performance of the contract agreeing to furnish sheet metal to repair or replace those that do not comply

with performance and other requirements specified in this Section within the specified warranty period.

.2 Defective work shall include, but is not limited to, premature corrosion, warping, failed anchors, fasteners, and welds, and leakage through seams.

2.0 PRODUCTS

2.2 EXTRUDED ALUMINUM SILL

.1 Refer to 08 51 13 – Aluminum Windows.

.2 Profile: removable for future cladding work.

2.3 GALVANIZED SHEET STEEL

.1 Zinc coated steel sheet: 24-gauge, commercial quality to ASTM A 653/A 653M, with Z275 designation zinc coating.

.1 Use 22-gauge for new through wall flashings.

.2 Finish: Colour samples to be submitted to the Owner and Consultant for review prior to installation. The intent is for new sheet metal flashing to match existing.

2.4 JOINTING

.1 Linear mating of Cap flashings and Parapet flashings shall be with an “S” lock joint.

.2 Corner mating shall be completed with a standing seam.

2.5 ACCESSORIES

.1 Starter Strips

.1 Same material as sheet metal, minimum 50mm (2”) wide with bent to accept cap flashing.

.2 Thickness to be minimum of 0.8mm (20ga).

.2 Touch-up paint

.1 As recommended by prefinished material manufacturer.

.3 Isolation Coating

.1 Bituminous Paint to meet CGSB1-GP-108.

.4 Sealant

.1 Refer to Section 07 90 00 – Sealant.

.5 Downspouts

.1 Downspout to be fabricated from Z275 galvanized sheet steel conforming to ASTM A653 M Grade 230 or AZ150 galvalume, sheet steel conforming to ASTM A792 Grade 230, having a norminal core thickness of 22 gauge.

.2 All components to be galvanized and have fully soldered seams. Downspout to be finished after soldering.

.3 Colour: to be selected from manufacturer’s standard colour range by the Owner.

.4 Downspout braces to be fabricated from 20 Ga pre-painted galvanized sheet steel. Braces to be installed at 36" o/c.

.5 Downspout hangers to be fabricated from 20 Ga pre-painted galvanized sheet steel. Braces to be installed at 36" o/c.

.6 Fasteners:

.1 Metal Substrates: 304-stainless-steel #10 hex head self-drilling screws complete with stainless steel and neoprene washers.

.2 Masonry Substrates: ¼" stainless-steel masonry fastener with minimum 1" embedment. Maximum spacing to be 36" o/c.

.6 Wood Substrates: #12 stainless-steel wood screws with minimum 1" embedment. Maximum spacing to be 24".

2.6 FASTENERS

.1 All fasteners shall be stainless steel or include an acceptable corrosion resistant coating.

.2 Fastener type and spacing to be in accordance with Factory Mutual Loss Prevention Data Sheet 1-49. The following table is a general guideline for fastener types and spacing:

Element	Substrate	Fastener	Min. Embedment	Max. Spacing	
				<8' from outside corner	>8' from outside corner
Starter strip (exterior face)	Wood	No. 10 screw	3/4"	24"	24"
Starter strip (exterior face)	Concrete or Masonry	1/4" tapcon screw	1"	24"	24"
Starter strip (interior face)	Wood	No. 10 screw w/ neoprene washer	1"	30"	30"
Starter strip (interior face)	Concrete or Masonry	1/4" tapcon screw	1"	30"	30"
Wood blocking	Wood	No. 12 screw	1-1/4"	2 rows staggered, 12" o/c per row	2 rows staggered, 24" o/c per row
Wood blocking	Concrete or masonry	1/4" tapcon screw	1"	24"	36"
Counter flashing	Masonry	1/4" tapcon screw	1"	36"	36"

2.7 FABRICATION

.1 Fabricate all components of the system in the factory, ready for field installation.

.2 Provide gutter sections in maximum 10 foot lengths. All seams to be sealed with sealant.

.3 Hem exposed edges on underside 1/2" (12 mm).

.4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.5 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

3.0 EXECUTION

3.1 EXAMINATION

.1 Examine work of other Sections upon which work of this Section depends.

.2 Report all discrepancies to the Consultant before beginning work on the metal panel cladding system.

3.2 INSTALLATION

.1 The fastener type to be utilized, and fastener spacing shall be in accordance with Factory Mutual Loss Prevention Data Sheet 1-49.

.2 Install continuous starter strips where indicated or required to present a true, non-waving, leading edge. Anchor to wood blocking, concrete or masonry substrate to provide rigid, secure installation.

.3 Install cap flashing by locking into starter strip, pull back tight and screw into blocking. Nail flange of “S-lock” into blocking. Face nailing of joints will not be permitted.

.4 The second cap flashing will follows same procedure locking into the “S-lock” a minimum of 20mm of previous component.

.5 Paint the mating surfaces of aluminum and galvanized steel with bituminous or zinc chromate primers. Taping or gasketing with non-absorptive materials or sealants is also acceptable.

.6 Corners shall be mated with a standing seam joint. Provide a bead of sealant along the inner flange of the seam before crimping tight.

.7 Use concealed fastenings except where approved before installation.

.8 Protect material from electrolytic action when dissimilar metals are in contact with one another.

3.3 CLEANING

.1 Daily as the work proceeds and on completion, remove all surplus materials and debris resulting from the foregoing work.

Remove all stains, caulking or other adhesive from all affected surfaces.

END OF SECTION 07 62 00

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

Section 07 90 00 – Sealant

GENERAL

1.1 SECTION INCLUDES:

.1 Sealant

.2 Foam Backer Rod

1.2 RELATED SECTIONS

.1 Section 01 11 13 Work Covered by Contract Documents.

.2 Section 07 62 00 Sheet Metal Flashing and Trim.

.3 Section 08 51 13 Aluminum Windows and Operable Sashes

.4 Section 08 80 00 Glass and Glazing

1.3 GENERAL REQUIREMENTS

.1 All work necessary for completion of work of this section, including but not limited to setting up of scaffolding, permits, authorization from utilities, etc. The cost associated with these items will not be paid for separately, but will be considered incidental to work of this section.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meeting:

.1 Convene pre-installation meeting 1 week prior to beginning work of this Section Consultant to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other building subtrades.

.4 Review mock-ups and procedures.

.5 Review manufacturers written installation instructions and warranty requirements.

.2 Ensure subcontractor representatives, site supervisor and project manager attend.

1.5 REFERENCES

.1 ASTM C 661 Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer

.2 ASTM C 719 Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).

.3 ASTM C 794 Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.

.4 ASTM C 920 Standard Specification for Elastomeric Joint Sealants.

.5 ASTM C 1330 Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants

.6 ASTM C 1193 Standard Guide for Use of Joint Sealants.

.7 ASTM C 1248 Standard Test Method for Staining of Porous Substrate by Joint Sealants.

.8 ASTM D 2240 Standard Test Method for Rubber Property—Durometer Hardness

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Four (4) weeks prior to starting the work, the contractor shall submit the following:

.1 List of the materials to be provided under this section.

.2 Manufacturer's product data, safety data sheet (SDS), and specifications for each material.

.3 Sealant manufacturer's written project recommendations.

.2 At the Consultant's request, submit samples, including available colours, of the materials to be used on the project.

1.7 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

.2 Warranty Documentation: Submit Warranty Documents Specified.

1.8 QUALITY ASSURANCE

.1 Perform the work in accordance with the manufacturer's written project recommendations.

.2 Obtain each type of joint sealant through one source from a single manufacturer.

1.9 QUALIFICATIONS

.1 The installation of the sealant work shall be performed by a recognized specialized applicator, having at least five (5) years of experience, with skilled mechanics, thoroughly trained and competent in all phases of the work.

1.10 MOCK-UP

.1 Construct mock-ups two (2) weeks prior to commencement of the work to demonstrate all of the joints encountered in this project.

.2 The mock-ups shall be 1 m in length for each type of sealant and substrate.

.3 Locate mock-ups where directed by the Consultant.

.4 The mock-ups shall demonstrate the surface preparation prior to the sealant installation and the location, size, shape, colour, depth of joints, and adhesion and cohesion, complete with back-up material, primer, and new sealant.

.5 Allow 48 hours for inspection by the Consultant before proceeding with the sealant work.

.6 Upon receipt of written confirmation from the Consultant, the mock-up may remain as part of the finished work.

.7 The approved mock-up shall be the standard to which all work shall be performed.

.8 The mock-up shall be performed prior to the pre-installation conference.

1.11 DELIVERY, STORAGE AND PROTECTION

.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 At time of delivery, the Contractor is to verify the sealant expiry dates. Any sealant that have expired or will expire prior to installation are to be returned to the supplier/manufacturer and should not be accepted on site.

.4 Storage and Handling Requirements:

.1 Store materials off ground, in dry location and in accordance with the manufacturer’s recommendations in clean, dry, well-ventilated area. .2 Store and protect joint sealants from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

1.12 SITE CONDITIONS

.1 Ambient Requirements:

.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 Joint-Substrate Conditions:

.1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates

ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials. Labelling and provision of MSDS sheets shall be acceptable to Heath Canada.

.2 Ensure that all materials, containers, rags, etc. are disposed of in accordance with the local Waste Management Plan and hazardous material disposal regulations and requirements.

.3 Ventilate area of work by use of approved portable supply and exhaust fans.

.4 VOC limit 250 g/L maximum.

1.13 ALTERNATIVES

.1 Alternatives to manufacturer's brands or supply sources of materials will not be accepted.

1.14 WARRANTY

.1 Contractor shall provide a warranty by the sealant manufacturer covering a period of five (5) years for all labour and materials from the date of Substantial Performance of the contract agreeing to furnish sealant to repair or replace those that do not comply with performance and other requirements specified in this Section within the specified warranty period.

.2 Defective work shall include, but is not limited to, joint leakage, cracking, crumbling, melting, running, loss of adhesion or loss of cohesion, and substrate staining.

1.15 CONSULTANT REVIEW

.1 The Contractor shall provide access, permit inspection, correct any defects and obtain written approval to proceed from the Consultant prior to commencing with each phase of work.

.2 The Consultant's general review during construction are undertaken to inform the Owner of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility.

.3 Should additional work and/or visits by the Consultant be required because of the Contractor's failure to perform in accordance with the contract documents, or if additional design or drafting time is required by the Consultant to provide/review corrective measures caused by the Contractor's failure to perform in accordance with the contract documents, the Contractor shall reimburse the Consultant at the rate of direct personnel expense plus 150% overhead plus travel, equipment and material costs plus H.S.T. where applicable.

1.16 ANTICIPATED FIELD TESTING PROGRAM

.1 Material and adhesion tests shall be conducted at the discretion of the Consultant on a random basis to show that properties are appropriate to the particular sealant and proper bond is achieved.

.2 Extent of testing shall be as follows:

.1 Ten (10) tests for the first 1 000 feet (300 m) of joint length for each type of elastomeric sealant and joint substrate.

.2 One (1) test for each 1 000 feet (300 m) of joint length therefore or one test per each floor per elevation.

.3 The Contractor shall repair all test areas as part of the work in accordance with this section.

.4 All sealant installation failing material and adhesion tests shall be rectified in accordance with manufacturer and Consultant approved methods. Rectified areas will be retested until results confirm compliance with the manufacturer's written requirements.

2.0

3.0 PRODUCTS

3.1 SEALANT

.1 Porous Substrates (Clay Brick, Concrete, Stone, etc.)

.1 Dow Corning 790 Silicone Building Sealant manufactured by Dow Corning Corporation.

.2 Dow Corning 756 SMS Silicone Building Sealant manufactured by Dow Corning Corporation.

.3 Spectrem 1 manufactured by Tremco Ltd.

.2 Non-porous Substrates (Glass, Metal, etc.)

.1 Dow Corning 756 SMS Silicone Building Sealant manufactured by Dow Corning Corporation.

.2 Dow Corning 795 manufactured by Dow Corning Corporation.

.3 Spectrem 2 manufactured by Tremco Ltd.

.3 Porous Substrate/Metal Substrate

.1 Dow Corning 790 Silicone Building Sealant manufactured by Dow Corning Corporation.

.2 Dow Corning 756 SMS Silicone Building Sealant manufactured by Dow Corning Corporation.

.3 Spectrem 1 manufactured by Tremco Ltd.

.4 Interior – Applicable for Window Perimeter

.1 Tremflex 834 manufactured by Tremco Ltd.

.2 Approved equivalent or as recommended by window manufacturer

.5 The colour of the sealant to be approved by the Owner. Custom The Contractor shall obtain written confirmation of the sealant suitability for this project. A copy of this confirmation shall be forwarded to the Consultant prior to commencing with the work of this section.

.6 Joints with Self-Adhered Waterproof SBS Membrane Sealant

.1 Dow Corning 758 Silicone Weather Barrier Sealant manufactured by Dow Corning Corporation.

.7 The colour of the sealant to match existing as approved by the Owner. Custom colour may be required if the manufacturer's range of standard colours is not suitable.

.8 The Contractor shall obtain written confirmation of the sealant suitability for this project. A copy of this confirmation shall be forwarded to the Consultant prior to commencing with the work of this section.

3.2 PRIMERS

.1 Primer shall be as specified by the sealant manufacturer.

3.3 JOINT BACKING

.1 Butt Joint and Bridge Joint Applications

.1 Cylindrical Sealant Backing, of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Material shall be of type that will not adhere to the specified sealant:

.1 Closed–cell material (i.e. polyethylene) with a surface skin. Do not puncture backer; rod may cause bubbling in sealant

.2 Bi-cellular material with a surface skin.

.3 Open cell foam backer rod shall not be used on this project.

.2 Where the joint size cannot accommodate foam rod, polyethylene tape or other joint backing material recommended by sealant manufacturer shall be used.

.2 Fillet Joint Applications

.1 Bond breaker tape, polyethylene tape or other plastic tape recommended by the sealant manufacturer shall be used to prevent adhesion to the specified sealant or to the back of joint.

3.4 CLEANING AGENT

.1 The cleaning material for the surfaces to receive the sealant shall be as recommended by the manufacturer of the sealant.

3.5 MASKING TAPE

.1 Non-staining, non-absorbent material compatible with joint sealant and surface adjacent to joints.

4.0 EXECUTION

4.1 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept the work of this section.

.2 Commencing with the installation means acceptance of the existing substrates by the Contractor.

.3 Examine the areas and conditions under which the work will be performed. Review the planned operating procedures with the Consultant. Do not proceed with work until any unsatisfactory conditions are corrected in a manner acceptable to both the Owner and the Consultant.

.4 Verify that the specified environmental conditions exist before commencing with the work.

.5 The Contractor shall arrange for the sealant Manufacturer's representative to visit the site and review the surface preparation and installation procedures at the start of the work.

4.2 PROTECTION

.1 The Contractor is responsible for maintaining the work weather tight during the course of the project. At the end of each work day or when stoppage occurs, provide necessary protection to prevent water penetration through the exterior walls.

.2 Seal and protect all openings, doors, windows and adjacent areas to minimize the potential for damage and the spread of dust, water or other materials into the building or adjacent sidewalks and properties.

.3 Protect adjacent finished materials from marking or damage during the work.

.4 Protect completed sealant installation during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes such that sealant is without deterioration or damage at time of substantial completion. If, despite such protection, damage or deterioration occurs, such sealant shall be rectified immediately.

4.3 SURFACE PREPARATION

.1 Consult and follow the sealant manufacturer's project recommendations.

.2 Remove the existing sealant around the penetrations without causing damage to the substrates.

.3 Remove dust, paint, loose mortar and other foreign matter, and dry joint surfaces.

.4 Where necessary to protect the adjacent surfaces, mask by suitable means prior to priming and sealant installation.

.5 Report in writing to the Consultant, any conditions which may be detrimental to the proper performance of the work. Proceeding with the work shall be taken as acceptance of the existing surfaces and conditions.

.6 The joints shall be clean, dry and free of frost and foreign matter prior to surface application.

.7 Butt and Bridge Joint Applications

.1 Examine the joint sizes and correct as required to allow for the anticipated movement and to achieve proper width / depth ratio in accordance with the manufacturer's recommendations for the specified sealant unless indicated differently on the drawings, or by the Consultant.

.2 Should joint width correction be required, ensure that the correction is distributed appropriately to each side of joint.

.8 Fillet Joint Applications

.1 Remove oil, grease and other coatings from non-ferrous metals with an approved cleaning solvent or abrasive technique. Obtain approval from the Consultant prior to commencing.

4.4 PRIMING

.1 Prime all substrates as directed by the sealant manufacturer's recommendations.

.2 Prime sides of the joint using the two cloth method in accordance with the manufacturer's directions, immediately prior to sealant installation.

.3 Primers that require application by the wipe of a clean soft cloth, shall be poured onto the cloth. Do not dip the cloth into the primer container.

.4 Prime only as much area as can be sealed in the same working day.

4.5 INSTALLATION OF THE BACK-UP MATERIAL

.1 Cylindrical Sealant Backing:

.1 Install the backer rod without stretching, twisting, braiding or puncturing the outer skin. Do not leave gaps between ends of sealant backings.

.2 Use an approved installation tool that is blunt surfaced and is designed accurately to place the backer rod.

.3 Using the approved tool, smoothly and uniformly place the backer rod to the recommended joint depth and rod compression.

.4 The minimum compression of the foam backer rod is twenty-five (25) percent. Vary backer rod size as required to achieve specified compression.

.2 Bond Breaker Tape:

.1 Install bond breaker tape without stretching, twisting or puncturing the tape.

.2 Use an approved installation tool that is blunt surfaced and is designed accurately to place tape within the joint.

.3 Width of bond breaker tape shall fit exactly the width of the joint.

.4 Install tape at the back of the joint.

.5 Do not leave gaps between ends of bond breaker tape.

.3 Three-sided adhesion is not permitted.

.4 Foam backer rod shall only be installed in areas that can be sealed in the same working day.

4.6 APPLICATION

.1 The Contractor shall have a trained representative on site at all times who is responsible for all sealant applications.

.2 Perform all work in strict accordance with the manufacturer's printed instructions. The Contractor shall provide the Consultant a copy of these instructions prior to commencing with the injection and sealing operations.

.3 Mix multi-component sealant such that air pocket formation is minimized in accordance with the manufacturer's recommendation.

.4 The sealant must be applied continuously to ensure that all voids and joints are completely filled.

.5 Tool the sealant with light pressure immediately after application to ensure positive and complete contact of the sealant to the interface. Only tooling agents that are approved in writing by the sealant manufacturer and that do not discolour sealants or adjacent surfaces shall be used.

.6 Neatly tool the surface to form a slight concave profile. The surface of the sealant shall be smooth, free from ridges, wrinkles, air pockets and embedded impurities.

4.7 TWO-STAGE SEALANT JOINT

.1 A two-stage sealant bead consists of two sealant beads separated by a drained air space with each sealant bead having its own appropriate joint backing material.

.2 The interior sealant bead shall be allowed to fully cure prior to the installation of the exterior bead. Sealant cut tests to confirm adhesive properties must be completed by the Consultant and repaired by the Contractor prior to the installation of the exterior bead. Obtain written confirmation from the Consultant prior to proceeding with the installation of the exterior bead.

.3 A minimum of 25 mm must be maintained between the exterior face of the interior sealant bead and the back of the joint backing material for the exterior bead.

.4 The Contractor is to ensure that the installation of a primer or surface preparation procedures for the interior sealant bead do not inhibit the adhesion of the exterior sealant bead.

.5 At the intersection of horizontal and vertical sealant joints, return the horizontal interior sealant bead to interface with the exterior sealant bead closing the air space between sealant beads.

.6 Install gap in the exterior vertical sealant joint at all intersections of horizontal and vertical sealant joints as per the details.

4.8 ROUT AND SEAL REPAIRS

.1 Grind sides of crack to a minimum width of 6mm and depth of 6mm (1/4 inch).

.2 Apply bond breaker tape inside the joint.

.3 Fill the joint with sealant. Tool sealant following application.

4.9 CLEAN UP

.1 Clean the adjacent surfaces immediately and leave the work area neat and clean. All excess (sealant and primer) and droppings shall be removed using the recommended cleaners as the work progresses.

.2 All masking shall be removed immediately after tooling the joints. Sealant affected by the masking removal shall be retooled to achieve proper joint configuration.

END OF SECTION 07 90 00

DIVISION 08 – WINDOWS

SECTION 08 51 13 – ALUMINUM WINDOWS

1.0 GENERAL

1.1 SECTION INCLUDES

.1 Thermally broken aluminum windows.

1.2 REFERENCES

.1 Aluminum Association (AA)

.1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.

.2 ASTM International (ASTM)

.1 ASTM A 123/A 123M-17, Standard Specification for Zinc (Hot-Dip galvanized) Coatings on Iron and Steel Products.

.2 ASTM E 1748-95(2017), Standard Test Method for Evaluating the Engagement Between Windows and Insect Screens as an Integral System.

.3 ASTM-E2112-18B, Standard Practice for Installation of Exterior Windows, Doors and Windows.

.3 CSA Group (CSA)

.1 AAMA/WDMA/CSA 101/I.S.2/A440-11(R2016), NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.

.2 CSA A440S1-17, Canadian Supplement to AAMA/WDMA/CSA 101/1.S.2/A440, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.

.3 CAN/CSA-A440.2-14(R2018)/A440.3-14(R2018), Fenestration energy performance/User guide to CSA A440.2, Fenestration energy performance.

.4 CAN/CSA-A440.4-18, Window, Door, and Skylight Installation

.5 CAN/CSA-Z91-17, Health and Safety Code for Suspended Equipment Operations.

.4 Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - current edition.

.2 MPI #79, Primer, Alkyd, Anti-Corrosive for Metal.

.5 Screen Manufacturers Association (SMA)

.1 SMA 1201R-2012 Specification for Insect Screens for Windows, Sliding Doors and Swinging Doors.

1.3 DESIGN CRITERIA

.1 Windows shall be designed by a professional engineer qualified in the Province of Ontario for this type of work. Shop drawings shall bear the professional engineering seal certifying compliance with design requirements.

.2 Compatibility: ensure that chemically incompatible products and accessories are not utilized in any part of the glazing system.

.3 Window systems to withstand, without any detrimental effects to appearance and performance, wind loads, and temperature range expected in geographical area of this project (OBC climatic information, 30-year probability) unless specified otherwise.

.4 Provide recommendations for glass thickness based on calculations of dead and wind loading.

.5 Framing system to be thermally broken to prevent thermal bridging.

.6 Manufacture and fabricate window systems to perform as an effective air and vapour barrier.

.7 Allow for thermal expansion and contraction of systems components.

.8 Allow for movement deflection and creep of building structural frame.

.9 Limit deflection of component parts under maximum design load to 1/175 of span or less if required by glass manufacturer.

1.4 PRE-INSTALLATION MEETINGS

.1 Convene pre-installation meeting minimum one (1) week prior to beginning the work of this Section, with Consultant and DDSB Project Supervisor to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other construction subtrades.

.4 Review manufacturer's written installation instructions and warranty requirements.

.2 Ensure subcontractor representatives, site supervisor and project manager attend.

1.5 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for windows and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two (2) copies of WHMIS MSDS to the Consultant and DDSB Project Supervisor.

.2 Test and Evaluation Reports:

.1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications. Reports shall be less than five (5) years old.

.2 All test reports must reference the current version of NAFS and must include, on the first page, a summary of the results including, at minimum:

.1 The product manufacturer.

.2 The type of product.

.3 The model number/series number.

.4 The primary product designation.

.5 The secondary product designation.

.6 Positive design pressure.

.7 Negative design pressure.

.8 Water penetration resistance test pressure.

.9 Canadian air infiltration and exfiltration levels.

.10 The test completion date.

.3 The report will also contain the following information:

.1 Test dates.

.2 Report preparation dates.

.3 Test information retention period.

.4 Location of testing facilities.

.5 Full description of test samples, including:

.6 Finish of aluminum window frame.

.7 Condensation resistance.

.8 Sash strength and stiffness – projecting (awning/hopper) .

.9 Forced entry resistance.

.10 Mullion deflection - combination and composite windows.

.11 Complete description of amendments, as applicable.

.12 Conclusion.

.13 Drawings signed by the testing laboratory, if provided.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer licensed in the province of Ontario.

.2 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, junction between combination units, interior and exterior trim, elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes, fasteners, and caulking. Indicate location of manufacturer's nameplates.

.3 Fastening of wood bucks to building structure to be included in window shop drawings or to be submitted as a separate engineered shop drawing confirming that the wood bucks can support the window lateral loads.

.4 If window sills are lower than 1070mm (3’-6”) above finished floor, the window frame, glazing and fastening are to be designed to meet required guard rail loads as per the OBC. This is to be confirmed on the sealed shop drawings.

.5 Indicate locations, dimensions, openings and requirements of related work.

.6 Do not order materials or start fabrication until shop drawings have been reviewed.

.4 Samples:

.1 Submit for review and acceptance of each unit.

.2 Samples returned for inclusion into work.

.3 Submit one (1) complete full-size window sample of each window type.

.4 Include frame, sash, sill, glazing and weatherproofing method, insect screens, surface finish and hardware. Show location of manufacturer's nameplates.

.5 Include 150 mm (6”) long samples of head, jamb, sill and intermediate mullion to indicate profile.

.6 Submit one 305mm (12”) long sample of each muntin profile proposed for the project complete with manufacturer’s product sheet and adhesive tape product sheet.

1.6 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: submit operation and maintenance data for windows for incorporation into manual.

.2 As-Built drawings: Submit “As-Built” drawings to Consultant at the completion of work. As-Built drawings are to legibly record all actual construction which deviates from the project drawings; using red-lines on black-line prints of the project drawings.

.3 Warranty Documentation: submit warranty documents specified.

1.7 QUALITY ASSURANCE

.1 Work of this section is to be done by Manufacturers of recognized standing, having personnel with minimum five (5) years experience in successful manufacture and installation of work specified herein, and who have the necessary equipment to carry out the work.

.2 Fabrication of windows to be done by the window manufacturer.

.3 Installation shall be by the window manufacturer or their approved installer using only mechanics skilled in this trade and in sealant trade as applicable.

.4 Certifications: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.5 Mock-Up:

.1 Provide site mock-up for work of this Section indicating methods and materials, and procedures proposed to achieve final results and to comply with following requirements, using materials indicated for completed work:

.1 Build mock-ups in location and of size as directed by Consultant.

.2 Build a separate mock-up for each window type in the project.

.3 Mock-up to include review of:

1. Rough Opening preparation.
2. Window frame installation.
3. Air/Vapour barrier installation.
4. Glazing and Sealant installation.
5. Louver Installation.
6. Pre-finished insulating metal panel installation.

.4 To properly review all of the items listed in 1.6.5.3, the mock up will need to be reviewed by the Consultant at multiple stages during the installation. The Contractor is to provide adequate notice to allow for review of the mock-up by the Consultant.

.5 Obtain Consultant's acceptance of mock-ups before starting construction; mock-up will be used throughout the construction period as standard of acceptance for subsequent work.

.6 Mock-up may form part of permanent structure when accepted by the Consultant. The Contractor is to repair or replace unacceptable mock-ups at no additional cost to Owner.

.6 Inspection and Testing:

.1 Windows are to be tested in accordance with Section 01 45 24 – Glazing Testing

.2 A minimum of one (1) window of each window type are to be tested.

.1 Approved Mock-up window for each window type.

.2 The fixed and operable portions of a window are to be tested separately for air leakage.

.3 In the event of a failed window test, the Contractor shall complete the necessary remedial work and retest the window until the window passes. This shall be done at no cost to the Owner.

.1 Once the window test has been passed, the remedial work performed on the failed window is to be completed on all of the remaining windows of that window type.

.2 Once a window type has failed its initial test, an additional window shall be chosen by the Consultant to be tested once the remedial work has been carried out on all of the windows.

.4 The mock-up is to be considered complete once it has passed the on site air leakage and water penetration testing.

1.8 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:

.4 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.5 Store and protect windows from nicks, scratches, and blemishes.

.6 Replace defective or damaged materials with new.

1.9 WARRANTY

.1 Manufacturer's warranty: Submit, for Consultant acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty in addition to and not limit other rights Owner may have under Contract Documents.

.2 The Contractor is to warrant work of this Section against defects and deficiencies for a period of five (5) years from the date the Work is certified as substantially performed in accordance with the General Conditions of the Contract and as amended by the Supplementary General Conditions.

.3 The Contractor is to promptly correct deficiencies which become apparent within the warranty period without cost to the Owner. Defects shall include, but not limited to, leaking, deformation of members, loss of seal in sealed glass units, breakage of glass caused by frame distortions and thermal forces, mechanical failure and discolouration of finishes.

2.0 PRODUCTS

2.1 MATERIALS

.1 Materials: to AAMA/WDMA/CSA 101/I.S.2/A440 supplemented as follows:

.2 Windows by same manufacturer

.3 All aluminum sections shall be of 6063-T6 alloy as per ASTM B 221

.4 Main Frame:

.1 Thermally broken aluminum: Window frame to be composed of two separate aluminum frames complete with structurally integrated continuous polyamide or PVC thermal break.

.1 Depth of frame: 5-1/4”

.2 Rainscreen design: Window frame to be purpose designed for drainage complete with:

.1 Concealed/Protected weep system

.2 Dropped glazing pocket to facilitate drainage and prevent water infiltration to the interior

.3 Purpose made setting block to raise glass out of dropped pocket

.3 Window frames to be designed to accept both double and/or triple glazed insulating glazing units

.5 Sash: Thermally broken aluminum. Sash frame to be composed of separate interior and exterior aluminum frames complete with structurally integrated continuous polyamide or PVC thermal break.

.6 Thermal Barrier: PVC or Polyamide

.7 Glass: Insulating Glazing Units – Refer to Section 08 80 00 – Glass and Glazing.

.8 Extruded aluminum sills, of type and size as detailed; minimum 3mm thickness complete with joint covers, jamb drip deflectors, chairs, anchors and anchoring devices.

.1 Profile: removable for future cladding work.

.9 Extruded aluminum panning: of type and size as detailed; minimum 3mm thickness; to be pre-cut and supplied by window manufacturer and mechanically fastened to window frame with concealed fasteners.

.10 Brake formed aluminum sheet metal of type and size as detailed; minimum 3mm thick. Brake forms to be fully supported with blocking and are to be mechanically fastened. All fasteners to be hidden unless detailed otherwise.

.11 Isolation Coating: alkali resistant bituminous paint.

.12 Fasteners: To be 300 series stainless steel to meet window requirements and as recommended by the manufacturer.

.13 Sealants:

.1 Refer to Section 07 92 00 – Sealants.

2.2 ALUMINUM AND FRAMING COMPONENTS

.1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes - 1980, complying with:

.1 Clear anodized

.1 Type: Architectural Class I Colour Anodizing

.2 AAMA Specification: Comply with AAMA 611

.3 Aluminum Association Designation: AA-M10-C21-A41

.4 Colour: Clear anodized

2.3 ACCEPTABLE MANUFACTURERS

.1 Aluminum rainscreen window (fixed), 115mm (4 ½") minimum nominal mullion depth with 115mm (4 ½") minimum depth perimeter frame with flush front at jambs, head and sill. Acceptable manufacturers include:

.1 Alumicor Limited: RainBlade 2970 Series Fixed Window

.2 Kawneer Company Inc.: AA 6500 Thermal Window

.3 Oldcastle Building Envelope: Series 1200-AR Arctic Fixed Window

.4 Windspec Inc.: 925 Rain Screen Window

.5 Alwind Industries Ltd.: FG 500 Series Fixed Window

.6 Commdoor Aluminum: Series 525 Fixed Window

.7 Or approved equivalent.

.2 Projected window vent inserts, awning type, opening out, 50mm (2") minimum frame depth

.1 Alumicor Limited: UniVent 1375 Series Projecting Window

.2 Kawneer Company Inc.: 526 IsoPort TPO Window

.3 Oldcastle Building Envelope: Series 2000-AR Arctic Projecting Window

.4 Windspec Inc.: 535 Series Projecting Window

.5 Alwind Industries Ltd.: VO-500 Series Projecting Window

.6 Commdoor Aluminum: Series 225 Projecting Window

.7 Or approved equivalent.

2.4 ISOLATION COATING

.1 Coatings: in accordance with manufacturer's recommendations for surface conditions.

.2 Isolate aluminum from following components, by means of isolation coating:

.1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.

.2 Concrete, mortar and masonry.

.3 Wood.

2.5 LIQUID FOAM INSULATION

.3 Liquid Foam Insulation: Single component, moisture cure, low expansion rate spray-in-place polyurethane liquid foam insulation to ULC-S710.1 and in accordance with manufacturer's written recommendations.

2.6 HARDWARE

.1 Hardware: stainless steel or white bronze sash locks and aluminum handles to provide security and permit easy operation of units.

.2 Locks: provide operating sash with spring loading locking device, to provide automatic locking in closed position.

.3 Hinging hardware: 4 bar heavy duty stainless steel concealed hinge complete with positive stop and adjustable friction stop; 301 series by Anderberg or equal.

.4 Include special keyed opening device for windows normally locked.

.5 Where window latching devices are located between floor level and 1800mm above floor level:

.1 Equip awning style projected units with roto operator with 2 locking handles.

.2 Roto operator arms to be Pivot shoe type series 22 by Truth Hardware or equal. Roto operator arms should not be easily disengaged without tools.

.3 Equip hopper style projected units with multi-point locking handle.

.6 Where windows latching devices are located in excess of 1800 mm above floor level:

.1 Equip awning style projected units with Teleflex operators. Operator control system by Highline Window Controls. or approved equal.

.2 Equip hopper style projected units with spring loaded pull catch complete with integrated ring for pole operation and cam handle locks complete with integrated ring for pole operation.

.3 Provide one (1) 1800mm long pole operator per room, with wall hook for pole storage.

.7 Limiting Stops: Aluminum angles or box sections to suit application. Stops of PVC or plastic are not acceptable. Vents to be limited to 230mm (9”) or as required to meet applicable building codes (vents to be restricted to 100mm (4”) if window sill is lower than 1070mm above finished floor). Upper vents out of student reach shall have no limiting stop restrictors.

.8 Vents shall be equipped with adjustment shoes so that ventilator will remain in any desired position when open.

2.7 AIR BARRIER AND VAPOUR RETARDER

.1 Air Seal to be achieved by self-adhered waterproof membrane, liquid foam insulation and sealant.

.1 Air seal to be located at thermal break and be achieved with backer rod and sealant which connects the window thermal break to the self-adhered waterproof membrane at the head and sill or the masonry of the window rough opening.

.2 Air seal to be located at the interior side of the window and be achieved with backer rod and sealant which connects the back of the window frame to the self-adhered waterproof membrane which wraps the window rough opening.

.3 Acceptable products:

.1 Self-adhered waterproof membrane:

.1 BlueSkin SA by Henry Company

.2 Or approved equivalent

.2 Sealant: Refer to Section 07 92 00 – Sealant

.2 Equip window frames with factory installed performed silicone sheet (including preformed corners), attached to air seal system of the window frame as per window manufacturer's written instructions. Silicone sheet to be wet sealed onto the vapour retarder system at the window rough opening.

.1 Acceptable products:

.1 DOWSIL Silicone Transition Strip by DOW Chemical Company or equal.

.3 All voids between perimeter aluminum window frames and window rough opening to be filled with liquid foam insulation.

.1 Acceptable Products: Liquid Foam Insulation: Single Component, moisture cure, low expansion rate spray-in-place polyurethane liquid foam insulation to ULC-S710.1

.1 CF-I XTW Extreme-Weather Insulating Foam by Hilti or equal.

2.8 INSECT SCREENS

.1 Screens shall be extruded aluminum frames containing stainless steel mesh and are to be mounted on the interior side of all operable windows.

.2 Screen screws to be tamper proof.

.3 Insect screening mesh: count 18 x 14.

.4 Screen frame aluminum colour to match window frames.

2.9 ROUGH OPENING PATCHING MORTAR

.1 Bagged parging mix intended for concrete block masonry and brick masonry walls. Acceptable products:

.1 Acceptable Product:

.1 Sikacrete-204 Parging by Sika Canada.

2.10 LAMINATED SILLS

.1 Profile and finish is to match existing sill.

3.0 EXECUTION

3.1 FABRICATION

.1 Take field measurements prior to fabrication

.2 Fabricate in accordance with CAN/CSA-A440

.3 The window framing system shall be fabricated from extrusions of sizes and shapes as indicated on the drawings.

.4 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.

.5 Face dimensions detailed are maximum permissible sizes.

.6 Brace frames to maintain squareness and rigidity during shipment and installation.

.7 Fabricate frames square from extrusions with sharply defined profiles and prepare for glazing. Fill frames with insulation.

.8 Design and fabricate necessary brackets and anchorage devices so that, when installed, they will compensate for unevenness and dimensional difference in structure, will allow full expansion and contraction of framing members without creating undesirable stresses in the components and will adequately sustain windows and superimposed wind and rain loads and all other stresses.

.9 Jig assemble components in shop and partially disassemble where necessary prior to delivery and installation. Field fabrication not permitted.

.10 Reinforce and prepare window frames for related hardware where applicable.

.11 Accurately form joints and intersections to tight, hairline fit, sealed against water penetration and air leakage.

.12 Cope and butt join or mitre all joints in main frame and sash, neatly, in weather tight manner and secure by means of screws anchored into integral screw posts.

.13 Deburr and make smooth all sharp milled edges and corners of sash frames.

.14 Nick threads to prevent loosening of nuts. Make bolted and screwed work as inconspicuous as possible.

.15 Construct and erect windows free of exposed fasteners. If unavoidable, fasteners shall be tamper proof.

.16 Glaze and weather-strip all units in factory as far as practicable. Weather-stripping shall be secured properly to prevent shrinkage or movement and be easily replaceable without use of special tools. It shall be resistant to deterioration by weathering or aging.

.17 Apply two shop coats of rust inhibiting primer to all steel components. Over primer and over aluminum coming in contact with masonry apply a shop coat of bituminous paint. Take all other necessary measures to prevent future deterioration due to corrosion and electrolysis.

.18 Welding of component members is permitted providing it does not in any way mar surface appearance. Make joints light, in true plane, ground and sand smooth, flush with base metal. Do all welding on concealed surface.

.19 Fabricate windows using two separate frames joined by means of thermal break. Provide complete metal to metal separation between 2 main frame members. Do not use connecting screws, clips or other devices which would tend to bridge thermal barrier members or restrict in any manner expansion and contraction of individual separate frame members. Factory seal all framing joints, as well as between thermal barrier and frame, around entire perimeter to ensure weather-tight assembly.

.20 Aluminum finish shall be free from blemishes or scratches and uniform in colour and sheen. For baked enamel finish, pre-treat aluminum and apply primer and finish coat in accordance with manufacturer's instructions.

.21 Fabricate sash for inside glazing secured with snap-in aluminum glazing beads.

.22 At each vent, install the specified hardware.

.23 Vent corner joint shall be mitred at 45 degrees, swaged with 3 heavy duty reinforcing angles per corner. Screwed corners on vents will not be permitted.

3.2 ALUMINUM SILLS

.1 Extruded aluminum to size and shape as detailed, with drip deflectors at edges and upturned dams at ends and sloped to drain complete with expansion cover plates and necessary anchors.

.2 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece lengths at each location.

.3 Cut sills to fit window opening.

.4 Secure sills in place with anchoring devices located at ends and evenly spaced 600 mm oc in between.

.5 Fasten expansion joint cover plates and drip deflectors with self-tapping stainless steel screws.

.6 Maintain 6 to 9 mm space between butt ends of continuous sills. For sills over 1200 mm in length, maintain 3 to 6 mm space at each end.

.7 Install end dams at each sill end.

3.3 GLAZING

.1 Install glass and infill panels in accordance with Section 08 80 00 – Glazing.

3.7 WEATHER STRIPPING

.1 Weather-strip around perimeter to provide complete air-tight seal.

.2 Double weather-strip opening sash of window units at sash perimeter. Conceal weather-stripping to accumulation of foreign matter or matting due to cleaning, operations and handling which would reduce effectiveness or life of seal.

.3 Install all weather-stripping in specially extruded ports and secure to prevent shrinkage, movement or loss when removing sash for cleaning or operating.

3.8 WINDOW INSTALLATION

.1 Install in accordance with CAN/CSA-A440.

.2 Inspection: Commence installation only when variations or discrepancies on Site which do not meet requirements or will prevent satisfactory installation of this Work are corrected.

.3 Install windows in accordance with manufacturer's instructions and to reviewed shop drawings.

.4 Provide all required fastenings and anchors. Conceal all fastenings of window components from view.

.5 All fasteners through window frame to be set in a bead of sealant.

.6 Securely install frames plumb, true, square and straight in openings and free from distortion. Do not exceed 3 mm (1/8") in 3 m (10') variation from plumb and level.

.7 At window air conditioning units, scribe insulated panels to tightly fit units and seal perimeter of openings to make installation weather-tight.

.8 Clean and restore primer and bituminous paint to surfaces distributed by field wielding or other operations.

.9 Entire window installation shall be water, air and weather-tight.

.10 Perimeter Foam-in-Place: Foam-in-place all voids between perimeter aluminum frames and window opening.

3.9 PERIMETER SEALANT

.1 Refer to Section 07 92 00.

3.10 INSTALLATION OF PATCHING MORTAR

.1 Prepare surface by removing all loose material. Grind brick face flush with concrete block masonry.

.2 Dampen surface with clean water. Substrate should be saturated surface dry, with no standing water during installation.

.3 Mix patching mortar in accordance with the manufacturer's written recommendations. Take necessary precautions for cold weather work.

.4 At the time of application, ensure that the substrate surface is damp.

.5 Apply the parging mix with a metal trowel in order to obtain a uniform thickness. Apply at a maximum thickness of 13 mm. Once parging mix has reached its initial set, smooth the surface using a wet sponge.

.6 Protect surface from sun, wind and rain. Keep the surface damp for the next 72 hours to allow for curing. Minimum cure temperature is 7°C and maximum cure temperature is 35 °C.

3.11 PROTECTION

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

.2 Repair damage to adjacent materials caused by window installation.

3.12 ADJUSTMENT AND CLEANING

.1 Inspect all window units for damage and correct damage found.

.2 Adjust all operating devices and leave in perfect working order

.3 Remove protecting coatings, stains and foreign matter from exposed, exterior and interior surfaces of work.

.4 Clean windows using soap and water or water and approved solvents not injurious to aluminum, glass, glazing and sealant compounds. Do not use abrasives.

END OF SECTION 08 51 13

DIVISION 08 – OPENINGS

Section 08 80 00 – Glass and Glazing

1. GENERAL

1.1 SUMMARY

.1 Section Includes:

.1 Transparent and translucent glass glazing for general and special purpose applications including; coated, float, heat-strengthened, insulating, low emissivity and tempered glass.

.2 Work Results: Manufacture, handle, deliver and install glazing systems as shown on the drawings or as otherwise specified and in accordance with the requirements of the contract documents.

1.2 REFERENCES

.1 ASTM C 1036 Standard Specification for Flat Glass

.2 ASTM C 1048 Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass

.3 ASTM C 1172 Standard Specification for Laminated Architectural Flat Glass

.4 ASTM C 1376 Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass

.5 ASTM E 2190 Standard Specification for Insulating Glass Unit Performance and Evaluation

.6 ASTM E 546 Standard Test Method for Frost/Dew Point of Sealed Insulating Glass Units

.7 ASTM E 576 Standard Test Method for Frost/Dew Point of Sealed Insulating Glass Units in the Vertical Position

.8 ASTM E 1300 Standard Practice for Determining Load Resistance of Glass in Buildings

.9 ASTM C 1349 Standard Specification for Architectural Flat Glass Clad Polycarbonate

.10 ASTM F 3057 Standard Test Method for Electromagnetic Shielding Effectiveness of Glazings.

.11 ANSI Z97.1 Performance Specifications and Methods of Test for Safety Glazing Materials Used in Buildings

.12 BS EN 14179 Glass in building - Heat-soaked thermally-toughened soda lime silicate safety glass

.13 CPSC 16 CFR 1201 Safety Standard for Architectural Glazing

1.3 PRE-INSTALLATION MEETINGS

.1 Convene pre-installation meeting minimum one (1) week prior to beginning the work of this Section, with Consultant and DDSB Project Supervisor to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other construction subtrades.

.4 Review manufacturer's written installation instructions and warranty requirements.

.2 Ensure subcontractor representatives, site supervisor and project manager attend.

1.4 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for glass, sealants, and glazing accessories and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in the province of Ontario, Canada.

.3 Samples:

.1 Submit for review and acceptance of each unit.

.2 Submit 305mm (12”) square samples of each glass/glazing type. (Samples of clear monolithic glass products are not required).

.3 Submit duplicate 305 mm (12”) square samples of the following glazing units for compatibility testing with sealants and curtain wall framing system:

.1 Insulating Glazing Units (IGUs).

.2 Laminated Glass.

.3 Pre-finished Aluminum Insulating Panels.

.4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.1 For solar control low-e coated glass, provide documentation demonstrating that the fabricator of coated glass is certified by coating manufacturer.

.5 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.1 Glazing Contractor shall obtain compatibility and adhesion test reports from sealant manufacturer indicating that glazing materials were tested for compatibility and adhesion with glazing sealant as well as other glazing materials including insulating glazing units.

.2 Submit shop testing for glass:

.1 Manufacturer to submit certificate demonstrating that insulating glazing units have been sampled and confirming sufficient argon fill.

1.5 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: submit operation and maintenance data for glazing for incorporation into manual.

.2 Warranty Documentation: Submit Warranty Documents Specified.

1.6 QUALITY ASSURANCE

.1 Qualifications:

.1 Manufacturers: Fabrication processes, including low emissivity and reflective coatings, insulating, laminated, silk-screening and tempering shall be manufactured by a single manufacturer with a minimum of ten (10) years of fabrication experience and meet ANSI / ASQC 9002 1994.

.2 Mock-ups: Before glazing, build mockups for each glass product indicated in section 2.5 Product Schedule to verify selections and to demonstrate aesthetic effects and qualities of materials and execution.

.1 Construction: Build mockups with glass and glazing systems specified for the project, including typical lite size, framing systems and glazing methods.

.2 Scheduling: Notify Consultant seven days in advance of dates and times when mockups will be available for viewing.

.3 Quality Assurance: Maintain mockups during construction in an undisturbed condition as a standard for judging the completed work. Accepted mockups may become part of the completed work if undisturbed at the time of substantial completion.

.3 Site Glazing Testing:

.1 Site Glazing Testing is to be carried out on 10% of glazing on a random basis.

.2 Site Verify the following properties on site using a Glass Meter

.1 Glass thickness

.2 Dimension of air space

.3 Confirmation of installation and location of Low-E coating.

.3 Surface strain verification for tempered/heat strengthened glazing using a Grazing Angle Surface Polarimeter (GASP) in accordance with ASTM C1048.

.4 Publications: Comply with recommendations in the publications below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this section or in Article 1.2 References.

.1 GANA Glazing Manual

.2 GANA Engineering Standards Manual

.3 GANA Laminated Glazing Reference Manual.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Storage and Handling Requirements:

.1 Protect glass from edge damage during handling. For insulating units exposed to substantial altitude changes, comply with insulating glass manufacturers written recommendations for venting and sealing to avoid hermetic seal ruptures.

.2 Storage and Protection: Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun or other causes.

1.8 WARRANTY

.1 Provide a written 10-year warranty from date of manufacture for insulating glass. Warranty covers deterioration and hermetic seal failure due to normal conditions of use and not handling, installing, protecting and maintaining practices contrary to the glass manufacturer's published instructions.

1.9 AMBIENT CONDITIONS

.1 Ambient Requirements

.1 Install glazing when ambient temperature is [10] degrees C minimum. Maintain ventilated environment for 24 hours after application.

.2 Maintain minimum ambient temperature before, during and [24] hours after installation of glazing compounds.

2. PRODUCTS

2.1 DESCRIPTION

.1 Provide glazing systems capable of withstanding normal thermal movements, wind loads and impact loads, without failure, including loss due to defective manufacture, fabrication and installation; deterioration of glazing materials; and other defects in construction.

2.2 PERFORMANCE / DESIGN CRITERIA

.1 Glass Strength: Analysis shall comply with ASTM E 1300 Determining Load Resistance of Glass in Buildings. Provide glass products in the thickness and strengths (tempered) required to meet or exceed the following criteria based on project loads and in-service conditions.

.1 Minimum thickness of annealed or heat-treated glass products to be selected so the worst case probability of failure does not exceed the following:

.1 8 breaks per 1000 for glass installed vertically or not 15 degrees or more from the vertical plane and under wind action.

.2 1 break per 1000 for glass installed 15 degrees or more from the vertical plane and under action of wind and/or snow.

.2 Deflection must be limited to prevent disengagement from the frame and be less than or equal to 1" (25mm).

.2 Thermal and Optical Performance: Provide glass products with performance properties specified in 2.5 Product Schedule. Performance properties to be manufacturer's published data as determined according to the following procedures:

.1 Center of glass U-Value: NFRC 100 methodology using LBNL WINDOW 5.2/6.3 computer program.

.2 Center of glass solar heat gain coefficient: NFRC 200 methodology using LBNL-35298 WINDOW 5.2/6.3 computer program.

.3 Solar optical properties: NFRC 300

2.3 FABRICATION

.1 Flat Glass: 1. Shall comply with ASTM C1036 Standard Specification for Flat Glass, Type 1, Class 1 clear and Quality q3

.2 ASTM C 1048 Heat Treated Flat Glass, Kind HS or, Condition A uncoated, B spandrel glass, one surface coated

.1 Heat Treated Flat Glass to be by horizontal process with inherent rollerwave distortion parallel to the bottom edge of the glass as installed.

.2 Maximum peak to valley rollerwave 0.003" (0.08mm) in the central area and 0.008" (0.20mm) within 10.5" (267mm) of the leading and trailing edge

.3 For clear or low-iron glass 1/4" to 3/8" thick without ceramic frit or ink, maximum + or – 100 mD (millidiopter) over 95% of the glass surface.

.4 Maximum bow and warp 1/32" per lineal foot (0.79mm).

.5 All tempered architectural safety glass shall conform with ANSI Z97.1 and CPSC 16 CFR 1201.

.6 For all fully tempered glass, provide heat soak testing conforming to EN14179 which includes a 2 hour dwell at 290°C±10°C.

.3 Insulating Glass:

.1 Shall comply with ASTM E 2190 Standard Specification for Insulating Glass Unit Performance and Evaluation.

.1 Units shall be certified for compliance by the IGCC in accordance with the above ASTM test method.

.2 The unit overall thickness tolerance shall be -1/16" (1.59mm) / +1/32" (0.79mm) for a 1" two ply insulating unit. Unit constructed with patterned or laminated glass shall be +/- 1/16" (1.59mm).

.3 Shall comply with ASTM E 546 Standard Test Method for Frost Point of Sealed Insulating Glass Units

.4 Shall comply with ASTM E 576 Standard Test Method for Frost Point of Sealed Insulating Glass Units in the Vertical Position

.5 Sealed Insulating Glass Units to be double sealed with a primary seal of polyisobutylene and a secondary seal of silicone.

.1 The minimum thickness of the secondary seal shall be 1/16” (1.59mm).

.2 The target width of the primary seal shall be 5/32” (3.97mm).

.3 There shall be no voids or skips in the primary seal.

.4 Up to a maximum of 3/32" of the spacer may be visible above the primary polyisobutylene sealant.

.5 Gaps or skips between primary and secondary sealant are permitted to a maximum width of 1/16” (1.59mm) by maximum length of 2” (51mm) with gaps separated by at least 18” (457mm). Continuous contact between the primary seal and the secondary seal is desired.

.6 To provide a hermetically sealed and dehydrated space, lites shall be separated by a spacer with bent corners and straight butyl injected zinc plated steel straight key joints.

2.4 ACCESSORIES

.1 Glazing Materials: Select glazing sealants, tapes, gaskets and additional glazing materials of proven compatibility with other materials they will contact, including glass products, seals of insulating glass units and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.

.1 Setting blocks to be 100% silicone, 80-90 Shore A durometer hardness to ASTM D2240, length of 25mm for each square metre of glazing and minimum 100mm x width of glazing rabbet space minus 1.5mm x height.

.2 Spacer shims: silicone 50-60 Shore A durometer hardness to ASTM D2240, 75mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.

.3 Glazing tape:

.1 Performed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper.

.2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2%, designed for compression of 25%, to effect an air and vapour seal.

.4 Glazing splines: resilient silicone, extruded shape to suit glazing channel retaining slot.

2.5 PRODUCT SCHEDULE

.1 Insulating Glass Units:

.1 Glazing Type G1: Insulated Glazing Unit (Standard Window)

.2 Min. 1" (25mm) Solarban 70XL Solar Control Glazing as manufactured by Vitro Architectural Glass Products or equal.

.1 Exterior Glass Ply: ¼" (6mm) clear, tempered glass.

.2 Coating: Solarban 70XL on #2 surface.

.3 Spacer: ½" (13.2mm) complete with stainless steel black painted spacer.

.4 Silicone: Black

.5 Interior Glass Ply: ¼" (6mm) clear, tempered glass.

.6 Inert gas fill: argon.

.3 Performance Requirements:

.1 Visible Light Transmittance: 62%

.2 Exterior Reflectance: 11%

.3 Solar Heat Gain Coefficient: 0.30

.4 U-Value (COG): winter 1.42 W/m2K maximum

.5 U-Value (COG): winter 1.70 W/m2K maximum

.1 Acceptable Manufacturers:

.1 AFG Glass Inc

.2 Trulite Glass & Aluminum Solutions

.3 PPG Industries

.4 Viracon

.2 Glazing Type G5: Pre-finished Aluminum Insulating Panels:

.1 25mm (1") Pre-finished Aluminum Insulating Panel to be composed of:

.1 Smooth Aluminum Panel, minimum thickness 0.51mm

.2 3mm impact resistant board (Polypropylene or exterior grade hardboard).

.3 Rigid Insulation: 18mm extruded polystyrene.

.4 3mm impact resistant board (Polypropylene or exterior grade hardboard).

.5 Smooth Aluminum Panel, minimum thickness 0.51mm

.2 Panels to be laminated together under heat and pressure. Edges of panel are to be sealed.

.3 Colour: as selected by Consultant/DDSB.

.4 Aluminum panel acceptable products:

.1 1000 WR+ Water Resistant Infill Panel by Citadel Architectural Products.

.2 Omega Foam-Ply Panel by Omega Panels Products Laminators Inc.

.3 Mapes-R Infill Panel by Mapes Architectural Panels.

3. EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions:

.1 Verify prepared openings for glazing are correctly sized and within tolerance. Verify that the minimum required face and edge clearances are being followed.

.2 Verify that a functioning weep system is present.

.3 Do not proceed with glazing until unsatisfactory conditions have been corrected.

.4 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed by Consultant.

3.2 PREPARATION

.1 Surface Preparation: Immediately before glazing, clean glazing channels and other framing members receiving glass, wipe contact surfaces with Isopropyl Alcohol 99% concrentration.. Remove coatings not firmly bonded to substrates

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealaer.

.3 Primer surfaces scheduled to receive sealant.

3.3 INSTALLATION

.1 Install products using the recommendations of manufacturers of glass, sealants, gaskets and other glazing materials including those in the GANA Glazing Manual except where more stringent requirements are indicated.

.2 Prevent glass from contact with contaminating substances that result from construction operations such as weld splatter, fire-safing or plastering.

3.4 CLEANING

.1 Clean excess sealant or compound from glass and framing members immediately after application using solvents or cleaners recommended by manufacturers.

.2 Final cleaning upon completion remove surplus materials, rubbish, tools and equipment.

3.5 ACCEPTANCE

.1 Installed materials which are damaged, or which in the opinion of the Owner and the Consultant do not conform to the specification requirements, shall be removed and replaced with acceptable material at no additional cost to the Owner.

END OF SECTION 08 80 00

DIVISION 9 – FINSHES

Section 09 20 00 – Drywall Repairs

1. GENERAL

1.1 SCOPE OF WORK

.1 Supply and install new moisture barrier and vapour barrier for all exterior walls opened.

.2 Supply and install new fiberglass batt insulation for all exterior walls opened.

.3 Supply and install new gypsum board to all walls where noted. Prepare all gypsum board joints for painting.

.4 Remove existing sill plate in sections (including all shoring and support) and supply and install new wood sill plate to all areas as directed by Consultant.

.5 Remove existing wood studs in sections (including all shoring and support) and supply and install new wood studs as directed by Consultant.

.6 Repair damage to the ceilings as required.

.7 Install access doors on walls where shown on drawings to allow for review of the floor/ wall interface within the wall cavity.

.8 Sand prepare and paint all affected wall and ceiling finishes.

1.2 DESIGN CRITERIA

.1 Conform to CSA A-82.27-M1977 and CSA A 82.31-M80 including appendixes.

1.3 EXAMINATION OF SITE

.1 Contractor shall examine the site to verify quantities, dimensions and physical conditions of existing materials and conditions affecting the work.

.2 Contractor shall report any condition which may impair the proper installation of the wall covering to the Consultant prior to commencement of work.

1.4 DELIVERY AND STORAGE

.1 Store materials in the building areas approved by the Owner.

.2 Handle and store materials carefully to prevent damage.

.3 Do not install damaged or deteriorated material but remove from site.

.4 Ensure adequate protection of adjacent existing materials and surfaces from damage by this trade.

.5 Protect existing floor finishes form dirt, stains, moisture and other damage.

.6 Materials as delivered shall bear manufacturer's name, brand name of material and, where applicable, CSA classification.

1.5 WORKMANSHIP

.1 Contractor in this section shall have a minimum 5 years proven experience. Proof of experience shall be submitted at the request of the Consultant.

.2 Maintain area of work in clean orderly manner, removing scraps, debris and other superfluous matter.

1.6 WARRANTY

.1 Contractor hereby warrants in accordance with the General Conditions, but for a period of not less than 2 years, that all work and materials shall remain free of defects and that any defects attributable to any fault, inadequate materials or poor workmanship shall be promptly corrected without cost to the Owner.

1.7 SAFETY

.1 Comply with all safety regulations and requirements of authorities having jurisdiction.

2. PRODUCTS

2.1 GYPSUM WALL BOARD AND ACCESSORIES

.1 Gypsum Wallboard

.1 CSA A-82.27. Wallboard to be a minimum thickness of 12.7 mm (1/2").

.2 Fire Resistant Gypsum Wallboard

.1 16mm 5/8” Type ‘X’ gypsum board.

.3 Corner Bead and Casting Bead

.4 28 ga. galvanized steel with perforated flanges; one piece per location.

.5 Screws

.1 CGC Brand Screws of type recommended by gypsum and steel stud manufacturer.

.6 Joint Treatment Material

.1 Use material recommended by board manufacturer for the proposed use.

.2 Reinforcing Tape Perf-A-Tape by CGC or equal.

2.2 CEMENT WALL BOARD AND ACCESSORIES

.1 Cement Wallboard

.1 (12.7mm) 1/2" 'Durock', Canadian Gypsum Co. Ltd. or approved equal.

.2 Fasteners

.1 All fasteners to be non-corrosive and non-oxidizing and as per manufacturer's printed recommendations. Durock/Duracrete Screws for metal studs or approved equal.

.3 Reinforcing Tape

.1 (50.8mm) 2” wide polymer coated open glass-fiber mesh tape. Durock interior tape or approved equal.

.4 Corner Bead and Casting Bead

.1 Duracrete Trim and Bead or equal

.5 Joint Treatment Material

.1 Use material recommended by board manufacturer for the proposed use.

2.3 MOISTURE BARRIER

.1 No. 15 Felt Paper

2.4 BATT INSULATION

.1 R12 Fibreglass batt insulation.

2.5 VAPOUR BARRIER

.1 6 mil polyethylene sheet.

2.6 WOOD STUDS AND PLATES

.1 No. 1 and 2 SPF grade dimensioned lumber to match existing. All lumber to be Kiln Dried and moisture content to be not greater than 12% at time of placement.

2.7 ACCESS DOORS

.1 12”x 12” metal door and frame with following minimum requirements

.1 Compatible with gypsum board and steel framing

.2 fully concealed pivot, piano type hinges.

.3 Door capable of opening 110 degrees

.4 Minimum 16 ga. Steel with 1” perforated flange for mounting purposes

.5 Surface painted to match wall colour(s).

.6 Latch openable with a screwdriver.

3. EXECUTION

3.1 PREPARATION

.1 Do not perform any work under this section until all cleaning and mould remediation work has been completed.

.2 Ensure caulking has been completed along the concrete foundation wall/ slab on grade interface as per Section 07900.

.3 Remove existing wood studs and plate and install new where directed by the Consultant. Additional cost based on unit price on submitted bid form.

3.2 INSTALLATION OF MOISTURE BARRIER

.1 Install and secure moisture barrier behind metal framing against exterior concrete foundation walls where drywall has been removed. Lap all edges a minimum 150mm, lower sheet over upper sheet. Terminate moisture barrier 300mm from base of wall.

3.3 INSTALLATION OF BATT INSULATION

.1 Fit batts snuggly between metal studs. Batt insulation to be installed continuously on all exterior walls from the ceiling to 600mm above the floor level following manufacturer's written instructions. Base of wall is to be left void of insulation.

3.4 INSTALLATION OF VAPOUR BARRIER

.1 Install and secure vapour barrier over metal framing. Lap all edges a minimum of 150mm. Below insulation loop vapour barrier between studs and secure to concrete foundation wall. Two fasteners to be used per stud opening.

3.5 INSTALLATION OF WALL BOARD

.1 Apply wall board parallel to framing members. Position all ends on studs. Use maximum practical lengths to minimize end joints. Fit ends at edges closely, but not forced together.

.2 Screw spacing for wall board to be as per manufacturer's recommendations.

3.6 APPLICATION OF ACCESSORIES

.1 Erect accessories straight, plum or level, rigid and at proper plane. Use full length pieces where practical. Joints shall be made tight, accurately aligned and rigidly secured.

.2 Reinforce all vertical and horizontal exterior corners with cornerbead fastened with screws at 200mm o.c. on both flanges along entire length of bead.

.3 Where assembly terminates against masonry or other dissimilar material, apply edge trim over panel edge and fasten with screws at 200mm o.c.

3.7 TAPING AND FILLING

.1 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturers' directions and feathered out into panel faces.

.2 Finish cornerbead and edge trim as required with two coats of joint compound and one coat taping compound, feathered out onto panel faces.

.3 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after painting is completed.

.4 Sand dried taping compound lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

.5 Completed installation to be smooth, level or plumb free from waves and other defects and ready for painting.

.6 Painting shall be done in accordance with Section 09900.

.7 Touch up scratches, abrasions, voids and other defects in painted surfaces.

3.8 INSTALLATION OF ACCESS DOORS

.1 Provide additional metal framing as required to support doors.

.2 Install doors at 300mm above floor to allow for observation/ review of the floor/ wall interface within wall cavity. Install as per manufacturer's recommendations.

END OF SECTION 09 20 00

DIVISION 9 – FINSHES

1. GENERAL

1.1 SECTION INCLUDES

.1 All surfaces as identified on the drawings to be painted or varnished, including but not limited to:

.1 Exposed walls/columns and radiator covers.

.2 Millwork/interior woodwork.

.3 Mechanical Equipment and ducts, including air grilles/vents not in 'as new' condition.

.4 Plumbing runs.

.5 All other items previously painted and/or varnished.

.2 All existing painted or varnished surfaces that are altered during the course of the work are to be painted or varnished.

.3 All surfaces damaged as a result of the work are to be painted or varnished.

.4 Provide surface preparation to receive painting and finishing specified under this section of the work in accordance with the Canadian Painting Contractors' Architectural (CPCA) Painting Specifications Manual and as specified herein. The most restrictive measure shall apply.

.5 Examine the Specifications and Drawings for the work of other Sections regarding the provisions for prime and finish coats. Paint or finish all materials installed throughout the project which are required to be painted and which are left unfinished or unpainted by other Sections.

.6 The only exception to the requirements of the preceding paragraph is where the Drawings, Specifications, or Schedules state positively and explicitly that a surface is not to be finished.

1.2 RELATED SECTIONS

.1 Section 07 92 00 – Sealant

1.3 SCOPE OF WORK

.1 Work of this section includes all necessary equipment and accessories to perform the repainting work.

.2 Where conflict exists in the scope of work, requirements, standards, or codes, the most stringent criteria shall apply.

1.4 REFERENCES

.1	ASTM D523	Test Method for Specular Gloss
.2	CAN/CGSB-85.100	Painting
.3	ECP	Environmental Choice Program

.4	CAN/CGSB 1.121	Vinyl Pre-treatment Coating for metals (vinyl Wash Primer)
.5	CGSB 85-GP-33M	Painting Interior Plaster and Wallboard.
.6	ECP-07	Water-borne Surface Coatings
.7	OPCA	Ontario Painting Contractors Association
.8	ULC	Underwriters' Laboratories of Canada

1.5 SUBMITTALS

.1 Two weeks after award of Contract, submit to the Consultant a complete list of paint and finish materials to be used, showing the name of the manufacturer, the catalogue number, grade and quality of the materials proposed for use.

.2 Two (2) weeks prior to the commencement of work, submit two (2) samples of each proposed paint demonstrating both finish and colour on a substrate matching the substrates encountered on site. Samples to be 4x12 inches in size. Resubmit samples until colours have been approved by the Consultant.

1.6 QUALIFICATIONS

.1 The installer shall be a company specializing in painting work with a minimum of ten (10) years proven experience for projects of similar size and complexity.

.2 Use single painting Contractor for all work.

1.7 DELIVERY, STORAGE AND PROTECTION

.1 Store materials in a cool dry place so as not to be in contact with earth and to be protected from elements.

.2 Keep the materials dry and protected from the weather, freezing and contamination.

.3 Ensure that the labels and seals on all materials are intact upon delivery.

.4 Remove rejected or contaminated materials from the site.

1.8 WARRANTY

.1 The Contractor shall submit a warranty of the work of this section covering a period of not less than two (2) years from the date of Substantial Performance of the Contract. Substantial completion shall be determined by the Consultant and the Owner.

.2 Defective work shall include, but is not limited to, cracking, peeling, flaking, chalking of the paint.

1.9 ENVIRONMENTAL REQUIREMENTS

.1 All work shall be performed in strict accordance with manufacturer’s written requirements for all products specified in the specification.

.2 Should a conflict arise between the requirements of this section and the manufacturer’s requirements, the more stringent requirements shall govern.

.3 Atmosphere at the area of work shall be dust free.

.4 Temperatures, humidity and moisture content of surfaces shall conform to the following:

.1 Temperatures: No painting shall be performed when temperatures on the surface, or the air in the vicinity of painting work are below 5°C. The minimum temperatures allowed for latex paints shall be 7°C. for interior work and 10°C for exterior work, unless specifically approved by the Consultant.

.2 Relative humidity shall not be higher than 85%.

.5 Painting work shall not proceed unless a minimum of 15 candle power/sq ft lighting is provided on the surface to be painted.

.6 All areas where painting work is proceeding shall have adequate continuous ventilation and sufficient heating to maintain temperatures above 7°C. for 24 hours before and after paint application.

.7 Take all necessary precautions to prevent fire hazard and spontaneous combustion.

.8 Where toxic materials, and both toxic and explosive solvents are used, take appropriate precautions

2. PRODUCTS

2.1 MATERIALS

.1 Paint, varnish, stain, enamel, lacquer, fillers and other finishing materials shall comply with or exceed CAN2-85.100 for Premium Grade Work, highest grade, top line quality products of the specified manufacturers, and be of a type and brand herein specified and listed under "Paint Product Recommendations" as covered in the CPCA Painting Manual, for the specific purposes.

.2 Paint materials such as linseed oil, shellac, turpentine, etc., and any of the above materials not specifically mentioned herein but required for first class work shall be the highest quality of an approved manufacturer. All coating materials shall be compatible.

.3 The approval of the manufacturer of the painting and finishing materials will be based on his agreement to provide the supervision service herein before specified.

.4 The following manufacturers are acceptable:

.1 Benjamin Moore Paints

.2 ICI Paints (Canada) Inc. (The Glidden Company/CIL)

.3 Pratt and Lambert Inc

.4 PPG Canada Inc.

.5 Sherwin-Williams Company of Canada Limited

.6 Sico Inc.

.7 Para Paints

.5 The Consultant reserves the right to refuse any paint or finishing material if in their opinion it is not suitable or adequate for the use which it is proposed.

.6 Interior Galvanized Metal Primer: Glid-Guard All-Purpose Metal Primer 5229 by Glidden Co. Canada Ltd., Alkyd/Calcium plumbate, #52 Galvaprime by Para Paints Limited,

Galvanized Metal Primer #150-00 by Benjamin Moore and Company Ltd., or other approved manufacture.

.7 Vinyl Wash Primer: Complying with CAN/CGSB 1.121.

.8 Millwork Coat: Low VOCs commercial level urethane.

2.2 MIXING

.1 Paints shall be ready-mixed unless otherwise specified, except that any coating in paste or powder form, or to be field-catalyzed shall be field-mixed in accordance with directions of its manufacturer. Pigments shall be fully ground and shall maintain a soft paste consistency in the vehicle during storage that can and shall be dispersed readily and uniformly by paddle to a complete homogeneous mixture.

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

2.3 COLOURS

.1 Colour: Standard colour as directed by the Owner.

.2 For bidding purposes, colour scheme shall include 4 colours.

.3 All bidders shall include in their bid price cutting-in for three (3) colours on walls, and alternate colour for ceiling and with doors and frames of a different colour.

3. EXECUTION

3.1 PROTECTION

.1 Adequately protect other surfaces from paint and damage and make good any damage caused by failure to provide suitable protection.

.2 Furnish sufficient drop cloths, shields and protective equipment to prevent spray or dropping from fouling surfaces not being painted and in particular, surfaces within storage and preparation area.

.3 Cotton waste, cloths and material which may constitute a fire hazard shall be placed in closed metal containers and removed daily from the site.

.4 Remove all electrical plates, surface hardware, fittings and fastenings, prior to painting operations. Carefully store, clean and replace these items on completion of work in each area. Do not use solvent that will remove the permanent lacquer to clean hardware.

3.2 INSPECTION

.1 Examine the work upon which the work of this Section depends prior to commencement of work. If surfaces cannot be put in proper condition by customary cleaning, sanding and puttying, report any defects to the Consultant.

.2 Failure to report defects will constitute acceptance of surfaces. Refinish the faulty work at no expense to the Owner.

.3 Test all surfaces by an approved moisture-testing device for moisture content before commencing work. Do not apply paint to substrates when the moisture content exceeds 12%.

3.3 PREPARATION - GENERAL

.1 Remove all old overpaint as well as new.

.2 Remove all foreign matter such as oil, grease, was, rust, stains, scale, efflorescence, mildew, mould, algae, and fungus from surfaces to be repainted and/or re-varnished.

.3 Remove all non-adhering and peeling paint and varnish to stable sub-surface and/or bare substrate.

.4 Remove thick and sharp edges of paint and varnish build ups, spiky and rough areas by sanding prior to painting. Provide a smooth and properly prepared substrate acceptable for painting. Dust off with a clean damp cloth to remove all residue prior to painting and allow to dry.

.5 Feather down surfaces visible to view prior to painting.

.6 Dull hard glossy surfaces by light sanding.

.7 Follow removal of all non-adhering and peeling paint, including surface imperfections, all surfaces shall be thoroughly washed with T.S.P. and rinsed with fresh clean water. Remove all surface residue prior to painting. Allow to dry.

.8 All cracks, holes, varying levels of paint and varnish, and other imperfections shall be filled. Use spackling compound and/or appropriate material and sand flush with adjacent surfaces, to provide a smooth and properly prepared substrate. Cracks, holes etc. up to 1/4" (6 mm.) deep and 1.0" (25 mm.) wide, shall be the responsibility of the Contractor. Thoroughly Dust-Off prior to painting.

.9 All protruding metals such as nails, tacks, pins, wires, bars, ties, etc. shall be cut flush with substrate. Plugs shall be removed and/or cut to below finish surface then filled and repaired.

.10 Leave in place screw heads intended for wall hung items.

3.4 SURFACE PREPARATION

.1 Refer to Chapter 7 -Surface Preparation and; Section 7.2 - Previously Painted Substrates of the National Standard of Canada CAN2-85.100-M81, for full extent of surface preparations and procedures and as herein specified. In the event of conflict between the Contract Documents and referenced documents, the most stringent provision shall apply:

.1 Mildew Removal: Scrub with solution of T.S.P., and bleach, rinse with water and allow surface to dry completely.

.2 Aluminum (excluding anodized aluminum): Remove surface contamination by steam, high-pressure water or xylene solvent washing. Apply touch-up etching primer (or acid etching), and then paint immediately, as per Manufacturer's instructions.

.3 Asbestos Cement (board, siding, piping, shingles, etc.): Remove dirt, powdery residue and other foreign matter.

.4 Canvas & Cotton Insulated Coverings: Remove dust, dirt, grease and oil, test for water moisture content of 12% or less prior to painting.

.5 Gypsum Board: Remove non-adhering and peeling paint and contamination, prime all areas/surfaces where required, to show defects prior to painting.

.6 Plaster: Remove non-adhering and peeling paint, dirt, powdery residue and other foreign matter. Bare plaster substrate where exposed shall be sealed with masonry conditioner. Application of conditioner shall also be applied beyond the area of bare substrate and over existing painted surface to a minimum of twelve (12") inches, prior to painting.

.7 Wood for Paint Finish; Remove non-adhering and peeling paint and/or varnish and all foreign matter, prior to spot priming. Fill all nail holes, splits and scratches with suitable wood paste filler before proceeding, sand and thoroughly dust off. Sharp or chipped edges to be feathered down. All surfaces shall be clean and dry with a moisture content reading of not more than 12%. Surfaces that have been defaced with marker pens that cannot be removed shall be additionally spot-primed to prevent residual bleeding prior to painting

.8 Wood for Varnish Finish; Remove non-adhering and peeling varnish and all foreign matter, prior to spot priming. Fill all nail holes, splits and scratches with suitable wood paste tinted filler before proceeding, sand and thoroughly dust off and wipe with rags dampened with mineral spirits. Lightly sand between coats. Sharp or chipped edges to be feathered down. Surfaces that have been defaced with marker pens that cannot be removed shall be brought to the attention of the Consultant. All surfaces shall be clean and dry with a moisture content reading of not more than 12% prior to painting

.9 Ferrous Metal; Remove rust, grease and scale, and wash with solvent. All ferrous surfaces to be primed before painting. Apply rust inhibitor/primer where necessary prior to painting

.10 Zinc Coated Metal; Remove surface contaminants and wash with solvent. Prepare surface to manufacturers instructions for priming prior to painting.

.11 Masonry and Concrete (brick, concrete, concrete block, stucco, cement render, etc.); Remove dirt, loose mortar, scale, powder and other foreign matter prior to spot priming. Oil and grease to be removed by solution containing T.S.P., then rinse and let dry. Fill minor cracks, holes and fissures with cement grout and smooth to a flush surface. Include bonding agent in cement grout mix. Surfaces that have been defaced with marker pens that cannot be removed shall be additionally spot-primed to prevent residual bleeding prior to painting

.12 Alkaline Surfaces: Wash and neutralize using proper type of solution compatible with paint to be used.

3.5 APPLICATION OF COATINGS

.1 All paint and varnish finish coats shall be applied to a film thickness of four (4) mils wet per coat and two (2) mils dry per coat

.2 All primer coats shall be applied to a film thickness of to achieve a dry mil thickness of one and a half (1 1/2) per coat

.3 Applied and cured coatings shall be uniform in thickness, sheen, colour and texture, and be free of defects detrimental to appearance and performance. Such defects include brush marks, streaks, runs, laps, heavy stippling, pile up of paints and skipped or missed areas. Edges of paint adjoining other materials shall be clean and sharp with no overlapping.

.4 Apply paint and finish materials with suitable equipment.

.5 Apply paint by brush or roller, except on wood or metal surfaces apply paint by brush only

.6 Use rollers which will produce the least possible stipple effect; maximum ten (10) pile for smooth surfaces. Heavier pile rollers may be permitted for use on rough surfaces, subject to the approval of the Consultant

.7 Tint filler to match wood when clear finishes are required. Work filler into the grain and wipe before setting

.8 Use same brand of paint for primer, intermediate and finish coats.

.9 Each coat of finish shall be dry before succeeding coats are applied with a minimum of 24 hours between coats.

3.6 APPLICATION – FINISH COATS

.1 Sand thick sharp edges, spiky and rough areas of paint when dry and touch-up as necessary.

.2 Finish tops, bottoms, edges and rear of doors in the same manner as the front of the door.

.3 When the primer-sealer coat is dry, touch up all visible suction spots before the next coat is applied and do not proceed with the work until all suction spots are sealed.

.4 Finish the work uniformly as to sheen, gloss, colour and texture.

.5 Paint surfaces and items visible through convector covers, grilles, heating cabinets, louvers and soffits with two coats black matte paint.

.6 Do not paint over UL labels on doors and frames or over identification labels on mechanical and electrical equipment.

.7 The following generally, will be painted in colour, texture and sheen to match adjacent surfaces:

.1 Columns

.2 Access Panels

.3 Registers

.4 Radiators and covers

.5 Prime coated butts

.6 Prime painted door closers

.7 Exposed Piping

.8 Paint reveals the same colour as the surface in which it occurs, unless otherwise indicated.

.9 Gloss terms shall have the following values when tested in accordance with ASTM D523 "Test for Specular Gloss":

Gloss Term	Gloss Value	Pittsburgh
Flat (F)	5 to 20	Less than 15
Eggshell (E)	20 to 40	5 to 20
Lo-Lustre (LL)		15 to 25
Satin (S)		15 to 35
Semi-Gloss (SG)	40 to 60	30 to 65
Gloss/medium (Gm)	60 to 80	Over 65
Gloss/high (Gh)	80 to 90	

.10 Finish walls in semi gloss, ceilings in flat and doors and frames in gloss (high), unless noted otherwise.

.11 Spray paint only with the approval of the Consultant, except exposed u/s of roofs and roof support assembly shall be finished using 'Dry Fog' method of application.

3.7 CLEANING

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

3.8 INTERIOR FINISHES

.1 Unless otherwise identified elsewhere, finish the various interior surfaces as follows, in addition to previously specified treatments, coatings or primers:

Painted Concrete Block/Steel Columns:	Masonry block filler c/w spot priming 1 coat primer 2 coats alkyd enamel (SG)
Painted Mist. Steel & Steel Doors/Frames:	1 coat primer 2 coats alkyd enamel (Gh)
Painted Misc. Wood:	1 coat primer 2 coats alkyd enamel (Gh)

Misc. Structural Steel (Girders, O.W.S.J., Beams, Bracing, Steel Roof Deck, etc.):	2 coats 'Dry Fog' Paint (SG)
Painted Mechanical Equipment:	2 coats alkyd enamel (SG)
Painted Pipes Insulation & Ducts:	2 coats alkyd enamel (SG)
Varnished Wood to Alkyd Paint Finish:	Wood filler 1 coat Benjamin Moore's 'Fresh Start', or equal 2 coats alkyd enamel (Gh)
Clear Finished Wood:	Tinted wood filler 1 coat sanding sealer/shellac 2 coats stained alkyd varnish (Gh)
Plaster, Gypsum Board and Misc. Board:	Repair with Plaster and/or Spackling Compound 1 coat Latex Primer Sealer 2 coats Latex Finish Coat (S or to match existing)

END OF SECTION 09 91 23

DIVISION 12 – FURNISHINGS

Section 12 24 00 – WINDOW COVERINGS

1.0 GENERAL

1.1 Section Includes

.1 Manual, chain operated, full height horizontal window roller shades.

1.2 Reference Standards

.1 NFPA 701 – Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.

.2 CAN/ULC S109-M87: Standard for Flame Tests of Flame-Resistant Fabrics and Films.

1.3 Submittals

.1 Product Data: Provide manufacturer's data sheets describing components, accessories, dimensions, tolerances for window openings required, colours and textures.

.2 Submit test results from recognized independent testing agency, acceptable to jurisdictional authorities showing that fire hazard classification of shade fabric meets regulatory requirements.

.3 Shop Drawings: Indicate dimensions in relation to window jambs, operator details, top rail, anchorage details, joint locations, method of joining, hardware and accessory details, conditions between adjacent blinds, corner conditions, required clearances, and electrical operating mechanisms and connections.

.4 Samples

.1 Submit two (2) sets of 300 mm long samples of each visible-to-view component, indicating colour, surface texture and sheen.

.2 Submit duplicate, minimum 200 x 200 mm samples of each shade fabric required.

.3 Submit duplicate, minimum 50 x 100 mm samples of each metal finish / colour required.

1.4 Close-out submittals

.1 Provide operating and maintenance instructions for inclusion into maintenance manual. Include instructions on care, maintenance and cleaning of shade fabrics.

1.5 Quality Assurance

.1 Provide shade systems specified by one manufacturer who takes full responsibility for design, engineering and installation.

.2 Pass NFPA 70 and CAN/ULC S109-M87.

1.6 Delivery, Storage and Handling

.1 All materials shall be free of damage when delivered to the site. Protect all work with suitable heavy wrapping before delivery to the site. Maintain protection until final clean-up.

.2 Store parts in a designated area to permit natural ventilation over their finished surfaces.

.3 Protect the work of this Section from damage resulting from the work of other Sections.

1.7 Warranty

.1 Provide a minimum one (1) year warranty of the work of this Section and Ten (10) year manufacturer's warranty.

.2 Promptly correct, at no expense to the owner, any defects, or deficiencies which become apparent within the Warranty Period from date of Substantial Performance.

.3 Warranty shall provide for steadfastness of dye colours, fade-proof fabric, free from deterioration in any fashion due to exposure to sunlight, to be permanently flame-retardant, shrink, and complete replacement cost including removal of existing system material and installation of new materials.

2.0 PRODUCTS

2.1 Manufacturers

.1 Acceptable Manufacturers offering functionally and aesthetically equivalent products:

.1 Solarfective Line: Chain-operated, manual Teleshades (with Fascia).

.2 SunProject of Canada Inc.: Moduline GC Shade System (with Fascia).

.2 Substitutions not permitted.

2.2 Components

.1 Horizontal Shade Band

.1 Assembly: Fabric, external bottom bar, attachment of shade bands to roller tube.

.2 Shade Fabric:

.1 Fabric: Pass NFPA 701 and CAN/ULC-S109-M87.

.2 Shade cloths woven of .018 vinyl coated polyester yarn consisting of single thickness non-raveling 0.03inch thick vinyl fabric, comprising 20-25% polyester and 75-80% reinforced vinyl (PVC), the fabric to be dimensionally stable.

.1 Blackout:

.1 For use in rooms for A/V Presentations, etc…

.2 SolarStop Room Darkening Shadecloth by Solarfective.

.3 Series B.O. 100 Blackout Fabric by SunProject of Canada Inc.

.2 Sun control fabric with 3% Openness Factor:

.1 For use on windows facing West and South exposure.

.2 Shadecloth by Solarfective; 4400 Series (previously 1A03: 3% SolarBlock 300), colour: Q15 Greystone or P07 Alabaster or P10 Granite; colour selected by Consultant.

.3 Shadecloth 4400 Series by SunProject Shadecloth, colour: Q15 Greystone or P07 Alabaster or P10 Granite, colour selected by Consultant.

.3 Sun control fabric with 5% Openness Factor:

.1 For use on windows facing North and East exposure.

.2 Shadecloth by Solarfective; 4000 Series (previously 1A05: 5% SolarShield 500), colour: Q15 Greystone or P07 Alabaster or P10 Granite; colour selected by Consultant.

.3 Shadecloth 4000 Series by SunProject Shadecloth, colour: Q15 Greystone or P07 Alabaster or P10 Granite, colour selected by Consultant.

.3 Shade Orientation: Shade cloth to roll at window side of roller.

.2 Shade Roller Tube: Extruded aluminum, 32 mm or 50 mm diameter, with reinforced internal ribs to provide maximum span without tube deflection. Tubes to suit shade size.

.3 Exterior Oval Hem Bar: 19 mm tubular extruded aluminum, with recess to secure fabric, without visible seams. Secure end plugs securely on ends showing no exposed aluminum. Design for shade to be pulled from hem bar.

.4 Internal Tension Idler: Adjustable, to automatically control the amount of torque generated for constant smooth operation of the shade system, with automatic release during down-travel, and automatic engage during up-travel.

.5 Chain Drive: Heavy duty, commercial grade sprocket, a planetary gear assembly for increased performance, speed ratio, smoothness, and balance to the chain and shade assembly. Provide infinite positioning of shade system.

.1 Operating Chain: No.10, heavy duty stainless steel bead chain, 40 kg load test.

.2 Chain Hold Down:

.1 To fully secure shade to chain holder.

.2 Supply chain retainer with bracket in every room to meet safety needs.

.3 Lifting mechanism to contain a memory lock to maintain pre-tensioning when the shade is removed from the cassette bracket, and not require re-tensioning when shade is re-inserted into the bracket. Roller to be reversible.

.6 Mounting Brackets: 0.60 mm galvanized steel, snap on brackets for mount at rough opening jambs.

.7 Closure Box: One-piece extruded aluminum box, closed on all four sides, top, back, sides, and bottom return.

.1 Closure Section: Square profile.

.2 Internal groove to accommodate a self cleaning brush.

.3 Gap brush on top back side of cassette to provide for a light seal.

.4 Wall Thickness: 1.52 mm.

.5 Closure End Caps: 2 mm. Delrin plastic with four countersunk flat headed screw holes.

.8 Noise-Reduction seals: insert for sound isolation and absorption of the mechanism.

2.3 Fabrication

.1 Provide manual shade chain drive window shade, of:

.1 Tension activated lifting mechanism with multi-layer concentric constant tension.

.2 Lifting mechanism with a memory tension lock.

.3 Shade to not require re-tensioning after removal for cleaning.

.4 Internally free-floating mechanism along grooved non-corrosive shaft, and reversible for future alterations and maintenance.

.2 Factory assemble in a one piece container, closed on all four sides, with top, back, sides and bottom return of plastic injected-molded end caps.

.3 Lifting mechanism to accommodate tension modules for maximum shade performance. Provide memory lock for tension modules to retain torque.

.4 Mounting detail: Face/wall mounted recessed above ceiling snap in mount.

3.0 EXECUTION

3.1 Examination

.1 Examine substrate and conditions for installation.

.2 Examine width of windows to match length of roller shade.

.3 Examine overall height of curtain wall to match fabric length of roller shade.

.4 Beginning of Installation means acceptance of substrate and project conditions.

3.2 Installation

.1 Install units and their accessories to manufacturer's written instructions.

.2 Securely screw end plugs to conceal exposed cut aluminum of exterior hem bar.

.3 Securely anchor units plumb and level, using hardware and accessories to provide smooth operation without binding, securely anchored to supporting work.

.4 Make all systems fully operational.

3.3 Installation Tolerances

.1 Maximum variation of gap at window opening perimeter: 6 mm per 2.4 m (plus or minus 3 mm) of shade height.

.2 Maximum offset from level: 3mm over 2.4m.

.3 Use manufacturer's edge clearance requirements for shades where the width-to-height ratio exceeds 1:3.

3.4 Adjusting

.1 Adjust units for smooth operation.

.2 Adjust shade and shade cloth to hang flat without waves, folds, or distortion.

.3 Replace any units or components which do not hang properly or operate smoothly.

.4 Check test operation of each unit and, if necessary make adjustments to ensure proper operation.

3.5 Cleaning

.1 Touch up damaged finishes and repair minor damage in a manner to eliminate evidence of repair. Remove and replace work that cannot be satisfactorily repaired.

.2 Clean exposed surfaces and edges/ends, including metal and shadecloth, using non-abrasive materials and methods recommended by manufacturer. Remove and replace work which cannot be satisfactorily cleaned.

3.6 Closeout Activities

.1 Demonstration: Demonstrate operation method and instruct Owner's personnel in the proper operation and maintenance of the window shade assembly.

3.7 Schedules

.1 Provide roller shades at:

.1 All windows within the scope of work of this project.

END OF SECTION 12 24 00

Parasol Environmental Inc.

125-1860 Appleby Line, Unit # 14,
Burlington, Ontario L7L 7H7

Limited Designated Substance Survey Report

Ajax High School

105 Bayly Street East, Ajax, Ontario

Prepared for

Durham District School Board
400 Taunton Road East, Whitby, Ontario

November 21, 2025
Parasol Project No: 13346

Executive Summary

Parasol Environmental Inc. (Parasol) was retained by the Durham District School Board to conduct a Limited Designated Substance Survey within Ajax High School located at 105 Bayly Street East, Ajax, Ontario. The purpose of the survey was to record the presence, location, condition and quantities of Designated Substances and Hazardous Materials within the surveyed area that may be disturbed during the planned window and exterior cladding replacement project. Additional information is provided to document corrective measures necessary to ensure that remedial action occurs applying the proper abatement procedures, if necessary.

The survey was completed by Brad Panzer of Parasol on November 13th and 14th, 2025.

The following table summarizes the Designated Substances and Hazardous Materials observed within the surveyed area.

Designated Substance or Hazardous Material	Findings	Recommendation
Asbestos	Confirmed and suspected asbestos-containing materials were identified as follows: Friable Asbestos • Textured Plaster Finishes • Mechanical Insulations (Parging Cement) • Brick Mortar (1966 Building Addition Survey Area) Non-Friable Asbestos • Caulking (CK-02)	All asbestos-containing materials were observed in GOOD condition. Remove using appropriate asbestos abatement procedures as per O. Reg. 278/05.
Benzene	No major sources were identified.	No recommendations are warranted as no benzene products were observed.
Lead	Low-level lead concentrations were found to be present in the following materials: • White Paint • Blue Paint • Masonry Block Mortar • Brick Mortar Lead-containing concentrations were found to be present in the following materials: • Off-white Paint Lead of varying concentrations is also suspected to be present in the following items: • Batteries in Emergency Lighting • Ceramic Floor Tile Glazing • Solder on pipe fittings • Masonry Mortar	Stabilize the following materials: • Remove flaking off-white paint where present using EACC Class 1 or 2A Guidelines.

Designated Substance or Hazardous Material	Findings	Recommendation
Mercury	Mercury vapour is presumed to be present within all fluorescent light tubes.	If removed, the fluorescent lights are to be kept sealed and intact, which will prevent direct skin contact and the inhalation of mercury vapour.
Silica	Crystalline silica is suspected to be present within: • Ceramic tiles and grout, • Masonry and mortar, • Concrete (poured or pre-cast)	The removal or disturbance of material suspected to contain crystalline silica are to follow procedures outlined in the MOL document *"Guideline - Silica on Construction Projects"*, dated September 2004.
Polychlorinated Biphenyls (PCBs)	Suspect PCB-containing products observed include: • T12 light fixtures	If disturbed, compare fluorescent light fixture's ballast to the Environment Canada Document, *"PCB Identification of Lamp Ballasts Containing PCBs"* dated August 1991. If the ballast does not contain a label that states "PCB Free" or the serial code that does not identify it as "PCB Free" then the ballast should be presumed to contain PCBs and disposed of accordingly.
Mould	Mould growth and water damage were observed on: • Visible mould growth on concrete walls • Efflorescence and staining on concrete walls.	Complete removal of mould and water damaged building material using EACC Level 1 Mould Remediation in combination with EACC Class 1 or 2A Lead Guidelines, where applicable.
Other Designated Substances	The following Designated Substances are not likely to be found in the area assessed: • Acrylonitrile • Arsenic • Coke Oven Emission • Ethylene Oxide • Isocyanates • Vinyl Chloride	No recommendations are warranted as none were observed.

Before any renovation activities, perform an intrusive investigation for concealed Designated Substances and sample building materials that were not previously tested and may be disturbed as part of the renovation. In addition, consideration should be given to mechanical, electrical and structural components that pass beyond the rooftop into the building and may be impacted by the project. Further, consideration of the known or suspected asbestos-containing materials within the building should be assessed that may be disrupted during the renovation.

This executive summary is to be read in conjunction with the remainder of the report.

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1.0 Introduction

1.1 Background

Parasol Environmental Inc. (Parasol) was retained by the Durham District School Board to conduct a Limited Designated Substance Survey within Ajax High School located at 105 Bayly Street East, Ajax, Ontario. The purpose of the survey was to record the presence, location, condition and quantities of Designated Substances and Hazardous Materials within the surveyed area that may be disturbed during the planned window and exterior cladding replacement project. Additional information is provided to document corrective measures necessary to ensure that remedial action occurs using the proper abatement procedures, if necessary.

The survey was completed by Brad Panzer of Parasol on November 13th and 14th, 2025.

2.0 Regulatory Framework

The following Acts, Regulations, Guidelines and documents were utilized for the survey and the preparation of this report:

1. *Occupational Health and Safety Act R.S.O. 1990, c. O.1.*
   - I. *Ontario Regulation 278/05- Designated Substances – Asbestos on Construction Projects and in Buildings and Repair Operations.*
   - II. *Ontario Regulation 490/09- Designated Substances*.
   - *III. Ontario Regulation 833 – Control of Exposure to Biological or Chemical Agents.*
   - *IV. Ontario Regulation 213/91 – Construction Projects*
2. Ministry of Labour (MOL) Document, "*Guideline - Lead on Construction Projects"*, September 2004.
3. Environmental Abatement Council of Canada (EACC) *"Lead Guideline for Construction, Renovation, Maintenance or Repair"*, October 2014.
4. Ministry of Labour (MOL) Document, "*Guideline - Silica on Construction Projects"*, September 2004.
5. Environment Canada Document, *"PCB Identification of Lamp Ballasts Containing PCBs"* August 1991.
6. Canadian Construction Association (CCA), "*Mould Guidelines for the Canadian Construction Industry*", 2018.
7. Environmental Abatement Council of Canada (EACC) "*Mould Abatement Guidelines - Edition 3"*, 2015.
8. Ontario Ministry of Labour (MOL), *Alert: Mould in Workplace Buildings*, ISSN: 1195-5228, December 2000.
9. Environmental Abatement Council of Canada (EACC) *"Pre-Construction Designated Substances and Hazardous Materials Assessments Guideline for Construction, Renovation and Demolition Projects"* 2021.

Ontario Regulation 490/09 – *Designated Substances* defines the eleven (11) Designated Substances, establishes the requirements for workplaces containing these materials, which include the health and safety responsibilities, control programs to minimize worker's exposures, and sets out the maximum exposure concentrations.

The control and management of asbestos in Ontario are further prescribed by Ontario Regulation *278/05- Designated Substances – Asbestos on Construction Projects and in Buildings and Repair Operations*.

The major components of O. Reg 278/05 require that an asbestos survey record be completed for buildings or private residences with more than four units, and an asbestos management program be established for the asbestos-containing materials present within these buildings. The regulation also states the frequency in which a building material must be sampled, and defines an asbestos-containing material. The current definition of asbestos-containing material in Ontario is having 0.5% or greater fibrous silicate asbestos content by dry weight. Further, the Regulation divides asbestos-containing material into friable material (a

material, when dry, can be crumbled, pulverized, or powdered by hand pressure, or is crumbled, pulverized, or powdered) and non-friable material. In addition, the Regulation also defines the minimum measures and procedures for the repair or removal of asbestos-containing materials. Due to the limited scope of this survey, this report does not meet all the requirements of O. Reg. 278/05 and additional asbestos-containing materials may be present within the building that are not noted within this report. Within this report, building materials are separated into the typical applications of asbestos-containing materials.

Section 30 of the Occupational Health and Safety Act requires an Owner to determine and list Designated Substances present at a project site before beginning work. Further, this information must be included in tender documents, and the Owner and Constructor must ensure that each prospective contractor and subcontractor receive a copy of the information before entering into a binding contract. Otherwise, the Owner is liable to the constructor and every contractor and subcontractor who suffers any loss or damage as a result of the failure. The same liability applies to the Constructor regarding their contractors and subcontractors. This report meets the requirements of Section 30 of the Act.

Section 6, subsection 3 of O. Reg 213/91 requires that a Notice of Project be filed with the Ministry of Labour before beginning a project and the document requires the constructor to remark if any Designated Substance will be used, handled, or disturbed on the project. The information provided in this report can be used for the Notice of Project.

Based on the Environmental Abatement Council of Canada (EACC) *"Lead Guideline for Construction, Renovation, Maintenance or Repair"*, dated October 2014, and for this report, paints, mortar, or surface coatings containing less than or equal to 0.1% lead by weight (1000 µg/g or 1000 mg/kg or 1000 ppm lead) are considered low-level lead paints, mortars, or surface coatings. Paints, mortars, or surface coatings containing greater than 0.1% lead by weight (1000 µg/g, or 1000 mg/kg, or 1000 ppm) but less than 0.5% lead by weight (5000 µg/g, or 5000 mg/kg, or 5000 ppm lead) are considered lead-containing paints, mortars, or surface coatings. Paints, mortars, or surface coatings containing equal to or greater than 0.5% lead by weight (5000 µg/g, or 5000 mg/kg, or 5000 ppm lead) are considered lead-based paints, mortars, or surface coatings.

3.0 Methodology and Scope

3.1 Scope of Assessment

The survey was limited to the areas of the building that are anticipated to be impacted by the planned window and exterior cladding replacement project as illustrated on the attached drawings. The survey was completed on an "addition by addition" approach, to delineate surfacing building materials (drywall, mortars etc.) based on the year of construction (reference Drawing DSR-01 – DSR-03 for building vintages).The scope of the assessment was carried out in all accessible areas on a non-intrusive basis. Areas that were inaccessible at the time of the survey are listed in Section 3.11.

For this assessment, the following Designated Substances, as defined under *Ontario Regulation 490/09-Designated Substances* made under the *Occupational Health and Safety Act R.S.O. 1990, c. O.1* were assessed for as they are typically found in buildings and building material:

1. Asbestos
2. Benzene
3. Lead
4. Mercury
5. Silica

In addition to the above-noted Designated Substances, Parasol personnel also documented the presence of the following hazardous materials, which have similar Regulations that outline the management, handling and disposal of the material.

1. Polychlorinated Biphenyls
2. Mould

For this assessment, the following Designated Substances, as defined under *Ontario Regulation 490/09- Designated Substances* made under the *Occupational Health and Safety Act R.S.O. 1990, c. O.1*, were not assessed as they would not be found in building materials that may be disturbed as part of this project and typically only found in industrial or manufacturing settings.

1. Acrylonitrile
2. Arsenic
3. Coke Oven Emission
4. Ethylene Oxide
5. Isocyanates
6. Vinyl Chloride

No additional comments will be made regarding these materials within this report unless the Owner or the Owner Representative notifies Parasol of the use of these materials within the building.

3.2 Methodology

The assessment was completed largely on a visual basis at ground level and representative checks were made above ceilings with the aid of a six-foot (6FT) step ladder. Locations and building materials present above this height were considered to be inaccessible. In addition, due to the non-intrusive nature of the assessment, materials concealed above solid ceiling finishes, within wall cavities, and below floor grade may be present that are not documented within this report. Designated Substances should be presumed to be present within these locations and all necessary precautions should be followed when accessing these spaces.

At the client's direction, flooring finishes present within the survey area were not included as part of the current assessment, as they are not likely to be disturbed as part of the planned window and exterior cladding replacement project. Should flooring finishes present within these areas require disturbance, sampling of the materials is required to prove them non-ACM.

3.3 Asbestos

Representative bulk samples of building materials were collected in the frequency required under Table 1, Subsection 3(3) of *Ontario Regulation 278/05- Designated Substances – Asbestos on Construction Projects and in Buildings and Repair Operations*. Samples were submitted to EMC Scientific Inc., an independent, NVLAP accredited laboratory for analysis. The bulk samples were analyzed using Polarized Light Microscopy (PLM) and dispersion staining techniques in accordance with the EPA 600/R-93/116 *Method for the Determination of Asbestos in Bulk Building Materials*. If a material was determined to be asbestos-containing, the laboratory was instructed to cease analysis of the remaining samples in the Sample Set.

The locations and conditions of the asbestos-containing materials identified within the building are detailed in this report. The condition criteria were evaluated using The Public Works and Government Services Canada (PWGSC) document *Public Services and Procurement Canada Asbestos Management Standard* updated June 1, 2019, which were then used to form recommendations for the asbestos-containing material present within the surveyed area.

The condition of the asbestos-containing material was assessed as follows:

Condition	Non-Friable	Friable
GOOD	• Material intact and stable • Minor cracks may be present on the surface	• Material is intact, with no signs of damage or delamination. • Up to 1% of sprayed fireproofing has visible damage. • Mechanical insulation is completely covered in jacketing, with no penetrations or exposed insulation.
FAIR	• Criteria not used	• Jacket insulation is missing

Condition	Non-Friable	Friable
		• Minor damage (cuts, tears, or nicks) to jacketed insulation. • Insulation is exposed but not showing surface disintegration. • Missing insulation ranges from minor to none.
POOR	• Material is broken, lifted, damaged, or deteriorated	• Damage cannot be easily repaired • More than 1% of sprayed fireproofing is damaged, delaminated, or deteriorated. • The original insulation jacket is missing, damaged, deteriorated, or delaminated. • Insulation is exposed and significant areas have been dislodged.

3.4 Excluded Asbestos-Containing Building Materials

Due to the non-intrusive basis of the survey, the following building materials, if present, were excluded from the survey but should be considered asbestos-containing until proven otherwise: flooring finishes, roofing materials, refractory brick in boilers and incinerators, fire door core insulation, elevator brakes, mastics, high voltage wiring, heat shields within light fixtures, mechanical packing and gaskets, insulation or vermiculite inside wall cavities or concealed spaces, insulations within mechanical units or ducts, wall finishes concealed behind visible wall finishes, window and door glazing/caulking compounds, flooring material concealed beneath visible flooring and/or concealed beneath existing sub-floors, ceramic tile grout and mortar/adhesive concealed behind ceramic tiles, and sub-grade materials.

3.5 Benzene

No samples of building materials suspected of containing benzene were collected. If above or below grade fuel tanks were present within the assessed area, they were noted within the appropriate findings section.

3.6 Lead

Representative bulk samples of the most prevalent painted finishes and/or masonry mortar suspected of containing lead that is to be disturbed as part of the project were collected at the time of the assessment. A small area of the mortar or paint and subsurface layers were collected by scraping the material down to the substrate to which they are applied. Paint finishes of limited applications were not collected. Samples were submitted to EMSL Canada Inc. (EMSL), an ELLAP accredited laboratory. The paint or mortar samples were analyzed using Flame Atomic Absorption Spectrometry in accordance with EPA Method SW 846 3050B/7000B *Flame Atomic Absorption Spectrophotometry*. Results of the analysis were reported by the laboratory as the percentage of lead by weight of the total sample (% by wt.) or the mass of lead by the mass of the total sample (mg/kg).

The condition of painted surfaces and/or masonry mortar is also detailed in this report. A visual assessment of the mortar or paint for signs of cracking, chipping, flaking, bubbling and deterioration due to friction were noted and were assessed as GOOD, FAIR or POOR based on the degree and extent of deterioration.

The remainder of the suspect lead-containing material (lead piping, masonry mortar, copper pipes soldering joints, wiring connectors, electric cable sheathing, batteries, and lead sheeting) were noted if present.

If flashing and soffits were covered in a paint that was applied during the manufacturing process, no samples were collected. The material should be considered to be lead-containing and handled and treated as such.

3.7 Mercury

A visual inspection was completed based on the age, appearance, and historical uses of suspect mercury-containing equipment, building materials, or products to identify their locations and quantities. Suspect

mercury-containing equipment was not dismantled nor were samples collected for the determination of mercury content.

3.8 Silica

A visual inspection of building materials suspected of containing crystalline silica (e.g., concrete, cement, tile, brick, masonry, mortar) was completed based on the historical use of suspect silica-containing materials in certain materials. Samples of building material were not collected for the determination of the presence or absence of crystalline silica.

3.9 Mould Contamination

A visual inspection to note the extent of surface mould growth and water-damaged building materials was completed within the assessed areas. No sampling for mould spore concentration, or destructive testing to identify concealed mould growth or water damage, was completed. Surface discolouration, material degradation, or suspect mould growth were noted.

3.10 Polychlorinated Biphenyls

A visual inspection for polychlorinated biphenyls (PCBs) was completed on a select number of accessible fluorescent light ballasts present within the assessed areas. If available, information was collected from the ballasts' label and compared to the information in the Environment Canada Document, *"PCB Identification of Lamp Ballasts Containing PCBs"*, dated August 1991. It is important to note that due to safety precautions, the light fixtures were not opened to obtain the manufacturer's details as the fixtures were not de-energized. If visual confirmation of PCB content within the ballast could not be made, it was assumed that light fixtures in areas constructed before 1980 and did not have T8 style fluorescent light fixtures are PCB-containing until proven otherwise.

Information from electrical equipment, transformers specifically, was limited to the exterior labels, or nameplates, a review of maintenance records, and the age of the building to determine PCB content. No dielectric fluids were collected at the time of the assessment.

Caulking and sealants were not sampled or analyzed for PCB content. It should be assumed that if the material was installed before 1980, it contains PCBs until proven otherwise.

Dry-type transformers and fluorescent light ballasts with T8 style lights are presumed to be free of PCBs.

3.11 Inaccessible Locations

At the time of the survey the following locations were inaccessible:

1. N/A

4.0 Existing Reports and Drawings

The following reports were provided to Parasol and the information presented within these reports was utilized in the preparation of this report.

1. Detailed Asbestos-Containing Building Materials Survey Report, Maple Environmental Inc. December 2016 (Maple Project No. 15465-110)

Detailed drawings were provided by the client and can be found in Appendix B.

5.0 Findings

The results of the visual identification and the bulk sampling completed during the duration of the survey are summarized below. The materials are divided into typical building material applications. The Laboratory Certificate of Analysis for the bulk samples collected while on site are presented in Appendix A.

5.1 Building Information

A summary of pertinent building details specific to the surveyed area is provided in the table below. Information is based on onsite observations, and interviews conducted as well as the provided prior reports.

Building Element	Details
Date of Construction & Additions	Original Building-1954, Additions-1959, 1966
Number of Floors	2 plus Basement
Floors	Vinyl Floor Tiles, Terrazzo, Ceramic Tiles
Walls	Masonry Block, Brick, Drywall, Concrete, Textured Paint, Acoustic Ceiling Tiles, Wood
Ceilings	Acoustic Ceiling Tiles, Drywall, Textured Plaster
HVAC	Forced Air, Radiators
Structure	Concrete, Steel, Wood
Exterior Cladding	Granex Panels, Concrete

The following section summarizes the findings of the assessment and provides a general description of the hazardous materials identified and their locations.

5.2 Asbestos

5.2.1 Building Materials Not Observed

At the time of the survey, the following building materials, which are known to historically contain asbestos were not observed and therefore are not discussed further within the report.

1. Vermiculite
2. Vinyl Sheet Flooring
3. Transite Cement Products

5.2.2 Sprayed Fireproofing

The following sprayed fireproofing was observed to be present at the time of the survey:

Number	Sample Number	Description	Locations	Asbestos Content	Notes
SFP-01	S07A-C	Grey, Fibrous	0004, 0005, 0006, 0007	ND	Applied to steel beams.

ND= None Detected, NA= Not Applicable, CH= Chrysotile Asbestos, AM= Amosite Asbestos

5.2.3 Acoustic Ceiling Tiles

The following acoustic ceiling tiles were observed to be present at the time of the survey:

Tile Number	Sample Number	Description	Locations	Asbestos Content	Notes
AT-01	S01A-C	1’x1’ Random Small and Medium Pinholes	Throughout 1966 Building Addition Survey Area	ND	-
AT-02	Previously Sampled (510 15A-C)	2’x4’ Pinholes and Random Flecks	Throughout 1966 Building Addition Survey Area	ND	-
AT-03	Previously Sampled 15465-110 S02A-C	2’x4’ Pinholes and Small Fissures	0004, 0005, 0006, 0007	ND	-

Tile Number	Sample Number	Description	Locations	Asbestos Content	Notes
AT-04	NA	2'x4' Pinholes and Random Flecks	1082	NA	Date Stamped (03/27/2017) Non-ACM
AT-05	S12A-C	1'x1' Ordered Holes	1959 Original Building and 1959 Building Addition	ND	Applied to the upper walls

ND= None Detected, NA= Not Applicable, CH= Chrysotile Asbestos, AM= Amosite Asbestos

5.2.4 Texture Coat Finishes

Textured paint applied to concrete walls was observed within the 1966 Building Addition Survey Area. Analysis of Sample Set S04A-E determined that the samples do not contain asbestos.

5.2.5 Plaster Finishes

Textured plaster was observed within the surveyed area and is limited to the exterior overhang of Location# B-1. Analysis of Sample Set S10A-C determined that the material contains **0.5% - 2% Chrysotile asbestos**. The textured plaster finish was observed in GOOD condition at the time of the assessment.

5.2.6 Drywall Finishes

Drywall with joint compound applied to gypsum board was observed throughout the 1966 Building Addition Survey Area as wall and ceiling finishes. Analysis of Sample Set S06A-E determined that the samples do not contain asbestos.

Drywall finishes present within the 1954 Original Building Survey Area and 1959 Building Addition Survey Area were observed to be vinyl wrapped. Drywall joint compound is not present on vinyl wrapped drywall finishes, as such they are not suspected to contain asbestos.

5.2.7 Insulations

Friable asbestos-containing insulations and non-asbestos-containing insulations were observed to be present on mechanical systems within the surveyed area.

5.2.7.1 Fitting Insulation

Parging cement applied to pipe fittings was observed within the surveyed area. Previous sampling performed by others determined that the material contains **60% - 80% Chrysotile asbestos**. Asbestos-containing parging cement applied to pipe fittings was observed in GOOD condition at the time of the assessment.

The remaining fitting insulation present within the surveyed area was observed to be fibreglass and PVC; materials not suspected to contain asbestos.

5.2.7.2 Straight Insulation

Straight insulation present within the surveyed area was observed to be fibreglass and PVC; materials not suspected to contain asbestos.

5.2.7.3 Duct Insulation

Ducts present within the surveyed area were observed to be externally insulated with fibreglass; a building material not suspected to contain asbestos, or were not insulated.

5.2.7.4 Mechanical Equipment Insulation

Mechanical equipment (radiators) within the surveyed area was observed to not be externally insulated.

5.2.8 Vermiculite

No loose-fill vermiculite was observed to be present within the surveyed area at the time of the assessment. However, as the survey was non-destructive, loose-fill vermiculite may be present within the voids of the

masonry blocks, which is a historical application of vermiculite. Precaution should be taken if the masonry block is to be disturbed.

5.2.9 Vinyl Floor Tiles

Asbestos-containing and non-asbestos vinyl floor tiles were previously identified by others to be present within the building. At the client's direction, representative samples were not collected of the materials as activities associated with the planned exterior cladding and window replacement project are not anticipated to disturb the flooring finishes. As such, the presence of asbestos-containing vinyl floor tiles have not been illustrated on the attached drawings or included as part of the current assessment. Should the flooring finishes require disturbance, sampling is required to prove the materials non-asbestos.

5.2.10 Caulking

The following caulking types were observed to be present at the time of the survey:

Number	Sample Number	Description	Locations	Asbestos Content	Notes
CK-01	S03A-C	Brown, Soft	1966-Building Addition Survey Area (Interior)	ND	Applied to window frames (Second and Ground Floors)
CK-02	**S05A-C**	**Black, Hard**	**1966-Building Addition Survey Area (Interior)**	**1% CH**	**Applied to window frames (Basement) GOOD Condition**
CK-03	S11A-C	Grey, Soft	B-1 (Interior and Exterior)	NA	Applied to door frame
CK-04	NA	Grey, Silicone	1954-Original Building Survey Area and 1959-Building Addition Survey Area (Interior)	NA	Applied to tops of window frames. Silicone, non-ACM
CK-05	S15A-C	Grey, Soft	1954-Original Building Survey Area and 1959-Building Addition Survey Area (Exterior)	ND	Applied to window frames.
CK-06	S16A-C	Dark Brown, Soft	1954-Original Building Survey Area and 1959-Building Addition Survey Area (Exterior)	ND	Applied to Granex panel seams
CK-07	S20A-C	Brown, Soft	1966-Building Addition Survey Area (Exterior)	ND	Applied to window frames (Second and Ground Floors)
CK-08	S21A-C	Dark Brown, Soft	1966-Building Addition Survey Area (Exterior)	ND	Applied to Granex panel seams
CK-09	S23A-C	Soft, Black	1966-Building Addition Survey Area (Exterior)	ND	Applied to window frames (Basement)
CK-10	NA	Clear, Silicone	Exterior Doors	NA	Silicone, non-ACM

ND= None Detected, NA= Not Applicable, CH= Chrysotile Asbestos, AM= Amosite Asbestos

5.2.11 Other

1954-Original Building Survey Area

- Mortar associated with masonry block finishes was observed within the 1954 Original Building Survey Area. Analysis of Sample Set S14A-C determined that the samples contain <0.5% Chrysotile asbestos. As per *Ontario Regulation 278/05*, building materials deemed "asbestos-containing" must contain 0.5% or more asbestos content by dry weight. Therefore Sample Set S14A-C is considered to not contain asbestos. A layer of white primer applied to the surface of the samples was analyzed as a separate sample layer and was determined to not contain asbestos.
- Mortar associated with brick finishes was observed within the 1954 Original Building Survey Area. Analysis of Sample Set S18A-C determined that the samples do not contain asbestos.
- Granex panels were observed to be applied to the exterior walls of the 1954 Original Building Survey Area. Analysis of Sample Set S17A-C determined that the samples do not contain asbestos.
- Yellow mastic associated with the exterior Granex panels was observed within the 1954 Original Building Survey Area. Analysis of Sample Set S19A-C determined that the samples do not contain asbestos.
- Black window glazing was observed to be present within the 1954 Original Building Survey Area. Analysis of Sample Set S13A-C determined that the samples do not contain asbestos.

1959-Building Addition Survey Area

- Granex panels were observed to be applied to the exterior walls of the 1959 Building Addition Survey Area. Analysis of Sample Set S17A-C determined that the samples do not contain asbestos.
- Yellow mastic associated with the exterior Granex panels was observed within the 1959 Building Addition Survey Area. Analysis of Sample Set S19A-C determined that the samples do not contain asbestos.
- Black window glazing was observed to be present within the 1959 Building Addition Survey Area. Analysis of Sample Set S13A-C determined that the samples do not contain asbestos.

1966-Building Addition Survey Area

- Mortar associated with masonry block finishes was observed within the 1966 Building Addition Survey Area. Analysis of Sample Set S02A-G determined that the samples contain <0.5% Chrysotile asbestos. As per *Ontario Regulation 278/05*, building materials deemed "asbestos-containing" must contain 0.5% or more asbestos content by dry weight. Therefore Sample Set S02A-G is considered to not contain asbestos. A layer of white primer applied to the surface of the samples was analyzed as a separate sample layer and was determined to not contain asbestos.
- Mortar associated with brick finishes was observed within the 1966 Building Addition Survey Area. Analysis of Sample Set S08A-C determined that the material contains **0.5% Chrysotile asbestos**. The majority of brick finishes present within the 1966 Building Addition Survey Area are concealed behind the exterior Granex panels. Visible portions of the brick finishes present within the 1966 Building Addition Survey Area were observed in GOOD condition.
- Granex panels were observed to be applied to the exterior walls of the 1966 Building Addition Survey Area. Analysis of Sample Set S22A-C determined that the samples do not contain asbestos.
- Yellow mastic associated with the exterior Granex panels was observed within the 1966 Building Addition Survey Area. Analysis of Sample Set S24A-C determined that the samples do not contain asbestos.
- Black window glazing was observed to be present within the 1966 Building Addition Survey Area. The window glazing was observed to be limited to the door assembly within Location #B-1. Analysis of Sample Set S09A-C determined that the samples do not contain asbestos.

5.3 Benzene

No products suspected of containing benzene were identified within the surveyed area.

5.4 Lead

Results of the lead in paint chips and/or masonry mortar are presented in the table below. The Certificate of Analysis is attached in Appendix A.

Sample No	Sample Location	Description	Substrate	Result	Lead Class	Condition
Pb-01	**2202-Classroom**	**Off-white Paint**	**Walls**	**0.15%**	**Lead-Containing**	**Flaking, FAIR**
Pb-02	1089-Principal	White Paint	Walls	<0.0064%	Low-level Lead	GOOD
Pb-03	1087F-Office	Mortar	Masonry Block	<32 mg/Kg	Low-Level Lead	GOOD
Pb-04	B-1 - Vestibule	Blue Paint	Door Frame	<0.0064%	Low-level Lead	GOOD
Pb-05	Exterior (1954 Building)	Mortar	Brick	<32 mg/Kg	Low-Level Lead	GOOD
Pb-06	Exterior (1966 Building)	Mortar	Brick	<32 mg/Kg	Low-Level Lead	GOOD

As noted in the EACC guidelines, results above 0.1% are considered elevated and specific procedures apply to the removal or disturbance of these materials.

The following building materials were observed to be present within the assessed area and are suspected to contain lead:

1. Batteries in Emergency Lighting
2. Ceramic Floor Tile Glazing
3. Solder on pipe fittings
4. Masonry Mortar

5.5 Mercury

5.5.1 Lamps

Mercury vapour is presumed to be present within all fluorescent light tubes.

5.5.2 Devices and Equipment

Thermostatic switches within the assessed areas were not observed to have liquid mercury present.

It is important to note that equipment present within the assessed area was not dismantled to verify the presence or absence of mercury within. As such, concealed mercury-containing devices may be present that are not noted within this report. Caution should be taken when dismantling this equipment as mercury-containing components should be assumed to be present.

5.6 Silica

The following building materials were observed to be present within the assessed area and are presumed to contain crystalline silica:

1. Ceramic tiles and grout

2. Masonry and mortar
3. Concrete (poured or pre-cast)

5.7 PCBs

5.7.1 Light Fixtures

Light fixtures observed within the surveyed area were observed to contain a combination of T8 and T12 lights. T8 lights contain electronic ballast and do not contain PCBs. T12 lights have the potential to contain PCBs.

5.7.2 Transformers

Transformers were not observed to be present within the surveyed area.

5.8 Mould

Visible mould growth and water damage were observed to be present on the following building material:

Location	Observations	Quantity of Mould and/or Water Damage
0002-Classroom	• Visible mould growth on concrete wall below the radiator.	~10SF
0003-Classroom	• Visible mould growth on concrete wall below the radiator. • Efflorescence on concrete wall.	~10SF ~5SF
0007-Classroom	• Efflorescence on concrete wall.	~2SF

6.0 Conclusions and Recommendations

Based on the results of the bulk sampling and visual identification, the following Designated Substances and Hazardous Materials are known and/or assumed to be present within the surveyed area:

1. Asbestos
2. Lead
3. Mercury
4. Silica
5. PCBs
6. Mould

Parasol proposes the following recommendations:

6.1 General Recommendations

6.1.1 Asbestos

Based on the results of the bulk sampling and visual identification, the following asbestos-containing building materials were identified:

1. Textured Plaster Finishes
2. Mechanical Insulations (Parging Cement)
3. Brick Mortar (1966 Building Addition Survey Area)
4. Caulking (CK-02)

Due to the presence of asbestos-containing materials within the building, the Asbestos Management Program must be updated and maintained for the building.

Perform a reassessment survey of asbestos-containing materials on an annual basis (minimum requirement).

Before any renovation activities, perform an intrusive investigation for concealed asbestos-containing materials and sample building materials that were not previously tested and may be disturbed as part of the renovation.

Before completing any renovation or alteration, all asbestos-containing material that may be disturbed as part of the project should be removed following Ontario Regulation 278/05.

6.1.2 Asbestos Abatement Procedures

The removal of non-friable asbestos-containing material (caulking) is to be completed using Type 1 asbestos abatement procedures provided that the material is wetted and non-powered hand tools are used. If power tools are required that are not equipped with a HEPA attachment, then Type 3 asbestos abatement procedures apply.

The removal of friable asbestos-containing material (textured plaster, brick mortar) is to be completed using Type 2 asbestos abatement procedures provided that less than one square meter ($1m^2$) of the material is disturbed. If greater than one square meter ($1m^2$) is disturbed, then Type 3 asbestos abatement procedures apply.

Depending on the condition, geometry and size, the removal of mechanical insulations are to be completed using Type 2, Glove Bag or Type 3 asbestos abatement procedures.

6.1.3 Lead

Based on the results of the bulk sampling and the visual identification, low-level lead concentrations (less than or equal to 0.1% lead by weight (1000 µg/g or 1000 mg/kg or 1000 ppm lead)) were found to be present in the following building materials: white paint, blue paint, masonry block mortar (1966 Building), brick mortar (1954 Building) and brick mortar (1966 Building).

Low-level lead guidelines only apply if they meet the following criteria:

1. The paint and substrate are not disturbed in an aggressive manner (grinding, cutting or blasting) or not heated where fumes are produced (welding or torching),
2. Dust control and suppression procedures are utilized so that the TWA (10 mg/m^3) for particulates not otherwise specified (PNOS) is not exceeded and airborne lead concentrations are kept below 0.05 mg/m^3,and,
3. Washing facilities are available for workers to wash hands and faces.

Based on the results of the bulk sampling and the visual identification, lead-containing concentrations (greater than 0.1% lead by weight (1000 µg/g, or 1000 mg/kg, or 1000 ppm) but less than 0.5% lead by weight (5000 µg/g, or 5000 mg/kg, or 5000 ppm lead) were found to be present in the following building materials: off-white paint.

Removal or disturbance of paints and brick mortar is to follow the procedures outlined in the EACC document *"Lead Guideline for Construction, Renovation, Maintenance or Repair"*, October 2014.

6.1.4 Mercury

Mercury vapour is present within fluorescent lights.

When removing the fluorescent lights, the materials are to be handled carefully to ensure they are kept sealed and intact, which will prevent direct skin contact and the inhalation of mercury vapour. Mercury is to be disposed of per Ontario Regulation 347 if greater than five kilograms (5 kg) is produced within a month.

6.1.5 Silica

Crystalline silica is suspected to be present within the ceramic tiles and grout, masonry and mortar, and concrete (poured or pre-cast) within the assessed area.

The removal or disturbance of material suspected to contain crystalline silica should follow procedures outlined in the MOL document "*Guideline - Silica on Construction Projects*", dated September 2004.

6.1.6 PCBs

Light fixtures observed within the surveyed area were observed to contain a combination of T8 and T12 lights. T8 lights contain electronic ballast and do not contain PCBs. T12 lights have the potential to contain PCBs.

If the fluorescent light fixtures are to be disturbed as part of the project, they should be disassembled and the information on the ballast compared to the Environment Canada Document, *"PCB Identification of Lamp Ballasts Containing PCBs"* dated August 1991. If the ballast does not contain a label that states "PCB Free" or the serial code that does not identify it as "PCB Free" then the ballast should be presumed to contain PCBs and disposed of accordingly.

6.1.7 Mould

All mould and water-damaged building materials are to be removed following the Environmental Abatement Council of Canada (EACC) "*Mould Abatement Guidelines - Edition 3"*, dated 2015. Further, a qualified Health and Safety professional should be consulted to inspect and verify the proper removal of the building materials.

6.2 Remedial Recommendations

The following remedial work should be completed regardless of the planned renovation.

6.2.1 Lead

The following paint and/or masonry mortar should be stabilized if they are to remain:

Location	Description	Remedial Recommendations
0006-Science Lab	Flaking off-white Paint on concrete wall	Remove using EACC Class 1 or 2A Guidelines
0007-Classroom	Flaking off-white Paint on concrete wall	Remove using EACC Class 1 or 2A Guidelines

Low-level lead guidelines only apply if they meet the following criteria:

1. The paint and substrate are not disturbed in an aggressive manner (grinding, cutting or blasting) or not heated where fumes are produced (welding or torching),
2. Dust control and suppression procedures are utilized so that the TWA (10 mg/m^3) for particulates not otherwise specified (PNOS) is not exceeded and airborne lead concentrations are kept below 0.05 mg/m^3,and,
3. Washing facilities are available for workers to wash hands and faces.

6.2.2 Mould

The following mould impacted and water damaged building materials should be remediated if they are to remain:

Location	Observations	Remediation
0002-Classroom	• Visible mould growth on concrete wall below the radiator.	EACC Level 1 Mould Remediation
0003-Classroom	• Visible mould growth on concrete wall below the radiator. • Efflorescence on concrete wall.	EACC Level 1 Mould Remediation
0007-Classroom	• Efflorescence on concrete wall.	EACC Level 1 Mould Remediation in combination with EACC Class 1 or 2A Lead Guidelines

7.0 Statement of Limitations

The information and recommendations detailed in this report were carried out by trained professional and technical staff following generally accepted engineering and scientific work practices and procedures. Recommendations provided in this report have been generated in accordance with accepted industry guidelines and practices. These guidelines and practices are considered acceptable as of the date of this report.

During the preparation of this report, Parasol relied on information provided by the client, which includes reports and test results prepared by other consultants, the history and use of the site supplied by on-site personnel, and testing services provided by independent laboratories. Parasol has not made any independent verification of the provided information.

The collection of samples at the location noted was consistent with the scope of work agreed upon with the person or entity to whom this report is addressed and the information obtained concerning prior site investigations. As conditions between samples may vary, the potential remains for the presence of unknown additional contaminants for which there were no known indicators.

Information provided in this report by Parasol is intended for the client's use only. Parasol will not provide results or information to any party unless disclosure by Parasol is required by law. Any use by a third party of reports or documents authored by Parasol 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. Parasol 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.

Please contact the undersigned regarding the information presented within this report.

Sincerely,

Brad Panzer, Senior Project Manager
Parasol Environmental Inc.

Appendix A
Laboratory Certificate of Analysis

emcscientific
INCORPORATED

Laboratory Analysis Report

To:

Brad Panzer
Parasol Environmental
125–1860 Appleby Line, Unit #14
Burlington, Ontario
L7L 7H7

EMC LAB REPORT NUMBER: A127381
Job/Project Name: Ajax H.S.
Analysis Method: Polarized Light Microscopy – EPA 600
Date Received: Nov 14/25 **Date Analyzed:** Nov 20/25
Analysts: Katelyn Stolte, Jayoda Perera & Chengming Li
Reviewed By: Malgorzata Sybydlo

Job No: 13346
Number of Samples: 80
Date Reported: Nov 20/25

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-01A	A127381-1	AT-01/ 2202 – classroom	Grey, ceiling tile	**ND**		75	25
S-01B	A127381-2	AT-01/ 2207 – classroom	Grey, ceiling tile	**ND**		75	25
S-01C	A127381-3	AT-01/ 0002 – classroom	Grey, ceiling tile	**ND**		75	25
S-02A	A127381-4	Masonry block mortar/ 2202 – classroom	2 Phases: a) White, primer b) Grey, cementitious material	 **ND** **Chrysotile**	 **<0.5**		 100 100
S-02B	A127381-5	Masonry block mortar/ 2204 – classroom	2 Phases: a) White, primer b) Grey, cementitious material	 **ND** **Chrysotile**	 **<0.5**		 100 100
S-02C	A127381-6	Masonry block mortar/ 0003 – classroom	2 Phases: a) White, primer b) Grey, cementitious material	 **ND** **Chrysotile**	 **<0.5**		 100 100
S-02D	A127381-7	Masonry block mortar/ 0005 – science	2 Phases: a) White, primer b) Light grey, cementitious material	 **ND** **ND**			 100 100
S-02E	A127381-8	Masonry block mortar/ 1089 – principal	2 Phases: a) Off white, primer b) Grey, cementitious material	 **ND** **Chrysotile**	 **<0.5**		 100 100
S-02F	A127381-9	Masonry block mortar/ 1088 – office	2 Phases: a) White, primer b) Grey, cementitious material	 **ND** **Chrysotile**	 **<0.5**		 100 100
S-02G	A127381-10	Masonry block mortar/ 1088C –	2 Phases:				

EMC LAB REPORT NUMBER: A127381
Client's Job/Project Name/No.: 13346
Analysts: Katelyn Stolte/ Jayoda Perera/ Chengming Li

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
		office	a) White, primer b) Grey, cementitious material	**ND** **Chrysotile**	 **<0.5**		100 100
S-03A	A127381-11	CK-01/ 2202 – classroom	Dark grey, caulking	**ND**			100
S-03B	A127381-12	CK-01/ 2207 – classroom	Dark grey, caulking	**ND**			100
S-03C	A127381-13	CK-01/ 1088 – office	Dark grey, caulking	**ND**			100
S-04A	A127381-14	Textured paint/ 2203 – classroom	Off white, paint	**ND**			100
S-04B	A127381-15[5]	Textured paint/ 2207 – classroom	White, primer	**ND**			100
S-04C	A127381-16	Textured paint/ 0002 – classroom	2 Phases: a) White, primer b) Grey, cementitious material	 **ND** **ND**		 1	 100 99
S-04D	A127381-17	Textured paint/ 0004 – science	White, primer	**ND**			100
S-04E	A127381-18[5]	Textured paint/ 0007 – classroom	White, joint compound	**ND**			100
S-05A	A127381-19	CK-02/ 0002 – classroom	Black, caulking	**Chrysotile**	**1**		99
S-05B	A127381-20	CK-02/ 0004 – science	NA	**NA**			
S-05C	A127381-21	CK-02/ 0006 – science	NA	**NA**			
S-06A	A127381-22[6]	DJC/ 0009 – prep	White, joint compound	**ND**			100
S-06B	A127381-23	DJC/ 1087D – office	White, joint compound	**ND**			100

EMC LAB REPORT NUMBER: A127381
Client's Job/Project Name/No.: 13346
Analysts: Katelyn Stolte/ Jayoda Perera/ Chengming Li

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-06C	A127381-24	DJC/ 1082 – classroom	White and off white, joint compound	**ND**			100
S-06D	A127381-25	DJC/ B-1-vestibule	White, joint compound	**ND**			100
S-06E	A127381-26	DJC/ B-1-vestibule	White, joint compound	**ND**			100
S-07A	A127381-27	SFP-01/ 0006 – science	Light grey, fibrous material	**ND**		70	30
S-07B	A127381-28	SFP-01/ 0005 – science	Light grey, fibrous material	**ND**		70	30
S-07C	A127381-29	SFP-01/ 0004 – science	Light grey, fibrous material	**ND**		70	30
S-08A	A127381-30	Brick mortar/ B-1 vestibule	Brown, cementitious material	**Chrysotile**	**<0.5**		100
S-08B	A127381-31	Brick mortar/ B-1 vestibule	Brown, cementitious material	**Chrysotile**	**<0.5**		100
S-08C	A127381-32[7]	Brick mortar/ B-1 vestibule	2 Phases: a) Brown, cementitious material b) Light grey, cementitious material	**Chrysotile** **Chrysotile**	**<0.5** **0.5**		100 99.5
S-09A	A127381-33	Window glazing/ B-1-vestibule	Black, caulking	**ND**			100
S-09B	A127381-34	Window glazing/ B-1-vestibule	Black, caulking	**ND**			100
S-09C	A127381-35	Window glazing/ B-1-vestibule	Black, caulking	**ND**			100
S-10A	A127381-36	Textured plaster/ exterior	2 Phases: a) White, textured plaster b) Grey, plaster	**Chrysotile** **Chrysotile**	**0.5** **2**		99.5 98
S-10B	A127381-37	Textured plaster/ exterior	NA	**NA**			

EMC LAB REPORT NUMBER: A127381
Client's Job/Project Name/No.: 13346
Analysts: Katelyn Stolte/ Jayoda Perera/ Chengming Li

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-10C	A127381-38	Textured plaster/ exterior	NA	**NA**			
S-11A	A127381-39	CK-03/ B-1 vestibule	Grey, caulking	**ND**			100
S-11B	A127381-40	CK-03/ B-1 vestibule	Grey, caulking	**ND**			100
S-11C	A127381-41	CK-03/ B-1 vestibule	Grey, caulking	**ND**			100
S-12A	A127381-42[5]	AT-05/ 1005 – classroom	Brown, ceiling tile	**ND**		90	10
S-12B	A127381-43[5]	AT-05/ 1007 – classroom	Brown, ceiling tile	**ND**		90	10
S-12C	A127381-44[5]	AT-05/ 1009A – work room	Brown, ceiling tile	**ND**		90	10
S-13A	A127381-45	Window glazing/ 1007 – classroom	Black, caulking	**ND**			100
S-13B	A127381-46	Window glazing/ 1007 – classroom	Black, caulking	**ND**			100
S-13C	A127381-47	Window glazing/ 1007 – classroom	Black, caulking	**ND**			100
S-14A	A127381-48	Masonry block mortar/ 1009A – work room	2 Phases: a) White, primer b) Grey, cementitious material	 **ND** **Chrysotile**	 **<0.5**		 100 100
S-14B	A127381-49	Masonry block mortar/ 1009A – work room	2 Phases: a) White, primer b) Grey, cementitious material	 **ND** **Chrysotile**	 **<0.5**		 100 100
S-14C	A127381-50	Masonry block mortar/ 1010 – classroom	2 Phases: a) White, primer b) Grey, cementitious material	 **ND** **ND**			 100 100

EMC LAB REPORT NUMBER: A127381
Client's Job/Project Name/No.: 13346
Analysts: Katelyn Stolte/ Jayoda Perera/ Chengming Li

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-15A	A127381-51	CK-05/ exterior	Grey, caulking	**ND**			100
S-15B	A127381-52	CK-05/ exterior	Grey, caulking	**ND**			100
S-15C	A127381-53	CK-05/ exterior	Grey, caulking	**ND**			100
S-16A	A127381-54	CK-06/ exterior	Black, caulking	**ND**			100
S-16B	A127381-55	CK-06/ exterior	Black, caulking	**ND**			100
S-16C	A127381-56	CK-06/ exterior	Black, caulking	**ND**			100
S-17A	A127381-57	Granex panels/ exterior	2 Phases: a) White, textured cementitious material b) Brown, caulking	 **ND** **ND**		5	 95 100
S-17B	A127381-58	Granex panels/ exterior	White, textured cementitious material	**ND**		5	95
S-17C	A127381-59	Granex panels/ exterior	White, textured cementitious material	**ND**		5	95
S-18A	A127381-60	Brick mortar/ exterior	Off white, cementitious material	**ND**			100
S-18B	A127381-61	Brick mortar/ exterior	Grey, cementitious material	**ND**			100
S-18C	A127381-62	Brick mortar/ exterior	Grey, cementitious material	**ND**			100
S-19A	A127381-63	Mastic/ exterior	2 Phases: a) Yellow, mastic b) Grey, cementitious material	 **ND** **ND**			 100 100
S-19B	A127381-64	Mastic/ exterior	Yellow, mastic	**ND**			100

EMC LAB REPORT NUMBER: A127381
Client's Job/Project Name/No.: 13346
Analysts: Katelyn Stolte/ Jayoda Perera/ Chengming Li

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-19C	A127381-65	Mastic/ exterior	Yellow, mastic	**ND**			100
S-20A	A127381-66	CK-07/ exterior	Grey, caulking	**ND**			100
S-20B	A127381-67	CK-07/ exterior	Grey, caulking	**ND**			100
S-20C	A127381-68	CK-07/ exterior	Grey, caulking	**ND**			100
S-21A	A127381-69	CK-08/ exterior	Grey, caulking	**ND**			100
S-21B	A127381-70	CK-08/ exterior	Grey, caulking	**ND**			100
S-21C	A127381-71	CK-08/ exterior	Grey, caulking	**ND**			100
S-22A	A127381-72	Granex panels/ exterior	Off white, textured cementitious material	**ND**		5	95
S-22B	A127381-73	Granex panels/ exterior	Off white, textured cementitious material	**ND**		5	95
S-22C	A127381-74	Granex panels/ exterior	Off white, textured cementitious material	**ND**		5	95
S-23A	A127381-75	CK-09/ exterior	Black, caulking	**ND**			100
S-23B	A127381-76	CK-09/ exterior	Black, caulking	**ND**			100
S-23C	A127381-77	CK-09/ exterior	Black, caulking	**ND**			100
S-24A	A127381-78	Mastic/ exterior	Yellow, mastic	**ND**			100
S-24B	A127381-79	Mastic/ exterior	Yellow, mastic	**ND**			100
S-24C	A127381-80	Mastic/ exterior	Yellow, mastic	**ND**			100

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Laboratory Analysis Report

EMC LAB REPORT NUMBER: A127381
Client's Job/Project Name/No.: 13346
Analysts: Katelyn Stolte/ Jayoda Perera/ Chengming Li

Note:
1. Bulk samples are analyzed using Polarized Light Microscopy (PLM) and dispersion staining techniques. The analytical procedures are in accordance with EPA 600/R-93/116 method.
2. The results are only related to the samples analyzed. **ND** = None Detected (no asbestos fibres were observed), **NA** = Not Analyzed (analysis stopped due to a previous positive result).
3. This report may not be reproduced, except in full without the written approval of EMC Scientific Inc. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.
4. The Ontario Regulatory Threshold for asbestos is 0.5%. The limit of quantification (LOQ) is 0.5%.
5. Another phase is present but is too small to analyze.
6. This sample is small in size.
7. Phase b) is small in size.

EMSL Canada Inc.
2756 Slough Street, Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
http://www.EMSL.com torontolab@emsl.com

EMSL Canada Or	552520046
CustomerID:	55PAEN75
CustomerPO:	13346
ProjectID:	

Attn: **Brad Panzer**
Parasol Environmental Inc.
125-1860 Appleby Line
Unit 14
Burlington, ON L7L 7H7

Phone: (416) 579-1284
Fax:
Received: 11/14/2025 02:04 PM
Collected: 11/13/2025

Project: **Ajax H.S. / 13346**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client SampleDescription	*Collected*	*Analyzed*	*Weight*	*RDL*	*Lead Concentration*
Pb-01	11/13/2025	11/17/2025	0.2517 g	0.0064 % wt	0.15 % wt
552520046-0001	Site: 2202-Classroom / Off-White Paint				
Pb-02	11/13/2025	11/17/2025	0.2536 g	0.0064 % wt	<0.0064 % wt
552520046-0002	Site: 1089- Principal / White Paint				
Pb-04	11/13/2025	11/17/2025	0.2542 g	0.0064 % wt	<0.0064 % wt
552520046-0004	Site: B-1-Vestibule / Blue Paint				

Rowena Fanto, Lead Supervisor
or other approved signatory

Initial report from 11/21/2025 09:36:30

EMSL Canada Inc.
2756 Slough Street, Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
http://www.EMSL.com torontolab@emsl.com

EMSL Canada Or	552520046
CustomerID:	55PAEN75
CustomerPO:	13346
ProjectID:	

Attn: **Brad Panzer**
Parasol Environmental Inc.
125-1860 Appleby Line
Unit 14
Burlington, ON L7L 7H7

Phone: (416) 579-1284
Fax:
Received: 11/14/2025 02:04 PM
Collected: 11/13/2025

Project: **Ajax H.S. / 13346**

Test Report: Lead by Flame AAS (SW 846 3050B/7000B)*

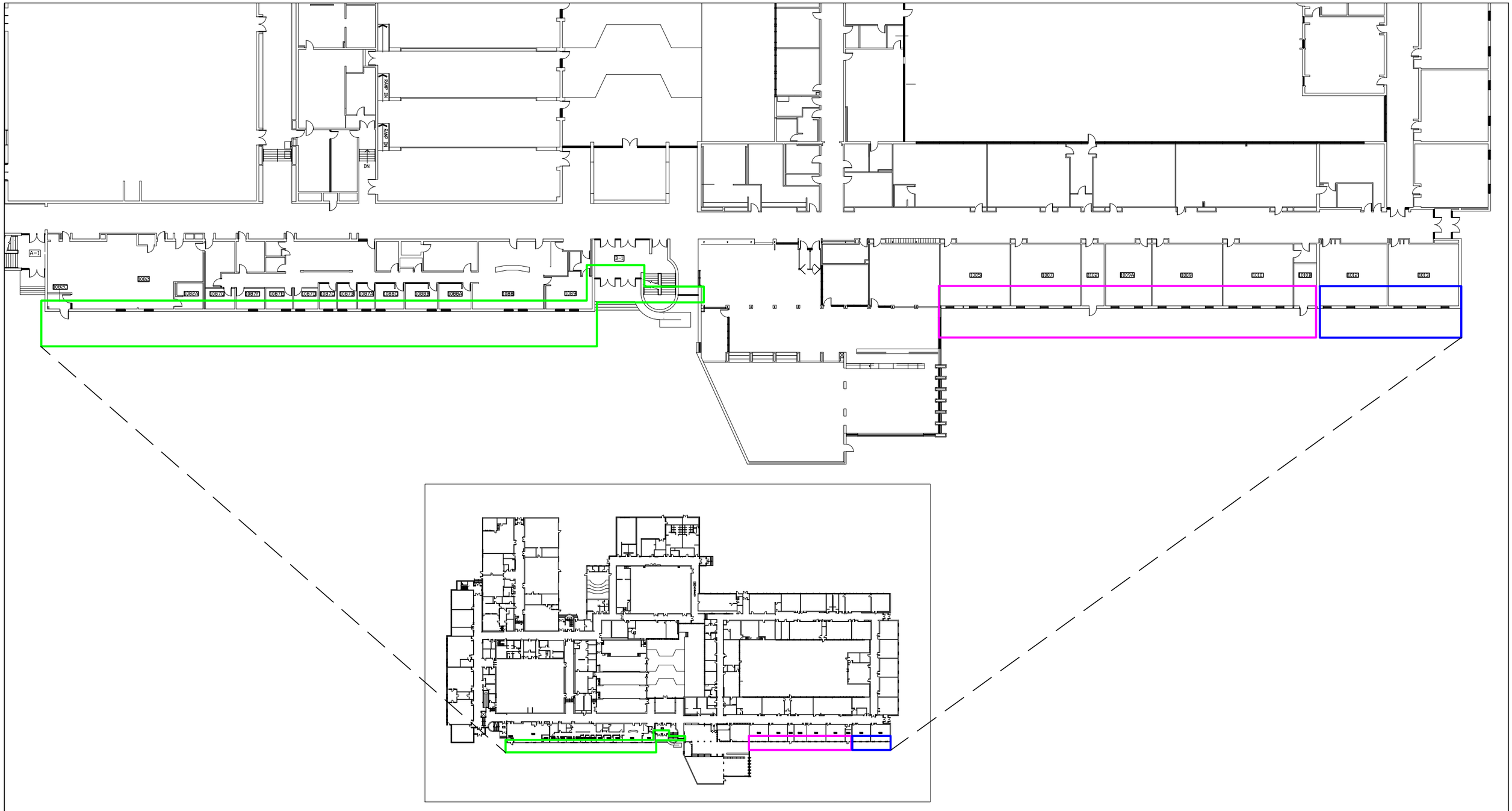
Client SampleDescription	*Collected*	*Analyzed*	*Weight (g)*	*RDL*	*Lead Concentration*
Pb-03	11/13/2025	11/17/2025	0.5007 g	32 mg/Kg	<32 mg/Kg
552520046-0003	Site: 1087F-Office / Masonry Block Mortar				
Pb-05	11/13/2025	11/17/2025	0.5018 g	32 mg/Kg	<32 mg/Kg
552520046-0005	Site: Exterior / Brick Mortar				
Pb-06	11/13/2025	11/17/2025	0.5071 g	32 mg/Kg	<32 mg/Kg
552520046-0006	Site: Brick Mortar / Exterior				

Rowena Fanto, Lead Supervisor
or other approved signatory

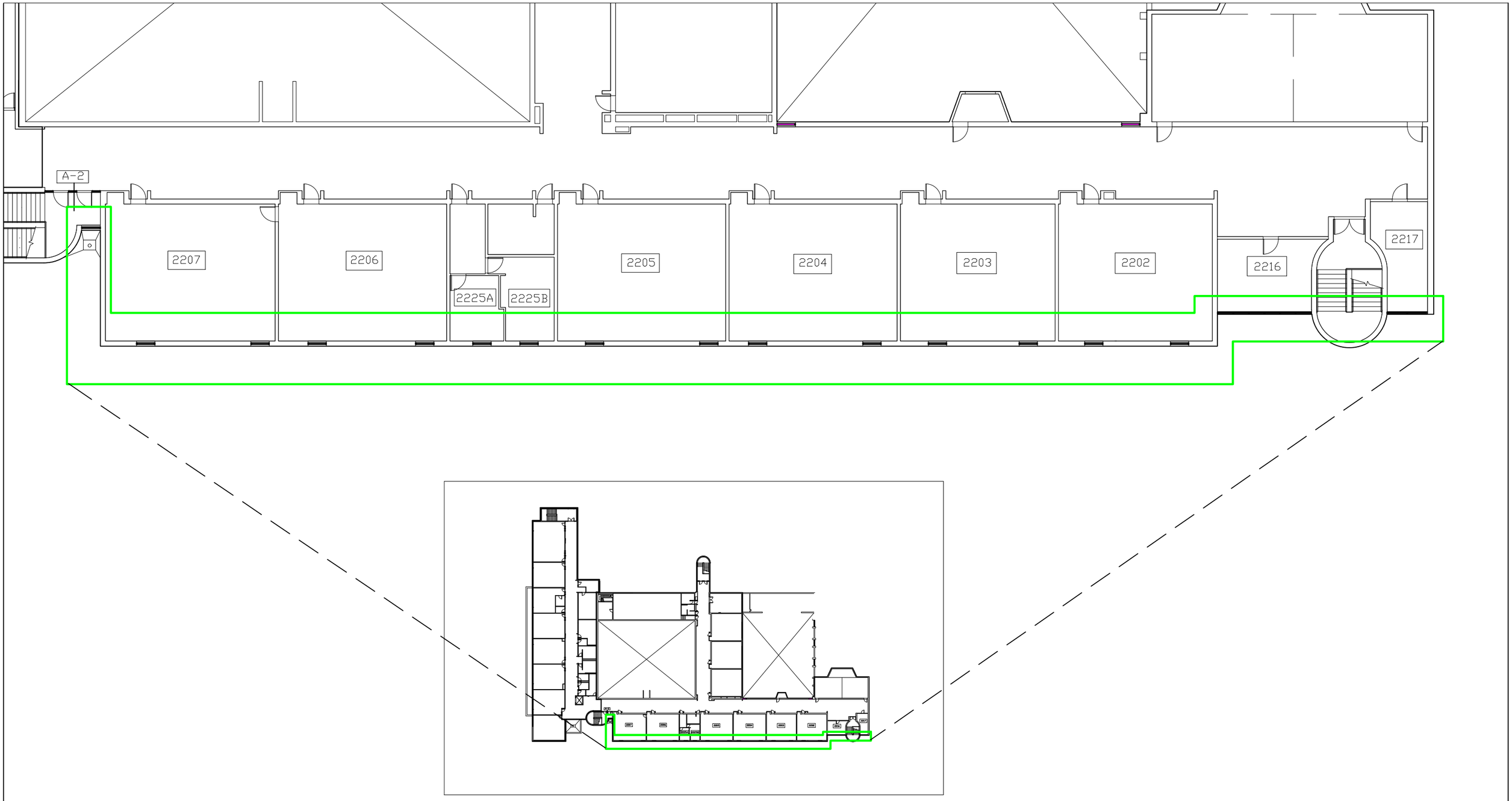
* Analysis following Lead in Soil/Solids by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 40 mg/kg based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request.
Samples analyzed by EMSL Canada Inc. Mississauga, ON

Initial report from 11/21/2025 09:36:30

Appendix B
Site Drawing

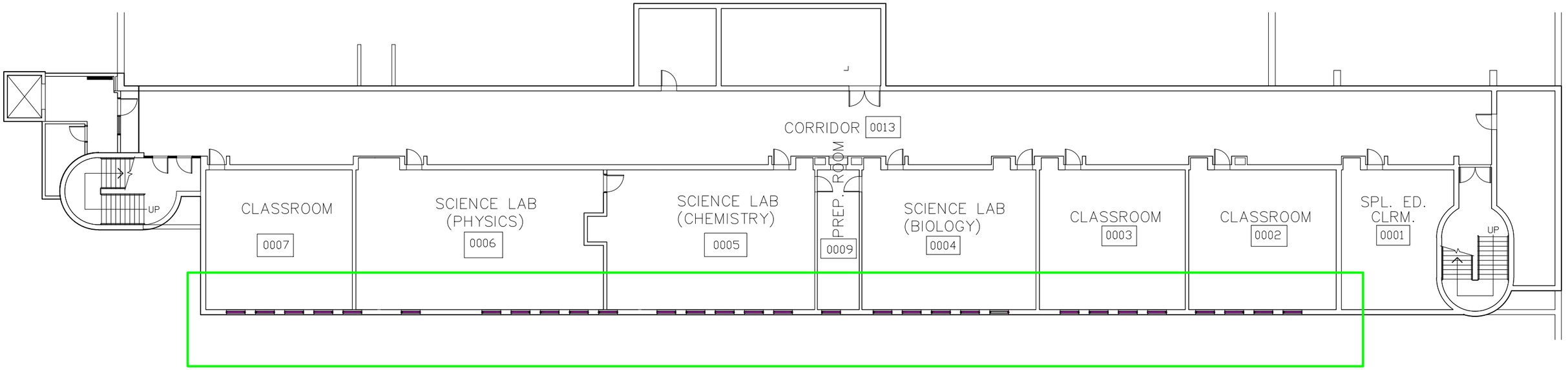


TITLE	LEGEND		DRAWING NO	DRAWN BY:	
Limited Designated Substance Survey First Floor Plan - Building Vintages	SURVEY AREA	VINTAGE	DSR-01	B. PANZER	
CLIENT		1954 ORIGINAL BUILDING SURVEY AREA	SCALE	PARASOL PROJECT NO	
Durham District School Board		1959 BUILDING ADDITION SURVEY AREA	NTS	13346	
LOCATION		1966 BUILDING ADDITION SURVEY AREA	DATE		
Ajax High School 105 Bayly Street East Ajax, Ontario			November 21, 2025		Parasol Environmental Inc.



TITLE	LEGEND		DRAWING NO	DRAWN BY:
Limited Designated Substance Survey Second Floor Plan - Building Vintages	SURVEY AREA	VINTAGE	DSR-02	B. PANZER
CLIENT		1954 ORIGINAL BUILDING SURVEY AREA	SCALE	PARASOL PROJECT NO
Durham District School Board		1959 BUILDING ADDITION SURVEY AREA	NTS	13346
LOCATION		1966 BUILDING ADDITION SURVEY AREA	DATE	
Ajax High School 105 Bayly Street East Ajax, Ontario			November 21, 2025	

Parasol Environmental Inc.



TITLE	LEGEND		DRAWING NO	DRAWN BY:
Limited Designated Substance Survey Basement Floor Plan - Building Vintages	SURVEY AREA	VINTAGE	DSR-03	B. PANZER
CLIENT		1954 ORIGINAL BUILDING SURVEY AREA	SCALE	PARASOL PROJECT NO
Durham District School Board		1959 BUILDING ADDITION SURVEY AREA	NTS	13346
LOCATION		1966 BUILDING ADDITION SURVEY AREA	DATE	
Ajax High School 105 Bayly Street East Ajax, Ontario			November 21, 2025	

Parasol Environmental Inc.

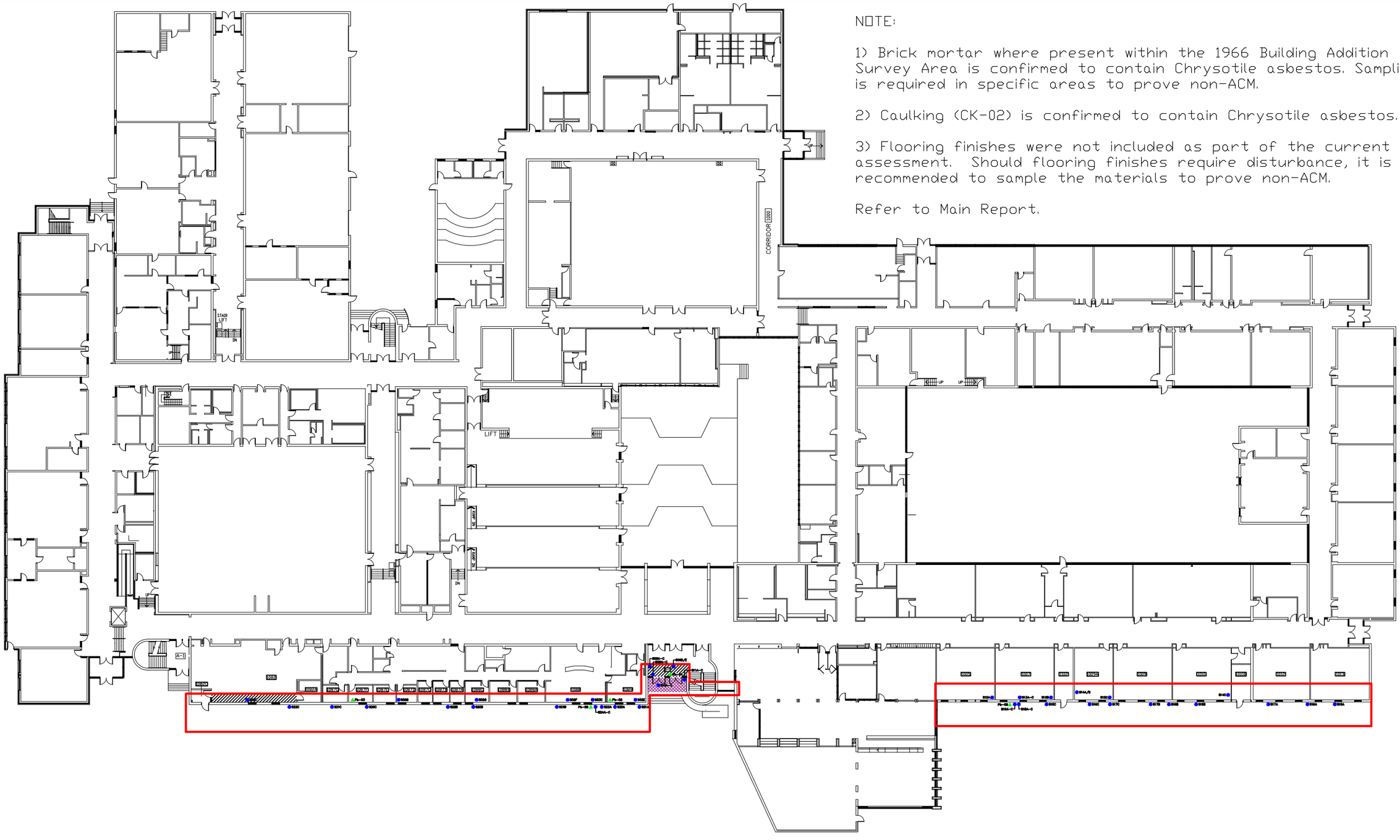
NOTE:

1) Brick mortar where present within the 1966 Building Addition Survey Area is confirmed to contain Chrysotile asbestos. Sampling is required in specific areas to prove non-ACM.

2) Caulking (CK-02) is confirmed to contain Chrysotile asbestos.

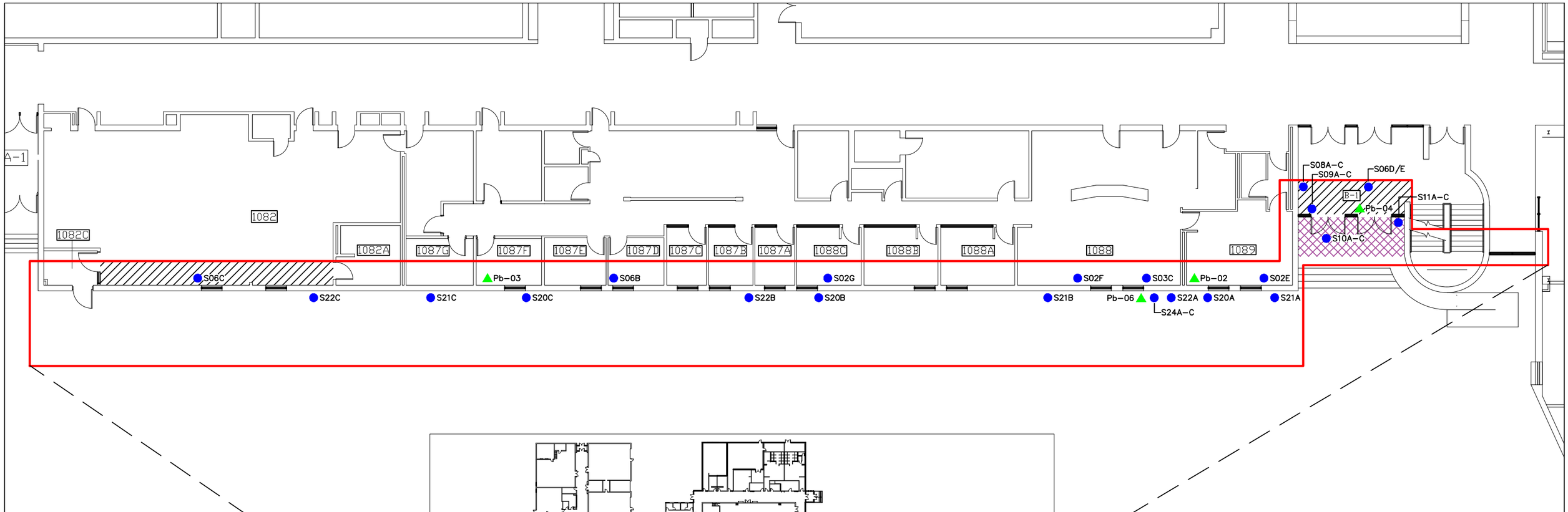
3) Flooring finishes were not included as part of the current assessment. Should flooring finishes require disturbance, it is recommended to sample the materials to prove non-ACM.

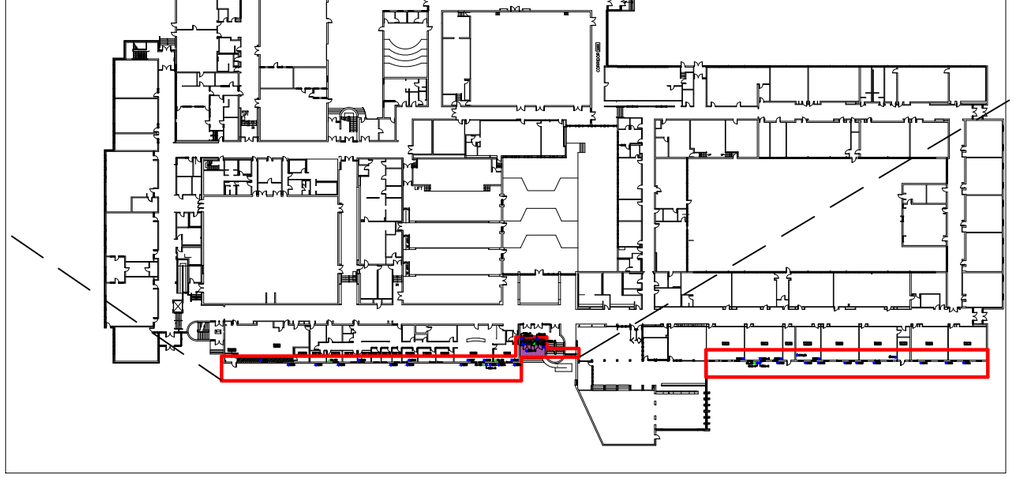
Refer to Main Report.



TITLE	LEGEND	CONFIRMED & SUSPECTED ACM	DRAWING NO / DRAWN BY:
Limited Designated Substance Survey First Floor Plan	SYMBOL / DESCRIPTION NO ACCESS ASBESTOS SAMPLE LOCATION LEAD SAMPLE LOCATION SURVEY AREA	SYMBOL / DESCRIPTION MECHANICAL INSULATIONS (PARGING CEMENT) TEXTURED PLASTER FINISHES NOTE: BRICK MORTAR (1966 BUILDING ADDITION SURVEY AREA) NOTE: CAULKING (CK-02) NOTE: FLOORING FINISHES	DSR-04 / B. PANZER
CLIENT Durham District School Board			SCALE / PARASOL PROJECT NO NTS / 13346
LOCATION Ajax High School 105 Bayly Street East Ajax, Ontario			DATE November 21, 2025

Parasol Environmental Inc.





NOTE:

1) Brick mortar where present within the 1966 Building Addition Survey Area is confirmed to contain Chrysotile asbestos. Sampling is required in specific areas to prove non-ACM.

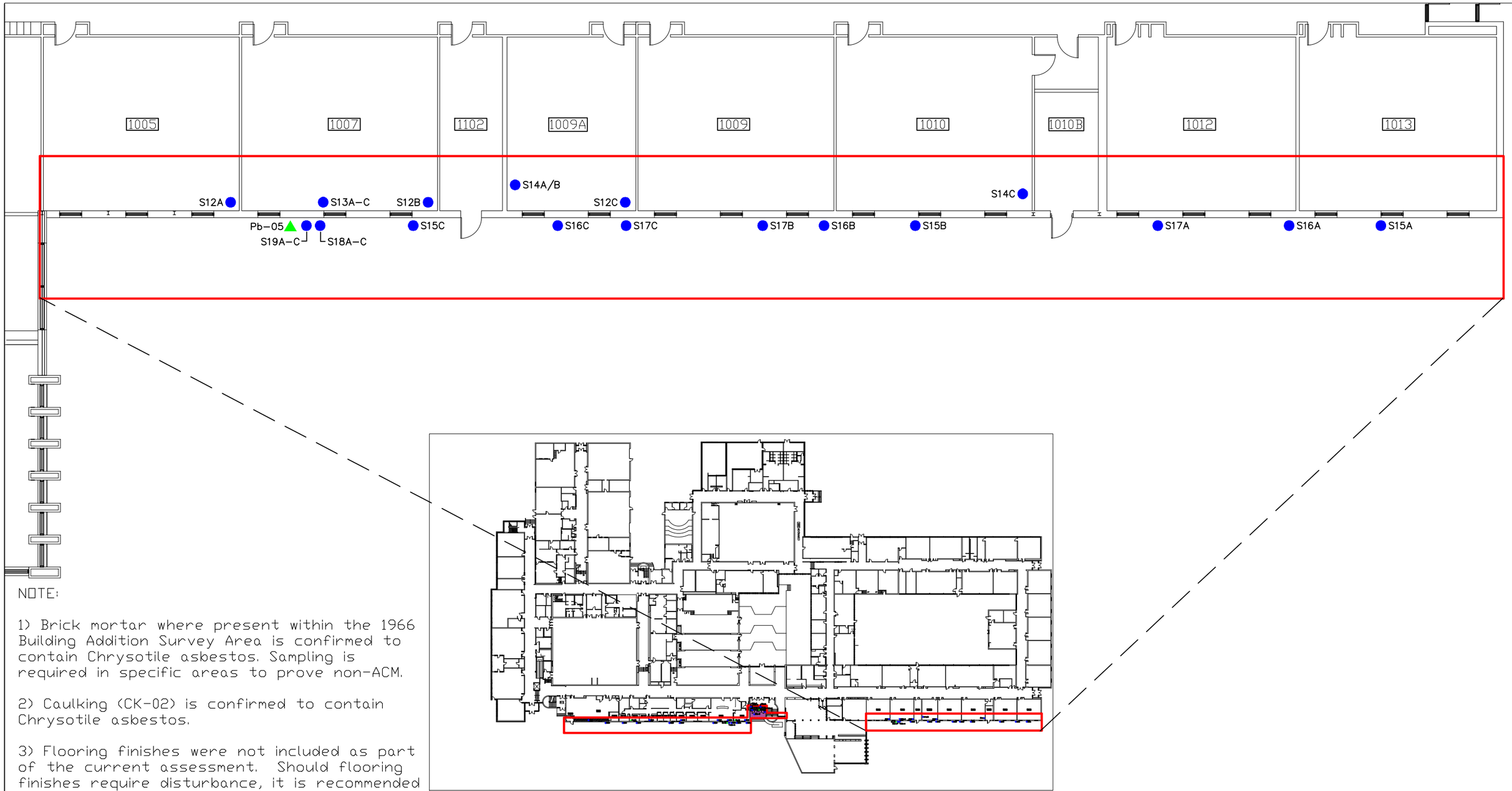
2) Caulking (CK-02) is confirmed to contain Chrysotile asbestos.

3) Flooring finishes were not included as part of the current assessment. Should flooring finishes require disturbance, it is recommended to sample the materials to prove non-ACM.

Refer to Main Report.

TITLE	LEGEND		CONFIRMED & SUSPECTED ACM		DRAWING NO	DRAWN BY:
Limited Designated Substance Survey First Floor Plan - Partial	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	DSR-05	B. PANZER
CLIENT	⊘	NO ACCESS	▨	MECHANICAL INSULATIONS (PARGING CEMENT)	SCALE	PARASOL PROJECT NO
Durham District School Board	●	ASBESTOS SAMPLE LOCATION	▩	TEXTURED PLASTER FINISHES	NTS	13346
LOCATION	▲	LEAD SAMPLE LOCATION	NOTE	BRICK MORTAR (1966 BUILDING ADDITION SURVEY AREA)	DATE	
Ajax High School 105 Bayly Street East Ajax, Ontario	▭	SURVEY AREA	NOTE	CAULKING (CK-02)	November 21, 2025	N
			NOTE	FLOORING FINISHES		

Parasol Environmental Inc.



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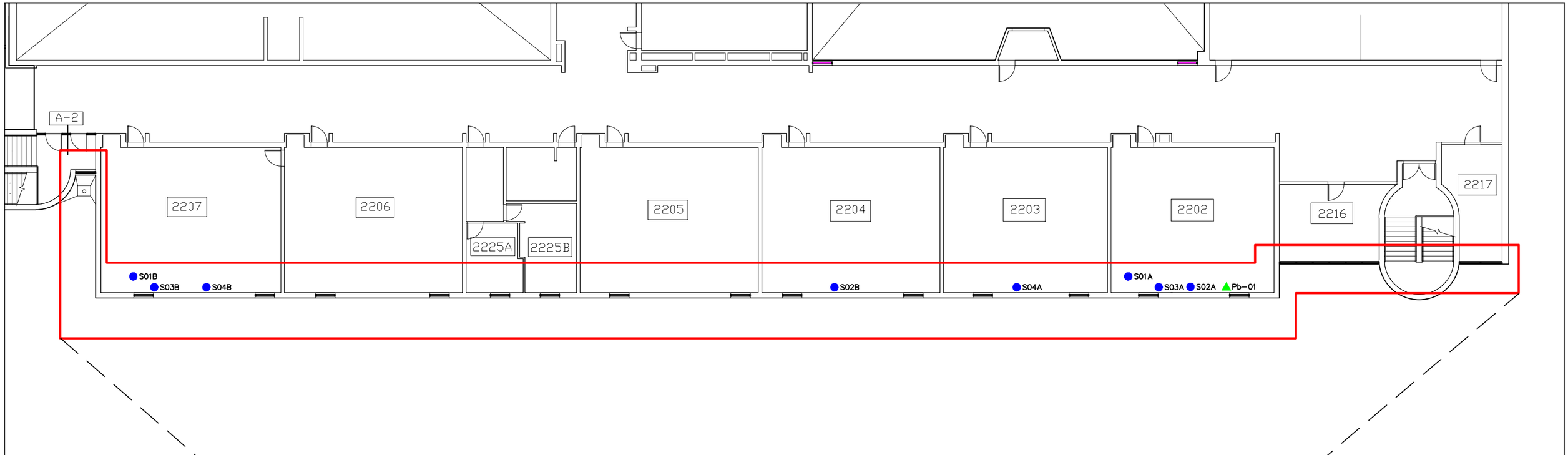
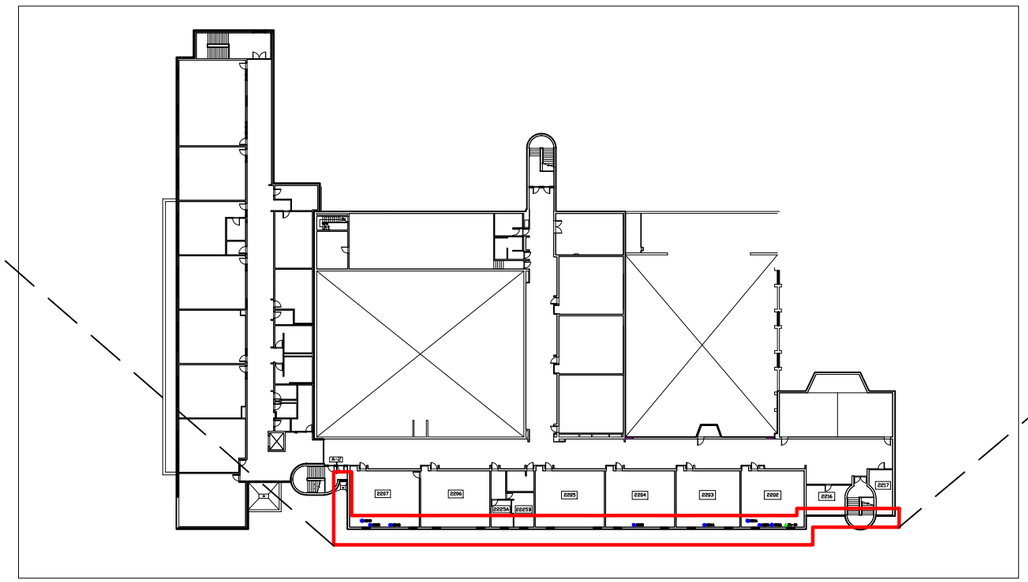
TITLE	LEGEND		CONFIRMED & SUSPECTED ACM		DRAWING NO	DRAWN BY:
Limited Designated Substance Survey First Floor Plan - Partial	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	DSR-06	B. PANZER
CLIENT	⊘	NO ACCESS	▨	MECHANICAL INSULATIONS (PARGING CEMENT)	SCALE	PARASOL PROJECT NO
Durham District School Board	●	ASBESTOS SAMPLE LOCATION	▩	TEXTURED PLASTER FINISHES	NTS	13346
LOCATION	▲	LEAD SAMPLE LOCATION	NOTE	BRICK MORTAR (1966 BUILDING ADDITION SURVEY AREA)	DATE	
Ajax High School 105 Bayly Street East Ajax, Ontario	▭	SURVEY AREA	NOTE	CAULKING (CK-02)	November 21, 2025	N
			NOTE	FLOORING FINISHES		

Parasol Environmental Inc.





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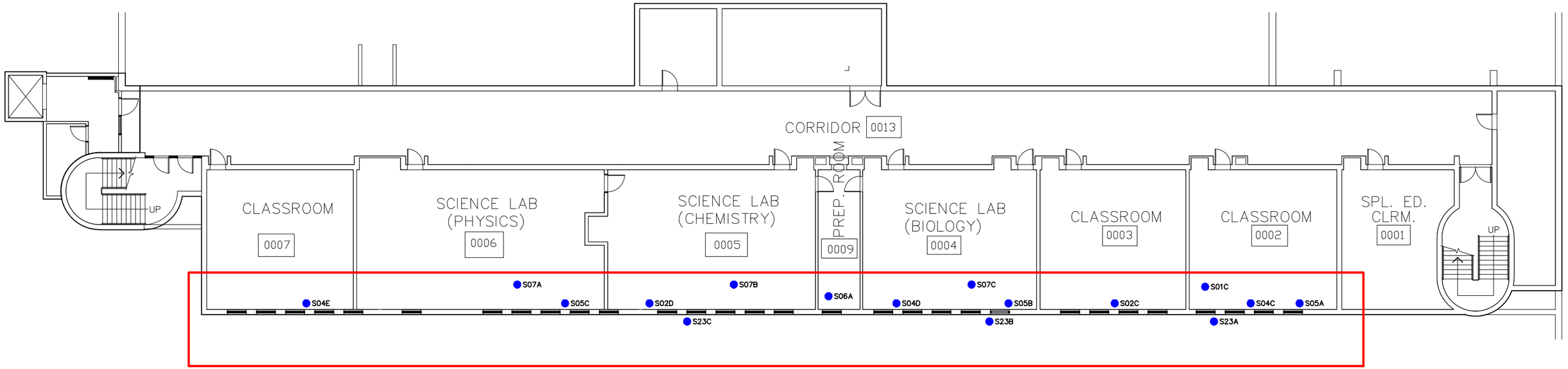
Refer to Main Report.

TITLE	LEGEND		CONFIRMED & SUSPECTED ACM		DRAWING NO	DRAWN BY:
Limited Designated Substance Survey Second Floor Plan - Partial	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	DSR-07	B. PANZER
CLIENT	⊘	NO ACCESS	▨	MECHANICAL INSULATIONS (PARGING CEMENT)	SCALE	PARASOL PROJECT NO
Durham District School Board	●	ASBESTOS SAMPLE LOCATION	▩	TEXTURED PLASTER FINISHES	NTS	13346
LOCATION	▲	LEAD SAMPLE LOCATION	NOTE	BRICK MORTAR (1966 BUILDING ADDITION SURVEY AREA)	DATE	
Ajax High School 105 Bayly Street East Ajax, Ontario	▭	SURVEY AREA	NOTE	CAULKING (CK-02)	November 21, 2025	N
			NOTE	FLOORING FINISHES		

Parasol Environmental Inc.



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TITLE	LEGEND		CONFIRMED & SUSPECTED ACM		DRAWING NO	DRAWN BY:
Limited Designated Substance Survey Basement Floor Plan	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	DSR-08	B. PANZER
CLIENT	⊘	NO ACCESS	▨	MECHANICAL INSULATIONS (PARGING CEMENT)	SCALE	PARASOL PROJECT NO
Durham District School Board	●	ASBESTOS SAMPLE LOCATION	▩	TEXTURED PLASTER FINISHES	NTS	13346
LOCATION	▲	LEAD SAMPLE LOCATION	NOTE	BRICK MORTAR (1966 BUILDING ADDITION SURVEY AREA)	DATE	
Ajax High School 105 Bayly Street East Ajax, Ontario	▭	SURVEY AREA	NOTE	CAULKING (CK-02)	November 21, 2025	N
			NOTE	FLOORING FINISHES		

Parasol Environmental Inc.