DURHAM DISTRICT
SCHOOL BOARD
PARTIAL WINDOW REPLACEMENT AND
AND CLUSTER COLUMN REHABILITATION -PHASE 4
PORT PERRY HIGH SCHOOL
160 ROSA STREET
PORT PERRY, ONTARIO

PROJECT NUMBER 21184.4

"ISSUED FOR TENDER"

DATE January 2025

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END OF SECTION

PART 1 GENERAL

1.1 Section Includes

.1 Work covered by contract documents
.2 Location of the site
.3 Permits and approvals
.4 Site access
.5 Contractor traffic route
.6 Work sequence
.7 Contractor use of premises
.8 References and codes
.9 Engineer design
.10 Hazardous material discovery
.11 Building smoking environment
.12 Special conditions
.13 Site security
.14 Protection of Drawings
.15 “By Others”

1.2 Work Covered by Contract Documents

.1 Work of this Contract comprises the Partial Window Replacement and Cluster Column Rehabilitation Phase 4 at Port Perry High School on behalf of Durham District School Board (DDSB), and as indicated on the drawings and specifications. This work is specific to the original 1926 building.

1.3 Location of Site

.1 The Work of this Contract is located at 160 Rosa Street, Port Perry, Ontario.

1.4 Permits and Approvals

.1 Comply with the requirements of the Durham District School Board.

.2 Comply with Town of Port Perry Bylaws.

.3 Obtain and pay for all necessary permits and licenses required to complete the work.

1.5 Site Access

.1 Access to the site to be arranged by the Owner.

.2 Provide secure construction fencing and/or temporary hoarding as specified and where directed by the Owner.

.3 Refer to the Site Location Plan for site storage, staging and laydown areas. Note that site storage is limited. Arrange deliveries of materials and equipment to suit DDSB working hours and delivery schedules.

.4 Include for all on and off site storage and staging as required, site storage and marshalling areas are limited. Note, the school will be in use by students and DDSB staff during the construction time

frame. Extreme care and caution must be taken in the storage of materials on site. Coordinate with owner all storage areas, and maintain full security.

1.6 Contractor Traffic Route

.1 Commercial motor vehicles are defined as any heavy equipment, tractor trailers, cement trucks, dump trucks, cranes, any vehicle towing a trailer, and delivery type trucks larger than cube vans.

.2 Maintain fire department access/control.

.3 Maintain access for owner's employees and visitors.

.4 Comply with Town of Port Perry bylaws for street access.

1.7 Work Sequence

.1 Construct Work continuously.

1.8 Contractors Use of Premises

.1 Contractor has restricted use of designated areas of the site until Substantial Performance, in accordance with DDSB scheduling and access arrangements.

.2 Provide minimum 48 hours' notice prior to carrying any disruptive work inside the building and obtain DDSB approval prior to proceeding.

1.9 References and Codes

.1 Perform Work in accordance with Ontario Building Code (OBC), National Fire Code of Canada (NFC), the Canadian Electrical Code CSA C22.1-15, and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:
.1 Contract documents.
.2 Specified standards, codes and referenced documents.

1.10 Engineer Design

.1 Where specifications require work to be designed by an engineer, engage an engineer licensed in the Province of Ontario to design such work.

1.11 Hazardous Material Discovery

.1 Refer to Designated Substances reports provided by the Owner for known hazardous materials and designated substances.

.2 Should any other material not identified in the above referenced report material and resembling asbestos or other hazardous substances be encountered in course of demolition work, immediately stop work and notify the Consultant.

1.12 Building Smoking Environment

.1 Smoking and vaping is prohibited in all workplaces within the Owner's buildings and on DDSB property.

1.13 Special Conditions

.1 The contractor will be working in and around students and DDSB staff for the duration of the contract. Extreme care and caution will be required in the completion of this work.

.2 All existing surfaces and finishes are to be repaired wherever damaged during the course of the Work.

.3 Include to supply and install all scaffolding or engineered platforms to carry out all work. Any temporary work platform type selected to complete the restoration work must be engineered.

1.14 Site Security

.1 Ensure the site is secure at all times, and ensure the building remains weatherproof.

1.15 Protection of Drawings

.1 Copyright of electronic document belongs to the Consultant. Electronic documents may not be forwarded to others, transmitted, downloaded or reproduced in any format, whether print or electronic, without the express, written permission of the copyright owner.

.2 Drawings, specifications and other contract related documents which are posted on Contractor controlled websites for access by sub-trades and suppliers, shall be posted only on password protected and secure websites approved by the Consultant to limit access to those with an expressed interest in the Project.

.3 Provide Consultant and owner with access to such websites as noted above.

1.16 "By Others"

.1 The term "by others" where it is used in the contract documents means that work shown or described in the contract documents and labeled with this designation is not included in the specific sub-trade's scope

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

End of Section

PART 1 GENERAL

1.1 General Requirements

.1 Unless specified otherwise, the provisions of all Sections of Division 1 shall apply to all Sections of the specifications.

.2 Study all Contract Documents to determine additional work required by your Section on which the work of other Sections depend.

.3 Workmanship shall be of highest quality in accordance with best standard practice for this type of work, except where specified more precisely.

.4 All materials shall be exactly as specified or approved alternate.

1.2 Specification Format

.1 These specifications are not intended as a detailed description of installation methods but serve to indicate particular requirements in the completed work.

.2 The Specification format is based on the Uniform Construction Index (U.C.I.) and the three part format of the Canadian National Master Specification. It is the contractor's sole responsibility to provide all Work indicated in the Contract Documents.

.3 Separation of materials and products by Section, does not relieve the Contractor of his responsibility to coordinate and complete all Sections of the Work in its entirety, and in accordance with the Contract Documents.

1.3 Co-Operation

.1 Cooperate with and coordinate with other trades as required for the satisfactory and expeditious completion of the work. Take field dimensions relative to this work. Fabricate and erect work to suit field dimensions and field conditions. Provide all forms, templates, anchors, sleeves, inserts and accessories required to be fixed to or inserted in the work and set in place or instruct the related trades as to their location. Pay the cost of extra work caused by and make up time lost as the result of failure to provide the necessary cooperation, information or items to be fixed to or built in.

.2 Cooperate fully with, and provide assistance to, all outside authorities including Building Inspectors, testing agencies and Consultants, with the inspection of the work.

.3 Existing building materials to be tested by DDSB environmental consultant for designated substances prior to demolition. Contractor to coordinate with the DDSB environmental consultant for testing and removals of all designated substances and to provide access to the exterior façade as required.

1.4 Cutting and Patching

.1 Cut, patch and make good to leave work in a finished condition.

.2 Do cutting and patching in the following manner:
.1 Regardless of which Subcontractor or Section of the specifications is responsible for any portion of cutting and patching work, in each case tradesmen qualified in the work being cut and patched shall be employed to ensure that it is correctly done.
.2 Make cuts with clean, true, smooth edges. Fit units to tolerances established and in conformance with best standard practice for applicable class of work. Make patches invisible in finished work.
.3 Co-ordinate work of all Sections, taking into account existing installations to assure best arrangement of components in available space. For critical locations review with Consultant before commencing work.

1.5 Closing Off Areas

.1 Close off access routes by placing barricades or to prevent unauthorized personnel from having access to areas of the work. Post signage for all alternate routes seek approvals from the building and fire department prior to proceeding. Unauthorized personnel shall mean anyone not directly concerned with the execution, supervision or inspection of the work. Any blocked access routes must be coordinated and approved by DDSB prior to proceeding.

1.6 Verification

.1 Carefully check the drawings and specifications and bring to the attention of the Consultant any apparent discrepancies or dimensional errors before proceeding with the work. Any deviation from the specifications and drawings shall be brought to the attention of the Consultant for decision before proceeding with the work. Check and verify all dimensions at the job site.

.2 All dimensions when pertaining to the work of other trades shall be verified with the Contractor concerned prior to start of the work.

1.7 Ownership of Materials

.1 All work or material delivered on the site or premises to form part of the works, shall be considered the property of the Contractor until installed and shall not be removed without the consent of the Owner, but the Contractor shall have the right to and shall remove the surplus material after he has completed the work.

.2 All excess or un-used materials shall be removed from the Owner's property.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Connecting to existing services.
.2 Scheduling requirements.
.3 Owners access.

1.2 Related Work

.1 Temporary Barriers and Enclosures Section 01 56 00

1.3 Existing Services

.1 Where any construction activities involve disruptions to the buildings existing services, carry out Work as approved by DDSB and at times directed by DDSB and/or authorities having jurisdiction. Schedule disruptions to services in consultation with the Owners and complete such work in off-hours when necessary.

.2 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.4 Scheduling Requirements

.1 Work shall be scheduled by the Contractor.

.2 Working hours shall be in accordance with local by-laws and ordinances where applicable.

.3 Refrain from work on Statutory Holidays recognized by Durham District School Board (DDSB) unless otherwise authorized.

.4 Provide all necessary protection including access routes for the public, to existing facilities at all times.

.5 A written procedure identifying all the work and detailed timing must be submitted by the Contractor for approval by the Consultant and Owner. All necessary governing authority approvals must be obtained and included with the proposed work plan submission.

.6 Provide all labour, material and equipment necessary to meet the schedule.

1.5 Owners Access

.1 Maintain access to aisle ways and parking areas at all times during construction.

.2 Provide access for other contractors or suppliers when required by the Owner.

.3 Maintain access to site as required for emergency services personnel.

.4 Maintain access to occupied areas.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Pre-construction meeting.
.2 Site meetings.
.3 Supervision.
.4 Documents on site.

1.2 Pre-Construction Meeting

.1 Immediately prior to construction and upon notification, attend where directed by the Owner, pre-construction meeting along with representatives of major subcontractors as requested by the Consultant and Owner.

.2 Purpose of the meeting will be as follows:
.1 Review communication procedures.
.2 Review contract administration requirements including submittals, payment and change notice procedures.
.3 Review construction schedule and identify critical dates and points in the schedule.
.4 Review construction constraints including owner's access to the site.
.5 Review procedures for independent Inspection and Testing.
.6 Identify product availability problems and substitution requests.
.7 Establish site arrangements and temporary facilities.
.8 Review any items requiring clarification.
.9 Review all historic documents and reference material related to the condition of the building site.

1.3 Site Meetings

.1 Prior to commencement of the Work, the Contractor together with the Owner and Consultant, shall mutually agree on a schedule for on-site project meetings.

.2 Organize, schedule and administer all necessary meetings. Ensure that persons whose presence is required are in attendance and that relative information is available to allow meetings to be conducted efficiently.

.3 The Contractor will prepare agenda and record minutes of each project meeting and will promptly distribute copies to be received by all participants and affected parties not in attendance not later than four days after meeting.

.4 Meetings shall be held bi-weekly unless mutually agreed otherwise.

.5 Additional trade specific "pre-construction meetings" will be held as required by the various Sections of the specifications.

1.4 Supervision

.1 Employ an experienced and qualified superintendent who shall devote his time exclusively to the work of this Contract and who shall be in complete charge of the work from commencement until Total Completion. A working foreperson will not be acceptable. The superintendent shall not be changed after commencement of the work without approval of the Consultant and the Owner.

.2 Supervise, direct, manage and control the work of all forces carrying out the work, including contractors and suppliers. Carry out daily inspections by the Contractor's forces to ensure compliance with the Contract Documents and the maintenance of quality standards. Ensure that the inspectors employed are personnel competent in inspecting the work of the mechanical and electrical trades.

1.5 Documents on Site

.1 Contractors field office shall at all times contain a complete set of Contract Documents including:
- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Reviewed Shop Drawings.
- .5 Samples.
- .6 Progress reports.
- .7 Supplemental Instructions.
- .8 Change Orders
- .9 Change Directives and logs.
- .10 Inspection and Test reports
- .11 Meeting minutes.
- .12 All as-built record documents related to the project and work including drawings provided by the Owner.

.2 Maintain approved building permit drawings and all related municipal inspection reports on site at all times.

.3 Maintain a copy of the current Ontario Building Code (O.Reg. 332/12) including Supplements, the Canadian Electrical Code, The Occupational Health and Safety Act, the Environmental Protection Act, the Ontario Fire Code and all other applicable legislated or referenced standards.

.4 Maintain a copy of the Contractor's approved Fire Safety Plan, Waste Management Plan and Corporate Health & Safety Policy.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Administrative
.2 Shop Drawings and Product Data
.3 Interference Drawings
.4 Progress Photographs
.5 Samples
.6 Mock-Ups
.7 Certificates and Transcripts

1.2 Administrative

.1 Submit to Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Work affected by submittal shall not proceed until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in Imperial units.

.4 Where items or information is not produced in Imperial units converted values are acceptable.

.5 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Consultant in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent work are coordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant’s review.

.10 Keep one reviewed copy of each submission on site.

1.3 Shop Drawings and Product Data

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided to illustrate details of a portion of Work.

.2 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.

.3 Submit shop drawings bearing stamp and signature of qualified professional Engineer registered or licensed in the Province of Ontario where required by the individual specification sections. Each submittal and each resubmittal must bear the stamp of the Engineer

.4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.5 Allow ten (10) days for Consultant's review of each submission.

.6 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.

.7 Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.

.8 Accompany submissions with transmittal letter containing:
- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.9 Submissions shall include:
- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.10 After Consultant's review, distribute copies.

.11 Submit 3 prints plus one electronic copy in PDF format of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.

.12 Submit electronic copy in PDF format of product data sheets or brochures for requirements requested in Specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.

.13 Delete information not applicable to project.

.14 Supplement standard information to provide details applicable to project.

.15 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.16 The review of shop drawings by the Consultant is for sole purpose of ascertaining conformance with general concept.
- .1 This review shall not mean that the Consultant approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
- .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.4 Interference Drawings

.1 Prepare interference drawings to coordinate the installation of the work of all sections, within available space. Conflicts between trades which could be determined beforehand, by the careful coordination and preparation of interference drawings, shall be corrected at no expense to the Owner.

.2 Prepare interference drawings of all buried services as necessary to avoid conflicts with new or existing structures, foundations or services.

1.5 Progress Photographs

.1 Progress photograph to be electronically formatted and labelled as to location and view.

1.6 Samples

.1 Submit for review samples as requested in respective specification Sections. Label samples with origin, manufacturer, product information, applicable specification section, and intended use.

.2 Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.3 Where colour, pattern or texture is criterion, submit full range of manufacturer’s samples.

.4 Adjustments made on samples by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.

.5 Make changes in samples which Consultant may require, consistent with Contract Documents.

.6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.7 Mock-Ups

.1 Erect mock-ups in accordance with 01 45 00 – Quality Control.

1.8 Certificates and Transcripts

.1 Submit Workers' Compensation Board status.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Administrative
.2 Fires
.3 Disposal of Wastes
.4 Pollution Control

1.2 Related Sections

.1 Section 01 51 00 Temporary Utilities
.2 Section 01 56 00 Temporary Barriers and Enclosures
.3 Section 01 74 19 Construction Waste Management and Disposal

1.3 References

.1 Statutes of Canada 1999 Chapter 33. Canadian Environmental Protection Act 1999.
.1 Transportation of Dangerous Goods Act, 1992 (1992, c. 34)

1.4 Administrative

.1 Comply with all federal, provincial, and municipal regulatory requirements and guidelines for environmental protection and natural resource conservation, including those referenced above.

.2 The Work Site is subject to inspection by the Consultant, without prior notice.

.3 Failure to comply with environmental requirements may result in a stop work order or assessment of damages commensurate with repair of damage.

.4 It is the Contractor's responsibility to be aware of environmental requirements and the best management practices and pollution control measures necessary to meet them.

.5 It is the Contractor's responsibility to obtain and abide by permits, licenses and compliance certificates at appropriate times and frequencies as required by the authorities having jurisdiction.

.6 All hazardous materials are to be stored with secondary containment. Contractor to coordinate with DDSB environmental consultant for all testing and removals.

1.5 Fires

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

1.6 Disposal of Wastes

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.7 Pollution Control

.1 Control emissions from equipment to conform to federal, provincial, and municipal requirements.

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

.3 Take all measures necessary to prevent material and mud tracking on adjacent roads and streets.

.4 Use mechanical sweepers as often as necessary to keep adjacent roads and streets clean of material and mud that is deposited from this project.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 References.
.2 Owner's Regulations.
.3 Standards and Definitions.
.4 Hazardous Materials.
.5 Spill Reporting
.6 Protection of Trees
.7 Access for Inspection and Testing.
.8 Other Regulatory Requirements.

1.2 Related Work

.1 General Instructions	Section 01 11 50
.2 Safety Requirements	Section 01 54 50

1.3 References

.1 Perform Work in accordance with the Ontario Building Code Act, O. Reg. 350/06, the Ontario Building Code (OBC) including all Supplements and other codes of provincial or local regulation provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Where a material is designated in the Contract Documents for a certain application, unless otherwise specified, that material shall conform to standards designated in the Code. Similarly, unless otherwise specified, installation methods and standards of workmanship shall also conform to standards invoked by the aforementioned Code.

.3 Meet or exceed requirements of:
.1 Contract documents.
.2 Specified standards, codes and referenced documents.
.3 Manufacturer's instructions.

.4 Where requirements of Contract Documents exceed Code requirements provide such additional requirements.

.5 Where the Building Code or the Contract Documents do not provide all information necessary for complete installation of an item, then the manufacturer's instructions for first quality workmanship shall be strictly complied with.

1.4 Owner's Regulations

.1 Conform to requirements, regulations and procedures of the Owner.

1.5 Standards and Definitions

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

.2 Have a copy of each specified standard which relates to your work available on the site to be produced immediately on Consultant's request.

.3 Where a standard designates authorities such as the "Engineer", the "Owner" (when used in a sense other than that defined in the General Conditions) the "Purchaser" or some other such designation, these designations shall be taken to mean the Consultant.

.4 Wherever the words "acceptable", "approved", "satisfactory", "selected", "directed", "submit", or similar words or phrases are used in standards or elsewhere in the Contract Documents, it shall be understood that they mean, unless the context provides otherwise, "acceptable to the Consultant", "approved by the Consultant", "satisfactory to the Consultant", "selected by the Consultant", "directed by the Consultant", "inspected by the Consultant", "instructed by the Consultant", "required by the Consultant" and "submit to the Consultants".

1.6 Hazardous Materials

.1 The Owner will arrange for independent testing of suspected hazardous materials of confirmed hazardous substances encountered on the site. Refer to the site Environmental Provisions and Procedures for additional information.

.2 In the event of discovery of potentially hazardous materials, immediately stop work and notify the Owner, both orally and in writing.

.3 "Hazardous Materials" will not be introduced for experimental or any other use prior to being evaluated for hazards.

.4 Make known to the Consultant those "hazardous materials" intended to be used in the workplace and receive "Permission to Use" before introducing to the Owner’s property.

.5 Provide SDS for all materials brought to the Place of Work.

.6 Definition: "Hazardous Material" is material, in any form, which by its nature, may be flammable, explosive, irritating, corrosive, poisonous, or may react violently with other materials, if used, handled or stored improperly. Included are substances prohibited, restricted, designated or otherwise controlled by law.

.7 Many common construction materials such as asbestos pipe and various insulations are hazardous materials and shall not be used under any circumstances. Such materials are banned from the Owner’s facilities.

1.7 Spills Reporting

.1 Spills or discharges of pollutants or contaminants under the control of the Contractor, and spills or discharges of pollutants or contaminants that are a result of the Contractor's operations that cause or are likely to cause adverse effects shall forthwith be reported to the Consultant. Such spills or discharges and their adverse effects shall be as defined in the Environmental Protection Act R.S.O. 1980.

.2 All spills or discharges of liquid, other than accumulated rain water, from luminaries, internally illuminated signs, lamps, and liquid type transformers under the control of the Contractor, and all spills or discharges from this equipment that are a result of the Contractor's operations shall, unless otherwise indicated in the Contract, be assumed to contain PCB's and shall forthwith be reported to the Consultant.

.3 This reporting will not relieve the Contractor of his legislated responsibilities regarding such spills or discharges.

1.8 Protection of Trees

.1 The site has trees around the work area which must be protected with adequate barriers and hoarding for the duration of construction. Damage to the trees will result in fines and replacement of multiple new trees to suit local by-law requirements.

1.9 Access for Inspections and Testing

.1 Cooperate fully with and provide assistance to, all outside authorities including Building Inspectors, utilities, testing agencies and consultants, with the inspection of the Work.

1.10 Other Regulatory Requirements

.1 Conform to the requirements of the Ontario Ministry of Transportation, Regional and Local authorities regarding transportation of materials.

.2 Obtain required road occupancy permits.

.3 Pay any required roadway damage deposits required by the municipality.

.4 Conform to the requirements of the Ontario Ministry of the Environment.

.5 Conform to the requirements of the Ontario Ministry of Labour.

.6 Conform to all applicable local by-laws, regulations and ordinances.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Inspection
.2 Independent Inspection Agencies.
.3 Access to Work
.4 Procedures
.5 Rejected Work
.6 Reports
.7 Contractors Responsibilities
.8 Tests
.9 Mock-Ups

1.2 Inspection

.1 Contractor is responsible for Quality Control (QC).

.2 Allow Owner and Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.

.4 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.5 Consultant will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Owner shall pay cost of examination and replacement.

1.3 Independent Inspection Agencies

.1 Independent Inspection/Testing Agencies will be engaged by Contractor for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Contractor.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Consultant. Pay costs for retesting and re-inspection.

1.4 Access to Work

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.5 Procedures

.1 Notify Owner and Consultant 48 hours in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples

1.6 Rejected Work

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Consultant it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Consultant will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Consultant.

1.7 Reports

.1 Submit electronic pdf format inspection and test reports to Consultant.

.2 Provide copies to Subcontractor of work being inspected or tested or manufacturer or fabricator of material being inspected or tested.

1.8 Contractors Responsibilities

.1 Contractor is responsible for the execution of the Construction Quality Plan and is to pay all costs for the execution of the Construction Quality Plan. Designate an experienced site representative for carrying out the Construction Quality Plan.

.2 The Contractor is responsible to provide the Owner with a completed quality product for the Work. Each Contractor shall be responsible for any costs associated with re-testing and reperforming the Work as a result of the Contractor's poor performance or workmanship or other failure to comply with the Contract Documents.

.3 All Work shall be done by persons qualified in their respective trades, and the workmanship shall be first-class in every respect. Each Contractor is responsible for ensuring employees are appropriately trained. All materials and equipment furnished shall be the best of their respective kinds for the intended use and unless otherwise specified, same shall be new and of the latest design.

.4 The Contractor shall provide the Owner and the Consultant access to the Work in preparation and progress wherever the Work is located at all reasonable times.

.5 The Consultant will have the authority to reject Work that does not conform to the Contract Documents or may require special inspection or testing, whether or not such Work is to be then fabricated, installed or completed.

.6 Failure by a Contractor to conduct its operations, means and methods and coordinate proper sequencing of the Work may cause the Owner to withhold payment or any other means deemed necessary to correct non-conforming Work.

.7 The Owner shall engage and pay for without cost to the Contractors, a testing firm to perform such engineering laboratory services and on-site inspection as deemed necessary by the Owner, The Consultant will determine compliance with the requirements of the Contract Documents. This Work will not be a service to the Contractors for the performing of tests and checking of materials required of the Contractors.

.8 Copies of test and inspection reports will be furnished to the appropriate Contractors. The laboratory and its representatives will be instructed to promptly call to the attention of the Contractor, any instance of non-compliance with the requirements of the Contract Documents. Failure to so notify the Contractor shall not relieve the Contractor of any of its responsibilities for compliance or making good workmanship or materials which are not in compliance with the requirements of the Contract Documents. The agency shall notify the Consultant and the Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services

.9 Contractor's construction materials, procedures and work shall be subject to specified testing procedures and shall be in conformance with the Contract Documents as verified by Testing Agency.

.10 Each Contractor shall cooperate with the testing firm and provide labor to assist with sample preparations where applicable.

.11 Except where specifically indicated to be provided by another entity as identified, inspections, tests, and similar quality control services including those specified to be performed by independent agency are the Contractor’s responsibility, and costs thereof are not to be included in contract sum.

.12 Responsibility for Associated Services: Contractor is required to cooperate with independent agencies performing required inspections, tests, and similar services. Provide auxiliary services as reasonably requested, including access to Work, the taking of samples or assistance with the taking of samples, delivery of samples to test laboratories, and security and protection for samples and test equipment at Project site.

.13 Coordination: Contractor and each engaged independent agency performing inspections, tests, and similar services for project are required to coordinate and sequence activities so as to accommodate required services with minimum delay of Work and without the need of removal/replacement of work to accommodate inspections and tests. Scheduling of times for inspections, tests, taking of samples, and similar activities is Contractor’s responsibility.

.14 Where sampling and testing is required for Sections of Work listed in the Contract Documents, the tests shall be performed by an independent testing lab and paid for by the Contractor.

.15 Test procedures to be used shall be submitted for approval of the Consultant where other than those specified are recommended by the testing agency.

.16 Testing Agency Duties: The independent Testing Agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Owner, the Consultant and Contractors in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.

.17 Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

1.9 Tests

.1 Furnish test results as requested.

.2 Cost of tests beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Consultant and may be authorized as recoverable.

1.10 Mock Ups

.1 Prepare mock-ups for Work specifically requested in specifications.

.2 Construct in locations acceptable to Consultant.

.3 Prepare mock-ups for Consultant's review with reasonable promptness and in orderly sequence, to not cause delays in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.5 Mock-ups may remain as part of Work unless indicated otherwise.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Installation and Removal
.2 Scaffolding
.3 Hoisting
.4 Site storage.
.5 Construction Parking
.6 Offices
.7 Equipment and Material Storage.
.8 Sanitary facilities.
.9 Construction Signage.
.10 Shoring

1.2 References

.1 Canadian Standards Association (CSA International)
.1 CAN/CSA Z321-96 (R2006), Signs and Symbols for the Workplace

1.3 Installation and Removal

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

.2 Remove from site all such work after use.

1.4 Scaffolding

.1 Provide and maintain scaffolding, ramps, ladders and platforms.

1.5 Hoisting

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

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

1.6 Site Storage/Loading

.1 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.

1.7 Construction Parking

.1 Parking will be permitted on site at areas designated by the Owner provided it does not disrupt performance of Work or ongoing Owners operations.

.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.

1.8 Offices

.1 General Contractor and Subcontractors may provide their own offices as necessary and subject to site constraints. Direct location of these offices.

1.9 Equipment, Tool and Material 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.

1.10 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. Keep area and premises in sanitary condition.

1.11 Construction Signage

.1 Direct requests for approval to erect a Contractor signboard to Consultant.

.2 Signs and notices for safety and instruction shall be in English. Graphic symbols shall conform to CAN/CSA Z321-96 (R2006).

.3 Post "Construction Zone" signage outside barrier and entrance to all work areas.

.4 Maintain approved signs and notices in good condition for duration of project, and dispose of off-site on completion of project.

.5 Install signage to direct site traffic and deliveries to the Construction work areas.

1.12 Shoring

.1 Examine the site to determine the conditions under which work will be performed.

.2 Contractor shall formulate his own conclusions as to the extent of the existing conditions and shoring required.

.3 The method of shoring shall be according to the Contractor's and his Engineer's directions.

.4 All existing loads must be shored prior to commencement of demolition and removal of load bearing elements.

.5 All shoring and frame braces must be supplied with a safe load rating which must not be exceeded. Install in accordance with manufacturer's recommended procedures and safety guidelines. Ensure that the safe load conditions of the shoring are not exceeded by dead, live or construction loads.

.6 All shoring shall be subject to the Consultant's review and approval prior to commencing demolition work.

.7 Submit shoring drawings and a proposed installation procedure stamped by a professional engineer registered in the Province of Ontario. Procedures shall follow the information provided on these drawings. The shoring design engineer shall be retained and paid for by the Contractor. The shoring engineer shall review all existing conditions on site prior to completing shoring design.

.8 Removal of existing materials without proper engineered shoring is a safety hazard and will not be permitted.

.9 Make good all damage to the existing structure and adjoining structures and bear full responsibility for failure to provide adequate shoring.

.10 The failure or refusal of the Consultant to suggest the use of shoring, shall not in any way or to any extent relieve the Contractor of any responsibility concerning the condition of the work or of any of their obligations under the Contract, nor impose any liability on the Owner or their agents; nor shall any delay, whether caused by any action or want of action on the part of the Contractor, or by any act of the Owner, or their agents, or employees, relieve the Contractor from necessity of properly and adequately protecting the existing structure from collapse or damage, nor from and of his obligations under the Contract relating to injury to persons or property, nor entitle him to any claims for extra compensation or an extension in schedule.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Requirements for temporary scaffolding.

1.2 Related Sections

.1 Section 01 33 00 Submittal Procedures.
.2 Section 01 52 00 Construction Facilities.

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM G154-12a Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials
.2 Canadian General Standards Board (CGSB)
  .1 CAN /CGSB -4.2 Textile Test Methods:
    .1 9.2-M 90 (R2004), Breaking Strength of Fabrics - Grab Method - Constant-time-to-break Principle.
    .2 9.4-M 91 (R 2004), Breaking Strength of Yarns - Single Strand Method.
    .3 11.1-94 (R 2000), Bursting Strength - Diaphragm Pressure Test.
.3 Underwriters Laboratories of Canada (ULC).
  .1 CAN/ULC -S109-03, Flame Tests of Flame-Resistant Fabrics and Films.

1.4 Submittals

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

.2 Scaffolding Drawings:
  .1 Submit drawings of each proposed temporary scaffolding assembly. Do not commence work on site until drawings have been reviewed and accepted by the Consultant.
  .2 Indicate the general layout of the scaffolding, materials, profiles, and details of connections.
  .3 Include exact locations of attachments to the existing buildings and complete details of methods of attachment.
  .4 Temporary scaffolding, including all related connections and fastenings, shall be designed by a structural engineer licensed to practice in the Province of Ontario. Each scaffolding drawing submitted shall bear the stamp and signature of the aforesaid structural engineer.

.3 If requested by the Consultant, submit engineering calculations.

.4 Post-Installation Certification: After the installation of each scaffolding assembly, provide written certification, signed by the Structural Engineer responsible for the scaffolding design, that all items have been properly installed in accordance with the scaffolding drawings and that the scaffolding assembly is compliant with governing regulations.

1.5 Design Responsibility

.1 Notwithstanding the requirements specified herein, the Contractor is responsible for the design and construction of temporary scaffolding and associated ladders, hoists, netting, cold weather enclosures and related items.

1.6 Regulatory Requirements

.1 The design and construction of the temporary scaffolding shall comply with all applicable municipal, provincial and federal safety regulations.

.2 Make required submittals to the authorities having jurisdiction and obtain necessary approvals and permits.

PART 2 PRODUCTS

2.1 Scaffolding

.1 Provide a demountable temporary metal scaffolding system, complete with all accessories, with the following characteristics:
- .1 Construct scaffolding from corrosion-resistant materials such as galvanized or stainless steel or aluminum.
- .2 Design the scaffolding assemblies to carry design loads, including wind loads imposed by the wind resistance of the netting.
- .3 Design and construct each scaffolding assembly so that it derives no vertical support from the building and requires minimum attachment to the building fabric.
- .4 Devices for attachment to the building fabric shall be fabricated from stainless steel and shall be reviewed and accepted by the Consultant prior to installation.
- .5 Generally, scaffolding shall consist of two rows of standards (vertical supports, connected by ledgers and transoms (horizontal elements)). Standards shall sit on timber sole plates to distribute the imposed loads and to protect the ground surfaces. If telescopic standards are used they shall be plumb and properly founded. Use only the manufacturer’s high tensile steel pins for support.
- .6 Equip scaffolding with sufficient platform s to provide complete access to the building facade without having to move platforms up or down.
- .7 Platforms shall be undamaged and shall not become slippery when wet. Remove and replace boards which are damaged and/or become slippery.
- .8 Provide an effective means to hold down platform boards in high winds.
- .9 If masonry units or other heavy localized loads are to be carried on a platform during the course of the work, design the supporting scaffolding framing and the platform for the loads to be supported.
- .10 Design and construct attachments to the building to minimize damage to the building fabric. Fabricate all attachments from stainless steel.
- .11 Design and erect scaffolding so that the building fabric is not damaged when minor movement occurs under loading conditions. Provide all tube ends within 25 mm of the wall surface with plastic end caps

PART 3 EXECUTION

3.1 Examination and Preparation

.1 Examine areas and conditions under which each scaffold is to be erected and notify the Consultant in writing of conditions detrimental to a proper scaffolding assembly.

.2 Verify that the ground surface provides adequate support for the scaffold structure.

.3 Examine the building at each point of attachment of the scaffold and verify the adequacy of the building fabric to accept the fastener with minim al damage and to withstand the in-service loads imposed by the scaffold.

.4 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.

.5 Obtain the Consultant's written approval of the locations and methods of attachment to the existing building fabric prior to the erection of each scaffold.

.6 Commencement of the erection of scaffolding will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for damage to the existing building fabric and shall make good any such dam age to the satisfaction of the Consultant and at no additional cost to the Contract.

3.2 Scaffold Erection

.1 Erect each scaffold in accordance with the reviewed and accepted scaffolding drawings and in conformity with applicable construction safety regulations.

.2 Install netting.
- .1 Do not attempt to install netting in windy conditions.
- .2 Tie netting to scaffold frame at the frequency indicated on the scaffolding drawings and recommended by the netting manufacturer.
- .3 At adjacent roll edges, overlap webbing and pass ties through both eyelets.

3.3 Inspections

.1 After the erection of each scaffold, have the engineer responsible for the scaffold design conduct a site inspection and issue the specified post-installation certification. Make any adjustments required by the scaffolding engineer and/or the authorities having jurisdiction.

.2 Conduct weekly inspections of each scaffold to verify netting remains firmly tied and scaffold frame, platform s and accessories remain in proper condition. Replace broken ties and torn netting. Adjust, repair or replace defective platform components, framing members, connectors and accessories to the satisfaction of the scaffolding engineer and/or the authorities having jurisdiction.

3.4 Scaffold Removal

.1 Deconstruct and remove each scaffold as soon as it is no longer required for the execution of the work and after review and acceptance of the work by the Consultant.

.2 Make good damage to the building fabric at the points of attachment and restore ground surfaces to a condition at least equal to that which existed prior to commencement of the work.

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Installation and Removal.
.2 Site Fencing.
.3 Hoarding.
.4 Guard Rails and Barricades.
.5 Weather Enclosures.
.6 Dust Tight Screens.
.7 Access to Site.
.8 Public Traffic Flow.
.9 Fire Routes.
.10 Protection for off-site and Public Property.
.11 Protection of Building Finishes.

1.2 Installation and Removal

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.3 Site Fencing

.1 Contractor's lay-down area to be determined at pre-construction meeting must be secure and there must be no access by unauthorized persons. Provide temporary fencing around whole work site. Use modular free-standing fencing: galvanized, minimum 1.8m high, chain link or welded steel mesh, pipe rail. Provide one lockable truck entrance gate and at least one pedestrian door as directed. Equip all gates with locks and keys. Maintain fence in good repair.

1.4 Hoarding

.1 Erect temporary site enclosure as required for safe entrance and exit, using new solid plywood hoarding, minimum 1.8 metres high. Provide gates as necessary. Maintain hoarding in good repair.

1.5 Guard Rails and Barricades

.1 Provide secure, rigid guard rails and barricades around all accessible window openings, open to the general public.

.2 Provide as required by governing authorities.

1.6 Weather Enclosures

.1 Provide weather tight closures to unfinished door and window openings and exterior walls.

.2 Design enclosures to withstand wind pressure and snow loading.

1.7 Dust Tight Screens

.1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such work is complete.

1.8 Access to Site

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

1.9 Public Traffic Flow

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

1.10 Fire Routes

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

1.11 Protection for Off Site and Public Property

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred

1.12 Protection of Building Finishes

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Consultant locations and installation schedule 3 days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 References
.2 Quality
.3 Availability
.4 Storage, Handling and Protection
.5 Transportation
.6 Manufacturer's Instructions
.7 Quality of Work
.8 Coordination
.9 Remedial Work
.10 Fastenings
.11 Fastenings- Equipment
.12 Protection of Work in Progress
.13 Existing Utilities

1.2 Related Work

.1 General Instructions Section 01 11 50

1.3 References

.1 Within text of each specifications section, reference may be made to reference standards.

.2 Conform to these reference standards, in whole or in part as specifically requested in specifications.

.3 If there is question as to whether products or systems are in conformance with applicable standards, Consultant reserves right to have such products or systems tested to prove or disprove conformance.

1.4 Quality

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections or whether product is installed fully or partly. 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 disputes arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.

.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 items. 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.

.2 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, Handling And Protection

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather. Store sand without direct contact to the ground by use of tarpaulin or polythene sheets.

.6 Store sheet materials, lumber and panel products on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of Consultant.

.9 Touch-up damaged factory finished surfaces to Consultant's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.7 Transportation

.1 Pay costs of transportation of products required in performance of Work.

.2 Unload, handle and store products supplied and delivered to site by Owner.

1.8 Manufacturer’s Instructions

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

.2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant will 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, 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 Co-ordinate all sections of the work. The responsibility as to which subcontractor, or supplier provides labour, material, equipment or services rests solely with the Contractor. The Consultant will not be required to settle disputes between the Contractor and subcontractors or suppliers.

.2 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

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

1.11 Remedial Work

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

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

1.12 Fastenings

.1 Supply all fastenings, anchors and accessories and adhesives required for fabrication and erection of the work.

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

.3 Metal fastenings shall be of the same material as the metal component they are anchoring or of a metal which will not result in an electrolytic action which would cause damage to the fastening or metal component under moist or acidic conditions.

.4 Anchoring and fastening devices or adhesive shall be of appropriate type and shall be used in sufficient quantity in such a manner as to provide positive permanent anchorage of the unit to be anchored in position. Install anchors at spacing to provide for required load carrying capacity.

.5 Prevent electrolytic action between dissimilar metals and materials.

.6 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.7 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.

.8 Keep exposed fastenings to a minimum, space evenly and install neatly.

.9 Supply adequate instructions and templates and, if necessary, supervise installation where fastenings or accessories are required to be built into work of other trades.

.10 Fastenings which cause spalling or cracking of material to which anchorage is being made are not permitted.

1.13 Fastenings- Equipment

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

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.

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

1.14 Protection Of Work In Progress

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

1.15 Existing Utilities

.1 Be responsible for the protection of all utilities where required. No claims will be considered which are based on delays or inconvenience resulting from relocation or repair due to the Contractor failing to provide adequate protection.

.2 Give proper notices for new services as may be required. Make arrangements with authorities and utilities for service connections required.

.3 Pay any charges levied by utilities or authorities for work carried out by them in connection with the Work, unless specified otherwise.

.4 Operate, maintain and pay for all utility systems affected by work of the Contract, until the building or specific portions thereof have been accepted by the Owner.

PART 2: PRODUCTS

2.01 Not Used

PART 3: EXECUTION

3.01 Not Used

End of Section

PART 1 GENERAL

1.1 Section Includes

1. Compliance Requirements
2. Responsibility of Constructor
3. Safety Requirements
4. Safety Meetings
5. Workplace Hazardous Materials Information System (WHMIS)
6. Fire Protection
7. Accident Reporting
8. Records on Site

1.2 References

.1 Federal regulations, latest edition including all amendments up to project date:
  .1 Fire Commissioners of Canada, FC 301, Standard for Construction Operations.
  .2 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
.2 Provincial regulations, latest edition including all amendments up to project date:
  .1 Ontario Building Code.
  .2 Occupational Health and Safety Act.
.3 NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2013 Edition

1.3 Submittals

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

.2 Submit to Owner and Consultant copies of the following documents, including updates issued:
  .1 Notice of Project filed with Provincial Ministry of Labour or equivalent for Place of Work
  .2 Site-specific Health and Safety Plan prior to commencement of work on the work site. Plan shall include but not be limited to the following:
    .1 Name and contact info of Contractor's Health and Safety Representative for Work Site; including twenty-four (24) hour emergency contact phone numbers.
    .2 Phone numbers of local fire, police, and ambulance outside of 911 services.
    .3 Location of nearest medical facility and level of injury that each can service.
  .3 Submit to the Owner, Consultant and Municipal Fire Department, for review, a “Fire Safety Plan” conforming to Section 2.14 of the National Fire Code of Canada. Maintain a copy of the “Fire Safety Plan” on site.
  .4 Copies of certification for all employees on site of applicable safety training including, but not limited to:
    .1 WHMIS.
    .2 Fall arrest and protection.
    .3 Suspended Access Equipment.
    .4 Erection of Scaffolding.
    .5 License for powder actuated devices.
  .5 Safety Data Sheets (SDS) of controlled products to be used.
  .6 On-site Contingency and Emergency Response Plan addressing:
    .1 Standard procedures to be implemented during emergency situations.
    .2 Preventative planning and protocols to address possible emergency situations.

.3 Guidelines for handling, storing, and disposing of hazardous materials that maybe encountered on site, including measures to prevent damage or injury in case of an accidental spill.

.4 Incident and accident reports, promptly if and upon occurrence
.1 Reports or directions issued by authorities having jurisdiction, immediately upon issuance from that authority.
.2 Accident or Incident Reports, within 24 hours of occurrence.

.5 Submit other data, information and documentation upon request by the Consultant as stipulated elsewhere in this section.

1.4 Compliance Requirements

.1 Comply with the latest edition of the Ontario Occupational Health and Safety Act, and the Regulations made pursuant to the Act.

1.5 Constructor

.1 The Contractor will be the “Constructor” as defined by the Occupational Health and Safety Act, will file a Notice of Project with the Ontario Ministry of Labour prior to commencement of the work and will pay all associated fees.

.2 The “Constructor” will be solely responsible for the safety of all persons on the Site.

1.6 Safety Requirements

.1 Observe and enforce all construction safety measures and comply with the latest edition and amending regulations of the following documents and in the event of any differences among those provisions, the most stringent shall apply:
.1 Occupational Health and Safety Act and Regulations for Construction Projects, August 1997, Ontario Regulation 213/91 including amendments.
.2 Hazardous Products Act and Canada Labour Code.
.3 The Workplace Safety and Insurance Board, O-Reg 454.
.4 Ontario Building Code Act, Ontario Regulation 332/12 including amendments.
.5 National Building Code of Canada, Part 8: Safety Measures on Construction and Demolition Sites.
.6 National Fire Code of Canada.
.7 NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2013 Edition
.8 Environmental Protection Act.
.9 The Power Commission Act.
.10 The Boiler and Pressure Vessels Act.
.11 The Elevators and Lifts Act.
.12 The Operating Engineer's Act.
.13 Municipal statutes.

.2 Obey all Federal, Provincial and Municipal Laws, Acts, Statutes, Regulations, Ordinances and By-laws which could in any way, pertain to the work outlined in the Contract, or to any employees of the Contractor. Satisfy all statutory requirements imposed by the Occupational Health and Safety Act and Regulations made thereunder, on a Contractor, and Constructor and/or Employer with

respect to or arising out of the performance of the Contractors obligations under this Contract.

.3 The supervisor of the project, will be responsible for his employees and subcontractors/suppliers maintaining standard safety practices, as well as the specific safety rules listed below, while working on the Owner's property.

.4 The Owner reserves the right to order individuals to leave the site if the individual is in violation of any safety requirement or any Act, and any expense incurred will be the responsibility of the Contractor.

.5 Notify the Owner should any hazardous condition become apparent.

.6 Enforce the use of CSA approved hard hats reflective vests, safety glasses and safety boots for all persons entering or working at the construction site. Refuse admission to those refusing to conform to this requirement.

.7 Provide safeguard and protection against accident or injury to any person on the site, adjacent work areas and adjacent property.

.8 Provide safeguard and protection against damage to adjacent structures, properties and services.

1.7 Safety Meetings

.1 Site toolbox safety meetings will be held weekly for all Contractor employees and all sub trade contractors.

.2 Where a Joint Health and Safety Committee(s) is required on a project, workers and supervisors, selected, as members of the committee must attend.

1.8 Workplace Hazardous Materials Information System (WHMIS)

.1 Contractor to be familiar with WHMIS regulations and be responsible for compliance.

.2 Contractor is responsible for all other requirements of regulations as applicable to Employers.

.3 All controlled products to be properly labelled and stored.

.4 Immediately inform Owner and Consultant if any unforeseen or peculiar safety-related factor, hazard, or condition becomes evident during performance of Work.

1.9 Fire Protection

.1 Provide and maintain safeguard and protection against fire in accordance with current fire codes and regulations.

.2 Provide temporary fire protection throughout the course of construction. Particular attention shall be paid to the elimination of fire hazards.

.3 Comply with the requirements of FCC No. 301 Standards for Construction Operations issued by the Fire Commissioner of Canada and the National Building Code.

.4 Provide and maintain portable fire extinguishers during construction, in accordance with Part 6 of

the National Fire Code of Canada and NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2013 Edition

.5 Maintain unobstructed access for firefighting at all areas in accordance with the National Building Code of Canada.

1.10 Accident Reporting

.1 Investigate and report incidents and accidents as required by Occupational Safety and Health Act, and the Regulations made pursuant to the Act.

.2 For the purpose of this contract immediately investigate and provide a report to the Consultant on incidents and accidents that involve:
.1 A resulting injury that may or may not require medical aid but involves lost time at work by the injured person(s).
.2 Exposure to toxic chemicals or substances.
.3 Property damage.
.4 Interruption to adjacent and/or integral infrastructure operations with potential loss implications.

1.11 Records on Site

.1 Maintain on site a copy of the safety documentation as specified in this section and any other safety related reports and documents issued to or received from the authorities having jurisdiction.

.2 Upon request, make copies available to the Consultant.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 Progressive Cleaning
.2 Final Cleaning

1.2 Project Cleaning

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by the Owner. Do not burn waste materials on site.

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 Provide on-site containers for collection of waste materials and debris.

.5 Provide and use clearly marked separate bins for recycling.

.6 Remove debris daily. The work site must be left clean and tidy upon completion, to the satisfaction of the Consultant.

.7 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.8 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.9 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

PART 2 PRODUCTS

2.1 Products

.1 All cleaning materials and products shall be low VOC type. Submit list of cleaning products including SDS for approval prior to commencement of cleaning operations.

.2 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.1 Final Cleaning

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and

suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Clean and polish glass, frames, and hardware. Replace broken, scratched or disfigured glazing.

.5 Remove stains, spots, marks and dirt from adjacent surfaces that are affected by the work.

.6 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.7 Remove dirt and other disfiguration from exterior surfaces that is associated with the work.

.8 Remove manufactures labelling from glazing

End of Section

PART 1 GENERAL

1.1 Section Includes

.1 References.
.2 Submittals.
.3 Waste Management Plan.
.4 Materials Source Separation Program.
.5 Disposal of Wastes.
.6 Scheduling.
.7 Storage, Handling and Protection.

1.2 Related Sections

.1 Section 01 33 00 Submittal Procedures
.2 Section 01 35 43 Environmental Procedures
.3 Section 01 74 11 Cleaning

1.3 References

.1 O. Reg. 102/94, Waste Audits and Waste Reduction Work Plans.

1.4 Submittals

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

.2 Submit 2 copies of completed Waste Management Plan (WMP) including Waste Reduction Workplan (WRW) and Materials Source Separation Program description prior to project start-up.

1.5 Waste Management Plan

.1 Waste Management Plan: Within 10 calendar days after receipt of Notice of Award of Contract, or prior to any waste removal, whichever occurs sooner, submit to the Owner and Consultant a Waste Management Plan. The Plan shall contain the following:
  .1 Analysis of the proposed job site waste to be generated, including the types of recyclable and waste materials generated (by volume or weight). In the case of demolition, a list of each item proposed to be salvaged during the course of the project should also be prepared
  .2 Alternatives to Land Filling: Contractor shall designate responsibility for preparing a list of each material proposed to be salvaged, reused, or recycled during the course of the Project.

.2 Post WMP or summary where workers at site are able to review its content.

1.6 Materials Source Separation Program (MSSP)

.1 The Waste Management Plan shall include a Source Separation Program for recyclable waste, and shall be in accordance with the established policies currently in place at the local Municipality, and the requirements of O. Reg. 102/94.

.2 Prepare MSSP and have ready for use prior to project start-up.

.3 Implement MSSP for waste generated on project in compliance with approved methods and as approved by Consultant.

.4 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and/or recyclable materials.

.5 Provide containers to deposit reusable and/or recyclable materials.

.6 Locate containers to facilitate deposit of materials without hindering daily operations.

.7 Locate separated materials in areas which minimize material damage.

.8 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.

1.7 Disposal of Wastes

.1 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.2 Provide appropriate on-site containers for collection of waste materials and debris.

.3 Provide and use clearly marked separate bins for recycling.

.4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site.

.5 Remove waste material and debris from site and deposit in waste container at end of each working day.

.6 Do not permit waste to accumulate onsite.

.7 Burying of rubbish and waste materials is prohibited.

.8 Disposal of waste into waterways, storm, or sanitary sewers is prohibited.

1.8 Scheduling

.1 Coordinate work with other activities at site to ensure timely and orderly progress of the Work.

1.9 Storage, Handling and Protection

.1 Store, materials to be reused, recycled and salvaged in locations as directed by Owner.

.2 Materials from building demolition to be salvaged or re-used are to be removed and salvaged.

.3 Unless specified otherwise, materials for removal become Contractor's property.

PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Application

.1 Do work in compliance with Waste Management Plan.

.2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

.3 Source separate materials to be reused/recycled into specified sort areas.

3.2 Diversion of Materials

.1 Separate materials from general waste stream and stockpile in separate piles or containers, to approval of Owner, and consistent with applicable fire regulations. Mark containers or stockpile areas. Provide instruction on disposal practices.

.2 On-site sale of materials is not permitted.

End of Section

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PART 1 GENERAL

1.1 Section Includes

.1 Administrative procedures preceding preliminary and final inspections of Work.

1.2 Related Work

.1 Closeout Submittals Section 01 78 00

1.3 Inspection And Declaration

.1 Contractor's Inspection: The Contractor and all Sub-contractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents. Submit duplicate copies of the deficiency list to the Owner and Consultant.
  .1 Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
  .2 Request Consultant's Inspection.

.2 Consultant's Inspection: Consultant and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:
  .1 Work has been completed and inspected for compliance with Contract Documents.
  .2 Defects have been corrected and deficiencies have been completed.
  .3 Operation of systems have been demonstrated to Owner's personnel.
  .4 Work is complete and ready for Final Inspection.

.4 Final Inspection: when items noted above are completed, request final inspection of Work by Consultant, and Contractor. If Work is deemed incomplete by the Consultant, complete outstanding items and request reinspection.

.5 Final Payment: When Consultant considers final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment.

PART 2: PRODUCTS

2.01 Not Used

PART 3: EXECUTION

3.01 Not Used

End of Section

PART 1 GENERAL

1.1 Section Includes

1. Submissions
2. Format
3. Contents
4. Record Drawings and Samples
5. Recording Actual Site Conditions
6. Materials and Finishes
7. Maintenance Materials
8. Independent Specialty Engineer's Sign-off

1.2 Related Work

.1	General Instructions	Section 01 11 50
.2	Submittal Procedures	Section 01 33 00
.3	Closeout Procedures	Section 01 77 00

1.3 Submissions

.1 Prepare instructions and data by personnel experienced in maintenance and operation of described products.

.2 Copy will be returned after final inspection, with Consultant's comments.

.3 Revise content of documents as required prior to final submittal.

.4 Two weeks prior to Substantial Performance of the Work, submit to the Consultant, three final copies of operating and maintenance manuals.

.5 Ensure spare parts, maintenance materials and special tools provided are new, not damaged or defective, and of same quality and manufacture as products provided in Work.

.6 If requested, furnish evidence as to type, source and quality of products provided.

.7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.8 Pay all costs for transportation and delivery of closeout submittals.

1.4 Format

.1 Organize data in the form of an instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 8 ½" x 11" (219 x 279 mm) with spine and face pockets.

.3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.

.4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project

and identify subject matter of contents.

.5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: Manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages

.9 Provide 2 electronic copies compatible with owner's requirements.

1.5 Contents-Each Volume

.1 Table of Contents: provide title of project, identify sections and page numbers.
  .1 Date of submission
  .2 Names, addresses, and telephone numbers of Project Team with name of responsible parties;
  .3 Schedule of products and systems, indexed to content of volume.

.2 For each product or system:
  .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
  .2 Provide contact names and telephone numbers for maintenance and repair services.

.3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

.6 Provide all reports including consultant reports, independent quality inspection reports, manufacturer reports, field testing, and all regulatory inspection reports.

.7 Provide a copy of all Engineer's sign off letters

1.6 Record Drawings And Samples

.1 In addition to requirements in General Conditions, maintain at the site for Consultant one record copy of:
  .1 Contract Drawings.
  .2 Specifications.
  .3 Addenda.
  .4 Change Orders and other modifications to the Contract.
  .5 Reviewed shop drawings, product data, and samples.
  .6 Field test records.
  .7 Inspection certificates.
  .8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

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

.5 Keep record documents and samples available for inspection by Consultant.

1.7 Recording Actual Site Conditions

.1 Record information on set of black line opaque drawings obtained from the Consultant.

.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
- .1 Any deviation from construction documents.
- .2 Measured depths of elements of foundation in relation to finish first floor datum.
- .3 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
- .4 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
- .5 Field changes of dimension and detail.
- .6 Changes made by change orders.
- .7 Details not on original Contract Drawings.
- .8 References to related shop drawings and modifications.

.5 On completion of the Work, and prior to Substantial Performance, transfer all “As-Built” information onto AutoCAD drawings and store drawings on a CD ROM or memory stick. Correct information as directed and hand over two sets of white prints, clearly marked “As-Built” and the CD ROM or memory stick to the Consultant.

.6 Specifications: legibly mark each item to record actual construction, including:
- .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
- .2 Changes made by Addenda and change orders.

.7 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.8 Materials And Finishes

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual specifications sections.

1.9 Maintenance Materials

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to site; place and store.

.4 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.10 Independent Specialty Engineers Sign-Off

.1 Prior to Substantial Performance, provide copies of signed and stamped engineers review and sign-off letters stating that the work has been built in accordance with their drawings and designs. Conditional or vague letters of sign-off will not be accepted. All specialty design engineers for all sub-contractors and suppliers will be required to review the work in progress at appropriate intervals to ensure compliance with their designs and drawings and shall provide final sign-off letters. Provide copies of all field reports issued by specialty engineers. Carry all costs associated with full compliance with this requirement.

PART 2: PRODUCTS

2.01 Not Used

PART 3: EXECUTION

3.01 Not Used

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 References

.1 The National Building Code of Canada, Part 8, Safety Measures on Construction and Demolition Sites.
.2 Ontario Regulation 102/94, Waste Audits and Waste Reduction Work Plans.
.3 Ontario Regulation 103/94.Environmental Protection Act.
.4 Ontario Regulation 213/07 The Fire Code.
.5 Ontario Regulation 232/98 Landfilling Sites.
.6 Ontario Regulation 278/05 Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations.
.7 Ontario Regulation 347 Environmental Protection Act, General - Waste Management.
.8 Ontario Regulation 350/06 The Building Code.
.9 Ontario Regulation 521/03 The Gasoline Handling Act.
.10 The Workplace Health and Safety Act, and Regulations for Construction Projects.
.11 The Gasoline Handling Act, and the Gasoline Handling Code.
.12 The Contractors Health and Safety Policy.
.13 Laws, rules and regulations of other authorities having jurisdiction.

1.3 Submittals

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

.2 Submit detailed written methodology with proposed demolition procedures and including a “Safe Work Plan” to Consultant and Owner for review prior to commencement of demolition.

.3 Submit schedule of demolition activities indicating the following:
  .1 Detailed sequence of demolition and removal work, including start and end dates for each activity.
  .2 Dates for shutoff, capping, and continuation of utility services.
  .3 If hazardous materials are encountered and disposed of, landfill records indicating receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

.4 Submit the following plans:
  .1 Phasing plan.
  .2 Fire safety plan.
  .3 Hoarding plans.
  .4 Waste management plan.

.5 Submit proposed dust-control measures.

.6 Submit proposed noise-control measures.

.7 Where required by authorities having jurisdiction, submit for approval drawings, diagrams or details clearly showing sequence of disassembly work or supporting structures.

.8 Provide a phasing plan indicating areas of work and methods of protection. Indicate hoarding, fencing and public way protection locations and details. Schedule and sequence work in accordance with the phasing plans.

.9 Drawings for structural elements of the demolition process including shoring shall bear signature and stamp of qualified professional engineer registered in the Province of Ontario.

.10 At Project Closeout: Submit record drawings in accordance with Section 01 78 00. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

1.4 Permits

.1 Obtain and pay for all other permits and comply with all laws, rules, ordinances, and regulations relating to Demolition of Building and preservation of Public Health and Safety.

1.5 Services

.1 Coordinate work in the vicinity of overhead power lines with the local Power Authority and in accordance with Ministry of Labour requirements.

1.6 Work Included

.1 Complete removal of existing windows as well as removal of facebrick to expose cluster columns as noted on the drawings.

1.7 Definitions

.1 Chemical Waste: Includes petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals and inorganic wastes.

.2 Demolition Waste: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous.

.3 Environmental Pollution and Damage: The presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human or animal life; affect other species of importance to humanity; or degrade the utility of the environment for aesthetic, cultural or historical purposes.

.4 Inert Fill: A permitted facility that accepts inert waste such as asphalt and concrete exclusively for the purpose of disposal.

.5 Inert Solids/Inert Waste: Non-liquid solid waste including, but not limited to, soil and concrete that does not contain hazardous substances or soluble pollutants at concentrations in excess of water-quality standards established by a regional water board and does not contain significant quantities of decomposable solid waste.

.6 Landfill: A landfill that accepts non-hazardous materials such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A

landfill must have a solid waste facilities permit from the Ministry of the Environment and be in conformance to O.Reg 232/98.

.7 Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.

.8 Remove: Remove and legally dispose of items, except those identified for use in recycling, re-use, and salvage programs.

.9 Reuse: The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.

.10 Solid Waste: All putrescible and nonputrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by law.

1.8 Quality Assurance

.1 Demolition Firm Qualifications: Demolition contractor shall be an experienced firm that has successfully completed demolition Work similar to that indicated for this Project.

.2 Regulatory Requirements: Comply with governing regulations before starting demolition. Comply with hauling and disposal regulations of authorities having jurisdiction. Obtain and pay for all permits required.

.3 Pre-demolition Conference: Conduct a conference at Project site.
- .1 Review the environmental goals of this Project with Contractors, subcontractors, and waste haulers and make a proactive effort to increase awareness of these goals among all labour forces on site.
- .2 Review schedule and scheduling procedures.
- .3 Review health and safety procedures.
- .4 Review of Designated Substances and Hazardous Materials Survey
- .5 Review of Project conditions including review of record photographs.

.4 Coordinate all demolition and removals with the window installer.

1.9 Shoring and Bracing

.1 Provide all shoring/scaffolding required for the execution of the work.

.2 If Owner/consultant considers additional bracing and shoring necessary to safeguard and prevent such, install bracing or shoring.

1.10 Project Site Conditions

.1 The Owner assumes no responsibility for the actual condition of the windows and doors to be demolished.

.2 Construct safety barriers, barricades, fencing and hoarding to separate public from work areas as described in Section 01 56 00.

.3 Conditions existing at the time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. Variations within the structures may occur by the Owner's salvage operations prior to start of demolition.

1.11 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

.1 All building materials removed from the building shall become the property of the Contractor unless specified otherwise and shall be removed from the Site.

.2 Conform to requirements of the General Conditions and Division 1, General Requirements, in particular, articles on Design and Safety Requirements for Temporary Work. Provide materials necessary for temporary shoring. On completion, remove temporary materials from site.

.3 Recycling:
- .1 All materials from demolition and land clearing which can be recycled through local municipal programs and which are not scheduled for salvage shall be sorted and separated in accordance with Regional, Provincial and Municipal standards and regulations.
- .2 Documentation must be kept of all recycled material in order to fill out waste reduction progress reports.
- .3 Recycle paper and beverage containers used by onsite workers. Provide recycling receptacles for the duration of construction activities at the building site.
- .4 Items of salvageable value to the Contractor may be removed from the structure as the work progresses.
- .5 All concrete, masonry, asphalt and similar materials shall be crushed prior to removals from site.

2.2 Designated Substances

.1 Should hazardous materials be encountered which are not identified in the referenced reports, stop work and contact the Owner and consultant immediately.

PART 3 EXECUTION

3.1 Examination

.1 Photograph clearly all areas of window demolition prior to the commencement of the work and submit to Consultant. Photos will be used to determine any and all building damage at conclusion of project. Areas not photographed will be determined as damaged if noted as such, subsequent to the completion of the contract.

.2 Review all areas of work to determine full extent of areas to be demolished, altered or renovated and become familiar with actual conditions and extent of work required.

.3 Before commencing demolition operations, examine site, and review site conditions. Assess strength and stability of damaged or deteriorated areas.

.4 Assess potential effect of removal of any part or parts on the remainder of structure before such part(s) are removed.

.5 Investigate for following conditions:
.1 load bearing walls
.2 presence of hazardous materials

3.2 Protection

.1 Provide, erect and maintain temporary enclosures, lights and other protection around site before commencing work. Maintain such areas free of snow, ice, mud, water and debris.

.2 Provide flagmen where necessary or appropriate, to provide effective and safe access to Site to vehicular traffic.

.3 Ensure scaffolds, ladders, equipment and other such equipment are not accessible to public. Protect with adequate fencing or remove and dismantle at end of each day or when no longer required.

.4 Provide enclosed chutes for disposal of debris from heights more than 1 storey in accordance with CAN S350-M.

.5 Do not interfere with use and activities of the building beyond hoarded off and approved areas of window demolition. Maintain free and safe passage to and from the buildings.

.6 Protect existing adjacent surfaces against damages which might occur from falling debris or other causes due to work of this Section.

3.3 Environmental Controls

.1 Comply with provincial and municipal regulations pertaining to water, air, solid waste, recycling, chemical waste, sanitary waste, sediment and noise pollution.

.2 Protection of Natural Resources:

.1 Preserve the natural resources within the project boundaries or restore to an equivalent condition.
.2 Confine demolition activities to areas defined by public roads, easements, and work area limits indicated on the drawings.
.3 Temporary Construction: Remove indications of temporary construction facilities, such as haul roads, work areas, structures, stockpiles or waste areas.
.4 Water Resources: Comply with applicable regulations concerning the direct or indirect discharge of pollutants to underground and natural surface waters. Provide sedimentation control where necessary.
.5 Oily Substances: Prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water in such quantities as to affect normal use, aesthetics, or produce a measurable ecological impact on the area.
.6 Store and service construction equipment at areas designated for collection of oil wastes.

.3 Dust Control, Air Pollution, and Odour Control: Prevent creation of dust, air pollution and odors.
.1 Use temporary enclosures and other appropriate methods to limit dust and dirt rising and scattering in air to lowest practical level.
.2 Store volatile liquids, including fuels and solvents, in closed containers.
.3 Properly maintain equipment to reduce gaseous pollutant emissions.

.4 Noise Control: Perform demolition operations to minimize noise.
.1 Provide equipment, sound deadening devices, and take noise abatement measures that are necessary to comply with the requirements of this Contract and with municipal regulations.
.2 Coordinate vibration creating operations with Owner such that nearby functioning facilities are disturbed minimally.

.5 Salvage, Re-Use, and Recycling Procedures:
.1 Identify re-use, salvage, and recycling facilities.
.2 Develop and implement procedures to re-use, salvage, and recycle demolition materials, based on the Contract Documents, the Contractor's Waste Management and Recycling Plan, estimated quantities of available materials, and availability of recycling facilities. Procedures may include on-site recycling, source-separated recycling, salvage, and/or mixed debris recycling efforts.
.3 Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.
.4 Source-separate clean and uncontaminated demolition materials including, but not limited to the following types:
.1 Concrete, Concrete Block, Concrete Masonry Units (CMU)
.2 Brick.
.3 Cement Fiber Products.
.4 Rigid Foam
.5 Glass
.6 Plastics
.7 Insulation
.8 Metal (ferrous and non-ferrous)
.9 Wood, Clean Dimensional Wood, Pallet Wood
.10 Sheet Wood: Plywood, Oriented Strand Board (OSB), Particle Board
.11 Beverage Containers
.12 Paper: Bond, Newsprint, Cardboard, Paper, Packaging Materials
.13 Other materials as appropriate.

.5 Develop and implement a program to transport loads of mixed demolition materials that cannot be feasibly source separated to a mixed materials recycling facility.

3.4 Performance

.1 Ensure demolition work is supervised by competent foreman at all times.

.2 At end of each day's work, leave work in safe condition and ensure the building is secure and weathertight.

.3 Maintain and preserve active utilities. Coordinate any shutdowns and/or removals of mechanical equipment with the owner.

.4 Keep work wetted down to minimize dust as required.

3.5 Demolition and Removals

.1 Maintain the work areas and storage areas clean and orderly at all times and free of rubbish and debris.

.2 Provide safe access and egress from working areas using entrances, hallways, stairways or ladder runs, protected to safeguard the personnel using them from falling debris.

.3 Particular attention shall be paid to prevention of fire and elimination of fire hazards.

.4 Review demolition procedures daily to ensure no personnel or equipment are located or working without additional safe working platforms or working surface adequate to support the operations.

.5 Carefully remove windows as detailed. Masonry openings to be made ready for new windows.

.6 At end of each day's work, leave work in safe condition. Secure building at all times and make weathertight.

.7 Demolish in a manner to minimize dusting.

.8 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work.

.9 Use methods required to complete the work within limitations of governing regulations.

.10 Locate demolition equipment throughout the building and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

.11 Damages: Report to consultant, and promptly repair damages to all facilities caused by demolition operations

3.6 Handling of Demolished Materials

.1 Conform to the approved Waste Management Plan.

.2 Do not allow demolished materials to accumulate or be stored on-site for more than 5 days.

.3 Do not burn, bury or otherwise dispose of rubbish and waste materials on project site.

.4 Disposal: Transport demolished materials off Owner's property and legally reuse, salvage, recycle, or dispose of materials.

.5 Legally transport and dispose of materials that cannot be delivered to a source separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.

.6 Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities prior to delivering materials.

.7 Use a permitted waste hauler or Contractor's trucking services and personnel.

.8 Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.

.9 Remove and transport materials from demolition in a manner that will prevent spillage on adjacent surfaces, streets, and areas or dust being emitted into the atmosphere.

.10 Implement a re-use program to the greatest extent feasible.

.11 Revenues or other savings obtained from recycled, re-used, or salvaged materials shall accrue to Contractor unless otherwise noted.

3.7 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work.

.3 Upon completion of demolition work, remove equipment and debris and leave work site clean.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 References

.1 ASTM International, (ASTM)
  .1 ASTM A53/A53M-12 Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless.
  .2 ASTM A123/A123M-12 Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
  .3 ASTM A153/A153M-16 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  .4 ASTM A307-10 Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
  .5 ASTM A325-10 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  .6 ASTM A385/A385M-15 Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
  .7 ASTM A1008/A1008M-12 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High Strength Low Alloy, High Strength Low Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
  .8 ASTM A1011/A1011M-12a Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
  .9 ASTM D6386-10 Standard Practice for Preparation of Zinc (Hot Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting
.2 Canadian Standards Association (CSA International)
  .1 CSA G40.20-04/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel
  .2 CSA-S16-09, Design of Steel Structures
  .3 CAN/CSA G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  .4 CSA-W47.1-09, Certification of Companies for Fusion Welding of Steel Structures.
  .5 CSA W48-06 (R2011), Filler Metals and Allied Materials for Metal Arc Welding
  .6 CSA W59-13 Welded Steel Construction (Metal-Arc Welding)
.3 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB 1.40-97, Anticorrosive Structural Steel Alkyd Primer
  .2 CAN/CGSB 1.108-M89, Bituminous Solvent Type Paint
  .3 CAN/CGSB 1.181-99, Ready Mixed, Organic Zinc Rich Coating.
.4 Canadian Sheet Steel Building Institute (CSSBI)
.5 Steel Structures Painting Council, Systems and Specifications Manual.
  .1 CISC/CPMA 1-73a, A Quick drying One-coat Paint for Use on Structural Steel.
  .2 CISC/CPMA 2-75, A Quick drying Primer for Use on Structural Steel.

1.3 Submittals

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

.2 Shop Drawings:
  .1 Submit Shop and Erection Drawings for review.
  .2 Verify site dimensions before proceeding with shop fabrication and to suit field conditions and

field openings.

.3 Show and describe in detail all the work of this Section including large scale detail of members and materials, of connection and jointing details, and of anchorage devices, dimensions, gauges, thicknesses, description of materials, metal finishing, as well as all other pertinent data and information, including type, size and description of all fasteners and anchors.

.4 Indicate connections to building structure.

.5 Shop drawings for all metal fabrications shall be stamped and signed by a Professional Engineer registered in the Province of Ontario. Each submission of the shop drawings shall bear the seal of the Engineer.

1.4 Qualifications

.1 Work of this Section shall be executed by a firm thoroughly conversant with laws, bylaws and regulations which govern and capable of workmanship of best grade of modern shop and field practice known to recognized manufacturers specializing in this work, and having a minimum ten (10) years proven experience in the fabrication of high quality metal fabrications. Use workmen skilled in work of this Section.

.2 Welding shall be performed by trades persons certified by The Canadian Welding Bureau under CSA Standard W47.1.

1.5 Examination

.1 All dimensions shall be taken from the drawings and checked against the building. Be responsible for the correctness of such measurements and report to the Consultant in writing all discrepancies between measurements at building and those shown on drawings prior to commencing work. Verify location of anchor bolts and embedded steel and ensure that work prepared by other trades is at a proper elevation, on line, level and true.

1.6 Shipping, Handling and Storage

.1 Label, tag or otherwise mark work supplied for installation by other Sections to indicate its function, location and shop drawing description.

.2 Protect work from damage and deliver to a location at the site in order to meet the scheduling requirements.

.3 Protect architecturally exposed materials during fabrication, delivery, handling, storage and erection to prevent marring of surfaces exposed to view, by marking, bending, denting or coarse grinding.

1.7 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

.1 Structural Steel Sections and Steel Plate: CSA G40.20-04/G40.21-04 (R2009), Grade 350W.

.2 Machine Bolts and Nuts: ASTM Standard A307-10 low carbon steel externally and internally threaded standard fasteners. Dimensions, sizes, thread, strength, quality and type of items shall be designed for the work intended. Exposed fasteners and anchors shall be same material, colour and finish as the metal to which they are applied.

.3 Welding Materials: CSA W59.

.4 Welding Electrodes: CSA W48 Series.

.5 Adhesive Anchors: Epoxy Adhesive Anchors sized to suit loading conditions, suitable for substrate.

.6 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 Finishes

.1 Primers: All primers for metal fabrications are to be factory applied under the requirements of this Section. Refer to Finish Schedules in Section 09 91 23 for types of primers required for each application.

.2 Pre Paint Finish: For galvanized surfaces to be exposed and finish painted, to ASTM D6386–10.

.3 Zinc Rich Primer: zinc rich, organic, ready mix to CAN/CGSB 1.181-92. Low VOC type.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

.1 General
  .1 Fabricate to reviewed shop drawings and in general to details, sizes and materials indicated on drawings and specified herein.
  .2 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
  .3 Fabricate work complete with all components required for anchoring; bolting or welding to structural frame; standing free or resting in frames or sockets; in a safe and sure manner.
  .4 Where possible fit and shop assemble various sections of the work and deliver to site in largest practicable sections. Where shop fabricating is not possible make trial assembly in shop.
  .5 Ensure exposed welds are continuous for length of each joint.
  .6 Grind and fill all welds after inspection and acceptance and leave ready for prime painting.
  .7 Fill all open joints, depressions, seams with metallic paste filler or by continuous brazing or welding and grind smooth to true sharp arises and profiles.
  .8 Fit joints and intersecting members accurately. Make work in true planes with adequate fastenings.
  .9 Supply all fastenings, anchors, accessories required for fabrication and erection of work of this Section. Such items occurring on or in an exterior wall or slab shall be hot dip galvanized. Make thread dimensions such that nuts and bolts will fit without re-threading or chasing threads.

.2 Make exposed metal fastenings and accessories of same material, texture, colour and finish as base metal on which they occur unless otherwise shown or specified. Keep exposed fastenings to an absolute minimum evenly spaced and neatly laid out. Make fastenings of permanent type unless otherwise indicated.

.3 Welding shall be done by the shielded metal arc method in accordance with the requirements CSA W59. Welding operators shall be currently certified under CSA W47.1 for the work they are performing.

.4 Surfaces to be welded shall be free from loose scale, rust, paint, or other foreign matter. Where weld material is deposited in two (2) or more layers, each layer shall be cleaned before the next layer is deposited. Care shall be taken to minimize stresses due to heat expansion, contraction and distortion by using proper sequence in welding and by approved methods.

.5 Appearance, quality of welds made, methods of correcting defective work shall be in accordance with CSA W59.

3.2 Shop Painting

.1 Cleaning Steel:
- .1 Clean steel, whether it is to be painted or not, to the degree required by CISC/CPMA 1-73a, except as specified below.
- .2 Prepare galvanized items scheduled to be painted in accordance with the requirements of Section 09 91 23, and ASTM D6386-10.
- .3 Steel to receive a shop or field paint finish shall be cleaned in accordance with Sections 09 91 23 or SSPC SP6, whichever produces a surface which has less rust and mill scale.
- .4 Clean steel which is specified to be painted to CISC/CPMA 2-75 in accordance with that Standard.
- .5 Clean steel which is specified to receive an organic zinc-filled epoxy primer, or zinc-rich paint, or inorganic zinc primer, in accordance with SSPC-SP 6, Commercial Blast Cleaning.
- .6 Clean welds by wire brushing and wash down with clean water, to remove the chemical residues left by the electrodes, prior to painting.

.2 The following surfaces shall not be painted:
- .1 Surfaces and edges to be field welded. If painted, remove paint for field welding for a distance of at least two inches on all sides of the joint, to ensure proper fusion of the metal.
- .2 The contact surfaces of friction type connections assembled by high strength bolts.
- .3 Portions of steel members which are to be encased in or in contact with concrete or masonry.
- .4 Galvanized items not specifically indicated to be painted.

.3 Preparation and priming of all metal work which will be exposed to view and which is scheduled to be finish painted.

.4 All other concealed or unpainted ferrous metal work shall be given one prime paint coat type CGSB 1.40 and in accordance with CISC/CPMA 2-75. Work paint into all corners and all joints. Metal parts in contact shall be primed before shop assembly. Priming damaged during erection or through lack of protection shall be cleaned and touched up.

.5 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7°C.

.6 Metals in contact with other dissimilar metals, concrete or masonry materials shall be insulated or separated from one another to prevent corrosion, staining or electrolysis by use of bituminous paint.

3.3 Installation

.1 Supervise the setting of bases, anchor bolts, and other steel to concrete connections. Cutting of base plates to accommodate anchor bolts is cause for rejection of base plates.

.2 Provide all bracing and shoring required to support the work of this Section during installation.

.3 Work shall be fabricated and erected square, plumb and true, straight, level and accurately fitted to size detailed on reviewed Shop Drawings. All joints shall be welded unless otherwise indicated. Exposed welds shall be ground smooth and/or flush. Exposed work shall be finished smooth and even, close joints and neat connections. Exposed welds continuous for full length of joints.

.4 Where anchors or fastenings, sleeves, have to be built in by other trades, supply all necessary templates, instructions and supervision to ensure satisfactory installation.

.5 Do all drilling, cutting and fitting necessary to attach this work to adjoining work and make it complete.

.6 Provide all components required for anchoring. Make anchoring in concealed manner where possible. Exposed anchors shall be approved by the Consultant, shall be neat, and of the same material, colour, texture and finish of base metal on which they occur. Exposed fastenings shall be evenly spaced.

.7 Grind all field welds smooth.

.8 Touch up shop coat of prime paint where damaged by field erection.

.9 Touch up galvanized finishes with zinc rich paint.

3.4 Fasteners and Anchors

.1 Use methods for fastening or anchoring metal fabrications to building construction as shown or specified.

.2 Securely anchor components in place. Unless otherwise indicated, anchor components as follows:
  .1 To concrete and solid masonry with expansion or epoxy adhesive type anchors.
  .2 To hollow construction with toggle bolts.
  .3 To thin metal with screws or bolts.
  .4 To thick metal with bolts or by welding.
  .5 Fill space between railing members and sleeves with non-shrink grout.

.3 Where fasteners and anchors are not shown, design the type, size, location and spacing to resist the loads imposed without deformation of the members or causing failure of the anchor or fastener, and suit the sequence of installation.

.4 Use material and finish of the fasteners compatible with the kinds of materials which are fastened together and their location in the finished work.

.5 Fasteners for securing metal fabrications to new construction only, may be by use of threaded or wedge type inserts or by anchors for welding to the metal fabrication for installation before the concrete is placed or as masonry is laid.

.6 Fasteners for securing metal fabrication to existing construction or new construction may be expansion bolts, toggle bolts, power actuated drive pins, welding, self-drilling and tapping screws or bolts.

3.5 Schedule

.1 General:
- .1 Supply and install all metal fabrications indicated on Drawings, and not included in the work of other Sections.
- .2 Coordinate and sequence the work to ensure timely delivery to the site, of all items to be built in.
- .3 Where items are required to be built into masonry, concrete or other work supply such items to respective Sections with all anchors and accessories for building in.
- .4 All items shall be of sizes and as detailed on drawings.
- .5 Review all coordination drawings prior to installation of materials, to ensure that no interferences with the work of other Sections will occur.

3.6 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 50 00 Metal Fabrications
.2 Section 06 20 00 Finish Carpentry

1.3 References

.1 Canadian Standards Association (CSA)
  .1 CSA C22.1-12 Canadian Electrical Code
  .2 CSA-080-M Wood Preservation
  .3 CSA-080.1 Preservative Treatment of all Timber Products by Pressure Processes.
  .4 CSA 080.9 Preservative Treatment of Plywood by Pressure Processes.
  .5 CSA 086.1 Engineering Design in Wood (Limit States Design).
  .6 CSA 0121-M Douglas Fir Plywood.
  .7 CSA 0141 Softwood Lumber.
  .8 CSA 0151-M Canadian Softwood Plywood
  .9 CAN3-0437.0-M85 Waferboard and Strandboard
  .10 CSA B111 Wire Nails, Spikes and Staples.
  .11 CSA G164 Hot Dip Galvanizing of Irregularly Shaped Articles.
.2 Canadian General Services Board (CGSB)
  .1 CAN/CGSB 71.26 Adhesive for Field Glueing Plywood to Lumber Framing for Floor Systems.
.3 Underwriters Laboratories Canada (ULC)
  .1 CAN/ULC-S102 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
.4 National Lumber Grading Authority (NGLA)
  .1 Standard Grading Rules for Canadian Lumber, Latest Edition.

1.4 Submittals

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

1.5 Quality Assurance

.1 Sawn lumber shall be identified by the grade stamp of an association or independent grading agency certified by the Canadian Lumber Standards Accreditation Board.

.2 Plywood identification shall be by grade mark in accordance with applicable CSA Standards.

.3 Pressure treated and fire retardant treated materials shall conform to CAN/CSA-080.1.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Materials shall not be delivered before they are required for proper conduct of the work.

.3 Protect materials, under cover, both in transit and on the site.

.4 Store materials to prevent deterioration or the loss or impairment of their structural and other essential properties. Do not store materials in areas subject to high humidity and areas where masonry and concrete work are not completely dried out.

.5 Protect work from damage during storage, handling, installation and until the building is turned over to the Owner. Make good damage and loss without additional expense to the Owner.

.6 Store sheathing materials level and flat, in a dry location. Protect panel edges from moisture at all times.

.7 Deliver anchor bolts for setting into concrete foundation walls and masonry walls by others.

1.7 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

.1 Material shall be Grade Stamped.

.2 Construction Lumber: To CAN/CSA 0141 Softwood Lumber graded to NLGA Standard Grading Rules for Canadian Lumber, published by the National Lumber Grades Authority. All lumber shall bear grade stamps. Moisture content of softwood lumber not to exceed 19% at time of installation.
- .1 All wood blocking shall be SPF #2 or pressure treated.
- .2 Nailing strips, furring and strapping: No. 4 S-P-F.
- .3 Fitment framing: No. 1 S-P-F.
- .4 Glue end jointed (finger jointed) material is not acceptable.

.3 Panel Materials: Type, grade and thickness as specified in accordance with the following standards:
- .1 Canadian Softwood Plywood: to CSA 0151-M, standard construction, good one or both sides as required, thickness as shown or specified.
- .2 Douglas Fir Plywood: to CSA 0121-M, standard construction, good one side, thickness as shown on the drawings.
- .3 Poplar Plywood: to CSA 0153, standard construction.
- .4 Plywood used for exposed interior work shall have select grade veneer, one or both faces where exposed, with fire retardant finish. Fire retardant shall be in accordance with CAN/CSA-080.1, and all treated materials shall bear a ULC approval stamp.
- .5 Mat formed structural panel board (oriented strand board): to CAN3-0437.0, square edge, 12.7 mm thickness.

.4 Rough Hardware: Nails, screws, anchors and special fastening devices required for the erection of rough carpentry shall be galvanized and conform to CSA B111. Use common spiral nails and spiral spikes except where indicated otherwise. Use hot dip galvanized finished steel for exposed exterior work, highly humid interior areas and for pressure preservative and fire retardant treated lumber.

.5 Bolts: 12.5 mm diameter, galvanized, complete with nuts and washers.

.6 Proprietary Fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.

.7 Wood Preservative to CAN/CSA-080-M.

.8 Adhesive: contractor's gun grade cartridge loaded wood adhesive, general purpose, to CSA 0112 Series and CAN/CGSB-71.26.

.9 Vapour Retardant: 0.152 mm polyethylene film to CAN/CGSB 51.34 Type 1.

.10 Galvanizing: to CAN/CSA-G164. Use galvanized fasteners, and hardware for exterior work, preservative treated lumber, and materials in contact with concrete or masonry.

.11 Sealant: As specified in Section 07 92 00.

PART 3 EXECUTION

3.1 Installation

.1 Workmanship
- .1 Execute work using skilled mechanics according to best practice, as specified herein and indicated on drawings.
- .2 Lay out work carefully and to accommodate work of other trades. Accurately cut and fit; erect in proper position true to dimensions; align, level, square, plumb, adequately brace, and secure permanently in place. Join work only over solid backing.

.2 Rough Hardware
- .1 Work shall include rough hardware such as nails, bolts, nuts, washers, screws, clips, hangers, connectors, strap iron, and operating hardware for temporary enclosures.
- .2 Fasten rough hardware; to hollow masonry units with adequate size toggle bolts; to solid masonry or concrete surfaces with expansion shields and lag screws. Where screws are required, use lead or inorganic fibre plugs. Wood or organic plugs are not permitted. Do not ramset fastenings into concrete floor or concrete block or structural steel sections.

.3 Blocking:
- .1 Provide solid wood or plywood backing to walls to support accessories, specialty items and the like.
- .2 Provide solid wood blocking, shims and nailers as required to provide substrate for window stools.
- .3 Provide wood strapping and blocking where required to support fitments, window blinds, and the like.
- .4 Provide continuous wood blocking as required and where detailed in walls and partitions at door, window and louvre jambs. Blocking in exterior cavity walls shall be pressure treated.

3.2 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 50 00 Metal Fabrications
.2 Section 06 10 00 Rough Carpentry
.3 Section 07 92 00 Joint Sealants
.4 Section 09 21 16 Gypsum Board
.5 Section 09 91 23 Interior Painting

1.3 References

.1 ASTM International, (ASTM)
  .1 ASTM E1333-14 Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber
.2 American National Standards Institute (ANSI)
  .1 ANSI A208.1-99, Particleboard.
  .2 ANSI A208.2-02, Medium Density Fibreboard (MDF).
  .3 ANSI/HPVA HP-1-2004, Standard for Hardwood and Decorative Plywood.
  .4 ANSI/NEMA LD 3-2005 High-Pressure Decorative Laminates (HPDL)
.3 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  .1 Architectural Woodwork Quality Standards Illustrated.
.4 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-11.3-M87, Hardboard.
.5 Canadian Plywood Association (CanPly)
  .1 The Plywood Handbook 2005.
.6 Canadian Standards Association (CSA International)
  .1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.
  .2 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  .3 CSA O121-M89 (R2003), Douglas Fir Plywood.
  .4 CAN/CSA O141-91(R1999), Softwood Lumber.
  .5 CSA O151-04, Canadian Softwood Plywood.
  .6 CSA O153-M1980 (R2003), Poplar Plywood.
  .7 CSA Z760-94, Life Cycle Assessment
.7 Forest Stewardship Council (FSC)
  .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
  .2 FSC-STD-20-002-2004, Structure and Content of Forest Stewardship Standards V2-1
  .3 FSC Accredited Certified Bodies.
.8 National Hardwood Lumber Association (NHLA)
  .1 Rules for the Measurement and Inspection of Hardwood and Cypress 1998.
.9 National Lumber Grades Authority (NLGA)
  .1 Standard Grading Rules for Canadian Lumber 2005.
.10 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
  .1 SCAQMD Rule 1168-03, Adhesives and Sealants Applications

1.4 Submittals

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

.2 Submit shop drawings.
.1 Indicate details of construction, profiles, jointing, fastening and other related details.
.2 Indicate materials, thicknesses, finishes and hardware.

.3 Submit duplicate 300 mm long samples of each type of solid wood or 300 x 300 mm square type of plywood to receive stain or natural finish.

.4 Submit samples of plastic laminate materials.

1.5 Quality Assurance

.1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

.3 Wood materials certified by Forestry Stewardship Council.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Protect materials against dampness during and after delivery.

.3 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

1.7 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Lumber Materials

.1 Softwood lumber: unless specified otherwise, S4S, moisture content 19% or less in accordance with following standards:
.1 CAN/CSA- O141-91(R1999).
.2 NLGA Standard Grading Rules for Canadian Lumber.
.3 AWMAC custom premium grade, moisture content as specified.
.4 Machine stress-rated lumber is acceptable.

.2 Hardwood Lumber: To NHLA requirements, moisture content of 6% maximum, maple species, AWMA Custom Grade.

2.2 Panel Materials

.1 Douglas fir plywood (DFP): to CSA O121-M89 (R2003), standard construction.
.1 Forestry Stewardship Council (FSC) certified.
.2 Urea-formaldehyde free.

.2 Canadian Softwood Plywood (CSP): to CSA O151-04, standard construction.
  .1 Forestry Stewardship Council (FSC) certified.
  .2 Urea-formaldehyde free.

.3 Hardwood Veneered Plywood: To CSA 0115, of thickness indicated, Type II Select Grade Maple, where transparent finish is required and Solid Grade where paint finish is required. Good two sides for work with two sides exposed to view; good one side for work with one side exposed to view. Use particle board core with Type I bond.

.4 Particleboard: to ANSI A208.1-99.
  .1 Forestry Stewardship Council (FSC) certified.
  .2 Urea-formaldehyde free.

.5 Medium density fibreboard (MDF): to ANSI A208.2-02, density 640-800 kg/m³.
  .1 Forestry Stewardship Council (FSC) certified.
  .2 Urea-formaldehyde free.

2.3 Plastic Laminate

.1 Plastic laminate facing sheet: ANSI/NEMA LD 3-2005 High-Pressure Decorative Laminates (HPDL) PF-S and GP-S;
  .1 Backing sheet: BK Grade by manufacturer of facing sheet.
  .2 Core: CAN3-0188.1M, Grade R.
  .3 Laminating adhesive: CAN3-0112 Series M.
  .4 Core sealer: clear water resistant synthetic resin sealer.
  .5 Colours, pattern, gloss and texture will be selected by Consultant from full range of products by one of the following:
    .1 Formica,
    .2 Arborite,
    .3 Pionite,
    .4 Nevamar
    .5 Wilsonart.
  .6 Up to three (3) colours and patterns will be selected by the Consultant.

2.4 Accessories

.1 Rough Hardware: Bolts, lag screws, anchors, nails and expansion shields required to secure this portion of work. Rough hardware hot dip galvanized conforming to latest edition of CAN/CSA-G164. All fasteners used in damp or wet areas to be suitable for use in corrosive environment. Use hot dipped galvanized or other material approved by the Consultant.

.2 Nails and staples: to CSA B111-74(R2003), galvanized to CAN/CSA- G164-M92 (R2003).

.3 Wood screws: to CSA B 35.4 plain type and size to suit application.

.4 Stainless Steel hardware: Type 316 Stainless steel for exposed or wet locations, tamper proof.

.5 Splines: wood or metal to suit application.

.6 Adhesive: recommended by manufacturer, waterproof type, maximum VOC limit 30 g/L SCAQMD Rule 1168 - Adhesives and Sealants Applications.

PART 3 EXECUTION

3.1 Construction

.1 Fastening:
- .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
- .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
- .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
- .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.

.2 Interior and exterior frames:
- .1 Set frames with plumb sides, level heads and sills, and secure.

3.2 Fabrication

.1 General:
- .1 Field measure all dimensions.
- .2 Fabricate all finish carpentry items to AWMAC premium grade, and in accordance with the reviewed shop drawings.
- .3 Set nails and screws, apply stained plain wood filler to indentations, sand smooth and leave ready to receive finish.
- .4 Provide 10 mm thick solid matching wood strip on plywood and particle board edges 13 mm or thicker, exposed in final assembly.
- .5 Ease edges of solid lumber components to 1.6 mm radius.

.2 Plastic Laminate Components
- .1 Fabricate plastic laminate window stools as detailed. Stools shall be minimum 19 mm thick plastic laminate plywood, with edge banding on all exposed faces. Fabricate in one piece, without joins, wherever as possible. Where necessary, joins shall be centred on window mullions and tightly butted together with concealed splines.
- .2 Unless otherwise specified herein, comply with requirements of CAN3-A172-M Appendix 'A'.
- .3 Assembly: Bond plastic laminate to core with adhesive, under pressure.
- .4 Core: unless otherwise indicated: 19 mm thick.
- .5 Balanced construction: plastic laminate covered components shall be of balanced construction, with plastic laminate on both faces of core. Seal core edges not covered with plastic laminate.
- .6 Use largest practicable plastic laminate sheet size.
- .7 Provide joints symmetrically; provide joints as corners and at changes in superficial areas; provide concealed draw bolt anchors and joints. All butt joints shall have a blind spine.
- .8 Openings and cutouts:
  - .1 Radius internal corners at least 3 mm and chamfer edges.
  - .2 Where core edge is to remain exposed, cover with plastic laminate edging.
  - .3 Where core edge is to be concealed, seal with sealer.

3.3 Installation

.1 Do finish carpentry to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.

.2 All fastenings shall be concealed.

.3 Provide heavy duty grounds as necessary for secure installation of finish carpentry work.

.4 All wood surfaces shall be sanded smooth, ready to receive finish.

.5 Scribe and cut as required, fit to abutting walls and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.

.6 Form joints to conceal shrinkage.

.7 Set and secure materials and components in place, rigid plumb and square.

.8 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.

.9 Set finishing nails to receive filler. Where screws are used to secure members, countersink screws in round, cleanly cut hole and plug with wood plug to match material being secured.

.10 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.

.11 Install plastic laminate components using concealed fastening devices.

.12 Install window stools with wood levelling shims, after installation of windows and interior finishing is complete. Screw levelling shims to metal stud framing with self-tapping sheet metal screws. Bond stools to shims with waterproof adhesive. Tightly butt all joints and bond together with adhesive and concealed splines. Cut to fit tight to all penetrations.

.13 Apply mildew resistant clear silicone sealant to perimeter of all vanity tops and window stools as specified in Section 07 92 00.

3.4 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 06 10 00 Rough Carpentry
.2 Section 07 27 13 Modified Bituminous Sheet Air Barriers
.3 Section 07 92 00 Joint Sealants
.4 Section 08 50 00 Aluminum Doors, Windows and Screens

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C518-15 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
  .2 ASTM C578-15 Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
  .3 ASTM C612-14 Standard Specification for Mineral Fiber Block and Board Thermal Insulation
  .4 ASTM C665-12 Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
  .5 ASTM D1621-10 Standard Test Method for Compressive Properties of Rigid Cellular Plastics
  .6 ASTM D1623-09 Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
  .7 ASTM E1677-11 Standard Specification for Air Barrier (AB) Material or System for Low-Rise Framed Building Walls
  .8 ASTM E84-15b Standard Test Method for Surface Burning Characteristics of Building Materials
.2 Underwriters Laboratories Canada (ULC)
  .1 CAN/ULC S701, Thermal Insulation, Polystyrene, Boards and Pipe Covering
  .2 CAN/ULC-S702-09, Thermal Insulation Mineral Fibre for Buildings
  .3 CAN/ULC S704 Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.
.3 Canadian General Services Board (CGSB)
  .1 CGSB 71-GP-24M Adhesive, Flexible, for Bonding to Cellular Polystyrene Insulation.
  .2 CAN 2-51.32 Sheathing, Membrane, Breather Type.
.4 Canadian Standards Association (CSA)
  .1 CSA B111-1974 (R2003) Wire Nails, Spikes and Staples

1.4 Submittals

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

.2 Submit insulation manufacturer's product literature including specified physical properties for each type of insulation specified.

.3 Submit installation instructions.

.4 Submit certification that product complies with specification requirements and is suitable for the use indicated.

1.5 Quality Assurance

.1 Insulation shall not be produced with, or contain, any of the regulated CFC compounds listed in the Montreal Protocol of the United Nations Environmental Program.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

.3 Deliver material to the site in the original unbroken packages bearing the name of manufacturer.

.4 Store materials in an approved manner at the site preceding application and protect from damage at all times.

.5 Remove damaged or deteriorated materials from site.

1.7 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.8 Warranty

.1 Provide written warranty that the actual thermal resistance of the extruded polystyrene foam insulation will not vary by more than 10% from its published thermal resistance.

.2 Warranty period is 15 years after date of Substantial Performance.

PART 2 PRODUCTS

2.1 Batt Insulation

.1 Fibreglass friction fit batts to CSA A101-M, Type 1 or mineral fibre to CAN/ULC-S702 Type 1 for window enclosure application, width and thickness as shown on details:
  .1 Owens Corning Fibreglass Batt Insulation, unfaced.
  .2 Roxul Batt Insulation.

2.2 Spray Foam Insulation

.1 Spray Foam Insulation: one component expanding polyurethane or polyisocyanurate foam, ULC approved and compatible with rigid insulating materials, with Class 1 fire rating to ASTM E84 for window and frame application:
  .1 Ultra Seal PF-100 Gun Foam by Nuco Inc.
  .2 Handi-Foam by Fomo Products Inc.
  .3 Pinkseal by Owens Corning.

2.3 Accessories

.1 Sealing Tape: minimum 65 mm width, polypropylene sheathing tape with acrylic adhesive.

.2 Rough Hardware: Nails and staples as required for installation of insulation and membrane materials, galvanized to CSA B111 and B34.

PART 3 EXECUTION

3.1 Installation – General

.1 Install insulation after building substrate materials are dry.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Fit insulation tightly around all structural angles, penetrations and other protrusions.

.4 Cut and trim insulation neatly to fit spaces. Butt joints tightly; offset vertical joints. Use only

.5 Do not enclose or conceal insulation until it has been inspected by the Consultant.

3.2 Batt Insulation

.1 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.2 Pack loose fibreglass insulation in crevices between exterior masonry and cluster columns as exposed by the work, as well as window frames and other places where shown or required to eliminate air infiltration.

3.3 Spray Foam Insulation

.1 Completely fill all joints and penetrations in exterior walls, and window frames and where indicated, with expanding spray foam insulation, in accordance with manufacturer’s instructions.

3.4 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 07 62 00 Sheet Metal Flashing and Trim
.2 Section 07 92 00 Joint Sealants

1.3 References

.1 The National Building Code of Canada.
.2 ASTM International, (ASTM)
  .1 ASTM D412-06 ae2, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension.
  .2 ASTM D4541-09e1, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
  .3 ASTM E96/E96M-15 Standard Test Methods for Water Vapor Transmission of Materials
  .4 ASTM E330-02 (2010), Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls, by Uniform Static Air Pressure Difference.
  .5 ASTM E783-02 (2010), Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.
  .6 ASTM E1186-03 (2009), Standard Practices for Air Leakage Site Detection in Building Envelope and Air Retarder Systems.
  .7 ASTM E2178-13 Standard Test Method for Air Permeance of Building Materials
  .8 ASTM E2357-11 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
  .9 ASTM D624-00 (2012) Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
  .10 ASTM D4541-09e1 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
.3 National Air Barrier Association (NABA)
  .1 National Air Barrier Association's (NABA) Quality Assurance Program (QAP)

1.4 Submittals

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

.2 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Submit WHMIS SDS - Safety Data Sheets.

.4 Submit manufacturer’s complete set of standard details for air barriers.

.5 Quality Assurance Submittals: submit following in accordance with Section 01 45 00 - Quality Control.
  .1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

1.5 Performance Requirements

.1 Select and install components and assemblies to resist air leakage caused by static air pressure across exterior wall assemblies, including windows, glass, doors, and other interruptions to integrity of wall systems; to maximum air leakage rate of 0.01 L/s.m² when subjected to pressure differential of 75 Pa as measured in accordance with ASTM E783-02 (2010), and ASTM E 330-02 (2010).

.2 Select and install wall components and assemblies to resist air leakage caused by dynamic air pressure across exterior wall assemblies, including windows, glass, doors and other interruptions to integrity of wall systems; to maximum air leakage rate of 0.013 L/s.m² when subjected to hourly wind design loads in accordance with NBC, using 1 in 10 year probability, as measured in accordance with ASTM E783-02 (2010) and ASTM E330-02 (2010).

.3 If ongoing testing is required throughout air/vapour barrier system installation, perform qualitative testing methods in accordance with ASTM E1186-03 (2009) and ASTM D4541-09 e1.

.4 Provide continuity of air/vapour barrier materials and assemblies in conjunction with materials described in other Sections.

1.6 Quality Assurance

.1 Quality Assurance Program: Submit evidence of current Contractor accreditation and Installer certification under the National Air Barrier Association's (NABA) Quality Assurance Program (QAP).

.2 Submit accreditation number of the Contractor and certification number(s) of the NABA Certified Installer(s).

.3 Preconstruction Meeting: Convene a minimum of two weeks prior to commencing work of this Section. Agenda shall include, at a minimum, construction and testing of mock-up, sequence of construction, coordination with substrate preparation, air barrier materials approved for use, compatibility of materials, coordination with installation of adjacent and covering materials, and details of construction and chemical/fire safety plans. Attendance is required by representatives of related trades including covering materials, substrate materials and adjacent materials.

.4 Mock-Ups: Build mock-up representative of primary air barrier assemblies and glazing assemblies including backup wall and typical penetrations as acceptable to the Architect. Mock-up shall be dimensions no less than 2.50 metres long by 2.50 metres high [eight (8) feet long by eight (8) feet high] and include the materials and accessories proposed for use in the exterior wall assembly. Mock-ups shall be suitable for testing as specified in the following paragraph.

.5 Mock-Up Tests for Air and Water Infiltration: The third party testing agency shall test the mock-up for air and water infiltration in accordance with ASTM E1186 (air leakage location), ASTM E783 (air leakage quantification) at a pressure difference of 1.57 lb/ft2 (75 Pa), and ASTM E1105 (water penetration). Use smoke tracer to locate sources of air leakage. If deficiencies are found, the air barrier Contractor shall reconstruct mock-up for retesting until satisfactory results are obtained. Deficiencies include air leakage beyond values specified, uncontrolled water leakage, unsatisfactory workmanship.

.1 Perform the air leakage test and water penetration test of mock-up prior to installation of cladding and trim but after installation of all fasteners for cladding and trim and after installation of other penetrating elements.

.6 Mock-Up Tests for Membrane Adhesion: Test mock-up for transition membrane adhesion in accordance with ASTM D4541 (modified), using a type II pull tester except that the membrane shall be cut through to separate the material attached to the disc from the surrounding material. Perform test after curing period recommended by the material manufacturer. Record mode of failure and area where the material failed in accordance with ASTM D4541. When the material manufacturer has established a minimum adhesion level for the product on the particular substrate, the inspection report shall indicate whether this requirement has been met. Where the material manufacturer has not declared a minimum adhesion value for their product/substrate combination, the value shall simply be recorded.

1.7 Sequencing

.1 Sequence work to permit installation of materials in conjunction with related materials and seals.

1.8 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

.3 Clean spills and leave area as it was prior to spill.

1.9 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.10 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of three (3) years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Materials

.1 Materials: as required to achieve specified performance criteria; meeting specified reference standards and functionally compatible with adjacent materials and components.

.2 Air/vapour barrier membrane components and accessories must be obtained as a single-source from the membrane manufacturer to ensure total system compatibility and integrity.

2.2 Membranes

.1 Self-adhered air/vapour barrier transition membrane shall be SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film, and having the following physical properties:
- .1 Thickness: 1.0 mm (40 mils) min.
- .2 Air leakage: <0.01 L/s.m² @ 75 Pa to ASTM E283-91,
- .3 Vapour permeance: 1.6 ng/Pa.m².s (0.03 perms) to ASTM E96,
- .4 Low temperature flexibility: -30 degrees C to CGSB 37-GP-56M,
- .5 Elongation: 200% to ASTM D412-modifed.

.2 Acceptable Products:
- .1 Blueskin SA by Monsey-Bakor Inc.
- .2 Perm-A-Barrier by W.R. Grace & Co.
- .3 Air Shield by W.R. Meadows
- .4 ExoAir 110 by Tremco
- .5 DELTA-VENT SA by Cosella-Dörken
- .6 Sopraseal Stick 1100T by Soprema

2.3 Adhesive and Primers

.1 As recommended by manufacturer.

2.4 Mastics & Termination Sealants

.1 As recommended by manufacturer.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 General

.1 Perform Work in accordance with National Air Barrier Association - Professional Contractor Quality Assurance Program and requirements for materials and installation.

3.3 Examination

.1 Examine all surfaces to ensure conformance to the manufacturer's recommended surface conditions.

3.4 Preparation

.1 Prepare substrate surfaces in accordance with air/vapour barrier material manufacturer's instructions.

.2 All surfaces which are to receive flexible air barrier must be smooth, clean, dry, frost-free and in sound condition. All moisture, frost, grease, oils, loose mortar, dust, or other foreign materials which may impede the adhesion of the air barrier must be removed.

.3 New mortar must be cured 14 days and must be dry before air barrier membrane is applied.

.4 Concrete must be cured 28 days and dry before air barrier membrane is applied.

.5 Remove any and all sharp protrusions and repair any defects such as spalled or loose aggregate areas.

.6 Do not proceed with air barrier application until all substrate defects are repaired.

.7 All new window frame blocking and materials to be prepared to receive new membrane all around. Existing membrane to be repaired and made good where exposed and where tie in to new membrane to occur.

3.5 Installation

.1 Install air/vapour barrier materials in accordance with manufacturer's instructions.

.2 Prime surfaces and apply membrane in strict accordance with manufacturer's printed directions.

.3 Primed surfaces not covered by air barrier membrane during the same working day must be reprimed.

.4 Cut sheet membrane into manageable sizes, position membrane for alignment prior to removing protective film.

.5 At new windows tie into existing air/vapour barrier for continuous seal, and as shown on drawings. Provide continuous membrane all around frame.

.6 Clean off all loose and deleterious materials to ensure adhesion to proper substrate.

.7 Ensure all projections including wall ties, are properly sealed with a trowel or caulk application of specified sealant.

3.6 Inspection and Repair

.1 Inspect membrane thoroughly before covering and make any corrections to punctures, tears, voids and other obvious defects which would impede the membrane from performing as intended.

.2 Notify Consultant when sections of work are complete so as to allow for review prior to installation of insulation. Remove, replace or repair materials not satisfactory to the Consultant sand wait for re-inspection before covering work.

3.7 Cleaning and Protection

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Protect air barrier materials from damage during installation and the remainder of the construction period, according to material manufacturer's written instructions.

.3 Coordinate with installation of materials which cover the air barrier assemblies, to ensure exposure period does not exceed that recommended by the material manufacturer.

.4 Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction and acceptable to the primary material manufacturer.

.5 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 01 74 11 Cleaning
.2 Section 07 92 00 Joint Sealants

1.3 References

.1 The Ontario Building Code.
.2 Canadian Roofing Contractors Association (CRCA) Roofing Specifications Manual.
.3 ASTM International (ASTM)
  .1 ASTM A653/A653M-15e1 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  .2 ASTM D523-14 Standard Test Method for Specular Gloss
.4 Canadian Standards Association (CSA):
  .1 CSA B111, Wire Nails, Spikes and Staples.
.5 Canadian General Services Board (CGSB):
  .1 CAN/CGSB 1.108-M, Bituminous Solvent Type Paint.
  .2 CAN/CGSB-37.5, Cutback Asphalt Plastic Cement.
  .3 CAN/CGSB-51.32, Sheathing, Membrane, Breather Type.
.6 Canadian Sheet Steel Building Institute (CSSBI):
  .1 CSSBI - Standard Practice for Sheet Steel Cladding.
  .2 CSSBI 20M-91 Sheet Steel Cladding for Architectural and Industrial Applications.
  .3 CSSBI B16-94 Prefinished Sheet Steel for Building Construction.

1.4 Submittals

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

.2 Submit duplicate 300 x 300 mm samples of each type of sheet metal material, colour and finish when requested by the Consultant.

.3 Submit WHMIS Material Safety Data Sheets for all products intended to be used, including adhesives and sealants.

1.5 Design and Performance Requirements

.1 Appearance: neatly and evenly lay out and install components. Exposed fastening devices not permitted.

.2 Effects of Wind: resist positive and negative wind pressures without detrimental effects.

.3 Water Control: prevent passage of water.

.4 Thermal Movement: accommodate expansion and contraction of component parts without buckling, failure of joints, undue stress on fasteners and other detrimental effects.

.5 Compatibility: components shall be compatible with dissimilar metals and materials with which they are in contact or fastened to so as to prevent corrosion, staining and other detrimental effects. If required, treat or separate contact surfaces with inert and non-staining insulation material to achieve compatibility.

1.6 Quality Assurance

.1 Work of this Section shall be performed by a qualified sheet metal contractor with a minimum of 5 years of experience in the type of work required and specified. Submit proof of experience where requested by the Consultant.

1.7 Shipping, Handling and Storage

.1 Materials shall be handled and stored on the job in such a manner that no damage shall be done to the material or the structures.

.2 Materials showing evidence of improper handling and storage shall be rejected and removed from the site at no additional expense to the Owner.

1.8 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.9 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of five (5) years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

.2 Submit manufacturer’s warrantee that pre-finished materials will not lose film integrity for 25 years and will not chalk or fade for 20 years following date of Substantial Performance.

PART 2 PRODUCTS

2.1 General

.1 Ensure compatibility of all materials.

2.2 Materials

.1 Sheet Metal: 24 gauge (0.61 mm) thick galvanized sheet steel, commercial quality to ASTM A653 Grade 'A' with a minimum yield stress of 230 MPA, and a working stress of 144 MPA, to CSA 136. Material shall have Z275 designation zinc coating.

.2 Prefinished material shall be colour coated with manufacturer’s standard finish system equivalent to VicWest Colourite HMP with 100% ceramic colour pigmentation, minimum dry film thickness of 1.0 ± 0.2 mils (ASTM D1005). This Section shall supply all metal flashing and prefinished metal infills for all window, applications whether shown or not, and as necessary for the complete installation.
   .1 Colour for all sheet metal flashing and trim shall be as selected by the Consultant from full range of manufacturer’s standard colours.
   .2 Up to three colours may be selected.

.3 Continuous hook on strips and metal bellows: 22 gauge (0.65 mm) galvanized sheet steel, zinc coating designation ZF275.

.4 Isolation Coating: Alkali resistant exterior bituminous paint to CAN/CGSB 1.108-M.

.5 Plastic Cement: To CAN/CGSB 37.5.

.6 Nails, Bolts, Screws and Other Fastenings: same metal finish as sheet metal being used to CSA B111. The size of fastenings shall suit the applicable conditions.

.7 Underlay: No. 15 perforated asphalt felt to CSA A123.3-M or dry sheathing, breather type, to CAN/CGSB-51.32

.8 Cleats: Of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.

PART 3 EXECUTION

3.1 General

.1 Install sheet metal work in accordance with CRCA specifications and as detailed.

.2 Use concealed fastenings except where approved before installation.

3.2 Fabrication

.1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA specifications and as indicated.

.2 Form pieces in 2440 mm maximum lengths.

.3 Hem exposed edges on underside 13 mm. Mitre and seal corners with sealant.

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

.5 Apply isolation coating (two coats) to metal surfaces to be in contact with concrete or mortar or dissimilar metals.

.6 Install underlay under sheet metal in accordance with CRCA "FL" series details. Lap joints 100 mm.

.7 All seams shall be of the "slip lock type" that permit adequate movement without resulting in deformation or loosening of metal flashings. Lapped joints or exposed raw edges will not be accepted. Exposed edges shall be "double back" at least 13 mm.

.8 All flashings shall be installed in perfectly straight lines. Irregular or badly fitted work will not be accepted. Exposed fastenings will only be permitted where concealed fastening is not possible. Provide neoprene washers for exposed fasteners.

.9 Imperfections in metal flashing work such as holes, dents, creases, or oil-canning will not be accepted.

3.3 Caulking of Flashings

.1 Sealants shall be as specified in Section 07 92 00 - Joint Sealants.

.2 Caulk all joints in flashing.

.3 Dissimilar metals in contact, or metals in contact with adjacent surfaces shall be separated from one another to prevent corrosion, staining, or electrolysis by use of approved methods and materials.

.4 Do caulking between metal flashing and concrete.

.5 Caulking compound shall be applied in strict accordance with the manufacturer's application instructions. Use proper surface primers where necessary.

.6 Colour of caulking compound shall be the integral colour of the abutting material.

3.4 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 06 20 00 Finish Carpentry
.2 Section 07 62 00 Sheet Metal Flashing and Trim

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C834-14 Standard Specification for Latex Sealants
  .2 ASTM C920-14a Standard Specification for Elastomeric Joint Sealants
  .3 ASTM C1184-14 Standard Specification for Structural Silicone Sealants
  .4 ASTM C1193-13 Standard Guide for Use of Joint Sealants
  .5 ASTM C1311-14 Standard Specification for Solvent Release Sealants
.2 Canadian General Standards Board (CGSB)
  .1 CGSB 19-GP-SM, Sealing compound, one component, acrylic base, solvent curing.
  .2 CGSB 19.13-M, Sealing compound, one component, elastomeric chemical curing.
  .3 CGSB 19-GP-14M Sealing compound, one component, butyl-polyisobutylene, polymer base, solvent curing.
  .4 CAN/CGSB-19.24-M90, Multi component, chemical curing sealing compound.
.3 South Coast Air Quality Management District (SCAQMD) California State
  .1 SCAQMD Rule 1168-03: Adhesives and Sealants.

1.4 Submittals

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

.2 Submit product data for all sealant materials and accessories.

.3 Submit SDS Data Sheets for review and acceptance by the Owner prior to delivery to the project site. Obtain written approval from the Owner and do not deliver any materials to the Owner’s property, prior to receipt of such approval.

1.5 Quality Assurance

.1 Installation of caulking shall be performed only by workmen thoroughly skilled and specially trained in the techniques of caulking.

.2 Caulking work shall be carried out in strict accordance with manufacturer's printed directions.

1.6 Shipping, Handling and Storage

.1 Deliver, handle and store materials in accordance with manufacturer’s printed instructions.

.2 Use all means necessary to protect caulking materials before, during and after installation and to protect the installed work and materials of all other trades.

.3 In the event of damage, immediately make all repairs and replacements necessary to the approval of the Consultant and at no additional cost to the Owner.

.4 Store all caulking materials and equipment under conditions recommended by its manufacturer.

.5 Do not use materials stored for a period exceeding the maximum recommended shelf-life of the material.

.6 Materials shall be delivered to the job in their original containers or wrapping with the manufacturer's seal and labels intact.

1.7 Environmental Considerations

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials, and regarding labelling and provision of material safety data sheets.

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

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

1.8 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.9 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of three (3) years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Manufacturer

.1 Products of the following manufacturers are approved for use subject to meeting the specifications for the particular product listed below:
  .1 Canadian General Electric
  .2 Dow Corning
  .3 Nuco Inc.
  .4 Sika Canada Limited
  .5 Tremco Manufacturing Company (Canada) Ltd.
  .6 W.R. Grace and Company.
  .7 CR Laurence.

2.2 Materials

.1 Primers: Type recommended by sealant manufacturer. Low VOC type

.2 Joint Fillers:
  .1 General: Compatible with primers and sealants, outsized 30 to 50%.

.2 Vertical Joints: Polyethylene, Urethane, Neoprene or Vinyl:
  .1 Extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa.
  .2 Sealtight-Etha Foam Backer Rod, W. R. Meadows Canada Ltd.
.3 Horizontal Joints: Neoprene or Butyl Rubber (Horizontal Joints): Round solid rod, Shore A hardness 70.
.4 Premoulded Joint Filler: Unifoam R1009, Goodco Limited

.3 Sealants:
  .1 All sealants shall be Low VOC Type.
  .2 Colour of sealants to match new frame colour.
  .3 For Exterior Locations: To ASTM C920-14a, two component LP polysulphide base sealant Type 2 where subjected to foot traffic and Type 1 where not subjected to foot traffic (20-35 Shore A) Class B, bearing seal of approval of Thiokol Chemical Corporation:
    .1 DOW Corning 790/795
    .2 Tremco Dymeric 240FC
  .4 For Interior Locations:
    .1 Moving joints:
      .1 Low modulus, high performance, one-component, polyurethane-based, non-sag elastomeric sealant.
        .1 Sikaflex 15LM
    .2 Non-moving Joints
      .1 To CAN3-11.13-M, one component polysulphide base sealant bearing seal of approval of Thiokol Chemical Corporation.
        .1 Vulkem 116 – Tremco
        .2 Mono 555
    .3 Acrylic Latex: Siliconized acrylic latex to ASTM C834.
        .1 Tremflex 834 - Tremco
    .4 Mildew Resistant Sealant: Silicone to ASTM C920.
    .5 Vapour Barrier Sealant: CAN/CGSB 19.21-M.

.4 Bond Breaker Tape: Polyethylene bond breaker tape which will not bond to sealant.

.5 Joint Cleaner: Xylol, methylethyleketon or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

PART 3 EXECUTION

3.1 Inspection

.1 Inspect conditions and substrates upon which work of this Section is dependent. Report to Consultant in writing any defects that may jeopardize the performance of this work.

.2 Commencement of work implies acceptance of conditions.

3.2 Preparation

.1 Remove dust, paint, loose mortar and other foreign matter. Ensure joint surfaces are dry and free of frost.

.2 Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.

.3 Remove oil, grease and other coatings from non-ferrous metals with joint cleaner.

.4 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.5 Prepare concrete, masonry glazed and vitreous surfaces to sealant manufacturer's instructions.

.6 Examine joint sizes and conditions to achieve correct depth ratio ½ of joint width with minimum width and depth of 6 mm, maximum width 25 mm.

.7 Install joint filler to achieve correct joint depth.

.8 Where necessary to prevent staining, mask adjacent surface prior to priming and caulking.

.9 Apply bond breaker tape where required to ensure performance of sealant.

.10 Prime sides of joints when required and as recommended by sealant manufacturer to ensure performance of sealant immediately prior to caulking.

3.3 Application

.1 Apply sealants in accordance with manufacturer's instructions, in continuous beads, to provide watertight joint. Apply sealant using gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.

.2 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities. Neatly tool surface to a slight concave joint.

.3 Clean adjacent surfaces immediately and leave work neat and clean. Remove excess sealant and droppings using recommended cleaners as work progresses. Remove masking after tooling of joints.

.4 Apply sealant to joints between window or door frames to adjacent building components, around perimeter of every external opening, to control joints in masonry walls where shown.

.5 Caulk joints in surfaces to be painted before surfaces are painted. Where surfaces to be caulked are primed in shop before caulking, check to make sure prime paint and caulking are compatible. If they are incompatible, inform Consultant and change caulking to compatible type approved by Consultant.

3.4 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 06 10 00 Rough Carpentry
.2 Section 06 20 00 Finish Carpentry
.3 Section 07 21 13 Building Insulation
.4 Section 07 92 00 Joint Sealants.
.5 Section 08 80 05 Glazing
.6 Section 09 21 16 Gypsum Board

1.3 References

.1 The National Building Code of Canada.
.2 ASTM International (ASTM)
  .1 ASTM E330/E330M-14 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
  .2 ASTM E783-02(2010) Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors
  .3 ASTM E1186-03(2009) Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems
.3 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-1.40-97, Anticorrosive Structural Steel Alkyd Primer.
  .2 CAN/CGSB-79.1-M91, Insect Screens
.4 Canadian Standards Association (CSA)
  .1 CSA A440-11, NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights, Includes Update No. 1 (2014)
  .2 CSA A440.2-14/A440.3-14 Fenestration Energy Performance/User Guide to CSA A440.2-14, Fenestration Energy Performance
  .3 CAN/CSA-G164-M92 (R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
.5 American Architectural Manufacturers Association (AAMA)
  .1 AAMA/WDMA/CSA 101/I.S.2/A440-08 - NAFS - North American Fenestration Standard / Specification for Windows, Doors, and Skylights
.6 Aluminum Association (AA), Designation System for Aluminum Finishes (2000)

1.4 Submittals

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

.2 Submit shop drawings.
  .1 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim, junction between combination units, 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 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:
  .1 Windows classifications.

.2 Anodized finish, weathering characteristics.
.3 Air tightness.
.4 Water tightness.
.5 Wind load resistance.
.6 Condensation resistance.
.7 Forced entry resistance.
.8 Mullion deflection.

.4 Closeout Submittals
.1 Provide operation and maintenance data for doors, windows and hardware for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.6 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.7 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of five (5) years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

.2 Provide a warranty stating that the anodized finish will be non-fading, nonconvertible, and permanently a part of the metal surface for a period of five years after acceptance of the building. The warranty shall state that any item showing failure during the warranty period will be replaced or refinished to the original condition, at no cost to the Owner.

PART 2 PRODUCTS

2.1 Manufacturers

.1 Manufacture: Aluminum sections and products manufactured by Commdoor form the basis of the drawings and specifications. The following manufacturers are considered as acceptable alternates subject to approval by the Consultant, of supporting technical literature, samples, drawings, engineering data and performance data:
.1 Alumicor
.2 Kawneer
.3 Oldcastle
.4 Windspec
.5 Aerloc Industries
.6 Allwind Industries
.7 Sherwood Windows

.2 It is a mandatory requirement that all aluminum windows and frames, and associated hardware be supplied by the same manufacturer.

2.2 Materials

.1 Materials: to CSA-A440/A440.1 supplemented as follows:
  .1 All windows shall be by same manufacturer.
  .2 Sash: aluminum, thermally broken.
  .3 Main frame: aluminum, thermally broken.

.2 Glass: Double glazed or single glazed and tinted as scheduled and as specified in Section 08 80 05.

.3 Exterior aluminum sills and facings: extruded aluminum and brake formed aluminum sheet metal of type and size to suit job conditions; minimum 3 mm thick, complete with joint covers, jamb drip deflectors, chairs, anchors and anchoring devices.

.4 Isolation coating: alkali resistant bituminous paint.

.5 Aluminum Sheet: ASTM B209 (ASTM B209M), alloy 5005-H14, stretcher leveled.

.6 Extruded Aluminum: ASTM B221 (ASTM B221M), alloy 6063-T5 or alloy 6463-T5.

.7 Finish Coatings: To AAMA Based on Kynar 500 Resins are to be applied in accordance AAMA 605.2. Specify colour from Valspar current chart.

2.3 Exterior Fixed Windows and Storefront Framing

.1 Window
  .1 Commdoor Series 525 or equal
  .2 5” deep framing

2.4 Exterior Operable Windows

.1 Commdoor Series 225 thermally broken operable window.

.2 All glazing pockets shall be vented, pressure equalized and drained to the exterior.

.3 Elastomeric air seal gasket shall be installed around the full perimeter of glass and sealed at corners with silicone sealant. Air seal gasket must provide adhesion with silicone sealant.

.4 Glazing System: Glazing method shall be a wet/dry type in accordance with manufacturer’s standards. Exterior glazing shall be silicone back bedding sealant. Interior glazing shall be snap-in type glazing beads with an interior gasket in accordance with AAMA 702 or ASTM C864.

.5 Hardware:
  .1 General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock aluminum windows, and sized to accommodate sash weight and dimensions.

  .2 Out, Top Hinge, Awning Type Windows: Provide the following operating hardware.
    .1 S.S. 4 Bar Hinges
    .2 Cam Handle with Pole Ring
    .3 Pole Ring

.4 Sash Pole
.5 Key Release Limit Arm (4” Max Opening)
.6 Insect Screens: Armour Guard security safety screen model #900 complete with solid aluminum profile and 304 Stainless steel wire mesh screens. .
.1 wire .028"
.2 wire spacing 0.055"
.3 frame colour to match new window frame.
.4 tamperproof fastening.
Coordinate installation with window supplier
.7 Auto operators for high level windows Room 107
.1 Operator model CD1003DC, 24VDC, 1.2 amps, IP class, IP42, 400N push and pull force,
.2 Provide and install all required wiring from nearest electrical panel . Installation to be by certified electrician.
.3 Provide wall mount for wireless remote.

2.5 Accessories

.1 Fasteners: Aluminum, non-magnetic stainless steel, or other material warranted by manufacturer as non-corrosive and compatible with aluminum components.

.2 Brackets and Reinforcements: Manufacturer's high-strength aluminum units where feasible, otherwise, non-magnetic stainless steel or steel hot-dip galvanized in compliance with ASTM A123/A123M.

.3 Muntin bars as detailed

.4 Bituminous Coating: Cold-applied asphaltic mastic, compounded for 30-mil (0.76 mm) thickness per coat.

2.6 Fabrication

.1 Fabricate in accordance with CSA-A440/A440.1 supplemented as follows:
.1 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.
.2 Face dimensions detailed are maximum permissible sizes.
.3 Brace frames to maintain squareness and rigidity during shipment and installation.
.4 Finish steel clips and reinforcement with shop coat primer to CAN/CGSB-1.40.

2.7 Aluminum Finishes

.1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.

.2 Fluoropolymer paint Coating. Based on Kynar 500 Resins are to be applied in accordance AAMA 605.2. Specify colour from Valspar current chart.

2.8 Isolation Coating

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

.1 Dissimilar metals except stainless steel.
.2 Concrete, mortar and masonry.

.2 Coating material shall be low VOC type conforming to SCAQMD Rule 1113-96.

2.9 Glazing

.1 Glaze windows and screens in accordance with CSA-A440/A440.1 and Section 08 80 05 – Glazing.

2.10 Air Barrier and Vapour Retarder

.1 Equip frames with site installed air barrier and vapour retarder material for sealing to building air barrier and vapour retarder as follows:
.1 Material: identical to, or compatible with, building air barrier and vapour retarder materials to provide required air tightness and vapour diffusion control throughout exterior envelope assembly.
.2 Material width: adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder from interior.

PART 3 EXECUTION

3.1 Window and Screen Installation

.1 Install in accordance with CSA-A440/A440.1, shop drawings and manufacturer's instructions.

.2 Arrange components to prevent abrupt variation in colour.

.3 Erect and secure window units in prepared openings, plumb and square, free from warp, twist or superimposed loads.

.4 Secure work accurately to structure and in a manner not restricting thermal movement of materials.

.5 Provide shims under sill frame at setting block locations, and as recommended by window frame manufacturer.

.6 Conceal all anchors and fitments. Exposed heads of fasteners not permitted.

.7 Mechanically fasten flexible membrane air and vapour seal to window frame with continuous aluminum channel as detailed on drawings.

.8 Maintain dimensional tolerances after installation. Maintain alignment with adjacent work.

.9 Isolate aluminum surfaces from dissimilar materials adjacent after installation, using coating of bituminous paint.

.10 Seal framing joints with butyl polyisobutylene or silicone sealant.

.11 Install glazing splines and gaskets uniformly, with accurately formed corners and bevels. Ensure that proper contact is made with glass and rabbet interfaces.

.12 Continuously and uniformly compress glazing splines and gaskets during installation.

3.2 Mechanical

.1 Where mechanical duct, vent or the like interferes with window removal, engage a certified Mechanical technician to remove and reinstall interference. Coordinate all Mechanical shutdowns with the owner and recommission mechanical duct/ venting /units upon reassembly.

3.3 Sill Installation

.1 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.

.2 Cut sills to fit window opening.

.3 Secure sills in place with anchoring devices located at ends and evenly spaced 600 mm on centre in between.

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

.5 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.

3.4 Caulking

.1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.

.2 Apply sealant in accordance with Section 07 92 00 - Joint Sealants. Conceal sealant within window units except where exposed use is permitted by Consultant.

3.5 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Wash down exposed interior metal surfaces using a solution of mild domestic detergent in warm water, applied with soft clean wiping cloths.

.3 Clean exposed exterior non-metal surfaces as recommended by manufacturer of the material.

.4 Clean interior and exterior surfaces as soon as adjacent construction which might soil surfaces, iscompleted.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 07 92 00 Joint Sealants
.2 Section 08 50 00 Aluminum Doors, Windows and Screens
.3 Section 12 24 13 Roller Shades

1.3 References

.1 ASTM International (ASTM).
  .1 ASTM C162-05 (2010), Standard Terminology of Glass and Glass Products.
  .2 ASTM C 542-94 (1999), Specification for Lock-Strip Gaskets.
  .3 ASTM D 790-02, Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
  .4 ASTM D 1003-00, Test Method for Haze and Luminous Transmittance of Plastics.
  .5 ASTM C1048- 12e1, Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
  .6 ASTM D 1929-96(R2001), Test Method for Determining Ignition Temperature of Plastics.
  .7 ASTM D 2240-02b, Test Method for Rubber Property - Durometer Hardness.
  .8 ASTM E 84-01, Test Method for Surface Burning Characteristics of Building Materials.
  .9 ASTM E1300-12 ae1, Standard Practice for Determining Load Resistance of Glass in Buildings
.2 American National Standards Institute (ANSI).
  .1 ANSI/ASTM E330-02, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
  .2 ANSI Z97.1 - American National Standard for Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
.3 National Fire Protection Association
  .1 NFPA 80 Standard for Fire Doors, Fire Windows.
.4 Canadian General Standards Board (CGSB).
  .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
  .2 CAN/CGSB-12.2-M91, Flat, Clear Sheet Glass.
  .3 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
  .4 CAN/CGSB-12.8-97, Insulating Glass Units.
  .5 CAN/CGSB-12.9-M91, Spandrel Glass.
  .6 CAN/CGSB-12.11-M90, Wired Safety Glass.
.5 Canadian Standards Association (CSA International).
  .1 CSA A440-11, NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights, Includes Update No. 1 (2014)
  .2 CSA A440.2-14/A440.3-14 Fenestration Energy Performance/User Guide to CSA A440.2-14, Fenestration Energy Performance
  .3 CSA Certification Program for Windows and Doors 2000.
.6 Consumer Product Safety Commission
  .1 CPSC 16 CFR 1201, - Safety Standard for Architectural Glazing Materials.
.7 Environmental Choice Program (ECP).
  .1 CCD-045-95, Sealants and Caulking.
.8 Flat Glass Manufacturers Association (FGMA).
  .1 FGMA Glazing Manual - 1997.

.9 Laminators Safety Glass Association (LSGA).
.1 LSGA Laminated Glass Design Guide 2000.
.10 Glass Association of North America (GANA)
.1 GANA Glazing Manual
.2 GANA Sealant Manual
.3 GANA Laminated Glass Design Guide
.11 South Coast Air Quality Management District, California State (SCAQMD)
.1 SCAQMD Rule 1168-03, Adhesives and Sealants Applications.

1.4 Submittals

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

.2 Product Data: Submit manufacturer's printed product literature, specifications and data sheets.

.3 Samples: Submit duplicate 300 x 300 mm size samples of glass and sealant material.

.4 Manufacturer's Instructions: Submit manufacturer's installation instructions.

.5 Closeout Submittals: Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 Quality Assurance

.1 Perform work in accordance with FGMA Glazing Manual and Laminators Safety Glass Association Standards Manual for glazing installation methods.

.2 Installer: Company specializing in the installation of structural glazing with five (5) years proven experience and approved by the manufacturer for installation of their products.

.3 Safety glass products shall comply with the testing requirements of CAN/CGSB-12.1-M, Type 1 for Laminated Glass and Type 2 for Tempered Glass.

.4 Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this section or referenced standards.
.1 GANA Publications
.2 AAMA Publications
.3 IGMA/IGMAC Publications

.5 Provide safety glass permanently marked with the company name or logo and CAN/CGSB-12.1-M if the product meets categories 1 and 2, or mark as CAN/CGSB 12.1-M-1 if the product meets the requirements of Category 1 only.

.6 Insulating Glass products are to be permanently marked either on spacers or at least one insulating unit component with appropriate certification label of the Insulating Glass Manufacturers Alliance (IGMA) or Insulating Glass Manufacturers Association of Canada (IGMAC)

.7 Single-source fabrication responsibility: All glass fabricated for each type shall be processed and supplied by a single fabricator.

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

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

1.6 System Description

.1 Performance Requirements: Provide continuity of building enclosure vapour and air barrier using glass and glazing materials as follows:
.1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.

1.7 Design Requirements

.1 Design glass, glazing channels, connections, attachments and glazing accessories to withstand loads designated by the Ontario Building Code and to accommodate all building deflections.

.2 Size glass to withstand wind loads, dead loads and positive and negative live loads acting normal to plane of glass to a design pressure of 1.2 kPa as measured in accordance with ANSI/ASTM E330.

.3 Limit glass deflection to 1/200 with full recovery of glazing materials.

.4 Glass thicknesses indicated are minimum and are for detailing only. Confirm glass thickness by analyzing project conditions, including in-service conditions and loads. Provide glass lites for various size openings in nominal thicknesses indicated but not less than required to meet performance requirements of referenced standards. Coordinate glass thicknesses with manufacturers of framing systems.

1.8 Environmental Requirements

.1 Install glazing when ambient temperature is 10^{O}C minimum. Maintain ventilated environment for 24 hours after application.

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

1.9 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer’s printed instructions.

.3 Provide glass units with interleaving protection between lites. Keep glass and interleaving dry and store cases in clean, cool, dry areas with temperatures above the dew point. Circulation of cool, dry air in storage areas is essential. Open cases and inspect units periodically for moisture accumulation.

.4 Do not store glass in direct sunlight without an opaque protective covering over same.

1.10 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.11 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of ten (10) years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

.2 Warrant insulating glass units for ten (10) years from date of Substantial Performance against seal failure, interpane dusting, or interpane misting.

.3 Warrant low-emissivity coatings when applied to the second or third surfaces of an insulating glass unit, for ten (10) years against peeling or coating deterioration due to product failure.

.4 Warrant Laminated glass for ten (10) years against delamination and discoloration.

PART 2 PRODUCTS

2.1 Materials-Flat Glass

.1 Float glass: to CAN/CGSB-12.3, glazing quality, 6 mm thick minimum.

.2 Sheet glass: to CAN/CGSB-12.2, selected, 6 mm thick minimum.

.3 Tempered Safety Glass: To CAN/CGSB-12.1-M, transparent, 10 mm thick unless indicated otherwise. Type 2-tempered.
.1 Class B-float.
.2 Category 1 11.
.3 Edge treatment: ground, bevel edge.

2.2 Insulating Glass Units

.1 Insulating Glass Units: To CAN/CGSB-12.8-M, sealed units, not less than 1” thick or as required to meet code requirements. Minimum ½” air space.
.1 Exterior Units: Insulating Glass Type 1:
.1 Overall Unit Thickness: 1”.
.2 Outboard Lite: ¼” clear with solarban 67 low-e coating on second surface, tempered.
.3 ½” air space, argon filled.
.4 Inboard Lite: 6mm clear, laminated safety glass.
.5 Performance: All performance data shall be calculated according to ASHRAE standard procedures and verified using the LBL “Window 4.1” program:
.1 Winter nighttime U value: 0.24
.2 Summer Daytime U value: 0.22
.3 Shading Coefficient: 0.33
.4 Solar Heat Gain Coefficient: 0.29
.5 Relative Heat Gain: 68.7
.6 LSG: 1.86
.7 Visible Light transmittance: 54%
.8 Ultraviolet transmittance: 11%
.6 Product: Vitro 6mm Solarban 67 (2) on Clear + 1/2 " (12.7 mm) Argon + 6mm Clear

.2 Exterior Unit: Insulating Units Type 2:
.1 Overall Unit Thickness: 1"

.2 Outdoor Lite: “Pacifica®” Glass by Vitro Architectural Glass, tempered.
.3 Indoor Lite: Clear (transparent) Float Glass, Sputter Coated on third surface (3)
.4 Low-E Coating: “Solarban®” 90 Solar Control (Sputtered) by Vitro Architectural Glass
.5 Location: Third Surface (3)
  .1 Winter U value: 0.29
  .2 Summer U value: 0.27
  .3 Shading Coefficient: 0.24
  .4 Solar Heat Gain Coefficient: 0.29
  .5 Relative Heat Gain: 68.7
  .6 LSG: 1.86
  .7 Visible Light transmittance: 24%
  .8 Ultraviolet trans 11%
.6 Product: Pacifica by Vitro Architectural Glass
.7 Approved Manufacturers: Vitro Certified™ Fabricator Required
.8 Certification: Both lites to be Cradle to Cradle Certified™, minimum Bronze Level, by Cradle to Cradle Product Innovation Institute (www.c2ccertified.org).
.9 Outdoor Appearance: Deep-blue
.10 Insulating Unit Construction: 1/4” (6mm) glass + 1/2” (13mm) air space + 1/4” (6mm) glass

2.3 Spandrel Glass

.1 Spandrel Glass: to CAN/CGSB-12.9, 1/4” thick.
  .1 Type 2 Heat strengthened.
  .2 Class A-Float.
  .3 Style 1 Opacifying coating on the No. 2 (inboard) surface.
  .4 Form M-Monolithic.
  .5 Colour to be selected by the Consultant from full range of manufacturer’s standards. Up to two (2) colours will be selected.

2.4 Glazing Products

.1 Select appropriate glazing sealants, tapes, gaskets and other glazing materials of proven compatibility with other materials that they contact. These include glass products, insulating glass unit seals and glazing channel substrates under installation and service conditions, as demonstrated by testing and field experience.

.2 Setting blocks: Neoprene 80-90 Shore A durometer hardness to ASTM D 2240, to suit glazing method, glass light weight and area.

.3 Spacer shims: Neoprene 50-60 Shore A durometer hardness to ASTM D 2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self-adhesive on one face.

.4 Glazing tape:
  .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D 2240; coiled on release paper; black colour.
  .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.

.5 Glazing splines: resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot, colour as selected.

.6 Lock-strip gaskets: to ASTM C 542.

.7 Sealant: as specified in Section 07 92 00 – Joint Sealants. Low VOC.

.8 Aluminum mutting between panes. Clear anodized finish to match frames.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

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

3.2 Examination

.1 Verify that openings for glazing are correctly sized and within tolerance.

.2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.3 Preparation

.1 Clean contact surfaces with solvent and wipe dry.

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

.3 Prime surfaces scheduled to receive sealant.

3.4 Installation: Exterior Dry Method- Preformed Glazing

.1 Perform work in accordance with FGMA Glazing Manual IGMAC and Laminators Safety Glass Association - Standards Manual for glazing installation methods.

.2 Cut glazing tape to length; install on glazing light. Seal corners by butting tape and sealing junctions with sealant.

.3 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.4 Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.

.5 Install removable stops without displacing glazing tape. Exert pressure for full continuous contact.

.6 Trim protruding tape edge.

3.5 Installation: Exterior Wet/Dry Method (Preformed Tape and Sealant)

.1 Perform work in accordance with FGMA Glazing Manual IGMAC and Laminators Safety Glass Association - Standards Manual for glazing installation methods.

.2 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.

.3 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter

seal between glass and frame to complete continuity of air and vapour seal.

.4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.5 Rest glazing on setting blocks and push against tape and heel head of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.

.6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line.

.7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.

.8 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.6 Installation: Interior - Dry Method

.1 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.

.2 Apply cap bead of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

.3 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.

.4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.5 Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.

.6 Place glazing tape on free perimeter of glazing.

.7 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

.8 Knife trim protruding tape.

3.7 Installation: Interior Butt Glazed Method (Sealant Only)

.1 Temporarily brace glass in position for duration of glazing process. Mask edges of glass at adjoining glass edges and between glass edges and framing members.

.2 Temporarily secure a small diameter non-adhering foamed rod on backside of joint.

.3 Apply sealant to open side of joint in continuous operation; thoroughly fill the joint without displacing the foam rod. Tool the sealant surface smooth to concave profile.

.4 Permit sealant to cure then remove foam backer rod. Apply sealant to opposite side, tool smooth to concave profile.

.5 Remove masking tape.

3.8 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Perform cleaning to remove construction and accumulated environmental dirt.

.3 Remove traces of primer, caulking.

.4 Remove glazing materials from finish surfaces.

.5 Remove labels after work is complete.

.6 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.

.7 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.9 Protection of Finished Work

.1 After installation, mark light with an "X" by using removable plastic tape.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 06 10 00 Rough Carpentry
.2 Section 07 21 13 Building Insulation
.3 Section 07 92 00 Joint Sealants
.4 Section 09 91 23 Interior Painting

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM C1396 / C1396M - 14a Standard Specification for Gypsum Board
  .2 ASTM C475/C475M-12e1 Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
  .3 ASTM C514-04(2014) Standard Specification for Nails for the Application of Gypsum Board
  .4 ASTM C840-13 Standard Specification for Application and Finishing of Gypsum Board
  .5 ASTM C954-11 Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
  .6 ASTM C1047-14a Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base
  .7 ASTM C1177/C1177M-13 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
  .8 ASTM C1178/C1178M-13 Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel
  .9 ASTM C1280 - 13a Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing.
  .10 ASTM E90-09 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
  .11 ASTM E814-13a Standard Test Method for Fire Tests of Penetration Firestop Systems
  .12 ASTM E1966-15 Standard Test Method for Fire-Resistive Joint Systems
.2 Canadian Standards Association (CSA)
  .1 CSA A82.31-M Gypsum Board Application.
  .2 CSA A82.27-M. Gypsum Board
.3 Canadian General Services Board (CGSB)
  .1 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
  .2 CAN/CGSB 19-GP-21M Sealing and Bedding Compound for Acoustical Purposes
.4 CAN/ULC-S102, Building Materials and Assemblies, Standard Method of Test for Surface Burning Characteristics of.
.5 Underwriters Laboratories of Canada (ULC)
  .1 ULC List of Equipment and Material, Volume III, Fire Resistance Ratings.

1.4 Submittals

.1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
.2 Submit WHMIS Data Safety Sheets (SDS) for all products, prior to delivery of products to the site.

1.5 Quality Assurance

.1 Dry wall installers: minimum 5 years proven experience.

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

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

.4 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer’s printed instructions.

.3 Use all means necessary to protect gypsum board materials before, during and after installation and to protect the installed work and materials of other trades affected by this work. Store materials in a dry area inside the building. Do not remove wrapping until ready for use. Prevent damage to all edges and surfaces.

1.7 Environmental Requirements

.1 Maintain temperature minimum 10^{O}C, maximum 21^{O}C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours after completion of joint treatment.

.2 Apply board and joint treatment to dry, frost free surfaces.

.3 Ventilation: Ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

1.8 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Gypsum Board

.1 To CSA A82.27-M and ASTM C1396/C1396M. Standard for non-rated applications, Type X for rated applications, 1220 mm wide x maximum practical length, ends square cut, edges tapered with round edge, 12.7 mm thick or to thickness indicated on drawings. All fire rated board shall be minimum 16 mm thickness.

.2 Water and Moisture Resistant Board: to CSA A82.27 and ASTM C1396, 12.7 mm thick, 1220 mm wide with tapered edges.

2.2 Fastening and Adhesives

.1 Drywall Screws: To CSA A82.31-M, and ASTM C954-11self-drilling, self-tapping, case hardened, length to suit board thickness and provide minimum 12 mm penetration into support.

.2 Sheathing Screws: Pan head Buildex S-12 climaseal polymer coated, corrosion resistant self-tapping sheet metal screws minimum 32 mm long.

.3 Joint Tape: 50 mm perforated with preformed seam, mould and mildew resistant.
.1 Joint tape for abuse resistant gypsum board: CGC Mould Resistant Fiberglass Drywall Tape.

.4 Joint Compound: To CSA A82.31-M, asbestos-free.

.5 Joint Filler and Topping: Casein, vinyl or latex base, slow setting.

.6 Joint treatment for Gypsum Sheathing: 50 mm wide, 10 x 10 woven threads per inch, self-adhering fibreglass joint tape and Borden HPPG Elmer's Siliconized Acrylic Latex Caulk.

.7 Laminating Compound: To CSA A82.31-M, asbestos-free.

2.3 Accessories

.1 Casing Beads, Corner Beads and Edge Trim: To ASTM C 1047, 0.5 mm gauge base thickness commercial grade sheet steel with G90 zinc finish to ASTM A525-80A; perforated flanges; one piece length per location.

.2 Insulating Strip: Rubberized, moisture resistant, 3.0 mm thick, 12 mm wide closed cell neoprene strip, with self-sticking permanent adhesive on one face; lengths as required.

PART 3 EXECUTION

3.1 General

.1 Prior to installation of gypsum wallboard, ensure that all required vapour barriers, air seals, gaskets and the like installed under another Section have been inspected and accepted by Municipal authorities and the Consultant. Failure to do so will result in removal of all gypsum board installed prior to approval and replacement, at no additional cost to the Owner.

3.2 Acoustic insulation

.1 Install acoustic blankets full width and length, with tight joints, between wall framing and around penetrating electrical service boxes, piping, air ducts and frames.

.2 Place acoustic blankets where indicated on the Drawings and to thickness required to obtain acoustic performance indicated for the assembly.

.3 Place acoustic blankets between studs ensuring friction fit, free of sags, folds or open joints that may let sound pass through.
.4 Install blankets from the bottom up, tightly adjusted and trim accurately with a utility knife.

3.3 Gypsum Board Application

.1 Do application and finishing of gypsum board in accordance with ASTM C 840 except where specified otherwise.

.2 Do not apply gypsum board until bucks, anchors, blocking, electrical, and mechanical work are approved.

.3 Do not apply gypsum board to ceilings until insulation, vapour retarder and air seals have been installed and inspected by others, including consultant, owner and municipal building inspectors.

.4 Apply gypsum board at right angles to framing members or furring using screw fasteners. Maximum spacing of screws 300 mm o.c.

.5 Apply water resistant gypsum wallboard where indicated. Apply water resistant sealant to edges, ends and cut outs which expose gypsum core.

3.4 Accessories

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges.

.2 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated.

.3 Install insulating strips continuously at edges of gypsum board or casing beads abutting exterior door or window frames, to provide thermal break.

3.5 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 manufacturer's directions and feathered out onto panel faces.

.2 Finish corner beads, control joints and trims as required with two coats of joint compound and one coat of 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 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.

3.6 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 09 91 23 Interior Painting

1.3 References

.1 Environmental Protection Agency (EPA)
  .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  .1 Safety Data Sheets (SDS).
.3 Master Painters Institute (MPI)
  .1 MPI Architectural Painting Specifications Manual, 2004.
  .2 Standard GPS-1-05, MPI Green Performance Standard for Painting and Coatings.
.4 National Fire Code of Canada.
.5 Society for Protective Coatings (SSPC)
  .1 Systems and Specifications, SSPC Painting Manual 2005.
.6 South Coast Air Quality Management District, California State (SCAQMD)
  .1 SCAQMD Rule 1113-96, Architectural Coatings.
.7 Green Seal GS-11 Green Seal Environmental Standard for Paints and Coatings, January 1997.
.8 CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.4 Submittals

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

.2 Product Data:
  .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  .2 Submit WHMIS SDS - Safety Data Sheets for all materials.

.3 Samples:
  .1 Submit full range colour sample chips to indicate where colour availability is restricted.
  .2 Submit duplicate 200 x 300 mm sample panels of each paint, stain, clear coating and special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards.
  .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.

.4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties and SCAQMD Rule 1113-96.

.5 Closeout Submittals: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:
  .1 Product name, number, type and use.
  .2 Colour numbers.

.3 MPI Environmentally Friendly classification system rating.

1.5 Quality Control

.1 Provide mock-up in accordance with Section 01 45 00 - Quality Control.

.2 Mock-Ups:
.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
.2 Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen and textures. Locate where directed.
.3 Mock-up will be used to judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
.4 Allow 24 hours for inspection of mock-up before proceeding with work.
.5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.6 Quality Assurance

.1 Qualifications:
.1 Contractor: to have a minimum of five years proven satisfactory experience. When requested, provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
.2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work.
.3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.

.2 Conform to latest MPI requirements for exterior painting work including preparation and priming.

.3 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.

.4 Paint materials such as linseed oil, shellac, and turpentine to be highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and to be compatible with other coating materials as required.

.5 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Consultant.

.6 Standard of Acceptance:
.1 Walls: No defects visible from a distance of 1000 mm at 90 degrees to surface.
.2 Soffits: No defects visible from floor at 45 degrees to surface when viewed using final lighting source.
.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.7 Performance Requirements

.1 Environmental Performance Requirements:
.1 .Provide paint products meeting MPI "Environmentally Friendly" E2 or E3 ratings based on VOC (EPA Method 24) content levels.
.2 Green Performance in accordance with MPI Standard GPS-1.

1.8 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver and store materials in original containers, sealed, with labels intact. Labels to indicate:
.1 Manufacturer's name and address.
.2 Type of paint or coating.
.3 Compliance with applicable standard.
.4 Colour number in accordance with established colour schedule.

.3 Remove damaged, opened and rejected materials from site.

.4 Provide and maintain dry, temperature controlled, secure storage.

.5 Observe manufacturer's recommendations for storage and handling.

.6 Store materials and supplies away from heat generating devices.

.7 Store materials and equipment in well-ventilated area with temperature range 7^0C to 30^0 C.

.8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant. After completion of operations, return areas to clean condition to approval of Consultant.

.10 Remove paint materials from storage only in quantities required for same day use.

.11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

1.9 Fire Safety Requirements

.1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.10 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

.2 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministry of Environment and Regional levels of Government.

.3 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.4 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.5 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground the following procedures shall be strictly adhered to:
- .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
- .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
- .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
- .4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.
- .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
- .6 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .7 Set aside and protect surplus and uncontaminated finish materials: Deliver to or arrange collection by employees, individuals, or organizations for verifiable re-use or re-manufacturing.
- .8 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

1.11 Maintenance

.1 Extra Materials:
- .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Extra Materials:
- .1 Deliver to extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 - Closeout Submittals.
- .2 Quantity: provide one four litre can of each type and colour of primer stain finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
- .3 Delivery, storage and protection: comply with Consultant's requirements for delivery and storage of extra materials.

1.12 Ambient Conditions

.1 Heating, Ventilation and Lighting:
- .1 Ventilate enclosed spaces in accordance with Section 01 51 00 – Temporary Utilities.
- .2 Do not perform painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10^0 C for 24 hours before, during and after paint application until paint has cured sufficiently.
- .3 Provide continuous ventilation for seven days after completion of application of paint
- .4 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:
- .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, perform no painting work when:
  - .1 Ambient air and substrate temperatures are below 10^0 C.
  - .2 Substrate temperature is over 32^0 C unless paint is specifically formulated for application at high temperatures.

.3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.
.4 Relative humidity is above 85 % or when dew point is less than 3^0 C variance between air/surface temperature.
.5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
.2 Perform no painting work when maximum moisture content of substrate exceeds 12%.
.3 Conduct moisture tests using a properly calibrated electronic Moisture Meter.
.4 Test concrete surfaces for alkalinity as required.

.3 Surface and Environmental Conditions:
.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.
.3 Apply paint when previous coat of paint is dry or adequately cured.
.4 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.
.5 Do not apply paint when:
.1 Temperature is expected to drop below 10^O C before paint has thoroughly cured.
.2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.
.3 Surface to be painted is wet, damp or frosted.
.6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.
.7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.
.8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

PART 2 PRODUCTS

2.1 Materials

.1 Paint materials listed in latest edition of MPI Approved Products List (APL) are acceptable for use on this project.

.2 Paint materials for paint systems: to be products of single manufacturer.

.3 Only qualified products with E2 or E3 "Environmentally Friendly" ratings are acceptable for use on this project.

.4 Use only MPI listed ‘L’ rated materials.

.5 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, to be as follows:
.1 .Be water-based water soluble water clean-up.
.2 Be non-flammable biodegradable.
.3 Be manufactured without compounds which contribute to ozone depletion in upper atmosphere.
.4 Be manufactured without compounds which contribute to smog in the lower atmosphere.
.5 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.

.6 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including Fisheries Act and Canadian Environmental Protection Act (CEPA).

.7 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavelant chromium or their compounds.

.8 Water-borne surface coatings and recycled water-borne surface coatings must have flash point of 61^{O} C or greater.

.9 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:
- .1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
- .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.10 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" E2 or E3 rating.

.11 Recycled water-borne surface coatings must contain 50 % post-consumer material by volume.

.12 Recycled water-borne surface coatings must not contain:
- .1 Lead in excess of 600.0 ppm weight/weight total solids.
- .2 Mercury in excess of 50.0 ppm weight/weight total product.
- .3 Cadmium in excess of 1.0 ppm weight/weight total product.
- .4 Hexavelant chromium in excess of 3.0 ppm weight/weight total product.
- .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

.13 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and canned. These tests must be performed at a laboratory or facility which has been accredited by the Standards Council of Canada.
- .1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
- .2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
- .3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

2.2 Colours

.1 Consultant will provide Colour Schedule.

.2 Exterior colour schedule will be based upon selection of three base colours and two deep tint accent colours.

.3 Selection of colours will be from manufacturer’s full range of colours.

.4 Where specific products are available in restricted range of colours, selection will be based on limited range.

.5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 Mixing and Tinting

.1 Perform colour tinting operations prior to delivery of paint to site.

.2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.

.3 Add thinner to paint manufacturer's recommendations. Do not use kerosene or organic solvents to thin water-based paints.

.4 Thin paint for spraying according in accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Consultant.

.5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 Gloss/Sheen Ratings

.1 Paint gloss: defined as sheen rating of applied paint, in accordance with following values:

Gloss Level Category/	Units @ 60 Degrees	Units @ 85 Degrees
G1 – matte finish	0 to 5	Max. 10
G2 – velvet finish	0 to 10	10 to 35
G3 – eggshell finish	10 to 25	10 to 35
G4 – satin finish	20 to 35	Min. 35
G5 – semi-gloss finish	35 to 70	
G6 – gloss finish	70 to 85	
G7 – high gloss finish	> 85	

.2 Gloss level ratings of painted surfaces as specified.

2.5 Exterior Painting Systems

.1 Concrete Vertical Surfaces:
  .1 EXT 3.1K - Latex semi-gloss finish (over alkali resistant primer).
  .2 Add structural steel - check Ryerson
    .1 EXT 5.1D - Alkyd G5 semi-gloss finish over alkyd primer.
  .3 Structural Steel at building exterior:
    .1 EXT 5.1G Polyurethane, pigmented finish (over epoxy zinc rich primer and high build epoxy).

PART 3 EXECUTION

3.1 Manufacturer’s Instructions

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 Examination

.1 Exterior repainting work: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor to notify Paint Inspection Agency minimum of one week prior to commencement of work and provide copy of project repainting specification and Finish Schedule.

.2 Surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify Consultant in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.

.3 Where assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.

3.3 Preparation

.1 Perform preparation and operations for exterior painting in accordance with MPI Maintenance Repainting Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

.3 Clean and prepare exterior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:
   .1 Remove dust, dirt, and surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
   .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
   .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
   .4 Allow surfaces to drain completely and allow to dry thoroughly. Allow sufficient drying time and test surfaces using electronic moisture meter before commencing work.
   .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.
   .6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.

.4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

.5 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

3.4 Existing Conditions

.1 Investigate substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Consultant damages, defects, unsatisfactory or unfavourable conditions before

proceeding with work.

3.5 Protection

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Remove light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Store items and re-install after painting is completed.

.4 Protect factory finished products and equipment.

.5 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas to approval of Consultant.

3.6 Application

.1 Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:
.1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
.2 Work paint into cracks, crevices and corners.
.3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple unless approved by Consultant.
.5 Remove runs, sags and brush marks from finished work and repaint.

.3 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Consultant.

.4 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.6 Sand and dust between coats to remove visible defects.

.7 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.

.8 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

.9 Metal attachments .
1. Plates, angles, anchors, and embedments shall conform to ASTM A36/A36M, and shall be prime painted with inorganic zinc primer

3.7 Field Quality Control

.1 Inspection:
- .1 Field inspection of exterior painting operations to be carried out by Consultant.
- .2 Advise Consultant when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .3 Co-operate with inspection firm and provide access to areas of work.

.2 Manufacturer's Field Services:
- .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.8 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

3.9 Restoration

.1 Clean and re-install hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 05 50 00 Metal Fabrications
.2 Section 06 20 00 Finish Carpentry
.3 Section 09 21 16 Gypsum Board
.4 Section 09 91 13 Exterior Painting

1.3 References

.1 Environmental Protection Agency (EPA)
  .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  .1 Safety Data Sheets (SDS).
.3 Master Painters Institute (MPI)
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.4 National Fire Code of Canada.
.5 Society for Protective Coatings (SSPC)
  .1 Systems and Specifications, SSPC Painting Manual 2005.
.6 South Coast Air Quality Management District, California State (SCAQMD)
  .1 SCAQMD Rule 1113-96, Architectural Coatings.
.7 Green Seal GS-11 Green Seal Environmental Standard for Paints and Coatings, January 1997.
.8 CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.4 Submittals

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.2 Product Data:
  .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  .2 Submit WHMIS SDS - Safety Data Sheets for all materials.

.3 Samples:
  .1 Submit full range colour sample chips to indicate where colour availability is restricted.
  .2 Submit duplicate 200 x 300 mm sample panels of each paint, stain, clear coating and special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards.
  .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.

.4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties and SCAQMD Rule 1113-96.

.5 Closeout Submittals: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:
  .1 Product name, number, type and use.
  .2 Colour numbers.
  .3 MPI Environmentally Friendly classification system rating.

1.5 Quality Control

.1 Provide mock-up in accordance with Section 01 45 00 - Quality Control.
.2 Mock-Ups:
  .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
  .2 Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen and textures. Locate where directed.
  .3 Mock-up will be used to judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
  .4 Allow 24 hours for inspection of mock-up before proceeding with work.
  .5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.6 Quality Assurance

.1 Qualifications:
  .1 Contractor: to have a minimum of five years proven satisfactory experience.
  .2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work.
  .3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.

.2 Conform to latest MPI requirements for painting work including preparation and priming.

.3 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.

.4 Paint materials to be highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and to be compatible with other coating materials as required.

.5 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Consultant.

1.7 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver and store materials in original containers, sealed, with labels intact. Labels to indicate:
  .1 Manufacturer's name and address.
  .2 Type of paint or coating.
  .3 Compliance with applicable standard.
  .4 Colour number in accordance with established colour schedule.

.3 Remove damaged, opened and rejected materials from site.

.4 Provide and maintain dry, temperature controlled, secure storage.

.5 Observe manufacturer's recommendations for storage and handling.

.6 Store materials and supplies away from heat generating devices.

.7 Store materials and equipment in well-ventilated area with temperature range 7^0C to 30^0 C.

.8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant. After completion of operations, return areas to clean condition to approval of Consultant.

.10 Remove paint materials from storage only in quantities required for same day use.

.11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

1.8 Fire Safety Requirements

.1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.

1.9 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Place materials defined as hazardous or toxic in designated containers. Handle and dispose of hazardous materials in accordance with Municipal regulations.

.4 Ensure emptied containers are sealed and stored safely.

.5 Unused materials must be disposed of at official hazardous material collections site as approved by Owner.

.6 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.

.7 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.8 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes

and containers, in containers or areas designated for hazardous waste.

.9 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
- .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
- .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
- .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
- .4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
- .5 Empty paint cans are to be dry prior to disposal or recycling (where available).

.10 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.

1.10 Maintenance

.1 Extra Materials:
- .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Deliver to Owner, extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels.
- .3 Quantity: provide one four litre can of each type and colour of primer stain finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
- .4 Delivery, storage and protection: comply with Consultant's requirements for delivery and storage of extra materials.

1.11 Ambient Conditions

.1 Heating, Ventilation and Lighting:
- .1 Ventilate enclosed spaces in accordance with Section 01 51 00 – Temporary Utilities.
- .2 Provide heating facilities to maintain ambient air and substrate temperatures above 10^0 C for 24 hours before, during and after paint application until paint has cured sufficiently.
- .3 Provide continuous ventilation for seven days after completion of application of paint.
- .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
- .5 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:
- .1 Unless pre-approved written approval by Consultant and product manufacturer, perform no painting when:
  - .1 Ambient air and substrate temperatures are below 10^0 C.
  - .2 Substrate temperature is above 32^0 C unless paint is specifically formulated for application at high temperatures.
  - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
  - .4 The relative humidity is under 85% or when the dew point is more than 3^0 C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3^0 C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
- .2 Ensure that conditions are within specified limits during drying or curing process, until newly

applied coating can itself withstand 'normal' adverse environmental factors.

.3 Perform painting work when maximum moisture content of the substrate is below:
  .1 15% for wood.
  .2 12% for plaster and gypsum board.
.4 Allow new concrete to cure minimum of 28 days.
.5 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
.6 Test concrete and plaster surfaces for alkalinity as required.
.7 Surface and Environmental Conditions:
  .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
  .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
  .3 Apply paint when previous coat of paint is dry or adequately cured.
.8 Additional interior application requirements:
  .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

PART 2 PRODUCTS

2.1 Materials

.1 Products to meet requirements of GS-03, GS-11 or SCAQMD Rule 1113-96

.2 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.

.3 Provide paint materials for paint systems from single manufacturer.

.4 Only qualified products with E2 or E3 "Environmentally Friendly" rating are acceptable for use on this project.

.5 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.

.6 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids:
  .1 Water-based, Water clean-up.
  .2 Non-flammable, biodegradable.
  .3 Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
  .4 Manufactured without compounds which contribute to smog in the lower atmosphere.
  .5 Do not contain methylene chloride, chlorinated hydrocarbons or toxic metal pigments.
  .6 Recycled content of 15% post-consumer and ½ post-industrial waste.

.7 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

.8 Flash point: 61^0C or greater for water-borne surface coatings and recycled water-borne surface coatings.

.9 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne

surface coatings does not release:

.1 Matter in undiluted production plant effluent generating 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.

.2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.

.10 Recycled water-borne surface coatings to contain 50% post-consumer material by volume.

.11 Recycled water-borne surface coatings must not contain:

.1 Lead in excess of 600.0 ppm weight/weight total solids.
.2 Mercury in excess of 50.0 ppm weight/weight total product.
.3 Cadmium in excess of 1.0 ppm weight/weight total product.
.4 Hexavelant chromium in excess of 3.0 ppm weight/weight total product.
.5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

2.2 Colours

.1 Consultant will provide Colour Schedule.

.2 Colour schedule will be based upon selection of eight base colours and six deep tint accent colours.

.3 Selection of colours will be from manufacturer’s full range of colours.

.4 Where specific products are available in restricted range of colours, selection based on limited range.

.5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 Mixing and Tinting

.1 Perform colour tinting operations prior to delivery of paint to site.

.2 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.

.3 Thin paint for spraying in accordance with paint manufacturer's instructions.

.4 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 Gloss/Sheen Ratings

.1 Paint gloss: defined as sheen rating of applied paint, in accordance with following values:

Gloss Level Category/	Units @ 60 Degrees	Units @ 85 Degrees
G1 – matte finish	0 to 5	Max. 10
G2 – velvet finish	0 to 10	10 to 35
G3 – eggshell finish	10 to 25	10 to 35

G4 – satin finish	20 to 35	Min. 35
G5 – semi-gloss finish	35 to 70	
G6 – gloss finish	70 to 85	
G7 – high gloss finish	> 85	

.2 Gloss level ratings of painted surfaces as specified and as noted on Finish Schedule.

2.5 Interior Painting Systems

.1 Concrete Vertical Surfaces (includes horizontal soffits and ceilings)
.1 INT 3.1E Latex G4 finish.

.2 Structural Steel:
.1 INT 5.1X Latex G4 finish (over quick dry shop primer).

.3 Metal Fabrications:
.1 INT 5.3A Latex G5 semi-gloss finish

.4 Wood Clear Polyurethane Finish:
.1 INT 6.3K Polyurethane varnish G6 gloss finish.

.5 Gypsum Board: Walls and Bulkheads.
.1 INT 9.2A Latex G3 eggshell finish over latex sealer.

.6 All other surfaces not noted above: high performance finish suitable for commercial and institutional environment and in accordance with MPI painting manual.

PART 3 EXECUTION

3.1 Manufacturer’s Instructions

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 General

.1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 Examination

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Consultant damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

3.4 Preparation

.1 Protection:
.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking and in accordance with paint manufacturers and MPI recommendations. If damaged, clean and restore surfaces as directed by Consultant.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.
.3 Protect factory finished products and equipment.

.2 Surface Preparation:
.1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-install after painting is completed.
.2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
.3 Place "WET PAINT" signs in occupied areas as painting operations progress.

.3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
.1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths, or compressed air.
.2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
.4 Allow surfaces to drain completely and allow to dry thoroughly.
.5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
.6 Use trigger operated spray nozzles for water hoses.
.7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.

.4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

.5 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
.1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
.2 Apply wood filler to nail holes and cracks.
.3 Tint filler to match stains for stained woodwork.

.6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

.7 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements and SSPC-SP 6. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes blowing with clean dry compressed air or vacuum cleaning.

.8 Touch up of shop primers with primer as specified.

.9 Do not apply paint until prepared surfaces have been accepted by Consultant.

3.5 Application

.1 Brush and Roller Application:
.1 Apply paint in uniform layer using brush and/or roller type suitable for application.
.2 Work paint into cracks, crevices and corners.

.3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
.5 Remove runs, sags and brush marks from finished work and repaint.

.2 Spray application:
.1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
.3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
.4 Brush out immediately all runs and sags.
.5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.

.3 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.

.4 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.6 Sand and dust between coats to remove visible defects.

.7 Finish surfaces both above and below sight lines as specified for surrounding surfaces.

.8 Finish alcoves as specified for adjoining rooms.

.9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 Field Quality Control

.1 Manufacturer's Field Services:
.1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.2 Standard of Acceptance:
.1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
.2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.7 Restoration

.1 Clean and re-install hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

3.8 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

PART 1 GENERAL

1.1 General

.1 Conform to the requirements of Division 1.

1.2 Related Sections

.1 Section 06 10 00 Rough Carpentry
.2 Section 06 20 00 Finish Carpentry

1.3 References

.1 ASTM International (ASTM)
  .1 ASTM D5116-10 Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products
  .2 ASTM D6670-13 Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products
.2 Underwriters Laboratories of Canada (ULC)
  .1 CAN/ULC S109-14 Flame Tests of Flame Resistant Fabrics and Films
.3 National Fire Protection Association (NFPA)
  .1 NFPA 701, Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
.4 Canadian Electrical Code.

1.4 Submittals

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

.2 Submit shop drawings
  .1 Clearly indicate, by large scale details, anchorage, assembly, materials, components, finishes, and perimeter construction conditions.

.3 Submit duplicate 300 mm x 300 mm samples of fabric in selected colour.

.4 Submit manufacturer's maintenance data in the form of printed instructions for cleaning and maintaining roller shades, for inclusion in Operation and Maintenance Manuals specified in section 01 78 00 – Closeout Submittals

1.5 Quality Assurance

.1 Work of this Section shall be by forces in the direct employ or under control of the system manufacturer, skilled, trained and experienced in work of similar scope and complexity.

.2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section, with a minimum of ten years of experience.

.3 Mock-Ups: Erect one full size mock-up of each roller shade type for review. Completed and accepted mock-up shall act as the standard to which the balance of the work will be judged.

1.6 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Test all operable components prior to shipping.

.3 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.7 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.8 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of two (2) years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

.2 Manufacturer's Warranty: Submit manufacturer's standard 10 year product warranty executed by an authorized company official.

PART 2 PRODUCTS

Manufacturers

.1 Roller Shade System shall be mounted per details, electrical Operated Motorized & non-electrically Operated Solar Shades as manufactured by Solarfective Products Limited.

.2 Acceptable Products:
.1 Solarflective Teleshade System and Televent System.

.3 Subject to compliance with the contract documents, acceptable equivalent products of the following manufacturers may be used upon approval:
.1 Elite Window Fashions;
.2 Lighting Harvesting Shading Solutions;
.3 Mechoshade Systems Inc.;
.4 Nysan Solar Control;
.5 Sun Glow Window Covering Products of Canada;
.6 SunProject Inc.

2.2 Hardware – Manually Controlled Shades

.1 Chain Operated with infinite positioning. Left or right hand operation and banding as applicable to project conditions.
.1 Drive assembly:
.1 Must allow fingertip control and include a built-in shock absorber system to prevent chain breakage under normal operating conditions.
.2 Factory set for size and travel of shades.
.3 Capable of being filed adjusted from the exterior of the shade unit without having to disassemble the hardware.
.4 Drive Chain: No. 10 stainless steel bead chain formed in a continuous loop. The chain shall have passed a 40kg load test. Chain may be positioned at either, or both ends of

the shade without disassembly of the shade unit.
.1 Supply and install child safe chain retainers.

.5 Supply and install counter balancing mechanism designed to offset the weight of the shade and give fingertip control.

.2 Control shades and room darkening shades independently.

2.3 Shade Mounting System

.1 Extruded aluminum bracket designed to accept preassembled shade system.
.1 Brackets shall be used to facilitate the alignment with shade opening.
.2 Design brackets to be mounted from the building only, do not mount from frame. Any bracket design mounted from window frame will be rejected and responsibility of damage to the window frame by such install will be borne by the installer.

.2 Modular Construction: shades must be removable as a complete modular unit without any component disassembly required.

2.4 Aluminum Finish

.1 Exposed aluminum: Baked enamel, colour to be selected by the Consultant.

.2 Unexposed aluminum: mill finish.

2.5 Shade Fabric

.1 Sun control fabric: dimensionally stable shade fabric.
.1 Acceptable Products: 3% open area:
.1 Phifer Sheerweave, Style 4600.
.2 Colour: to be selected by the Consultant.

.2 Blackout shade fabric: dimensionally stable blackout fabric.
.1 To be selected from manufacturer’s full range.

.3 Performance: fabric shall hang flat, without buckling or distortion. Edge, where trimmed, shall hang true and straight, without shifting sideways more than 3 mm in either direction due to warp distortion or weave design.

.4 Fabric shall be certified by an independent laboratory to pass the small scale vertical burn requirements test CAN/ULC-S109 and NFPA-701.

2.6 Hardware- Motor Controlled Shades

.1 Electrical shade motors:
.1 Somfy roller motor, 500 series or better, 3-wire, instantly reversible, adjustable limit switches, thermal overload protector, and electric brake.
.2 Torque Limiter with self-adjusting shut-off.
.3 Motor Coupler: Machined fr4om solid aluminum 6063-T5 stick, sized to roller, half-lapped and double bolted at each motor to allow ease of installation and service of motor.
.4 Shade motor shall be equipped with externally located control wheels which allow exact control of shade limits in raised and lowered positions, preventing over winding of the fabric/shadecloth.

.2 Motor Control System:
.1 Infra-red control:
.1 Groups of roller shades shall be controlled by RTS wall mounted switch.

.2 Sender shall be programmed to operate from 1 to 12 different individual roller shade motors or groups or zones with one hand held sender.
.3 Receiver shall incorporate a microprocessor and shall have a manual override switch to allow manual control of the shade motors either single, group or zone control. Receiver shall be 120V/220V, 4 Amp with output duration of 3 minutes, and shall be located as indicated on the drawings, and as per manufacturer's recommendations.
.4 The receiver shall be supplied with an external diode located as indicated on the drawings. External diode shall be connected to the receiver with a shielded low voltage 2-conductor wire. Receiver shall be powered with line voltage, and signal wiring to the MC2, zone or group relays shall be low voltage 4-conductor wire.

.2 Audio-Visual (office environment) interface control:
.1 Shade manufacturer shall provide low voltage interface ready MC2 relay system to allow shade operation control from audio-visual equipment not supplied or installed under this section.

.3 Control shades and room darkening shades independently.

2.7 Assembly

.1 Supply and install fully factory assembled shade units consisting of 2 shade brackets, shade tube, extruded aluminum fascia, hembar and fabric as specified.

.2 Factory modify housings where necessary to bypass columns and other obstructions.

.3 End Brackets: 2 piece molded ABS construction with nylon drive sprocket. Bracket colour coordinated with fascia colour.

.4 Shade tube; Minimum 1.52 mm thick extruded aluminum with 3 equally spaced continuous stiffening fins, non-sag design, maximum deflection under full load of fabric L/700.

.5 Fascia: One piece extruded aluminum 1.7 mm thickness complete with three continuous screw flutes. Anodized. Colour as selected by the Consultant. Extruded aluminum snap lock fascia which continuously fits on the end and center brackets as a one-piece section.

.6 Hembar: extruded aluminum with matching plastic end finials.

.7 Blackout Shade Features: 13 mm pile mounted in prefinished 38 x 28 mm extruded aluminum side and bottom channels finished to match window framing. Include dynamic hembar to allow for variances in window sill level.

2.8 Fabrication

.1 Finished assemblies shall be square, true to size and free from distortion, twist or other defects that could affect their strength, operation or appearance.

.2 Factory applied finish shall be uniform, smooth and without blemishes.

.3 The fabric shall be colour fast, retain its shape, not be affected by moisture or heat, and shall be non-flammable. Cut fabric to eliminate glare and reflection from shining surfaces while maintaining exterior view. The top of the fabric shall be retained in the recessed spline of the shade roller and the bottom of the fabric shall be retained by the hem bar.

PART 3 EXECUTION

3.1 Installation

.1 Install shading devices in accordance with manufacturer's instructions.

.2 Take field measurements prior to fabrication to ensure fit.

.3 Fabric shall be premeasured and manufactured off-site.

.4 Install square, plumb, true to line, adequately anchored, maintaining uniform clearances, accurate alignment levels and parallel with the window plane. Fabric shall not travel more than 3 mm in either direction within channels after installation.

.5 Adjust operable parts for correct function.

.6 Secure with non-corrosive fasteners, concealed in final assembly.

.7 Fabric shall hang flat, without buckling or distortion. The edge, when trimmed, shall hang straight without raveling. An unguided roller shade cloth shall roll true and straight, without shifting sideways more than + 3 mm in either direction due to warp distortion, or weave design.

.8 Black out shades shall be installed to eliminate passage of light from exterior.

.9 Electrical wiring, hook-up, switches, motorized shades: in accordance with Division 26, 27 and 28 requirements.

.10 Adjust to provide for operation without binding.

.11 Refinish damaged or defective work so that no variation in surface appearance is discernable.

3.2 Demonstration

.1 Prior to acceptance of system, arrange for demonstration of equipment with authorized representatives of the owner, to be performed by representative of shade manufacturer to assure proper function, operation and explanation.

.2 Conduct comprehensive demonstration for Owner’s staff on operation and care of interior window treatments.

3.3 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

Appendix 1

Parasol Environmental Inc.

125-1860 Appleby Line, Unit # 14,
Burlington, Ontario L7L 7H7

Limited Designated Substance Survey Report

Port Perry High School

160 Rosa Street, Port Perry, Ontario

Prepared for

Durham District School Board
400 Taunton Road East, Whitby, Ontario

October 20, 2023
Parasol Project No: 13164

Executive Summary

Parasol Environmental Inc. (Parasol) was retained by the Durham District School Board to conduct a Limited Designated Substance Survey within Port Perry High School located at 160 Rosa Street, Port Perry, 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 replacement. 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 October 6, 2023.

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 • Mechanical Insulations (Parging Cement) Non-Friable Asbestos • Window Caulking • Grey Window Glazing Distinctive Asbestos • Acoustic Tiles (applied to walls)	The following remedial work is necessary to comply with Ontario Regulation 278/05: • Repair parging cement fitting insulation using Type 2 asbestos abatement procedures • Remove damaged acoustic tiles using Type 1 asbestos abatement procedures
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: • Beige paint (1958-Addition) • White paint (1958-Addition) • Light yellow paint (1958-Addition) • Exterior brown paint (1958-Addition) • Masonry block mortar (1958-Addition) • Exterior brick mortar (1958-Addition) • Beige paint (1926-Original) • Yellow paint (1926-Original) • Exterior brick mortar (1926-Original)	Stabilize the following materials: • Remove flaking grey paint and beige paint and debris using EACC Class 1 or 2A Guidelines

Designated Substance or Hazardous Material	Findings	Recommendation
	Lead-containing concentrations were found to be present in the following materials: • Grey paint (1926-Original) • White paint (1926-Original) • Light blue paint (1926-Original) • Cream paint (1926-Original) Lead-based concentrations were found to be present in the following materials: • Exterior beige paint (1926-Original) Lead of varying concentrations is also suspected to be present in the following items: • Batteries in Emergency Lighting • Solder on pipe fittings	
Mercury	Mercury vapour is presumed to be present within all fluorescent light tubes. Liquid mercury was observed to be present within the thermostatic switches.	If removed, the fluorescent lights and thermostats 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: • 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: • Water damaged lay-in acoustic ceiling tiles.	Complete removal of mould and water damaged building material using EACC Level 1 Mould Remediation

Designated Substance or Hazardous Material	Findings	Recommendation
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.

TABLE OF CONTENTS

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 Port Perry High School located at 160 Rosa Street, Port Perry, 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 replacement. 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 October 6, 2023.

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 interior and exterior perimeter window walls of the 1926 original building and 1958 building addition as illustrated on the architectural drawings provided by the client. 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 checks were made above ceilings with the aid of a ten-foot (10FT) step ladder. Locations and building materials present above this height were considered to be inaccessible. Due to height restrictions, the exterior side of the window walls were not assessed above the first-floor level. Prior to their disturbance, it is recommended to sample materials present at inaccessible heights that were not previously sampled. 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.

The survey was completed on an "addition by addition" approach, to delineate surfacing building materials (plaster, drywall, mortars) based on the year of construction.

At the client's direction, flooring finishes present were not included as part of the current assessment, as they are not likely to be disturbed as part of the planned window 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 materials, 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, door glazing/caulking compounds, 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, copper pipes soldering joints, wiring connectors, electric cable sheathing, batteries, and lead sheeting) were noted if present.

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.15465-128)
2. Limited Designated Substance Survey Report – Parasol Environmental Inc. September 29, 2023 (Parasol Project No: 13159)

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-1926, Building Additions - 1958, 1966, 1999, 2011
Number of Floors	3
Total Area	160,005 SF
Roof Type	Built-up
Floors	Concrete, Vinyl Floor Tiles, Wood
Walls	Smooth Plaster, Textured Plaster, Texture Coat, Acoustic Tiles, Masonry Block, Drywall
Ceilings	Lay-in Ceiling Tiles, Glue-on Ceiling Tiles, Smooth Plaster, Drywall, Wood Panels, Tectum Panels
HVAC	Forced Air, Radiators, Suspended Heaters
Structure	Unknown
Exterior Cladding	Brick, Metal, Texture Coat

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	Previously Sampled (15465-128 S18)	Grey, Fibrous	205	ND	Applied to deck and upper walls

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	Previously Sampled (15465-128 S17)	1’x1’ Medium and Large Holes (Brown Interior)	Throughout Surveyed Area	ND	-

Tile Number	Sample Number	Description	Locations	Asbestos Content	Notes
AT-02	**Previously Sampled (601-10)**	**1'x1' Medium and Large Holes (Grey Interior)**	**114, 214, 216**	**1.2%CH**	**Applied to select upper walls. POOR-GOOD condition**
AT-03	NA	2'x4' Pinhole and Random Fleck	Throughout Surveyed Area	NA	Date Stamped (08/13/2014) Non-ACM
AT-04	Previously Sampled (13159 S04A-C)	18"x18" Flat White	Throughout Third Floor	ND	Associated mastic does not contain asbestos (13159 S08A-C)
AT-05	NA	2'x4' Medium Holes and Deep Fissures	314	NA	Date Stamped (09/05/1999) Non-ACM
AT-06	Previously Sampled (15465-128 S20)	1'x1' Pinhole and Fissure	110	ND	-

ND= None Detected, NA= Not Applicable, CH= Chrysotile Asbestos, AM= Amosite Asbestos

5.2.4 Texture Coat Finishes

1926-Original Building

Rough finish texture coat was observed within the 1926 original building survey area and is applied to the surface of smooth plaster walls. Rough finish texture coat is limited to exterior door area within Location #103A and #109. Previous sampling (Sample Set 13159 S09A-C) determined that the samples do not contain asbestos.

1958-Building Addition

Rough finish texture coat was observed within the 1958 building addition survey area is and applied to the surface of the exterior door canopy. Analysis of Sample Set S10A-C determined that the samples do not contain asbestos.

5.2.5 Plaster Finishes

1926-Original Building

Smooth plaster was observed to be applied to walls and ceilings throughout the 1926 original building survey area. Previous sampling (Sample Set 13159 S02A-G) determined that the samples do not contain asbestos. As part of the current assessment, an additional five (5) samples were collected and submitted for analysis. The analysis of Sample Set S11A-E determined that the samples do not contain asbestos.

Textured finish plaster was observed to be applied to the lower portion of the walls throughout the 1926 original building survey area. Previous sampling (Sample Set 13159 S03A-E) determined that the samples do not contain asbestos. As part of the current assessment, an additional five (5) samples were collected and submitted for analysis. The analysis of Sample Set S12A-E determined that the samples do not contain asbestos.

1958-Building Addition

Smooth plaster was observed to be applied to walls and ceilings throughout the 1958 building addition survey area. Analysis of Sample Set S01A-G determined that the samples do not contain asbestos.

5.2.6 Drywall Finishes

1926-Original Building

Joint compound applied to gypsum board was observed within the 1926 original building survey area as wall, ceiling and bulkhead finishes. Previous sampling (Sample Set 13159 S06A-C) determined that the samples do not contain asbestos. As part of the current assessment, an additional three (3) samples were collected and submitted for analysis. The analysis of Sample Set S14A-C determined that the samples do not contain asbestos.

1958-Building Addition

Joint compound applied to gypsum board was observed within the 1958 building addition survey area as wall, ceiling and bulkhead finishes. Analysis of Sample Set S05A-C determined that the samples do not contain asbestos.

5.2.7 Insulations

Friable asbestos-containing insulations and non-asbestos-containing insulations were observed to be present on mechanical systems throughout the surveyed area.

5.2.7.1 Fitting Insulation

Asbestos-containing parging cement insulation was observed to be present on pipe fittings within the surveyed area. Previous sampling performed by others determined that the material contains **40%-80% Chrysotile asbestos.** At the time of the current assessment, asbestos-containing parging cement was observed in FAIR to GOOD condition.

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 uninsulated.

5.2.7.4 Mechanical Equipment Insulation

Mechanical equipment (radiators, unit ventilators and suspended heaters) 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

Previously noted, asbestos and non-asbestos vinyl floor tiles are present throughout the surveyed area. At the client's direction, representative samples of the materials were not collected at the time of the assessment as the planned removal and replacement of the window assemblies 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 survey. Should the flooring finishes require disturbance, sampling of the materials is required to prove the materials non-asbestos.

5.2.10 Window Caulking

The following window caulking types were observed to be present at the time of the survey:

Number	Sample Number	Description	Locations	Asbestos Content	Notes
CK-01	S04A-C	White, Hard	116	ND	-
CK-02	S06A-C	Grey, Soft	Throughout Interior of 1958 Building Addition Survey Area	ND	-
CK-03	**S07A-C**	**Grey, Sticky**	**210, 211**	**3% CH**	**GOOD Condition May be present in adjacent areas**
CK-04	S08A-C	Light Grey, Hard	Exterior-1958 Building Addition	ND	-
CK-05	S13A-C	Silver, Soft	Throughout interior of 1926 Original Building Survey Area	ND	-
CK-06	**S17A-C**	**Black, Hard**	**310**	**5% CH**	**GOOD Condition**
CK-07	NA	Light Grey, Silicone	310	NA	Silicone (Non-ACM)
CK-08	NA	White, Silicone	103	NA	Silicone (Non-ACM)
CK-09	S19A-C	Light Grey, Soft	Exterior-1926 Original building	ND	-
CK-10	**S21A-C**	**Grey, Hard**	**Exterior-1926 Original Building**	**3% CH**	**Present behind CK-09 GOOD Condition**

ND= None Detected, NA= Not Applicable, CH= Chrysotile Asbestos, AM= Amosite Asbestos

5.2.11 Other

1926-Original Building

- Mortar associated with interior and exterior brick finishes was observed within the 1926 original building survey area. Analysis of Sample Set S16A-G determined that the samples do not contain asbestos.
- Mortar associated with masonry block finishes was observed within limited areas of the 1926 original building survey area. Previous sampling (Sample Set 13159 S10A-C) determined that the samples do not contain asbestos.
- Beige window putty was observed within the 1926 original building survey area and limited to the exterior portion of the window of Location #305-Work Room. Analysis of sample Set S15A-C determined that the samples do not contain asbestos.

- Exterior grey window glazing was observed within the 1926 original building survey area. Analysis of Sample Set S20A-C determined that the material contain **3% Chrysotile asbestos**. At the time of the current assessment the exterior grey window glazing was observed in GOOD condition.
- Tectum panels were observed to be applied to ceilings within select locations of the 1926 original building survey area. No samples of the material were collected, as the tectum panels are not suspected to contain asbestos.

1958-Building Addition

- Mortar associated with masonry block finishes was observed throughout the 1958 building addition survey area. Analysis of Sample Set S02A-G determined that the samples do not contain asbestos.
- Mortar associated with exterior brick finishes was observed within the 1958 building addition survey area. Analysis of Sample Set S09A-E determined that the samples do not contain asbestos.
- Exterior grey window glazing where present within the survey area is presumed to contain asbestos. Additional sampling in specific areas is required to prove the material non-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	114-Classroom	Beige Paint	Walls	<0.0080%	Low-Level Lead	GOOD
Pb-02	114-Classroom	White Paint	Walls and Ceilings	0.041%	Low-Level Lead	GOOD
Pb-03	116-Classroom	Light Yellow Paint	Walls	<0.0080%	Low-Level Lead	GOOD
Pb-04	216-Classroom	Mortar	Masonry Block	<40 mg/Kg	Low-Level Lead	GOOD
Pb-05	Exterior-1958 Addition	Mortar	Brick	<40 mg/Kg	Low-Level Lead	GOOD
Pb-06	Exterior-1958 Addition	Brown Paint	Aluminum Window Inserts	<0.0080%	Low-Level Lead	GOOD
Pb-07	**304-Classroom**	**Grey Paint**	**Window Trim**	**0.36%**	**Lead-Containing**	**Flaking, FAIR**

Sample No	Sample Location	Description	Substrate	Result	Lead Class	Condition
Pb-08	**307-Classroom**	**White Paint**	**Window Trim and Walls**	**0.19%**	**Lead-Containing**	**GOOD**
Pb-09	**305-Work Room**	**Light Blue Paint**	**Window Trim and Walls**	**0.26%**	**Lead-Containing**	**GOOD**
Pb-10	**Exterior-1926 Original (Outside 305-Work Room)**	**Beige Paint**	**Window Frames**	**4.5%**	**Lead-Based**	**Flaking, FAIR**
Pb-11	103-Classroom	Beige Paint	Walls	<0.0081%	Low-Level Lead	GOOD
Pb-12	107-Spec. Ed	Yellow Paint	Walls	0.064%	Low-Level Lead	GOOD
Pb-13	Exterior-1926 Original	Mortar	Brick	93 mg/Kg	Low-Level Lead	GOOD
Pb-14	**303-Drama Room**	**Cream Paint**	**Window Frames**	**0.21%**	**Lead-Containing**	**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. Solder on pipe fittings

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

Liquid mercury was observed to be present within the thermostatic switches within the surveyed area.

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. Masonry and mortar
2. 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
109-Stair	• Water damaged 2'x4' lay-in acoustic ceiling tile.	1 Tile
208-Office	• Water damaged 2'x4' lay-in acoustic ceiling tiles.	3 Tiles
238-Lounge	• Water damaged 2'x4' lay-in acoustic ceiling tiles.	5 Tiles

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. Acoustic Tiles (applied to walls)
2. Mechanical Insulations (Parging Cement)
3. Window Caulking
4. Window Glazing

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 (window caulking, window glazing) 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 less than seven and a half square meters (7.5m^2) of acoustic ceiling tiles require the use of Type 1 asbestos abatement procedures provided that it is removed without being broken, cut, drilled, abraded, ground, sanded or vibrated. Any quantity greater requires the use of Type 2 asbestos abatement procedures.

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: 1926-Original Building (beige paint, yellow paint, brick mortar). 1958-Building Addition (beige paint, white paint, light yellow paint, masonry block mortar, exterior brown paint and exterior brick mortar).

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: 1926-Original Building (grey paint, white paint, light blue paint and cream paint).

Based on the results of the bulk sampling and the visual identification, lead-based concentrations (equal to or greater 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: 1926-Original Building (exterior beige paint outside of 305-Work Room).

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 and liquid mercury is present within thermostats.

When removing the fluorescent lights and thermostats, 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 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 Asbestos

The following remedial work is necessary if the asbestos-containing building materials are to remain:

Location	Description and Quantity	Remedial Recommendations
114-Classroom	1 Acoustic Tile (applied to wall)	Removed damaged Acoustic Tile using Type 1 Asbestos Abatement Procedures
214-Classroom	12 Acoustic Tiles (applied to wall)	Removed damaged Acoustic Tiles using Type 1 Asbestos Abatement Procedures
216-Classroom	2 Acoustic Tiles (applied to wall)	Removed damaged Acoustic Tiles using Type 1 Asbestos Abatement Procedures
103-Classroom	1 Parging Cement Fitting	Repair damaged parging cement fitting using Type 2 Asbestos Abatement Procedures

6.2.2 Lead

The following paint and/or masonry mortar should be stabilized if they are to remain:

Location	Description	Remedial Recommendations
304-Classroom	Grey paint on window trim	Remove flaking grey paint and debris using EACC Class 1 or 2A Guidelines
Building Exterior-Outside of 305-Work Room	Beige paint on exterior window frame	Remove flaking beige paint and debris 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.

6.2.3 Mould

The following mould impacted and water damaged building materials should be remediated if they are to remain:

Location	Observations	Remediation
109-Stair	• Water damaged 2'x4' lay-in acoustic ceiling tile.	EACC Level 1 Mould Remediation
208-Office	• Water damaged 2'x4' lay-in acoustic ceiling tiles.	EACC Level 1 Mould Remediation
238-Lounge	• Water damaged 2'x4' lay-in acoustic ceiling tiles.	EACC Level 1 Mould Remediation

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

emc scientific INCORPORATED

Laboratory Analysis Report

To:

Brad Panzer
Parasol Environmental
125–1860 Appleby Line, Unit #14
Burlington, Ontario
L7L 7H7

EMC LAB REPORT NUMBER: A96671
Job/Project Name: Port Perry H.S
Analysis Method: Polarized Light Microscopy – EPA 600
Date Received: Oct 10/23 **Date Analyzed:** Oct 17/23
Analyst: Arth Parikh
Reviewed By: Malgorzata Sybydlo

Job No: 13164
Number of Samples: 75
Date Reported: Oct 17/23

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-01A	A96671-1	Smooth plaster/ 114- classroom	2 Phases: a) White, plaster b) Light grey, plaster	 **ND** **ND**			 100 100
S-01B	A96671-2	Smooth plaster/ 116- classroom	2 Phases: a) White, plaster b) Light grey, plaster	 **ND** **ND**			 100 100
S-01C	A96671-3	Smooth plaster/ 220- classroom	2 Phases: a) White, plaster b) Light grey, plaster	 **ND** **ND**			 100 100
S-01D	A96671-4[5]	Smooth plaster/ 218- storage	3 Phases: a) White, joint compound b) White, plaster c) Light grey, plaster	 **ND** **ND** **ND**			 100 100 100
S-01E	A96671-5	Smooth plaster/ 216- classroom	2 Phases: a) White, plaster b) Light grey, plaster	 **ND** **ND**			 100 100
S-01F	A96671-6	Smooth plaster/ 214- classroom	2 Phases: a) White, plaster b) Light grey, plaster	 **ND** **ND**			 100 100
S-01G	A96671-7	Smooth plaster/ 211- office	2 Phases: a) White, plaster b) Light grey, plaster	 **ND** **ND**			 100 100

EMC LAB REPORT NUMBER: A96671
Client's Job/Project Name/No.: 13164
Analyst: Arth Parikh

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-02A	A96671-8	Masonry block mortar/ 114- class room	Grey, cementitious material	**ND**			100
S-02B	A96671-9	Masonry block mortar/ 116- class room	Grey, cementitious material	**ND**			100
S-02C	A96671-10	Masonry block mortar/ 120- cosmetology	Grey, cementitious material	**ND**			100
S-02D	A96671-11	Masonry block mortar/ 220- class room	Grey, cementitious material	**ND**			100
S-02E	A96671-12	Masonry block mortar/ 216- class room	Grey, cementitious material	**ND**			100
S-02F	A96671-13	Masonry block mortar/ 214- class room	Grey, cementitious material	**ND**			100
S-02G	A96671-14	Masonry block mortar/ 116- class room	Grey, cementitious material	**ND**			100
S-04A	A96671-15	CK-01/ 116- classroom	White, caulking	**ND**			100
S-04B	A96671-16	CK-01/ 116- classroom	White, caulking	**ND**			100
S-04C	A96671-17	CK-01/ 116- classroom	White, caulking	**ND**			100
S-05A	A96671-18	DJC/ 116-classroom	White, joint compound	**ND**			100
S-05B	A96671-19	DJC/ 120 – cosmetology	White, joint compound	**ND**			100
S-05C	A96671-20	DJC/ 116-classroom	White, joint compound	**ND**			100
S-06A	A96671-21	CK-02/ 120- cosmetology	Grey, caulking	**ND**			100
S-06B	A96671-22	CK-02/ 220- classroom	Grey, caulking	**ND**			100
S-06C	A96671-23	CK-02/ 216- classroom	Grey, caulking	**ND**			100
S-07A	A96671-24	CK-03/ 210- office	Grey, caulking	**Chrysotile**	**3**	2	95

EMC LAB REPORT NUMBER: A96671
Client's Job/Project Name/No.: 13164
Analyst: Arth Parikh

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-07B	A96671-25	CK-03/ 210- office	NA	**NA**			
S-07C	A96671-26	CK-03/ 210- office	NA	**NA**			
S-08A	A96671-27	CK-04/ Exterior	Off white, caulking	**ND**		2	98
S-08B	A96671-28	CK-04/ Exterior	Off white, caulking	**ND**		2	98
S-08C	A96671-29	CK-04/ Exterior	Off white, caulking	**ND**		2	98
S-09A	A96671-30	Brick mortar/ exterior	Grey, cementitious material	**ND**			100
S-09B	A96671-31	Brick mortar/ exterior	Grey, cementitious material	**ND**			100
S-09C	A96671-32	Brick mortar/ exterior	Grey, cementitious material	**ND**			100
S-09D	A96671-33	Brick mortar/ exterior	Grey, cementitious material	**ND**			100
S-09E	A96671-34	Brick mortar/ exterior	Grey, cementitious material	**ND**			100
S-10A	A96671-35	Texture coat/ exterior	2 Phases: a) White, textured cementitious material b) Grey, cementitious material	**ND** **ND**			100 100
S-10B	A96671-36[6]	Texture coat/ exterior	2 Phases: a) White, textured cementitious material b) Grey, cementitious material	**ND** **ND**			100 100
S-10C	A96671-37	Texture coat/ exterior	2 Phases: a) White, textured cementitious material	**ND**			100

EMC LAB REPORT NUMBER: A96671
Client's Job/Project Name/No.: 13164
Analyst: Arth Parikh

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
			b) Grey, cementitious material	**ND**			100
S-11A	A96671-38	Smooth plaster/ 304- classroom	White, plaster	**ND**			100
S-11B	A96671-39	Smooth plaster/ 102- classroom	White, plaster	**ND**			100
S-11C	A96671-40	Smooth plaster/ 103- classroom	White, plaster	**ND**			100
S-11D	A96671-41	Smooth plaster/ 204- classroom	White, plaster	**ND**			100
S-11E	A96671-42	Smooth plaster/ 209- classroom	White, plaster	**ND**			100
S-12A	A96671-43[7]	Textured plaster/ 304- classroom	Green, textured primer	**ND**			100
S-12B	A96671-44	Textured plaster/ 306- classroom	2 Phases: a) Yellow, textured primer b) Grey, cementitious material	 **ND** **ND**			 100 100
S-12C	A96671-45	Textured plaster/ 202- classroom	2 Phases: a) Yellow and green, textured primer b) Grey, cementitious material	 **ND** **ND**			 100 100
S-12D	A96671-46[6]	Textured plaster/ 207- classroom	2 Phases: a) Yellow, textured primer b) Grey, cementitious material	 **ND** **ND**			 100 100
S-12E	A96671-47	Textured plaster/ 202- classroom	2 Phases: a) Yellow and green, textured primer b) Grey, cementitious material	 **ND** **ND**			 100 100
S-13A	A96671-48	CK-05/ 304- classroom	Grey, caulking	**ND**			100

emcscientific INCORPORATED

Laboratory Analysis Report

EMC LAB REPORT NUMBER: A96671
Client's Job/Project Name/No.: 13164
Analyst: Arth Parikh

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-13B	A96671-49	CK-05/ 205- work room	Grey, caulking	**ND**			100
S-13C	A96671-50	CK-05/ 103- classroom	Grey, caulking	**ND**			100
S-14A	A96671-51	DJC/ 316- work room	White and off white, joint compound	**ND**			100
S-14B	A96671-52	DJC/ 314- work room	White and off white, joint compound	**ND**			100
S-14C	A96671-53	DJC/ 207- classroom	White and off white, joint compound	**ND**			100
S-15A	A96671-54	Window putty/ exterior	Off white and white, caulking	**ND**			100
S-15B	A96671-55	Window putty/ exterior	Off white and white, caulking	**ND**			100
S-15C	A96671-56	Window putty/ exterior	Off white and white, caulking	**ND**			100
S-16A	A96671-57	Brick mortar/ 303- theatre arts	Grey and white, cementitious material	**ND**			100
S-16B	A96671-58	Brick mortar/ 108- storage	Grey and white, textured cementitious material	**ND**			100
S-16C	A96671-59	Brick mortar/ exterior	Grey and white, cementitious material	**ND**			100
S-16D	A96671-60	Brick mortar/ exterior	Grey, cementitious material	**ND**			100
S-16E	A96671-61	Brick mortar/ exterior	Grey and white, cementitious material	**ND**			100
S-16F	A96671-62	Brick mortar/ exterior	Grey and white, cementitious material	**ND**			100
S-16G	A96671-63	Brick mortar/ exterior	Grey and white, cementitious material	**ND**			100
S-17A	A96671-64	CK-06/ 310-storage	Black, caulking	**Chrysotile**	**5**		95
S-17B	A96671-65	CK-06/ 310-storage	NA	**NA**			

emcscientific INCORPORATED

Laboratory Analysis Report

EMC LAB REPORT NUMBER: A96671
Client's Job/Project Name/No.: 13164
Analyst: Arth Parikh

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-17C	A96671-66	CK-06/ 310-storage	NA	**NA**			
S-19A	A96671-67	CK-09/ Exterior	Grey, caulking	**ND**			100
S-19B	A96671-68	CK-09/ Exterior	Grey, caulking	**ND**			100
S-19C	A96671-69	CK-09/ Exterior	Grey, caulking	**ND**			100
S-20A	A96671-70	Grey window glazing/ exterior	Grey, caulking	**Chrysotile**	**3**		97
S-20B	A96671-71	Grey window glazing/ exterior	NA	**NA**			
S-20C	A96671-72	Grey window glazing/ exterior	NA	**NA**			
S-21A	A96671-73	CK-10/ exterior	Grey, caulking	**Chrysotile**	**3**		97
S-21B	A96671-74	CK-10/ exterior	NA	**NA**			
S-21C	A96671-75	CK-10/ exterior	NA	**NA**			

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. Phase c) is small in size.
6. Phase b) is small in size.
7. Another phase is present but is too mall to analyze.

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	552315514
CustomerID:	55PAEN75
CustomerPO:	13164
ProjectID:	

Attn: **Brad Panzer**
Parasol Environmental Inc.
125-1860 Appleby Line
Unit 14
Burlington, ON L7L 7H7

Phone: (416) 579-1284
Fax:
Received: 10/10/2023 09:00 AM
Collected: 10/6/2023

Project: **Port Perry H. S/ 13164**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client SampleDescription	Collected	Analyzed	Weight	RDL	Lead Concentration
Pb-01	10/6/2023	10/10/2023	0.2504 g	0.0080 % wt	<0.0080 % wt
552315514-0001	Site: 114-classroom/ Beige Paint				
Pb-02	10/6/2023	10/10/2023	0.2586 g	0.0080 % wt	0.041 % wt
552315514-0002	Site: 114-classroom/ White Paint				
Pb-03	10/6/2023	10/10/2023	0.2579 g	0.0080 % wt	<0.0080 % wt
552315514-0003	Site: 116-classroom/Light Yellow Paint				
Pb-06	10/6/2023	10/10/2023	0.2516 g	0.0080 % wt	<0.0080 % wt
552315514-0006	Site: Exterior/ Brown Paint				
Pb-07	10/6/2023	10/10/2023	0.2541 g	0.0080 % wt	0.36 % wt
552315514-0007	Site: 304-classroom/ Grey Paint				
Pb-08	10/6/2023	10/10/2023	0.2521 g	0.0080 % wt	0.19 % wt
552315514-0008	Site: 307-classroom/ White Paint				
Pb-09	10/6/2023	10/10/2023	0.2488 g	0.0080 % wt	0.26 % wt
552315514-0009	Site: 305-Workroom/ Light Blue Paint				
Pb-10	10/6/2023	10/10/2023	0.2502 g	0.16 % wt	4.5 % wt
552315514-0010	Site: Exterior/ Beige Pait				
Pb-11	10/6/2023	10/10/2023	0.2464 g	0.0081 % wt	<0.0081 % wt
552315514-0011	Site: 103-Classroom/ Beige Paint				
Pb-12	10/6/2023	10/10/2023	0.2581 g	0.0080 % wt	0.064 % wt
552315514-0012	Site: 107-Spec. Ed Room/ Yellow Paint				
Pb-14	10/6/2023	10/10/2023	0.2564 g	0.0080 % wt	0.21 % wt
552315514-0014	Site: 303-Drama Room/ Cream Paint				

Rowena Fanto, Lead Supervisor
or other approved signatory

Initial report from 10/17/2023 09:00:03

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	552315514
CustomerID:	55PAEN75
CustomerPO:	13164
ProjectID:	

Attn: **Brad Panzer**
Parasol Environmental Inc.
125-1860 Appleby Line
Unit 14
Burlington, ON L7L 7H7

Phone: (416) 579-1284
Fax:
Received: 10/10/2023 09:00 AM
Collected: 10/6/2023

Project: **Port Perry H. S/ 13164**

Test Report: Lead by Flame AAS (SW 846 3050B/7000B)*

Client SampleDescription	*Collected*	*Analyzed*	*Weight (g)*	*RDL*	*Lead Concentration*
Pb-04	10/6/2023	10/10/2023	0.5002 g	40 mg/Kg	<40 mg/Kg
552315514-0004	Site: 216-classrooom/ Masonny Block mortar				
Pb-05	10/6/2023	10/10/2023	0.5001 g	40 mg/Kg	<40 mg/Kg
552315514-0005	Site: Exterior/ Brick Mortar				
Pb-13	10/6/2023	10/10/2023	0.5017 g	40 mg/Kg	93 mg/Kg
552315514-0013	Site: Exterior/ Brick Mortar				

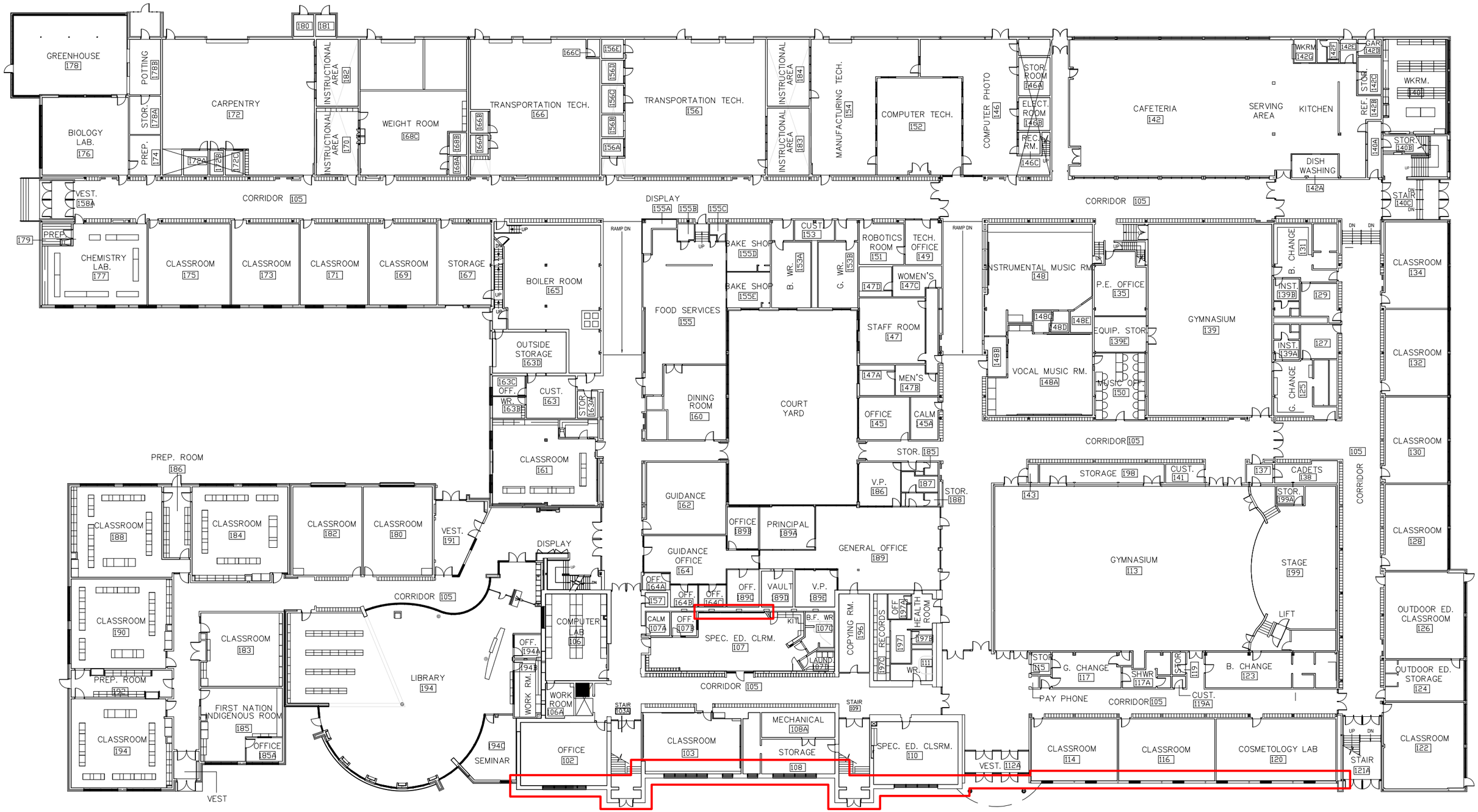
Rowena Fanto, Lead Supervisor
or other approved signatory

* 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

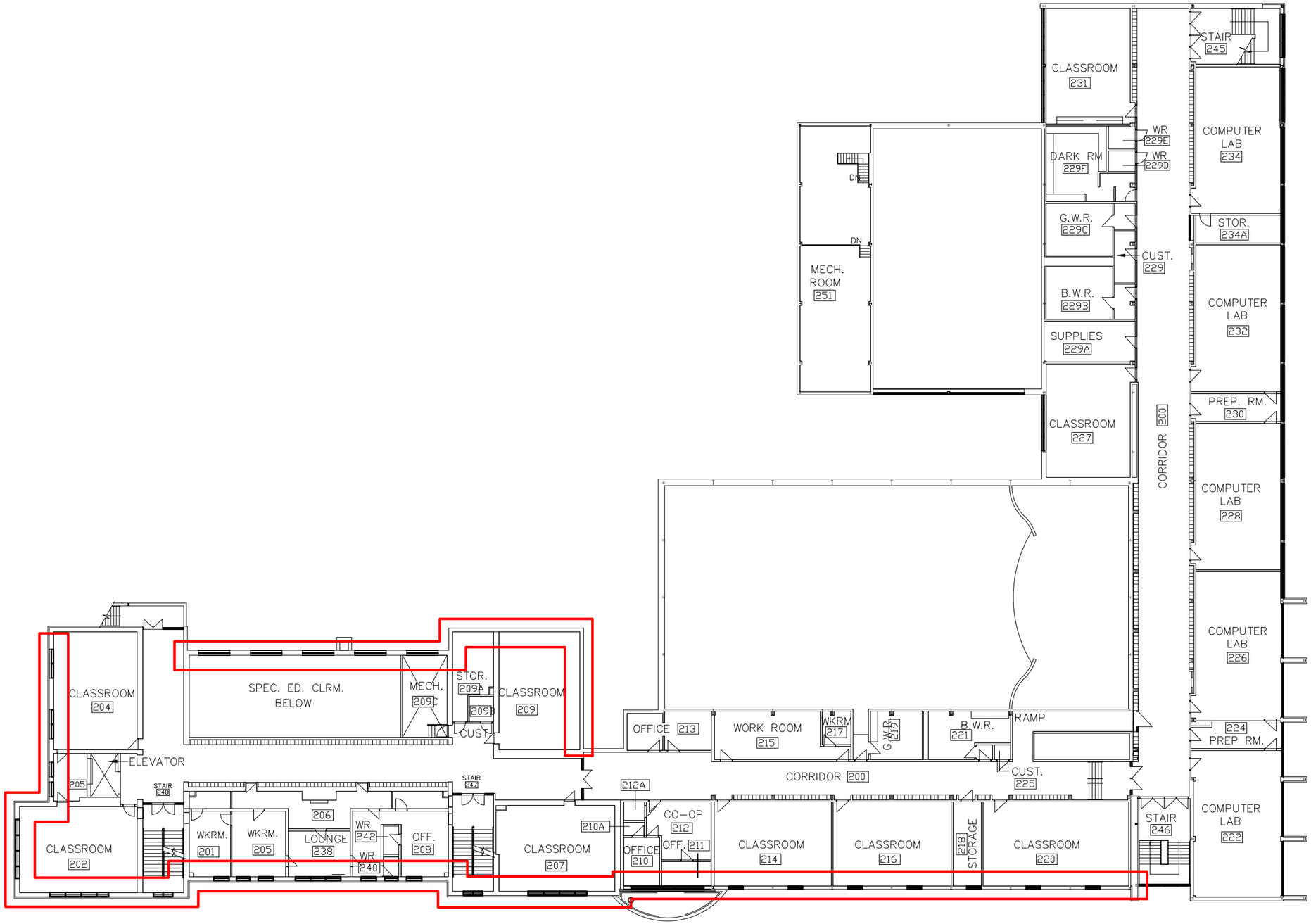
Initial report from 10/17/2023 09:00:03

Appendix B
Site Drawing



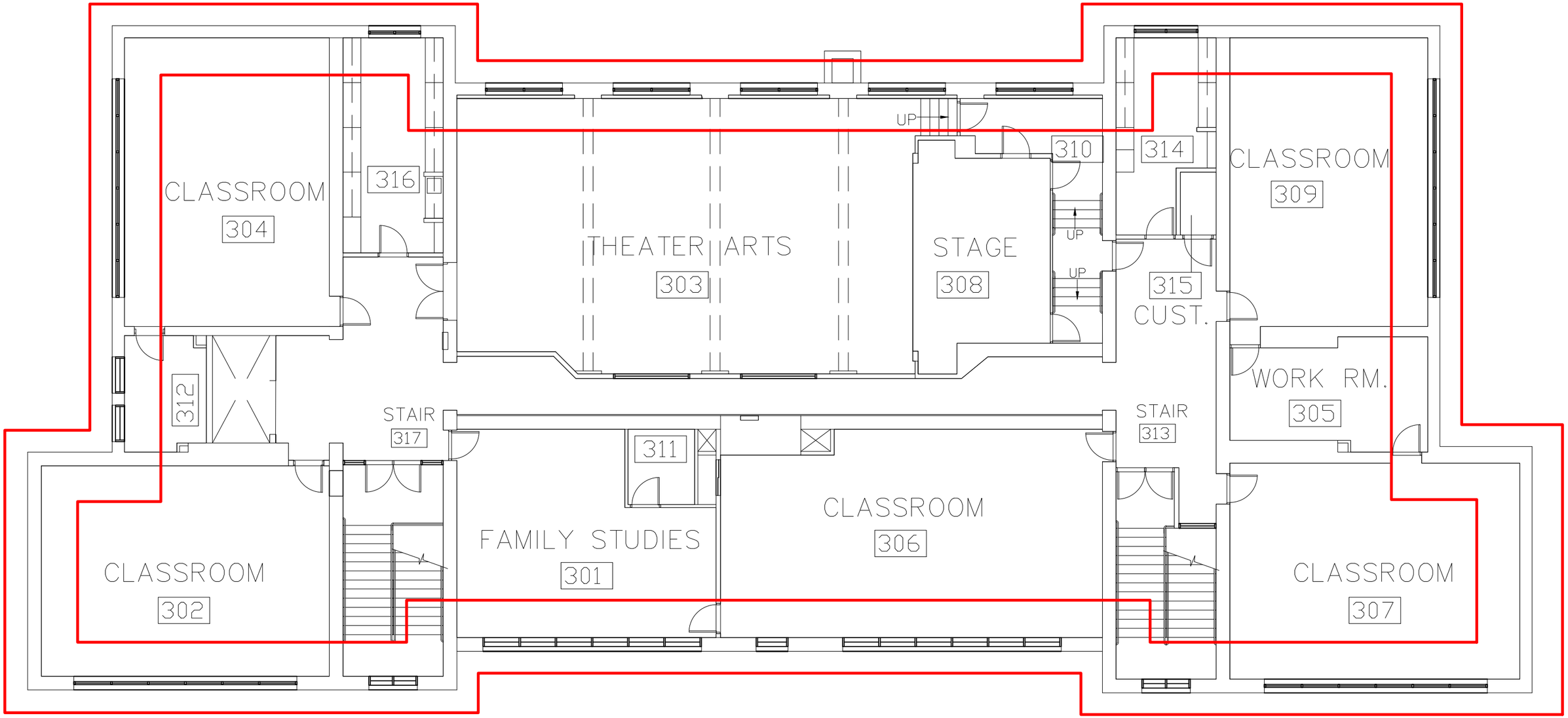
TITLE	LEGEND			DRAWING NO	DRAWN BY:
Limited Designated Substance Survey First Floor Plan	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	DSR-01	B. PANZER
CLIENT		GENERAL SURVEY AREA			SCALE	PARASOL PROJECT NO
Durham District School Board					NTS	13164
LOCATION					DATE	
Port Perry High School 160 Rosa Street Port Perry, Ontario					October 20, 2023	

Parasol Environmental Inc.



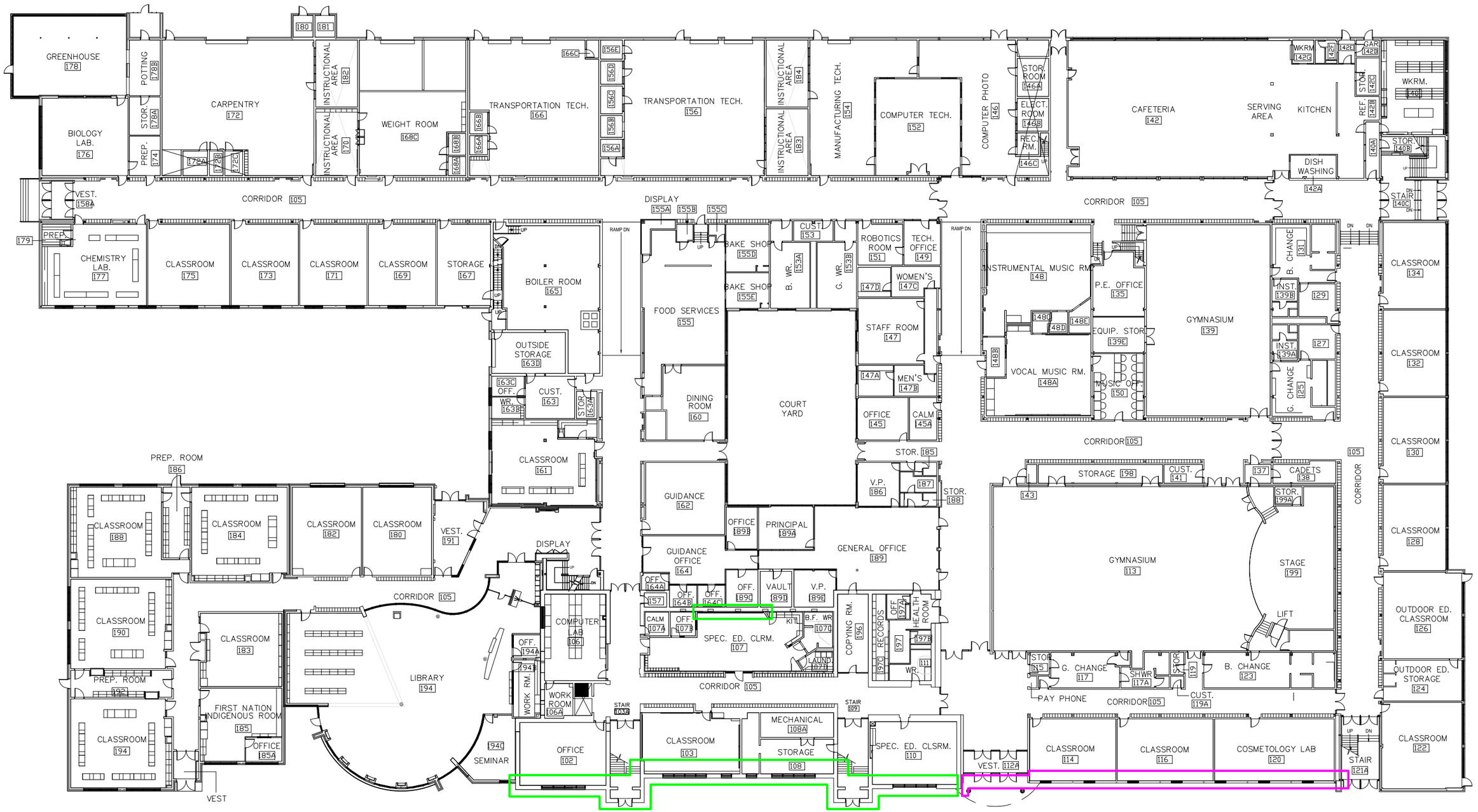
TITLE	LEGEND			DRAWING NO	DRAWN BY:
Limited Designated Substance Survey Second Floor Plan	SYMBOL / DESCRIPTION	SYMBOL / DESCRIPTION		DSR-02	B. PANZER
CLIENT	GENERAL SURVEY AREA			SCALE	PARASOL PROJECT NO
Durham District School Board				NTS	13164
LOCATION				DATE	
Port Perry High School 160 Rosa Street Port Perry, Ontario				October 20, 2023	

Parasol Environmental Inc.



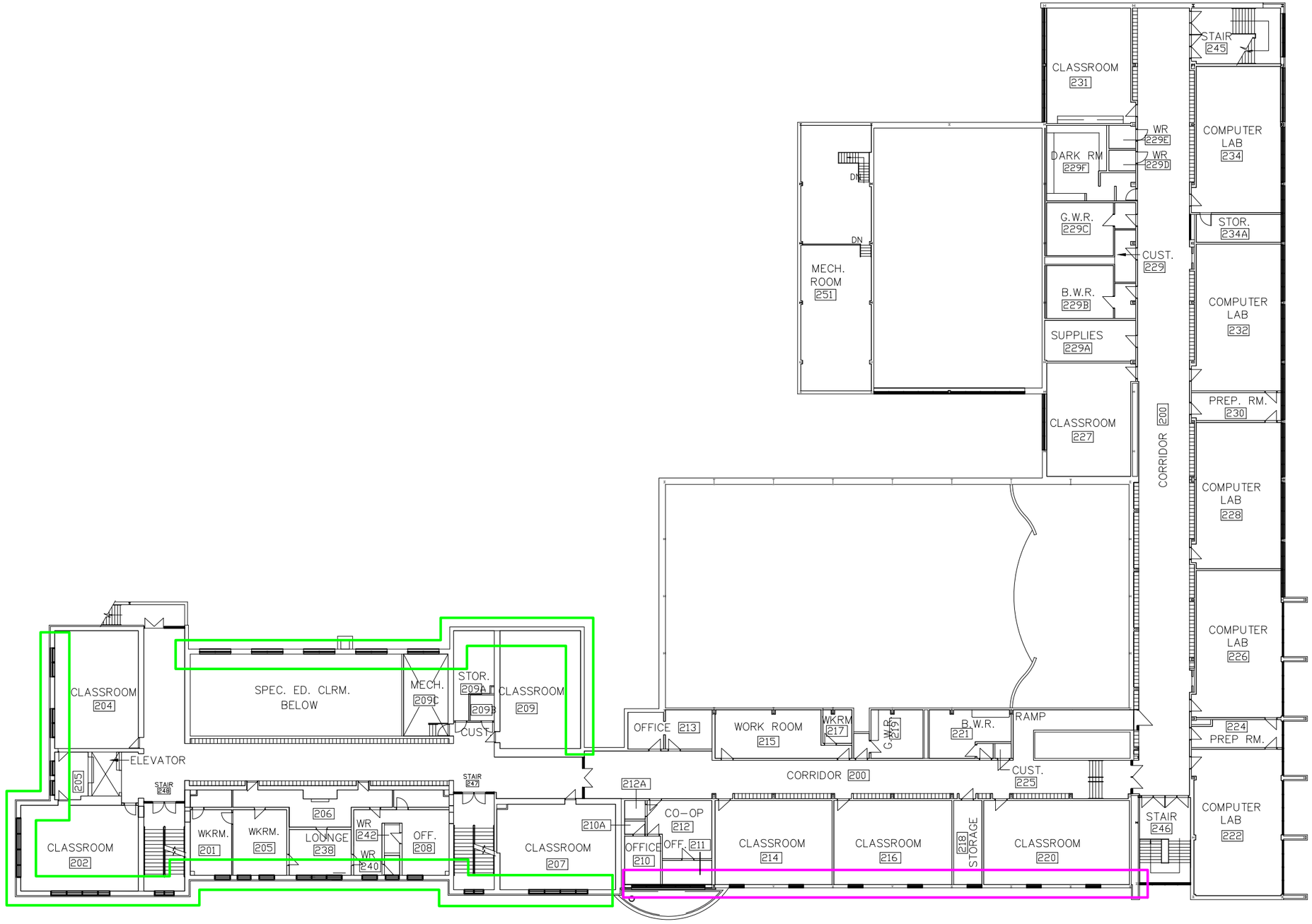
TITLE	LEGEND			DRAWING NO	DRAWN BY:
Limited Designated Substance Survey Third Floor Plan	SYMBOL / DESCRIPTION	SYMBOL / DESCRIPTION		DSR-03	B. PANZER
CLIENT	GENERAL SURVEY AREA			SCALE	PARASOL PROJECT NO
Durham District School Board				NTS	13164
LOCATION				DATE	
Port Perry High School 160 Rosa Street Port Perry, Ontario				October 20, 2023	

Parasol Environmental Inc.



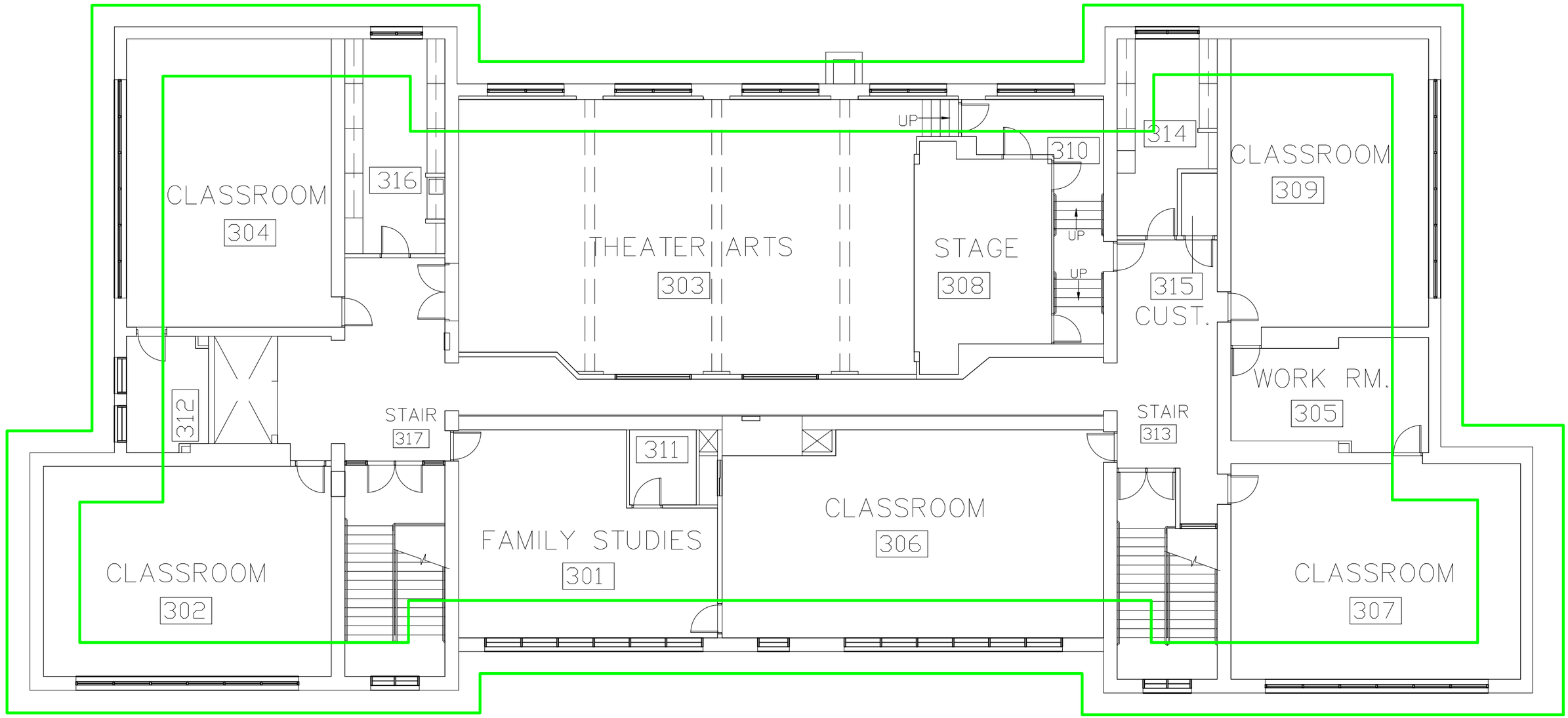
TITLE	LEGEND			DRAWING NO	DRAWN BY:
Limited Designated Substance Survey First Floor Plan	SYMBOL / DESCRIPTION	SYMBOL / DESCRIPTION		DSR-04	B. PANZER
CLIENT	SURVEY AREA - 1926 ORIGINAL BUILDING (DRAWING NO. DSR-07)			SCALE	PARASOL PROJECT NO
Durham District School Board	SURVEY AREA - 1958 BUILDING ADDITION (DRAWING NO. DSR-10)			NTS	13164
LOCATION				DATE	
Port Perry High School 160 Rosa Street Port Perry, Ontario				October 20, 2023	

Parasol Environmental Inc.

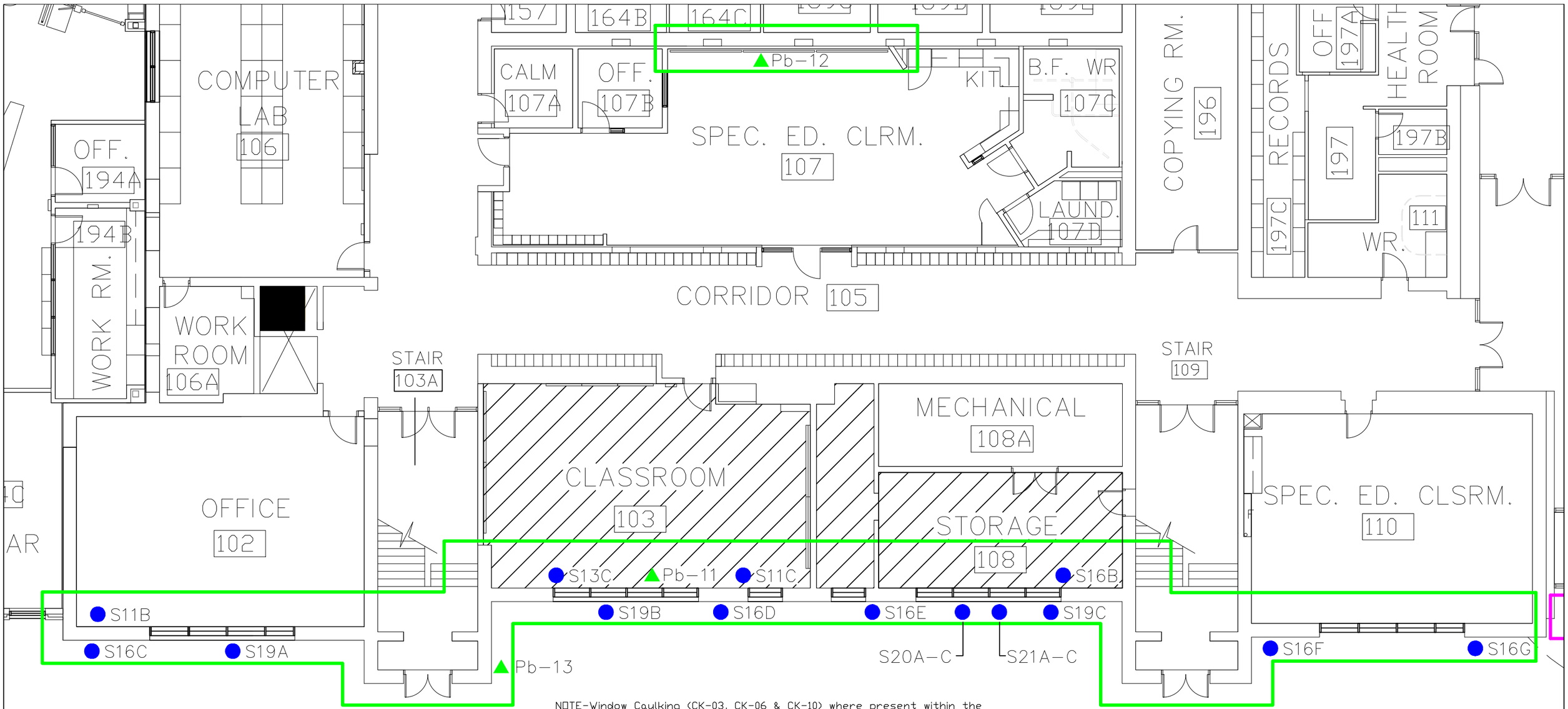


TITLE	LEGEND			DRAWING NO	DRAWN BY:
Limited Designated Substance Survey Second Floor Plan	SYMBOL / DESCRIPTION	SYMBOL / DESCRIPTION		DSR-05	B. PANZER
CLIENT				SCALE	PARASOL PROJECT NO
Durham District School Board	SURVEY AREA - 1926 ORIGINAL BUILDING (DRAWING NO. DSR-08)			NTS	13164
LOCATION	SURVEY AREA - 1958 BUILDING ADDITION (DRAWING NO. DSR-11)			DATE	
Port Perry High School 160 Rosa Street Port Perry, Ontario				October 20, 2023	

Parasol Environmental Inc.



TITLE	LEGEND		DRAWING NO	DRAWN BY:	
Limited Designated Substance Survey Third Floor Plan	SYMBOL / DESCRIPTION	SYMBOL / DESCRIPTION	DSR-06	B. PANZER	Parasol Environmental Inc.
CLIENT	SURVEY AREA - 1926 ORIGINAL BUILDING (DRAWING NO. DSR-09)		SCALE	PARASOL PROJECT NO	
Durham District School Board			NTS	13164	
LOCATION			DATE		
Port Perry High School 160 Rosa Street Port Perry, Ontario			October 20, 2023		



NOTE-Window Caulking (CK-03, CK-06 & CK-10) where present within the surveyed area is confirmed to contain Chrysotile asbestos.

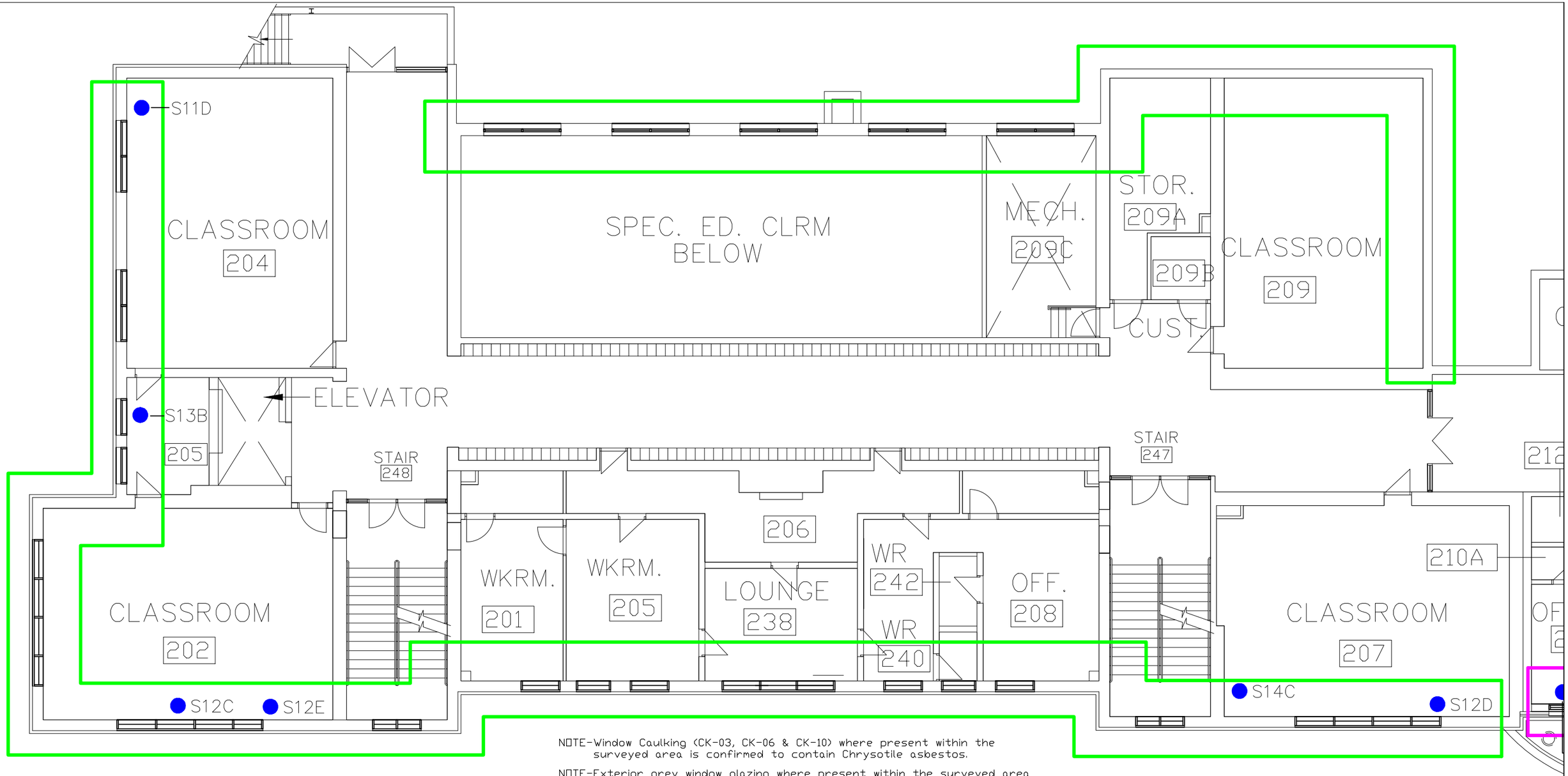
NOTE-Exterior grey window glazing where present within the surveyed area is confirmed to contain Chrysotile asbestos.

NOTE-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 the Main Report

TITLE	LEGEND		CONFIRMED & SUSPECTED ACM		DRAWING NO	DRAWN BY:
Limited Designated Substance Survey First Floor Plan	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	DSR-07	B. PANZER
CLIENT	⊘	NO ACCESS		ACOUSTIC TILES (APPLIED TO WALLS)	SCALE	PARASOL PROJECT NO
Durham District School Board	●	ASBESTOS SAMPLE LOCATION		MECHANICAL INSULATIONS (PARGING CEMENT)	NTS	13164
LOCATION	▲	LEAD SAMPLE LOCATION	NOTE	WINDOW CAULKING	DATE	
Port Perry High School 160 Rosa Street Port Perry, Ontario		SURVEY AREA - 1926 ORIGINAL BUILDING	NOTE	WINDOW GLAZING	October 20, 2023	
			NOTE	FLOORING FINISHES		

Parasol Environmental Inc.



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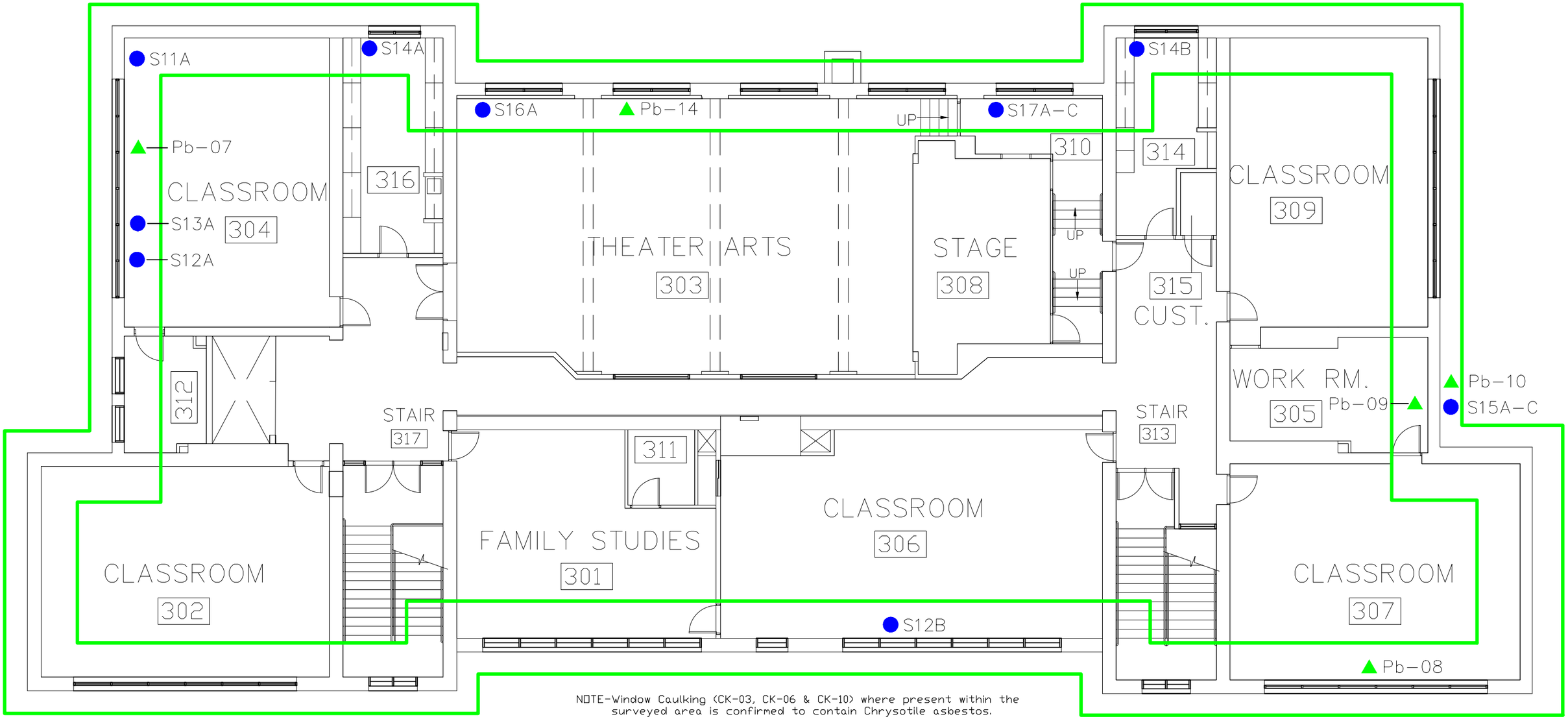
TITLE	LEGEND		CONFIRMED & SUSPECTED ACM		DRAWING NO	DRAWN BY:
Limited Designated Substance Survey Second Floor Plan	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	DSR-08	B. PANZER
CLIENT	⊘	NO ACCESS		ACOUSTIC TILES (APPLIED TO WALLS)	SCALE	PARASOL PROJECT NO
Durham District School Board	●	ASBESTOS SAMPLE LOCATION		MECHANICAL INSULATIONS (PARGING CEMENT)	NTS	13164
LOCATION	▲	LEAD SAMPLE LOCATION	NOTE	WINDOW CAULKING	DATE	
Port Perry High School 160 Rosa Street Port Perry, Ontario	▭	SURVEY AREA - 1926 ORIGINAL BUILDING	NOTE	WINDOW GLAZING	October 20, 2023	
			NOTE	FLOORING FINISHES		

Parasol Environmental Inc.



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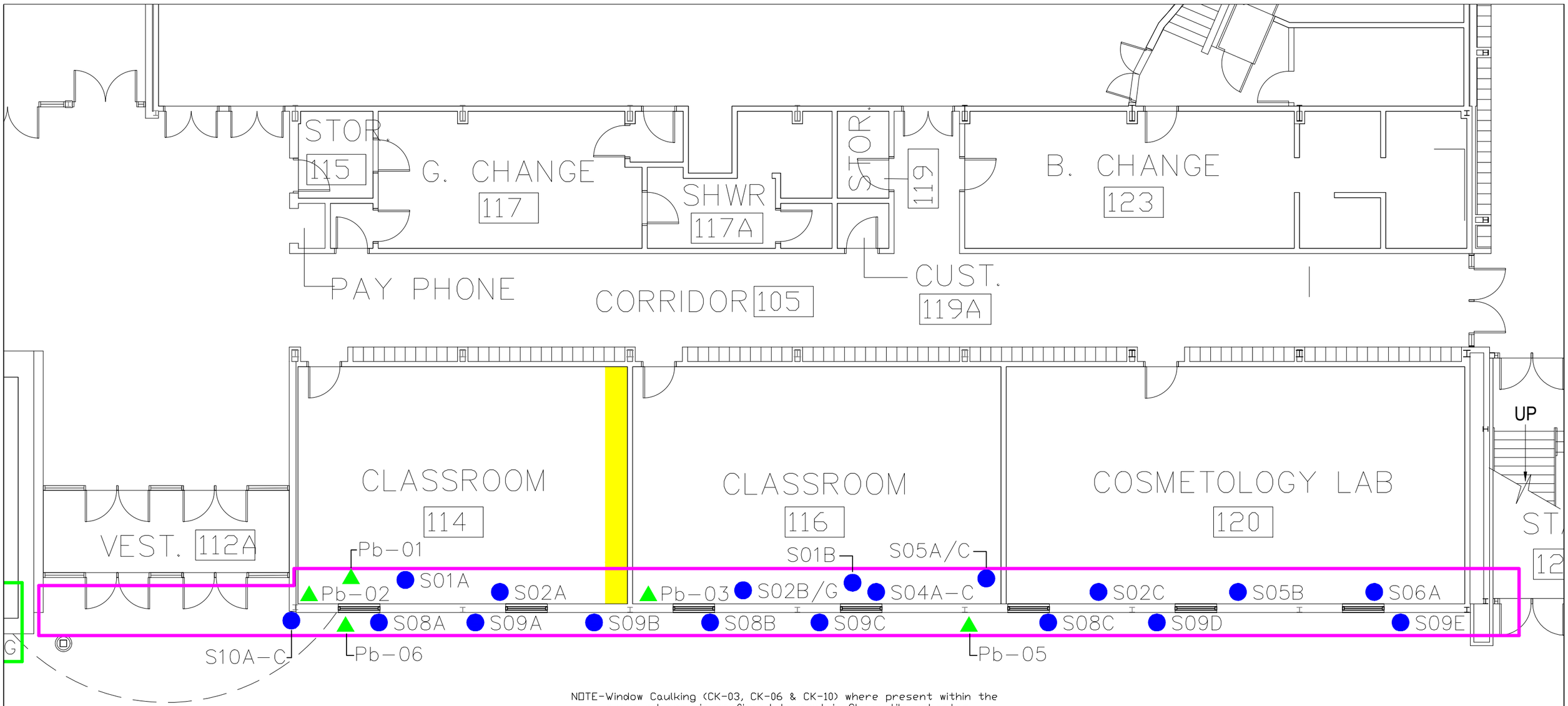
TITLE	LEGEND		CONFIRMED & SUSPECTED ACM		DRAWING NO	DRAWN BY:
Limited Designated Substance Survey Third Floor Plan	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	DSR-09	B. PANZER
CLIENT	⊘	NO ACCESS		ACOUSTIC TILES (APPLIED TO WALLS)	SCALE	PARASOL PROJECT NO
Durham District School Board	●	ASBESTOS SAMPLE LOCATION		MECHANICAL INSULATIONS (PARGING CEMENT)	NTS	13164
LOCATION	▲	LEAD SAMPLE LOCATION	NOTE	WINDOW CAULKING	DATE	
Port Perry High School 160 Rosa Street Port Perry, Ontario		SURVEY AREA – 1926 ORIGINAL BUILDING	NOTE NOTE	WINDOW GLAZING FLOORING FINISHES	October 20, 2023	

Parasol Environmental Inc.



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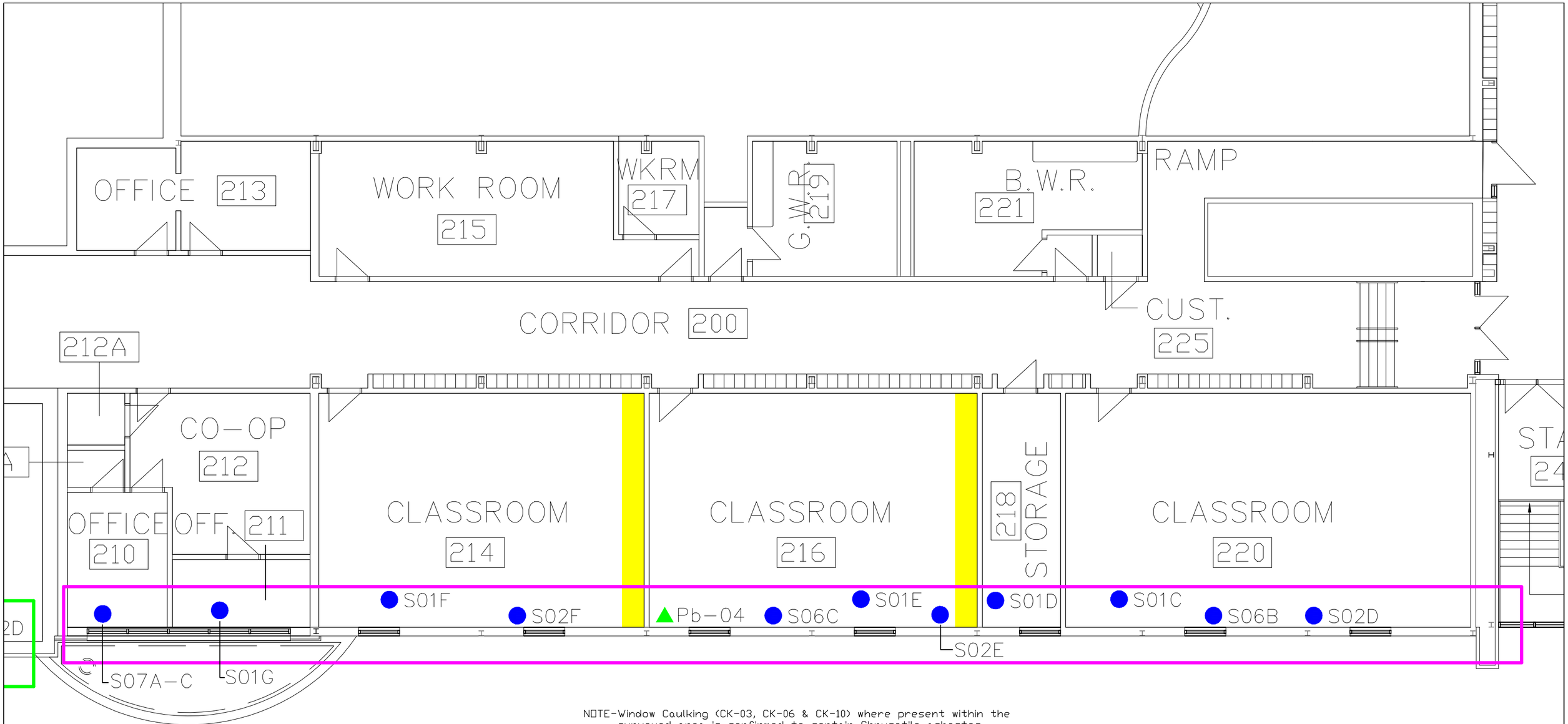
TITLE	LEGEND		CONFIRMED & SUSPECTED ACM		DRAWING NO	DRAWN BY:
Limited Designated Substance Survey First Floor Plan	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	DSR-10	B. PANZER
CLIENT	⊘	NO ACCESS		ACOUSTIC TILES (APPLIED TO WALLS)	SCALE	PARASOL PROJECT NO
Durham District School Board	●	ASBESTOS SAMPLE LOCATION		MECHANICAL INSULATIONS (PARGING CEMENT)	NTS	13164
LOCATION	▲	LEAD SAMPLE LOCATION	NOTE	WINDOW CAULKING	DATE	
Port Perry High School 160 Rosa Street Port Perry, Ontario		SURVEY AREA - 1958 BUILDING ADDITION	NOTE NOTE	WINDOW GLAZING FLOORING FINISHES	October 20, 2023	

Parasol Environmental Inc.



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TITLE	LEGEND		CONFIRMED & SUSPECTED ACM		DRAWING NO	DRAWN BY:
Limited Designated Substance Survey Second Floor Plan	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	DSR-11	B. PANZER
CLIENT	⊘	NO ACCESS		ACOUSTIC TILES (APPLIED TO WALLS)	SCALE	PARASOL PROJECT NO
Durham District School Board	●	ASBESTOS SAMPLE LOCATION		MECHANICAL INSULATIONS (PARGING CEMENT)	NTS	13164
LOCATION	▲	LEAD SAMPLE LOCATION	NOTE	WINDOW CAULKING	DATE	
Port Perry High School 160 Rosa Street Port Perry, Ontario		SURVEY AREA - 1958 BUILDING ADDITION	NOTE	WINDOW GLAZING	October 20, 2023	
			NOTE	FLOORING FINISHES		

Parasol Environmental Inc.