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End of Section

Available Project Information

1. MTE Designated Substance Report and Specifications

    1. A copy of the following report with respect to the identified portion of the Work is being made available as part of the Bid Documents; files titled as follows:

        .1 Titled: Limited Designated Substance Audit Report
        Prepared by: MTE Consultants Inc.
        File No.: 56043-100
        Dated: January 20, 2025
        No. of Pages: 48

        .2 Abatement Specifications (16 pages)

3. These reports provide detailed descriptions of the assessment criteria, findings, recommendations and limitations with respect to toxic or hazardous materials present at the identified property.

4. The reports, by their nature, cannot reveal all conditions that exist or can occur. Should conditions, in the opinion of the Consultant, be found to vary substantially from the report, changes in the scope of Work will be made, with resulting credits or expenditures to the Contract Price accruing to the Owner.

5. HWDSB Construction School Specific Information Sheet

    1. Refer to attached HWDSB Appendix A instructions and information sample sheet, of construction site specific protocols the contractor will be required to follow. (6 pages)

End of Section

Accessibility Project

Parkdale Elementary School

Limited Designated Substance Audit Report

Project Location:
139 Parkdale Avenue North, Hamilton, ON

Prepared for:
Hamilton-Wentworth District School Board
20 Education Court, Hamilton, ON

Prepared by:
MTE Consultants Inc.
1016 Sutton Drive, Unit A
Burlington, ON L7L 6B8

November 15, 2024
Revised: January 20, 2025

MTE File No.: 56043-100

Engineers, Scientists, Surveyors.

Contents

Appendices

1.0 INTRODUCTION

1.1 Authorization

MTE Consultants Inc. (MTE) was retained by Hamilton-Wentworth District School Board (the Client) to conduct a Designated Substance Audit for the building located at 139 Parkdale Avenue North in Hamilton, Ontario.

The purpose of the audit was to identify the presence of Designated Substances within the building(s) in accordance with Section 30 of the Occupational Health & Safety Act (OHSA), in advance of an accessibility upgrade renovation. This report meets the requirements of Section 30 of the OHSA and the requirements of Ontario Regulation (O. Reg.) 278/05.

2.0 SCOPE OF WORK

As requested by the Client, this assessment was limited to the following areas:

- Classrooms 108, 203 and 211;
- Storage Room 116;
- Girls and Boys First Floor Washrooms;
- Storage Closet 108C
- First and Second Floor Corridors; and,
- Roof.

These areas are referred to in the following sections as the “Subject Areas” and are depicted on the Figures provided in Appendix C.

The Scope of Work for this assessment was completed by MTE and included the following activities:

- Review of existing or historical reports and documentation pertaining to Designated Substances within the building;
- Visual inspection of accessible locations within the Subject Areas to identify the following suspect Designated Substances and Hazardous Building Materials:
    - Asbestos;
    - Lead;
    - Mercury;
    - Silica;
    - Mould growth;
    - Ozone Depleting Substances; and,
    - Polychlorinated Biphenyls limited to fluorescent light ballasts.
- The following Designated Substances are not expected to be present due to the building use or in a form that is hazardous: Acrylonitrile, Arsenic, Benzene, Coke Oven Emissions, Ethylene Oxide, Isocyanates, and Vinyl Chloride;
- Collection of bulk building material samples suspected to contain asbestos;
- Collection of paint scrape samples suspected to contain lead;
- Submission of samples to an accredited and/or qualified laboratory;

- Interpretation of laboratory results; and,
- Preparation of this report of findings and recommendations.

3.0 METHODOLOGY AND ASSESSMENT CRITERIA

This audit was conducted using visual and laboratory identification methods for the assessment of materials outlined in Section 2.0 and their corresponding location and use. Materials that are determined to be asbestos-containing materials (ACM) are further classified by their friability and condition. The areas outlined in Section 2.0 were inspected and limited to building components, materials and service connections. Notwithstanding that reasonable attempts were made to identify all Designated Substances, the possibility of concealed substances and material exists and may not become visible until substantial demolition has occurred and therefore are currently undocumented. All work was conducted in accordance with industry accepted methods and MTE Standard Operating Procedures and did not include the following:

- Materials indicated in this report as “Potentially Concealed”;
- Locations that may be hazardous to the surveyor (located at heights, electrical equipment, confined spaces);
- Where invasive inspection could cause consequential damage to the property or impair the integrity of the equipment, such as sealants, exterior finishes, underground services or components of mechanical equipment;
- Locations concealed by building finishes that require substantial demolition or removal for access or determination of quantities (plumbing or electrical lines);
- Non-permanent items or personal contents, furnishings; and,
- Settled dust or airborne agents unless otherwise stated.

4.0 ASSESSMENT AND RESULTS

An inspection of the building was conducted by MTE on October 22, 2024, and returned for additional sampling on December 3, 2024.

A description of the building and assessed finishes is provided below. Refer to Section 4.1 for a summary of findings.

Building Element	Description
Exterior Finishes	Flat roof system
Mechanical Systems/Insulations	Boiler heating Roof mounted central air conditioning Exterior central air conditioning Window mounted air conditioning
	Fibreglass insulation on pipe straights
Electrical/Plumbing Systems	Fluorescent Light tubes, bulbs
Floor Finishes	Vinyl floor tiles Terrazzo
Wall Finishes	Plaster Ceramic Tile and Grout Drywall

Building Element	Description
Ceiling Finishes	Hard texture finish 2'/4' Small Fissure Random Pinhole ceiling tiles (2022 manufacturing date stamp)

The roof within the Subject Areas was also inspected and intrusive investigation indicated the following composition:

- Gravel
- Tar Membrane
- Fibreboard
- Polyisocyanurate Foam Board
- Intermediate Tar Layer
- Tar Vapour Barrier
- Wood Deck

4.1 Findings and Analytical Results

A summary of sampling locations and analytical results are included in **Appendix A**.

Laboratory certificates of analysis are included in **Appendix B**.

Figures of inspected areas are included in **Appendix C**.

A photographic log is included in **Appendix D.**

A detailed summary of findings and recommended actions is provided in **Table 4.3 of Appendix A.**

4.1.1 Asbestos

Asbestos was used in building materials throughout the years with a peak usage in the 1950s and 1960s. While the manufacture of most ACM was banned in the 1970s, buildings constructed in the 1980s have the potential for ACM as well. In 1986, legislation limiting the use of asbestos in consumer products was introduced.

As part of this inspection, a total of 38 bulk samples of suspect ACM were submitted for asbestos analysis with a total of 35 analyses being performed. The difference between the number of samples submitted and the number of samples analysed can be a function of either the stop-positive method or the requirement of analyzing multiple layers, performed by the laboratory, from a single sample reported as additional samples or subsets of a sample.

Bulk samples were submitted for asbestos analysis to Paracel Laboratories Ltd. (Paracel), in Mississauga, Ontario. Paracel is certified under the Canadian Association of Laboratory Accreditation to perform asbestos analysis of bulk samples (accreditation number A3762). Laboratory analysis was conducted in accordance with the United States Environmental Protection Agency (USEPA), Test Method EPA/600-R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, June, 1993 by Polarized Light Microscopy (PLM) as prescribed by O. Reg. 278/05.

Based on the laboratory results and visual identification, ACM was confirmed present at the time of the inspection. In addition, suspect ACM was either observed or may potentially be concealed by building finishes.

4.1.2 Lead

Lead was historically used in mortar pigments, ceramic glazing; plumbing solder, electrical equipment and electronics solder, in pipe gaskets as packing in cast iron bell and spigot joints of sanitary drains, flexible plumbing connections, flashing panels, acoustical dampeners, phone cable casing and some architectural applications. In buildings constructed after 1990, these applications are no longer applicable outside of specialized uses (shielding for medical imaging etc.).

As part of this inspection, a total of 7 paint scrape samples were collected from surfaces and represent the paint colours observed throughout the Subject Areas.

Samples were submitted for laboratory analysis by ASTM D3335-85A “Standard Method to Test for Low Concentrations of Lead in Paint by Atomic Absorption Spectrophotometry” following MOE Method E3470 Inductively Coupled Plasma Optical Emission Spectrometry to Paracel Laboratories Ltd., in Ottawa, Ontario. Paracel is accredited by the Canadian Association of Laboratory Accreditation to perform bulk lead analysis of paint.

Based on the laboratory results and visual identification, lead-containing materials were confirmed present at the time of the inspection. In addition, lead-containing solder on copper pipe connections or lead pipe gaskets may potentially be concealed in buried lines or wall cavities.

4.1.3 Mercury

Mercury is typically used in building service applications such as fluorescent light tubes, compact fluorescent bulbs, metal halide (sodium halide) lamp bulbs, and neon lights as a vapour. Mercury may exist in thermostats and pipe or mechanical equipment thermometers as a liquid. Mercury is presumed to be present in the above materials.

Mercury-containing materials were visually identified at the time of the inspection.

4.1.4 Silica

Silica is present in rock, stone, soil, and sand. Masonry products such as concrete block, brick, and mortar, as well as concrete and associated products contain silica. Due to its ubiquitous nature, silica was historically used in a wide variety of building materials and is still used today in new construction.

Building materials that are presumed to contain silica were visually identified at the time of the inspection.

4.1.5 Mould

No water damaged or mould growth impacted building materials were observed during the inspection.

4.1.6 Polychlorinated Biphenyls (PCB)

Suspect PCB-containing light ballasts were visually identified during the inspection. All live electrical equipment that could not be properly and safely de-energized was not assessed, therefore light ballasts were not inspected. Light ballasts which were not accessed, will require additional investigation to determine their PCB content when removed from service.

4.1.7 Ozone-Depleting Substances (ODS)

ODS are chemical compounds that include chlorofluorocarbons (cfcs), hydrochlorofluorocarbons (hcfcs), halons, methyl bromide, carbon tetrachloride, hydrobromofluorocarbons, chlorobromomethane, and methyl chloroform which are widely used in cooling and refrigeration. The use of ODS is regulated under Ontario Regulation 463/10 *Ozone Depleting Substances and Other Halocarbons* Made under the Environmental Protection Act.

While sources of ODS may be present equipment, no ODS equipment will be impacted by the proposed work.

4.2 Conclusions and Recommendations

A detailed summary of recommended actions is provided in **Table 4.3 of Appendix A**.

In accordance with Section 30 of OHSA and Section 8 of O. Reg. 278/05, the Owner must provide a copy of this report to all contractors doing work at the building. The Owner must also provide a copy of this report to all prospective contractors.

Should any additional suspect Designated Substances be discovered during building renovation demolition, work in the vicinity should cease and the materials should not be disturbed until proper notification, testing and abatement instructions are provided. All waste generated as a result of any and all work at the Site must be handled, transported and disposed of in accordance with Ontario Regulation 347 made under the Environmental Protection Act and local by-laws. Based on the assessment findings and analytical results, the following abatement measures are presented. It should be noted that the recommended actions are the minimum required actions, as prescribed by the appropriate Acts, regulations, guidelines, standards, codes and general best practice measures.

4.2.1 Asbestos

ACMs were identified during the assessment. If these materials, including those deemed or suspected, will be disturbed, or will likely be disturbed, during building maintenance, renovations, construction, or demolition activities, they must be handled and disposed of in accordance with the procedures prescribed by O. Reg. 278/05.

All asbestos work must be conducted by contractors who are trained in the type of asbestos operations required, and should be overseen by a qualified third party Health, Safety and Environmental professional. In order to conduct Type 3 asbestos operations, contractors must be certified as Asbestos Abatement Workers AAW (Trade code 253W) and Asbestos Abatement Supervisors AAS (Trade code 253S) by The Ministry of Training, Colleges and Universities (Ministry of Advanced Education and Skills Development) as prescribed by Section 20 of O. Reg. 278/05. Suspect or visually confirmed ACM must be deemed to be asbestos-containing and treated as if they contain a type of asbestos other than Chrysotile.

ACM may be present in concealed locations and if construction, renovation, alteration, or maintenance activities are planned, invasive inspections of concealed locations for potential ACM must be performed prior to such activities.

Should any suspect ACM be discovered during the course of construction, renovation, alteration, or maintenance activities, work which disturbs the material must cease immediately. Suspect ACM must be treated as asbestos-containing or sampled prior to disturbance to assess the presence of asbestos.

4.2.2 Lead

Lead-containing paint was identified. As such special requirements for the management, handling and disposal of lead-containing materials by the owner, constructor, contractor, sub-contractors and workers apply. The abatement contractor should consult Environmental Abatement Council of Canada's (EACC) *Lead Guideline for Construction, Renovation, Maintenance or Repair (October 2014)* for the procedures and methods required to remove and dispose of lead-containing materials.

Low level lead-containing paint is also present and the following general procedures are recommended as a precautionary measure as per Environmental Abatement Council of Canada's (EACC) *Lead Guideline for Construction, Renovation, Maintenance or Repair (October 2014)*:

- General dust control;
- The washing of hands and face at on-site facilities;
- No smoking, eating, chewing gum or drinking in the work area; and,
- No removal of painted surfaces by means of abrasive blasting.

4.2.3 Mercury

Mercury-containing materials were identified. All mercury containing materials or sources should be removed, intact, prior to any work which may disturb or damage them and cause worker exposure to mercury liquid and/or vapour.

On-site crushing of mercury-containing materials should not occur. Care should be taken to ensure safe storage of the above until recycling or disposal can be coordinated. Under current legislation, mercury waste requires handling and disposal in accordance with Ontario Regulation 490/09 of the OHSA and Ontario Regulation 347 of the Environmental Protection Act.

4.2.4 Silica

Silica is presumed to be present; therefore, special requirements for management and handing are required. The contractor should also consult MOL Occupational Health and Safety Branch's Guideline: *Silica on Construction Projects* (April 2011) for the procedures and methods required to remove and dispose of silica-containing materials.

4.2.5 Mould

No water damage or suspect mould growth was observed during the assessment therefore no special management and handling requirements are warranted.

4.2.6 Polychlorinated Biphenyls (PCB)

Suspect PCB-containing fluorescent light ballasts were identified but could not be conclusively classified as PCB-containing or non-PCB-containing.

It is the responsibility of the owner to inspect, or ensure the inspection of all light ballasts as they are removed from service to make certain they are properly classified as PCB-containing or non-PCB containing. Fixtures will require dismantling to access date stamps (located on the back of the ballast) in order to be correctly classified in accordance with Environment Canada's document "*Identification of Lamp Ballasts Containing PCBs, Report EPS 2/CC/2 (revised), August 1991"*.

Statutory Orders and Regulations (SOR)/2008-273, the *PCB Regulations*, made under the *Canadian Environmental Protection Act,* permits continued use of in-service PCB-containing light ballasts until the end of service life or until December 31, 2025.

4.2.7 Ozone Depleting Substances (ODS)

No building components presumed to contain ODS and will be impacted by the proposed work were identified and no special requirements for management, handing and disposal by the owner, constructor, contractor, sub-contractors and workers apply.

5.0 LIMITATIONS

Services performed by **MTE Consultants Inc.** (MTE) were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the Environmental Engineering & Consulting profession. No other representation expressed or implied as to the accuracy of the information, conclusions or recommendations is included or intended in this report.

This report was completed for the sole use of MTE and the Client. It was completed in accordance with the approved Scope of Work referred to in Section 2.0. As such, this report may not deal with all issues potentially applicable to the site and may omit issues that are or may be of interest to the reader. MTE makes no representation that the present report has dealt with all-important environmental features, except as provided in the Scope of Work. All findings and conclusions presented in this report are based on site conditions, as they existed during the time period of the investigation. This report is not intended to be exhaustive in scope or to imply a risk-free facility.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based upon it, are the responsibility of such third parties. MTE accepts no responsibility for liabilities incurred by or damages, if any, suffered by any third party as a result of decisions made or actions taken, based upon this report. Others with interest in the site should undertake their own investigations and studies to determine how or if the condition affects them or their plans.

It should be recognized that the passage of time might affect the views, conclusions and recommendations (if any) provided in this report because environmental conditions of a property can change. Should additional or new information become available, MTE recommends that it be brought to our attention in order that we may re-assess the contents of this report.

All of which is respectfully submitted,

MTE Consultants Inc.

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Appendix A

Tables

TABLE 4.1: BULK ASBESTOS SAMPLE SUMMARY TABLE				
Sample #	**Location**	**Material Description**	**Asbestos Results (% Type)**	**Is Material ACM**
S01A	**CLASSROOM 203**	**9"X9" VINYL FLOOR TILE - BLACK AND GREEN WITH BEIGE MARBLE PATTERN**	**5% CHRYSOTILE**	**YES**
		MASTIC	**0.5% CHRYSOTILE**	**YES**
S01B	**CLASSROOM 203**	**9"X9" VINYL FLOOR TILE - BLACK AND GREEN WITH BEIGE MARBLE PATTERN**	**NA**	**YES**
		MASTIC	**NA**	**YES**
S01C	**CLASSROOM 211**	**9"X9" VINYL FLOOR TILE - BLACK AND GREEN WITH BEIGE MARBLE PATTERN**	**NA**	**YES**
		MASTIC	**NA**	**YES**
S02A	THROUGHOUT INTERIOR	PLASTER	ND	NO
		GREY BACKING	ND	NO
S02B	THROUGHOUT INTERIOR	PLASTER	ND	NO
S02C	THROUGHOUT INTERIOR	PLASTER	ND	NO
		GREY BACKING	ND	NO
S02D	THROUGHOUT INTERIOR	PLASTER	ND	NO
S02E	THROUGHOUT INTERIOR	PLASTER	ND	NO
S02F	THROUGHOUT INTERIOR	PLASTER	ND	NO
		GREY BACKING	ND	NO
S02G	THROUGHOUT INTERIOR	PLASTER	ND	NO
S03A	**THROUGHOUT INTERIOR**	**TEXTURE COAT CEILING**	**4% CHRYSOTILE**	**YES**
S03B	**THROUGHOUT INTERIOR**	**TEXTURE COAT CEILING**	**NA**	**YES**
S03C	**THROUGHOUT INTERIOR**	**TEXTURE COAT CEILING**	**NA**	**YES**
S03D	**THROUGHOUT INTERIOR**	**TEXTURE COAT CEILING**	**NA**	**YES**
S03E	**THROUGHOUT INTERIOR**	**TEXTURE COAT CEILING**	**NA**	**YES**
S03F	**THROUGHOUT INTERIOR**	**TEXTURE COAT CEILING**	**NA**	**YES**
S03G	**THROUGHOUT INTERIOR**	**TEXTURE COAT CEILING**	**NA**	**YES**
S04A	ROOF	MEMBRANE	ND	NO
S04B	ROOF	MEMBRANE	ND	NO
S04C	ROOF	MEMBRANE	ND	NO
S05A	ROOF	INTERMEDIATE TAR LAYER	ND	NO
S05B	ROOF	INTERMEDIATE TAR LAYER	ND	NO
S05C	ROOF	INTERMEDIATE TAR LAYER	ND	NO
S06A	ROOF	TAR VAPOUR BARRIER	ND	NO
S06B	ROOF	TAR VAPOUR BARRIER	ND	NO
S06C	ROOF	TAR VAPOUR BARRIER	ND	NO
S07A	**STORAGE ROOM 116**	**9"X9" VINYL FLOOR TILE - BROWN WITH BEIGE MARBLE PATTERN**	**5% CHRYOSTILE**	**YES**
		MASTIC	ND	NO
S07B	**STORAGE ROOM 116**	**9"X9" VINYL FLOOR TILE - BROWN WITH BEIGE MARBLE PATTERN**	**NA**	**YES**
		MASTIC	ND	NO
S07C	**STORAGE ROOM 116**	**9"X9" VINYL FLOOR TILE - BROWN WITH BEIGE MARBLE PATTERN**	**NA**	**YES**

TABLE 4.1: BULK ASBESTOS SAMPLE SUMMARY TABLE				
Sample #	**Location**	**Material Description**	**Asbestos Results (% Type)**	**Is Material ACM**
~~S07C~~	~~STORAGE ROOM 110~~	MASTIC	ND	NO
S08A	BOYS WASHROOM BUT OBSERVED IN THE GIRLS WASHROOM	DRYWALL JOINT COMPOUND	ND	NO
S08B	BOYS WASHROOM BUT OBSERVED IN THE GIRLS WASHROOM	DRYWALL JOINT COMPOUND	ND	NO
S08C	BOYS WASHROOM BUT OBSERVED IN THE GIRLS WASHROOM	DRYWALL JOINT COMPOUND	ND	NO
S09A	BOYS WASHROOM BUT OBSERVED IN THE GIRLS WASHROOM	WALL TILE GROUT	ND	NO
S09B	BOYS WASHROOM BUT OBSERVED IN THE GIRLS WASHROOM	WALL TILE GROUT	ND	NO
S09C	BOYS WASHROOM BUT OBSERVED IN THE GIRLS WASHROOM	WALL TILE GROUT	ND	NO
S10A	108C STORAGE CLOSET WALL	DRYWALL JOINT COMPOUND	ND	NO
S10B	108C STORAGE CLOSET WALL	DRYWALL JOINT COMPOUND	ND	NO
S10C	108C STORAGE CLOSET WALL	DRYWALL JOINT COMPOUND	ND	NO

NA: Not Analyzed due to stop positive method **ND**: No asbestos fibres detected above the laboratory minimum detection limit

A bulk material sample containing 0.5% or more asbestos therefore establishes that material as asbestos-containing. In accordance with Table 1 of O. Reg. 278/05, a minimum number of samples for the material to be classified as non asbestos. A homogeneous material is defined by O. Reg. 278/05 “as material that is uniform in colour and texture”. Homogeneous samples are identified by an alphabetical suffix to sample names to represent multiple samples of a homogeneous material. When a homogeneous material is analysed it is determined to be asbestos-containing upon the first positive detection of asbestos equal to or greater than 0.5%. Subsequent samples of the same material are therefore not analysed. Some bulk samples are comprised of multiple layers and as such will require multiple analysis. In such cases each layer is isolated at the laboratory and analysed individually to determine asbestos content. As a result the laboratory may report additional samples beyond the submitted number of samples or include multiple analyses as subsets within a sample.

TABLE 4.2: LEAD IN PAINT SAMPLE SUMMARY TABLE					
Sample #	**Location**	**Colour**	**Material**	**Lead Content (ug/g)**	**Classification**
LP1	CORRIDORS	WHITE	WALL	9	LOW LEVEL LEAD-CONTAINING
LP2	**CLASSROOM 203**	**GREEN**	**WALL**	**1,180**	**LEAD-CONTAINING**
LP3	**CLASSROOM 211**	**YELLOW**	**WALL**	**2,570**	**LEAD-CONTAINING**
LP4	**STORAGE CLOSET 116**	**YELLOW**	**WALL**	**3,800**	**LEAD-CONTAINING**
LP5	THROUGHOUT INTERIOR	GREY	DOOR FRAMES	<5	LOW LEVEL LEAD-CONTAINING
LP6	GIRLS/BOYS MAINFLOOR BATHROOMS	GREY	BATHROOM STALLS	28	LOW LEVEL LEAD-CONTAINING
LP7	**108C STORAGE CLOSET**	**GREEN**	**WALLS**	**2,840**	**LEAD-CONTAINING**

"<": The samples analysed reported concentrations of lead to be less than 1000 ug/g and are therefore classified as low level lead-containing. However, no lead concentrations were reported above the sample specific laboratory detection limit.

As outlined in EACO's Lead Guideline for Construction, Renovation, Maintenance or Repair (October 2014), for the purpose of classifying surface coatings and mortars by laboratory analysis, any material containing lead at a concentration:

- Greater than 0.5% by weight (5,000 µg/g, mg/kg, ppm) is considered lead-based;
- Between 0.1 % and 0.5% by weight (1,000 to 5,000 µg/g, mg/kg, ppm) is considered lead-containing; or
- Less than 0.1% (1,000 µg/g, mg/kg, ppm) is considered low level lead-containing.

Table 4.3 - Summary of Designated Substances and Recommended Actions				
139 Parkdale Avenue North, Hamilton, Ontario				
Material	**Location(s)**	**Material Description**	**Management Requirements If No Impacts to Material**	**Recommended Actions If Material Will Be Or Likely Be Impacted By Maintenance, Renovation, Construction or Demolition Activities**
Asbestos Non-Friable	Classroom 203 and 211	9"x9 " Black and Green with Beige Marble Pattern Floor Tile and associated Mastic	In place management in accordance with O. Reg. 278/05	Removal in accordance with O. Reg. 278/05 as a Type 1 Operation using non-powered hand tools OR a Type 2 Operation using powered-tools in conjunction with dust supppression.
Asbestos Non-Friable	Storage Room 116	9"x9" Brown with Beige Pattern Vinyl Floor Tile	In place management in accordance with O. Reg. 278/06	Removal in accordance with O. Reg. 278/05 as a Type 1 Operation using non-powered hand tools
Asbestos Non-Friable	Throughout the Interior on Ceilings	Hard Texture Coat	In place management in accordance with O. Reg. 278/05	Removal in accordance with O. Reg. 278/05 Type 2 Operation – hand held tools only with dust suppression or power tools with HEPA vacuum attachment in conjunction with dust suppression OR Type 3 Operation – power tools with no dust suppression
Potentially Concealed Asbestos	Concealed Beneath Blackboard/Whiteboards/Corkboard	Mastics	In place management in accordance with O. Reg. 278/05	Invasive sampling prior to maintenance/renovations/construction/demolition activities, if sampling confirms as ACM, removal in accordance with O. Reg. 278/05
Potentially Concealed Asbestos	Electrical Wiring Throughout Interior of Building	Jacketing on Electrical Wiring	In place management in accordance with O. Reg. 278/05	Invasive inspection prior to maintenance/renovations/construction/demolition activities, if present and sampling confirms as ACM, removal in accordance with O. Reg. 278/05
Potentially Concealed Asbestos	Toilet Fixtures	Pipe Gasket/Flange at Floor Connection	In place management in accordance with O. Reg. 278/05	Invasive inspection prior to maintenance/renovations/construction/demolition activities, if present and sampling confirms as ACM, removal in accordance with O. Reg. 278/05
Potentially Concealed Asbestos	Underground Piping Systems	Asbestos Cement (Transite) Pipe	In place management in accordance with O. Reg. 278/05	Invasive inspection prior to maintenance/renovations/construction/demolition activities, if present and sampling confirms as ACM, removal in accordance with O. Reg. 278/05

Table 4.3 - Summary of Designated Substances and Recommended Actions				
139 Parkdale Avenue North, Hamilton, Ontario				
Material	**Location(s)**	**Material Description**	**Management Requirements If No Impacts to Material**	**Recommended Actions If Material Will Be Or Likely Be Impacted By Maintenance, Renovation, Construction or Demolition Activities**
Lead-Containing Paint	Classroom 203, Storage Closet 108C	Green Paint on Walls	In place management in accordance with EACC's Lead Guideline	Removal as required prior to maintenance, renovations, construction or demolition activities in accordance with EACC's Lead Guideline as a: Class 1, Class 2A, Class 3A, or a Class 3B Operation
	Classroom 211, Storage Room 116	Yellow Paint on Walls	In place management in accordance with EACC's Lead Guideline	Removal as required prior to maintenance, renovations, construction or demolition activities in accordance with EACC's Lead Guideline as a: Class 1, Class 2A, Class 3A, or a Class 3B Operation
Low Level Lead-Containing Paint	Corridors Throughout Interior	White Paint on Walls	None	General hygiene procedures during renovation activities: • General dust control, • Washing of hands and face at on-site facilities, • No smoking, eating, chewing gum or drinking in the work area, • No abrasive blasting
Potentially Concealed Lead	Throughout Interior of Building on Plumbing Connections	Lead Solder on Copper Pipe	In place management in accordance with EACC's Lead Guideline	Removal prior to renovation/demolition activities in accordance with EACC's Lead Guideline as a: Class 1 Operation

Table 4.3 - Summary of Designated Substances and Recommended Actions				
139 Parkdale Avenue North, Hamilton, Ontario				
Material	**Location(s)**	**Material Description**	**Management Requirements If No Impacts to Material**	**Recommended Actions If Material Will Be Or Likely Be Impacted By Maintenance, Renovation, Construction or Demolition Activities**
Potentially Concealed Lead	Concealed on Sanitary/Waste Lines	Lead Packed Pipe Gaskets	None	Invasive inspection prior to renovation or demolition activities. If confirmed present, removal in accordance with EACC's Lead Guideline as a: Class 1 Operation
Mercury	Throughout Interior of Building in Light Fixtures	Fluorescent Light Tubes in Light Fixtures	None	Intact removal and storage with no on-site crushing and disposal of materials to a licensed facility
Silica	Throughout Interior and Exterior of Building	Terrazzo, Concrete, Ceramic Tile and Grout	None	Conduct any work during renovation, demolition activities in accordance with the Ministry of Labour Guideline Silica on Construction Projects
Potentially Concealed PCBs	Light Fixtures Throughout	Fluorescent Light Ballasts in Light Fixtures	SOR/2008-273, the PCB Regulations, permits continued use of in-service PCB-containing light ballasts until the end of service life or until December 31, 2025	Assess Each Ballast Upon Removal From Service Appropriate storage and disposal of any PCB-containing ballasts in accordance with SOR/2008-273

Notes:
1) A copy of this report should be provided to all prospective contractors prior to quotation, in accordance with Section 30 of the Occupational Health and Safety Act.
2) Recommended actions are the minimum required actions, as prescribed by the appropriate Acts, regulations, guidelines, standards, codes and general best practice measures. Prior to demolition, the Contractor may choose to alter the approach and combine or break out sections of work. This is acceptable provided that the appropriate Acts, regulations, guidelines, standards and codes are followed and afford protection for the health and safety of workers, occupants and the public that is at least equal to the protection that would be provided by complying with the minimum requirements.
3) All waste generated is subject to characterization and disposal in accordance with Ontario Regulation 347.

Appendix B

Laboratory Certificates of Analysis

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Certificate of Analysis

MTE Consultants Inc. (Burlington)

1016 Sutton Drive, Unit A
Burlington, ON L7L 6B8
Attn: Gavin Oakes

Client PO:
Project: 56043-100 - Parkdale ES Accessibility DSA
Custody:

Report Date: 6-Nov-2024
Order Date: 24-Oct-2024

Revised Report **Order #: 2443323**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2443323-01.1	S01A - 9x9 VFT - Black with Beige Marble
2443323-01.2	S01A - 9x9 VFT - Black with Beige Marble
2443323-01.3	S01A - 9x9 VFT - Black with Beige Marble
2443323-02.1	S01B - 9x9 VFT - Black with Beige Marble
2443323-02.2	S01B - 9x9 VFT - Black with Beige Marble
2443323-02.3	S01B - 9x9 VFT - Black with Beige Marble
2443323-03.1	S01C - 9x9 VFT - Black with Beige Marble
2443323-03.2	S01C - 9x9 VFT - Black with Beige Marble
2443323-03.3	S01C - 9x9 VFT - Black with Beige Marble
2443323-04.1	S02A - Plaster
2443323-04.2	S02A - Plaster
2443323-05	S02B - Plaster
2443323-06.1	S02C - Plaster
2443323-06.2	S02C - Plaster
2443323-07.1	S02D - Plaster
2443323-07.2	S02D - Plaster
2443323-08	S02E - Plaster
2443323-09.1	S02F - Plaster
2443323-09.2	S02F - Plaster
2443323-10	S02G - Plaster
2443323-11	S03A - Texture Coat Ceiling
2443323-12	S03B - Texture Coat Ceiling
2443323-13	S03C - Texture Coat Ceiling
2443323-14	S03D - Texture Coat Ceiling
2443323-15	S03E - Texture Coat Ceiling
2443323-16	S03F - Texture Coat Ceiling

Approved By:

Emma Diaz

Senior Analyst

2443323-17	S03G - Texture Coat Ceiling
2443323-18	S04A - Membrane
2443323-19	S04B - Membrane
2443323-20	S04C - Membrane
2443323-21	S05A - Intermediate Tar Layer
2443323-22	S05B - Intermediate Tar Layer
2443323-23	S05C - Intermediate Tar Layer
2443323-24	S06A - Tar Vapour Barrier
2443323-25	S06B - Tar Vapour Barrier
2443323-26	S06C - Tar Vapour Barrier

Certificate of Analysis

Report Date: 06-Nov-2024

Client: MTE Consultants Inc. (Burlington)

Order Date: 24-Oct-2024

Client PO:

Project Description: 56043-100 - Parkdale ES Accessibility DSA

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel ID	Sample Date	Colour	Description	Asbestos Detected	Material Identification	% Content
2443323-01.1	23-Oct-24	Black	Vinyl Floor Tile	**Yes**	**Client ID: S01A - 9x9 VFT - Black with Beige Marble**	
					Chrysotile	5
					Non-Fibers	95
2443323-01.2	23-Oct-24	Black	Mastic	**Yes**	**Client ID: S01A - 9x9 VFT - Black with Beige Marble** [AS-PT]	
					Chrysotile	0.5
					Non-Fibers	99.5
2443323-01.3	23-Oct-24		Compound		**Client ID: S01A - 9x9 VFT - Black with Beige Marble** [AS-NM-NA]	
					not analyzed	
2443323-02.1	23-Oct-24	Black	Vinyl Floor Tile		**Client ID: S01B - 9x9 VFT - Black with Beige Marble**	
					not analyzed, positive stop	
2443323-02.2	23-Oct-24	Black	Mastic	**Yes**	**Client ID: S01B - 9x9 VFT - Black with Beige Marble** [AS-PT]	
					Chrysotile	0.5
					Non-Fibers	99.5
2443323-02.3	23-Oct-24		Compound		**Client ID: S01B - 9x9 VFT - Black with Beige Marble** [AS-NM-NA]	
					not analyzed	
2443323-03.1	23-Oct-24	Black	Vinyl Floor Tile		**Client ID: S01C - 9x9 VFT - Black with Beige Marble**	
					not analyzed, positive stop	
2443323-03.2	23-Oct-24	Black	Mastic	**Yes**	**Client ID: S01C - 9x9 VFT - Black with Beige Marble** [AS-PT]	
					Chrysotile	0.5
					Non-Fibers	99.5
2443323-03.3	23-Oct-24		Compound		**Client ID: S01C - 9x9 VFT - Black with Beige Marble** [AS-NM-NA]	
					not analyzed	
2443323-04.1	23-Oct-24	Grey	Plaster	No	**Client ID: S02A - Plaster**	
					Non-Fibers	100
2443323-04.2	23-Oct-24	White	Plaster	No	**Client ID: S02A - Plaster**	
					Non-Fibers	100

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel ID	Sample Date	Colour	Description	Asbestos Detected	Material Identification	% Content
2443323-05	23-Oct-24	Grey/White	Plaster	No	**Client ID: S02B - Plaster** [AS-LR-NA]	
					Non-Fibers	100
2443323-06.1	23-Oct-24	Grey	Plaster	No	**Client ID: S02C - Plaster**	
					Non-Fibers	100
2443323-06.2	23-Oct-24	White	Plaster	No	**Client ID: S02C - Plaster**	
					Non-Fibers	100
2443323-07.1	23-Oct-24	Grey	Plaster	No	**Client ID: S02D - Plaster**	
					Non-Fibers	100
2443323-07.2	23-Oct-24	White	Plaster	No	**Client ID: S02D - Plaster**	
					Non-Fibers	100
2443323-08	23-Oct-24	Grey/White	Plaster	No	**Client ID: S02E - Plaster** [AS-LR-NA]	
					Non-Fibers	100
2443323-09.1	23-Oct-24	Grey	Plaster	No	**Client ID: S02F - Plaster**	
					Non-Fibers	100
2443323-09.2	23-Oct-24	White	Plaster	No	**Client ID: S02F - Plaster**	
					Non-Fibers	100
2443323-10	23-Oct-24	Grey/White	Plaster	No	**Client ID: S02G - Plaster** [AS-LR-NA]	
					Non-Fibers	100
2443323-11	23-Oct-24	White	Texture Coat	**Yes**	**Client ID: S03A - Texture Coat Ceiling**	
					Chrysotile	4
					Non-Fibers	96
2443323-12	23-Oct-24	White	Texture Coat		**Client ID: S03B - Texture Coat Ceiling**	
					not analyzed, positive stop	
2443323-13	23-Oct-24	White	Texture Coat		**Client ID: S03C - Texture Coat Ceiling**	
					not analyzed, positive stop	

Certificate of Analysis

Report Date: 06-Nov-2024

Client: MTE Consultants Inc. (Burlington)

Order Date: 24-Oct-2024

Client PO:

Project Description: 56043-100 - Parkdale ES Accessibility DSA

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel ID	Sample Date	Colour	Description	Asbestos Detected	Material Identification	% Content
2443323-14	23-Oct-24	White	Texture Coat		**Client ID: S03D - Texture Coat Ceiling**	
					not analyzed, positive stop	
2443323-15	23-Oct-24	White	Texture Coat		**Client ID: S03E - Texture Coat Ceiling**	
					not analyzed, positive stop	
2443323-16	23-Oct-24	White	Texture Coat		**Client ID: S03F - Texture Coat Ceiling**	
					not analyzed, positive stop	
2443323-17	23-Oct-24	White	Texture Coat		**Client ID: S03G - Texture Coat Ceiling**	
					not analyzed, positive stop	
2443323-18	23-Oct-24	Black	Membrane	No	**Client ID: S04A - Membrane** [AS-PRE]	
					Cellulose	10
					MMVF	5
					Non-Fibers	80
2443323-19	23-Oct-24	Black	Membrane	No	**Client ID: S04B - Membrane** [AS-PRE]	
					Cellulose	10
					MMVF	5
					Non-Fibers	80
2443323-20	23-Oct-24	Black	Membrane	No	**Client ID: S04C - Membrane** [AS-PRE]	
					Cellulose	10
					MMVF	5
					Non-Fibers	85
2443323-21	23-Oct-24	Black	Tar	No	**Client ID: S05A - Intermediate Tar Layer** [AS-PRE]	
					Cellulose	20
					MMVF	10
					Non-Fibers	70
2443323-22	23-Oct-24	Black	Tar	No	**Client ID: S05B - Intermediate Tar Layer** [AS-PRE]	
					Cellulose	20
					MMVF	10
					Non-Fibers	70

Certificate of Analysis

Report Date: 06-Nov-2024

Client: MTE Consultants Inc. (Burlington)

Order Date: 24-Oct-2024

Client PO:

Project Description: 56043-100 - Parkdale ES Accessibility DSA

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel ID	Sample Date	Colour	Description	Asbestos Detected	Material Identification	% Content
2443323-23	23-Oct-24	Black	Tar	No	**Client ID: S05C - Intermediate Tar Layer** [AS-PRE]	
					Cellulose	20
					MMVF	10
					Non-Fibers	70
2443323-24	23-Oct-24	Black	Tar vapour barrier	No	**Client ID: S06A - Tar Vapour Barrier** [AS-PRE]	
					MMVF	5
					Non-Fibers	95
2443323-25	23-Oct-24	Black	Tar vapour barrier	No	**Client ID: S06B - Tar Vapour Barrier** [AS-PRE]	
					MMVF	5
					Non-Fibers	95
2443323-26	23-Oct-24	Black	Tar vapour barrier	No	**Client ID: S06C - Tar Vapour Barrier** [AS-PRE]	
					MMVF	5
					Non-Fibers	95

* MMVF: Man Made Vitreous Fibers: Fiberglass, Mineral Wool, Rockwool, Glasswool

**** Analytes in bold indicate asbestos mineral content.**

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	Lab Accreditation	Analysis Date
Asbestos, PLM Visual Estimation	AppE to SubE of 40CFR Part763 and EPA/600/R-93/116	1 - Mississauga	CALA 3762	30-Oct-24

Mississauga Lab: 15 - 6800 Kitimat Rd Mississauga, Ontario, L5N 5M1

Qualifier Notes

Sample Qualifiers :

AS-LR-NA: Layers/materials inseparable, combined and not analysed separately

AS-NM-NA: No material present

AS-PRE: Due to the difficult nature of the bulk sample (interfering fibers/binders), additional NOB preparation was required prior to analysis

AS-PT: Asbestos quantitation by PLM Point Count method.

Work Order Revisions | Comments

Revision -1: This report includes additional analysis of layers.

PARACEL LABORATORIES LTD.

Paracel ID: 2443323

ffice
9 St. Laurent Blvd.
Ontario K1G 4J8
)-749-1947
:el@paracellabs.com

Chain of Custody
(Lab Use Only)

Client Name: MTE Consultants	Project Reference: 56043-100 - Parkdale ES Accessibilty DSA
Contact Name: Gavin Oakes; Aaron Rows	Quote #: MTE Standing Offer
Address: 1016 Sutton Drive, Unit A Burlington, ON L7L 6B8	PO #:
Telephone: 905-639-2552	Email Address: goakes@mte85.com arows@mte85.com

Turnaround Time:

- ☐ Immediate
- ☐ 4 Hour
- ☐ 8 Hour
- ☐ 1 Day
- ☐ 2 Day
- ☐ 3 Day
- ☒ Regular

Date Required: _____

ASBESTOS & MOLD ANALYSIS

Matrix: ☐ Air ☒ Bulk ☐ Tape Lift ☐ Swab ☐ Other **Regulatory Guideline:** ☒ ON ☐ QC ☐ AB ☐ SK ☐ Other:

Analyses: ☐ Microscopic Mold ☐ Culturable Mold ☐ Bacteria GRAM ☐ PCM Asbestos ☒ PLM Asbestos ☐ Chatfield Asbestos ☐ TEM Asbestos

Paracel Order Number: 2443323

	Sample ID	Sampling Date	Air Volume (L)	Analysis Required	Asbestos - Bulk: Identify Distinct Building Materials to Be Analyzed (if not specified, all materials identified will be analyzed) *	Asbestos - Bulk: Positive Stop?
1	S01 A-C - 9"x9" VFT - Black with Beige Marble	23 Oct 24	-	PLM		☒
2	S02 A-G - Plaster	23 Oct 24	-	PLM		☒
3	S03 A-G - Texture Coat Ceiling	23 Oct 24	-	PLM		☒
4	S04 A-C - Membrane	23 Oct 24	-	PLM		☒
5	S05 A-C - Intermediate Tar Layer	23 Oct 24	-	PLM		☒
6	S06 A-C - Tar Vapour Barrier	23 Oct 24	-	PLM		☒
7						☐
8						☐
9						☐
10						☐
11						☐
12						☐

* If left blank, all distinct materials identified in the samples will be analyzed and reported separately as per EPA 600/R-93/116. Additional charges will apply.

Comments:

Method of Delivery: Purolator

Relinquished By (Sign): Gavin Oakes Aaron Rows	Received at Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Aaron Rows			
Date/Time: 23 Oct 24 - 1:32pm	Date/Time:	Date/Time: Oct 24/24 8:45	Date/Time: Oct 24/24 9:20

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Certificate of Analysis

MTE Consultants Inc. (Burlington)

1016 Sutton Drive, Unit A
Burlington, ON L7L 6B8
Attn: Gavin Oakes

Client PO:
Project: 56043-100 Parkdale Additional Sampling
Custody:

Report Date: 16-Dec-2024
Order Date: 10-Dec-2024

Order #: 2450124

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2450124-01.1	S07A - 9x9 VFT - Brown with Beige Marble Pattern
2450124-01.2	S07A - 9x9 VFT - Brown with Beige Marble Pattern
2450124-02.1	S07B - 9x9 VFT - Brown with Beige Marble Pattern
2450124-02.2	S07B - 9x9 VFT - Brown with Beige Marble Pattern
2450124-03.1	S07C - 9x9 VFT - Brown with Beige Marble Pattern
2450124-03.2	S07C - 9x9 VFT - Brown with Beige Marble Pattern
2450124-04	S08A - Drywall Joint Compound - Girls/Boys Washroom
2450124-05	S08B - Drywall Joint Compound - Girls/Boys Washroom
2450124-06	S08C - Drywall Joint Compound - Girls/Boys Washroom
2450124-07	S09A - Wall Tile Grout - Girls/Boys Washroom
2450124-08	S09B - Wall Tile Grout - Girls/Boys Washroom
2450124-09	S09C - Wall Tile Grout - Girls/Boys Washroom
2450124-10	S10A - Drywall Joint Compound - 108C Storage Closet Wall
2450124-11	S10B - Drywall Joint Compound - 108C Storage Closet Wall
2450124-12	S10C - Drywall Joint Compound - 108C Storage Closet Wall

Approved By:

Emma Diaz

Senior Analyst

Certificate of Analysis

Report Date: 16-Dec-2024

Client: **MTE Consultants Inc. (Burlington)**

Order Date: 10-Dec-2024

Client PO:

Project Description: 56043-100 Parkdale Additional Sampling

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel ID	Sample Date	Colour	Description	Asbestos Detected	Material Identification	% Content
2450124-01.1	04-Dec-24	Brown	Vinyl Floor Tile	**Yes**	**Client ID: S07A - 9x9 VFT - Brown with Beige Marble Pattern**	
					Chrysotile	5
					Non-Fibers	95
2450124-01.2	04-Dec-24	Black	Mastic	No	**Client ID: S07A - 9x9 VFT - Brown with Beige Marble Pattern**	
					Non-Fibers	100
2450124-02.1	04-Dec-24	Brown	Vinyl Floor Tile		**Client ID: S07B - 9x9 VFT - Brown with Beige Marble Pattern**	
					not analyzed, positive stop	
2450124-02.2	04-Dec-24	Black	Mastic	No	**Client ID: S07B - 9x9 VFT - Brown with Beige Marble Pattern**	
					Non-Fibers	100
2450124-03.1	04-Dec-24	Brown	Vinyl Floor Tile		**Client ID: S07C - 9x9 VFT - Brown with Beige Marble Pattern**	
					not analyzed, positive stop	
2450124-03.2	04-Dec-24	Black	Mastic	No	**Client ID: S07C - 9x9 VFT - Brown with Beige Marble Pattern**	
					Non-Fibers	100
2450124-04	04-Dec-24	White	Drywall Joint Compound	No	**Client ID: S08A - Drywall Joint Compound - Girls/Boys Washroom**	
					Non-Fibers	100
2450124-05	04-Dec-24	White	Drywall Joint Compound	No	**Client ID: S08B - Drywall Joint Compound - Girls/Boys Washroom**	
					Non-Fibers	100
2450124-06	04-Dec-24	White	Drywall Joint Compound	No	**Client ID: S08C - Drywall Joint Compound - Girls/Boys Washroom**	
					Non-Fibers	100
2450124-07	04-Dec-24	Off-white	Grout	No	**Client ID: S09A - Wall Tile Grout - Girls/Boys Washroom**	
					Non-Fibers	100
2450124-08	04-Dec-24	Off-white	Grout	No	**Client ID: S09B - Wall Tile Grout - Girls/Boys Washroom**	
					Non-Fibers	100
2450124-09	04-Dec-24	Off-white	Grout	No	**Client ID: S09C - Wall Tile Grout - Girls/Boys Washroom**	
					Non-Fibers	100

PARACEL LABORATORIES LTD.

Order #: 2450124

Certificate of Analysis

Report Date: 16-Dec-2024

Client: MTE Consultants Inc. (Burlington)

Order Date: 10-Dec-2024

Client PO:

Project Description: 56043-100 Parkdale Additional Sampling

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel ID	Sample Date	Colour	Description	Asbestos Detected	Material Identification	% Content
2450124-10	04-Dec-24	White	Drywall Joint Compound	No	**Client ID: S10A - Drywall Joint Compound - 108C Storage Closet Wall**	
					Non-Fibers	100
2450124-11	04-Dec-24	White	Drywall Joint Compound	No	**Client ID: S10B - Drywall Joint Compound - 108C Storage Closet Wall**	
					Non-Fibers	100
2450124-12	04-Dec-24	White	Drywall Joint Compound	No	**Client ID: S10C - Drywall Joint Compound - 108C Storage Closet Wall**	
					Non-Fibers	100

**** Analytes in bold indicate asbestos mineral content.**

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	Lab Accreditation	Analysis Date
Asbestos, PLM Visual Estimation	AppE to SubE of 40CFR Part763 and EPA/600/R-93/116	1 - Mississauga	CALA 3762	16-Dec-24

Mississauga Lab: 15 - 6800 Kitimat Rd Mississauga, Ontario, L5N 5M1

Work Order Revisions | Comments

None

PARACEL LABORATORIES LTD.

2450124

fice
St. Laurent Blvd.
Ontario K1G 4J8
-749-1947
el@paracellabs.com

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: MTE Consultants	Project Reference: 56043-100 - Parkdale Additional Sampling	**Turnaround Time:**	
Contact Name: Gavin Oakes; Aaron Rows	Quote #: MTE Standing Offer	☐ Immediate	☐ 1 Day
Address: 1016 Sutton Drive, Unit A	PO #:	☐ 4 Hour	☐ 2 Day
Burlington, ON L7L 6B8	Email Address: goakes@mte85.com	☐ 8 Hour	☐ 3 Day
Telephone: 905-639-2552	arows@mte85.com		☒ Regular
		Date Required:	

ASBESTOS & MOLD ANALYSIS

Matrix: ☐ Air ☒ Bulk ☐ Tape Lift ☐ Swab ☐ Other **Regulatory Guideline:** ☒ ON ☐ QC ☐ AB ☐ SK ☐ Other:

Analyses: ☐ Microscopic Mold ☐ Culturable Mold ☐ Bacteria GRAM ☐ PCM Asbestos ☒ PLM Asbestos ☐ Chatfield Asbestos ☐ TEM Asbestos

Paracel Order Number: 2450124

	Sample ID	Sampling Date	Air Volume (L)	Analysis Required	Asbestos - Bulk: Identify Distinct Building Materials to Be Analyzed (if not specified, all materials identified will be analyzed) *	Positive Stop?
1	S07 A-C - 9"x9" VFT - Brown with Beige Marble Pattern	4 Dec 24	-	PLM		☒
2	S08 A-C - Drywall Joint Compound - Girls/Boys Washroom	4 Dec 24	-	PLM		☒
3	S09 A-C - Wall Tile Grout - Girls/Boys Washroom	4 Dec 24	-	PLM		☒
4	S10 A-C - Drywall Joint Compound - 108C Storage Closet Wall	4 Dec 24	-	PLM		☒
5						☐
6						☐
7						☐
8						☐
9						☐
10						☐
11						☐
12						☐

*** If left blank, all distinct materials identified in the samples will be analyzed and reported separately as per EPA 600/R-93/116. Additional charges will apply.**

Comments:

Method of Delivery: Purolator

Relinquished By (Sign): Gavin Oakes	Received at Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Gavin Oakes			
Date/Time: 5 Dec 24 - 9:30 a.m.	Date/Time:	Date/Time: Dec 10/24 8.47	Date/Time: Dec 10/24 9.00

PARACEL LABORATORIES LTD.
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1-800-749-1947
www.paracellabs.com

Certificate of Analysis

MTE Consultants Inc. (Burlington)

1016 Sutton Drive, Unit A
Burlington, ON L7L 6B8
Attn: Gavin Oakes

Client PO:
Project: 56043-100-Parkdale ES Accessibilty DSA
Custody:

Report Date: 29-Oct-2024
Order Date: 24-Oct-2024

Order #: 2443321

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2443321-01	LP01-White
2443321-02	LP02-Green
2443321-03	LP03-Yellow

Approved By:

Alex Enfield, MSc
Lab Manager

Certificate of Analysis

Report Date: 29-Oct-2024

Client: MTE Consultants Inc. (Burlington)

Order Date: 24-Oct-2024

Client PO:

Project Description: 56043-100-Parkdale ES Accessibilty DSA

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	28-Oct-24	28-Oct-24

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions/Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Certificate of Analysis

Report Date: 29-Oct-2024

Client: MTE Consultants Inc. (Burlington)

Order Date: 24-Oct-2024

Client PO:

Project Description: 56043-100-Parkdale ES Accessibilty DSA

Sample Results

Lead

Matrix: Paint

Paracel ID	Client ID	Sample Date	Units	MDL	Result
2443321-01	LP01-White	22-Oct-24	ug/g	5	9
2443321-02	LP02-Green	22-Oct-24	ug/g	5	1180
2443321-03	LP03-Yellow	22-Oct-24	ug/g	5	2570

Laboratory Internal QA/QC

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Matrix Blank									
Lead	**ND**	**5**	**ug/g**						
Matrix Duplicate									
Lead	**232**	**5**	**ug/g**	**213**			**8.50**	**50**	
Matrix Spike									
Lead	53.5	5.00	ug/g	8.5	90.1	70-130			

PARACEL LABORATORIES LTD. | TRUSTEI RESPON RELIABI

Paracel ID: 2443321

cel Order Number (Lab Use Only)

Chain Of Custody (Lab Use Only)

Client Name: MTE Consultants	Project Ref: 56043-100 - Parkdale ES Accessibilty DSA	Page 1 of 1
Contact Name: Gavin Oakes;Aaron Rows	Quote #: MTE Standing Offer	**Turnaround Time**
Address: 1016 Sutton Drive, Unit A Burlington, ON L7L 6B8	PO #:	☐ 1 day ☐ 3 day ☐ 2 day ☑ Regular
Telephone: 905-639-2552	E-mail: goakes@mte85.com arows@mte85.com	Date Required:

☐ REG 153/04 ☐ REG 406/19	Other Regulation	Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)	Required Analysis
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO		
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA		
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm		
☐ Table ___	Mun:		
For RSC: ☐ Yes ☐ No	☐ Other:		

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Lead
1	LP01-White	P	-	1	22 Oct 24	3:50 pm	X
2	LP02-Green	P	-	1	↓	↓	X
3	LP03-Yellow	P	-	1	↓	↓	X
4							
5							
6							
7							
8							
9							
10							

Comments:

Method of Delivery: Purolator

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: AV	Verified By: AV
Relinquished By (Print): Aaron Rows	Date/Time:	Date/Time: 10/24/24 9:10	Date/Time: 10/24/24 9:14
Date/Time: 23 Oct 24 - 1:30 pm	Temperature: °C	Temperature:	pH Verified: ☐ By:

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Hamilton, ON L8H 7P4
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

MTE Consultants Inc. (Burlington)

1016 Sutton Drive, Unit A
Burlington, ON L7L 6B8
Attn: Gavin Oakes

Client PO:
Project: 56043-100 - Parkdale Additional Sampling
Custody:

Report Date: 16-Dec-2024
Order Date: 10-Dec-2024

Order #: 2450136

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2450136-01	LP04 - Yellow - Room 116 Storage
2450136-02	LP05 - Grey - Door Frames
2450136-03	LP06 - Grey - Bathroom Stalls
2450136-04	LP07 - Green - 1080 Storage
2450136-05	LP08 - White - Walls Throughout

Approved By:

Milan Ralitsch, PhD
Senior Technical Manager

Certificate of Analysis

Report Date: 16-Dec-2024

Client: MTE Consultants Inc. (Burlington)

Order Date: 10-Dec-2024

Client PO:

Project Description: 56043-100 - Parkdale Additional Sampling

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	13-Dec-24	13-Dec-24

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions/Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

PARACEL LABORATORIES LTD.

Order #: 2450136

Certificate of Analysis

Report Date: 16-Dec-2024

Client: MTE Consultants Inc. (Burlington)

Order Date: 10-Dec-2024

Client PO:

Project Description: 56043-100 - Parkdale Additional Sampling

Sample Results

Lead

Matrix: Paint

Paracel ID	Client ID	Sample Date	Units	MDL	Result
2450136-01	LP04 - Yellow - Room 116 Storage	4-Dec-24	ug/g	5	3800
2450136-02	LP05 - Grey - Door Frames	4-Dec-24	ug/g	5	<5
2450136-03	LP06 - Grey - Bathroom Stalls	4-Dec-24	ug/g	5	28
2450136-04	LP07 - Green - 1080 Storage	4-Dec-24	ug/g	5	2840
2450136-05	LP08 - White - Walls Throughout	4-Dec-24	ug/g	5	<5

Laboratory Internal QA/QC

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Matrix Blank									
Lead	**ND**	**5**	**ug/g**						
Matrix Duplicate									
Lead	**ND**	**5**	**ug/g**	**59.0**			**NC**	**50**	
Matrix Spike									
Lead	47.0	5.00	ug/g	ND	89.3	70-130			

PARACEL LABORATORIES LTD.

Paracel ID: 2450136

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2450136	

Client Name: MTE Consultants	Project Ref: 56043-100 - Parkdale Additonal Sampling	Page 1 of 1
Contact Name: Gavin Oakes;Aaron Rows	Quote #: MTE Standing Offer	**Turnaround Time**
Address: 1016 Sutton Drive, Unit A Burlington, ON L7L 6B8	PO #:	☐ 1 day ☐ 3 day ☐ 2 day ☑ Regular
Telephone: 905-639-2552	E-mail: goakes@mte85.com arows@mte85.com	Date Required:

☐ REG 153/04 ☐ REG 406/19

☐ Table 1 ☐ Res/Park ☐ Med/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☐ Table 3 ☐ Agri/Other
☐ Table ___
For RSC: ☐ Yes ☐ No

Other Regulation

☐ REG 558 ☐ PWQO
☐ CCME ☐ MISA
☐ SU - Sani ☐ SU - Storm
Mun: ___
☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analysis: Lead
1	LP04 - Yellow - Room 116 Storage	P	-	1	4 Dec 24	3:30 pm	X
2	LP05 - Grey - Door Frames	P	-	1	↓	↓	X
3	LP06 - Grey - Bathroom Stalls	P	-	1			X
4	LP07 - Green - 1086 Storage	P	-	1			X
5	LP08 - White - Walls throughout	P	-	1			X
6							
7							
8							
9							
10							

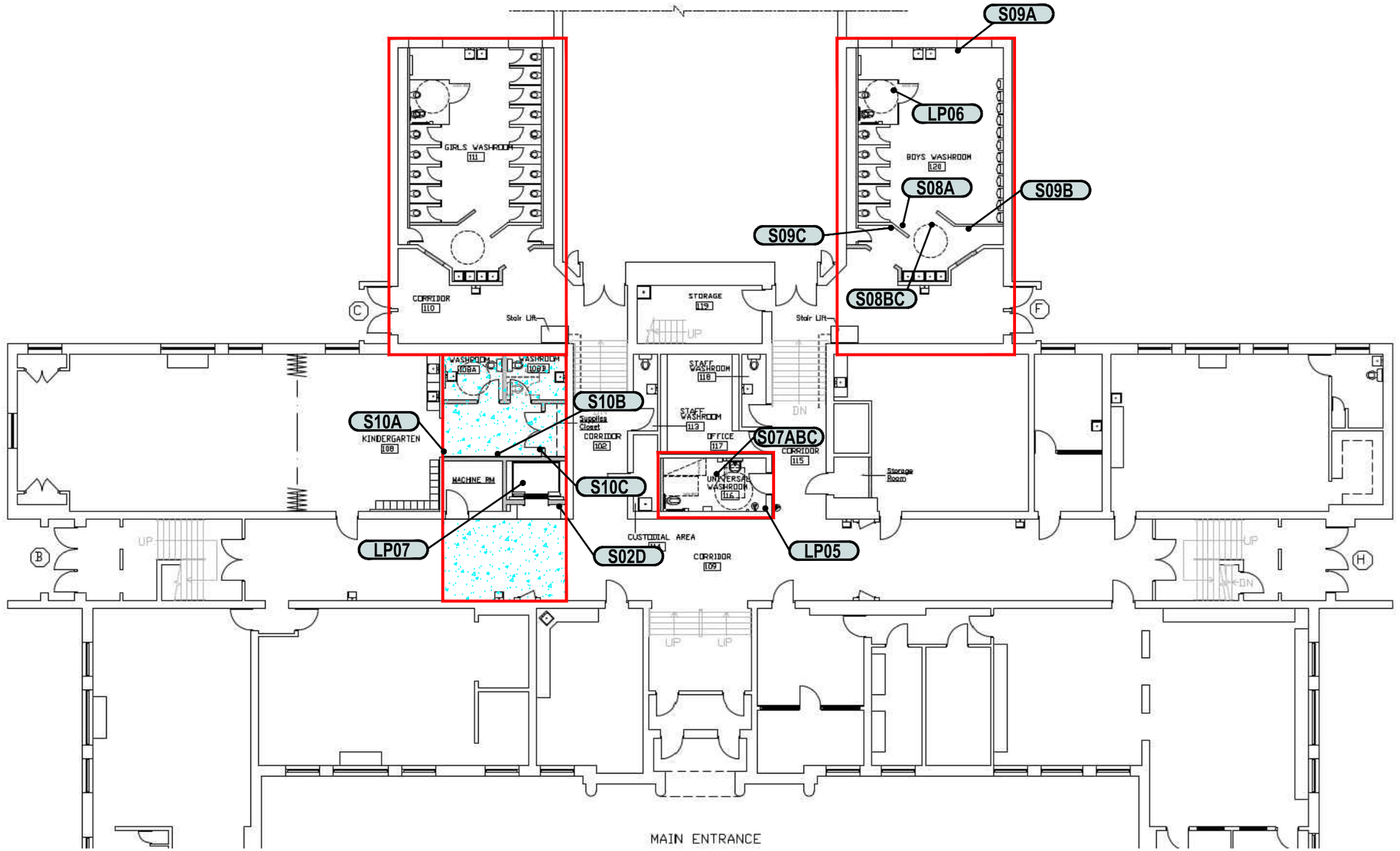
Comments:

Method of Delivery: Purolator

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Aaron Rows	Date/Time:	Date/Time: 12/10/24 850	Date/Time: 12/10/24 1032
Date/Time: 5 Dec 24 - 9:30 a.m.	Temperature: °C	Temperature: —	pH Verified: ☐ By:

Appendix C

Figures



Notes:

ALL DRAWINGS TO BE REFERENCED WITH THE DSA REPORT. LOCATIONS AND QUANTITIES ARE APPROXIMATE.

ALL KNOWN OR SUSPECT DESIGNATED SUBSTANCES ARE NOT DEPICTED ON THIS FIGURE. REFER TO THE DSA REPORT FOR A COMPLETE LIST OF IDENTIFIED KNOWN AND SUSPECT DESIGNATED SUBSTANCES.

THIS FIGURE IS COLOUR DEPENDENT, PHOTOCOPIES MAY ALTER INTERPRETATION OF FIGURE. ALWAYS REFER TO ORIGINAL DRAWINGS AND DSA REPORT.

Designated Substances and Hazardous Materials Legend

S02D — Sample Identification

Work Area

ACM Texture Coat Ceiling

MTE
Engineers, Scientists, Surveyors

Ph. (905) 639-2552 www.mte85.com

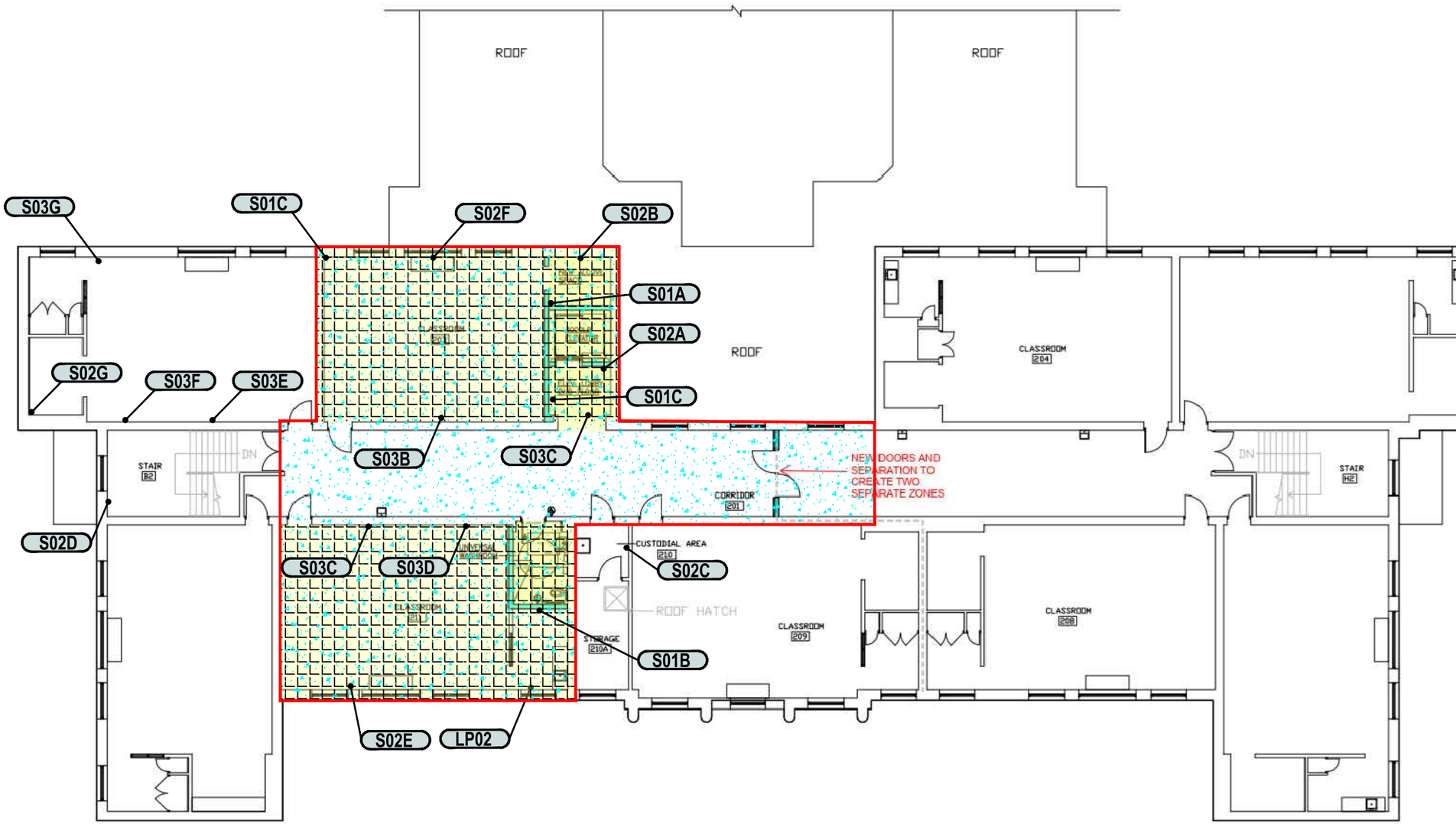
CLIENT
Hamilton– Wenworth District School Board

PROJECT
DESIGNATED SUBSTANCE AUDIT

DRAWING
MAIN FLOOR-
PARKDALE ELEMENTARY SCHOOL
139 PARKDALE AVENUE NORTH.
HAMILTON, ONTARIO

Project Manager	G. OAKES	Date	NOVEMBER 2024
Baseplan By	MTE	Project No.	56043-100
Figure By	SXS	Drawing No.	1.0
Scale	N.T.S.		

Project: 56043-100 CAD: P:\P\56043\100\56043-100.DWG
November 08, 2024 – 11:00 pm – Plotted By: SXS



Notes:

ALL DRAWINGS TO BE REFERENCED WITH THE DSA REPORT. LOCATIONS AND QUANTITIES ARE APPROXIMATE.

ALL KNOWN OR SUSPECT DESIGNATED SUBSTANCES ARE NOT DEPICTED ON THIS FIGURE. REFER TO THE DSA REPORT FOR A COMPLETE LIST OF IDENTIFIED KNOWN AND SUSPECT DESIGNATED SUBSTANCES.

THIS FIGURE IS COLOUR DEPENDENT, PHOTOCOPIES MAY ALTER INTERPRETATION OF FIGURE. ALWAYS REFER TO ORIGINAL DRAWINGS AND DSA REPORT.

Designated Substances and Hazardous Materials Legend

- S02D — Sample Identification
- Work Area
- ACM Texture Coat Ceiling
- ACM Tiles and Mastic

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Engineers, Scientists, Surveyors
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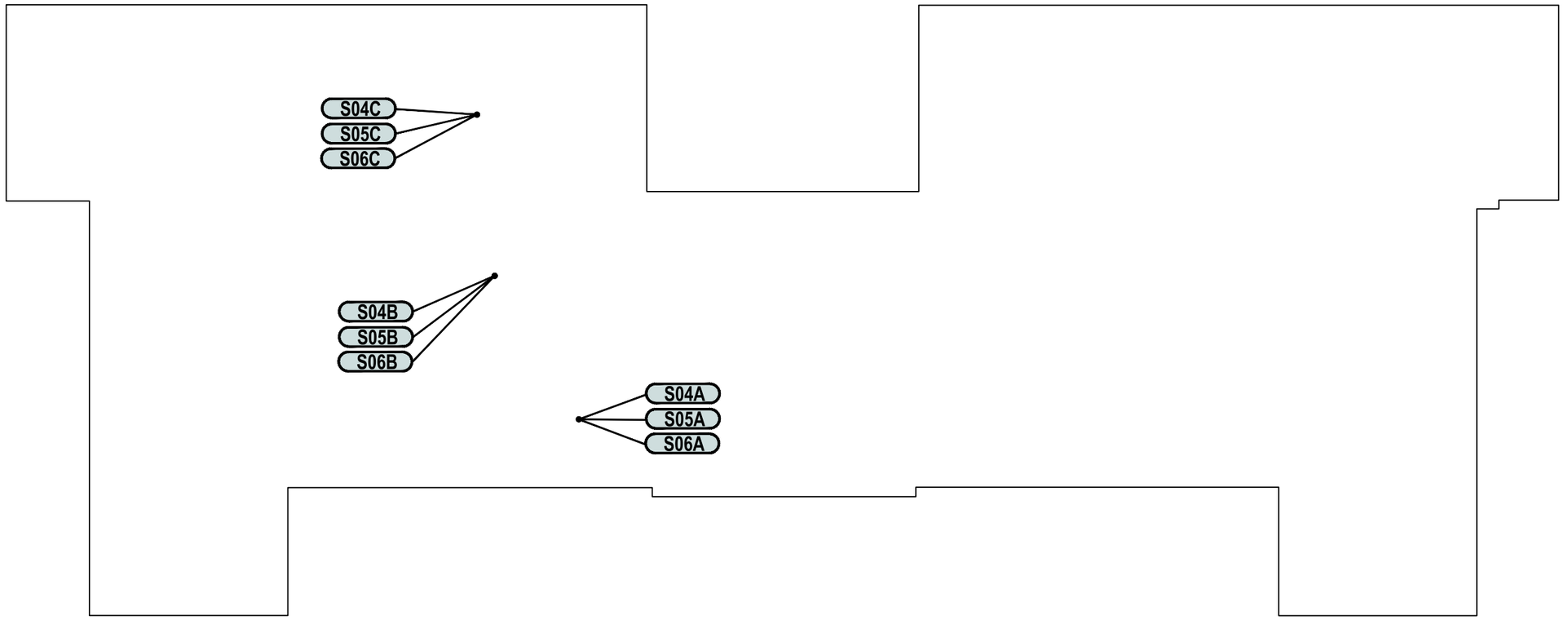
Hamilton- Wenworth District School Board

PROJECT
DESIGNATED SUBSTANCE AUDIT

DRAWING
SECOND FLOOR-
PARKDALE ELEMENTARY SCHOOL
139 PARKDALE AVENUE NORTH.
HAMILTON, ONTARIO

Project Manager	G. OAKES	Date	NOVEMBER 2024
Baseplan By	MTE	Project No.	56043-100
Figure By	SXS	Drawing No.	2.0
Scale	N.T.S.		

Project: 56043-100 CAD: P:\P\56043\100\56043-100.DWG
November 08, 2024 - 11:00 pm - Plotted By: SXS



Notes:

ALL DRAWINGS TO BE REFERENCED WITH THE DSA REPORT. LOCATIONS AND QUANTITIES ARE APPROXIMATE.

ALL KNOWN OR SUSPECT DESIGNATED SUBSTANCES ARE NOT DEPICTED ON THIS FIGURE. REFER TO THE DSA REPORT FOR A COMPLETE LIST OF IDENTIFIED KNOWN AND SUSPECT DESIGNATED SUBSTANCES.

THIS FIGURE IS COLOUR DEPENDENT, PHOTOCOPIES MAY ALTER INTERPRETATION OF FIGURE. ALWAYS REFER TO ORIGINAL DRAWINGS AND DSA REPORT.

Designated Substances and Hazardous Materials Legend

S02D — Sample Identification

MTE
Engineers, Scientists, Surveyors

Ph. (905) 639-2552 www.mte85.com

CLIENT
Hamilton- Wenworth District School Board

PROJECT
DESIGNATED SUBSTANCE AUDIT

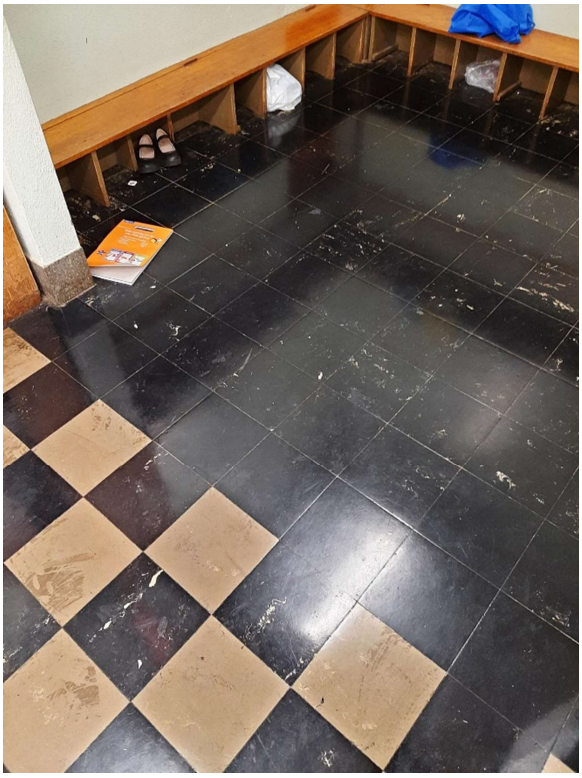
DRAWING
ROOF PLAN -
PARKDALE ELEMENTARY SCHOOL
139 PARKDALE AVENUE NORTH.
HAMILTON, ONTARIO

Project Manager	G. OAKES	Date	NOVEMBER 2024
Baseplan By	MTE	Project No.	56043-100
Figure By	SXS	Drawing No.	3.0
Scale	N.T.S.		

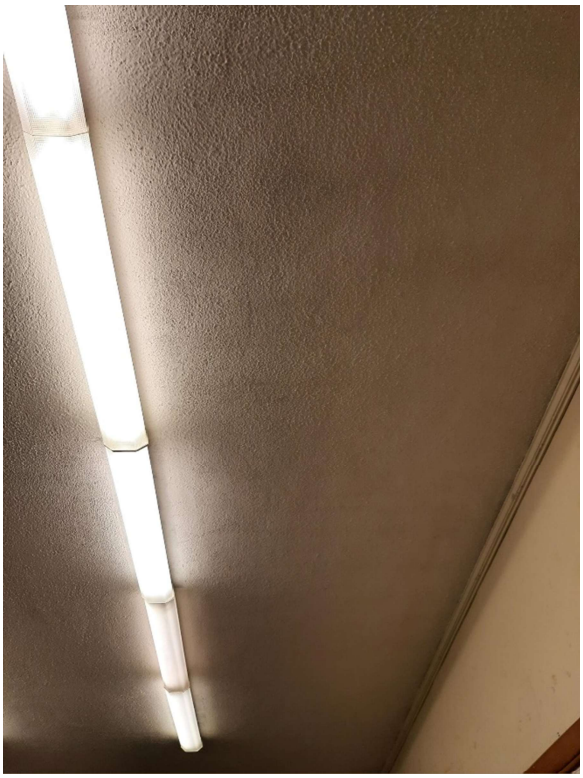
Project: 56043-100 CAD: P:\P\56043\100\56043-100.DWG
November 08, 2024 - 11:00 pm - Plotted By: SXS

Appendix D

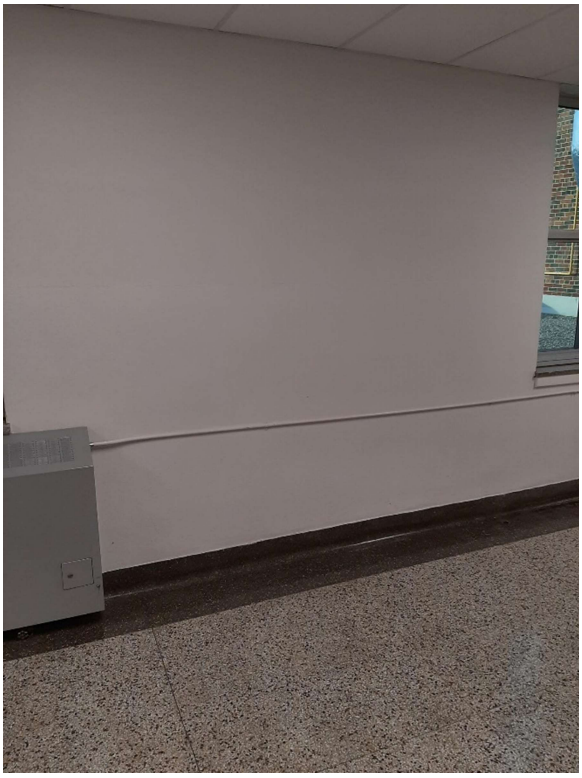
Photographic Log



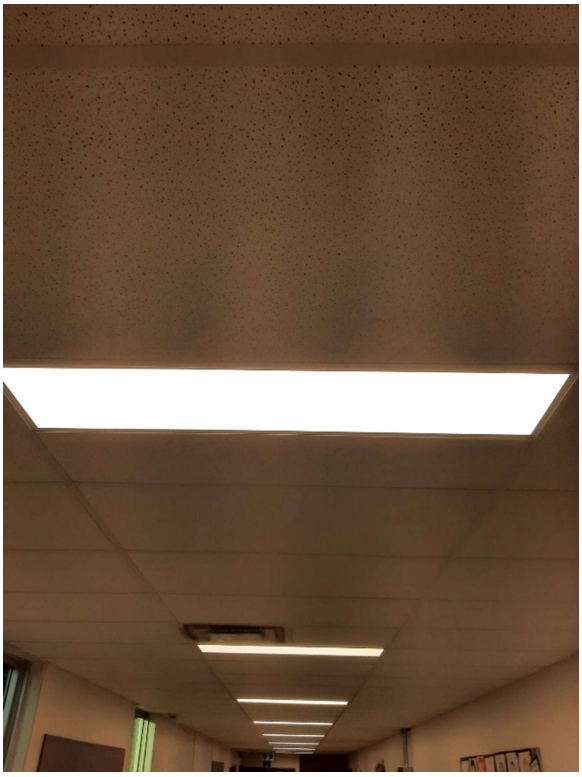
Photograph No. 1 – 9”x9” Green/beige and black with beige marble pattern vinyl floor tiles were observed in Classrooms 203 and 211. The tiles were sampled (S01A,B,C) and found to be asbestos-containing. The associated mastic is also asbestos-containing.



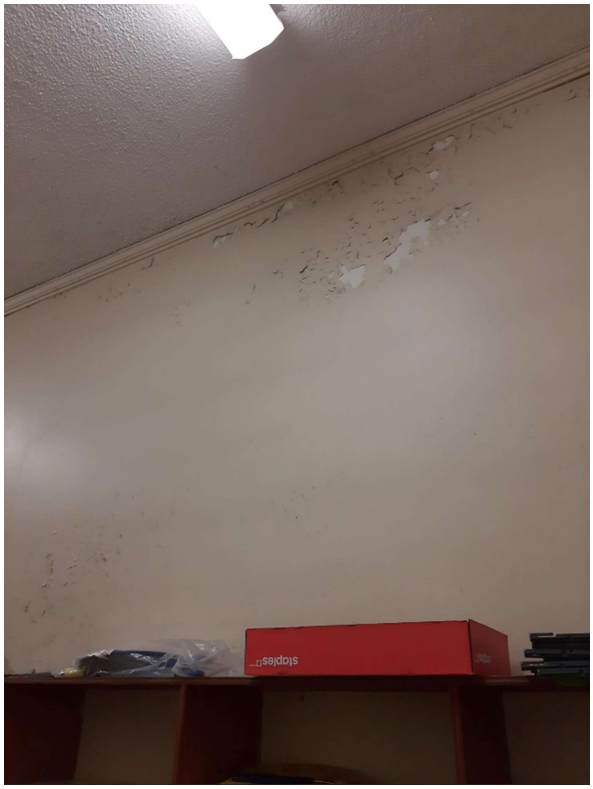
Photograph No. 2 – A texture coat ceiling was observed throughout the interior and was sampled (S03A,B,C,D,E,F,G). The texture coat ceiling is asbestos-containing.



Photograph No. 3 – Plaster walls were observed throughout the interior. The plaster was sampled (S02A-G) and is non-asbestos.



Photograph No. 4 – Mercury containing fluorescent light tubes are present throughout the interior. The 2'x4' ceiling tile had a 2022 date stamp and therefore is non-asbestos.



Photograph No. 5 – The yellow paint observed in Classroom 203 was sampled (LP03) and is lead-containing.

Photograph No. 6 – The green paint observed in Classroom 211 and Storage room 108C was sampled (LP02) and is lead-containing.

Photograph No. 7 – The roof system was sampled (S04A,B,C / S05A,B,C / S06A,B,C) and is non-asbestos.

Photograph No. 8 – 9”x9” Brown with beige marble pattern vinyl floor tiles were observed in storage Room 116 and was sampled (S07A,B,C). The vinyl floor tiles are asbestos-containing; however, the associated mastic is non-asbestos.

Photograph No. 8 – The yellow paint observed within storage Room 116 was sampled (LP4) and is lead-containing.

Photograph No. 9 – Potentially concealed asbestos-containing mastics maybe be present underneath corkboards.

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

.1 Read this section in conjunction with all other sections so as to conform to Division 1, and the General Requirements of the project.

.2 Inform all sub-trades of the presence of Asbestos Containing Materials identified in the documents.

.3 The Contractor involved directly or indirectly with the removal, handling, management, transportation and disposal of Asbestos Containing Materials and Asbestos Waste in any and all aspects shall take all reasonable precautions, due care and diligence to prevent asbestos from becoming airborne and shall take all reasonable precautions to control and prevent the spread of airborne asbestos in the event of an incident, accidental release or loss of containment. Cost of additional work by the Contractor and/or Consultant to rectify unsatisfactory conditions, shall be charged to the Contractor.

.4 No allowance will be made for any difficulties encountered or any expenses incurred on account of any conditions of the site or any item existing thereon that is visible or known or can be reasonably anticipated.

.5 The Contractor shall be prepared to respond throughout the duration of the project in order to repair, encapsulate remove or otherwise manage additional asbestos as required. The abatement contractor shall provide an emergency contact phone number and be on call to provide emergency services.

.6 The abatement contractor shall control all water migration (including leakage and spillage) from the abatement work area to areas below/adjacent. It is the responsibility of the contractor to protect all items from damage caused by water used in the abatement work area(s). The abatement contractor must immediately mitigate any and all damage to the satisfaction of the owner and Consultant resulting from water used in the abatement work area(s) at their own expense. No allowances shall be made as a result of lost time, resources, materials or equipment.

.7 It is the Contractor’s responsibility to ensure all construction aspects of the project are conducted in accordance with applicable construction safety legislation, regulations and general approved practice. This includes, but is not limited to; all means, methods, techniques, sequences, procedures, safety programs and precautions used.

1.2 DEFINITIONS

.1 Asbestos Containing Material: Materials that contain 0.5 percent or more asbestos by dry weight.

.2 Asbestos Waste: is material that contains asbestos in more than a trivial amount or proportion as defined by Ontario Regulation 347 as amended by Ontario Regulation 558/00 and includes the following:

.1 Solid or liquid waste that results from the removal of asbestos-containing construction or insulation materials and contains asbestos;

.2 Commercial waste and/or domestic waste that contains asbestos;

.3 Non-hazardous solid industrial waste that contains asbestos; and

.4 Materials determined or deemed contaminated with asbestos.

.3 Authorized Visitors: The Consultant or their representative, Architect, Owner's representatives, and persons representing regulatory agencies.

.4 Contractor: Contractors or Sub-Contractor performing work included in this specification.

.5 Consultant: Owner's Representative providing inspection and air monitoring.

MTE Consultants Inc.
1016 Sutton Drive, Unit A, Burlington, Ontario, L7L 6B8
Phone: 905-639-2552 Fax: 905-639-7727
Contact: Gavin Oakes Cell: 905-719-5217

PART 2 – SCOPE OF WORK

2.1 SUMMARY OF MATERIALS

.1 Refer to the following documents regarding Designated Substances within the work areas. The survey and documentation of Designated Substances is required by Section 30 of the Occupational Health and Safety Act and shall be read in conjunction with these specifications.

.1 "*Designated Substance Audit Report – Parkdale Elementary School Accessibility Project, 139 Parkdale Elementary School, Hamilton, ON*" dated November 15, 2024 (revised January 20, 2025) prepared by MTE Consultants Inc.

.2 Removal and/or disturbance of asbestos-containing materials shall be performed in accordance with Ontario Regulation 278/05 – Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations.

.3 Removal and/or disturbance of lead-based and lead-containing materials shall be performed in accordance with the Environmental Abatement Council of Canada's Lead Guideline for Construction, Renovation, Maintenance and Repair (2014)

.4 Removal and/or disturbance of mercury-containing materials shall be performed in a manner which maintains the mercury intact, with no on-site crushing. Following removal, mercury-containing materials shall be safely stored on-Site until the Contractor can safely dispose of the materials at a licensed landfill.

.5 Removal and/or disturbance of silica-containing materials shall be performed in accordance with the Ministry of Labour's Guideline Silica on Construction Projects.

.6 Suspect PCB-containing equipment, including light ballasts, shall be assessed upon removal from service to determine PCB content. If identified as PCB-containing, equipment shall be appropriately stored and disposed of by the Contractor in accordance with SOR 2008-273 - PCB Regulations.

.2 ACM may be present in concealed locations and become apparent during construction, renovation, alteration, or maintenance activities. Should any suspect ACM be discovered during the course of regular construction, renovation, alteration, or maintenance activities,

work should cease and the materials should not be disturbed. Suspect ACM must be treated as asbestos-containing or sampled and proven to not contain asbestos. Any activities that require disturbance of ACM must be performed in accordance with Ontario Regulation 278/05. It is the responsibility of the constructor to provide supervision and training and undertake due care and diligence in situations where such discoveries can and would occur.

.3 Upon discovery of suspect or known ACM not identified or referred to in Section 2.0 or the reports referenced, the constructor shall immediately notify, orally and in writing; an inspector at the office of the Ministry of Labour nearest the workplace, the owner/representative, the Contractor and the joint health and safety committee or the health and safety representative, if any, for the workplace. The written notice shall include the following:

.1 The name and address of the person giving the notice;

.2 The name and address of the owner of the place where the work will be carried out;

.3 The municipal address or other description of the place where the work will be carried out sufficient to permit the inspector to locate the place, including the location with respect to the nearest public highway;

.4 A description of the work that will be carried out;

.5 The starting date of the work that will be carried out; and

.6 The name and address of the supervisor in charge of the work.

.4 No work that is likely to involve handling, dealing with or disturbing or removing the discovered materials shall be done unless it has been determined whether the material is asbestos-containing; or, the work is performed in accordance to Ontario Regulation 278/05 as though the materials were asbestos-containing materials and, in the case of sprayed-on friable material, as though it contained a type of asbestos other than Chrysotile.

2.2 SUMMARY OF MATERIALS

.1 Where required to complete the scope of the proposed renovations, disturbance of Asbestos-Containing Materials shall be performed as follows, in accordance with Ontario Regulation 278/05:

Location	ACM	Asbestos Operation	Notes
Throughout Interior of Classrooms and Corridor (102, 108, 108A, 108B, 108C, 201, 203, 211)	Hard Texture Coat Ceiling	Type 2	Removal using non-powered hand tools in conjunction with dust suppression Or Removal using power tools with HEPA-attachment in conjunction with dust suppression
		Type 3	Removal using power tools without HEPA-attachment or dust suppression
Classroom 203 and 211	9” x 9” Vinyl Floor Tile – Black and Green with Beige Marble Pattern (Associated Mastic is Asbestos-Containing)	Type 1	Removal using non-powered hand tools in conjunction with dust suppression
		Type 2	Removal using power tools with HEPA-attachment in conjunction with dust suppression
Storage Room 116	9” x 9” Vinyl Floor Tile – Brown with Beige Pattern (Associated Mastic is Non-Asbestos)	Type 1	Removal using non-powered hand tools in conjunction with dust suppression

2.3 SCHEDULING

.1 The Contractor shall schedule and perform work in accordance with the Contract Time established in the agreement.

2.4 INSPECTION

.1 From project set-up to completion of clean-up, the Asbestos Abatement Consultant will be present on both the inside and outside of the work area.

.2 Inspections will be conducted to confirm the Contractor’s compliance. Failure to comply with the specified requirements may result in a stoppage of work at no additional cost to the Owner.

.3 Promptly notify the Consultant of any ACM or potential ACM discovered during the work and not apparent in the audit, specifications or site meeting(s). DO NOT disturb such material until given direction by the Consultant. Assume such material to contain asbestos of a type other than Chrysotile until proven otherwise. Failure to notify the Consultant of ACM prior to removal will result in the dispute of payment of fees for any extra work

performed.

.4 The following inspections will be conducted at the Owner's cost. Provide Consultant with minimum of 24 Hours verbal notice:

.1 Pre Start Inspection: conducted after completion of work area set-up and prior to start of contaminated work.

.2 Contaminated Work Inspections: inspections and routine monitoring of the abatement will be conducted for the duration of the work.

.3 Final Inspection: conducted after removal of all ACM, and application of lockdown agent to confirm cleanliness. Additional labour or materials expended by the Asbestos Abatement Contractor to provide satisfactory performance to the level specified shall be at no additional cost.

.4 Final Clearance Air Testing: All Type 3 asbestos removals completed indoors are subject to air clearance testing in accordance with Ontario Regulation 278/05 by the Consultant prior to the shut-down of Negative Air Units and/or tear-down of the enclosure in whole or in part. Clearance air testing shall be conducted in accordance with sample methods and procedures prescribed in Ontario Regulation 278/05 Section 17 and Table 3.

2.5 SUBMITTALS

.1 Submit to the Consultant upon request:

.1 AAW and AAS certification and relevant training for all workers/supervisors on-site and involved in the project.

.2 Names, credentials and contact information of Site superintendent and shift supervisors.

.3 All necessary permits, certificates, and documents for all aspects of the work to be completed.

.4 Ministry of Labour Notice of Project if applicable.

.5 Certificate of Approval for transportation of asbestos waste.

.6 Negative air unit performance leak tests.

.7 HEPA/P100 filtered vacuum performance leak tests.

.8 Any and all proposed changes, alterations, deviations intended to be made in scope, procedures and/or measures from these specifications or associated regulations, guidelines and standards.

.2 The contractor shall have all asbestos waste transported under a current and valid Certificate of Approval or Provisional Certificate of Approval that specifically authorizes the transportation of asbestos waste in bulk. A copy of the Certificate of Approval will be maintained on-site and within the transport vehicle(s) and will be provided to the Consultant upon request.

2.6 PERMITS AND REGULATIONS

.1 Comply with all federal, provincial and local requirements, Regulations and Acts as well as client/owner corporate policies and procedures pertaining to asbestos and health and safety, provided that in any case of conflict among these requirements or with these specifications the more stringent requirements shall apply.

.2 Comply will all aspects of the Occupational Health and Safety Act Revised Statues of Ontario, 2005.

.3 Comply with Ontario Regulation 278/05 “Asbestos on Construction Projects and in Buildings and Repair Operations”, made under the Occupational Health and Safety Act.

.4 Comply with “Handling, Transportation and Disposal of Asbestos Waste’ in accordance with Ontario Regulation 347 as amended by Ontario Regulation 558/00, under the Environmental Protection Act (General-Waste Management), June 1992.

.5 Before varying a measure or procedure described in Ontario Regulation 278/05, or these specifications, the contractor/constructor must ensure that the varied measure(s) and/or procedure(s), affords protection for the health and safety of workers and building occupants that is at least equal to the protection that would be provided by complying with Ontario Regulation 278/05. Written notice of the varied measure(s) and/or procedure(s) shall be given in advance to the joint health and safety committee and safety representative, if any, for the workplace. Such notice shall also be provided to the Consultant.

2.7 INSTRUCTION AND TRAINING

.1 It shall be the responsibility of the Constructor to inform all workers involved in this project of the hazards in regard to the work to be performed and ensure appropriate training has been provided to all workers.

.2 Every worker shall be properly trained in accordance with Section 19 of Ontario Regulation 278/05 in the removal/management of asbestos as a Type 1, Type 2 and Type 3 Operation and have had instruction and training in:

.1 Asbestos awareness;

.2 The hazards of asbestos exposure;

.3 Personal hygiene and work practices;

.4 The use, cleaning, maintenance, selection and disposal of respirators and protective clothing; and

.5 The measures and procedures prescribed by Ontario Regulation 278/05.

.3 Instruction and training related to personal protective equipment and hygiene shall include but shall not necessarily be limited to:

.1 Limitations of the equipment;

.2 Inspection and maintenance of the equipment;

.3 Fitting of the equipment; and

.4 Disinfecting and decontamination of the equipment.

.4 The abatement contractor shall ensure that every worker/supervisor involved in a Type 3 operation meets the training and certification requirements of Section 20 of Ontario Regulation 278/05.

2.8 WORKER PROTECTION

.1 All personal protective equipment shall be used and maintained in accordance to the manufactures specifications and/or federal, provincial, local regulations and Acts and any corporate policies and procedures.

.2 All Personal protective equipment shall be of a nature that can be readily and effectively decontaminated or shall be of a disposable type.

.3 Damaged, deteriorated or defective personal protective equipment shall be repaired or replaced immediately and the worker shall not continue with their duties until such damages, deterioration or defects have been corrected.

.4 All personal protective equipment shall be durable enough and otherwise suitable to withstand the nature of the work being performed and the environmental conditions present within the work area(s).

.5 The contractor shall provide all workers with personally issued respirators suitable for protection against asbestos and acceptable to the Ministry of Labour.

.6 It shall be the responsibility of the contractor/constructor to ensure that all procedures for the use of respiratory equipment in accordance with Ontario Regulation 278/05 and manufacturers requirements are complied with. This shall include but shall not necessarily be limited to:

.1 The worker being physically able to perform the required duties while wearing the respirator;

.2 Respirators must be fit checked by qualitative or quantitative fit testing. Instruction must be provided as defined by the Occupational Health and safety Act;

.3 Air purifying respirators will be equipped with Ministry of Labour and NIOSH approved N 100, P 100, R 100 or HEPA hard exterior cassette style filters and shall be fitted so that an effective seal exists between the respirator and the workers face;

.4 Supplied air respirators will have supply air meet the Canadian Standards Association (CSA) standard Z180.1-00, Compressed Breathing Air and Systems (March 2000);

.5 Cleaning and disinfecting of respirator(s) after each use or more often if needed;

.6 Inspection of respirator(s) and/or respiratory equipment before each use;

.7 The proper storage in a clean, dry and sanitary location when respirator(s) are not in use; and

.8 The development of written procedures regarding selection, use and care of

respirators.

.7 Protective Clothing: The contractor shall provide every worker who enters the work area with disposable coveralls and gloves which:

.1 Shall be made of a material that does not readily retain nor permit the penetration of asbestos fibres;

.2 Shall consist of head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garment and skin under the protective clothing;

.3 Shall include suitable footwear; and

.4 Shall be repaired or replaced if torn or damaged.

.8 The contractor shall provide worker(s) with Canadian Standards Association approved head, hearing and foot protection for the work being performed and as required by applicable construction safety regulations.

2.9 AUTHORIZED VISITOR PROTECTION

.1 The contractor shall provide all prescribed personal protective equipment to authorized visitors to the work area(s).

.2 Ensure authorized visitors have received required training prior to entry to the work areas.

.3 Instruct authorized visitors in all relevant procedures to be followed while in and around the work area(s).

PART 3 - APPROVED PRODUCTS

3.1 MATERIALS AND EQUIPMENT

.1 Amended Water: Water with a surfactant agent added to reduce water tension for thorough wetting of fibres.

.2 Decontamination Shower: For the purpose of worker decontamination, a portable self-contained shower equipped with the following shall be utilized:

.1 Hot and cold water connections;

.2 Interior hot and cold fixtures that can be controlled by the person using the shower; or provide a constant water temperature of not less the 40 Celsius but not greater 50 Celsius;

.3 A containment basin of sufficient capacity to collect and contain the quantity of water required for at least one worker to properly decontaminate; and

.4 Shall be supplied with soap and clean towels.

.3 Drop Sheets: Fire retardant Polyethylene: 0.15mm (6mil) minimum thickness or Fire

retardant Fibre Reinforced (FR) polyethylene: 0.15mm (6mil) minimum thickness. New Materials Only.

.4 Exhausted Ducting: For use with Negative Air Unit(s) shall be flexible reinforced heavy duty type duct and be free of tears, punctures and damage and be otherwise suitable for the conditions of the work area(s). The cross sectional area of the ducting shall be maintained during the operation of the Negative Air Unit(s). And reasonable care shall be taken to ensure the ducting does not become damaged.

.5 Micronic Water Filter: Shall be used to filter contaminated water that is to be discharged to local sanitary sewers. Contaminated water includes but is not necessarily limited to wash down water and decontamination shower water. The filter shall be equipped with a secondary 5 micrometer filter. As an alternative to filtration, contaminated water may be collected in appropriate waste containers for off-site disposal.

.6 Negative Air Units: Shall be equipped with HEPA/P100 filters and shall have performance leak testing to verify efficiency of filters. Copies of filter tests shall be provided to the consultant upon request.

.7 Power Tools: Used in the cutting, grinding, drilling, abrading, sanding, vibrating or removal of Asbestos Containing Material, as a Type 2 Operation, shall be equipped with an effective dust collection device with a HEPA/P100 filtration system capable of capturing all debris and dust generated by the tool. All tools and assemblies of dust collection and filtration equipment will be subject to approval and testing by the Consultant as seen fit prior to use.

.8 Pressure Differential Measuring Device: Shall be capable of measuring pressure differential of 0.02 inches of water column and shall otherwise measure pressure differential in an appropriate range and interval. The device shall be dedicated to the site/work area, properly calibrated, installed and maintained throughout the duration of work to measure pressure differential between the enclosed removal area and the occupied area and shall be acceptable to the consultant. Daily records shall be kept by the contractor, on site, and made available to the consultant.

.9 Sealant: A suitable water based post-removal sealer appropriate for the lock-down and sealing of asbestos fibres to polyethylene sheeting and cleaned substrate.

.10 Sprayer(s): Shall be capable of delivering low velocity mist pattern spray of Amended water or sealant. Sprayers may be hand held reservoir type or powered airless units.

.11 Surfactant: A commercial or industrial agent that when added to potable water reduces surface tension.

.12 Tape: Shall be able to create and maintain a suitable seal on polyethylene and other materials within the work area under both wet and dry conditions and ambient temperatures for the duration of the work being performed and shall otherwise be suitable for the work being performed.

.13 Waste Containers: Waste shall be contained in two overlying dust tight containers impervious to asbestos fibres. The outer container shall be a minimum of 0.15mm (6mil.) thick sealable polyethylene waste bag.

.1 Should the waste material include sharp objects/materials, the inner container shall be a sealable metal, cardboard, fibre or plastic type suitable to resist puncturing of

the containers;

.2 Containers shall be cleaned with a damp cloth or vacuum equipped with a HEPA filter immediately before being removed from the work area;

.3 Outer waste containers shall have a pre-printed cautionary asbestos warning identifying it as asbestos waste in both official languages clearly visible and legible in a colour which contrasts with the background on which it is printed; and,

.4 Be otherwise suited for the waste being contained.

.14 Vacuums: Shall be equipped with HEPA/P100 filters and shall have performance leak testing to verify efficiency of filters. Copies of filter tests shall be provided to the consultant upon request.

3.2 SIGNAGE AND PLACARDS

.1 Before beginning work, post a sufficient number of signs at each entrance/exit to the work area(s) warning of asbestos hazards and restricting access to authorized persons wearing personal protective equipment.

.2 On both sides of all containers and vehicles used in the transport of asbestos waste in large easily legible letters of a minimum of ten centimetres (10cm) in height which contrast in colour with the background of the container or vehicle the following words shall be clearly displayed:

.1 CAUTION: CONTAINED ASBESTOS FIBRES; Avoid Creating Dust and Spillage; and,

.2 Asbestos May be Harmful to Your Health; Wear Approved Protective Equipment.

PART 4 - EXECUTION

4.1 GENERAL REQUIREMENTS – ALL PROCEDURES

.1 Before beginning work, post at each entrance/exit to the work area(s) a sufficient number of signs warning of asbestos hazards and restricting access to authorized persons wearing personal protective equipment.

.2 Eating, drinking, chewing or smoking shall not be permitted in the work area.

.3 Where wet removals are to take place de-energize and disable with proper lock-out tag-out procedures electrical systems.

.4 Temporary electrical distribution systems equipped with Ground Fault Circuit Interrupters (GFCI) shall be supplied and used by the Contractor during wet removals.

.5 Remove all items from the work area(s). If items are affixed or otherwise cannot be removed from the work area(s), ensure that they are pre-cleaned using a HEPA/P100 filtered vacuum or damp wiping and completely covered and sealed with polyethylene sheeting and otherwise adequately protected.

.6 Before commencing with work, disable and seal all ventilation to and from the work area and ensure ventilation remains disabled throughout the duration of activities. Seal any and all openings within the work area(s).

.7 Removal of Asbestos Containing Materials shall commence only after set-up is complete.

.8 Frequently and at regular intervals during the Work and immediately upon completion of the work clean up and place all asbestos dust, debris and waste in approved waste containers.

.9 Prevent the spread of dust from the Work Area.

.10 At completion of Work or at the end of the work day, remove from work area(s) all asbestos waste and in accordance with requirements of Ontario Regulations and these specifications dispose of asbestos waste off-site.

4.2 EXECUTION OF TYPE 1 OPERATION

.1 Set-Up

.1 Ensure adequate signage is posted restricting access to the work area to authorized personnel.

.2 Prevent the spread of dust from the work area using measures appropriate to the work to be done. Use single layer rip proof polyethylene drop sheets. In areas with carpeted or textured floors which cannot be readily cleaned use double layer rip proof polyethylene over flooring in work area(s).

.3 Provide facilities for washing hands and face.

.4 Allow for inspection by the Consultant to confirm that set-up is sufficient prior to the start of work.

.2 Asbestos Removal

.1 If a worker requests, the contractor shall supply a respirator in accordance with Ontario Regulation 278/05 Table 2 requirements, suitable for protection against asbestos and protective coveralls and the worker shall wear the respirator and coveralls.

.2 Perform removal of ACM in a manner to reduce dust creation to lowest level practicable by:

- Dust and waste shall not be permitted to fall freely from one work level to another
- Use of hand tools only for the removal of ACM
- Careful removal of ACM
- Continual wetting of Asbestos Containing Materials throughout the work
- Placing removed asbestos waste directly into approved waste containers

.3 All workers shall proceed to washing facilities and wash hands and face before leaving the work area.

.3 Clean-Up

.1 After completion of the removal; perform final thorough cleanup of polyethylene, barriers, drop sheets, tools, equipment, items, work area(s) and adjacent areas using HEPA/P100 filtered vacuum or damp wiping methods. Ensuring work area(s) and all items within the work area(s) are clean of visible asbestos dust, debris and waste. Place and seal asbestos dust debris and waste in approved waste containers.

.2 Allow for inspection by Consultant to determine abatement is complete and an acceptable level of cleanliness prior to application of sealant.

.3 Wet and fold polyethylene drop sheets and barriers in a manner which contains asbestos dust, debris and waste, place and seal in approved waste containers.

.4 If Personal Protective Equipment was requested and used by the worker prior to leaving the work area(s) clean all asbestos dust, debris and waste from clothing and personal protective equipment (PPE). Remove and place disposable PPE in approved waste container.

.5 Immediately before their removal from the work area, clean each filled waste container using HEPA/P100 filtered vacuum and place and seal in a secondary clean waste container.

4.3 EXECUTION OF TYPE 2 OPERATION

.1 Set-Up

.1 Construct an enclosure using polyethylene sheeting that extends from floor to ceiling and encompasses the entire work area were asbestos containing materials will be removed or encapsulated. The enclosure shall include the following:

- Double flap weighted air lock doors at all entrances, exits and doorways of the enclosure and rooms within the enclosure;
- Transparent windows for inspection purposes from outside the enclosure area;
- Sealed edges of the entire enclosure using tape or other suitable methods; and
- Ensure all edges of enclosure are securely fixed.

.2 Construct a decontamination facility as close as practicable to the work area which shall include the following:

- A room suitable for changing into protective clothing and for storing contaminated protective clothing and equipment; and,
- A room suitable for changing into street clothes and for storing clean clothing and equipment.

.3 Arrange configuration of the above-mentioned rooms so that (a) person(s) entering/exiting the work area must pass through each room in the correct order.

.4 Allow for inspection by the Consultant to confirm that set-up is sufficient prior to the start of work.

.2 Asbestos Removal

.1 Workers entering the work area shall don all appropriate personal protective equipment including coveralls and respiratory protection prior to entering the work area.

.2 Before commencing with work and at the beginning and end of each work shift and at a minimum of at least once per day the enclosure shall be inspected for any defects of deficiencies.

.3 Any defects or deficiencies observed shall be repaired forthwith and no work other than such repairs shall be conducted until repair activities are completed

.4 Other than loose material which is pulverized, crumbled and or powdered and shall be removed by HEPA/P100 filtered vacuum, Asbestos Containing Materials to be removed or disturbed shall be thoroughly wetted with Amended Water before and during work unless wetting creates a hazard or causes damage.

.5 Perform removal of ACM in a manner to reduce dust creation to lowest level practicable by:

- Dust and waste shall not be permitted to fall freely from one work level to another;
- Use of hand tools only for the removal of ACM;
- Careful removal of ACM;
- Continual wetting of Asbestos Containing Materials throughout the work; and
- Placing removed asbestos waste directly into approved waste containers.

.6 All workers shall proceed to the washing facilities while wearing respirator and shall wash hands and face before leaving the work area.

.3 Clean-Up

.1 After completion of the removal; perform final thorough cleanup of polyethylene, barriers, tools, equipment, items, work area(s) and adjacent areas using HEPA/P100 filtered vacuum or damp wiping methods. Ensuring work area(s) and all items within the work area(s) are clean of visible asbestos dust, debris and waste. Place and seal all asbestos dust debris and waste in approved waste containers.

.2 Allow for inspection by Consultant to determine abatement is complete and an acceptable level of cleanliness prior to application of sealant.

.3 Apply sealant to all vertical and horizontal surfaces, enclosures, drop sheets and items within the enclosure. Allow sufficient time for sealant to dry.

.4 Wet and fold polyethylene and barriers in a manner which contains asbestos dust, debris and waste, place and seal in approved waste containers.

.5 Prior to leaving the work area(s) workers shall clean all asbestos dust, debris and waste from Personal Protective Clothing Using HEPA/P100 filtered vacuum or damp wipe methods prior to removing the clothing. Remove and place disposable Personal Protective Clothing in approved waste containers.

.6 Immediately before their removal from the work area, clean each filled waste container using HEPA/P100 filtered vacuum and place and seal in a secondary clean waste container.

4.4 EXECUTION OF TYPE 3 OPERATION

.1 Set-Up

.1 Construct an enclosure using polyethylene sheeting that extends from floor to ceiling and encompasses the entire work area were asbestos containing materials will be removed or encapsulated. The enclosure shall include the following:

- Double flap weighted air lock doors at all entrances, exits and doorways of the enclosure and rooms within the enclosure;
- Transparent windows for inspection purposes from outside the enclosure area;
- Sealed edges of the entire enclosure using tape or other suitable methods; and
- Ensure all edges of enclosure are securely fixed.

.2 Construct a decontamination facility as close as practicable to the work area which shall include the following:

- A room suitable for changing into protective clothing and for storing contaminated protective clothing and equipment;
- A decontamination shower; and,
- A room suitable for changing into street clothes and for storing clean clothing and equipment.

.3 Arrange configuration of the above-mentioned rooms so that (a) person(s) entering/exiting the work area must pass through each room in the correct order.

.4 The spread of dust from the work area shall also be prevented by:

- Installing a ventilation system equipped with HEPA filtered exhaust to create and maintain a negative air pressure of 0.02 inches of water within the enclosed area, relative to the area outside the enclosed area;
- Ensuring that replacement air is taken from outside the enclosed area and is free from contamination with any hazardous dust, vapour, smoke, fume, mist or gas; and,
- At regular intervals, using a device to measure and record the difference in air pressure between the enclosed area and the area outside it.

.5 Allow for inspection by the Consultant to confirm that set-up is sufficient prior to the start of work.

.2 Asbestos Removal

.1 Workers entering the work area shall don all appropriate personal protective equipment including coveralls and respiratory protection prior to entering the work area.

.2 Before commencing with work and at the beginning and end of each work shift and

at a minimum of at least once per day the enclosure shall be inspected for any defects of deficiencies.

.3 Any defects or deficiencies observed shall be repaired forthwith and no work other than such repairs shall be conducted until repair activities are completed

.4 Other than loose material which is pulverized, crumbled and or powdered and shall be removed by HEPA/P100 filtered vacuum, Asbestos Containing Materials to be removed or disturbed shall be thoroughly wetted with Amended Water before and during work unless wetting creates a hazard or causes damage.

.5 Perform removal of ACM in a manner to reduce dust creation to lowest level practicable by:

- Dust and waste shall not be permitted to fall freely from one work level to another;
- Use of hand tools only for the removal of ACM;
- Careful removal of ACM;
- Continual wetting of Asbestos Containing Materials throughout the work; and
- Placing removed asbestos waste directly into approved waste containers.

.6 All workers shall proceed to the decontamination facilities before leaving the work area. Each worker shall:

- Clean all dust and debris from Personal Protective Equipment (PPE) using HEPA/P100 filtered vacuum or damp wipe methods;
- Proceed to first decontamination room and remove and place disposable PPE, except respirator, in approved waste containers;
- Still wearing the respirator, proceed to the decontamination shower. Thoroughly wash exposed skin and hair with soap and water until clean;
- Thoroughly clean outside of respirator with soap and water;
- Remove the respirator and wash face with soap and water; and,
- After showering, proceed to clean change room, dry-off and change into street clothes, or clean coveralls before eating, smoking, drinking or otherwise leaving work area(s).

.3 Clean-Up

.1 After completion of the removal; perform final thorough cleanup of polyethylene, barriers, tools, equipment, items, work area(s) and adjacent areas using HEPA/P100 filtered vacuum or damp wiping methods. Ensuring work area(s) and all items within the work area(s) are free of asbestos dust, debris and waste. Place and seal all asbestos dust debris and waste in approved waste containers.

.2 Allow for inspection by Consultant to determine abatement is complete and an acceptable level of cleanliness prior to application of sealant.

.3 Apply sealant to all vertical and horizontal surfaces, enclosures, drop sheets and items within the enclosure. Allow sufficient time for sealant to dry.

.4 Prior to leaving the work area(s), workers shall clean all asbestos dust, debris and waste from Personal Protective Clothing using HEPA/P100 filtered vacuum or

damp wipe methods prior to removing the clothing. Remove and place disposable Personal Protective Clothing in approved waste containers.

.5 Immediately before their removal from the work area, clean each filled waste container using HEPA/P100 filtered vacuum and place and seal in a secondary clean waste container.

.6 Allow for Final Clearance Air Testing prior to shut-down of Negative Air Units and/or tear-down of the enclosure in whole or in part.

.7 Following confirmation by the Consultant that the work area(s) can be dismantled, wet and fold polyethylene and barriers in a manner which contains asbestos dust, debris and waste and place and seal in approved waste containers. Polyethylene sheeting, drop sheets and similar materials used for barriers shall not be reused.

END

Appendix A – Construction School Specific Information Sheet Sample

In addition to the terms and conditions of the Contract Documents, the Contractor shall follow the protocols of the Construction Site Specific Information Sheet, sample provided below.
A completed version of this document, with site specific content, will be provided to the Contractor at the pre-construction meeting.

HWDSB

Capital Projects
Facility Services

Construction School Specific Information Sheet

1. School Information:

School Name:	Insert School Name
Bell Times	
Morning (School Entry)**:**	0:00 AM
Afternoon (School Dismissal):	0:00 PM
Aftercare Program Dismissal:	6:00 PM
Caretaking Phone Number:	000-000-0000
***After-Hours Emergency Number:**	905-667-3079
****Caretaking Hours**	
September to June	6:00 AM – 10:00 PM
December Holiday Break	6:00 AM – 2:00 PM
March Break	6:00 AM – 2:00 PM
July to August	6:00 AM – 2:00 PM
Saturday / Sunday	CLOSED
Account Code:	HP0000
Security Panel Code:	0000

*Please call the After-Hours Emergency Number noted above if issues arise outside of Caretaking Hours. These would include unanticipated interruption of services, issues with building or room access, fire alarm or security concerns, etc.

**Caretaker hours are not guaranteed. Please confirm with the HWDSB Project Supervisor prior to any Work taking place, and then on a weekly basis throughout the duration of the project.

2. School Entry for afterhours, school holidays or closures:

Please follow these steps upon entry to the building outside of caretaker hours and on school holidays or closures:

1. Call API Alarm Inc. at 1-877-787-5237 and notify them in advance of the day(s) and time(s) that access to the building will be required. They will require the HP code noted above.
2. Disarm the security panel when arriving.
3. Arm the security panel when leaving.
4. Call API to verify that the building is armed and secure.

Failure to follow this procedure outside of caretaker hours and on school holidays or closures will result in an automatic dispatch of a security guard to the building to verify who has entered/exited the building. Security costs associated with the dispatch of a security guard for failing to follow the procedure will be expensed to the contractor responsible for the incident.

3. Hot Work Permits:

Contractors are required to advise HWDSB at least 24 hours before any hot work is scheduled to take place. The Contractor is required to provide a hot work permit to HWDSB at the same time.

4. Protocol for Work Impacting Fire Alarm System or Devices

The Contractor is to follow this guide when the fire alarm system is impacted during school renovations.

References and Definitions:

Fire Alarm Control and Testing Service Provider: Hamilton Fire Control

Fire Alarm and Security System Monitoring Service Provider: API Alarm Inc.

Fire Watch: An hourly patrol of the school when the fire alarm system is on bypass, in trouble, or a device is disconnected/red-capped. Contractors cover the construction area; caretakers cover the occupied school area.

Fire Watch Log: A written record of the Fire Watch, maintained separately by contractors and caretakers and kept on the school premises at all times.

Mandatory Pre-Construction Site Meeting with Hamilton Fire Control

1. Contractor to request a meeting prior to mobilization with Michael Fleet from Hamilton Fire Control (HFC), the Project Supervisor from HWDSB, the Facility Operation Supervisor from HWDSB and the Head Caretaker to review any Work that will affect the fire alarm system.

   Contact: Michael Fleet - Hamilton Fire Control
   Phone: (905) 527-7042
   Email: michael@hamiltonfirecontrol.ca

2. Contractor to minute the meeting and submit to the Project Supervisor and Michael Fleet from HFC for review within 48 hours of the site-walk-through.

Mandatory Construction Protocol if the Fire Alarm System is Impacted

1. Contractor to follow procedures discussed and documented from the pre-construction site meeting with Hamilton Fire Control.

2. If fire alarm devices in the occupied area of the school **are not** affected:
   Contractor to maintain Fire Watch within the construction area only and keep a Fire Watch log for the duration of Work affecting the fire alarm system. Fire Watch is not required during unoccupied hours.

3. Contractor is to schedule Work after hours when devices within occupied areas of the school will be affected, excepting certain circumstances.

4. If fire alarm devices in the occupied area of the school **are** affected, and the Work cannot be done after hours:
   - 4.1. Contractor to notify Caretaking that fire watch is required 24 hours before Work affecting the fire alarm system begins.
   - 4.2. Caretaking to post Fire Watch notice that the school is on Fire Watch on the exterior doors.
   - 4.3. Caretaking to maintain Fire Watch and keep a Fire Watch Log for the duration of Work affecting the fire alarm system until the Contractor notifies them the devices are no longer affected. Fire Watch is not required during unoccupied hours.
   - 4.4. Contractor to maintain Fire Watch and keep a Fire Watch log for the duration of work affecting the fire alarm system. Fire Watch is not required during unoccupied hours.
   - 4.5. Contractor to notify Caretaking when the Work affecting the fire alarm system is complete and the devices are functioning normally.

Mandatory Additional Requirements:

- **Everyone to Evacuate if Alarm Activates:** In the event a fire alarm device is activated, all occupants of the school, including contractors, must evacuate the school. The Fire Department will be dispatched.

5. Please follow these steps for planning any service (electrical, gas, water) shutdowns:

A. Internal Localized System/Service Shutdowns:

1. Localized shutdowns **require minimum 3 days' notice** to HWDSB project supervisor for coordination with the school facility and staff.
2. Shutdowns must be completed outside of school bell times/operational hours which vary by facility and must be scheduled for evenings after 6:00 PM, weekends or board holidays.

3. If a shutdown will impact the security system, the contractor shall contact API Alarm Inc. at 1-877-787-5237 and notify them in advance of the day(s) and time(s) of the shutdown.
4. If a shutdown impacts the fire alarm system, the contractor shall follow the Fire Alarm Bypass Protocol, section 4 above.
5. If required, the contractor is to coordinate with Board vendor/s to be on site to ensure boilers, roof top units, heat pumps, etc. are functioning properly after service disruption has concluded.

    - Chamberlain Building Services Inc - info@chbs.ca, 905-664-1914 or
    - Union Boiler Company Limited - info@unionboiler.com, 905-528-7977

6. Process will vary based on services shutdown and ability to localize shutdown.

B. Complete School System/Service Shutdowns:

1. Complete building shutdowns **require minimum 5 days' notice** to HWDSB project supervisor.
2. Shutdowns must be completed outside of school bell times/operational hours which vary by facility and must be scheduled for evenings after 6:00 PM, weekends or board holidays.
3. Contractor to contact API Alarm Inc. at 1-877-787-5237 and notify them in advance of the day(s) and time(s) of shutdown.
4. During the shutdown, the contractor is responsible for following Fire Alarm Bypass Protocol, section 4 above.
5. The contractor is to coordinate with Board vendor/s to be on site to ensure boilers, roof top units, heat pumps, etc. are functioning properly after service disruption has concluded.

    - Chamberlain Building Services Inc - info@chbs.ca, 905-664-1914 or
    - Union Boiler Company Limited - info@unionboiler.com, 905-528-7977

6. HWDSB project supervisor will coordinate with other HWDSB departments to ensure all systems (IIT, security, communications) are up and running after service disruption has concluded.
7. If required, HWDSB project supervisor will coordinate with City of Hamilton staff if site has shared facilities such as recreation centre, community centre, pool or library, etc.
8. Process will vary based on service shutdown.

C. Heating and Cooling System Shutdowns:

1. Heating and cooling system shutdowns **require minimum 5 days' notice** to HWDSB project supervisor
2. Shutdowns must be completed outside of school bell times/operational hours which vary by facility and must be scheduled for evenings after 6:00 PM, weekends or board holidays.

3. The contractor is to coordinate with Board vendor/s to be on site to ensure boilers, roof top units, heat pumps, etc. are functioning properly after service disruption has concluded.

   - Chamberlain Building Services Inc - info@chbs.ca, 905-664-1914 or
   - Union Boiler Company Limited - info@unionboiler.com, 905-528-7977

4. If the boiler system is drained, the contractor upon refilling the system, is responsible for coordinating Board approved chemical treatment vendor to treat water.

   - Aquarian Chemicals Inc - info@aquarianchemicals.com, 905-825-3711

5. Process will vary based on services shutdown and ability to localize shutdown.

D. Asbestos Abatement and Designated Substance Related Work:

1. Designated substance related work **requires minimum 5 days' notice** to HWDSB project supervisor.
2. Designated substance related work in occupied areas must be completed outside of school bell times/operational hours which vary by facility and must be scheduled for evenings after 6:00 PM, weekends or board holidays.

1. Definitions

1. The following Section of this Specification are of the abbreviated type and include incomplete sentences. Definite and indefinite articles have often been omitted and sentences are written in the form of direct instructions to the Contractor without using the phrase `the Contractor shall.' Standard specifications and other quality references inserted govern materials and workmanship without using phrases `conform with,' `conformity therewith,' etc. Omitted words and phrases to be supplied in the same manner as they are when a note appears on the Drawings.

2. The Specifications are separated into Sections for reference convenience only. Such separation must in no instance make Owner or his Consultants arbiter to establish subcontract limits between Contractor and Subcontractor.

3. Provide all items, articles, materials, operations or methods listed, mentioned or scheduled on Drawings and/or in Specifications, including all labour, materials, equipment, tools, services, and incidentals necessary and required to complete the work. Responsibility for breakdown into and extension of subcontracts, including co-ordination of same, rests entirely with the Contractor.

4. Standard Specifications referred to are editions in force at Tender Closing Date.

2. Terminology

1. Consultants are the team of Architects, Engineers and other experts commissioned by the Owner, directly or indirectly, to execute design, contract documents and supervision for the project, including any of their agents or employees.

2. Prime Consultant is the Architect.

3. Contractor is the Firm or Corporation who, having signed the Agreement, has the sole legal responsibility to carry out the work shown or described in the Contract Documents for the Owner, whether contractually assigned to a Subcontractor or supplier, or not.

3. Minimum Standards

1. Unless otherwise specified, work and material to conform or exceed the minimum standards set out in the editions of the Canadian Government Specification Board, Canadian Standards Associations, the Ontario Building Code, Underwriters' Laboratories of Canada, the Canadian Electrical Code, the Local Building Code in force, whichever is applicable.

2. Copies of Standard Specifications referred to in this Specification to be kept on the site.

3. The use of the name (or its abbreviation) of any of the following bodies, accompanied by the reference number of a specification of that body to mean that the entire specification of the body to apply as noted:

AISC: American Institute of Steel Construction;
ASTM: American Society for Testing Materials;
CEC: Canadian Electric Code;
CGSB: Canadian Government Specification Board;
CISC: Canadian Institute of Steel Construction;
CRCA: Canadian Roofing Contractors' Association;
CSA: Canadian Standards Association;
OBC: Ontario Building Code;
ULC: Underwriters' Laboratories of Canada;
CLA: Canadian Lumbermen's Association.

4. Cooperation

1. Each trade to cooperate with the trades of adjacent or affected work. Supply in good time requirements effecting adjacent and underlying work in writing and items to be set or built in. Similarly, heed requirements and build-in items provided by other trades.

2. Take necessary precautions to protect work of other trades from contamination, marring or other damage due to application or installation processes, methods and activities.

3. General Contractor and each trade to cooperate with Contractors which may be assigned or selected by the Owner to perform work under Cash Allowances. Owner reserves the right to assign nonunionized labour to perform work under Cash Allowances, at Owners discretion.

5. Coordination

1. Coordinate the work of all trades in such a manner that each trade co-operates with the trade of adjacent work.

2. Organize weekly job site meetings and send out notices stating time and place to Consultants, subcontractors, Suppliers and all others whose presence is required at the meetings.

3. Take note of all persons attending these meetings and submit to Consultants and Owner, Minutes of these Meetings showing any major decisions made and instructions or information required.

4. Coordinate the Work in this Contract with the work of others awarded work under Cash Allowances.

6. Building Dimensions and Co-ordination

1. Ensure that all necessary job dimensions are taken and all trades are coordinated for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions, and for coordination.

2. Verify that all work, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out by

requirements of the drawings, and ensure that work installed in error is rectified before construction resumes.

3. Check and verify all dimensions referring to the work and the interfacing of all services. Verify all dimensions, with the trade concerned when pertaining to the work of other trades. Be responsible to see that Subcontractors for various trades co-operate for the proper performance of the Work.

4. Avoid scaling directly from the drawings. If there is ambiguity or lack of information, immediately inform the Consultant. Be responsible for any change through the disregarding of this clause.

5. All details and measurements of any work which is to fit or to conform with work installed shall be taken at the building.

6. Advise Consultant of discrepancies and if there are omissions on drawings, particularly reflected ceiling plans and jointing patterns for paving, ceramic tile, or carpet tile layouts, which affect aesthetics, or which interfere with services, equipment or surfaces. DO NOT PROCEED without direction from the Consultant.

7. Ensure that each Subcontractor communicates requirements for site conditions and surfaces necessary for the execution of the Subcontractor's work, and that he provides setting drawings, templates and all other information necessary for the location and installation of material, holes, sleeves, insets, anchors, accessories, fastenings, connections and access panels. Inform other Subcontractors whose work is affected by these requirements and preparatory work.

8. Prepare interference drawings to properly co-ordinate the work where necessitated. Refer to Section 01340.

7. Use of Premises Before Substantial Performance

1. The Owner shall have the right to enter and occupy the building, in whole or in part, for the purpose of placing fittings and equipment, or for other use, before completion of the Contract if, in the opinion of the Consultant, such entry and occupancy does not prevent or interfere with the Contractor in the performance of the Contract. Such entry shall in no way be considered as an acceptance of the Work in whole, or in part, nor shall it imply acknowledgment that terms of the Agreement are fulfilled.

2. No smoking, vaping, drugs or alcohol permitted on school property, violators will be banned from the site. Caretaker equipment is not to be used, including cleaning equipment, ladders, etc.

8. Layout of Work

1. Layout work with respect to the work of all trades. Arrange mechanical and electrical work such as piping, ducts, conduits, panels, equipment and the like to suit the architectural and structural details.

2. Alterations necessary due to conflict and interference between trades, to be executed at no cost to the Owner unless notification is given in writing before Tender Closing Date.

9. By-Laws and Regulations

1. Nothing contained in the Drawings and Specifications are to be so construed as to be knowingly in conflict with any law, by-law or regulation of municipal, provincial or other authorities having jurisdiction.

2. Perform work in conformity with such laws, by-laws and regulations and make any necessary changes or deviations from the Drawings and Specifications subsequently required as directed and at no cost to the Owner unless notification is given in writing before Tender Closing Date.

3. Furnish inspection certificates and/or permits as may be applicable as evidence, that installed work conforms with laws, by-laws, and regulations of authorities having jurisdiction.

10. Protection

1. Take necessary precautions and provide and install required coverings to protect material, work and finishes from contamination, damage, the elements, water and frost.

2. Make good any damage or replace damaged materials, as directed. Repairs to be made by the trade having originally installed or fabricated the damaged material, finish or item. Protect electrical equipment from water and the elements.

3. Protect adjacent private and public property from damage and contamination.

4. Protect curbs and sidewalks from damage from trucking by means of boards and the like. Repair, or pay or repair of damage to existing roads and sidewalks.

5. Mark glass after glazing in an acceptable manner, and leave in place until final clean-up.

6. Protect floor finishes from construction traffic and transport of construction materials and equipment by means of 6 mm plywood panels.

11. Delivery, Handling and Storage of Materials

1. Schedule material delivery so as to keep storage at site to the absolute minimum, but without causing delays due to late delivery.

2. Store materials which will be damaged by weather in suitable dry accommodation. Provide heat, as required, to maintain temperatures recommended by material manufacturer.

3. Store highly combustible or volatile materials separately from other materials, and under no circumstances, within the building. Protect against open flame and other fire hazards. Limit volume of supply on the site to minimum required for one day's operations.

4. Handle and store material so as to prevent damage to material, structure and finishes. Avoid undue loading stresses in materials or overloading of floors.

5. Do not store material and equipment detrimental to finished surfaces within areas of the building where finishing has commenced or has been completed. All material storage within the building is subject to relocation, as directed.

6. Deliver package material in original, and Storage of unopened and undamaged containers with manufacturer's labels and seals intact.

12. Debris

1. Assign clean-up duties to a crew with own Foremen which will be of sufficient size to prevent accumulation of debris and dirt in any part of the structure or on the site.

2. Remove construction debris on a daily basis and legally dispose of same.

3. Under no circumstances, should debris, rubbish or trash be burned or buried on the site.

13. Cutting, Fitting and Patching

1. Required cutting to be done by General Contractor. Patching and painting of work to be executed by the General Contractor.

2. All sub-trades are to notify the General Contractors bidding as to the extent of the cutting, patching, and painting of their respective trades.

3. Drilling, cutting, fitting and patching necessary due to failure to deliver items to be built-in time, or installation in wrong location to be executed, as directed, at no cost to the Owner.

4. Give written notification prior to commencement of drilling and cutting of load bearing structural members and finished surfaces.

5. Cut holes with smooth, true, clean edges, after they are approved by applicable trade. Size holes and openings for hot water and steam pipes, so as to allow for expansion and contraction of such pipes.

14. Fastenings

1. Supply all fastenings, anchors and accessories required for fabrication and erection or work.

2. Metal fastenings to be of the same material as the metal component they are anchoring, or of a metal which will not set up an electrolysis action which would cause damage to the fastening or metal component under moist conditions.

3. Exposed metal fastenings and accessories to be of the same texture, color, and finish as base metal on which they occur. Keep to a minimum; evenly space and lay out.

4. Fastenings to be permanent, of such a type and size and installed in such a manner to provide positive anchorage of the unit to be secured. Wood plugs are not acceptable. Install anchors at required spacing to provide required load bearing or shear capacity.
5. Power actuated fastenings not to be used without prior written approval for specific use.

15. Surplus Materials

1. Surplus materials specifically so specified, to remain property of the Owner and be neatly stockpiled or stored, as directed.

2. All other surplus materials to become property of the Contractor; to be removed from the site and legally disposed of.

16. Documents Required and General Duties

1. **At Commencement of Contract**

   .1 Supply Public Liability and Property Damage Insurance Certificates.
   .2 Supply Certificates of good standing from Workers' Compensation Board for the General Contractor and all Subcontractors.
   .3 Supply Contract Sum Breakdown of all sub-trades or parts of work and general expense items.
   .4 Supply Construction Schedule.
   .5 Supply Schedule of Shop Drawing Submissions.
   .6 The Owner has paid for the cost of the Building Permit. Mechanical Subcontractor will pay the cost of other Fees related to the Work Specified under Division 15. Electrical Subcontractor will pay the cost of all permits and fees related to the Work Specified under Division 16.
   .7 The General Contractor is to pay all other fees and refundable deposits if applicable.

2. **During Construction**

   .1 Adjust Allowances, as required.
   .2 Organize Job Meetings.
   .3 Supply Monthly Progress Reports and Construction Schedule.
   .4 Confirm that payments are being made to subcontractors and suppliers by submission of receipts with the second and subsequent Progress Payment Application. No payment will be made for unincorporated material on the site, unless Bill of Sale in proper format is provided.

3. **Upon Completion**

   .1 Upon completion of work before the Final Certificate of Payment is issued, the following to be observed, executed and submitted:
      .1 All deficiencies to have been completed in a satisfactory manner.

.2 All final clean-up to have been executed.
.3 Finishing Hardware, Inspection and Verification.
.4 Organize a Final Inspection tour at which to be present:
- the Owner's authorized representative;
- the Architectural, Structural, Mechanical and Electrical Consultants, and their supervisory personnel, if any;
- the Contractor and his superintendent.

.5 Where the above procedure is impossible or where any deficiencies remain outstanding, the Owner's representative and the Consultant concerned, to inspect and accept the affected work and/or material upon notification by the Contractor, that all deficiencies involving this Consultant have been made good.
.6 A complete release of all liens arising out of this Contract, other than his own. If a subcontractor or supplier refuses to furnish a release of such a lien, furnish a bond satisfactory to the Owner to indemnify him against any claim under such a lien.
.7 Certificates of good standing from the Workers' Compensation board, for the General Contractor and all Subcontractors.
.8 Certificate of Inspection from Mechanical and Electrical Engineers.
.9 Copies of all Lists of Deficiencies with each Deficiency verified when complete by only this project's job Superintendent. The Final List of Deficiencies to be signed, completed by all concerned, if accepted.
.10 Statement of Completion from General Contractor.
.11 Final adjustment of all Allowances.
.12 H.E.P.C. Inspection Certificate and all other Inspection Certificates required by Provincial, Municipal and other authorities having jurisdiction.
.13 Balancing Reports.
.14 As-Built Drawings - Hardcopy mark ups and digital pdf.
.15 Two hard copies of Operation and Maintenance Manuals. A digital copy (pdf file) of all closeout documents to be provided on a CD or USB memory stick format.

17. Progress Reports

1. Submit to the Architect, Monthly Progress Reports consisting of a concise narrative and a marked-up summary schedule showing physical percentage complete by item and in total. These progress calculations must agree with the Progress Payment Claims.

2. Keep permanent written daily records on the site on the progress of work. Record to be open to inspection at reasonable times and copies to be furnished upon request. Records to show notes of commencement and completion of different trades and parts of work; daily high and low temperatures and other weather particulars; number of men engaged on the site (including sub-trades) broken down in groups for each type of construction work, and particulars about excavation and shoring; erection and removal of form work; pouring and curing of concrete; floor finishing; placing and compaction of backfill, masonry work; roofing;

3. Daily progress to give particulars on commencement and completion of each trade or part of work; form work erections and removal; concrete pouring and curing; floor finishing; masonry work; roofing; waterproofing; finishing trades, tests and inspection and the like.

19. Inspection and Testing

1. The Owner will retain the services of Inspection and Testing Companies. The cost of inspection and testing will be deducted from the Inspection and Testing Allowance noted on the Tender Form.
2. Where tests or inspections reveal work not in accordance with Contract requirements, the Contractor shall pay costs for additional tests or inspections as the Architect may require to verify acceptability of corrected work.

3. The Inspection and Testing by the Owner's Testing Company does not relieve the Contractor of his responsibility to provide his own quality control in order to meet or exceed the requirements of specified standards, codes, design criteria and referenced documents.

End of Section

1. Selection of Products

1. If requested by the Consultant, provide the following services and/or information:

   .1 Assist the Consultant in determining qualified suppliers.
   .2 Obtain proposals from suppliers.
   .3 Make appropriate recommendations for consideration of Consultant.
   .4 Notify Consultant of any effect anticipated by selection of product or supplier under consideration, on construction schedule and contract sum.

2. On notification of selection, enter into purchase agreement with designated supplier.

2. Cash Allowance

1. Expend cash allowance **only** as authorized by the Owner though the Consultant's written instructions.

2. Include in Contract price the Contractor's charges for handling at site, including uncrating and storage, protection from elements and damage, labour, installation and finishing, testing, adjusting and balancing, and other expenses including overhead and profit on account of Cash Allowance in accordance with Article GC4.1 of the General Conditions of the Contract as amended.

3. Credit the Owner with any unused portion of Cash Allowances in the statement for final payment.

4. If a test made under payment by a specific allowance proves that the material or system is not in accordance with the Documents, then the subsequent testing including Owner's testing of replacement materials or systems shall be Contractor's expense and not taken from Cash Allowance.

5. Add or deduct any variation in cost from the Cash Allowance. No adjustment will be made to Contractor's expense.

6. The amount of each allowance includes the net cost of the product or service, delivery and unloading at the site.

7. All refunds, trade and/or quantity discounts which the Contractor may receive in the purchase of goods under allowances, to be extended to the Owner.

8. Receipted invoices covering all disbursements made by the Contractor under Allowances, to be submitted to the Consultant for audit.

9. Where the Cash Allowance stipulates "Supply Only," the Contract Price and not the Cash Allowances include the installation and hook-up costs. The installation and hook-up of some equipment and materials are specified under other Sections of the Specifications. The General Contract includes the installation and hook-up not specified elsewhere.

10. Contractor's profit and overhead on all Cash Allowances to be carried in his lump sum amount, not in the Cash Allowances.

11. All Cash Allowances will be dealt with in accordance with Article GC4.1 of the General Conditions.

12. All expenditures under Cash Allowances must be approved by the Owner.

13. Include in the Stipulated Price quoted, a Cash Allowance in the amount of **Thirty Five Thousand Dollars ($35,000).**

    To be allocated as follows:
    1. Door Hardware, supply only.
    2. Inspections and Testing

14. H.S.T. Goods and Services tax is not included in Cash Allowance amount and is to be carried in the General Contractor's Stipulated Sum Amount.

15. Refer to Section 01005 for co-operation with others assigned to this Section.

End of Section

1. Project Meetings for Coordination

1. In consultation with the Consultant during the second week of construction, arrange for site meetings weekly or every 2 weeks as appropriate to the stage of construction, for project coordination. Such meetings shall fall at the same time each week the meeting is scheduled.

2. Responsible representatives of the Contractor's and Subcontractor's office and field forces and suppliers shall be obliged to attend.

3. Inform the Owner, Consultant, and those others whose attendance is obligatory, of the date of each meeting, in sufficient time to ensure their attendance.

4. Provide physical space for meetings, prepare an agenda, chair and record the minutes of each meeting. Relevant information must be made available to all concerned, in order that problems to be discussed may be expeditiously resolved. Identify "action by: _____".

5. Within three days after each meeting, distribute two copies of the minutes to each invited person.

2. Pre-construction Meeting

1. Within 5 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

2. Include in the agenda the following:

    .1 Appointment of official representative of participants in the Work.
    .2 Scheduling of Work. Schedule to include a detailed breakdown of mechanical and electrical works.
    .3 Interference with ongoing business.
    .4 Work by other Contractors.
    .5 Schedule of submission of shop drawings and samples.
    .6 Requirements for temporary facilities, site sign, offices, storage sheds, utilities.
    .7 Delivery schedule of specified equipment.
    .8 Site security.
    .9 Contemplated change notices, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
    .10 Record drawings.
    .11 Maintenance manuals.
    .12 Take-over procedures, acceptance, warranties.
    .13 Monthly progress claims, administrative procedures, photographs, holdbacks.
    .14 Appointments of inspection and testing agencies or firms.
    .15 Insurance, transcript of policies.
    .16 Schedule for progress meetings.

3. Project Meetings for Progress of Work

1. Conduct progress meetings in accordance with the schedule and/or decisions made at Pre-construction meeting.

2. Inform the Owner, Consultant, project consultants, Subcontractors and suppliers and those whose attendance is obligatory, of the date of the meeting, in sufficient time to ensure their attendance.

3. Include in the agenda the following:

   .1 Review, approval of minutes of previous meeting.
   .2 Review of Work progress since previous meeting.
   .3 Field observations, problems, conflicts.
   .4 Problems which impede construction schedule.
   .5 Review of off-site fabrication delivery schedules.
   .6 Corrective measures and procedures to regain projected schedule.
   .7 Revisions to construction schedule.
   .8 Progress during succeeding work period.
   .9 Review submittal schedules: expedite as required.
   .10 Maintenance of quality standards.
   .11 Pending changes and substitutions.
   .12 Review proposed changes for effect on construction schedule and on completion date.
   .13 Other business.

4. Progress Records

1. Maintain a permanent written record on the site of the progress of the work using standard OGCA form. This record shall be available to the Consultant at the site, and a copy shall be furnished to same on request. The record shall contain:

   .1 Daily weather conditions, including maximum and minimum temperatures.
   .2 Dates of the commencement and completion of stage or portion of the work of each trade in each area of the project.
   .3 Conditions encountered during excavation.
   .4 Dates of erection and removal of formwork, in each area of the project.
   .5 Dates of pouring the concrete in each area of the project, with quantity and particulars of the concrete.
   .6 Work force on project daily per trade.
   .7 Visits to site by personnel of Consultant, Jurisdictional Authorities and testing companies.

End of Section

1. General

1. Submit to Architect, for review, shop drawings, product data and samples specified.

2. Until submission is reviewed, work involving relevant product must not proceed.

2. Shop Drawings

1. Drawings to be originals prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate appropriate portion of work; showing fabrication, layout, setting or erection details as specified in appropriate Sections.

2. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

3. Maximum sheet size 24” x 36” as PDF.

3. Project Data

1. Certain specification Sections specify that manufacturer's standard schematic drawings, catalogue sheets, diagrams schedules, performance charts, illustrations and other standard descriptive data will be accepted in lieu of shop drawings.

2. Above will only be accepted if they conform to following:
   .1 Delete information which is not applicable to project.
   .2 Supplement standard information to provide additional information applicable to project.
   .3 Show dimensions and clearances required.
   .4 Show performance characteristics and capacities.
   .5 Show wiring diagrams (when requested) and controls.

4. Coordination of Submissions

1. Review shop drawings, product data and samples prior to submission.

2. Verify:
   .1 Field measurements.
   .2 Field construction criteria.
   .3 Catalogue numbers and similar data.

3. Coordinate each submission with requirement of work and Contract documents. Individual shop drawings will not be reviewed until all related drawings are available.

4. Contractor's responsibility for errors and omissions in submission is not relieved by Architect's review of submittals.

5. Contractor's responsibility for deviations in submission from requirements of Contract documents is not relieved by Architect's review of submission, unless Architect gives written acceptance of specified deviations.

6. Notify Architect, in writing at time of submission, of deviations from requirements of Contract documents.

7. After Architect's review, distribute copies.

5. Submission Requirements

1. Schedule submissions at least fourteen (14) days before dates that reviewed submissions will be required to be returned.

2. Submit a digital copy (PDF) of shop drawings, product data to Architect for review.

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

4. Submissions must include:
   .1 Date and revision dates.
   .2 Project title and number.
   .3 Name of:
      .1 Contractor.
      .2 Subcontractor.
      .3 Supplier.
      .4 Manufacturer.
      .5 Separate detailer when pertinent.

5. Identification of product or material.
   .1 Relation to adjacent structure or materials.
   .2 Field dimensions, clearly identified as such.
   .3 Specification Section number.
   .4 Applicable standards, such as CSA or CGSB numbers.
   .5 Contractor's stamp, initialled or signed, certifying review of submission, verification of field measurements and compliance with Contract documents.

6. Interference Drawings
   .1 Prepare interference drawings for all work in confined space ie: ceiling space.

End of Section

1. Access

1. Provide and maintain adequate service roads to project site to provide safe and convenient access for deliveries.

2. Contractor's Site Office

1. Contractor's trailer will be used as site office during construction and to accommodate site meetings. It shall be furnished with drawing layout table, telephone, and facsimile machine for the duration of the project. Facsimile is to be installed on dedicated line and not connected to telephone line. Coordinate location with Owner and obtain approval. Pay telephone not acceptable.

2. Maintain in clean condition.

3. Provide and maintain in clean condition: two separate plans layout tables, minimum 48" x 72" each. One table shall be used by the General Contractor, and Subcontractors, at their discretion. The second shall be provided for use by subcontractors and by the consultant or Inspection and Testing Companies during site visits or project meetings.

3. Storage Sheds

1. Provide adequate weathertight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather.

4. Sanitary Facilities

1. Existing sanitary facilities cannot be used during construction. Contractor to provide their own portable toilets and coordinate location with school. Keep area and premises in sanitary condition.

5. Parking

1. Existing on-site parking can be used for construction during the months of July and August. Spaces will be designated by the owner. There is no-onsite parking during the school year September to June. The general contractor is responsible for coordinating parking with the local municipality.

6. Site Enclosures

1. Erect temporary site enclosures, hoarding, using prefabricated lock fence system.

2. Size and location of enclosure to suit area of construction.

7. Enclosure of Structure

1. Provide temporary weathertight enclosures protection for exterior openings until permanently enclosed.

2. Erect enclosures to allow access for installation of materials and working inside enclosure.

3. Design enclosures to withstand wind pressure.

4. Erect dust barriers to prevent dust migration to non-renovated areas.

8. Power supply

1. Electrical power is available in existing building and will be provided at no charge for construction purpose.

9. Water Supply

1. Water is available in existing building and will be provided at no charge for construction purpose.

10. Scaffolding

1. Construct and maintain scaffolding in rigid, secure and safe manner.

2. Erect scaffolding independent of walls. Remove promptly when no longer required.

3. Scaffolding to be designed by a professional Engineer when required under the Occupational Health and Safety act.

11. Heat and Ventilating

1. Not applicable.

End of Section

1. Construction Safety Measures

1. Observe and enforce construction safety measures required by the National Building Code; the O.B.C.; The Provincial Government; Workers' Compensation Board; and, Municipal authorities.

2. In particular, the Occupational Health and Safety Act (Ont. Re. 213/91), the Occupational Health and Safety Act, the regulations of the Ontario Ministry of Labour and Ontario Hydro Safety requirements shall be strictly enforced.

3. Contractor shall ensure that copies of all applicable construction safety regulations, codes and standards are available on the jobsite throughout the period of construction. All workers are to be informed that these documents are available for reference at any time.

4. The Contractor shall ensure that all supervisory personnel on the job-site are fully aware of the contents of the Occupational Health and safety Act (Ontario Regulation 213/91 - Construction Projects) the Workers' Compensation Act" and, Bill 208 (Chapter 7, Standards of Ontario) “An Act to Amend the Occupational Health & Safety Act and the Workers’ Compensation Act”, and, that they comply with all requirements and procedures prescribed therein. These documents include, but are not limited to, the following construction safety requirements:

    .1 Contractor to register with the Director of the Occupational Health and Safety Division before or within 30 days of the commencement of the project, (O.Reg. 213/91, sec 5).
    .2 File a notice of project with a Director before beginning work on the project, (O.Reg 313/91, sec 6).
    .3 Notification prior to trenching deeper than 1.2m, (O.Reg. 213/91, sec 7).
    .4 Accident Notices and Reports, (O.Reg. 213/91, sec 8 through sec 12).
    .5 General Safety Requirements, (O.Reg. 213/91, sec 13 through sec 19).
    .6 General Construction Requirements, e.g. protective clothing, hygiene practices, housekeeping, temporary heat, fire safety, access to the job-site, machine and equipment guarding and coverings, scaffolds and platforms, electrical hazards, roofing, et al, (O.Reg. 213/91, sec 20 through sec 221).
    .7 Establish a Joint Health and Safety Committee where more than 19 workers are employed for more than 3 months, (Bill 208, S.8(2) to S.8(14).
    .8 Establish a Worker Trades Committee for all projects employing more than 49 workers for more than 3 months, (Bill 208, S-8a(1) to S.8b(4).
    .9 Ensure that all activities arising out of (.07) and (.08) above are recorded and that minutes are available to an inspector of the Ontario Ministry of Labour.

5. The Contractor shall be considered as the "Constructor" in consideration of the rights and responsibilities for all construction safety requirements, procedures, facilities and inspection of all work performed by the Contractor, Subcontractors/Sub-trades and other Contractors engaged on this project.

6. In the event of a conflict between any of the provisions of the above authorities the most stringent provisions are to be applied.

2. Material Safety Data Sheet

1. Material safety Data Sheets (MSDS) must be available at the jobsite for any product listed on the Hazardous Ingredients List prior to being used, installed or applied inside of the building.

2. A Material Safety Data Sheet is to be submitted to the Architect for any product which is known to create, or suspected of creating, a health hazard or discomfort during construction or upon commissioning of the project including, but not limited to, the following:
   .1 adhesives
   .2 solvents
   .3 sealants, (caulking, vapour seals, etc.)
   .4 sprayed-on fireproofing
   .5 resilient flooring
   .6 carpet, paint, varnish or other coatings
   .7 exposed membrane waterproofing
   .8 special coatings, (terrazo sealants, chafing coatings, etc.)
   .9 solder, brazing and welding and other filler metal
   .10 other products whose particles or vapours may become air borne after installation.
   .11 any other product as directed by the Consultant.

3. Comply with WHMIS regulation, Workplace Hazardous Material Information System.

3. Fire Safety Requirements

1. Comply with requirements for Building Construction, the Ontario Building Code, the Ontario Fire Code, the requirements of Local Fire Authorities and of the requirements of the Office of the Fire Marshal.

4. Overloading

1. Ensure no part of Work is subjected to a load which will endanger its safety or will cause permanent deformation.

5. Falsework

1. Design and construct falsework in accordance with CSA S269.1-1975.

6. Scaffolding

1. Design and construct scaffolding in accordance with CSA S269.2-M1980.

2. Scaffolding to be designed by a Professional Engineer when required under the Occupational Health and Safety Act.

7. Materials Specifically Excluded

1. Asbestos and/or asbestos-containing products are not permitted. Submit Material Safety Data Sheets for any product suspected of containing asbestos if so requested by

Consultant. Examples of some materials requiring close scrutiny and/or confirmation include:

.1 Transite drainage pipe - whether buried or above grade - not permitted.
.2 Composite floor tile containing asbestos - not permitted.
.3 Lay-in ceiling tiles containing asbestos - not permitted.
.4 Insulation and/or jacketing for pies, ducts, motors, pumps, etc. - not permitted if any asbestos is present.

2. Solder for all piping is to be lead-free.
   .1 "Lead Free" shall mean solder which contains less than 0.030% of lead when dissolved in fluoroboric and nitric acids and tested by inductively coupled argon plasma atomic emission spectroscopy. "Steelbond 281" and "Silverbrite" are acceptable solder products.
   .2 The mechanical contractor shall provide an affidavit signed by the Principal of the company, on company letterhead, that all of the solder used on the project was either one of the two acceptable products or that the solder used (identified by brand name) meets or exceeds the testing criteria.
   .3 The Owner shall undertake random testing of the soldered joints. Should testing prove that the solder used was not as specified, the Owner shall take action against the contractor to the full extent of the law.

3. All paint and finish coatings are to be lead and mercury-free. Submit Material Safety Data Sheets confirming that these products are free of all lead and/or mercury compounds.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. These specifications apply to all 16 divisions of the project specification. It is the responsibility of the contractor to apply these provisions wherever practical within specification limits to all products and services used on this project.

2. It is recognized that currently specified materials and methods may conflict with the basic intention of this section. Where reasonable alternate materials and methods exist that are not specified here, and that do not compromise quality or create additional cost for the owner, notify the Architect of such alternate materials or methods. Do not proceed to use alternate materials or methods to those specified without the express approval of the Architect.

3. Elsewhere, apply the provisions of this section to all work. Exceptions can only be made when signed off by the Architect. Suitability of all products used is the responsibility of the contractor.

1.2 Compliance Specifications

1. The contractor must comply with all applicable health, safety and environmental regulations.

1.3 Beyond Compliance Specifications

1. These specifications apply in addition to all applicable health, safety and environmental compliance regulations. They are incorporated here to reflect the Owner's intention to develop a specification which maximizes environmentally "friendly" materials and methods wherever possible within current technical and budget limitations.

2. Beyond compliance specifications recognize that performance well beyond the minimum regulatory standard is often desirable, possible and affordable, often with no cost or low cost options. It also recognizes that application methods or protocols may be as important as the material specified. Therefore, these specifications cover both material and methods.

3. The primary goal of beyond compliance specification is to reduce the use of products or methods which have negative health and environmental impacts both during and after construction. These considerations may include full life cycle impacts, associated with raw materials, manufacturing, transport, deconstruction and their eventual fate.

4. These specifications will specifically address primary categories of readily identifiable products, ingredients and methods.

5. These provisions apply to both indoor and outdoor applications equally.

1.4 Exceptions

1. These specifications recognize that not all substitutes are equal and therefore exceptions can be made based on substantive evidence of necessary and superior performance. Special considerations may be given to restricted substances when secondary provisions are made such as sealed in place (contained) applications. All such exceptions must be approved in writing by the Architect.

PART 2 - MATERIALS

2.1 Products or Substances to be Avoided or Limited in Use

1. No product containing the following substances may be used on this project when an equivalent product without or with a lower concentration of this substance is suitable and available. All products containing substances which are known to cause health effects including but not limited to cancer, mutagenic, neurological, or behavioral effects should be avoided if suitable substitutes not containing or containing lower concentrations are available. This provision shall be limited to information contained on Material Safety Data Sheets, therefore MSDS sheets must be reviewed for all products for which such sheets are required. Applications for exceptions must be accompanied by related MSDS and product application and performance sheets, clearly showing a need for the exception.

2.2 Volatile Organic Compounds

1. No product containing volatile organic compounds (in over simplified terms volatile petro chemical or similar plant derived solvents) may be used on this project when a suitable non-VOC or failing that a low VOC substitute is available. Manufacturers may refer to the U.S. EPA definition of VOC's for guidance or alternatively use the low molecular weight organic compound descriptor.

   Example: Paints, Coatings, Primer, Adhesives, Chalks, Firestops, etc.

2. Waterborne equivalents are available for most of the solvent borne products used in construction and in most cases would be the preferred alternative. Waterborne products may in some instances have high VOC contents, therefore the fact that a product is waterborne does not automatically make it acceptable.

2.3 Chlorinated Substances

1. Poly Vinyl Chloride (vinyl) and other chlorinated products should be avoided if suitable substitutes are available.

2.4 Plasticizers

1. Plasticisers which offgass (low molecular weight) should be avoided.

2.5 Man Made Mineral Fibres

1. Products containing mineral fibres which can be emitted or abraded should be avoided.

   Examples: duct liner, mineral fibre ceiling tiles, etc.

2.6 Radiation

1. Products or methods which result in the lowest emission of Electro Magnetic Fields are preferred.

2.7 Biocides

1. Products containing biocides (pesticides, miticides, mildeweides. fungicides, rodenticides, etc.) are not to be used if suitable alternatives are available. Highly stable, low human toxicity biocides such as Portercept may be acceptable substitutes. Biocide formulas which break down, emit powders of offgass should be avoided.

2.8 Heavy Metals

1. Heavy metals such as lead, cadmium, mercury etc. should be avoided.

2.9 Aluminum

1. Raw aluminum should be avoided, anodized or factory painted aluminum is acceptable. This is particularly applicable to surfaces which people can touch.

2.10 Ozone Depleting Substances

1. Products which contain, or which use Ozone Depleting Substances such as Bromide, Chlorofluorocarbons (CFC) or Hydrofluorocarbons (HFC) etc. should be avoided if suitable substitutes are available.

2.11 Greenhouse Gasses

1. Products which contain, use or generate Greenhouse gasses such as CO2 should be avoided if suitable substitutes are available.

2.12 Bituminous (tar) Products

1. Products containing tar compounds should not be used if suitable substitutes are available.

2.13 Chemical Compounds

1. Products containing the following chemical compounds should not be used if suitable substitutes are available: Neoprene, Latex, Butyl, ABS, Formaldehyde.

2.14 Adhesives

1. Adhesives containing solvents or other non preferred ingredients should be avoided if suitable substitutes are available, including systems designs which do not need adhesives or can use mechanical etc. fastening alternatives

2.15 Composite Products

1. Some composite products contain adhesives such as formaldehyde which are not preferred, and some composites such as Fibre Reinforced Plastics are not practical for recycling. These products should be avoided if suitable substitutes are available.

2.16 Cleaners and Solvents

1. Products, equipment, and methods which require the use of cleaners and solvents are not preferred if suitable substitutes are available. Examples of preferred products would include No Wax floors, or primerless caulks and adhesives, or products not requiring caulks and adhesives.

End of Section

1. Fires

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

2. Disposal of Wastes

1. Do not bury rubbish and waste materials on site.

2. Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

3. Asbestos and Hazardous Substances

1. General Contractor is to inform Architect in the event of encountering material suspected of containing asbestos or hazardous substances.

2. Architect will notify owner of such findings and owner to engage directly a certified Asbestos Abatement Contractor.

End of Section

1. General

1. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

2. Store volatile wastes in covered metal containers and remove from premises daily.

3. Prevent accumulation of wastes which create hazardous conditions.

4. Provide adequate ventilation during use of volatile or noxious substances.

2. Materials

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

2. Provide on-site dump containers for collection of waste materials, and rubbish.

3. Cleaning During Construction

1. Maintain project grounds, and public properties free from accumulations of waste materials and rubbish.

2. Remove waste materials, and rubbish from site.

3. Vacuum clean interior building areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until building is ready for substantial completion or occupancy.

4. Schedule cleaning operations so that resulting dust and other contaminants will not fall on wet, newly painted surfaces.

4. Final Cleaning

1. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all surfaces exposed to view; leave project clean and ready for occupancy.

2. Employ experienced workers, or professional cleaners, for final cleaning.

3. In preparation for Substantial Performance or Fitness for Occupancy status, whichever occurs first, conduct final inspection of interior and exterior surfaces exposed to view, and of concealed spaces.

4. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from all sight-exposed interior and exterior finished surfaces; polish resilient and ceramic surfaces so designated to shine finish. Vacuum carpet.

5. Clean and polish glass and mirrors.

6. Repair, patch and touch-up marred surfaces to specified finish, to match adjacent surfaces.

7. Broom-clean paved surfaces; rake clean other surfaces of grounds.

8. Clean exposed ductwork and structure.

9. Replace filters.

10. Clean bulbs and lamps and replace those burned out.

11. Clean diffusers and grilles.

12. Clean sinks, faucets, and water closets and controls.

13. Maintain cleaning until project, or portion thereof, is occupied by Owner.

End of Section

1. Requirements Included

1. Record documents, samples, and specifications.

2. Equipment and systems.

3. Product data, materials and finishes, and related information.

2. Quality Assurance

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

3. Format

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

2. Binders: commercial quality, 8½" x 11" maximum 2½" ring size.

3. When multiple binders are used, correlate data into related consistent groupings.

4. Cover: Identify each binder with type or printed title "Project Record Documents", list title of Project, identify subject matter of contents.

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

4. Contents, Each Volume

1. Table of Contents: Provide title of project; names, addresses, and telephone numbers of Consultant and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

2. For each Product or System: list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

3. Product Data: mark 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. Typed Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

5. Submission

1. Submit one copy of completed volumes in final form 15 days prior to substantial performance. For equipment put into use with Owner's permission during construction, submit Operating and Maintenance Manuals within 10 days after start-up. For items of Work delayed materially beyond date of Substantial Performance, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

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

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

4. Submit two copies of revised volumes of data in final form within ten days after final inspection.

5. For contract drawings (architectural, landscaping, structural, mechanical, electrical), transfer neatly as-built notations onto second set and submit both sets.

6. Prepare digital pdf file for submission on CD or USB of completed closeout documents.

6. Record Documents and Samples

1. In addition to requirements in General Conditions, maintain at the site for Owner 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. Provide files, racks, and secure storage.

3. Label 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 a clean, dry, and legible condition. Do not use Record Documents for construction purposes.

5. Keep Record Documents and samples available for inspection by Consultant.

7. Recording As-Built Conditions

1. Consultant will provide two (2) complete sets of white prints of project drawings and two (2) complete sets of specifications for the purpose of recording as-built conditions. Mark and record one set on an on-going basis as construction proceeds. **Near the end of the construction period transfer all marks neatly to second set for submission as project record documents.**

2. Refer to drawings/specifications for additional mechanical and electrical requirements.

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 Measure depths of elements of foundation in relation to finish first floor datum.
   .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
   .4 Field changes of dimension and detail.
   .5 Changes made by change orders.
   .6 Details not on original Contract Drawings.
   .7 References to related shop drawings and modifications.

5. Specifications: legibly mark each item to record actual construction, including:
   .1 Manufacturer, trade name, and catalog number of each project actually installed, particularly optional items and substitute items.
   .2 Changes made by Addenda and Change Orders.

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

8. Digital As-Built Drawings

1. Retain the services of a CAD drafting company acceptable to the consultant to prepare digital CAD As-Built documents for all Architectural and Engineering drawings.

2. After the consultant has found the Redlined As-Built drawings to be acceptable, transfer to digital file all information recorded on As-Built drawings. Layering of information as per consultant's instructions.

9. Equipment and Systems

1. Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

2. Panelboard Circuit Directories: provide electrical service characteristics, controls, and communications.

3. Include installed colour coded wiring diagrams.

4. Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instruction. Include summer, winter, and any special operating instructions.

5. Maintain Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair and reassemble instructions; and alignment, adjusting, balancing, and checking instructions.

6. Provide servicing and lubrication schedule, and list of lubricants required.

7. Include manufacturer's printed operation and maintenance instructions.

8. Include sequence of operation by controls manufacturer.

9. Provide original manufacturer's parts lists, illustrations, assembly drawings, and diagrams required for maintenance.

10. Provide installed control diagrams by controls manufacturer.

11. Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.

12. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

13. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

14. Include test balancing reports as specified in mechanical specifications.

15. Additional Requirements: As specified in individual specification sections.

10. Materials and Finishes

1. Building Products, Applied Materials, and Finishes: include product data, with catalog number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.

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

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

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

11. Guarantees, Warranties and Bonds

1. Separate each warranty or bond with index tab sheets keyed to the List of Contents listing.

2. List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal. Use Guarantee/Warranty Form as provided in Section 01721 whenever standard preprinted trade or manufacturer's Guarantee/Warranty forms are not available.

3. Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.

4. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.

5. Verify that documents are in proper form, contain full information, and are notarized.

6. Co-execute submittals when required.

7. Retain warranties and bonds until time specified for submittal.

End of Section

1. Maintenance Manual

1. On completion of project, submit to Owner two (2) copies of Operations Data and Maintenance Manual in English, made up as follows:

    .1 Bind data in vinyl hard covered, 3 ring loose leaf binder for 8½" x 11" size paper.
    .2 Enclose title sheet, labeled "Operation Data and Maintenance Manual", project name, date and list of contents.
    .3 Organize contents into applicable sections of work to parallel project specification break-down. Mark each section by labeled tabs protected with celluloid covers fastened to hard paper dividing sheets.
    .4 A digital copy of all documents in the operations and manuals must be provided on a USB format to be PDF.

2. Include following information, plus data specified.

    .1 Maintenance instructions for finished surface and materials.
    .2 Copy of hardware and paint schedules.
    .3 Description, operation and maintenance instructions for equipment and systems, including complete list of equipment and parts list. Indicate nameplate information such as make, size, capacity, serial number.
    .4 Names, addresses and phone numbers of sub-contractors and suppliers.
    .5 Guarantees, Warranties and bonds showing:
        .1 Name and address of project.
        .2 Guarantee commencement date (date of Final Certificate of Completion).
        .3 Duration of guarantee.
        .4 Clear indication of what is being guaranteed and what remedial action will be taken under guarantee.
        .5 Signature and seal of Contractor.
        .6 Additional material used in project listed under various Sections showing name of manufacturer and source of supply.

3. Neatly type lists and notes. Use clear drawings, diagrams or manufacturers' literature.

4. Include in the Manuals a complete set of final shop drawings indicating corrections and changes made during fabrication and installation.

End of Section

1. Standard Warranty

1. Refer to HDSB Supplementary Conditions and to Standard Contract Document CCDC for warranty requirements and conditions for the standard warranty which is required for the work of this contract.

2. Extended Warranties

1. Refer to individual specifications sections for requirements of extended warranties required for particular sections or items of work.

2. Extended warranties are required to be issued by manufacturers, fabricators, suppliers and/or installers, sometimes jointly, due to their unique position in the construction process and their ability to guarantee a particular section of work. Refer to individual requirements of extended warranties requested.

3. Unless specifically noted otherwise, all extended warranties shall commence on the date of Substantial Performance of the Work as certified by the Consultant.

4. Listed below is a summary of extended warranties required for individual Sections. This list, if inconsistent with the specified requirements of individual extended warranties, shall be deemed correct with respect to length of extended warranties. Extended warranties required shall include, but not be limited to, the following:

   Extended warranties (total warranty period listed, including entire building warranty)

Built Up Roofing (Section 07520)	refer to section
SBS Modified Bituminous Membrane Roofing (07521)	refer to section
Sheet Metal Flashing and Trim (Section 07620)	2 years
Caulking (Section 07900)	5 years
Joint Sealers for Roofing (Section 07901)	2 years
Commercial Steel Doors and Frames (Section 08100)	refer to section
Floor Porcelain Tiles (Section 09330)	3 years
Acoustic Unit Ceiling (Section 09510)	2 years
Painting (Section 09900)	2 years

End of Section

PART 1 - GENERAL

1.1 Related Work Specified Elsewhere

1. Not applicable

1.2 Existing Conditions

1. Take over structures to be demolished based on their conditions (on date that tender is accepted).

1.3 Demolition Drawings

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

1.4 Protection

1. Prevent movement, settlement or damage of adjacent grades. Provide bracing, shoring as required.

2. Prevent debris from blocking surface drainage inlets which must remain in operation.

3. Protect existing items designated to remain and materials designated for salvage. In the event of damage to such items, immediately replace or make repairs to approval of Owner and at not cost to Owner.

PART 2 - PRODUCTS

1. Not applicable.

PART 3 - EXECUTION

3.1 Work

1. Dispose of demolished materials except where noted otherwise.

3.2 Safety Code

1. Unless otherwise specified, carry out demolition work in accordance with Canadian Construction Safety Code 1980.

2. Should material resembling spray or trowel-applied asbestos be encountered, notify Architect. Any asbestos encountered will be removed by the Owner’s Contractor.

3.3 Preparation

1. Disconnect electrical and telephone service lines entering areas to be demolished as per rules and regulations of authorities having jurisdiction. Post warning signs on electrical lines and equipment which must remain energized to serve other areas during period of demolition.

2. Inspect site and rectify with Architect items designated for removal and items to remain.

3. Disconnect and cap mechanical services in accordance with requirements of local authority having jurisdiction.

4. Natural gas supply lines to be removed by gas company or by qualified tradesman in accordance with gas company instructions.

3.4 Demolition & Field Work

1. Demolish areas as indicated on the drawings.

2. Remove existing equipment, services and obstacles, where required, for refinishing or making good of existing surfaces, and replace same as work progresses.

3. At end of each day's work, leave work in safe condition so that no part is in danger of toppling or falling. Protect interiors of parts not to be demolished from exterior elements at all times).

4. Demolish in a manner to minimize dusting. Keep dusty materials wetted.

5. Demolish masonry and concrete walls in small sections. Carefully remove and lower structural framing and other heavy or large objects.

6. Burning materials on site is not permitted.

7. Remove contaminated or dangerous materials from site and dispose of in safe manner.

8. Employ rodent and vermin exterminators to comply with health regulations.

3.5 Salvage

1. Carefully dismantle items containing materials for salvage and stock pile salvaged materials at locations as directed by Architect.

3.6 Restoration

1. Upon completion of work, remove debris, trim services and leave work site clean.

2. Reinstall areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas.

3.7 Scheduling

1. Demolition of areas adjacent to occupied spaces may not occur during occupancy of these spaces. Contractor to schedule the demolition of these areas to occur after school hours or weekends.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Structural Steel Framing — refer to Structural Drawings
2. Miscellaneous Metal Fabrication: — Section 05500

1.2 Reference Standards

1.	CSA-S304.1-04	Design of Masonry Structures
2.	CSA- A370-04 (R2009)	Connectors to Masonry.
3.	CAN/CSA-A371-04 (R2009)	Masonry Construction for Buildings.
4.	CSA A179-04 (R2009)	Mortar and Grout for Unit Masonry
5.	CSA-A82-06	Fired Masonry Brick From Clay or Shale
6.	CSA A165 Series-04	CSA Standards for Concrete Masonry Units.
7.	CSA G30.18-09	Carbon Steel Bars for Concrete Reinforcement
8.	CAN/CSA-A3000-08	Cementitious Materials Compendium
9.	ASTM A951/A951M-06	Standard Specification for Steel Wire for Masonry Joint Reinforcement
10.	ASTM C216-07a	Standard Specification for Facing Brick (Solid Masonry Units Made from Clay of Shale)
11.	ASTM C568-08a	Standard Specification for Limestone Dimension Stone
12.	ASTM A1064/A1064	Standard Specification for Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
13.	ASTM C331-05	Standard Specification for Lightweight Aggregates for Concrete Masonry Units
14.	ASTM A153/A153M-09	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

1.3 Source Quality Control

1. Submit laboratory test reports certifying compliance of masonry units (and mortar ingredients) with specification requirements.

2. For clay units, in addition to requirements set out in referenced CSA and ASTM Standards include data indicating initial rate of absorption for units proposed for use.
3. All masonry: mortar and grout is to be tested in accordance with CSA-S304.

1.4 Product Delivery, Storage and Handling

1. Ensure that materials are delivered to job site in dry condition.

2. Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

3. Store cement under cover. Keep dry and unfrozen.

4. Pile sand on platforms. Exclude foreign matter.

5. Materials stacked on floors of building shall not exceed structural design loads.

1.5 Cold Weather Requirements

1. Comply with Clause 6.7.2 of CSA-A371.

1.6 Hot Weather Requirements

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

1.7 Protection

1. Until completed and protected by flashings or other permanent construction, keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain.

2. Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.

3. Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

4. When air temperature has dropped below 0 degrees C (eg. Overnight), ensure that materials are above freezing and free from ice when installed.

5. Prevent work from freezing for at least 48 hours by enclosure, artificial heat, or other acceptable method.

6. Provide adequate bracing to walls during erection to prevent damage due to winds or other lateral loads.

7. Make good any damage to masonry work until completion of the work.

8. Build masonry in enclosures heated by approved smokeless means, when temperature remains below 0 degrees C. All materials shall be above 4 degrees when installed.

9. Demolish and replace masonry work damaged by freezing.

10. Supplement CSA-A371 as follows:

    .1 Maintain temperature of mortar between 5° C and 50° C until used.

PART 2 - PRODUCTS

2.1 Materials

1. **Concrete Masonry Units:**

   Must be "Bubble Cure" or autoclave process, modular metric size conforming to CSA Standard A165 series.
   Normal Weight - H/20/A/M, S/20/A/M.
   Lightweight - H/20/C/M, S/20/C/M.
   Use normal weight in below ground floor elevation. Use light weight for all above grade walls. All exposed corners to have bullnose units. All block to be uniform in color, shade and texture. Special shapes as required.

2. **Portland Cement:**

   .1 Type 10, in accordance with CSA A3001.

3. **Masonry Cement:**

   .1 Type “S” and shall comply with CSA A3002.

4. **Hydrated Lime**:

   .1 Type “S”, in accordance with CSA A179.

5. **Aggregate:**

   .1 Fine grain aggregate, grading in accordance with CSA A179. When 6mm joints are specified, grain shall pass through a 1.18 mm sieve.

6. **Water:**

   .1 Ensure that water contains no salts which may cause efflorescence.

7. **Horizontal Masonry Reinforcing:**

   Welded truss type or ladder type, as specified from wire to ASTM A951, hot dipped galvanized after fabrication to ASTM A153-05, Class B2, minimum coating 457 G/m2, wire size 4.76 mm diameter. Reinforcing as per the following:
   - Single wythe walls Dur-O-Wal DW 100;
   - Double wythe walls (up to 390 in width) Dur-O-Wal DW 120;
   - Double wythe walls (greater than 390) Dur-O-Wal DW 220;
   - Cavity Walls Blok-Lok- Blok truss II - BL37 to accommodate 95 mm cavity with 64 mm thick insulation. Use Blok-truss BL 30- or DW 100 if using Ferro slotted block ties.

   Similar reinforcing by Dur-O-Wal, Blok-Lok, and Hohmann & Barnard Inc. is acceptable.

8**. Reinforcing Bars:** billet steel to grade 400, deformed bars to CSA-G30.18.

9. **Bolts and Anchors:** To CSA-A370.

10. **Natural Mortar:**

    .1 **Generally:** Use materials only as specified in CSA A179. Ensure that weather and aggregate used in mortar, other than in walls buried in earth, will not cause efflorescence.
    .2 **Mixes:** Mix mortars as specified in CSA A179 using the Proportion Specification.
    .3 **Mortar Types:**
        .1 For masonry walls in contact with earth and bedding forbearing plates and lintels: Mortar Type "S".
        .2 For load-bearing walls: Mortar Type "S".
        .3 For all other masonry walls, use regular Type "N" mortar.
    .4 **Grout:** To CSA A179 Table 5.

11. **Mortar Dropping Control Device**: "Mor-Control" manufactured by Dur-O-Wal or Mortar-Net.

PART 3 - EXECUTION

3.1 Workmanship

1. Build masonry plumb, level, and true to line, with joints in proper alignment.

2. Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

3. Set out and build masonry work to the respective dimensions called for on the drawings. Build and lay the block true to line, and level, align vertical joints. Keep angles, reveals, etc. square and plumb.

4. Assume complete responsibility for dimensions of this work.

5. Construct masonry fire rated assemblies in accordance with tested design specifications.

6. Make all joints uniform, in line, square and plumb, with mortar compressed to form joints as specified.

7. Course units to bring wall to required elevations using even, uniform, horizontal and vertical joints of maximum 10mm thickness.

8. Check and co-ordinate location of all anchors, connections and built-in items.

9. Bond units at intersection of walls by horizontal prefabricated "tee" or corner reinforcing units.

10. Lay each solid unit in full bed or mortar. Fill vertical joints. Slushing of joints not permitted.

11. Base course to be solid concrete masonry units laid in full mortar bed.

12. Lay each hollow unit in full bed or mortar for face shells. Butter vertical joints full. When laying closure units, butter vertical units already in place instead of units being placed.

13. Lay exposed masonry units using blocks having square, unbroken edges and corners.

14. Tolerances:

    .1 Variation from mean plane: 6 mm when measured with 3000 mm straight edge.
    .2 Variation from plumb: 6 mm on any vertical line up to 6000 mm high.
    .3 Variation in wall opening sizes: 6 mm maximum.
    .4 Variation of building lines from plan: in any bay or 6000 mm maximum – 12 mm or in 1200 mm or more, 20 mm.

15. Lay out masonry units carefully so as to run as often as possible in full and half unit dimensions. All exposed ends shall match the finish of the faces.

16. All units cut around pipes, ducts, openings, etc. shall be accurately and neatly cut with a power carborundum wheel, and remaining voids shall be slushed full with mortar.

17. Make joints flush and smooth on both sides excepts where they are to be exposed to view. When exposed to view, tool the joints concave, unless otherwise noted.

18. Lay and set up all units carefully so that both faces of the walls are true and even. Do not use chipped or cracked units where exposed to view, even where the defect would not impair strength or durability.

19. Take particular care to keep cavities, weep holes, vents and exposed faces of all units free of mortar.

3.2 Tolerances

1. Clause 6.2 of CAN3-A371 applies except as follows: Walls to receive thinset ceramic tile: plumb within 1:600.

3.3 Exposed Masonry

1. Remove chipped, cracked, and otherwise damaged units in exposed masonry and replace with undamaged units.

3.4 Jointing

1. Concave joints, allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, compressed, uniformly concave joints.

2. Raked joints, where split rib blocks are used, allow joints to set just enough to remove excess water, then rake joints uniformly to depth of rib and compress with square tool to provide smooth, compressed, raked joints of uniform depth.

3. Where joints are concealed in walls and where walls are to receive plaster, tile insulation, or other applied material, except paint or similar thin finish coating, strike flush.

3.5 Joining of Work

1. Where necessary to temporarily stop horizontal runs of masonry, and in building corner, Step-back masonry diagonally to lowest course previously laid. Do not "tooth" new masonry. Fill in adjacent course before heights of stepped masonry reach 1200 mm.

3.6 Cutting

1. Cut out neatly for electrical switches, outlet boxes, and other recessed or built-in objects.

2. Make cuts straight, clean, and free from uneven edges. Use masonry saw where necessary.

3.7 Building-In

1. Build in items required to be built into masonry by other trades.

2. Prevent displacement of built-in items during construction. Check for plumbness, alignment, and correctness of position, as work progresses.

3. Brace door jambs to maintain plumbness. Fill door frame with concrete.

3.8 Support of Loads

1. Where concrete fill is used in lieu of solid units, use 20 MPa concrete to Section 03300.

2. Install building paper below voids to be filled with concrete; keep paper 25 mm back from faces of units.

3.9 Provision for Movement

1. Leave 5 mm space below shelf angles.

2. Leave 6 mm space and do not use wedges between tops of non-load bearing walls and partitions and structural elements.

3.10 Loose Steel Lintels

1. Install loose steel lintels. Centre over opening width.

3.11 Horizontal Reinforcing

1. Horizontal reinforcing at 400 mm o.c. (every 2nd course), except solid walls greater than, or equal to 340 mm in width. At 340 mm, or greater, horizontal reinforcing at 200 mm o.c. (every course). Use prefabricated corners and tees at all intersecting load bearing walls.

3.12 Vertical Reinforcing

1. Install vertical reinforcing to size and spacing as shown on Drawings. Fill voids with 20MPa concrete.

3.13 Bonding

1. Walls of two or more widths: bond using metal ties in accordance with subsection 9.4 of CSA-A371.

2. Procedure approval by Architect.

3.14 Testing

1. Masonry units to be tested in accordance with S304.1, Clause 15.1, for engineered masonry design, and in conformance with clause 15.1.2.

2. Mortar testing to be in accordance with S304.1, clause 15.2.

3. Grout testing to be in accordance with S304.1, clause 15.3.

3.15 Blockwork - General

1. Do not wet concrete block before laying.

2. Lay block with thicker end of face shell upward.

3. Lay interior block in running board, concave tooled joints.
4. Use solid block or hollow block filled with concrete for top 2 courses under point bearing loads extending minimum 200 mm each side of bearing and where indicated.

5. Install special shaped units where indicated.

6. In block walls install continuous trussed wire reinforcement, as noted.

7. Where resilient base is indicated, tool the joints to within 100 mm of the floor. Cut joints flush behind the base.

8. Extend all walls/partitions to underside of steel/concrete deck unless shown otherwise on drawings and as required. Co-ordinate wall locations with structure above and prior to commencing work, advise Consultant of interference.

9. When masonry walls are not built at once, the ends of the walls are to be raked back at an angle, or terminated at a control joint. Toothing will not be permitted.

3.16 Mortar

1. Measure loose damp ingredients accurately by volume. Place water in mixer, add half volume of sand, add cement, add remainder of sand, add water for plasticity. Mix for at least four minutes. Keep mixer clean.

2. Incorporate colour into mixes in accordance with manufacturer's instructions.

3. Use clean mixer for coloured mortar.

4. Prehydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp unworkable mix that will retain its form when pressed into a ball. Allow to stand for not less than 1 hour nor more than 2 hours then remix with sufficient to produce mortar of proper consistency for pointing.

3.17 Concrete Core Fill

1. All concrete block walls shall have vertical grout core fill each side of openings and where shown and as detailed on the drawings.

2. Core fill in walls shall extend from bottom bearing surface to underside of bond beams or structure.

3. Grout core fill shall be placed with a trunk or chute in maximum lifts 2000 mm. Compaction shall be by interior mechanical vibrator. All fill shall be placed in accordance with CSA A23.1.

4. Fill minimum ½ block core each side of frame from foundation to underside of lintels of all door openings over 1 metre wide.

5. Provide inspection openings in base of walls to be grouted. Make good to match adjacent block work after inspection and approval by Engineer.

3.18 Reinforced Block Lintels

1. Install reinforced concrete block lintels at all openings where steel lintels are not indicated in accordance with structural details.

2. Install shoring and bracing as required to openings prior to placing lintel units and concrete fill.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Installation of anchors in masonry: Section 04200
2. Structural Steel Framing: refer to Structural Drawings
3. Steel Joist Framing: refer to Structural Drawings
5. Painting: Section 09900

1.2 Scope

1. Provide all miscellaneous metal items except those listed above Under Article 1.1.

1.3 Reference Standards

1. ASTM A167-99(2009) Standard Specification for Stainless and Heat-Resisting Chromium - Nickel Steel Plate, Sheet and Strip.
2. ASTM A325-09ae.1 Standard Specification for Structural Bolts, Steel, Heat-Treated, 120/105 ksi Minimun Tensile Strength.
3. ASTM A143/A143M-07 Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
4. ASTM A307-07b Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
5. ASTM A563-07a Standard Specification for Carbon and Alloy Steel Nuts.
6. ASTM A780/A780M-09 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
7. CAN/CSA-S16-09 Design of Steel Structures.
8. CSA W59-03(R2008) Welded Steel Construction (Metal Arc Welding).
9. CSA-G40.20-04/G40.21-04(R2009) General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.
10. ASTM A123/A123M-09 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
11. CISC/CPMA 2-75 Canadian Institute of Steel Construction/Canadian Paint Manufacturers Association-A Quick Drying Primer for Use on Structural Steel.
12. CAN/CGSB-1.40-97 Anticorrosive Structural Steel Alkyd Primer.

13. ASTM A53/A53M-07 — Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

1.4 Shop Drawings

1. Submit shop drawings in accordance with Section 01340 prepared and stamped by a Professional Engineer licensed to design structures in the Province of Ontario.

2. Clearly indicate materials, core thickness, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details and accessories.

PART 2 - PRODUCTS

2.1 Materials

1. Metals:

   .1 **Steel sections and plates:** to CAN3 G40.21, Grade 350W for tubes and Grade 300W for plates and flat shapes.
   .2 **Welding Materials:** to CSA W59.
   .3 **Bolts and anchor bolts:** to ASTM A307, A325, and A563 as applicable.
   .4 **Stainless Steel:** Type 302 or 304 alloy conforming to ASTM A167, No. 4 finish.

2. Primers, Coatings and Shop Painting

   .1 **Interior Steel in Dry Areas:** Quick drying oil alkyd conforming to CISC/CPMA 2.75.
   .2 **Exterior Steel, Interior Steel in Unheated Areas, Steel Embedded in Concrete:** Hot dip galvanized conforming to ASTM A123, minimum Z275 coating.
   .3 **Galvanizing** of structural steel components and loose lintels: refer to Section 05120.
   .4 **Galvanized Coating Touch-Up:** W.R. Meadows “Galvafroid” or Kerry Industries “Z.R.C.” zinc rich coating or similar manufacturer containing minimum 90% zinc by weight.
   .5. Apply one shop coat(s) of primer or coating as indicated above and according to manufacturer’s recommendations. Do not prime aluminum, stainless steel or those components to be galvanized or encased in concrete.
   .6 Use primer unadulterated, as provided by manufacturer. Paint on dry surfaces free from rust scale and grease. Do not paint when temperature is lower than 10 deg. Celsius and rising.
   .7 Clean surfaces to be field welded; do not paint.

3. Fastenings

   .1 Use nuts and bolts conforming to ASTM A307, A325, and A563 as applicable.
      .1 For interior work, use cadmium-plated fastenings where other protection is not specified.
      .2 For exterior work, use Type 300 or 400 stainless steel.

4. Anchors and Shims

    .1 For exposed anchorage of aluminum, if applicable, use stainless steel and otherwise to match metal anchored. For non-exposed work, anchors and shims may be galvanized steel.

5. Pipe

    .1 To ASTM A53, extra strong steel pipe for bollards.

6. Bituminous Paint

    .1 Alkali-resisting, use to insulate contact between dissimilar metals.

2.2 Fabrication

1. Build work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

2. Weld all connections where possible, and bolt where not possible unless indicated otherwise on drawings.

3. Use self-tapping shake-proof countersunk flat headed screws on items required to be assembled by screws or as indicated.

4. Where possible, work to be fitted and shop assembled, ready for erection.

5. Exposed welds to be continuous for length of each joint. File or grind exposed welds smooth and flush.

6. Weld all stainless steel by the Argon Arc Process. Grind smooth and polish joints, crence-free, and flush without seams.

2.3 List of Miscellaneous Metal Fabrications

1. This Section includes, but is not limited to the following list. Note: **Galvanize all exterior items** and other items noted. Prime paint all interior items.

    .1 Anchors, Bolts, Inserts, Sleeves for work in this Section.
    .2 Pit Ladder
    .5 Lintels (if not by Structural Steel).

PART 3 - EXECUTION

3.1 General

1. Supply and install all miscellaneous metal work indicated on the Drawings and not indicated in work of other Sections in addition to items listed below.

3.2 Fabrication & Erection

1. Erect metal work square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

2. Insulate metals, where necessary, to prevent corrosion due to contact between dissimilar metals and between metals and masonry or plaster. Use bituminous paint, butyl tape, building paper or other approved means.

3. Provide suitable and acceptable means of anchorage, such as dowels, anchor clips, bar anchors, expansion bolts and shields, toggles.

4. Make field connections with items specified in Articles 2.1.4 and 2.1.5 or weld to CSA S16.

5. Hand items to be cast into concrete or built into masonry over to appropriate trades together with setting templates.

6. Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection.

7. Touch-up galvanized surfaces with zinc primer where burned by field welding. Spray or brush apply a minimum of three (3) coats of zinc-rich paint to achieve a dry film thickness of 8 mils. Apply a finish coat of aluminum paint to provide a colour blend with the surround galvanizing.

3.3 Wall Benches and Upper Shelf

1. Steel Angles, Steel Channel, Flat Bar Steel, Steel Rod as indicated on details.

2. Use secure round head fasteners or countersink holes for flat head screws.

3. Prime paint: Galvafroid.

4. Chamfer cut ends of Rod 2 mm

3.4 Railings and Guards

1. Provide railings and handrails, as shown on Drawings.

2. Galvanize all exterior railings after fabrication.

3. Wall brackets, as shown, at 1200 mm o.c. maximum.

4. Set railing standards in concrete with heated liquid sulphur to fill hole. Remove overflow immediately.

3.5 Vanity Brackets

1. Angle steel frame, as shown on drawings - shop prime painted.

3.6 Wall Brackets and Hooks

1. As shown on Drawings - prime paint.

3.7 Bollards

1. Supply and install galvanized steel bollards as shown on Drawings. Bollards shall be 150 mm x 9.5 mm thick wall at 1200 mm high, seamless steel pipe. Install 1200 mm into a concrete foundation. Fill bollard with 25 Mpa concrete and round top. Round top of footing also. For number of Bollards required - refer to Drawings.

3.8 Galvanized Steel

1. Galvanize steel members, fabrications, and assemblies after fabrication by the hot dip process in accordance with ASTM A123, minimum Z275 coating.

2. Galvanize bolts, nuts and washers and iron and steel hardware components in accordance with ASTM A123.

3. Safeguard products against steel embrittlement in conformance with ASTM A143.

4. Design features which may lead to difficulties during galvanizing shall be pointed out prior to dipping.

5. The composition of metal in the galvanizing bath shall be not less than 98.0% zinc.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Commercial Steel Doors and Frames Section 08100

1.2 Source Quality Control

1. Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board.

PART 2 - PRODUCTS

2.1 Materials

1. **Wood Materials:** Material, straight, sawn square, true, dressed four (4) sides properly sized, shaped to correct dimensions from nominal sizes indicated or specified.

2. **Lumber: Use only grade marked lumber. Where left exposed, use best brand of lumber available.** lumber and moisture content to conform to official grading rules of NLGA, for particular lumber and grade, and structurally conform to latest requirements of Ontario Building Code. Conform to Grading Standards, CSA Standard Softwood Lumber 2005. Moist content not greater than 19% at time of installation.

3. **Blocking, Cants, Bucks, Grounds and Nailing Strips:** Douglas fir Graded 122-C, construction or No. 2 Pine, pressure treated in accordance with CSA 080 Series 08.

4. **Plywood:** Douglas fir plywood to CSA 0121-08, good one side with waterproof adhesive.

5. **Rough Hardware:** Nails, screws, bolts, lag screws, anchors, special fastening devices and supports required for erection of all carpentry components. Use galvanized components where exposed to exterior atmosphere.

PART 3 - EXECUTION

3.1 General

1. Do all wood framing in accordance with the Ontario Building Code, Engineering Design in Wood and CSA 086 - 01.

2. Machine dressed work shall be slow fed using sharp cutters and finished members shall be free from drag, feathers, slivers or roughness of any kind.

3. Frame materials with tight joints rigidly held in place.

4. Design construction methods for expansion and contraction of the materials.

5. Erect work plumb, level, square and to required lines.

6. Be responsible for methods of construction for ensuring that materials are rigidly and securely attached and will not be loosened by the work of other trades.

3.2 Furring and Blocking

1. Supply and install furring and blocking, required.

2. Align and plumb faces of furring and blocking to tolerance of 1:600.

3.3 Rough Bucks, Nailers

1. Install wood bucks and nailers, as indicated, including wood bucks and linings around frames for doors and windows.

2. Except where indicated, otherwise, use material at least 38 mm thick secured with 9 mm bolts located within 300 mm from ends of members and uniformly spaced at 1200 mm between.

3. Countersink bolts where necessary to provide clearance for other work.

3.4 Roof Fascias, Cants, Nailers, Curbs

1. Install wood cants, fascia backing, nailers, curbs and other wood supports for roofing, sheet metal fork, roof mounted equipment.
   Refer to Section 07550 Modified Bituminous Roofing.

2. In reference to section 07550 Modified Bituminous Roofing, subsection 3.4 Carpentry and Section 07610 Sheet Metal Roofing: all wood blocking work related to roofing including but not limited to parapets, walls and curbs is by Section 06100 Rough Carpentry. The general contractor is responsible to turn over this work in a dry condition to roofing contractor for making watertight as part of roofing work. After acceptance, the roofing contractor is responsible to maintain water tightness.

3.5 Supports for Mechanical Units

1. Install wood blocking for prefabricated curbs for mechanical units to allow for a level installation on sloping roof.

3.6 Pressure Treated Wood

1. Use wood pressure treated in accordance with CSA 080 for all wood members in contact with exterior walls and roofs.

2. Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

3. Fasten each slat to steel frames with 2 screws at top, bottom and at diagonal bracing.

3.7 Installation of Hollow Metal Frames

1. Set frames plumb and square in their exact location and at correct elevation. Firmly block and brace to prevent shifting. Shim up where required to ensure proper alignment dimensions from finished floor to head of frame. Install temporary wood spreaders at mid-height.

2. Where pressed steel frames are installed in concrete walls, secure frames to concrete using lead expansion shields and anchor bolts through pipe sleeves. Perform drilling of concrete as required. Fill recessed bolt heads flush to frame face with approved metal filler and sand smooth.

3. Install fire rated door frames in accordance with requirements of National Fire Code Volume 4, produced by The National Fire Protection Association (NFPA 80).

3.8 General

1. Supply and install all other carpentry shown on drawings or as required for completion of work. Co-operate with other trades in installing items supplied by other sections, cut openings in woodwork when so required and make good disturbed surfaces.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Rough carpentry: Section 06100

2. Painting: Section 09900

1.2 Reference Standards

1. Do millwork to Millwork Standards of the Architectural Woodwork Manufacturers' Association of Canada (AWMAC) Premium Grade.

1.3 Shop Drawings

1. Submit shop drawings in accordance with Section 01340.

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

1.4 Qualification

1. Millwork manufacturer to have not less than 5 years proven first class experience in institutional millwork and shall be a member of AWMAC.

PART 2 - PRODUCTS

2.1 Materials

1. Softwood lumber: to CSA 0121-M1978 and National Lumber Grades Authority (NLGA) requirements, with maximum moisture content of 10% for interior work. Yard lumber select for natural finish of species, indicated to AWMAC premium grade.

2. Hardwood lumber: to National Hardwood Lumber Association (NHLA) requirements, moisture content of maximum 10% for interior work, of species indicated to AWMAC premium grade.

3. Hardwood plywood: to CSA 0115-1967 of thickness indicated, rotary cut face veneer, birch plywood, veneer core. Select veneers to provide book match veneer strips to be 240 mm wide minimum. Grade: Select White.

4. Nails and staples: to CSA B111-1974 galvanized for exterior work, interior high-humidity areas and for treated lumber; plain finish elsewhere. Use spiral thread nails except where specified elsewhere.

5. Particle Board core: to CAN3-0188.1-M, Grade R, 720 kg/m3 density in thicknesses indicated.

6. Book Match Veneer: strips to be 240 mm wide minimum.

2.3 Melamine Clad Cabinetwork

1. All cabinet frames whether for base, wall or tall floor standing cases, shall be fabricated so each is a self-contained module. Front side top and bottom, exterior and interior surfaces shall be finished allowing future relocation of any module, into any bench arrangement, without need of any additional finishing.

2. Gables and panels shall be fabricated from 19 mm thick melamine surfaced panels with a P.V.C. edging applied to exposed edges.

3. Bottoms shall be fabricated utilizing the same materials and edge finish as gables. Front edge will be edged with P.V.C. edging. All other edges will be thoroughly sealed and moisture proofed prior to attachment to gables.

4. Rails shall be fabricated and machined to join the gables and form a rigid cabinet frame.

5. **Finish:**

    .1 Melamine surfaced panels shall be finished both sides in the same colours, patterns, and grain. Basis of design selection: Hardrock Maple

2.4 Shop Fabrication

1. Shop assemble work for delivery to site in size easily handled and to insure passage through building openings.

2.6 Moulding and Trims

1. Fabricate mouldings in maximum practical lengths to profile shown. Solid birch to receive varnish finish unless noted otherwise. Install with concealed fasteners.

PART 3 - EXECUTION

3.1 Installation

1. Set and secure all material and components in place, rigid, plumb and square.

2. Provide heavy duty fixture attachments for wall mounted cabinets.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Cast In Place Concrete — refer to Structural Drawings

1.2 Scope

1. Apply negative side waterproofing on all internal faces of elevator pit walls and pit floor slab. Refer to plans for extents of waterproofing applications.

1.3 Qualifications and Quality Assurance

1. Waterproofing shall be carried out by applicators skilled and with previous similar experience in this work in strict accordance with manufacturer's printed instructions. Submit proof of experience upon Consultant’s request.

2. Manufacturer’s representative shall be called by the applicator to inspect the substrate prior to commencement of work.

3. Manufacturer’s representative shall be retained by installer to provide technical assistance on an as-needed basis during course of installation of membrane.

1.4 Environmental Conditions

1. Do not proceed with waterproofing application during rainy or inclement weather.

1.5 Submittals

1. Submit samples and manufacturer's literature before ordering materials and proceeding with the work.

1.6 Delivery, Storage & Handling

1. Deliver and store materials in original containers with manufacturer's labels and seals intact.

2. Store solvent base liquids away from excessive heat and open flame.

3. Store emulsion liquids at above freezing temperatures, free from contact with cold or frozen surfaces.

1.7 Protection

1. Take extra care to provide ample protection of materials and work of this section from damage by weather, backfiring operations and other causes.

2. Apply protection board as soon as possible after installation of membrane.

PART 2 - PRODUCTS

2.1 Materials

1. Negative Side – applied to the interior face of walls and pit floor: materials shall be the following types supplied by W.R. Meadows:
   .1 CEM-KOTE CW Plus.
   Acceptable alternate: Permaquik Crystalline, Tremco

PART 3 - EXECUTION

3.1 Conditions of Surfaces

1. Before commencing work, ensure environmental and site conditions are suitable for installation of waterproofing membrane.

2. The substrate shall be clean and dry, free from surface water, ice snow or frost, dust, dirt, oil, grease, curing compounds or any other foreign matter detrimental to the adhesion of the waterproofing membrane.

3. Notify Consultant and Contractor in writing of unsuitable surfaces and working conditions. Commencement of work shall imply acceptance of surfaces and working conditions.

3.2 Membrane Application

1. **Application:** Apply waterproofing products per manufacturer's specifications. Refer to manufacturers product literature for application procedures.

3.3 Clean-Up

1. Promptly as the work proceeds and on completion, clean up and remove from the premises all rubbish and surplus materials resulting from the foregoing work.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Masonry: Section 04200
2. Rough Carpentry (Architectural) Plywood: Section 06100
3. Firestopping and Smoke Seals for Mechanical Work: Division 15
4. Firestopping and Smoke Seals for Electrical Work: Division 16

Note: Firestopping and Smoke Seals within mechanical and electrical assemblies are specified in Divisions 15 and 16. All other firestopping and smoke seals are the responsibility of this Section.

1.2 Reference

1. ASTM E814 - Test Method of fire tests of through-penetration firestops, Factory Mutual.
2. CAN4-S101M - Standard Methods of Fire Endurance Tests of Building Construction and Materials.
3. CAN4-S115M - Standard Method of Fire Tests of Firestop Systems.
4. ULC - List of Equipment and Materials.

1.3 System Description

1. Firestopping Materials: CAN4-S115M ASTM E814 to achieve a fire protection rating as noted on Drawings.
2. It is the intent of this Section that in conjunction with Divisions 15 and 16 a competent, single source be responsible for the firestopping and smoke seals of the entire project.

1.4 Submittals

1. Submit a product data to requirements of Section 01340.
2. Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation, ULC design references.
3. Submit proposed type of fireproofing system for each location for approval by Architect. Fireproofing System must be appropriate to achieve expected appearance and finish.

1.5 Quality Assurance

1. Manufacturer: Company specializing in manufacturing products of this Section with minimum five years documented experience.

2. Applicator: Approved, licensed and supervised by the manufacturer of firestopping materials. Company with minimum five years documented experience.

3. Product: Manufactured under ULC Follow-up Program. Each container or package shall bear ULC label.

1.6 Regulatory Requirements

1. Conform to applicable code for fire protection ratings.

2. Provide certificate of compliance for authority having jurisdiction indicating approval.

1.7 Delivery, Storage & Handling

1. Deliver and store materials in a dry, protected area, off ground in original, undamaged, sealed containers with manufacturer's labels and seas intact.

1.8 Project & Site Conditions

1. Application temperature and ventilation as per Manufacturer's instructions.

1.9 Sequencing & Scheduling

1. Sequence work to permit installation of firestopping and smoke seal materials to be installed after adjacent work is complete and before closure of spaces.

PART 2 - PRODUCTS

2.1 Materials

1. A/D Firebarrier Firestop Systems, by A/D Fire Protection Systems Inc., capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN4-S115 and not to exceed opening sizes for which they are intended.

2. Mineral Wood Backing Insulation: ULC labelled, preformed non-combustible material (A/D Firebarrier Mineral Wool) by A/D Fire Protection Systems Inc.

3. Retainers: Clips to support mineral wool.

4. Firestopping Sealant: ULC labelled, single component silicone bases, A/D Silicone Firebarrier Sealant by A/D Fire Protection Systems Inc.

5. Firestopping Seal: ULC labelled, single component water-base seal, A/D Firebarrier Seal by A/D Fire Protection Systems Inc.

6. Firestopping Foam: ULC labelled, two components silicone foam, A/D Firebarrier RTV Foam by A/D Fire Protection Systems Inc.

7. Firestopping Mortar: ULC labelled, non-combustible fibre reinforced, foamed cement mortar, A/D Firebarrier Mortar by A/D Fire Protection Systems Inc.

8. Damming Material: In accordance with tested assembly being installed as applicable and as acceptable to authorities having jurisdiction.

PART 3 - EXECUTION

3.1 Examination

1. Examine surfaces to receive work of this Section and report any defects which may affect the Work of this Section.

2. Verify that openings are ready to receive the Work of this Section.

3. Confirm compatibility of surfaces to receive firestopping and smoke seal materials.

4. Beginning of installation means acceptance of existing surfaces and substrate.

3.2 Preparation

1. Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

2. Prepare surfaces in contact with firestopping materials and smoke seals to manufacturer's instruction.

3.3 Application

1. Install firestopping and smoke seal material and components in accordance with ULC listing and manufacturer's instructions.

2. Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

3. Apply in sufficient thickness to achieve rating to uniform density and texture.

4. Provide temporary forming if required.

5. Tool or trowel exposed surfaces to a neat finish where required.

6. Remove excess material promptly as work progresses and upon completion.

7. Protect installed material until cured or set.

3.4 Cleaning

1. Clean adjacent surfaces of firestopping and smoke seal materials.

3.5 Field Quality Control

1. Notify Consultant when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.

3.6 Scheduling

1. Firestop and smoke seal at:

    .1 Penetrations through fire separations (rated and non-rated); masonry, concrete, and gypsum board partitions and walls.
    .2 Top of fire separations (rated and non-rated); masonry and gypsum board partitions.
    .3 Intersection of fire separation masonry and gypsum board partitions.
    .4 Control and sway joints in fire separation masonry and gypsum board partitions and walls.
    .5 Penetrations through fire separation floor slabs, ceilings and roofs, if applicable.
    .6 Openings and sleeves installed for future use through fire separations.
    .7 Refer to AD drawings for locations of fire separations.
    .8 Refer to AD725 for detail of top of wall fire separation assembly.

3.7 Sound Seal

1. At top of all non fire separations masonry partitions compress mineral wool and fill space between masonry and structure. Apply sealant on at least one side of the sound separation.

End of Section

PART 1 - GENERAL

1.1 Environmental Conditions

1. Sealant and substrata materials to be minimum 5 deg. C.

2. Should it become necessary to apply sealants below 5 deg. C, consult sealant manufacturer and follow their recommendations.

1.2 Warranty

1. Contractor hereby warrants that caulking work will not leak, crack, crumble, melt, shrink, run lose adhesion or stain adjacent surfaces in accordance with General Conditions, but for five (5) years total.

PART 2 - PRODUCTS

2.1 Materials

1. Primers: type recommended by sealant manufacturer.

2. Joint Fillers:

   .1 General: compatible with primers and sealants, outsized 30 to 50%.
   .2 Polyethylene, urethane, neoprene or vinyl: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa.
   .3 Neoprene or butyl rubber: round solid rod, Shore A hardness 70.
   .4 Polyvinyl chloride or neoprene: extruded tubing with 6 mm minimum thick walls.
   .5 Bond breaker: pressure sensitive plastic tape which will not bond to sealants.
   .6 Sealant Type A: One component, chemical curing, conforming to CAN2-19.13-M82, Class C-2-25-B-N; multi-component, chemical curing, conforming to CAN2-19.24-M80, Type 2, Class B.
   .7 Sealant Type B: Multi-component, chemical curing mildew resistant conforming to CGSB 19-GP-22M.
   .8 Sealant type C: Multi-component, acrylic emulsion base, conforming to CGSB 19-GP-17M.
   .9 Sealant type D: One component, polyurethane base, chemical curing, conforming to CAN2-19.13-M82, Class C-1-25-B-N; or multi-component, chemical curing, conforming to CAN2-19.24-M80, type 1.

3. Color of Sealants: to be selected by Consultant. Allow for a total of three (3) colours for Type A, two colours for Type B, two colours for Type C and one colour for Type D. Locations as directed on site by Consultant.

4. Joint cleaner: xylol, methylethyl-ketone or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

5. Vent tubing: 6 mm inside diameter extruded polyvinyl chloride tubing.

PART 3 - EXECUTION

3.1 New Work

1. Caulk where specified in 3.4 and everywhere required.

2. Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.

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

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

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

6. Examine joint sizes and correct to achieve depth ratio 1/2 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 surfaces prior to priming and caulking.

9. Apply bond breaker tape where required to manufacturer's instructions.

10. Prime sides of joints to sealant manufacturer's instructions immediately prior to caulking.

3.2 Application

1. Apply sealants, primers, joint fillers, bond breakers, to manufacturer's instructions. 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. In masonry cavity construction, vent caulked joints from cavity to 3 mm beyond external face of wall by inserting vent tubing at bottom of each joint and maximum to 1500 mm o.c. vertically. Position tube to drain to exterior.

4. In precast concrete panel facing, vent space behind panels by inserting vent tubing at bottom of each vertical caulked joint and at every second intersection of horizontal and vertical joints. Position tube to drain to exterior.
5. 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.

6. Use sealants specified in the following locations:

   Type A: Joints between windows or door frames and adjacent building components; control and expansion joints and all other locations where sealing is required, except in locations designated for Type B, C and D. Ensure that sealant chosen (from the several specified under "MATERIALS") for each location is recommended by manufacturer for use on surfaces encountered.

   Type B: Joints between splash backs and walls.

   Type C: Joints between interior metal door frames and partitions.

   Type D: Joints in horizontal surfaces between concrete slabs, pavers and precast concrete panels.

End of Section

PART 1 - GENERAL

1.1 Work Included

1. A single manufacturer shall fabricate products included within the scope of this Section.

2. Manufacturer shall be a member in good standing of the Canadian Steel Door Manufacturers Association (CSDMA).

3. Supply only of steel frame products including frames, transom frames, sidelight and window assemblies with provision for glazed, paneled or louvered openings, fire labeled and non-labeled, as scheduled or detailed by the Architect.

4. Supply only of flush steel doors with provision for glazed, paneled or louvered openings, insulated and un-insulated, fire labeled, with or without temperature rise ratings and non-labeled, as scheduled or detailed by the Architect.

5. Supply only of steel panels, similar in construction to steel doors, with flush or abetted bottoms for steel frames, transom frames, sidelight and window assemblies, fire labeled and non-labeled, as scheduled or detailed by the Architect.

6. Doors and frames shall be prepared for, but not limited to, preparation for continuous hinges, heavy weight hinges, cylindrical locks, rim and concealed vertical rod/ mortise lock case exit devices, surface door closers and concealed overhead stops.

1.2 Related Work

1. Building-in of frame product into unit masonry, previously placed concrete, structural or steel or wood stud walls.

2. Supply and installation of wood, plastic or composite core doors.

3. Supply and installation of builders' hardware except as specified for acoustic assemblies.

4. Drilling and tapping for surface mounted or non-templated builders' hardware.

5. Caulking of joints between frame product and other building components.

6. Supply and installation of gaskets or weather-strip.

7. Supply and installation of louvers or vents.

8. Supply and installation of glazing materials.

9. Site touch-up and painting.

10. Wiring for electronic or electric hardware.

11. Field measurements.

12. Fasteners for frame product in previously placed concrete, masonry or structural steel.

13. Steel lintels, posts, columns or other load-bearing elements.

14. Field welding.

1.3 Requirements of regulatory agencies

1. Install fire labeled steel door and frame product in accordance with NFPA-80, current edition, unless specified otherwise.

1.4 References

1.	ANSI A115.IG-1994	Installation Guide for Doors and Hardware
2.	ANSI A250.4-1994	Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings.
3.	ASTM A653-M97	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
4.	ASTM A924-M97	Standard Specification for General Requirements for Sheet, Metallic-Coated by the Hot-Dip Process.
5.	ASTM B117-95	Method of Salt Spray (Fog) Testing.
6.	ASTM C177-97	Test Method for Steady-State heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot -Plate Apparatus.
7.	ASTM C518-91	Test method for Steady State Heat Flux Measurements and Thermal Transmission properties by means of the heat Flow Meter Apparatus.
8.	ASTM C578-95	Specification for Rigid, Cellular polystyrene Thermal Insulation.
9.	ASTM C665-95	Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
10.	ASTM D1735-92	Practice for Testing Water Resistance of Coating Using Water Fog Apparatus.
11.	CAN4-S104-M80	Fire Tests of Door Assemblies.
12.	CAN4-S105-M85	Standard Specification for Fire Door Frames Meeting the performance required by CAN4-S104.
13.	CAN4-S106-M80	Standard Method for Fire Tests of Window and Glass Block Assemblies.

14. CGSB 41-Gp-19Ma Rigid Vinyl Extrusions for Windows and Doors
15. CGSB 82.5-M88 Insulated Steel Doors.
16. CSA A101-M83 Mineral Fiber Thermal insulation for Buildings.
17. CSA W59-M89 Welded Steel Construction (Metal Arc Welding)
18. ISO 9001:1994 Quality Systems – Model for Quality Assurance.
19. NFPA-80, 1999 Fire Doors and Windows
20. CSDMA Dimensional Standards for Commercial Steel Doors and Frames.
21. Manufacturers Standard and Galvanized Sheet Gauges
22. Fleming Fire Labeling Specifications
23. ULC List of Equipment and Materials, Volume 2

1.5 Testing and Performance

1. Door constructions covered by this specification shall be certified as meeting Level “A” (1,000,000 cycles) and Twist Test Acceptance Criteria (deflection not to exceed 6.4 mm /13.6kg force, total deflection at 136.1kg force not to exceed 63.5 mm and permanent deflection not to exceed 3.2 mm) when tested in strict conformance with ANSI-A250.4-1994. Test shall be conducted by an independent nationally recognized accredited laboratory.

2. Fire labeled product shall be provided for those openings requiring fire protection and temperature rise ratings, as determined and scheduled by the Architect. Doors, frames, transom frames and sidelight assemblies shall be tested in strict accordance with CAN4-S106. Product shall be listed by Underwriters Laboratories of Canada under an active Factory Inspection Program and shall be constructed as detailed in Follow-Up Service procedures issued to the manufacturer.

3. Should any door or frame specified by the Architect to be fire rated, not qualify for labeling due to design, hardware, glazing or any other reason, the Architect shall be so advised before manufacturing commences.

4. Core materials for exterior doors shall attain a thermal resistance rating of RSI 1.06 (R6.0) when tested in accordance with ASTM C177 or ASTM C518.

5. Product shall be manufactured by a firm experienced in the design and production of standard and custom commercial steel door and frame assemblies, the integration of builders’ or electronic hardware and glazing materials and their impact on the scope of work.

6. Manufacturer shall be assessed and registered as meeting the requirements of Quality Systems under ISO 9001.
7. Product quality shall meet standards set by the Canadian Steel Door Manufacturers Association.

1.6 Test Reports

1. All alternates to this specification shall be submitted to the Architect for acceptance ten (10) days prior to bid date, complete with test reports from independent, nationally recognized testing authorities, certifying that:

    .1 Steel door and frame assemblies furnished under this section meet the acceptance criteria of ANSI-A250.4-1994, Level “A”.
    .2 Insulated door cores furnished in exterior doors under this Section meet the specified thermal resistance rating.

2. All reports shall include name of testing authority, date of test, location of test facility, descriptions of test specimens, procedures used in testing and indicate compliance with acceptance criteria of the test.

1.7 Submittals

1. Submit shop drawings in accordance with the General Conditions of the Contract.

2. Indicate each type of door, frame, steel, core, material thickness, mortises, reinforcements, anchorages, locations of exposed fasteners, openings (glazed, paneled or louvered) and arrangement of standard builders’ hardware.

3. Include a schedule identifying each unit, with door marks or numbers referencing the numbering in Architect’s schedules or drawings.

4. Provide confirmation in writing that all aspects to reinforcing, construction, and gauge of metal are met as written in this section.

1.8 Warranty

1. All steel door and frame product shall be warranted from defects in workmanship for a period of one (1) year from date of shipment.

2. All steel door and frame product shall be warranted against rust perforation for a period of five (5) years when the installed and finish painted with a commercial quality paint to the manufacturers recommendations.

3. Finish paint adhesion on all door and frame product shall be warranted for a period of five (5) years when the product has been properly cleaned and finish painted with a commercial quality paint applied as recommended by the paint manufacturer. This warranty shall not exceed that provided by the paint manufacturer.

PART 2 - PRODUCTS

2.1 Doors

1. **Materials**

.1 Doors shall be fabricated from tension leveled steel to ASTM A924-M97, galvanized to ASTM A653-M97, Commercial Steel (CS), Type B, coating designation ZF75, known commercially as paintable Galvanneal.

.2 Door Cores:
Honeycomb:
Structural small cell (25.4 mm maximum) kraft paper "honeycomb". Weight: 36.3 kg per ream (minimum), density: 16.5 kg/m^3 (minimum), sanded to the required thickness.
.1 Polystyrene:
Rigid extruded, fire retardant, closed cell board, density 16kg/m^2, thermal values: RSI 1.06 minimum, conforming to ASTM C578.
.2 Temperature Rise Rated (TRR):
Solid slab core of non-combustible, inorganic composite to limit temperature rise on the "unexposed" side of door to 250°C at 30 or 60 minutes, as required by governing building code requirements and determined and scheduled by the Architect.

.3 Adhesives:
.1 Honeycomb Cores and Steel Components:
Heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement or ULC approved equivalent.
.2 Interlocking Edge Seams:
Resin reinforced polychloroprene (RRPC), fire resistant, high viscosity, sealant/adhesive or UL approved equivalent.
.3 Polystyrene Cores:
Heat resistant, epoxy based, low viscosity, contact cement.
4. Primer:
Rust inhibitive touch-up only.
5. Exterior Top Caps:
Rigid polyvinylchloride (PVC) extrusion.

2. **Construction**

.1 General:
.1 This section is based on doors and frames as manufactured by Fleming. Doors and frames by other manufacturers are acceptable subject to be similar to the one specified and meeting the terms of this section.
.2 Doors shall be swinging, 44.4 mm thick of the types and sizes indicated on the schedules or drawings.
.3 Exterior doors shall be lock seam, flush.
.4 Face sheets for exterior doors shall be fabricated from (16) gauge steel.

.5 Longitudinal edges of exterior doors shall be mechanically interlocked, fully welded, ground smooth with no visible seams. Do not fill seams.
.6 Face sheets of interior doors shall be fabricated from 18 gauge steel, except for heavy traffic doors (noted **HT** in Door Schedule) face sheet to be 16 gauge.
.7 Longitudinal edge of heavy traffic doors (noted **HT** in Door Schedule) shall be mechanically interlocked, fully welded, ground smooth with no visible seams. Do not fill seams.
.8 Interior doors shall be stiffened, insulated and sound deadened with honeycomb core laminated under pressure to each face sheet.
.9 Stiffened, insulated and sound deadened with core where Temperature Rise Rated (TRR) fire labeled doors are specified.
.10 Longitudinal edges of interior doors shall be mechanically interlocked, adhesive assisted with edge seams visible.
.11 Door faces of all steel doors shall be fabricated without visible seams, free of scale, pitting, coil brakes, buckles and waves.
.12 Formed edges shall be true and straight with a minimum radius for the thickness of steel used.
.13 Lock and hinge edges shall be beveled 3 mm in 50 mm unless builders' hardware or door swing dictates otherwise.
.14 Top and bottom of doors shall be provided with inverted, recessed, 16 gauge steel end channels, welded to each face sheet at 150 mm on center maximum.
.15 Exterior doors shall be provided with factory installed flush PVC top caps. Fire labeled exterior doors shall be provided with factory installed flush steel top caps.
.16 Unless ineligible due to design, size, hardware or glazing specified on the Architects' or hardware Suppliers' schedules or details, fire labeled doors shall be provided for those openings requiring fire protection ratings and temperature rise ratings, as determined and scheduled by the Architect.
.17 Exterior doors shall be internally reinforced with 20 gauge continuous; interlocking steel stiffeners at 150mm O.C. max, with voids between stiffeners filled and insulated with 24kg/m3 density loose batt type fiberglass material to suit fully welded design.

.2 **Hardware Preparations:**
.1 Doors shall be factory blanked, reinforced, drilled and tapped for fully templated mortised hardware only, in accordance with the final approved schedule and templates provided by the hardware supplier.
.2 Doors shall be factory blanked and reinforced only for mortised hardware that is not fully templated.
.3 Doors shall be factory reinforced only for surface mounted hardware.
.4 Templated holes 12.7mm diameter and larger shall be factory prepared, except mounting and through bolt holes, which shall be by the contractor responsible for installation on site, at the time of application. Templated holes less than 12.7mm diameter shall be factory prepared only when required for the function of the device (for knobs, levers, cylinders, thumb or turn pieces) or when these holes over-lap function holes.

.5 Drilling and tapping for surface mounted hardware or mortised hardware that is not fully templated shall be by the contractor responsible for installation on site, at the time of application.
.6 Hinge and pivot reinforcements shall be 10 gauge steel minimum high frequency type reinforcing.
.7 Hinge reinforcements for acoustic doors and doors in excess of 2450mm rabbet height shall be 10 gauge minimum with each cutout provided with 114.3mm heavy weight (4.6mm) high frequency type.
.8 Lock, strike and flush bolt reinforcements shall be 12 gauge steel minimum.
.9 Reinforcements for concealed closers and holders shall be 12 gauge steel minimum.
.10 For surface mounted hardware, reinforcements shall be 16 gauge steel minimum.
.11 All pairs of fire labeled doors shall be provided with 12 gauge steel surface mounted flat bar astragal, shipped loose for application on site, by the contractor responsible for installation.
.12 Pairs of doors up to 2450mm x 2450mm, to 1½ hour fire rating maximum shall be provided without astragals. Lock edge seam of such doors shall be tacked-welded and ground smooth. All other fire labeled pairs shall be provided with 12 gauge steel surface mounted flat bar astragal, shipped loose for application on site, by the contractor responsible for installation.
.13 Where electrically or electronically operated hardware is specified on the Architects' schedules or details of the final approved schedule and templates provided by the hardware supplier, hardware enclosures and/or junction boxes, where indicated on the templates, shall be provided and interconnected with CSA Approved 12.7mm diameter conduit and connectors.
.14 Prepare doors to receive security door contacts – refer to electrical drawings for locations. Door contacts to be installed at 100 mm from the latch side door edge.
.15 Doors and Frames shall be prepared for, but not limited to preparations for heavy weight oversized Butt Hinges, Continuous Hinges, Cylindrical Locksets, Concealed Vertical Rod and Mortise Lock Case Exit Devises, Surface Door Closer and concealed Overhead Stops.

.3. Glazing:
.1 Where 6mm thick glazing materials are specified on the Architects schedules or details, doors shall be provided with 20 gauge steel glazing trim and snap-in glazing stops.
.2 Where other that 6mm glazing is specified on the Architect's schedules or details, doors shall receive 20 gauge steel trim and screw fixed glazing stops. Screws shall be #6 x 32mm oval head scrulox (self-drilling) type at 300mm on center maximum.
.3 Glazing trim and stops shall be accurately fitted, butted at corners, with removable glazing stops located on the 'push' side of the door.

.4 Louver Preparations:
.1 Where specified on the Architect's schedules or details, non-labeled doors shall be prepared on accordance with the louver manufacturer's details.

.2 Where specified on the Architect's schedules or details, fire labeled doors shall be prepared for UL listed sight-proof fusible link louvers in accordance with the louver manufacturer's details.
.3 Louvers shall be supplied and installed by others.

.5 Finishing:
.1 Remove weld slag and splatter from exposed surfaces.
.2 All tool marks, abrasions and surface blemishes shall be filled and sanded to present smooth uniform surfaces.
.3 On exposed surfaces where zinc coating has been removed during fabrication, doors shall receive a factory applied touch-up primer.
.4 Primer shall be fully cured prior to shipment.

2.2 Panels

1. Panels shall be fabricated form the same materials, construction and finished in the same manner as doors as specified in Section 2.1.

2.3 Frame Product

1. **Materials**

.1 Steel:
Frame product shall be fabricated from tension leveled steel to ASTM A924-M97, galvanized to ASTM A653-M97, Commercial Steel (CS), Type B, coating designated ZF75, known commercially as paintable Galvanneal.

.2 Primer:
Rust inhibitive touch up only.

.3 Miscellaneous:
.1 Door Silencers:
GJ-64, Single Stud rubber/neoprene type
.2 Thermal Breaks:
Rigid polyvinylchloride (PVC) extrusion
.3 Fiberglass:
Loose batt type, density: 24kg/m^3 (minimum), conforming to ASTM C665

2. **Construction**

.1 General:
.1 All steel frame product shall be as manufactured by Fleming of the types, sizes and profiles indicated on the Architects' schedules or details.
.2 Exterior frames shall be thermally broken, Fleming *Therma-Frame* Series, fabricated from 16 gauge steel.
.3 Exterior frame product shall be supplied profile welded (PW)
.4 Interior and exterior sections of thermally broken frames shall be separated by a continuous PVC thermal break.
.1 Thermally broken sections shall not be assembled by means of screws, grommets or other fasteners and welds shall not cause

thermal transfers between interior and exterior surfaces of the frame sections.

.2 Closed sections (mullions and center rails) of thermally broken frames shall be factory insulated with 24kg/m^3 loose batt type fiberglass material.

.5 Insulation of open sections (jambs, heads and sills) on exterior frame product shall be provided and installed by the contractor responsible for installation.

.6 Interior frames shall be Fleming F-Series, fabricated from 16 gauge steel.

.7 Interior frame product shall be supplied profile welded (PW)

.8 Knocked-down and knocked-down drywall frames shall not be acceptable.

.9 Jambs, heads, mullions, sills and center rails shall be straight and uniform throughout their lengths.

.10 Frame product shall be square, free of defects, wraps or buckles.

.11 Corner joints shall be profile welded (PW) (continuously welded on the inside of the profiles' faces, rabbets, returns and soffit intersections with exposed faces filled and ground to a smooth, uniform, seamless surface)"

.12 Joints at mullions, transom bars, sills or center rails shall be coped accurately, butted and tightly fitted, with faces securely welded, matching corner joint faces.

.13 All steel mullions will be fabricated from the same materials as specified for the steel frames. Steel mullions will be fabricated as a fully assembled three piece unit consisting of a front, back and full height one piece attachment clip as per Fleming F Series. The attachment clip will completely fill the stop area of the mullion on both sides and span the void between each side forming a grid channel like structure. Mullions used as hinge mullions or strike mullions between doors will be filled with grout by the general contractor either prior to or following installation of the frame. The head of the frame shall have an opening sufficient for the grout to be poured in to the mullion.

.14 Mullions shall be fabricated with continuous 20 gauge galvanneal steel internal reinforcing clips.

.15 Frame product shall be fabricated with integral door stops having a minimum height of 16mm.

.16 Glazing stops shall be formed 20 gauge steel, 16mm height channel, accurately fitted, butted at corners and fastened to frame sections with #6 x 32mm oval head scrulox (self-drilling) type screws at 300mm on center maximum.

.17 Where required due to site access, as indicated on the Architects' schedules or details, when advised by the contractor responsible for co-ordination or installation, or when shipping limitations so dictate, frame product shall be fabricated in sections for splicing in the field.

.1 Field spliced jambs, heads and sills shall be provided with 16 gauge steel splice plates securely welded into one section, extending 100mm minimum each side of splice joint.

.2 Field splices at closed sections (mullions or center rails) shall be 16 gauge steel splice angles securely welded to the abutting member. Face of splice angle shall extend 100mm minimum into closed sections when assembled.

.3 Field splice joints shall be welded, filled and ground to present a smooth uniform surface by the contractor responsible for installation after assembly.

.18 Each door opening shall be provided with two (2) temporary steel jamb spreaders welded to the base of the jambs or mullions to maintain proper alignment during shipping and handling. Spreaders shall be removed by the contractor responsible for installation prior to anchoring of frame to floor.

.19 Each door opening shall be prepared for GJ-64 or equivalent, single stud door silencers, three (3) for single door openings, two (2) for double door openings. Silencers shall be shipped loose for installation by the contractor after finish painting.

.20 Unless ineligible due to design, size, hardware or glazing specified on the Architects' or Hardware Suppliers' schedules or details, fire labeled frame product shall be provided for those openings required fire protection ratings as determined and scheduled by the Architect.

.2 Hardware Preparations

.1 Frame product shall be blanked, reinforced, drilled and tapped for fully templated mortised hardware only, in accordance with the final approved schedule and templated provided by the hardware supplier.

.2 Frame product shall be factory blanked and reinforced only for mortised hardware that is not fully templated.

.3 Frame product shall be reinforced only for surface mounted hardware.

.4 Drilling and tapping for surface mounted hardware or mortised hardware that is not fully templated shall be by the contractor responsible for installation on site, at the time of application.

.5 Frames shall be prepared for 114.3mm standard weight hinges (minimum).

.6 Hinge and pivot reinforcements shall be 10 gauge steel minimum reinforcing, high frequency type shall be provided.

.7 Hinge reinforcements for acoustic frames and frames in excess of 2450mm rabbet height shall be 10 gauge minimum with each cutout provided with 114.3mm heavy weight (4.6mm) high frequency type.

.8 Strike reinforcements shall be 16 gauge steel minimum.

.9 Reinforcements for surface mounted hardware, concealed closers and holders and flush bolts shall be 12 gauge steel minimum.

.10 Mortised cutouts shall be protected with 22 gauge steel minimum guard boxes.

.11 Where electrically or electronically operated hardware is specified on the Architects schedules or details or the final approved schedule and templates provided by the hardware supplier, hardware enclosures and/or junction boxes, where indicated on templates, shall be provided and inter-connected with CSA Approved 12.7mm diameter conduit and connectors.

.12 Prepare frames to receive security door contacts – refer to electrical drawings for locations. Door contacts to be installed at 100 mm from the latch side door edge.

.3 Anchorage:

.1 Frame product shall be provided with anchorage appropriate to floor, wall and frame construction.

.2 Each wall anchor shall be located immediately above or below each hinge reinforcement on the hinge jamb and directly opposite on the strike jamb, except as indicated below.
.3 Frame product installed in unit masonry partitions shall be provided with 4.0mm diameter steel wire anchors, 18 gauge steel adjustable stirrup and strap or "T" type anchors as conditions dictate.
.4 Where frame product is installed prior to construction of the adjacent wall, each jamb shall be provided with 16 gauge steel floor anchors. Each anchor shall be provided with two (2) holes for mounting to the floor and shall be securely welded to the inside of the jamb.
.5 Floor anchors for thermally broken exterior frames shall be designed so as not to permit thermal transfers from exterior to interior surfaces of the frame sections.
.6 Frame product installed in drywall partitions shall be provided with 20 gauge steel snap-in or "Z" type stud type anchor.
.7 Jambs of frames in previously placed concrete, masonry or structural steel shall be punched and dimpled to accept machine bolt anchors, 6.4mm diameter, located not more than 150mm from the top and bottom of each jamb. Anchor preparations and guides shall also be located immediately above or below the intermediate hinge reinforcings and directly opposite on the strike jamb. Each preparation shall be provided with 16 gauge anchor bolt guides.
.8 Anchor bolts and expansion shell anchors for the above preparations shall be provided by the contractor responsible for installation.
.9 After sufficient tightening of the anchor bolts, the heads shall be welded do as to provide a non-removable application. Welded bolt head and dimple shall be filled and ground to present a smooth uniform surface by the contractor responsible for installation, prior to finish painting.
.10 Where indicated on the Architects' schedules or details, channel extensions shall be provided from the top of the frame assembly to the underside of the structure above. Extensions shall be fabricated from 12 gauge steel formed channel, mounting angles welded to inside of frame head and adjusting brackets. Formed channels, adjusting brackets and fasteners shall be shipped loose. Channels shall be mechanically connected to mounting angles and adjusting brackets with supplied fasteners, on site, by contractor responsible for installation.

.4 Finishing:
.1 Remove weld slag and spatter from exposed surfaces.
.2 All tool marks, abrasions and surface blemishes shall be filled and sanded to present smooth and uniform surfaces.
.3 On exposed surfaces where zinc has been removed during fabrication, frame product shall receive a factory applied touch-up primer.
.4 Primer shall be fully cured prior to shipment.

2.4 Sizes and Tolerances

1. All sizes and tolerances shall be in accordance with the Canadian Steel Door Manufacturers Association "Recommended Dimensional Standards for Commercial Steel Doors and Frames" as follows:

.1 Widths of door openings shall be measured from inside of frame jamb rabbet with a tolerance of +1.6mm, -0.8mm.
.2 Heights of door openings shall be measured from the finished floor (exclusive of floor coverings) to the head rabbet of the frame with a tolerance of ± 1.2mm.
.3 Unless builders' hardware dictates otherwise, doors shall be sized so as to fit the above openings and allow a 3mm clearance at jambs and head. A clearance of 19mm between the bottom of the door and the finished floor (exclusive of floor coverings) shall be provided. Tolerances on door sizes shall be ± 1.2mm.
.4 Manufacturing tolerances on formed frame profiles shall be ± 0.8mm for faces, door stop heights and jamb depths. Tolerances for throat openings and door rabbet shall be ± 1.6mm and ± 0.4mm respectively. Hardware cutout dimensions shall be as per template dimensions, +0.4mm, -0.

2.5 Hardware Locations

1. Hardware preparations in frame product shall be as noted below and locations on doors shall be adjusted for clearances specified in 2.4.

2. Top of upper hinge preparation for 114.3mm hinges shall be located 180mm down from head, transom mullion or panel as appropriate. The top of the bottom hinge preparation for 114.3mm hinges shall be located 310mm from finished floor as defined in 2.4.3. Intermediate hinge preparations shall be spaced equally between top and bottom cutouts. For dutch door frames, top and bottom hinge locations shall be as above, with the tops of intermediate hinges located at 930mm and 1403mm from finished floor.

3. Strike preparations for unit, integral, cylindrical and mortise locks and roller latches shall be centered 1033mm from finished floor. Strikes for deadlocks shall be centered at 1200mm from finished floor. Strikes for panic or fire exit hardware shall be located as per device manufacturer's templates.

4. Push and/or pulls on doors shall be centered 10701mm from finished floor.

5. Preparations not noted above shall be as per hardware manufacturer's templates.

6. Hardware preparation tolerances shall comply with the ANSI A115 series standards.

PART 3 - EXECUTION

3.1 Site and Protection of Materials

1. The contractor responsible for installation shall remove wraps or covers from door and frame product upon delivery at building site.

2. All materials shall be thoroughly inspected upon receipt and all discrepancies, deficiencies and/or damages shall be immediately reported in writing to the supplier. All damage shall be noted on the carriers' Bill of Landing.

3. Contractor responsible for installation shall ensure all materials are properly stored on planks or dunnage in a dry location. Product shall be stored in a vertical position, spaced with blocking to permit air circulation between them. Materials shall be covered to protect them from damage from any cause.

4. Contractor shall notify the supplier in writing of any errors or deficiencies in the product itself before initiating any corrective work.

3.2 Installation

1. Install doors and frames in accordance with the Door and Hardware Institute "Installation guide for doors and hardware".

2. Set frame product plumb, square, aligned, without twist at correct elevation.

3. Frame Product Installation Tolerances:

    .1 Plumbness tolerance, measured through a line from the intersecting corner of vertical members and the head to the floor, shall be $\pm$ 1.6mm.
    .2 Squareness tolerance, measured through a line 90^0 from one jamb at the upper corner of the product, to the opposite jamb, shall be $\pm$ 1.6mm.
    .3 Alignment tolerance, measured on jambs, through a horizontal line parallel to the plane of the wall, shall be $\pm$ 1.6mm.
    .4 Twist tolerance, measured at face corners of jambs, on parallel lines perpendicular to the plane of the wall, shall be $\pm$ 1.6mm.

4. Fire labeled product shall be installed in accordance with NFPA-80.

5. Secure anchorages and connections to adjacent construction.

6. Brace frame product rigidly in position while building-in. Remove temporary steel shipping jamb spreaders. Install wood spreaders at mid points of frame rabbet height and at floor level to maintain frame widths. Provide vertical support at center of head for openings exceeding 1250mm in width. Remove wood spreaders after product has been built-in.

7. Frame product in unit masonry shall be fully grouted in place.

8. Install doors maintaining clearances outlined in Section 2.4.

9. Install louvers and vents.

10. Adjust operable parts for correct clearances and function.

11. Steel surfaces shall be kept free of grout, tar or other bonding materials or sealers.

12. Any grout or other bonding material shall be cleaned from products immediately following installation.

13. Exposed field welds shall be finished to present a smooth uniform surface and shall be touched-up with a rust inhibitive primer.

14. Exposed surfaces that have been scratched or otherwise marred during shipment, installation or handling shall be touched-up with a rust inhibitive primer.

15. Finish paint in accordance with Section 09900.

16. Install glazing materials and door silencers.

End of Section

PART 1 - GENERAL

1.1 General Finish Notes

1. The Material and Colour Schedule will be issued by the Consultant after tender. It shall be read in conjunction with the Drawings, Specifications, Room Schedule and Door Schedule. Colour and material references named will be based on one manufacturer, as carried by the Contractor or, in the case that no specific manufacturer is carried, based on the Consultant's choice.

2. Approved alternative manufacturers will be acceptable only as indicated in the specifications. However, approved alternate products submitted must match the products named in the Specification to the Consultant's selection. Alternate products other than those named in the specifications will not be allowed unless previously approved by the Consultant.

3. Consult Architect prior to painting any surface not included in the formulae as listed.

4. Final colour for exterior painted surfaces and prominent interior areas shall be approved on the job site by the Architect.

5. Paint samples: Contractor to submit paint samples for all areas required to "Match Adjacent Finish".

6. All similar paint formulations are to be identical when dry. Variations in tone, texture or sheen shall not be accepted.

7. Submit two 300 mm x 300 mm paint samples of each colour required for approval by the Architect.

8. Exact locations of accent paint called for in the Material and Colour Schedule, to be issued after Contract award, not specifically identified on the drawings are to verified on site with the Architect.

1.2 Exterior Finish Notes

1. All exposed metal (doors, frames, lintels, stairs, handrails, mechanical equipment, etc.) to be painted except for prefinished metal louvres, stainless steel, and aluminum. Mechanical equipment is to be painted whether delivered to the site prepainted or not (exhaust fans, goosenecks, exhaust stacks, supports, HVAC units, HRU units, etc.). Colours to match adjacent material-generally either to match brick or tan to match flashing or siding material. Do not paint exposed white PVC pipe covers on interior. Architect will advise on jobsite which other items mentioned above, if any, do not require painting.

2. All unfinished metal work provided by landscaping is to be painted by Section 09900.

1.3 Interior Finish Notes:

1. All heating units, recessed convectors, grilles, pipes, access panels, hangers and miscellaneous exposed metal work (except stainless steel or anodized aluminum) to be painted to match the surfaces on which they occur unless noted otherwise on the colour schedule, prefinished in suitable colour or directed by the Architect. If prefinished equipment is damaged, it shall be re-painted. Painting to be by formulations specified in Section 09900.

2. All interior fitments, casework, millwork, etc. to be melamine unless otherwise noted. Refer to Sections for specific requirements regarding materials, construction, finishes and hardware. Note that drawer and cupboard interiors are to be considered as exposed surfaces and will therefore be finished.

3. Do not paint over nameplates, identification tags, etc.

4. Make good all existing surfaces and finishes that are damaged during construction.

1.4 Abbreviations Legend

1. Refer to Room Finish Schedule for abbreviations Legend.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Gypsum Board: Section 09250
2. Rough Carpentry Section 06100

1.2 Reference Standards

1. Do work to CSA A82.31-1977, except where specified otherwise.

PART 2 - PRODUCTS

2.1 Materials

1. Metal Studs: non-load bearing channel stud framing to ASTM C645-09a, roll formed from 0.59 mm thickness electro-galvanized steel sheet for screw attachment of gypsum lath and metal lath, and with service access holes.

2. Structural Metal Studs: CSA-S13-01 and hot-dipped galvanized to ASTM A525M-87, minimum 1.22 (18ga.) use thicker materials where required to suit structural requirements. Framing shall be designed by a licensed professional engineer registered in the province of Ontario. Follow fabrication standards ASTM C955.

3. Floor and ceiling tracks: to ASTM C645-09a in width to suit stud sizes, 30 mm legs for floor track, 50 mm for ceiling track.

4. Metal channel stiffener: 38 mm size, 2 mm thick cold rolled galvanized steel.

5. Furring channels (channels, hangers, tie wire, insert, anchor): CGSB 7.1-98-CAN/CGSB.

6. Touch-up Zinc Rich Paint: CAN/CGSB-1.181-92.

PART 3 - EXECUTION

3.1 Stud Partitions

1. Align partition tracks at floor and underside of structure above and secure at 24” o.c. maximum. All partitions to extend to underside of structure above.

2. Place studs vertically at 16” o.c. and not more than 2” from abutting walls and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs, as required, to provide rigid installation to manufacturer's instructions.

3. Erect metal studding to tolerance 1:1000.

4. Attach studs to bottom track using screws.

5. Coordinate simultaneous erection of studs with installation of service lines. When erecting studs, ensure web openings are aligned.

6. Install steel frames and anchor frames securely to studs using minimum of three (3) anchors per jamb for jambs up to 84” high and a minimum of four (4) anchors per jambs for jambs over 84” high.

7. Provide two (2) studs at each side of openings wider than stud centre specified.

8. Install, cut to length, piece of runner horizontally over door frames.

9. Provide 38 mm x 89 mm vertical and horizontal wood studs secured between metal studs for attachments of bathroom fixtures, accessories, cabinet work, and other fixtures, including grab bars, towel rails, attached to steel stud partitions.

10. Install steel stud or furring channel between studs for attaching electrical and other boxes.

11. Extend all partitions to underside of structure above for sound and fire separation.

12. Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.

3.2 Ceiling Furring

1. Install runners level to tolerance of 1/8” over 11’-8”. Provide runners at interruptions of continuity and change in direction.

2. Frame with furring channels, perimeter of openings to accommodate access panels, light fixtures, diffusers, grilles, etc.

3. Furring for bulkheads within or at termination or ceilings.

4. Install furring channels at 16” o.c. maximum.

3.3 Wall Furring

1. Install steel furring, as indicated.

2. Frame opening and around built-in equipment on four (4) sides with channels.

3. Box-in beads, columns, pipes, and around exposed services.

3.4 Fire-rated Assemblies

1. Where required, install Metal Stud System and Furring in accordance with appropriate ULC Design and with supplement to the National Building Code of Canada 1985.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Metal Stud System — Section 09111
2. Painting — Section 09900
3. Access Doors: — refer to related mechanical and electrical

1.2 Reference Standards

1. Do work to CSA A82.31-1977, except where specified otherwise.

PART 2 - PRODUCTS

2.1 Gypsum Board

1. Plain: to CSA A82.27-M1977 standard, 5/8” thick or as indicated, tapered edges.
2. Plain: to CSA A82.27-M1977, Fire-rated Type X, 5/8” thick or as indicated, tapered edges.
3. Plain: to CSA A82.27-M1977, Washroom walls 5/8” dens-shield where CWT is being installed or as indicated, tapered edges.

2.2 Fastenings and Adhesives

1. Screws: to CSA A82.31-1977.
2. Adhesive: to CGSB 71 GP 25M.
3. Laminating Compound: to CSA A82.31-1077.
4. Concrete Anchors: Phillips Red Head TW-614 or equivalent. Do not use powder activated fasteners for ceiling support.
5. Tie Wire: #16 ga. galvanized soft annealed steel wire.

2.3 Accessories

1. Casing Beads and Corner Beads: 0.5 mm base thickness commercial sheet steel with G90 zinc finish to ASTM A 525-78 A.
2. Joint compound: to CSA A82.31-1977, asbestos-free.
3. Caulking: Acoustical sealant.

PART 3 - EXECUTION

3.1 Gypsum Board Application

1. Do not apply gypsum board until bucks, anchors, blocking, electrical and mechanical work are approved.

2. Apply single and double layers gypsum board to metal furring or framing, using screw fasteners and laminating adhesive. Maximum spacing of screw 12” oc.

3. Apply gypsum board to concrete block surfaces, where indicated, using laminating adhesive.

4. Apply type x gypsum board where indicated, in accordance with U.L.C. requirements and with supplement to the National Building Code of Canada to obtain the required fire protection, fire rating and fire separation.

3.2 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 secure. Mitre and fit corners accurately, free from rough edges.

2. Install casing beads around perimeter of suspended ceilings.

3. Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated.

3.3 Access Doors

1. Install access doors to electrical and mechanical fixtures specified in respective Sections.

2. Rigidly secure frames to furring or framing systems.

3.4 Taping and Filling and Sound Seal

1. Seal with acoustical sealant at ceilings, floors, wall intersections and all penetrations such as electrical outlets.

2. 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.

3. Finish corner beads, control joints and trim as required with two (2) coats of joint compound and one (1) coat of taping compound, feathered out onto panel faces.

4. 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.

5. Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

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

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Sealants: Section 07900

1.2 Reference Standards

1. Do tile work to Installation Manual 200-1979, "Ceramic Tile," produced by Terrazzo Tile and Marble Association of Canada (TTMAC).

1.3 Environmental Conditions

1. Main minimum 13 deg. C air temperature at tile installation area for 24 hours prior to, during and 48 h after installation. Do not proceed without the correct tiles or if substrate conditions are not suitable.

1.4 Maintenance Material

1. Provide one FULL box of additional tiles of each type and color of tile required for project for maintenance use. Store where directed. Clearly identify each box.

2. Maintenance material to be of same production area as installed material.

1.5 Extended Warranty:

1. Submit a warranty for entire wall tile installation, covering materials and labour and the repair or replacement of defective work, but for three (3) years total.

PART 2 - PRODUCTS

2.1 Thin-Set Mortar

1. Latex-Portland Cement Mortar to ANSI A118.4

2.2 Wall Tile

1. **Ceramic Wall Tile** (**CT):** to CAN2-75, 1-M77, Type 5, Class MR-4, 8” x 20” matte Colour and Dimension Series as supplied by Olympia Tile. Colours as selected by consultant up to (2) colours including. Stacked bond pattern.

2. Tile complete wall to underside of ceiling unless indicated otherwise.

2.3 Grout

1. Wall Grout: to ANSI A118.6; polymer-modified unsanded grout; eg. Mapei Keracolor U, multiple colours, max. two (2) colours for any room, as selected by Consultant.

2. Floor Grout: to ANSI A118.6; polymer-modified sanded grout; eg. Mapei Keracolor S, multiple colours, max. two (2) colours for any room, as selected by Consultant. Mould resistant grout in shower areas.

3. Shower Grout: Mold resistant Epoxy based grout by Mapei – Kerapoxy suitable for wet areas.

2.4 Accessories

1. Tile Edging - Schluter – Jolly for edge protection. Typical at all exposed CWT edges.

2. Control Joints – Schluter – Dilex –KSN for floors and walls with Tiles.

PART 3 - EXECUTION

3.1 Workmanship

1. Apply tile to clean and sound surfaces.

2. Fit tile around corners, fitments, fixtures, drains and other built-in objects to maintain uniform joint appearance. Cut edges smooth, even and free from chipping. Edges resulting from splitting, not acceptable.
3. Maximum surface tolerance 1:800 for walls, floors.

4. Make joints between tile uniform, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.

5. Lay out tiles so perimeter tiles are minimum 1/2 size.

6. Sound tiles after setting and replace hollow-sounding units to obtain full bond.

7. Make internal angles square, external angles rounded.

8. Use round edged tiles at termination of wall tile panels, except where panel butts projecting surface or differing plane.

9. Install soap dishes into block recess. Fit tiles around soap dishes.

10. Allow minimum 24 hours after installation of tiles before grouting.

11. Clean installed tile surfaces after installation and grouting cured.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Sealants: caulking — Section 07900

1.2 Reference Standards

1. Do tile work to Installation Manual 200-1979, "Ceramic Tile," produced by Terrazzo Tile and Marble Association of Canada (TTMAC), except where specified otherwise.

1.3 Maintenance Material

1. Provide maintenance data for tile work for incorporation into Maintenance Manual specified in Section 01720.

2. Provide 12 additional tiles of each type and color of tile required for project for maintenance use. Store where directed. Clearly identify each box.

3. Maintenance material to be of same production area as installed material.

1.4 Environmental Requirements

1. Air temperature and structural base temperature at tile installation area must be above 13 degrees C for 24 hours before, during and 24 hours after installation.

1.5 Extended Warranty:

1. Submit a warranty for entire flooring tile installation, covering materials and labour and the repair or replacement of defective work for three (3) years total.

PART 2 - PRODUCTS

2.1 Tiles

1. Designation PT: porcelain tile to CAN 2-75-1M77.

    .1 Basis of design: Lea Stone Series distributed by Olympia tile, size 300 mm x 600 mm, up to two colours. Acceptable alternates by Centura and Crossville.

2.2 Accessories

1. Control Joints – Schluter – Dilex –KSN for floors and walls with Tiles.
2. Transition Strips with other floor finishes– Schluter – Schiene, or as needed.

2.3 Setting Materials

1. Cement Mortar: Mixture of 1 part Portland cement, 4 parts dry sand and 1/10 hydraulic lime. Materials shall conform to the following:

2. Portland Cement: To CAN3-A, Type 10.
3. Hydrated Lime: To ASTM C-206 or 207, Type 5.

4. Sand: To CSA A82.56, passing 1.6 mm sieve.

5. Water: Potable, containing no contaminants which cause efflorescence.

6. Thin Set Mortar: field mixed, blended sand-Portland cement-latex mortar, “Kerapoxy” by Mapei, distributed by Midgley and West, Hamilton Ontario.

    .1 Acceptable Alternates: “Laticrete 4237 distributed by Ceratec Inc., or Flextile 52 thin set.
    .2 Latex Additive: “Cemtex” by Master Builders, Laticrete 2022” distributed by Ceratec Inc.

2.4 Grout

1. Sanded, Portland cement based with Plastijoints acrylic additive, Kerncolour / Floor by Mapei or similar by Laticrete. Colour as selected by Architect.

PART 3 - EXECUTION

3.1 Workmanship

1. Apply tile to clean and sound surfaces.

2. Fit tile units around corners, fitments, fixtures, drains and other built-in objects to maintain uniform joint appearance. Make cut edges smooth, even and free from chipping. Edges resulting from splitting not acceptable.

3. Maximum surface tolerance: 1:800.

4. Make joints between tiles uniform and approximately 3 mm wide, (maximum 4 mm) plumb, straight, true, even and with adjacent units flush. Align patterns.

5. Lay out units so perimeter tile are minimum 1/2 size.

6. Install floor tiles as per pattern. Pattern will be supplied by architect at a later date.

7. Sound tiles after setting and replace hollow sounding units to obtain full bond.

8. Make internal angles square, external angles chamfered at 45° with narrow tile strip.

9. Construct base, as indicated on drawings, with rounded top edge.

10. Use bullnose edged tiles at termination of wall tiles, except where tiles abut projecting surface or differing plane.

11. Seal grouted joints with sealer.

12. Clean installed tile surfaces after installation cured.
13. Keep building expansion joints free of mortar or grout.

14. Tiles must be flush with adjacent dissimilar finishes. Add leveler at lower floor finishes to porcelain tile at all door openings, feather back as required to eliminate visible elevation difference around doorways. Typical at all locations.

15. Install steel floor termination strip at all door openings where porcelain tile meets VCT.

3.2 Setting System

1. Install porcelain floor tiles in accordance with TTMAC applicable thinset detail.

End of Section

PART 1 - GENERAL

1.1 Reference Standards

1. Fabrication: to ASTM 365-78 and CAN/GSB-92.1-M77.

2. Installation: to ASTM C636-76, except where specified otherwise.

1.2 Design Criteria

1. Maximum deflection 1/360 of span to ASTM 365-78 deflection test.

1.3 Samples

1. Submit two each 12” x 12” samples of each individual tile and grid type in accordance with Section 01340.

1.4 Warranty

1. Submit an extended warranty covering materials and labour and the repair or replacement of defective work but for two (2) years total.

PART 2 - PRODUCTS

2.1 Materials

1. **Acoustic Panel Type (ACT-1)**
    1. **ACT-1**: 610 mm x 1220 mm x 25mm, fine fissured, square lay-in, #1729 by Armstrong. Suspension system: 15/16” Prelude XL, white, by Armstrong.
    2. Acceptable equal as manufactured by CGC.

2. **Exposed Tee Bar Grid Components:** Cold rolled steel, zinc coated, shop painted, satin sheen, white, interlocking, main and cross tee of double web with rectangular bulb, depth governed by span, 1” exposed face.

3. **Hangers:** 1/8” galvanized soft annealed steel wire. Maximum spacing 12.0 feet.

4. **Accessories:** splices, clips, retainers, etc., to complement suspension system components.

2.2 Installation

1. Co-ordinate suspension system with related components.

2. Install acoustic units parallel to building lines with edge unit not less than 50% or unit width.

3. Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.

4. Support suspension system main runners at 48” oc maximum with hangers from structure. Assembly shall support super-imposed loads. Maximum permissible deflection, 1/360 of span.

5. Attach cross member to main runner to provide rigid assembly.
6. Install suspension assembly to manufacturer's written instructions.

7. Install flush edge moulding at junction of acoustic unit ceiling and other materials around entire length of joint. Secure to construction. Butt joints neatly, square and true in alignment.

8. Set acoustic units in place.

9. Set all ceiling levels by the use of transit or laser level.

10. Provide for Owner one (1) complete carton of each type of ceiling tile.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Not applicable.

1.2 Maintenance Data

1. Provide data for maintenance of resilient flooring for incorporation into Maintenance Manual.

1.3 Environmental Requirements

1. Maintain minimum 20 deg. C air temperature at flooring installation area for three (3) days before, during and for seven (7) days after installation.

PART 2 - PRODUCTS

2.1 Materials

1. **Vinyl composition tile (VCT):** to ASTM F 1066-1995 a, Type A design, asbestos free, 3 mm thick, 300 mm x 300 mm size Standard Excelon, Imperial Texture by Armstrong. **Acceptable Alternate**: Mannington Commercial: Designer Essentials Series full range.

2. **Resilient rubber base (RB):** top set coved, 3 mm thick, rubber, 100 mm high minimum 1200 mm long, including premoulded end stops and external corners. Acceptable materials: non-shrink Rubber Wall Base with toe as manufactured by Johnsonite. Colours: Three (3) from full Johnsonite/ Tarkett "Coloright" colour line.

3. **Transition Strips:** aluminum, Reno-T same height by Schluter or equivalent.

4. **Primers and adhesives:** waterproof, recommended by flooring manufacturer for specific material on applicable substrate, above, at or below grade. Use Johnsonite 990 Solvent Free Environmentally Safe White Acrylic Cove Base Adhesive for rubber base.

PART 3 - EXECUTION

3.1 Inspection

1. Ensure concrete floors are dry, by using test methods recommended by tile manufacturer, and inspect for negative alkalinity, carbonization or dusting.

2. Commencement of work indicates acceptance of conditions by flooring installer.

3.2 Subfloor Treatment

1. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with subfloor filler.

2. Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured.

3. Ensure of smooth transition between any raised surfaces at door ways. Prepare subfloor with leveling compound to ensure smooth transition. Typical where VCT meets PT floors.

3.3 Tile

1. Apply adhesive uniformly using recommended notched trowel in accordance with Flooring Manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place.

2. Lay flooring with joints parallel to building lines to produce symmetrical tile pattern. Border tiles - minimum half tile width or as indicated by drawings and Finish Schedule.

3. Cut tile and fit neatly around fixed or excessively heavy objects.

4. Install flooring in pan type floor access covers and all clean out covers, where applicable. Maintain floor pattern.

5. Terminate flooring at center line of door in openings where adjacent floor finish or color is dissimilar.

6. Install metal edge strips at unprotected or exposed edges where flooring terminates.

7. At doorways to incrapack units, extend tile and base fully into door opening to incrapak classroom.

3.4 Base Application

1. Set base in adhesive tightly against wall and floor surfaces. Use lengths as long as practicable and not less than minimum 500 mm long.

2. Install straight and level to variation of 1:1000.

3. Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.

4. Miter internal corners. Use premoulded corner pieces at all external corners and ensure full adhesion through to ends of corner pieces. See detail for termination at door frames.

5. Leave in the building one (1) complete carton of each of two (2) colours of floor tile and twelve (12) tiles of each of the remaining colours. Colours of extra tile to be specified by Architect.

3.5 Initial Maintenance after Installation

1. Broom sweep or vacuum thoroughly.

2. Do not wet mop, wash, scrub, or strip the floor. These procedures will be done by the Owner.

3.6 Protection of Work

1. Following broom sweeping, protect new floors with 0.15 mm thick Polyethylene cover and lay planking in all necessary traffic areas to minimize damage by other trades. Maintain until just before final inspection.

3.7 Preparation for Inspection

1. Only if so notified by Architect, and in the presence of the Owner, scrub the floor using a neutral detergent and a floor machine of 170-250 rpm capability equipped with a scrub brush or a scrubbing pad (3M blue or equal).

2. Lightly rinse and allow to dry. Note: Do not flood the floor with rinse water, scrubbing, or stripping solutions. Final re-washing, if required, and waxing will be done by owner.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Not applicable.

1.2 Reference Standard

1. Ontario Painting Contractors Association (OPCA) Architectural Specification Manual - referenced as OPCA Manual, latest Edition. Paint formulations and methods referred to herein refer to this Manual. If contractor is unfamiliar with this reference standard, contact the OPCA.

1.3 Product Data

1. Submit to Architect, for review, product data for all formulas, including manufacturer's trade names.

2. Paint Manufacturer will provide periodic reviews and reports to Architect regarding work in this Section and if Contractor is adhering to manufacturer’s product specifications.

1.4 Environmental Requirements

1. Do not apply paint finish in areas where dust is being generated.

2. Conform to requirements of OPCA Manual.

3. Comply with the requirements of Health and Environmental Specifications.

1.5 Extent of Painting

1. For new construction, for rooms shown in room finish schedule to have painted walls, paint all non prefinished surfaces unless indicated otherwise, and repaint prefinished surfaces where indicated.

2. For existing construction, for rooms shown in room finish schedule to have repainted walls:
   - Paint all non prefinished new surfaces unless indicated otherwise.
   - Repaint prefinished surfaces where indicated.
   - Repaint all previously painted surfaces unless indicated otherwise.

1.6 Finishes and Colours

1. Review the requirements outlined in Finish and Colour Notes.
   A separate colour schedule will be issued after contract award.

1.7 Warranty

1. Provide a two (2) year warranty on completion stating that the work has been performed with respect to the standards and requirements incorporated in the OPCA specification manual latest edition

PART 2 - PRODUCTS

2.1 Materials

1. Acceptable products: Per Chapter 5 OPCA Manual as listed.

2. Paint materials for each paint system to be products of a single manufacturer.

3. Use low-VOC and low-odour paints only.

PART 3 - EXECUTION

3.1 Preparation of Surfaces in new Construction

1. Prepare surfaces to receive paint per Chapter 3 OPCA Manual.

2. Prepare wood surfaces to CGSB 85-GP-1M.
   .1 Use CGSB 1-GP-126M vinyl sealer over knots resinous areas.
   .2 Apply wood paste filler to nail holes and cracks.
.3 Tint filler to match stains for stained woodwork.

3. Touch up shop paint primer on steel with CGSB 1-GP-40M to CGSB 85-GP-14M.

4. Prepare galvanized steel and zinc coated surface to CGSB 85-GP-16.

5. Prepare wallboard surfaces to CGSB 85-GP-33M. Fill minor cracks with plaster patching compound.

3.2 Preparation of Previously Painted Surfaces

1. Remove screws, bolts, nails, etc. from all surfaces to be painted

2. Remove all peeling and scaling paint by scraping and sanding.

3. Remove loose and broken pieces. Fill all holes, cracks and crevices with appropriate patching compound and match surrounding texture. Touch-up with appropriate primer.

4. Remove all dirt, grease, oil, wax and other contaminants by scrubbing with a detergent solution such as trisodium phosphate. Rinse with clean water.

5. All metal surfaces must be washed with mineral sprits. Change solvent and rags frequently. Remove all rust by sanding. Prime with rust inhibitive paint.

6. Dull all glossy surfaces by sanding.

7. Wash with solvent surfaces that have been subject to writing with marking pens, crayons, or lipsticks. Prime to stop bleeding.
8. For joints within or adjacent to exterior areas to be painted or cleaned, remove old cracked and loose caulking and replace with a high quality caulking compound.

3.3 Application

1. Sand and dust between each coat to remove defects visible from distance up to 60”.

2. Finish closets and alcoves as specified for adjoining rooms.

3. Apply each coat at the proper consistency. Each coat of finish should be fully dry and hard before applying the next coat, unless the manufacturer’s instructions state otherwise.

3.4 Mechanical and Electrical Equipment

1. Paint exposed conduits, pipes, hangers and other mechanical and electrical equipment occurring in finished areas as well as inside cupboards and cabinet work. Colour and texture to match adjacent surfaces, except as noted otherwise. Coordinate with mechanical trades applying banding and labeling after pipes have been painted. Do not paint white PVC covers on exposed mechanical water, drain and other lines

2. Paint gas piping standard yellow where visible on roof or in service spaces.

3. Paint surfaces inside of ductwork and elsewhere behind grilles where visible using primer and one coat of matte black paint.

4. Paint both sides and edges of plywood backboards for equipment before installation.

5. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

3.5 Paint Systems

1. System references listed are based on Chapters 4A and 4B of OPCA Manual and are OPCA Premium Grade, unless noted otherwise.

3.6 Interior Finishes

1. Wood, where applicable: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade.

2. Gypsum board - Ceilings and bulkheads - INT. 4-A, Alkyd Flat Finish, Premium Grade.

3. Gypsum board – walls: JNT4A, Alkyd eggshell, Premium Grade.

4. Concrete Block: INT. 8-B, Alkyd Semi-Gloss Finish, Premium Grade.

5. Galvanized metal: INT. 13-A, Alkyd Semi-Gloss Finish, Premium Grade.

3.7 Refinishing of Previously Painted Surfaces

1. Apply two (2) finishing coats of paint materials listed in Section 3.5 and 3.6 for the type of surface considered.

2. When satisfactory coverage can be achieved by only one (1) coat, the second coat is not required.

3. Apply additional coats if necessary to cover accent colours, graphics, etc.

End of Section

PART 1 - GENERAL

1.1 Shop Drawings

1. Submit shop drawings in accordance with Section 01340.

PART 2 - PRODUCTS

2.1 Fixtures

1. **Tackboard (TB)** - As manufactured by Architectural School Products, Mississauga; natural coloured cork tackboard:

    .1 Single layer cork sheet 6 mm thick; natural color, on 6 mm particle board to Can 3.188.1-M78, Grade R.
    .2 Extruded aluminum trim No. 205, 1.5 mm wall thickness, mitred, clear anodized finish
    .3 Concealed steel fastenings (1 coat CGSB 1-GP-81e baked primer) to toggle bolts. Do not fasten to wall with adhesive.
    .4 Acceptable alternates: Martack Specialties Limited.
    .6 Size and quantities as shown on plans.

PART 3 – EXECUTION

3.1 Installation

1. Install where indicated on drawings and as per manufacturer’s instructions.

End of Section

PART 1 - GENERAL

1.1 General Requirements

1. Division One, General Requirements is part of this Section and shall apply as if repeated here.

1.2 Related Work Specified Elsewhere

1. Toilet Partitions: Section 10165

1.3 Referenced Standards

1. ASTM A167-87: Specification for Stainless and Heat Resisting Chromium -Nickel Steel Plate, Sheet and Strip

2. ASTM A525: Standard Specification for General Requirements for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process (Metric)

3. CAN/CSA-G164-M92: Hot Dip Galvanizing of Irregularly Shaped Articles.

1.4 Shop Drawings

1. Submit shop drawings in accordance with Section 01300, for Consultant's review before fabrication. Shop drawings of units for use by the handicapped shall be distinctly marked and cross-referenced to the corresponding article in the specifications.

1.5 Quality Standard

1. This specification section is based generally on Bobrick equipment. Similar equipment and accessories by ASI Group Watrous and American Specialties Inc. are also acceptable.

PART 2 - PRODUCTS

2.1 Materials - Generally

1. Ferrous Steel: Sheet, cold-rolled furniture steel, double annealed, mill stretched and leveled, and fully pickled. Otherwise, steel shall be hot-rolled or cold-rolled of alloy to suit needs of fabrication, use, and appearance.

2. Stainless Steel: Type 304, conforming to ASTM A167-87, No. 4 finish.

3. Galvanized Steel: For sheet, Z275 zinc coating designation in accordance with ASTM Specification A525. For irregular sections, hot dip galvanized to comply with CSA G164.

4. Anchors and Fastenings: Where exposed, use stainless steel and otherwise to match metal anchored. Where non-exposed, use the same as that specified for exposed, or

use galvanized steel. Anchors and fastenings shall be of the type appropriate for the substrate to which accessory unit is secured.

2.2 Products

1. **Handicapped Grab Bars (GB)**: by Bobrick
   .1 GB-1: 750 mm x 750 mm "L" shaped grab bar beside water closet mounted as per OBC requirements. Series B-5898
   GB-2: 600 mm long bar behind water closet. Installed as per drawings. Series B5806
   GB-3: 750 mm long swing up grab bar. Series B-4998

   .2 All bars to have concealed mounting hardware.
   .3 Quantity: refer to drawings.
   .4 All bars to withstand horizontal and vertical pull of 2.2 kN

2. **Toilet Paper Dispenser (TPD)**: install only – Allow for installation of Owner supplied units.

3. **Paper Towel Dispensers (PTD)**: install only – Allow for installation of Owner supplied units.

4. **Soap Dispensers**: Install only - Allow for installation of Owner supplied units.

5. **Mirrors**:
   .1 **(M1)** B-290 series by Bobrick, stainless steel frame, vandal resistant mounting, 6 mm glass mirror with 15 year guarantee against silver spoilage. Size: 600 x 910 mm. Quantity: refer to drawings

   .2 Handicapped mirror **(M2):** B-293 series by Bobrick, tilt mirror, stainless steel. Size: 600 x 910 mm. Quantity: Refer to drawings.

6. **Sanitary Napkin Disposal (ND)**: Model B-270 by Bobrick
   .1 Stainless Steel
   .2 Quantity: at all female washrooms and unisex washrooms and stalls. Refer to drawings.

7. **Mop and Broom Holder (MH)**: Model B-223 x 24
   .1 Quantity: 1

8. **Vandal Resistant Clothes Hooks (CH)**: Model B-983
   .1 Stainless Steel
   .2 Quantity: as per drawings, one per barrier-free or universal washroom stall and one per shower drying area. Mounting height to be 1200 max.

2.3 Component Minimum Requirements

1. **Construction** Fabricate with materials, component sizes, metal gauges, reinforcing, anchors and fasteners of adequate strength to withstand intended use.
2. Where specified as frameless, provide stainless steel accessories with one-piece fronts having 90 degree formed returns at their edges and openings.

3. Where accessory fronts are framed, frame edges, both inside and outside, with 90 degree formed returns continuously welded and ground smooth at the corners. Doors shall also have 90 degree formed returns as specified.

4. Unless otherwise specified, hinges shall be semi-concealed stainless steel piano hinges extending full-length of hinged element. Provide hinged elements with concealed, mechanically-retained rubber bumpers for silent closing, and shall close flush with faces of fronts or frames.

5. Ensure that work will remain free of warping, buckling, opening of joints and seams, distortion and permanent deformation.

6. No exposed fixings permitted. Cut edges and openings square and smooth. Chamfer corners of edges and cut-outs 1.6 mm.

7. **Assembly** Accurately cut, machine and fit joints, corners, copes and mitres so that junctions between components fit together tightly and in true planes.

8. Fasten work with concealed methods, unless otherwise indicated on Drawings.

9. Weld all connections where possible, bolt where not possible and cut off bolts flush with nuts. Countersunk bolt heads, and provide method to prevent loosening of nuts. Ream holes drilled for fastening.

10. Welded joints shall be tight, flush, and in true planes with base metals. Make welds continuous at joints where entry of water into voids of members or assemblies is possible.

11. Provide for differential movements within assemblies and at junctions of assemblies with surrounding work.

12. Welds in exposed locations shall be ground and polished smooth.

13. **Finish Work:** Provide holes and connections for related work installed under other Sections of this specification, if applicable.

14. Cleanly and smoothly finish exposed edges of materials, including holes.

PART 3 - EXECUTION

3.1 Inspection of Site

1. Take site measurements to ensure that work is fabricated to fit surrounding construction around obstructions and projects in place, or as shown on drawings, and to suit service locations.

3.2 Installation

1. Install all accessories in accordance with manufacturer's instructions at their recommended mounting heights unless noted otherwise on drawings.

2. Securely fasten accessories plumb, true, square, straight, level, and accurately and tightly fitted together and to surrounding work. Install in locations shown and specified herein. Mounting heights as shown or in accordance with the OBC in the case of barrier-free accessories.

3. Work shall include anchor bolts, bolts, washers and nuts, lag screws, expansion shields, toggles, straps, sleeve brackets, clips, and other items necessary for secure installation, as required by loading and by Jurisdictional Authorities.
4. Attach work at wood by screws through countersunk holes in metal.

5. Attach work to masonry with lead plugs and non-corrosive fastenings, to support load with a safety factor of 3. Perform all drilling necessary to install the work.

6. Insulate between dissimilar metals or between metals and masonry or concrete with bituminous paint, to prevent electrolysis.

7. Coordinate installation with the work of other trades adjacent to accessories to achieve the reveals or other edge conditions shown, where their front faces are flush with the finished wall surfaces.

8. Owner to supply and install remainder of washroom accessories not specified here (toilet paper dispensers, etc.). Cooperate with Owner as required.

3.3 Cleaning Up and Adjustment

1. Upon completion of the work, or when directed, remove all traces of protective coatings or paper.

2. Test mechanisms, hinges, locks and latches, and where necessary, adjust and lubricate and ensure that accessories are in perfect working order.

End of Section

PART 1 - GENERAL

1.1 Description of Work

1. This section covers and includes the furnishing and installing of passenger hydraulic elevator equipment as hereinafter described. Refer to Division 1 for general project requirements.

2. All terms of this specification shall have their meaning defined in the American Society of Mechanical Engineers Safety Code for Elevators and Escalators A17.1 and hereinafter referred to as the ANSI A17.1 Code, including all revisions and authorized changes to date.

1.2 Related Work by Others

1. General contractor shall provide the following in accordance with the requirements of the ANSI A17.1 Code plus applicable Model Building Code. For specific rules, refer to ANSI A17.1, Section 300 for hydraulic elevators. State or local requirements must be used if more stringent.

    .1 Clear, plumb hoistway, with variations not to exceed 1/2" at any point. Minimum two hours of fire resistance rating of hatch walls.
    .2 75° Bevel guards on all projections, recesses or setbacks over 2" (4" for A17.1 2000 areas) except for loading or unloading.
    .3 Supports for rail brackets at pit, each floor and roof. Maximum allowable vertical spacing of rail supports, without backing. Divider beams between hoistway at each floor and roof, for guide rail bracket supports.
    .4 Supports for holeless jack synchronization cables to hatch walls in overhead. Hoist beam to be provided.
    .5 Light outlet, in center of hoistway (or in the machine room) as indicated by elevator contractor.
    .6 Recesses, supports, and patching, as required, to accommodate hall button boxes, signal fixtures, etc.
    .7 All barricades outside elevator hoistways as required.
    .8 Dry pit reinforced to sustain normal vertical forces from rails, holeless jack units and buffers. Pit floor to be level and free of debris.
    .9 Convenience outlet and light fixture in pit with switch located adjacent to the access door.
    .10 Where access to the pit is by means of the lowest hoistway entrance, vertical ladder of non-combustible material extending 42" minimum, 48" minimum for A17.1-2000 areas, above sill of access door or handgrips shall be provided to the same height.
    .11 Enclosed and protected machine room.
    .12 Access to the machine room and machinery space as required by the governing code or authority.
    .13 Lighting, convenience outlets, heating, cooling and ventilation of machine room, and machinery space. Machine room temperature to be maintained between 55 and 90 degrees F.
    .14 A fused disconnect switch for each elevator and light switch located per the National Electrical Code (NFPA No. 70), and where practical, located inside the

machine room adjacent to the door.
.15 Suitable copper feeder, ground and branch wiring circuits for signal system and power operated door, included main line switch. Feeder and branch wiring circuits for car light and fan, including main line switch.
.16 Clear access above ceiling, or metal/concrete raceways in floor, for oil line and wiring duct from machine room, if machine room is remote from elevator hoistway.
.17 Convenience outlet and telephone outlet on control panel.
.18 Cutout through machine room wall, 8" x 16", for oil line and wiring duct. Coordinate with elevator contractor at the building site.
.19 All conduit and wire runs remote from either the machine room or the hoistways.
.20 Heat, smoke or products of combustion sensing devices connected to elevator machine room terminals when such devices are required. Make contacts on the sensors should be sided for 120 volt D.C.
.21 Furnish and install finished flooring in elevator cab.
.22 Entrance walls and finished floors are not to be constructed until after door frames and sills are in place. Consult elevator contractor for rough opening size. When drywall construction is used, the general contractor shall supply the drywall framing so that the wall fire resistance rating is maintained.
.23 Where drywall or sheet rock construction is used for front walls, it shall be of sufficient strength to maintain the doors in true lateral alignment. Drywall contractor to coordinate with elevator contractor.
.24 Door frames are to be anchored to walls and properly grouted in place to maintain legal fire rating (masonry construction).
.25 The interface of the elevator wall with the hoistway entrance assembly shall be in strict compliance with the elevator contractor's requirements.
.26 Filling and grouting around entrances by general contractor as required.
.27 For sill support by the elevator contractor, hoistway capable of accepting anchor stud type fasteners must be provided.
.28 When fixtures are mounted in drywall, wall thickness may increase. The general contractor must coordinate requirements with the elevator contractor.
.29 Where openings occur, all walls and sill supports must be plumb.

1.3 Quality Assurance

1. The elevator contractor is a company specializing in manufacturing and installing elevator equipment with not less than five years successful experience.

2. All designs, clearances, construction, workmanship and material, unless specifically excepted, shall be in accordance with the requirements of the ANSI code, handicap accessibility, Americans with Disabilities Act and all codes having legal jurisdiction. The ANSI A17.1 Code shall govern except where codes having legal jurisdiction include more rigid requirements or conflict with the ANSI A17.1 Code.

3. The elevator shall follow design and manufacturing procedures, certified in accordance with International Organization for Standardization (ISO9001-2000) to meet product and service requirements for quality assurance for new products.

1.4 Submittals

1. The elevator contractor shall, after structural and architectural drawings are furnished,

submit complete working drawings, showing the location of all equipment, loads, and all other information necessary to render a totally functional elevator to the owner.

2. The elevator contractor shall provide finish samples upon request.

3. The elevator contractor shall provide wiring diagrams.

4. The elevator contractor shall provide Renewal Parts Catalogs and Maintenance Instructions.

1.5 Temporary Use

1. Temporary use of the car shall be negotiated with the elevator contractor if required and shall be in accordance with the terms and conditions of the elevator contractor's temporary acceptance form.

1.6 Warranty

1. The elevator contractor shall guarantee the material and workmanship of the equipment installed by him under these specifications and make good any defects not due to ordinary wear or to improper use which may develop within one year after the completion of the installation or acceptance thereof by beneficial use, whichever is earlier.

1.7 Proprietary Information

1. Any proprietary material, information or data contained in the equipment, or any component or feature thereof, remains the property of the elevator contractor. This includes, but is not limited to, tools, devices, manuals, software, source codes, access codes, object codes, passwords and remote monitoring feature, which is deactivated if elevator contractor maintenance is discontinued.

1.8 Maintenance

1. The elevator included in these specifications shall receive regular maintenance on each unit for a period of 12 months after the completion of work described herein or acceptance thereof by beneficial use, whichever is earlier.

2. Trained employees shall make periodic examinations and perform work including necessary adjusting, greasing, oiling and replacing parts to keep the elevator in operation, except parts that require replacement because of accidents, vandalism, misuse or negligence by parties other than the manufacturer.

3. The elevator contractor shall perform all work under this Agreement, except emergency minor adjustment call-back service, on overtime. The elevator contractor shall provide emergency minor adjustment call back service, 24 hours 7 days a week.

4. Should the owner request that examinations, cleaning, lubrication, adjustments, repairs, replacements or emergency minor adjustment callback service (unless included above) be performed on other than the elevator contractor's regular working hours of his regular

working days, the elevator contractor shall absorb the straight time labor charges and the owner shall compensate the elevator contractor for the overtime premium, travel time and expense at his normal billing rates.

5. The elevator control system can incorporate a built-in remote diagnostic module to relay the constant status of the elevator and control system to a 24 hours 7 days a week central monitoring facility. The remote monitoring device is capable of transmitting information on the current status of the elevator, including any malfunction, system error or shutdown.

PART 2 - PRODUCTS / OPERATIONS

2.1 Acceptable Manufacturers

1. Subject to compliance with requirements, provide products of one of the following manufacturers or approved equivalent, supplying 2500lb capacity in max. 8’-4” width by max. 5’-9” depth hoistway.

   .1 Schindler Elevator Corporation (Basis of Design – 330A product)
   .2 South Western
   .3 Thyssen Krupp
   .4 Vertechs Elevator

2.2 Elevator System and Components

1. Elevator Equipment Summary:

Building:	Parkdale Elementary School
Customer:	Hamilton-Wentworth District School Board
Location:	Hamilton, ON
Building Type:	School/College/University
Application:	Telescopic Holeless Dual Piston
Service:	General Purpose Passenger
Quantity:	1
Capacity:	2500 lbs
Speed:	100 fpm
Travel:	14 feet 0 inches
Landings:	2
Front Openings:	2
Rear Openings:	0
Operation:	Microprocessor Single Car Automatic Operation
Machine Room:	Adjacent to elevator hoistway.
Platform Size:	7'-0" wide x 5'-6" deep
Cab Height:	8'-0"
Guide Rails:	16 lb. per foot
Hoistway Entrances:	3'-6" wide x 7'-0" high SSSO doors
Power Supply:	208 Volts 3 Phase 60 Hz
Contract Maintenance:	12 months with emergency callback, 24 hours 7 days a week

2. Additional Features:
   Anti-Stall Feature
   Braille and Audible Signals
   Door Open and Close Stall Protection
   Emergency Lighting
   Firefighter's Service, sensors by others
   Independent Service Feature
   Infrared Light Curtain Door Protection
   Low Oil Return
   Overload Sensors
   Phase Protection
   Start Type: Soft Start
   Cab Pads and Fasteners: 1 set(s)
   Certificate Frame
   Digital Hall Position Indicator at main floor(s)
   Hoistway Access Switch at top floor(s)
   Locking Service Panel in Car Operating Panel
   Pressure Switch
   Remote Monitoring Capable
   Battery powered lowering Rescue Feature
   Telephone (ADA compliant)
   Key switch at hall stations

2.3 Materials and Components

1. Stainless steel and bronze shall have #4 satin or #8 mirror finish as specified herein. Baked enamel colors, if specified, shall be chosen by the architect from elevator manufacturer's standard color selections.

2. Aluminum used for threshold and hoistway entrance sills shall be extruded; aluminum used for exposed frames in suspended ceilings shall be anodized.

3. Plastic laminates shall be general purpose type and meet flame spread ratings as required by code. Pattern shall be selected from the elevator contractor's standard selection.

4. Motors, pumps, valves, fluid tank, hydraulic fluid, microprocessor controller, controls, pushbuttons and wiring shall be UL or CSA approved.

5. Spring buffers, attachment brackets and anchors shall be designed and sized according to code with safety factors.

6. Pump shall be of the positive displacement screw type, designed for steady discharge with minimal pulsations.

7. A muffler shall be provided to reduce noise transmission.

8. A holeless dual jack system that utilizes two mechanically synchronized jacks shall be provided. The jacks are located at each side of the car and connected to the elevator structure. An external mechanical assembly shall be used to synchronize the jack

section movement as the elevator travels up and down the hoistway, if two or more jack stages are applied.

2.4 Cab

1. Cab shall be 8'-0" high from finished floor to underside of canopy.
2. The cab walls shall be steel, baked enamel finish with plastic laminate raised panels.
3. The base, frieze and reveals will be #4 stainless steel.
4. The ceiling shall be suspended with exposed frame with aluminum eggcrate lay-in panels. The lighting shall be fluorescent.
5. Front returns shall be of integral construction. Transoms shall run full width of cab and will be finished in #4 stainless steel.
6. Cab doors shall be flush design both sides, rib construction, finished in #4 stainless steel.
7. A one speed exhaust fan shall be mounted in cab transom or canopy.
8. A 1 1/2" round diameter in #4 stainless steel handrail shall be mounted on the side walls.
9. The threshold shall be extruded aluminum.
10. The cab finish flooring shall be furnished and installed by others.
11. There will be 1 set of quilted, soil resistant and fire-retardant pads with appropriate fasteners shall be furnished.
12. A certificate frame shall be provided.

2.5 Hoistway Entrances

1. Hoistway door and frame construction shall be UL rated, with required fire rating. Doors shall be of rigid flush panel construction and contain sound-deadening material. Frames shall be securely fastened at the corners to form a unit frame. Frames shall be bolted.
2. Exposed areas of the corridor frames shall be finished in #4 stainless steel on all floors.
3. Doors shall be finished in #4 stainless steel on all floors.
4. Sills shall be extruded aluminum on all floors.

2.6 Cab Fixtures

1. The main car operating panel shall be mounted in the return and comply with handicap requirements. Pushbuttons and illuminating indications shall be included for each floor served, and emergency buttons and switches shall be provided per code. Switches for

car light and accessories shall be provided.

2. The following cab fixtures shall also be provided:
   Car Lantern(s)
   Digital Car Position Indicator
   Locking Service Panel in Car Operating Panel
   Certificate Frame
   Telephone (ADA compliant)

2.7 Hall Fixtures

1. An up button and down button at intermediate floors and a single button at each terminal floor at a height to comply with handicap requirements.

2. The following hall fixtures shall also be provided:

   .1 Digital Hall Position Indicator at main floor(s)

3. Hall Fixtures shall be finished in #4 stainless steel. Fixture cover plates shall be mounted with tamper resistant screws in the same finish as the fixture.

PART 3 - EXECUTION

3.1 General

1. Prior to commencing elevator installation, inspect hoistways, hoistway openings, pits and machine rooms as constructed. Verify that hoistway, pit, machine room and openings are of correct size and within tolerance and are ready for work of this section. Notify General Contractor in writing of any dimensional discrepancies or other conditions detrimental to the proper installation or performance of elevator work. Do not proceed with elevator installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer. Arrange for temporary electrical power to be available for installation work and testing of elevator components.

3.2 Installation of Elevator System

1. Components will be arranged in machine room so equipment can be removed for repairs or replaced without dismantling or removing other equipment components.

2 Coordinate elevator work with work of other trades, for proper time and sequence to avoid construction delays.

3. Set entrances in vertical alignment with car openings, and aligned with plumb hoistway lines.

4. Adjust for smooth acceleration and deceleration of car so not to cause passenger discomfort. Adjust doors to prevent opening of doors at any landing on the corridor side unless the car is at rest at that landing, or is in the leveling zone and stopping at that landing. Adjust automatic floor leveling feature at each floor to achieve within 1/4" of the landing.

3.3 Permits and Tests

1. The elevator contractor shall obtain and pay for all necessary Municipal and State permits and relating to the installation of the elevator at his expense, shall make all tests as required by governing codes in effect at the time of the award. The elevator contractor shall be reimbursed for any permits, tests or equipment necessitated by governing authorities after the date of the award.

End of Section

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Indoor inclined platform wheelchair lifts.

1.2 RELATED SECTIONS

A. Section 04800 - Masonry Assemblies: Anchor placement in masonry.

B. Division 16 - Electrical: Electrical power service and wiring connections.

C. Division 16 - Electrical: Concealed low voltage control wiring.

D. Division 16 - Electrical: Intercom and wiring.

1.3 REFERENCES

A. ASME A17.5 - Elevator and Escalator Electrical Equipment.

B. ASME A18.1a 2001 - Safety Standard for Platform Lifts and Stairway Chairlifts.

C. CSA B44.1 - Elevator and Escalator Electrical Equipment.

D. CSA B355 - Lifts for Persons with Physical Disabilities.

E. ICC/ANSI A117.1 - Accessible and Usable Buildings and Facilities.

F. NFPA 70 - National Electric Code.

G. CSA - National Electric Code.

1.4 SUBMITTALS

A. Submit under provisions of Section 01340.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Submit manufacturer's installation instructions, including preparation, storage and handling requirements.
   2. Include complete description of performance and operating characteristics.

C. Shop Drawings:
   1. Show typical details of assembly, erection and anchorage.
   2. Show complete layout and location of equipment, including required clearances.

D. Selection Samples: For each finished product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finished product specified, two samples, representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Firm with minimum 10 years documented experience in manufacturing of inclined wheelchair platform lifts of installations of type specified.

B. Installer Qualifications: Firm licensed to install equipment of this scope, with evidence of experience with specified equipment. Installer shall maintain an adequate stock of replacement parts and have qualified people available to ensure timely maintenance and callback service at the project site.

1.6 REGULATORY REQUIREMENTS

A. Provide platform lifts in compliance with:
1. ASME A18.1 - Safety Standard for Platform Lifts and Stairway Chairlifts.
2. ASME A17.5 - Elevator and Escalator Electrical Equipment.
3. NFPA 70 - National Electric Code.

B. Provide platform lifts in compliance with:
1. CSA B355 - Lifts for Persons with Physical Disabilities.
2. CSA B44.1/ASME A17.5 - Elevator and Escalator Electrical Equipment.
3. CSA - National Electric Code.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store components off the ground in a dry covered area, protected from adverse weather conditions.

1.8 PROJECT CONDITIONS

A. Do not use wheelchair lift for hoisting materials or personnel during construction period.

1.9 WARRANTY

A. Warranty: Provide a two year limited warranty covering replacement of defective parts and excluding labor. Preventive maintenance agreement required.

B. Extended Warranty: Provide an additional five year limited warranty covering replacement of defective parts and excluding labor for a total of seven years. Preventive maintenance agreement required.

1.10 MAINTENANCE SERVICE

A. Furnish service and maintenance for elevating system and components for the following period from Date of Substantial Completion.
1. Two years.

B. Include systematic examination, adjustment, and lubrication of elevator equipment. Repair or replace parts whenever required. Use parts produced by manufacturer of original equipment. Replace wire ropes when necessary to maintain required factor of safety.

C. Provide emergency call back service for this maintenance period.

D. Perform maintenance work using competent and qualified personnel approved by elevator manufacturer or original installer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. **Acceptable Manufacturer:** Garaventa Xpress II Lift – Canada

B. **Alternate**: Delta, Savaria

2.2 STAIR LIFT FOR STRAIGHT OR TURNING STAIRWAYS

A. Inclined Platform Lift: Garaventa Stair-Lift, Model Xpress II inclined platform lift for straight stairway. Lift consists of a tubular guide rail system, a folding platform that is moved along the guide rails by a rope sprocket drive system, overspeed safety system and call stations at each landing. Conform to the following design requirements:
   1. Application:
      a. Indoor.
   2. Platform Load Rating: 660 lbs (330 kg)
   3. Travel Speed: 20 fpm (101.6 mm/s), slowing to 50 percent of rated speed before entering and while rounding corners.
   4. Platform Deck: 16 gauge (1.6 mm) sheet metal coated with electrostatically applied and baked anti-skid Sandex black paint.
      a. Platform Size A (ADA Compliant): 31-1/2 inches (800 mm) wide by 49-1/4 inches (1250 mm) long.
   5. Platform Operation:
      a. Automatic Fold: Folded and unfolded electrically from the call station.
      b. Emergency Manual Fold: When unit is left in the open position, platform may be manually folded and retained in closed position.
   6. Under Platform Obstruction Sensing:
      a. Provide an under platform sensing device to stop the platform from traveling in the downward direction when encountering 4 lbs (1.8 kg) of pressure.
      b. Platform is permitted to travel in the opposite direction of obstruction to allow clearing.
   7. Passenger Restraining Arms:
      a. Platform equipped with retractable passenger restraining arms in compliance with ASME A18.1a.
      b. Arms stop moving when an obstruction causing 4 lbs (1.8 kg) of pressure is encountered and will immediately retract when the signal is removed.
      c. Provide with means to manually unlock and open the restraining arms for passenger emergency evacuation.
      d. Arms are folded and unfolded electrically from the call stations or platform controls.
      e. Top of arms mounted 37-3/8 inches (948 mm) above the platform deck. When in guarding position the arms are located above the perimeter of the platform.
      f. The gaps between ends of arms shall not exceed 4 inches (100 mm).
   8. Boarding Ramps:
      a. Provide boarding sides of platform with retractable ramps positioned for travel at a height of 6 inches (152 mm) measured vertically above the platform deck.
      b. Lock ramps in their guarding positions during travel. When the platform is at the landing, only the retractable ramp servicing the landing shall be operable.
      c. Ramps shall be folded and unfolded electrically.

d. Retractable ramps, in the guarded position, shall withstand a force of 125 lbs (556 N) applied on any 4 inch (100 mm) by 4 inch (100 mm) area. This force shall not cause the height of the ramp, at any point in its length, to be less than 6 inches (152 mm) measured vertically above the platform deck.
e. Provide a means to manually unlock the ramps for emergency evacuation when platform is located at a landing.
f. Provide a bi-directional obstruction sensitive device on the travel direction end of the platform to stop lift when 1.8 kg (4 lbs.) of pressure is encountered, either from inside or outside of the platform. Platform is permitted to travel in the opposite direction of obstruction to allow clearing.
g. When platform folds, passenger restraining arms shall fold down and be covered by the folded platform.

9. Platform Kick Plate:
   a. Provide non-boarding and non-guide-rail side of the platform with a kick plate barrier of not less than 6 inches (152 mm) in height, measured vertically from the platform deck.
   b. When the platform is folded the kick plate shall cover the platform controls providing protection from vandalism.
10. Pedestrian Safety Lights:
   a. Equip platform with amber pedestrian safety lights located at both ends of the platform to alert pedestrian traffic that the platform is on the stairway.
11. Hand Grips:
   a. Equip platform with two 6-7/8 inch (174 mm) long by 1-1/4 inch (32 mm) diameter aluminum hand grips or grab bars on the front face of the platform with the top being 33-1/4 inch (845 mm) above the platform deck.
12. Clearance Dimensions:
   a. When folded platform shall not protrude more than 12-5/8 inches (321 mm) to 13-5/8 inches (346 mm) from mounting surface.
   b. When unfolded and in use platform shall not protrude more than 40 inches (1015 mm) to 41 inches (1040 mm) from wall.
13. Controls:
   a. Platform Controls: 24 V Low Voltage type.
   b. Platform equipped with emergency stop switch located within reach of the passenger 37-1/8 inches (942mm) above platform deck. When activated emergency stop button shall cause electric power to be removed from the drive system stopping lift immediately.
   c. Operating controls shall be two separate 1-1/2 inches (36 mm) round constant pressure buttons with directional arrows mounted on the front surface of the platform control panel.
   d. Directional buttons shall prompt the user with the available travel direction by illuminating the appropriate button.
   e. When platform arrives at landing and the user releases the directional button, the passenger restraining arms and boarding ramp shall unfold automatically allowing passenger to disembark.
   f. Platform shall equipped for:
      1) Keyed Operation.
14. Platform Deck Light: Integral lamp automatically activated when platform is in unfolded position.
15. Platform Security Lock: Provide to prevent unauthorized unfolding of the

platform.

16. Autofold Platform: Automatically fold platform into storage position when left unused in open position at any landing for:
    a) 3 minutes (recommended)
    b) a specified delay of _2_ minutes (1 to 10 minutes, factory set)
17. Pedestrian Audio Alert: Provide chime mounted on platform to indicate platform is folded up and in motion, traveling on stairway.
18. Platform On Board Emergency Alarm: Provide platform with on board alarm that sounds when emergency stop button is pushed. Provide battery back up for platform on board alarm.
19. Remote Platform Boarding: Platform shall travel beyond standard boarding position to remote boarding location away from stairs. Provide with ramp extensions 3 inch (76 mm) extruded aluminum added to the boarding ramps.
20. Under Hanger Sensing: Provide bottom of platform hanger with a sensing plate to stop the platform from traveling in the downward direction when encountered with 4 lbs (1.8Kg) of pressure. It shall be possible to drive the platform away from the obstruction.
21. Side of Hanger Obstruction Device: Provide a sensor that detects obstructions in the path of the side of the hanger. Lift shall stop immediately and not travel until the obstruction is removed. It shall be possible to drive the platform away from the obstruction.

B. Drive and Guide Rail System

1. Operation:
    a. Motor: 2 H.P. electric motor with an integrated brake.
    b. Required power: 208-240 VAC, single phase, 50/60 Hz. on a dedicated 20 amp circuit. Rated current shall be 7 amps for operation with rated load.
    c. Locate roped sprocket drive system consisting of a motor, gearbox and PCC controller (Programmable Configuration Controller) at the upper end of the tubes. PCC controller shall be custom programmed to soft start and stop and the slow down platform travel speed for all corners and landings of the lift. Normal operating speed shall be 20 feet per minute (6 m per minute), slowing to 50 percent of this speed before entering and while rounding corners.
    d. Equip drive with an emergency manual lowering system.

2. Standard Drive Cabinet:
    a. Cabinet: 20-1/2 inches (520 mm) wide by 41-1/2 inches (1053 mm) high by 10-5/8 inches (270 mm) deep.
    b. Cabinet door is key locked and monitored with an electrical cutout safety switch.
    c. Provide an integrated lockable main disconnect switch and breaker on the drive cabinet.

3. Guide Rail:
    a. Construct of two 2 inch (51 mm) diameter steel tubes spaced 23-5/8 inches (600mm) apart vertically. Tubes will run parallel to the stairs and horizontal to landings throughout the length of travel.
    b. When negotiating a horizontal landing a third 2 inch (51 mm) diameter steel tube shall be added to the tube system to guide and stabilize platform.
    c. Tube system shall not protrude more than 4-7/8 inches (125 mm) to 5-

7/8 inches (150 mm) from the wall.

d. Suspension means contained in the tubes shall be a 3/8 inch (8 mm) diameter galvanized steel core wire rope with a breaking strength of 9460 pounds (4300 kg).
e. Locate overspeed safety at the bottom of the tube assembly and shall consist of a mechanical overspeed sensor and brake with electrical drive cut-out protection.
f. Provide a final limit switch at the upper end of the tubes to stop the platform if it travels past the normal terminal stopping device.

4. Platform Storage Beyond Upper/Lower Landings:
   a. Platform shall travel in the folded position beyond the upper landing at the top stair nose to a remote parking position away from the stairs.
   b. Platform shall travel in the folded position beyond the lower landing to a remote parking position. Provide with a ramp extension for this configuration.
5. Final Limit Switch at Lower Landing: Platform will land over a flight of stairs and will have a final lower limit switch.
6. Rail Mounting:
   a. Direct Mount Solid Walls: Rails directly mounted to the stairway wall.
   b. Direct Mount Wood Stud Walls: Upper rail attached to a 2 inch (51 mm) by 8 inch (203 mm) board that is secured to the wall. Lower rail attached to a 2 inch (51 mm) by 4 inch (102 mm) board secured to the wall. Fasten each board to every available stud with a minimum of two fasteners.
   c. Tower Mount Struts: Provide with 2-1/2 inches (65 mm) by 2-1/2 inches (65 mm) hollow structural steel tubular posts to support the guide rails.
7. In-Fill Safety Panels: Provide a filler panel system to act as a barrier where existing handrails are removed and there is no wall behind the lift. Filler panels between the support posts shall be between 34 inches (864 mm) and 38 inches (965 mm) above the stair nosing.
   a. Steel Screen Fill Panels: Supports posts with steel mesh infill.

   b. Steel Tube Filler: Provide additional 2 inch (51mm) diameter steel tubes added to the guide rail system for aesthetics or to create a further safety barrier with a maximum 6 inch (152 mm) opening between tubes.

C. Call Stations:
   1. Provide a call station at each serviced landing that will automatically shut off if left unattended for over 2 minutes.
   2. Call stations, 24 V low voltage with four illuminated 2 inches (51 mm) by 2 inches (51mm) square membrane touch sensitive buttons: one touch platform fold, one touch platform unfold and two directional call and send buttons.
   3. Provide call stations with Smart-Lite Technology to prompt the user with the next sequential step of operation. Call station buttons will emit an audible "beep" when pushed to confirm button activation to the user.
   4. Provide intermediate stops between the upper and lower landings at the following locations:
      a. As indicated on the Drawings.
   5. Call stations shall equipped for:
      a. Keyed Operation.

D. Additional Safety or Code Requirements

1. Wall Mounted Audio Visual Alerts: Provide with adjustable volume control that sound while the lift is in operation and are visible by pedestrian traffic from all flights and landings.

E. Finish Environment Requirements:
   1. Design and fabricate lift to manufacturer's standard design for indoor location.
   2. Painting: After pretreating paint with electrostatically applied and baked powder coat as follows:
      a. Fine Textured Satin Grey (RAL 7030).

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify required supports are correct.

C. Verify electrical rough-in is at correct locations.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install platform lifts in accordance with in compliance with regulatory requirements specified and the manufacturer's instructions.

B. Install system components and connect to building utilities.

C. Accommodate equipment in space indicated.

D. Startup equipment in accordance with manufacturer's instructions.

E. Adjust for smooth operation.

3.4 FIELD QUALITY CONTROL

A. Perform tests in compliance with regulatory requirements specified and as required by authorities having jurisdiction.

B. Schedule tests with agencies and Architect, Owner, and Contractor present.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

End of Section