2025-113-P02100 Kanetskare Elementary School – Corridor Floor Replacement Project

222 Robinson St, Hamilton, ON

AMRA J
ARCHITECTS INC.

Pages

INTRODUCTORY INFORMATION

Hamilton Wentworth District School Board – Front End Documents

Division 01 – General Requirements

Division 02 – Existing Conditions

Division 09 – Finishes

DRAWINGS

NO. **Description**

ARCHITECTURAL DRAWINGS

END OF THIS SECTION

1. MTE Designated Substance Audit Report

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: Kanetskare Elementary School
Corridor Flooring Replacement
Prepared by: MTE
File No.: 56046-100
Dated: December 5, 2024
No. of Pages: 30

.2 Abatement Specifications (#pages 16)

2. 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.

3. 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.

4. 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

Kanétskare Elementary School

Corridor Flooring Replacement

Designated Substance Audit Report

Project Location:
222 Robinson Street, Hamilton, ON

Prepared for:
Hamilton-Wentworth District School Board
20 Education Court, PO Box 2558
Hamilton, ON L8N 3L1

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

December 5, 2024

MTE File No.: 56046-100

Engineers, Scientists, Surveyors.

Contents

Appendices

1.0 INTRODUCTION

1.1 Authorization

MTE Consultants Inc. (MTE) was retained by Hamilton-Wentworth School Board (the Client) to conduct a Designated Substance Audit for the building located at 222 Robinson Street in Hamilton, Ontario.

The purpose of the audit was to identify the presence of Designated Substances within the building in accordance with Section 30 of the Occupational Health & Safety Act (OHSA), in advance of a corridor flooring replacement. 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 corridors, and associated vestibules. These areas are referred to in the following sections as the “Subject Areas”.

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 Area 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 roof system, 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 21, 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
Floor Finishes	Vinyl floor tiles
Wall Finishes	Vinyl baseboards Brick and Mortar
Ceilings	Not inspected

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 15 bulk samples of suspect ACM were submitted for asbestos analysis with a total of 25 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.

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 1 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.

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.

While mercury-containing materials were visually identified at the time of the inspection, it is not expected that these materials will be impacted by the proposed work.

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)

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.

While sources of PCB's may be present in light ballasts, no PCB-containing materials will be impacted by the proposed work.

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 in air conditioning 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

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.

4.2.3 Mercury

No mercury-containing materials will be impacted by the proposed project. No special requirements for management, handing and disposal by the owner, constructor, contractor, sub-contractors and workers apply.

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)

No PCB-containing materials will be impacted by the proposed work. No special requirements for management, handing and disposal by the owner, constructor, contractor, sub-contractors and workers apply.

4.2.7 Ozone Depleting Substances (ODS)

No building components presumed to contain ODS will be impacted by the proposed work. 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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AKR

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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	**LOBBY 101 (ALSO OBSERVED IN CORRIDORS 105, 110, 123, 128, AND 129)**	**12"X12" VINYL FLOOR TILE - BROWN WITH BLACK AND WHITE FLECK**	**1% CHRYSOTILE**	**YES**
		MASTIC	ND	NO
S01B	**CORRIDOR 105 (ALSO OBSERVED IN CORRIDORS 101, 110, 123, 128 AND 129)**	**12"X12" VINYL FLOOR TILE - BROWN WITH BLACK AND WHITE FLECK**	**NA**	**YES**
		MASTIC	ND	NO
S01C	**CORRIDOR 129 (ALSO OBSERVED IN CORRIDORS 101, 105, 110, 123, AND 128)**	**12"X12" VINYL FLOOR TILE - BROWN WITH BLACK AND WHITE FLECK**	**NA**	**YES**
		MASTIC	ND	NO
S02A	VESITBULE 107 (ALSO OBSERVED IN VESTIBULE 124 AND 130)	12"X12" VINYL FLOOR TILE - WHITE WITH BEIGE FLECK	ND	NO
		MASTIC	ND	NO
S02B	VESITBULE 124 (ALSO OBSERVED IN VESTIBULE 107 AND 130)	12"X12" VINYL FLOOR TILE - WHITE WITH BEIGE FLECK	ND	NO
		MASTIC	ND	NO
S02C	VESITBULE 130 (ALSO OBSERVED IN VESTIBULE 107 AND 124)	12"X12" VINYL FLOOR TILE - WHITE WITH BEIGE FLECK	ND	NO
		MASTIC	ND	NO
S03A	VESTIBLE 115	12"X12" VINYL FLOOR TILE - BROWN WITH WHITE FLECK	ND	NO
		MASTIC	ND	NO
S03B	VESTIBLE 115	12"X12" VINYL FLOOR TILE - BROWN WITH WHITE FLECK	ND	NO
		MASTIC	ND	NO
S03C	VESTIBLE 115	12"X12" VINYL FLOOR TILE - BROWN WITH WHITE FLECK	ND	NO
		MASTIC	ND	NO
S04A	LOBBY 101	BENCH BRICK MORTAR	ND	NO
S04B	LOBBY 101	BENCH BRICK MORTAR	ND	NO
S04C	LOBBY 101	BENCH BRICK MORTAR	ND	NO
S05A	CORRIDOR 105 BUT PRESENT THROUGHOUT	VINYL BASE BOARD	NO	NO
		MASTIC	NO	NO

TABLE 4.1: BULK ASBESTOS SAMPLE SUMMARY TABLE				
Sample #	**Location**	**Material Description**	**Asbestos Results (% Type)**	**Is Material ACM**
S05B	CORRIDOR 105 BUT PRESENT THROUGHOUT	VINYL BASE BOARD	NO	NO
		MASTIC	NO	NO
S05B	CORRIDOR 105 BUT PRESENT THROUGHOUT	VINYL BASE BOARD	NO	NO
		MASTIC	NO	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	**WALLS**	**GREEN**	**LOCKERS**	**1,240**	**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

222 Robinson Street, 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	Corridors 101, 105, 110, 123, 128, and 129	12"x12" Brown with Black and White Fleck Floor Tile (Associated Mastic is Non-Asbestos)	In place management in accordance with O. Reg. 278/05	Removal in accordance with O. Reg. 278/05 as a Type 1 Operation
Lead-Containing Paint	Main Corridor	Green Paint on Lockers	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
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	Brick Mortar, Concrete Slab	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

PARACEL LABORATORIES LTD.

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15 - 6800 Kitimat Rd
Mississauga, ON, L5N 5M1
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: 56046-100 - Kanetskare ES Corridor Flooring DSA
Custody:

Report Date: 30-Oct-2024
Order Date: 24-Oct-2024

Order #: 2443318

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

Paracel ID	Client ID
2443318-01.1	S01A - 12x12 VFT - Brown with Black and White Fleck
2443318-01.2	S01A - 12x12 VFT - Brown with Black and White Fleck
2443318-02.1	S01B - 12x12 VFT - Brown with Black and White Fleck
2443318-02.2	S01B - 12x12 VFT - Brown with Black and White Fleck
2443318-03.1	S01C - 12x12 VFT - Brown with Black and White Fleck
2443318-03.2	S01C - 12x12 VFT - Brown with Black and White Fleck
2443318-04.1	S02A - 12x12 VFT - White with Beige Fleck
2443318-04.2	S02A - 12x12 VFT - White with Beige Fleck
2443318-05.1	S02B - 12x12 VFT - White with Beige Fleck
2443318-05.2	S02B - 12x12 VFT - White with Beige Fleck
2443318-06.1	S02C - 12x12 VFT - White with Beige Fleck
2443318-06.2	S02C - 12x12 VFT - White with Beige Fleck
2443318-07.1	S03A - 12x12 VFT - Brown with White Fleck
2443318-07.2	S03A - 12x12 VFT - Brown with White Fleck
2443318-08.1	S03B - 12x12 VFT - Brown with White Fleck
2443318-08.2	S03B - 12x12 VFT - Brown with White Fleck
2443318-09.1	S03C - 12x12 VFT - Brown with White Fleck
2443318-09.2	S03C - 12x12 VFT - Brown with White Fleck
2443318-10	S04A - Bench Brick Mortar
2443318-11	S04B - Bench Brick Mortar
2443318-12	S04C - Bench Brick Mortar
2443318-13.1	S05A - Vinyl Base Trim
2443318-13.2	S05A - Vinyl Base Trim
2443318-14.1	S05B - Vinyl Base Trim
2443318-14.2	S05B - Vinyl Base Trim
2443318-15.1	S05C - Vinyl Base Trim

Approved By:

Emma Diaz

Senior Analyst

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 30-Oct-2024

Client: MTE Consultants Inc. (Burlington)

Order Date: 24-Oct-2024

Client PO:

Project Description: 56046-100 - Kanetskare ES Corridor Flooring DSA

2443318-15.2 S05C - Vinyl Base Trim

Certificate of Analysis

Report Date: 30-Oct-2024

Client: MTE Consultants Inc. (Burlington)

Order Date: 24-Oct-2024

Client PO:

Project Description: 56046-100 - Kanetskare ES Corridor Flooring DSA

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

Paracel ID	Sample Date	Colour	Description	Asbestos Detected	Material Identification	% Content
2443318-01.1	21-Oct-24	Brown	Vinyl Floor Tile	**Yes**	**Client ID: S01A - 12x12 VFT - Brown with Black and White Fleck**	
					Chrysotile	1
					Non-Fibers	99
2443318-01.2	21-Oct-24	Black	Mastic	No	**Client ID: S01A - 12x12 VFT - Brown with Black and White Fleck**	
					Non-Fibers	100
2443318-02.1	21-Oct-24	Brown	Vinyl Floor Tile		**Client ID: S01B - 12x12 VFT - Brown with Black and White Fleck**	
					not analyzed, positive stop	
2443318-02.2	21-Oct-24	Black	Mastic	No	**Client ID: S01B - 12x12 VFT - Brown with Black and White Fleck**	
					Non-Fibers	100
2443318-03.1	21-Oct-24	Brown	Vinyl Floor Tile		**Client ID: S01C - 12x12 VFT - Brown with Black and White Fleck**	
					not analyzed, positive stop	
2443318-03.2	21-Oct-24	Black	Mastic	No	**Client ID: S01C - 12x12 VFT - Brown with Black and White Fleck**	
					Non-Fibers	100
2443318-04.1	21-Oct-24	White	Vinyl Floor Tile	No	**Client ID: S02A - 12x12 VFT - White with Beige Fleck**	
					Non-Fibers	100
2443318-04.2	21-Oct-24	Black	Mastic	No	**Client ID: S02A - 12x12 VFT - White with Beige Fleck**	
					Non-Fibers	100
2443318-05.1	21-Oct-24	White	Vinyl Floor Tile	No	**Client ID: S02B - 12x12 VFT - White with Beige Fleck**	
					Non-Fibers	100
2443318-05.2	21-Oct-24	Black	Mastic	No	**Client ID: S02B - 12x12 VFT - White with Beige Fleck**	
					Non-Fibers	100
2443318-06.1	21-Oct-24	White	Vinyl Floor Tile	No	**Client ID: S02C - 12x12 VFT - White with Beige Fleck**	
					Non-Fibers	100
2443318-06.2	21-Oct-24	Black	Mastic	No	**Client ID: S02C - 12x12 VFT - White with Beige Fleck**	
					Non-Fibers	100

Certificate of Analysis

Report Date: 30-Oct-2024

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

Order Date: 24-Oct-2024

Client PO:

Project Description: 56046-100 - Kanetskare ES Corridor Flooring DSA

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

Paracel ID	Sample Date	Colour	Description	Asbestos Detected	Material Identification	% Content
2443318-07.1	21-Oct-24	Brown	Vinyl Floor Tile	No	**Client ID: S03A - 12x12 VFT - Brown with White Fleck**	
					Non-Fibers	100
2443318-07.2	21-Oct-24	Black	Mastic	No	**Client ID: S03A - 12x12 VFT - Brown with White Fleck**	
					Non-Fibers	100
2443318-08.1	21-Oct-24	Brown	Vinyl Floor Tile	No	**Client ID: S03B - 12x12 VFT - Brown with White Fleck**	
					Non-Fibers	100
2443318-08.2	21-Oct-24	Black/grey	Mastic	No	**Client ID: S03B - 12x12 VFT - Brown with White Fleck** [AS-LR-NA]	
					Non-Fibers	100
2443318-09.1	21-Oct-24	Brown	Vinyl Floor Tile	No	**Client ID: S03C - 12x12 VFT - Brown with White Fleck**	
					Non-Fibers	100
2443318-09.2	21-Oct-24	Black/grey	Mastic	No	**Client ID: S03C - 12x12 VFT - Brown with White Fleck** [AS-LR-NA]	
					Non-Fibers	100
2443318-10	21-Oct-24	Grey	Mortar	No	**Client ID: S04A - Bench Brick Mortar**	
					Non-Fibers	100
2443318-11	21-Oct-24	Grey	Mortar	No	**Client ID: S04B - Bench Brick Mortar**	
					Non-Fibers	100
2443318-12	21-Oct-24	Grey	Mortar	No	**Client ID: S04C - Bench Brick Mortar**	
					Non-Fibers	100
2443318-13.1	21-Oct-24	Black	Vinyl	No	**Client ID: S05A - Vinyl Base Trim**	
					Non-Fibers	100
2443318-13.2	21-Oct-24	Brown	Mastic	No	**Client ID: S05A - Vinyl Base Trim**	
					Non-Fibers	100
2443318-14.1	21-Oct-24	Black	Vinyl	No	**Client ID: S05B - Vinyl Base Trim**	
					Non-Fibers	100
2443318-14.2	21-Oct-24	Brown	Mastic	No	**Client ID: S05B - Vinyl Base Trim**	
					Non-Fibers	100

Certificate of Analysis

Report Date: 30-Oct-2024

Client: MTE Consultants Inc. (Burlington)

Order Date: 24-Oct-2024

Client PO:

Project Description: 56046-100 - Kanetskare ES Corridor Flooring DSA

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

Paracel ID	Sample Date	Colour	Description	Asbestos Detected	Material Identification	% Content
2443318-15.1	21-Oct-24	Black	Vinyl	No	**Client ID: S05C - Vinyl Base Trim**	
					Non-Fibers	100
2443318-15.2	21-Oct-24	Brown	Mastic	No	**Client ID: S05C - Vinyl Base Trim**	
					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	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

Work Order Revisions | Comments

None

PARACEL LABORATORIES LTD.

2443318

Office
19 St. Laurent Blvd.
, Ontario K1G 4J8
0-749-1947
cel@paracellabs.com

Chain of Custody
(Lab Use Only)

Client Name:	MTE Consultants	Project Reference:	56046-100 - Kanetskare ES Corridor Flooring DSA
Contact Name:	Gavin Oakes; Aaron Rows	Quote #:	MTE Standing Offer
Address:	1016 Sutton Drive, Unit A	PO #:	
	Burlington, ON L7L 6B8	Email Address:	goakes@mte85.com
Telephone:	905-639-2552		arows@mte85.com

Turnaround Time:

- ☐ Immediate
- ☐ 1 Day
- ☐ 4 Hour
- ☐ 2 Day
- ☐ 8 Hour
- ☐ 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: 2443318 / 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	S01 A-C - 12"x12" VFT - Brown with Black and White Fleck	21 Oct 24	-	PLM		☒
2	S02 A-C - 12"x12" VFT - White with Beige Fleck	21 Oct 24	-	PLM		☒
3	S03 A-C - 12"x12" VFT - Brown with With Fleck	21 Oct 24	-	PLM		☒
4	S04 A-C - Bench Brick Mortar	21 Oct 24	-	PLM		☒
5	S05 A-C - Vinyl Base Trim	21 Oct 24	-	PLM		☒
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):	Received at Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Aaron Rows			
Date/Time: 23 Oct 24 - 10:50am	Date/Time:	Date/Time: Oct 24/24 8.45	Date/Time: Oct 24/24 9.00

PARACEL LABORATORIES LTD.

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RELIABLE.

351 Nash Road North, unit 9B
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: 56046-100 - Kanetskare ES Corridor Floor DSA
Custody:

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

Order #: 2443320

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

Paracel ID	Client ID
2443320-01	LP01 - Green - Lockers

Approved By:

Alex Enfield, MSc
Lab Manager

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising shall be limited to the amount paid by you for this work, and that our employees or agents shall not under circumstances be liable to you in connection with this work

Certificate of Analysis

Report Date: 29-Oct-2024

Client: MTE Consultants Inc. (Burlington)

Order Date: 24-Oct-2024

Client PO:

Project Description: 56046-100 - Kanetskare ES Corridor Floor 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: 56046-100 - Kanetskare ES Corridor Floor DSA

Sample Results

Lead

Matrix: Paint

Paracel ID	Client ID	Sample Date	Units	MDL	Result
2443320-01	LP01 - Green - Lockers	21-Oct-24	ug/g	5	1240

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.

Paracel ID: 2443320

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2443320	

Client Name: MTE Consultants	Project Ref: 56046-100 - Kanetskare ES Corridor Floor 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

☐ 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
1	LP01 - Green - ~~Lockers~~ Lockers	P	–	1	21 Oct 24	345	
2							
3							
4							
5							
6							
7							
8							
9							
10							

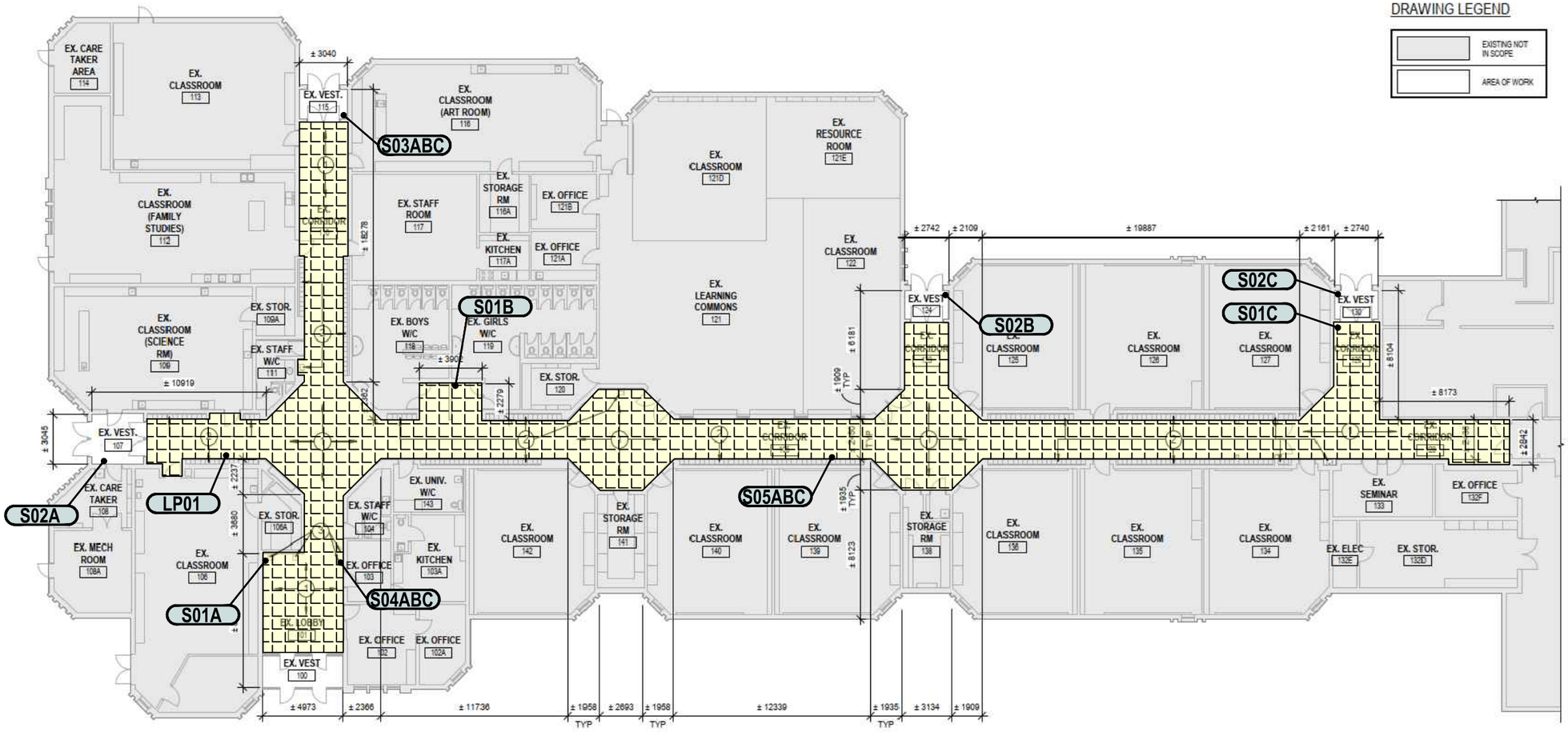
Comments:

Method of Delivery: Purolator

Relinquished By (Sign): Aaron Rows	Received By Driver/Depot:	Received at Lab: KM	Verified By: KM
Relinquished By (Print): Aaron Rows	Date/Time:	Date/Time: 10/24/23 911.	Date/Time: 10/24/23 957
Date/Time: 23 Oct 24 - 1:30 pm	Temperature: °C	Temperature: —	pH Verified: ☐ By: NA

Appendix C

Figures



DEMOLITION PLAN
SCALE: 1 : 150
1 A0.01

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

S02CD — Sample Identification

ACM Vinyl Floor Tile

MTE
Engineers, Scientists, Surveyors
Ph. (905) 639-2552 www.mte85.com

CLIENT
Hamilton-Wentworth District School Board

PROJECT
DESIGNATED SUBSTANCE AUDIT

DRAWING
KANETSKARE ELEMENTARY SCHOOL
MAIN FLOOR- 222 ROBINSON STREET
HAMILTON, ON

Project Manager	G. OAKES	Date	NOVEMBER 2024
Baseplan By	MTE	Project No.	56046-100
Figure By	SXS	Drawing No.	1.0
Scale	N.T.S.		

Project: 56046-100 CAD: P:\P\56046\100\56046-100 DSA.DWG
November 04, 2024 - 3:00 pm - Plotted By: SXS

Appendix D

Photographic Log

Photograph No. 1 – 12”x12” Brown with black and white fleck vinyl floor tile was observed throughout the corridors and was sampled (S01A,B,C). The vinyl floor tile is asbestos-containing; however, the associated mastic is non-asbestos.

Photograph No. 2 – 12”x12” White with beige fleck vinyl floor tile observed in Vestibules 107, 124, and 130 was sampled (S02A,B,C). The vinyl floor tile and associated mastics are non-asbestos.

Photograph No. 3 – 12”x12” Brown with white fleck vinyl floor tile was observed in Vestibule 115 and was sampled (S03A,B,C). The vinyl floor tile and associated mastics are non-asbestos.

Photograph No. 4 – The bench brick mortar was sampled (S04A,B,C) and is non-asbestos.

Photograph No. 5 – The vinyl baseboard observed in the corridors was sampled (S05A,B,C). The baseboard and associated mastics are non-asbestos.

Photograph No. 6 – The green paint observed on the lockers was sampled (LP01) and is lead-containing.

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 "Kanetskare *Elementary School, Corridor Flooring Replacement, Designated Substance Audit Report – 222 Robinson Street, Hamilton, ON*" dated December 5, 2024 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-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
Corridors 101, 105, 110, 123, 128 and 129	12” x 12” Vinyl Floor Tiles Brown with Black and White Fleck (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.

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.

END

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;
ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers;
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 co-operate with the trades of adjacent or affected work. Supply in good time requirements affecting 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 co-operate with Contractors which may be assigned or selected by the Owner to perform work under Cash Allowances. Owner reserves the right to assign non-unionized labour to perform work under Cash Allowances, at Owners discretion.

4. Cooperate with and assist in coordinating work by Owner’s own forces or other contractors engaged by the Owner, in the interest of the school.

5. Coordination

1. Co-ordinate 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. Co-ordinate 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 co-ordination.

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.

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. No storage available within the school for materials. Contractor to make necessary arrangements for storage containers as needed. Storage container location to be approved by the Owner prior to commencing project. Coordinate location of storage container/staging area with school prior to placement and protect all existing surfaces including turf, asphalt. The Contractor is fully responsible for security, or any storage containers, fencing, equipment or material stored on school premises. HWDSB will not be held liable for missing or damaged items.

2. All deliveries to the school premises must be scheduled to arrive when no students are outside. This includes avoiding times when students are arriving, departing, or during outdoor activities.

3. Any maneuvering of vehicles or equipment within or around the school premises must be conducted while students are in class. This excludes maneuvering during breaks, lunch periods, or any other times when students might be outside.

4. All site maneuvering activities must be accompanied by a flag person to ensure the safety of students and staff.

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

6. 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.

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

8. Avoid undue loading stresses in materials or overloading of floors. Do not store materials in building or utilize it for construction purposes in any manner which would exceed design loading on any building element. Temporarily support or strengthen parts of the structure subjected to excessive loads during construction.

9. Do not store material and equipment detrimental to finished surfaces within areas of the building where finishing has commenced or has been completed. No storage will be available within the school. Contractor to make necessary arrangements exterior to the school in storage containers as needed. Coordinate locations with school prior to placement and protect all existing surfaces.

10. 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 daily and dispose of this debris in a legal manner so as to avoid causing hazards to occupants and visitors on site.

3. Under no circumstances should debris, rubbish or trash be burned or buried on the site.
    - Do not dispose of any waste in the Owner's facilities unless Owner authorized. Under no circumstances shall the Contractor use the school's garbage disposal containers including those in the classrooms and interior spaces of the school.
    - Perform a scan of the ground areas adjacent to the work area by use of metal detector/magnetic sweeper daily. Any construction debris is to be removed from the grounds on a daily basis.
    - Pathways used to access exterior waste bins for demolition should take precautions to ensure routes are protected and cleared of any debris.

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 are 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 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 Mechanical Scope. Electrical Subcontractor will pay the cost of all permits and fees related to the Work specified under Electrical Scope.
   .2 The General Contractor is to pay all other fees and refundable deposits if Applicable

2. **During Construction**
   .1 Organize Job Meetings in accordance with Section 01200.
   .2 Supply Monthly Progress Reports and Construction Schedule in accordance with Section 01200.
   .3 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, as specified in Section 01710.
   .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 Clearance Certificates from the Workplace Safety and Insurance Board, for the General Contractor and all Subcontractors.
.8 All reference records, as specified, under Section 01720.
.9 Certificate of Inspection from Mechanical and Electrical Engineers.
.10 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.
.11 Statement of Completion from General Contractor.
.12 Final adjustment of all Allowances.
.13 H.E.P.C. Inspection Certificate and all other Inspection Certificates required by Provincial, Municipal and other authorities having jurisdiction.
.14 Balancing Reports.
.15 As-Built Drawings. –Digital pdf files and AutoCAD v2018 or higher.
.16 A softcopy of Operation and Maintenance Manuals. A digital copy (pdf file) of all closeout documents.

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.

18. Inspection and Testing

1. The contractor is responsible 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. Project Meetings for Coordination

1. Following the pre-construction meeting/construction phase kick-off meeting, arrange for site meetings 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. Prior to substantial performance, meetings shall be scheduled for every week in an effort to effectively complete all obligations under the contract in a timely manner.

2. General contractor's site supervisor and project manager as well as other 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 within the construction office, 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 digital copies of the minutes to each invited person, regardless of attendance.

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.

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 the preceding work period.
    .9 Look ahead for the succeeding two-week work period.

.10 Review submittal schedules: expedite as required.
.11 Maintenance of quality standards.
.12 Pending changes and substitutions.
.13 Review proposed changes for effect on construction schedule and on completion date.
.14 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 the submission is reviewed, work involving relevant products must not proceed.

2. Shop Drawings

1. Drawings to be originals prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate the 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 a PDF.

4. General Contractor shall provide and maintain an up-to-date shop drawing tracking log, which shall be reviewed at each construction meeting.

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, in duplicate, 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. Storage Sheds

1. Provide adequate weather-tight sheds with raised floors, for storage of materials, tools and equipment. Coordinate location with Owner and obtain approval.

2. The contractors and/or subcontractors are not permitted to use school spaces/areas for storage at any time.

3. Storage shed to be within fast fence compound staging area to prevent vandalism. Staging area to be confirmed with Owner and Consultant prior to erecting area.

3. Sanitary Facilities

1. Provide portable toilets and other washroom facilities as required. Coordinate location with Owner and obtain approval. Keep area and premises in sanitary condition.

2. The contractors and/or subcontractors are not permitted to use school sanitary facilities at any time.

3. Portable toilet to be within fast fence compound staging area to prevent vandalism. Staging area to be confirmed with Owner and Consultant prior to erecting area.

4. Parking

1. The contractors and/or subcontractors are responsible for coordinating parking with the local municipality.

2. The contractors and/or subcontractor are not permitted to use the school parking lots during the months of September to June. The school parking lots can be used for construction during the months of July and August. Coordinate use of spaces with Owner and obtain approval.

5. Site Enclosures

1. Erect temporary site enclosures, hoarding, using prefabricated lock fence system. Fencing shall be mechanically fastened to the ground using secure spikes on the construction side of the fence. Alternatively, construction fencing shall be mechanically fastened to the vertical t-bar piled into the ground. The ground shall be repaired to its original condition matching adjacent surfaces once the fence is no longer required and removed off site. Exterior fencing shall include visual barrier using geotextile fastened to the fence. Access into this fenced area shall be controlled by the general contractor. Maintain fence at all times for the duration of the project.

2. Interior hoarding walls shall be erected at all locations where existing occupied spaces are in the vicinity and adjacent to the construction area. All interior hoarding walls shall be constructed using stud framing and drywall. Alternatively, good-one-side plywood can be used. All hoarding walls shall include a properly latching and lockable man door complete with locking handset/lever or orbit hardware. Access through this door shall be controlled by the general contractor. Maintain hoarding walls at all times for the duration of the project.

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

6. Enclosure of Structure

1. Provide temporary weather-tight enclosures protection for exterior openings until permanently enclosed.
2. Erect enclosures to allow access for installation of materials and working inside enclosures.

3. Design enclosures to withstand wind pressure.

4. Erect dust barriers to prevent dust migration to non-renovated areas. Provide boot dust mats at each interior connection to occupied areas from the construction entrances/exits. If contractor is not able to prevent dust migration to non-renovated areas, the contractor shall provide negative air units and maintain for the duration of the project until such time where dust migration can be prevented.

7. Power supply

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

8. Water Supply

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

9. 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.

10. 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; Workplace Safety & Insurance Board; and Municipal authorities.

2. In particular, the Occupational Health and Safety Act (O. Reg. 213/91), the regulations of the Ontario Ministry of Labour and Ontario Electrical Safety Code shall be strictly enforced.

3. Contractor shall ensure that copies of all applicable construction safety regulations, codes and standards are available on the job-site 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 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.

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

2. Safety Data Sheet

1. Safety Data Sheets (SDS) must be available at the job-site for any product listed on the Hazardous Ingredients List prior to being used, installed or applied inside of the building.

2. A 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

Design and construct falsework in accordance with CSA S269.1

6. Scaffolding

1. Design and construct scaffolding in accordance with CSA Z797.

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 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. General

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

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

3. Prevent accumulation of waste, which create hazardous conditions.

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

5. At no time shall waste be stored inside the school building. All waste and waste containers must be separated from general public and school occupants using properly secured and locking construction hoarding.

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 construction specific dump containers for collection of waste materials, and rubbish. The school waste bins, and garbage collection shall not be used to dispose of construction related waste materials, debris and/or 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 and leave project clean and ready for occupancy.

2. Employ experienced 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 and of concealed spaces.

4. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from all 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 and to match new adjacent surfaces.

7. Broom-clean, magnet roll, and pressure wash all concrete and asphalt 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. Correlate data into related consistent groupings.

3. Cover: Identify each section with type or printed title “Project Record Documents”, list title of Project, identify subject matter of contents.

4. Arrange content in folders under Section numbers and sequence of Table of Contents.

5. Provide separate folder for each separate product and system, with typed description of product and major component parts of equipment.

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 for review a digital pdf file of completed closeout documents 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. Consultant comments will be returned, and the contractor is to revise the content of documents as required prior to final submittal.

3. Submit one (1) digital copy of revised volumes of data in final form within ten days after final inspection.

4. For contract drawings (architectural, landscaping, structural, mechanical, electrical), transfer neatly as-built notations onto a digital set and submit to consultant.

5. Prepare digital pdf file for submission on 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. The consultant will provide electronic copies of project drawings in PDF format. Make one (1) hardcopy of the project drawings for the purpose of recording as-built conditions. Mark and record changes on an on-going basis as construction proceeds. **Near the end of the construction period transfer all marks to the supplied electronic documents and submit for consultant review as project record as-built 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, shutdown, and emergency instruction. Include summer, winter, and any special operating instructions.

5. Maintain Requirements: include routine procedures and guide for troubleshooting; 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 a list of the 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 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. Notes

1. To be made out on the letterhead of Guarantor or Warrantor which usually is a Subcontractor.

2. This format is to be used only when standard preprinted trade or manufacturer's forms are not available. Preprinted forms are to include all elements of information shown on this sample or as a minimum.

3. Comply with Requirements for Guarantee/Warranty as specified in Section 01720, Article 10.

To: Hamilton-Wentworth District School Board
20 Education Court
Hamilton, ON L9A 0B9

Date: _____

SECTION _____

TITLE _____

GUARANTEE/WARRANTY TO:

OWNER	Hamilton-Wentworth District School Board
PROJECT	*Kanetskare Street ES* *Corridor Floor Replacement* *Project No. P02100*
ARCHITECT	*AMRA J Architects Inc.*
REFERENCE	(to specifications or drawings)
TIME	Period of Guarantee/Warranty:_____ years
GUARANTEE/ WARRANTY	Starting Date: Substantial Performance as certified by Architect Date: _____

(Description of Guarantee/Warranty)

_____
_____
_____

Upon written notification from the Owner or the Consultant that the above work is defective any repair or replacement work required shall be to the Consultant's satisfaction at no cost to the Owner.

This guarantee shall not apply to defects caused by the work of others, maltreatment of materials, negligence or Acts of God.

SUBCONTRACTOR

_____ _____
Signature Date

Authorized Signing Officer:

_____
(Name Printed)

_____
Title

Name of Firm: _____

Address: _____

Telephone Number _____

CONTRACTOR

_____ _____
Signature Date

Authorized Signing Officer:

_____ _____
(Name Printed)

_____
Title

Name of Firm: _____ SEAL

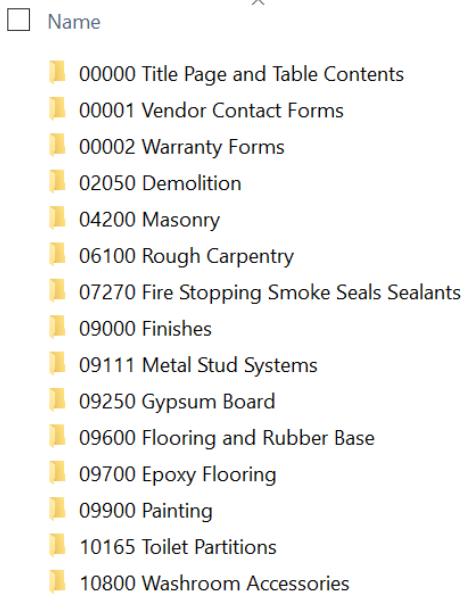
Address: _____

Telephone Number _____

End of Section

1. Maintenance Manual

1. On completion of project, submit to the Owner one (1) digital copy of Operations Data and Maintenance Manual in English, made up as follows:
   1.1. Enclose title sheet, labeled "Operation Data and Maintenance Manual", project name, date and list of contents.
   1.2. Organize content folders into applicable sections of work to parallel project specification break-down. Mark each section by labeled folder similar to the following example:



   1.3. The digital copy of all documents in the operations and manuals must be provided on a USB, format to be PDF.

2. Include the 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.

5. Include in the manuals a complete set of final as-built red line drawings. Include each drawing sheet and indicate on the title block “As-Build Drawing”

End of Section

1. General

1. **Bonds:** Refer to RFT Document for bonding requirements at time of tender submission and throughout the duration of the construction period.

2. Standard Warranty

1. Refer to Supplementary General Conditions and to Standard Contract Document CCDC No. 2, 2020 for warranty requirements and conditions for the standard warranty which is required for the work of this contract.

3. Extended Warranties

1. Refer to individual specification 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. All Extended Warranties shall be listed separately and included as a separate section in the operations and maintenance manuals provided to the HWDSB at project close out. Each Extended Warranty document shall include the vendor's contact information, date of warranty commencement and expiry as well as listing the specific product with extended warranty. This document shall clearly indicate if the warranty includes or excludes labour.

5. 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 the 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)

Sealants (Section 07 92 00)	5 years
Painting (Section 09 91 00)	2 years

End of Section

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. Protocol for Work Impacting Fire Alarm System or Devices

The contractor is to follow this procedure when the fire alarm system is impacted.

A. 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 areas that are not protected/monitored by the fire alarm system. These include but are not limited to, a disconnected device, a covered device, a bypassed device, or device in trouble. The general contractor is responsible for fire watch in all construction areas. Caretaking staff are responsible for fire watch in all other areas of the school. Fire watch is to be recorded in a Fire Watch Log.

Fire Watch Log: The general contractor is to document and maintain a written log confirming fire watch has been conducted hourly. This log is to remain on site for the duration of the project. This written log is maintained separate from the caretaking fire watch log. The caretaking log is digitally recorded within the Boards asset management system (eBase).

B. 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. This can be coordinated by the project supervisor upon request.

   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.

C. 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 devices are impacted during occupied hours:
   - Per the Fire Safety Plan, contractor to notify API that they'll be on Fire Watch (in the area of the impacted devices only). API will not take any action; the notification is for information purposes only.
   - Contractor to either take the device offline or protect/cover it. Fire watch (in the area of the impacted device only) is required in either of these scenarios. If the alarm goes off during work, all occupants, including contractors, are to evacuate the building and the fire department will be dispatched.

   If hot work is taking place, prior to the above-noted steps:
   - 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.

3. If devices are impacted outside of occupied hours, and the contractor is the only party in the building:
   - The same protocol above is to be followed.

4. If the system or specific devices will not be operational while the school is completely vacant (i.e. overnight or on a weekend when no Work is taking place):
   - No action required.

The system is to be bypassed (device(s) or full system). The system is NOT to be put on test. The only time the system will be put on test and the school will be on Fire Watch is if the system is being tested.

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. The contractor will be responsible for all fire department costs resulting from construction.

4. 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.

PART 1 - GENERAL

1.1. SUMMARY

1.1.1. Section Includes: Provide selective removal, including but not limited to following:

1.1.1.1. Flooring.

1.1.1.2. Wood benches with a masonry base

1.1.1.3. Lockers not attached to the floor base as required for the floor installation

1.2. REFERENCES

1.2.1. Review "Designated Substance Report" and take appropriate precautions.

1.2.2. Definitions:

1.2.2.1. Hand Demolition: Systematic demolition of structures by workers using hand-held tools.

1.2.2.2. Mechanical Demolition: Systematic demolition of structures using powered equipment.

1.2.2.3. Systematic Demolition: Methodical dismantling of structure piece by piece, usually carried out in reverse order of construction.

1.2.2.4. Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.

1.3. ADMINISTRATIVE REQUIREMENTS

1.3.1. Review Specification for work included under this Section and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, inspection of construction to be demolished, methods to be used, sequence and quality control, Project staffing, restrictions due to environmental protection requirements and other matters affecting demolition, to permit compliance with intent of this Section.

1.3.2. Scheduling:

1.3.2.1. Where practicable, remove or neutralize hazardous or toxic materials before demolition begins.

1.3.2.2. Phase selective demolition to be coordinated with Owner’s on-going occupancy of the school.

1.4. QUALITY ASSURANCE

1.4.1. Comply with National Building Code, Part 8, Construction Safety Measures at Construction and Demolition Sites.

1.4.2. Do work in accordance with CSA S350 and comply with pertinent codes, regulations and insurance carriers providing coverage for this work.

1.4.3. Execute the work in strict accordance with The Occupational Health and Safety Act and Regulations for Construction Projects, latest addition. Keep copy of the Act at the place of the Work at all times.

1.4.4. Restrictions: Restrict demolition activities to hours in accordance with Section 01 10 00 – Project Administrative Requirements.

1.5. SITE CONDITIONS

1.5.1. Demolition performed on this Project in school areas adjacent to occupied areas. Every part of the demolition work must be carefully planned, scheduled, and coordinated with the HWDSB Protect Manager, including:

1.5.1.1. Hours of operation

1.5.1.2. Dust control, infection prevention and control.

1.5.1.3. Disruption to existing mechanical or electrical services, fire alarm, sprinkler, communications systems.

1.5.1.4. Noise control.

1.5.1.5. Protection to existing building

1.5.1.6. Access to the work area including procedures for movement and removal of materials.

PART 2 - PRODUCTS

2.1. MATERIALS

2.1.1. Description:

2.1.1.1. Regulatory Requirements:

2.1.1.1.1. Conform to The Occupational Health and Safety Act and Regulation for Construction Projects

2.1.1.1.2. Conform to OBC, especially Division C, Part 1, Article 1.2.2.3 as applicable.

2.1.1.1.3. Conform to Fire Code, Regulation under Fire Marshal Act especially Part 8.

2.1.2. Materials and Products Removed From Existing Building

2.1.2.1. Refer to drawings for existing items that are designated to be carefully removed and reinstalled or relocated.

2.1.2.2. Refer to drawings for existing items that are to be carefully removed and handed over to the Owner.

2.1.2.3. Materials resulting from demolition and not required to be retained shall be removed promptly from site in accordance with requirements of authorities having jurisdiction and in safe manner to minimize danger at site and during disposal.

2.1.2.4. Materials that are to be removed from the site and can be reused should be sent to the appropriate facility.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Review audit of hazardous materials and designated substances of existing construction provided by Owner.

3.1.2. Consultant does not guarantee that existing conditions are the same as those indicated in Construction Documents.

3.1.3. Preliminary Survey:

3.1.3.1. Before commencing demolition operations, examine building to determine type of construction, condition of structure and site conditions. Assess strength and stability of damaged or deteriorated structures.

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

3.1.3.3. Investigate for presence of hazardous materials not identified in the construction documents.

3.1.3.4. Prepare a complete photographic record of all finishes and equipment to remain. Note any damages, missing items, breaches in fire rated construction, potential hazardous materials, conditions that are different from what is shown in the Construction Documents, and any other items of concern that could impact the construction. Submit report of existing conditions before start of demolition operations, for each work area.

3.1.4. Existing Services:

3.1.4.1. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element.

3.1.4.2. Identify all services and systems exposed as part of the demolition.

3.1.4.3. Verify services are cut off and properly capped before commencing associated or effected demolition.

3.1.4.4. Provide and maintain temporary fire alarm and fire protection services required during demolition to satisfaction of authorities having jurisdiction, fire departments and HWDSB Project Manager.

3.1.4.5. Verify prior to commencement work of this Section that disconnection and capping of electrical and mechanical services have been carried out.

3.1.4.6. Verify that dust control hoardings have been completed, inspected and accepted before proceeding.

3.2. PREPARATION

3.2.1. Protection of In-Place Conditions:

3.2.1.1. Post suitable warning signs outside of work area for protection of staff and public. Supervise entrance to work area to prevent entrance by unauthorized persons. If requested, provide lockable doors to prevent public entering danger zone.

3.2.1.2. Post warning signs on electrical lines and equipment which must remain energized to serve other portions of the building during period of demolition.

3.2.1.3. Provide fire extinguishers acceptable to fire prevention authorities in locations and of type suitable to enable personnel to deal with fire occurring during progress of work.

3.2.1.4. Provide suitable protection to existing lockers, doors, walls and finishes to remain. This includes a sealed 6 mil poly cover to prevent dust getting into equipment and fixtures.

3.2.2. Environmental Protection:

3.2.2.1. Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.

3.2.2.2. Removal of all demolition materials shall be in sealed containers. Removal of transite panels from work area shall be in approved sealed bags.

3.2.3. Protection to Existing Services:

3.2.3.1. Provide protection required to enable existing building services, systems and equipment to remain in continuous and normal operations.

3.2.3.2. Demolition shall be carried out in a manner to ensure the minimum of disruption to Owner, and other contractors working in the building.

3.3. DEMOLITION — GENERAL

3.3.1. Execute work in conformance to Hamilton Wentworth School Board Standards. Notify HWDSB Project Manager before disrupting building access or services.

3.3.2. Carry out demolition in accordance with CSA S350-M. Demolish structure and remove materials from site. Use hand tools only. Adhere to manufacturer's recommendations in use of hand held tools while conforming to the Occupational Health and Safety Act requirements.

3.3.3. Do not demolish spray or trowel-applied friable materials, materials suspected of containing PCBs or other hazardous materials. Where such materials are encountered notify HWDSB Project Manager immediately. Do not proceed until instructions have been received from Consultant.

3.3.4. Remove mechanical and electrical items indicated to be removed. Remove all abandoned services, communication lines, electrical wiring, plumbing, and ductwork.

3.3.5. The use of pneumatic or electrical jack hammers is not permitted.

3.3.6. Report any existing conditions uncovered by the demolition work that require remediation. This includes:

3.3.6.1. Damaged or unsafe services.

3.3.6.2. Unsupported services, structural members or missing hangers.

3.3.6.3. Incomplete insulation, vapour retarder or air barrier.

3.3.6.4. Incomplete or unacceptable fire separation, missing seals, fire dampers, fireproofing or firestopping.

3.3.7. Minimize noise. Avoid use of noisy equipment. Proposed methods for demolition to be reviewed at the pre-construction meetings ahead of the work in each work area.

3.3.8. Firestopping and Smoke Seal: In event work of this Section impacts on integrity of fire separations, ensure trade performing firestopping is notified.

3.3.9. Where items are to be removed from existing structure or surfaces that are to remain in place, remove those items complete with hangers, brackets and other readily removable supports and fastenings:

3.3.10. Building Services:

3.3.10.1. Arrange with HWDSB Project Manager to disconnect or interrupt existing building services. Cut-off and cap existing building services under Owner's supervision.

3.3.10.2. Prevent demolition debris from entering building drains.

3.3.11. Relocation of Salvaged Items:

3.3.11.1. Carefully remove, store, protect and re-install where applicable existing materials and equipment noted on Drawings to be retained and relocated. Relocate items to be retained and store them in areas directed by Consultant. In addition to items indicated on Drawings, Owner still reserves the right to retain any items or materials.

3.4. REMOVAL OF RESILIENT FLOOR FINISHES

3.4.1. Remove vinyl composite tile where shown. Strip all adhesive, underlayment or other cleavage membranes.

3.4.2. Remove resilient base.

3.4.3. Coordinate surface preparation of concrete slab with flooring trades in Division 09. Leave substrate flush, smooth and level suitable for new floor finish.

3.5. EXISTING SLAB PREPARATION

3.5.1. Remove existing floor finishes and bases as noted above.

3.5.2. At existing locations where flooring and base, has been removed, where concrete curbs, bases, steps and pads have been removed, grind and patch existing concrete slabs as required and clean slab and base surfaces, remove ridges, bumps, adhesives and other matter detrimental to bond of levelling coat, new finish application or underlayment. Surfaces shall be smooth, level and free of gouges; prepare for levelling coat and/or new finish application specified in respective Sections or underlayment.

3.5.3. At existing locations designated to receive new flooring, remove paint, old adhesives, and hard applied finishes by grinding or other approved means, as required to accommodate new flooring. Prepare for flooring application. Coordinate requirements with Work specified in flooring Sections.

3.5.4. At existing locations where slabs have been contaminated with oil, grease, resins or other such material not compatible with subsequent applied underlayment or flooring, remove contaminants by blast tracking or prepare existing surfaces by other approved means.

3.5.5. Rinse subfloor and vacuum clean.

3.6. CUTTING AND PATCHING

3.6.1. Obtain Consultant's approval before cutting, boring or sleeving load-bearing members.

3.6.2. Cut and patch as required to make work fit.

3.6.3. Make cuts with clean, true, smooth edges.

3.6.4. Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.

3.6.5. Patch openings created where mechanical and electrical services are removed in existing building.

3.6.6. Use specialists in affected materials to execute cutting, fitting and remedial work.

3.6.7. Make good surfaces exposed or disturbed by work with material and finish to match existing adjoining surfaces.

3.7. CLEANING

3.7.1. Waste Management:

3.7.1.1. Clear away dirt, rubbish and loose litter resulting from work of this Section, minimum daily. Keep dust to a minimum. When necessary and practical demolition works shall be sprayed periodically with water to reduce dust. Wet down debris from time to time to control dust.

3.7.1.2. Selling or burning of materials on site is not permitted.

3.7.1.3. Conform to requirements of authorities having jurisdiction regarding disposal of waste materials.

3.7.1.4. Materials prohibited from municipality waste management facilities shall be removed from site and dispose of at recycling companies specializing in recyclable materials.

END OF SECTION

PART 1 - GENERAL

1.1. SUMMARY

1.1.1. Section Includes:

1.1.1.1. Testing and preparation of substrate for installation of flooring.

1.1.1.2. Moisture vapour control topping.

1.1.2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1.1.2.1. Filling of major holes, crack repairs, patching chases and trenches in concrete substrate Flatness and levelness requirements for floor to receive resilient sheet flooring: Section 03 01 30 – Repairs to Concrete.

1.1.2.2. Ceramic and porcelain tile: Section 09 30 00 - Tiling

1.2. ADMINISTRATIVE REQUIREMENTS

1.2.1. Coordination:

1.2.1.1. Coordinate preparation of concrete flooring with installation of flooring materials. Ensure that proposed materials are compatible and will achieve correct results.

1.2.1.2. Determine acceptable limits for moisture vapour emissions, and pH with each of the finish flooring manufacturers.

1.2.1.3. Schedule surface preparation work with the concrete trade and flooring installation trade.

1.2.2. Preinstallation Meeting:

1.2.2.1. Prior to start of concrete work, arrange for Project site meeting of all parties associated with work of this Section, including Contractor, various flooring installers, and concrete finisher in accordance with Section 01 10 00.

1.2.2.2. Review Specification for work included under this Section and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, Project staffing, restrictions flooring installation and other matters affecting construction, to permit compliance with intent of this Section. Ensure Division 03 requirements for concrete are compatible with requirements of this Section; floor flatness and floor levelness requirements for various floor finishes and their acceptability by flooring manufacturer; surface texture of finished floor required for various floor finishes; acceptable approaches to remediation of high moisture and high pH floors; adhesive application and floor covering installation.

1.3. SUBMITTALS

1.3.1. Product Data Sheets:

1.3.1.1. Submit product data sheets for all products proposed for use in this Section.

1.3.1.2. Submit WHMIS Safety Data Sheets for each product.

1.3.2. Shop Drawing: submit floor plan showing the locations of all field testing of concrete floors.

1.3.3. Test and Evaluation Reports:, submit field test reports from recognized approved independent testing laboratory for following requirements:

1.3.3.1. Submit letters of acceptance from each manufacturer of flooring products specified in related Sections that the combination of products and methods used in the overall flooring preparation and installation are compatible and appropriate for their intended application.

1.3.3.2. Submit moisture vapour emissions testing for all concrete floor areas.

1.3.3.3. Submit calcium chloride test results in accordance with requirements specified herein.

1.3.3.4. Submit pH test results and verify their acceptability to resilient sheet flooring manufacturer in accordance with requirements specified herein.

1.4. CLOSEOUT SUBMITTALS

1.4.1. Update floor plan shop drawing with notes to confirm field testing locations and final test readings.

1.5. QUALITY ASSURANCE

1.5.1. Qualifications:

1.5.1.1. Field Testing Inspectors: Independent 3rd party inspectors with minimum three years experience with concrete testing.

1.5.1.2. Installers: Provide work of this Section executed by competent installers with minimum of 5 years experience in concrete preparation and application of concrete Products specified.

1.6. DELIVERY, STORAGE AND HANDLING

1.6.1. Delivery and Acceptance Requirements:

1.6.1.1. Deliver materials in good condition to site in manufacturer's original unopened containers that bears name and brand of manufacturer, Project identification, shipping and handling instructions.

1.7. SITE CONDITIONS

1.7.1. Ambient Conditions:

1.7.1.1. Maintain appropriate environmental conditions and protect work during and after installation. Comply with trade standards and manufacturer's Product instructions. Follow Product MSDS and label instructions concerning safety, health and other related precautionary and environmental protection.

1.7.1.2. Maintain relative humidity in accordance with manufacturer's instructions.

1.7.1.3. Exhaust temporary heaters to building exterior to prevent health hazards and damage to work from toxic fumes and emanations.

1.7.1.4. Maintain ambient air temperature and temperature of floor covering areas at not less than 10 deg C (50 deg F) or more than 29 deg C (85 deg F) 48 hours before, during installation and for 48 hours after application unless otherwise required in Product instructions.

1.8. WARRANTY

1.8.1. Manufacturer Warranty: Warrant work of this Section for period of 25 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, at no expense to Owner.

1.8.2. Defects include but are not limited to; failure of floor finish remaining in place and bonding to structural slab and finish becoming defective and spalling and/or cracking.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Ardex Canada, Inc.; www.ardex.ca

2.1.1.2. Flextile Ltd.; www.flextile.net

2.1.1.3. Laticrete International, Inc.; www.laticrete.com

2.1.1.4. Mapei Corporation; www.mapei.ca

2.2. MATERIALS

2.2.1. Concrete Moisture Emission Reducer: Characteristics, performance requirements:

2.2.1.1. Epoxy cement, compliant with ASTM F3010.

2.2.1.2. Antimicrobial additive

2.2.1.3. Reduce the moisture vapour emission rate of concrete slabs ≤ 3 lbs. per 1,000 ft^2 per 24 hours.

2.2.1.4. Reduce the surface alkalinity of concrete slabs down to pH levels of 9

2.2.1.5. Provide 1 of following:

2.2.1.5.1. “Planiseal™ VS” by Mapei Corporation.

2.2.1.5.2. “Sikafloor® 81 EpoCemCA” by Sika Canada Inc.

2.2.1.5.3. “Ardex MC Rapid” by Ardex Canada

2.2.2. Primer:

2.2.2.1. Provide 1 of following:

2.2.2.1.1. “4040 Acrylic Primer” by Flextile Ltd except where epoxy moisture mitigation systems.

2.2.2.1.2. “Primer X” by Mapei Corporation

2.2.2.1.3. “Sikafloor 155 WN” by Sika Canada

2.2.2.1.4. “Ardex P4” by Ardex Canada

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions for New Concrete:

3.1.1.1. Ensure new concrete slab has been properly cured and dry for minimum of 28 Days and has reached minimum compressive strength of 25 MPa (3625 psi) and a minimum of 1.5 MPa (218 psi) in tension.

3.1.1.2. Ensure no curing and sealing compounds, hardeners or other chemical additives have been used on concrete.

3.1.1.3. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.2. TESTING FOR ALL CONCRETE FLOORS:

3.2.1. Conduct concrete testing on all concrete floors prior to application of moisture vapour control topping and following corrective work.

3.2.2. Moisture Vapour Testing:

3.2.2.1. Perform calcium chloride test no earlier than 28 Days after concrete has been placed in accordance with requirements of ASTM F1869 for new and existing concrete floors, and in-situ probe RH testing in accordance with ASTM F2170 for new concrete prior to installation of flooring material.

3.2.2.2. Conduct 3 tests for each of the RH test methods for first 93 m2 (1000 sq ft) and 1 additional test for every 93 m² (1000 sq ft) of flooring. Ensure moisture emission from concrete floor does not exceed 2.27 kg/93 m² (5 lbs/1000 sq ft) in 24 hours or has a maximum RH of 80%.

3.2.2.3. Provide results to Consultant prior to commencement of installation including diagram of area tested showing location of each moisture test.

3.2.2.4. When concrete moisture emission rate is between 2.27 kg/93 m² (5 lbs/1000 sq ft) and 6.79 kg/93 m² (15 lbs/1000 sq ft) and in 24 hours use a concrete moisture emission reducer.

3.2.2.5. Do not proceed with installation until moisture problem has been corrected.

3.2.3. Alkalinity Testing (pH):

3.2.3.1. Measure pH of concrete in accordance with ACI PRC-364.17: How to Measure pH of a Concrete Surface Prior to Installation of a Floor Covering.

3.2.3.2. Perform pH test no earlier than 28 Days after concrete has been placed to ensure alkali salt residue is within limitation acceptable to manufacturer and to avoid adhesive failure, discoloration, shrinkage and softening of floor covering. If pH results are higher than 9.0, report to Consultant, Contractor or Owner for investigation and remedial work.

3.2.3.3. Perform at least three pH tests must be performed for the first 93 m² (1,000 square feet) of space. One additional test should be performed for each additional 93 m² (1,000 square feet 0 thereafter.

3.2.3.4. Refer to manufacturer for ways to neutralize floor prior to beginning of installation. Neutralize by sanding, vacuuming and/or by water plus mild sulfuric or sulfamic acid application as recommended by manufacturer.

3.2.3.5. Retest to assure pH has been neutralized.

3.2.4. Capillary Moisture Testing:

3.2.4.1. Moisture content of concrete substrate must be ≤ 4 % by mass (PBW – part by weight) as measured with a Tramex®CME / CMExpert type concrete moisture meter.

3.2.4.2. Before proceeding with application, test surfaces for moisture content in accordance with ASTM D4263 and in consultation with manufacturer to ensure they are suitable for application.

3.2.4.3. Provide all test results to Consultant prior to commencement of installation including diagram of area tested showing location of each moisture test, alkalinity test and capillary moisture test.

3.2.5. Evaluation and Assessment:

3.2.5.1. Report all testing results to manufacturer's representative and submit written acceptance of these results approval before proceeding.

3.2.5.2. Commencement of work implies acceptance of previously completed work.

3.3. SURFACE PREPARATION

3.3.1. For all new and existing concrete floor areas:

3.3.1.1. Prepare existing and new concrete floors over entire area with steel shot blasting or other method recommended by manufacturer. Remove uneven joints, rough areas, foreign and projection off surfaces. Surface to be hard, sound and roughened to irregular surface with weak concrete removed and surface holes and voids exposed. Equip dry blasting machine with vacuum to minimize dust.

3.3.1.2. Shot blast floor to remove soft material and to achieve a profile equivalent to ICRI / CSP 3 – 4.

3.3.1.3. Shot blast to expose cracks in concrete surface. For cracks lesser than 1.5 mm (1/16") employ crack reinforcing tape in accordance manufacturer's recommendations. Repair cracks, holes or other deficiencies in accordance with manufacturer's recommendations.

3.3.1.4. Blow clean control joints, sawcuts and cracks with compressed air.

3.4. MOISTURE BARRIER APPLICATION

3.4.1. If moisture levels exceed acceptable limit, apply moisture emission reducer in accordance with ASTM F710 and ASTM F3010.

3.4.2. Follow manufacturer's recommendations to determine whether cracks are filled before or after application of moisture barrier cement.

3.4.3. Mix moisture barrier in accordance with manufacturer's printed instructions.

3.4.4. Material components minimum 15°C (60°F) at time of mixing.

3.4.5. Apply coating using roller to achieve thickness as per manufacturer's instructions. Allow to cure.

3.4.6. Apply second coat of moisture barrier coating, dry film thickness of 12.8 mils. Allow to cure.

3.4.7. Re-test for moisture vapour emission and pH level.

3.5. CLEANING

3.5.1. Remove excess adhesive from floor, base and wall surfaces without damage.

3.5.2. Clean floor and base surface to flooring manufacturer's instructions.

3.6. PROTECTION

3.6.1. Protect installed flooring as recommended by flooring manufacturer against damage from rolling loads, other trades or placement of fixtures and equipment.

3.6.2. Prohibit foot traffic on floor for 24 hours after installation. Prohibit heavy traffic, rolling loads and furniture or appliance placement for a minimum of 72 hours after installation.

END OF SECTION

PART 1 - GENERAL

1.1. SUMMARY

1.1.1. Section Includes: Provide tiling including but not limited to following:

1.1.1.1. Grouting control joints in floor slab under tile.

1.1.1.2. Uncoupling membrane.

1.1.1.3. Thin-set mortar bond coat.

1.1.1.4. Floor tile, base and fittings.

1.1.1.5. Movement joints.

1.1.1.6. Grouting tile joints.

1.1.1.7. Caulking tile control joints.

1.1.1.8. Caulking penetrations through wall and floor tile.

1.2. ADMINISTRATIVE REQUIREMENTS

1.2.1. Coordination:

1.2.1.1. Provide Floor Flatness (FL) and Floor Levelness (FL) requirements to Section 03 01 30 – Repairs to Concrete.

1.2.1.2. Provide requirements to Section 09 05 61 – Common Work Results for Flooring Preparation for concrete testing. Coordinate testing, confirm acceptance of final preparations.

1.2.2. Preinstallation Meeting:

1.2.2.1. Prior to start of work, arrange for site meeting of parties associated with work of this Section. Attendance to include Contractor, Subcontractor, and manufacturer's representative.

1.2.2.2. Review work included under this Section and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials to be used, installation, methods and procedures, quality control, Project staffing, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of this Section. Also discuss following items:

1.2.2.2.1. Substrate and backing surfaces flatness requirements

1.2.2.2.2. Installation techniques associated with specified materials

1.2.2.2.3. Compatibility between specified materials and between adjacent materials

1.2.2.2.4. Concerns arising from site conditions

1.2.2.2.5. Concerns of the installer or supplier arising from as-constructed conditions

1.3. SUBMITTALS

1.3.1. Product Data:

1.3.1.1. Submit manufacturer's technical data sheets, MSDS and installation instructions for specified materials.

1.3.1.2. Where more than 1 manufacturer's Products are part of single tile assembly, arrange for each manufacturer to submit a written statement of compatibility with respect to other manufacturer's materials.

1.3.2. Shop Drawings: In addition to minimum requirements indicate following:

1.3.2.1. Special tile patterns or conditions affecting installation

1.3.2.2. Locations transitions and intersections between differing materials

1.3.2.3. Widths, details, and locations of expansion and contraction joints, and control and isolation joints in tile substrates and finished tile surfaces

1.3.3. Samples: Submit individual sample panels of each colour of ceramic tile, set with adhesive, grouting and bonding method as specified, showing quality, colour and finish of material, grout and pattern of tiles. Ensure each panel is minimum 600 mm x 600 mm (24" x 24").

1.4. QUALITY ASSURANCE

1.4.1. Project Quality Standard:

1.4.1.1. Tile Installation Manual published by the TTMAC, together with authorized additions and amendments will be used as a reference standard and forms part of this project specification

1.4.2. Qualifications:

1.4.2.1. Manufacturers: Obtain each specified material from one source with resources to provide products from the same production run for each contiguous area consistent in quality, appearance and physical properties.

1.4.2.2. Installers: Execute work of this Section using a company who is a member in good standing with TTMAC and has minimum 5 years successful experience in application of Products, systems and assemblies specified. Perform tile work using skilled mechanics trained and experienced in work of this complexity. Install waterproofing system using an applicator approved by system manufacturer.

1.5. SITE CONDITIONS

1.5.1. Ambient Conditions: Apply tile after completion of work by other Sections is complete; to surfaces sufficiently dry, clean, firm, level, plumb and free from oil or wax or any other material harmful to tile adhesion and as follows:

1.5.1.1. Temperature: Maintain tile materials and substrate temperature between TTMAC recommended minimum and maximum temperature range; unless indicated otherwise by manufacturer, as follows:

1.5.1.1.1. Tile and Cementitious Materials: Install tiles between 12 degrees C and 38 degrees C, meeting installation material manufacturer’s written recommendations.

1.5.1.1.2. Epoxy Materials: Install epoxy mortar and grouts between 18 degrees C and 35 degrees C, meeting installation material manufacturer’s written recommendations.

1.5.1.1.3. Curing Time: Maintain temperature range for 48 hours before and during installation and maintain temperature range until materials are fully set and cured in accordance with manufacturer’s recommendations, and as follows:

1.5.1.1.3.1. Provide additional heat when there is a risk that surface temperatures may drop below minimum recommended temperatures.

1.5.1.1.3.2. Provide cooling or wait until temperature range is below maximum recommended temperatures; do not install materials when temperature is at or above maximum recommended temperature.

1.5.2. Ventilation: Maintain adequate ventilation where Work of this Section generates toxic gases or where there is a risk of raising relative humidity to levels that could damage building finishes and assemblies.

1.6. WARRANTY

1.6.1. Manufacturer Warranty:

1.6.1.1. Warrant work of this Section against defects, excessive wear and loss of adhesion including replacement of defective tiling, materials, labour costs for demolition of defective work, accessories and installation systems at Owner's convenience. Cracks arising from normal shrinkage and/or expansion of concrete are not considered as structural failure. Hairline cracks in grout joints which result from these causes are considered normal and warranty is not voided as a result of these minor defects.

PART 2 - Products

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1. Ardex Canada, Inc.; www.ardex.ca

2.1.1.2. Centura; www.centura.ca

2.1.1.3. Flextile Ltd.; www.flextile.net

2.1.1.4. Interstyle Ceramic & Glass Tile; www.interstyle.ca

2.1.1.5. Laticrete International, Inc.; www.laticrete.com

2.1.1.6. Mapei Corporation; www.mapei.ca

2.1.1.7. Schluter Systems (Canada) Inc.; www.schluter.com

2.1.2. Use proprietary Products in full compliance with manufacturer's recommendations. As far as possible obtain Product from single manufacturer ensuring compatibility with adjacent components while maintaining quality.

2.2. PERFORMANCE REQUIREMENTS:

2.2.1. Select suitable systems for tile setting according to TTMAC design details and tile manufacturer's recommendations.

2.2.2. Provide tile products manufactured and tested in accordance with ANSI A108/A118/A136.1, ANSI A137.1 as appropriate to the Basis-of-Design Materials listed in this Section.

2.2.3. Substrate and Backing Surface Flatness Tolerances: final measurement for flatness and level using mortar bed or self levelling screed materials to achieve minimum of FF50; equivalent to 3 mm with no more than 2 gaps under 3000 mm straightedge measurement. in accordance with ASTM E1155. Same requirement for wall tiles.

2.3. UNDERLAYMENTS

2.3.1. Uncoupling Membrane: Ensure membrane conforms to definition for uncoupling membranes in TTMAC's Specification Guide 09 30 00 Tile Installation Manual and meets or exceeds requirements of ANSI A108/A118/A136.1. Membrane uncouples the floorcovering from the substrate and prevents the transfer of stresses to the tiled surface, providing Shear Stress Control. Cracks in the substrate are bridged and not transferred to the tile installed. Membrane to allow for installations of both latex-modified and unmodified tile mortars, for proper installation and maximum strength of large format porcelain, tile and stone. Provide 1 of following:

2.3.1.1. "Schluter®-DITRA-XL" by Schluter Systems (Canada) Inc.; 7 mm (9/32") thick, orange, high-density polyethylene membrane with a grid structure of 12 mm x 12 mm (1/2" x 1/2")

square cavities, each cut back in a dovetail configuration and a polypropylene anchoring fleece laminated to its underside.

2.3.1.2. “FLEXMAT” by Flextile Ltd; High Performance Universal Uncoupling Membrane, 0.5 mm (0.02”) thickness.

2.3.1.3. “Mapeguard UM” by Mapei Corporation; 3 mm (1/8”) thick, light green, polypropylene membrane with a tri-layered design of textured foil, backing fleece and mesh.

2.3.1.4. “Strata Matt Uncoupling Mat” by Laticrete International, Inc

2.3.2. Site Prepared Sanded Cement Mortar Mixture (Dry Pack):

2.3.2.1. Mortar Bed for Quarry Tile: A mixture of cement, sand and water (latex additive may be included) installed to thickness as required to provide an even substrate on which to apply tiling. Use mortar to correct irregularities in subsurface planes and slope accurately as required to meet design requirements. Reinforce mortar beds on floors with 50 mm x 50 mm x 1.6 mm (2” x 2” x 1/16”) galvanized or stainless steel square wire mesh and on walls expanded metal lath weighing not less than 1.4 kg/m2 (0.287 lbs/sq ft). Apply scratch coat where expanded metal lath is used before mortar bed is applied.

2.3.2.2. Conform to admixture manufacturer's recommendations for Products and mixtures.

2.3.2.3. Cement: CAN/CSA-A3000 grey or white Portland cement; white for grout.

2.3.2.4. “Fast-Setting”, Shrinkage Compensating, HCT Cement Binder for Interior Floors. Acceptable products:

2.3.2.4.1. “Ardex EB 2™ Fast Setting Screed Cement” by Ardex Canada, Inc.

2.3.2.4.2. “Mapecem Premix®” by Mapei Corporation.

2.3.2.4.3. “3701 Fortified Mortar Bed – Premixed” or “3701 Lite Mortar R – Rapid Curing & Lightweight” by Laticrete International, Inc.

2.3.2.5. Sand: ASTM C144 or CSA A23.1, sharp, screened mortar sand free from organic and deleterious materials.

2.3.2.6. Water: Potable.

2.3.2.7. Lime: ASTM C207, Type S, hydrated lime, except for “Mapecem®” products by Mapei Corporation.

2.3.2.8. Reinforcing Mesh: Conform to ASTM A1064/A1064M.

2.3.2.9. Reinforcing Metal Lath: Conform to ASTM C847.

2.3.2.10. Cleavage Membrane: CAN/CGSB-51.34-M, 0.10 mm (4 mil) thick polyethylene film or CSA A123.3, Type 1, asphalt saturated roofing felt.

2.4. ADHESIVES

2.4.1. Setting Bed and Thin-Set Adhesive:

2.4.1.1. Latex Mortar Bond Coat: ISO 13007-1 performance level (C2ES2P2); ANSI A108/A118/A136.1; for improved (C2) cement adhesive with (E) extended open time (S2) high-deformability (>5 mm) and improved (P2) for adherence to EGP characteristics, conforming to ANSI A108/A118/A136.1requirements. Acceptable products:

2.4.1.1.1. “Ardex X 77™ Microtec® Premium Microfiber Reinforced Polymer Modified Thin Set Mortar” by Ardex Canada, Inc.,

2.4.1.1.2. “Thin-Set Mortar 254 Platinum One-Step Thinset” by Laticrete International, Inc.,

2.4.1.1.3. “Kerabond/Keralastic" by Mapei Corporation

2.4.1.1.4. “#51 Floor and Wall Mix Thin-Set Mortar” and “#44 High Solids Latex Thin-Set Mortar Additive” by Flextile Ltd.

2.4.1.2. Latex Cement Mortars:

2.4.1.2.1. ISO 13007-1 (C2) performance level for improved cement adhesive with specific additional characteristics according to specified basis of design Project requirements; ANSI A108/A118/A136.1.

2.4.1.2.2. Full Contact Polymer-Modified Thin-Set Mortar Bond Coat for Horizontal Applications: ISO 13007-1 (C2) performance level improved cement adhesive; ANSI A108/A118/A136.1for EGP mortar installation over Plywood). Acceptable products:

2.4.1.2.2.1. “Ardex FB 9 L Pourable ShearFlex® Mortar” by Ardex Canada, Inc.

2.4.1.2.2.2. “"Keraflex Plus" Professional, Extra Smooth Large and Heavy Tile Polymer-Modified Mortar" by Mapei Corporation.

2.4.1.2.2.3. “61 Polymer Modified Full Coverage Mortar” by Flextile Ltd.

2.4.1.2.3. Polymer-Modified Thin-Set Mortar Bond Coat for Vertical Application of Large Modular Tiling: (300 mm x 300 mm (12” x 12”) and larger) ISO 13007-1 performance level (C2TES1) for improved cementitious (C2) for adhesive with (T) slip-resistant (E) extended open time (S1) deformable characteristics conforming to ANSI A108/A118/A136.1for single component latex cement mortar. Acceptable products:

2.4.1.2.3.1. “Ardex X 77™ Microtec® Premium Microfiber Reinforced Polymer Modified Thin Set Mortar” by Ardex Canada, In.

2.4.1.2.3.2. “Ultraflex™ LFT” by Mapei Corporation.

2.4.1.2.3.3. “56SR Premium Sag-Resistant LHT Mortar” by Flextile Ltd.

2.4.1.2.3.4. “4-XLT Polymer Fortified Adhesive Mortar” by Laticrete International, Inc.

2.4.1.2.4. Fast-setting Full Contact Polymer-Modified Thin-Set Mortar Bond Coat for Horizontal Applications: ISO 13007-1 performance level (C2FS1P1) for improved (C2) for cementitious adhesive (F) for fast-setting (S1) deformable (2.5 mm to 4.9 mm) with normal adherence (P1) for adherence to EGP characteristics, conforming to ANSI A108/A118/A136.1for EGP mortar installation over plywood). Acceptable products:

2.4.1.2.4.1. “"Keraflex RS" Rapid-Setting Extra Smooth Large & Heavy Tile Mortar” by Mapei Corporation

2.4.1.2.4.2. “62 Full Coverage Fast Set Mortar” by Flextile Ltd.

2.4.1.2.5. Polymer-Modified Thin-Set Mortar Bond Coat: ISO 13007-1 performance level (C2ES1P1) for improved (C2) for cementitious adhesive with (E) extended open time, (S1) deformable (2.5 mm to 4.9 mm) and normal (P1) for adherence to EGP characteristics, conforming to ANSI A108/A118/A136.1. Acceptable products:

2.4.1.2.5.1. “Ardex X 5™ Thin Set Mortar” by Ardex Canada, Inc.

2.4.1.2.5.2. “Ultraflex™ LFT” by Mapei Corporation.

2.4.1.2.5.3. “52 Versatile Premium-Grade, Polymer-Modified Mortar” by Flextile Ltd.

2.4.1.2.6. Fast-setting Polymer-Modified Thin-Set Mortar Bond Coat: ISO 13007-1 performance level (C2FS1P1) for improved (C2) for cementitious adhesive with (F) for fast-setting (S1) deformable (2.5 mm to 4.9 mm) and normal adherence

(P1) for adherence to EGP characteristics, conforming to ANSI A108/A118/A136.1. Acceptable products:

2.4.1.2.6.1. “Ultraflex™ RS Premium-Grade, Rapid Setting, Single Component Polymer-Modified HCT™ Mortar” by Mapei Corporation.

2.4.1.2.6.2. “58 Fast-Set Polymer-Modified Mortar” by Flextile Ltd.

2.5. TILE

2.5.1. Floor tile: Academia by

2.5.1.1. Size: as noted in drawings

2.5.1.2. Finish: soft

2.5.1.3. Colour: as noted in drawings

2.6. GROUT

2.6.1. Epoxy Grout: Conforming to ANSI A108/A118/A136.1and ISO 13007-3 (RG) performance level for reactive resin grouts; 100% solids, 2 component water washable epoxy grout. Acceptable products:

2.6.1.1. “Ardex WA Easy to Use Epoxy Grout and Adhesive” by Ardex Canada, Inc.,

2.6.1.2. “100 Flex-Epoxy 100% Solids Epoxy Grout” by Flextile Ltd.,

2.6.1.3. “SpectraLOCK® PRO Premium Grout” by Laticrete International, Inc.

2.6.1.4. “Kerapoxy” by Mapei Inc.

2.6.2. Polymer-Modified Un-sanded Cement Wall Grout: Conforming to ANSI A108/A118/A136.1 and ISO 13007-3 (CG1) performance level for normal cementitious grout, joint width less than 3 mm (1/8") for porous and absorbent body glazed tiles, marbles or soft glazed wall tiles. Acceptable products:

2.6.2.1. “Ardex FG-C™ Microtec® Unsanded Floor & Wall Grout” by Ardex Canada, Inc.,

2.6.2.2. “500 Polymer Modified Unsanded Grout” by Flextile Ltd.,

2.6.2.3. “Laticrete 1600 Unsanded Grout, with “Stonetech Grout Up Additive” by Laticrete International, Inc.

2.6.2.4. “Keracolor-U” by Mapei Corporation.

2.6.3. Polymer-Modified Sanded Cement Tile Grout:

2.6.3.1. Normal Setting Grout: Conforming to ANSI A118.7 and ISO 13007-3 (CG2A) performance level for improved cementitious grout with high abrasion resistance for joint width 3 mm (1/8") to 9 mm (3/8") for impervious and vitreous type tiles. Acceptable products:

2.6.3.1.1. “600 Polymer Modified Sanded Grout” by Flextile Ltd.,

2.6.3.1.2. “Laticrete 1500 Sanded Grout” with optional “Stonetech GroutUp Additive” by Laticrete International, Inc

2.6.3.1.3. “Keracolor-S” by Mapei Corporation.

2.6.4. Do not add water or other materials to dilute mortar or grout additives unless recommended by admixture manufacturer.

2.7. MOVEMENT JOINT PROFILES

2.7.1. Field Joint Profile:

2.7.1.1. Provide profile with integrated trapezoid-perforated anchoring legs, connected by a 11 mm (7/16”) wide replaceable thermoplastic rubber movement zone, which together form the visible surface. Acceptable Product:

2.7.1.1.1. “Schluter®-DILEX-KSN (AKSN)” by Schluter Systems (Canada) Inc.

2.7.1.1.2. “Expansion Movement Joint Profiles – Style 1 EJ1” by Laticrete International, Inc.

2.7.1.1.3. "Equal Cerfix Projoint DIL NAN" by Mapei Corporation

2.7.2. Perimeter Joint Profile:

2.7.2.1. Provide profile with integrated trapezoid-perforated anchoring leg, connected by a 10 mm (3/8”) wide replaceable thermoplastic rubber movement zone with self-adhesive backing strip, which together form the visible surface. Acceptable Products:

2.7.2.1.1. “Schluter®-DILEX-KSA (AKSA)” by Schluter Systems (Canada) Inc.

2.7.2.1.2. “Perimeter Joint – Style 1 PJ1” by Laticrete International, Inc.

2.7.2.1.3. "Equal Cerfix Projoint DIL NIL" by Mapei Corporation

2.8. EDGE PROTECTION PROFILES

2.8.1. Transition Strip (TH-1): Provide profile with 6 mm (1/4”) wide top section (visible surface), 10 mm (3/8”) high integrated trapezoid-perforated anchoring leg and integrated grout joint spacer, satin anodized aluminum:

2.8.1.1. “Schluter -Deco”, by Schluter Systems (Canada) Inc., Product number: AE 100 D

2.8.2. Transition Strip between Different Heights (TH-2): anodized aluminum, with an integrated joint spacer, integrated trapezoid-perforated anchoring leg, 10 mm (3/8”) high integrated trapezoid-perforated anchoring leg and integrated grout joint spacer, satin anodized aluminum:

2.8.2.1. “Schluter -RENO-TK”, by Schluter Systems (Canada) Inc.

2.8.3. Edge Protector (TH-3): anodized aluminum, with an integrated joint spacer, integrated trapezoid-perforated anchoring leg, 3.5 mm high integrated trapezoid-perforated anchoring leg and integrated grout joint spacer, satin anodized aluminum:

2.8.3.1. “Schluter -RENO-U”, by Schluter Systems (Canada) Inc

2.8.4. Transition Strip between Different Heights (TH-4): anodized aluminum, with an integrated joint spacer, integrated trapezoid-perforated anchoring leg, 6 mm (1/4”) high integrated trapezoid-perforated anchoring leg and integrated grout joint spacer, satin anodized aluminum:

2.8.4.1. “Schluter -RENO-TK”, by Schluter Systems (Canada) Inc.

2.8.5. Edge-Protection and Transition Profiles for Floors: Provide L-shaped profile with 3 mm (1/8”) wide top section and vertical wall section that together form the visible surface, integrated trapezoid-perforated anchoring leg and integrated grout joint spacer. Acceptable Product:

2.8.5.1. “Schluter®-SCHIENE” by Schluter Systems (Canada) Inc.

2.8.5.2. “Finishing Edge Profile Style 4 FP4” by Laticrete International, Inc.

2.8.5.3. "Equal Cerfix Proangle" by Mapei Corporation

2.8.6. Finishing and Edge-Protection Profiles for Walls and Countertops: Provide L-shaped profile with 3 mm (1/8”) wide top section and vertical wall section that together form the visible surface, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer. Acceptable Product:

2.8.6.1. “Schluter®-JOLLY” by Schluter Systems (Canada) Inc.

2.8.6.2. “L-Shape Edging Profile LS4“ by Laticrete International, Inc.

2.8.6.3. "Equal Cerfix Proangle" by Mapei Corporation

2.9. TILE CLEANER

2.9.1. A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers. Acceptable products:

2.9.1.1. “Ultracare Concentrated Tile & Grout Cleaner” by Mapei Corporation.

2.9.1.2. “Stonetech Stone & Tile Cleaner” by Laticrete International, Inc

2.10. MIXING MORTARS AND GROUT

2.10.1. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

2.10.2. Add materials, water, and additives in accurate proportions.

2.10.3. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions:

3.1.1.1. Ensure new concrete slab has been properly cured and dry for minimum of 28 Days and has reached minimum compressive strength of 25 MPa (3625 psi) and a minimum of 1.5 MPa (218 psi) in tension.

3.1.1.2. Ensure no curing and sealing compounds, hardeners or other chemical additives have been used on concrete.

3.1.1.3. Notify Consultant in writing of any conditions which would be detrimental to the installation.

3.1.2. Preinstallation Testing for all Concrete Floors:

3.1.2.1. Refer to Section 09 05 61 - Common Work Results for Flooring Preparation

3.1.2.2. Proceed only when moisture levels and pH reading are within acceptable tolerances.

3.2. PREPARATION

3.2.1. Surface Preparation:

3.2.1.1. Ensure substrates are structurally sound, solid, stable, level, plumb and true to a tolerance in plane of 6 mm in 3 m (1/4” in 10’ - 0”) in accordance with ANSI A108/A118/A136.1 specification requirements. Ensure substrates are clean and free of dust, oil, grease, paint, tar, wax, curing agent, primer, sealer, form release agent or any deleterious substance and debris which may prevent or reduce adhesion.

3.2.1.2. Mechanically sand, shot blast or scarify substrate as required to completely remove paint, loosely bonded topping, loose particles and contaminants. Surface etching or contaminant removal by chemical means is not permitted. When sanding or scarifying surfaces that may contain silica sand, wear an approved dust mask.

3.2.1.3. In all cases, structural design of substrate shall not allow a deflection greater than L/360 when tested to 136 kg (300 lb) concentrated loads in accordance with ASTM C627 test method. Deflection and curvature should be uniform over length of the span.

3.2.1.4. Review setting out point with Consultant for each location, verify patterns and edge condition.

3.2.1.5. Verify substrate expansion joints have been installed properly.

3.3. UNCOUPLING MEMBRANE:

3.3.1. Apply a thin-set mortar suitable for substrate (mixed to a fairly fluid consistency, but still able to hold a notch) using uncoupling membrane manufacturer's recommend trowel.

3.3.2. Apply uncoupling membrane to floor, fleece side down. Solidly embed uncoupling membrane into thin-set mortar using a float, screed trowel or manufacturer's recommended roller.

3.3.3. When using a roller, place weight not to exceed 34 kg (75 lbs) on roller shelf. Slowly move roller from 1 end of uncoupling membrane to other, slightly overlapping successive passes.

3.3.4. Lift up a corner of uncoupling membrane to check coverage. Proper installation results in full contact between fleece webbing and thin-set mortar. Simply abut end and side sections of adjacent sheets.

3.4. INSTALLATION - TILES

3.4.1. Provide tiling in accordance with TTMAC's "Specification Guide 09 30 00 Tile Installation" unless specified otherwise.

3.4.2. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions:

3.4.2.1. Terminate Work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

3.4.2.2. Make cut edges smooth, even and free from chipping.

3.4.2.3. Do not split tile.

3.4.3. Accurately form intersections and returns; perform cutting and drilling of tile without marring visible surfaces:

3.4.3.1. Cut, drill, and fit tile to accommodate work of other subcontractors penetrating or abutting work of this Section.

3.4.3.2. Carefully grind cut edges of tile abutting trim, finish, or built in items for straight aligned joints.

3.4.3.3. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so that plates, collars, or covers overlap tile and to provide a uniform joint appearance.

3.4.4. Lay tile in pattern indicated on Drawings and as follows:

3.4.4.1. Align joints when adjoining tiles on floor, base, walls, and trim are the same size.

3.4.4.2. Lay out tile Work and centre tile sites in both directions in each space or on each wall area.

3.4.4.3. Centre tile patterns between control and movement joints; notify Consultant for further instructions where tile patterns do not align with control or movement joints.

3.4.4.4. Cut tile accurately and without damage.

3.4.4.5. Smooth exposed cut edges with abrasive stone, where exposed.

3.4.4.6. Chipped or split edges are not acceptable.

3.4.4.7. Minimum tile width is half unit size unless specifically indicated otherwise on Drawings.

3.4.4.8. Adjust tile layout to minimize tile cutting.

3.4.4.9. Provide uniform joint widths.

3.4.4.10. Make joints between tile sheets the same width as joints within tile sheets so joints between sheets are not apparent in finished Work.

3.4.4.11. Slope floor tile towards floor drains in thick-bed mortar installations.

3.4.5. Bonding Bed: Set tile in place while bond coat is wet and tacky and as follows:

3.4.5.1. With pressure, apply a coat of mortar by using the trowel's flat side to key the mortar into the substrate. Apply additional mortar, combing it in a single direction parallel to the tile's shortest dimension, with the trowel's notched side.

3.4.5.2. Use sufficient bond coat to provide a minimum 80% contact for tiles smaller than 300 mm x 300 mm and areas having Residential or Light Load Bearing Performance requirements with bonding material evenly dispersed and pressed into back of tile; refer to back buttering requirements for larger materials and installations having Moderate or higher Load Bearing Performance requirements.

3.4.5.3. Place tiles firmly into the wet mortar. Push the tiles back and forth in a direction perpendicular to trowel lines, to collapse the mortar ridges and to help achieve maximum coverage.

3.4.5.4. Verify that corner and edges are fully supported by bonding material by periodically picking up freshly installed tile and inspecting.

3.4.5.5. Set tiles to prevent lippage greater than 1 mm over a 3 mm grout joint.

3.4.5.6. Keep two-thirds of grout joint depth free of bonding materials.

3.4.5.7. Clean excess bonding materials from tile surface prior to final set.

3.4.5.8. Sound tiles after bonding materials have cured and replace hollow sounding tile before grouting.

3.4.6. Back Buttering: Obtain 100% mortar coverage in accordance with applicable requirements for back buttering of tile in referenced TTMAC and ANSI A108/A118/A136.1 series of tile installation standards.

3.4.7. Install prefabricated edge strips and control at locations indicated or where exposed edge of floor tile meets different flooring materials and exposed substrates.

3.4.8. Protect exposed edges of floor tile with properly sized transition strips, use sloped reducer strips where uneven transitions between 6 mm and 13 mm occur.

3.4.9. Control and Movement Joints: Install control joints and expansion joints in tile work in accordance with TTMAC Detail 301MJ-2019-2021; keep control and expansion joints free of bonding materials and as follows:

3.4.9.1. Cut tiles to establish line of joints; sawn joints after installation of tiles will not be acceptable to Consultant.

3.4.9.2. Locate joints in tile surfaces directly above joints in concrete substrates.

3.4.9.3. Provide floor control joints over structural control joints.

3.4.9.4. Install prefabricated joint profiles in accordance with manufacturer's written instructions, set with top surface of joint profile slightly below top surface of tile.

3.4.9.5. Prepare joints and apply sealants in accordance with requirements of Section 07 92 00.

3.4.9.6. Keep control and movement joints free from setting materials.

3.4.9.7. Form an open joint for sealant in tile wherever a change in backing material occurs, at all vertical interior corners, around penetrating pipes and fixtures, and where tile abuts other materials or fixtures.

3.4.10. Grouting: Install grout in accordance with manufacturer's written instructions, the requirements of TTMAC, and as follows:

3.4.10.1. Allow proper setting time before application of grout.

3.4.10.2. Pre-seal or wax tiles requiring protection from grout staining.

3.4.10.3. Force grout into the joints with a rubber grout float. Make sure all joints are well-compacted and free of voids and gaps.

3.4.10.4. Remove excess grout in accordance with manufacturer's written instructions and polish tile with clean cloths.

3.5. CLEANING

3.5.1. Remove grout and mortar residue immediately while work progresses and before materials harden on tiling surface.

3.5.2. Clean tiling completely leaving no apparent cement laitance on the surface. Do not acid wash especially where pigmented grouts are specified.

3.5.3. Clean adjacent surfaces that have been soiled or otherwise marred, to completely remove evidence of materials causing same.

3.5.4. Upon completion, remove protective coverings and clean down finished work of this Section leaving it in a correct condition according to industry standards. Correct defective jointing and grouting and other non-conformities.

3.6. PROTECTION

3.6.1. Remove and replace with new materials, sections of work that have become stained, soiled, broken, chipped or otherwise damaged.

3.6.2. Protect finished work from weather, freezing and complete water immersion for periods of at least 72 hours to 14 Days after completion of the Work depending on setting and grouting materials used. Follow Product instructions for requirements.

3.6.3. Walls: Protect walls from impact, vibration and hammering on adjacent and opposite walls for periods of at least 24 hours to 7 Days after installation depending on setting and grouting materials used. Follow Product instructions for requirements.

3.6.4. Floors: Protect floors from foot traffic for at least 4 hours to 48 hours after installation depending on the setting and grouting materials used. In all cases prohibit heavy commercial and equipment traffic for at least 48 hours to 7 Days depending on setting and grouting materials used. Follow product instructions for requirements.

3.6.5. Since temperature and humidity conditions during and after installation affect final curing time of cement based and epoxy materials, allow for extended periods of cure and protection when ambient and/or substrate temperatures drop below 15 deg C (60 deg F) and/or when relative humidity is higher than 70%.

3.6.6. Protect finished work from damage by other trades and general abuse until ready for takeover of the Work and acceptance.

END OF SECTION

PART 1 - GENERAL

1.1. SUMMARY

1.1.1. Section Includes: painting new and existing surfaces as indicated on the drawings and specifications. Work under this contract shall also include, but not necessarily be limited to following:

1.1.1.1. Surface preparation of substrate: cleaning and preparation of surfaces for application of paint systems.

1.1.1.2. Priming except where pre-primed with an approved primer under other Sections of work and painting of structural steel, miscellaneous metal, ornamental metal and primed steel equipment.

1.1.1.3. Priming and back-priming of wood materials as noted herein.

1.1.1.4. Painting of all semi-concealed areas e.g. inside of light troughs and valances, behind grilles, and projecting edges above and below sight lines.

1.1.1.5. Painting and finishing of all door frames.

1.1.1.6. Provision of safe and adequate ventilation as required over and above temporary ventilation supplied by others, where toxic and/or volatile / flammable materials are being used.

1.2. REFERENCES

1.2.1. Definitions:

1.2.1.1. Exposed: Visible in completed work. In case of closets, cabinets and drawers, it includes their interiors.

1.2.1.2. Gloss or Sheen: Capacity of a finish on a surface to reflect light at specific angles as tested in accordance with ASTM D523.

1.2.1.3. Hazardous Waste: Construction and demolition materials that are regulated for disposal by local, city, county, province or federal authorities having jurisdiction.

1.2.1.4. Painting: In this Section refers to application of various types of paint, stain, varnishes and lacquers, etc.

1.2.1.5. Surface Preparation: Cleaning or treating of surface to be painted to ensure best possible bond between surface and painting to be applied to surface; remove surface contaminants that will affect performance of painting, without limitations such as oil, grease, salts, dust, dirt, rust, rust scale, mill scale and old coatings where applicable; remove surface imperfections without limitation including but not limited to such as weld spatter, sharp edges, burrs, slivers, laminations, pits, porosities and crevices; prepare surfaces to provide anchor profile or surface profile which improve mechanical bonding of coating to prepared surface by increasing surface area.

1.3. SUBMITTALS

1.3.1. Product Data:

1.3.1.1. Submit Product data and a Schedule of Finishes listing manufacturer's Product name, colour, textures, MSDS and test reports requested for each paint system. Submit test reports for odourless, low or zero VOC Products when requested.

1.3.1.2. Painting Subcontractor to receive written confirmation of specific surface preparation procedures and primers used for fabricated steel items from fabricator/supplier to ensure appropriate and manufacturer compatible finish coat materials prior to commencement of painting.

1.3.1.3. Submit Product data for concrete and concrete block primers.

1.3.2. Samples: Submit samples 30 Days before materials are required.

1.3.2.1. Submit following samples in sizes indicated:

1.3.2.1.1. 2 copies of brushouts minimum 200 mm x 250 mm (8" x 10") of each finish including colour, sheen and texture. Identify each sample with job, finish, colour name, number, sheen and gloss values, substrate to be applied to, date and name of Subcontractor.

1.4. SITE CONDITIONS

1.4.1. Ambient Conditions:

1.4.1.1. Paint and finish in clean, dust-free, properly ventilated and adequately lit areas minimum 323 Lx (30 ft candles) on surfaces to be painted or decorated.

1.4.1.2. Provide each paint materials in accordance with manufacturer's recommended tolerances for:

1.4.1.2.1. Substrate Moisture Content: Perform tests with a properly calibrated electronic moisture meter to ensure compliance with manufacturer’s recommendations. Without limitation, maximum moisture content as follows:

1.4.1.2.1.1. Concrete and Concrete Unit Masonry: Maximum 12 - 14% for solvent coatings and as recommended by manufacturer for each water based system.

1.4.1.2.1.2. Gypsum Based Board and Plaster: Maximum 12 - 14%.

1.4.1.2.1.3. Wood: Maximum 15%.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications

2.1.1.1. Benjamin-Moore www.benjaminmoore.com

2.1.1.2. Dulux Paints www.dulux.ca

2.1.1.3. Sherwin Williams www.sherwin-williams.com

2.1.2. Basis of Design: for interior latex applications (PT-1): “Promar 200 HP Zero VOC” by Sherwin Williams

2.1.3. Substitution Limitations: Substitution Limitations: Comparable Products from other manufacturers not listed herein will be considered provided:

2.1.3.1. They are submitted in accordance with Substitution Procedures specified in Division 01

2.1.3.2. Meet requirements of this Specification.

2.1.3.3. Acceptance by Consultant.

2.2. MATERIALS

2.2.1. General: paint systems for existing surfaces shall be same finish system as for new work as specified below, but primer for existing painted or wallpapered surfaces: 1 coat X-Pert Gripper 250 by PPG, or as otherwise recommended by the finish paint manufacturer.

2.2.2. Finishes:

2.2.2.1. Colours: to be selected by Consultant

2.2.2.2. Gloss Values Definition, as determined by ASTM D523:

		Light Reflection Unit
G1	Gloss Level 1 – Traditional matte finish, Flat	< 5
G2	Gloss Level 2 – High side sheen Flat, “Velvet-like” finish	< 10
G3	Gloss Level 3 – Traditional “Eggshell-like” finish	10 - 25
G4	Gloss Level 4 – “Satin-like” finish	20 - 35
G5	Gloss Level 5 – Traditional Semi-Gloss	35 - 70
G6	Gloss Level 6 – Traditional Gloss	70 - 85
G7	Gloss Level 7 – High Gloss	> 85

2.2.2.3. Gloss Values unless otherwise specified:

2.2.2.3.1. Walls: G4

2.2.2.3.2. Floors: G5 or G6

2.2.2.3.3. Ceilings: G1

2.2.2.3.4. Trim and Doors: G5

2.2.2.3.5. Signage: G1

2.2.3. Mixing and Tinting:

2.2.3.1. Unless otherwise specified herein or pre-approved, all paint shall be ready-mixed and pre-tinted. Re-mix all paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and color and gloss uniformity.

2.3. INTERIOR FINISH SCHEDULE:

2.3.1. Concrete Vertical Surfaces:

2.3.1.1. 1 coat primer alkali resistant water based: Dulux Gripper Universal Acrylic Primer/ Sealer code 60000A

2.3.1.2. 2 coats latex: Dulux Lifemaster code 59311

2.3.1.3. Finish: G3 -Eggshell.

2.3.2. Concrete Masonry Units (CMU’s): (concrete block and concrete brick):

2.3.2.1. 1 coat latex block filler: Dulux X-Pert Acryluc

2.3.2.2. 2 coats latex: Dulux Lifemaster code 59311

2.3.2.3. Finish: G3 -Eggshell.

2.3.3. Structural Steel and Metal Fabrications: (with existing shop coat primer):

2.3.3.1. Unexposed: No further finishing required except for touch-up of damaged surfaces.

2.3.3.2. Exposed:

2.3.3.2.1. 1 coat quick dry metal primer: PPG Pitt-Tech Plus EP WB Acrylic Primer

2.3.3.2.2. 2 coats quick dry enamel: PPG HPC Alkyd Industrial Semi-Gloss Enamel code 4336H

2.3.3.2.3. Finish: G5 - Semi-Gloss.

2.3.4. Galvanized Metal (Not Chromate Passivated): (High contact/high traffic areas (doors, frames, railings, pipes, etc.) low contact/low traffic areas (overhead decking, pipes, ducts, etc.):

2.3.4.1. 1 coat waterborne primer: PPG Pitt-Tech Plus EP WB Acrylic Primer

2.3.4.2. 2 coats latex: Dulux acrylic eggshell code 14220

2.3.4.3. Finish: G3 - Eggshell

2.3.5. Gypsum Board:

2.3.5.1. 1 coat latex primer sealer: Dulux X-Pert code 11000

2.3.5.2. 2 coats latex:

2.3.5.2.1. Walls: Dulux Lifemaster code 59311

2.3.5.2.1.1. Finish: G3 - Eggshell

2.3.5.2.2. Ceilings: Dulux Lifemaster code 59111

2.3.5.2.2.1. Finish: G1 - Flat.

2.3.6. Plywood Backer Panels:

2.3.6.1. 2 coats Albi Cote FRL-X

2.3.6.2. Finish: G1 – Flat

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions:

3.1.1.1. Do work only when surfaces and conditions are satisfactory for production of quality work. Report to Consultant in writing any surfaces which are found to be unsatisfactory.

3.1.1.2. Ensure temperature of surfaces to be finished are as required for application of finish. Refer to “Temperature and Ventilation” article specified herein. Ensure surfaces are dry and free of dirt, grease or other contaminants that may affect applied finish.

3.1.1.3. Verify moisture content of surfaces with electronic moisture meter. Do not proceed without written directions if moisture reading is higher than as required for application. Refer to “Ambient Conditions” article specified herein for substrate moisture content requirements.

3.1.1.4. If substrate is masonry, allow to cure for 30 to 90 Days. Ensure moisture content is between 12% and 14% and test for alkalinity and neutralize (pH 6.5 - 7.5) before proceeding with priming.

3.1.1.5. If substrate is gypsum board, inspect to ensure joints are completely filled and sanded smooth. Inspect surfaces for "nail popping", screw heads not recessed and taped, breaks in surface or other imperfections and have repaired as required.

3.2. PREPARATION

3.2.1. Protection of In-Place Conditions:

3.2.1.1. Provide scaffolding, staging, platforms and ladders, as required for execution of work. Erect scaffolding to avoid interference with work of other trades. Comply with Occupational Health and Safety Act.

3.2.1.2. During work of this Section, provide drop cloths, plastic, plywood or metal sheets to protect floors in areas assigned for storage and mixing of paints. Cover finished floors, walls, ceilings and other work in vicinity and protect from paint and damage.

3.2.1.3. Protect work of other trades against paint splattering and Make Good at own expense any such damage.

3.2.1.4. Vacuum clean floors in areas to be painted.

3.2.1.5. Remove and securely store miscellaneous and finish hardware and surface fittings, electrical switch and outlet covers, receptacle plates, louvres, fittings and fastenings, to protect from paint splatter. Mask items not removable. Use sufficient drop cloths and protective coverings for full protection of floors, furnishings, mechanical, electrical and special equipment, other components of building which do not require painting or to be removed, from paint spotting and other soiling. Carefully clean and re-install items when paint is dry. Clean any components that are paint spotted or soiled. Do not use solvent or reactive cleaning agents on items that will mar or remove finishes (e.g. lacquer finishes).

3.2.1.6. Prohibit traffic, where possible, from areas where painting is being carried out and until paint is cured. Post “wet paint” or other warning signage during and on completion of work. Provide also warning signs at points of entry to areas where painting is applied and drying.

3.2.2. Surface Preparation:

3.2.2.1. Prepare defective surfaces to obtain a satisfactory substrate and in accordance with paint manufacturer's instructions.

3.2.2.2. Prior to painting, wipe down wall surfaces, vacuum clean floors, ensure all surfaces are dust-free.

3.2.2.3. Clean soiled surfaces to be painted. Wash existing surfaces with a biodegradable detergent, and bleach where applicable, and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants. Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface. Allow surfaces to drain completely and allow to dry thoroughly.

3.2.2.4. Remove efflorescence, chalk, dust, dirt, oil, grease, rust, form oil, release agents, loose mill scale and other extraneous matter from surfaces.

3.2.2.5. Remove mildew by scrubbing affected area with solution of 150 g (5.3 oz) TSP and 125 g (4.4 oz) bleach in 3.5 ℓ (0.92 gal) water. Rinse well with clean water and allow to dry. If condition is serious, source out finishes with extra mildew resistance.

3.2.2.6. Be responsible for surface preparation to suit surface condition and conform to level of cleaning based on SSPC, recommended metal cleaning procedures most commonly used to suit site conditions.

3.2.2.7. Existing surfaces - general: Remove or set screws, nails, hooks, tacks, and fasteners. Make repairs to damaged surfaces.

3.2.2.7.1. Existing gypsum board: Repair cracks and fissures by cutting away broken, damaged or loose material to expose substrate. Fill crack or damaged area with suitable new material in accordance with Section 09 29 00 – Gypsum Board.

3.2.2.8. Concrete and Masonry:

3.2.2.8.1. Form Oil Removal: Remove with Xylol or TSP.

3.2.2.8.2. Efflorescence Removal: Remove by dry brushing or washing with 1 part commercial muriatic acid to 20 parts water by volume and thoroughly rince with clean water.

3.2.2.8.3. Mildew Removal: Remove by scrubbing affected area with 1 part sodium hypochlorite to 3 parts water. Where dirt is also evident, add 1.36 kg (3 lbs) TSP to 6.8 ℓ (1.5 gal) of above solution.

3.2.2.8.4. Concrete Vertical Surfaces: Use sand blasting, high pressure water blasting, high pressure water blasting with abrasives, vacuum blasting with abrasives or alternatively, needle guns or power grinders equipped with suitable grinding stone, to remove concrete, loose mortar, fins, projections and surface contaminants. Vacuum or blow down and remove dust and loose particles from surface. Fill large cracks and/or voids in consultation with design engineer using either polyester, epoxy or acrylic resin, block filler or cement sand mixture in accordance with design engineer's written instructions. Fill only flush to surface and allow to set.

3.2.2.8.5. Concrete Block Masonry: Fill voids and cracks in masonry block wall to provide uniform surface for subsequent coats.

3.2.2.9. Metals:

3.2.2.9.1. Ensure application of paint and coatings occurs within appropriate time frame after cleaning when environmental conditions encourage flash-rusting, rusting, contamination or manufacturer's paint specifications require earlier applications.

3.2.2.9.2. SSPC-SP 3 (Power Tool Cleaning): Use of power sanders and wire brushes, impact tools, grinders and power chipping hammers to remove loose mill scale, loose rust, paint or other foreign matter. Do not employ power tool cleaning excessively causing burnished mill scale preventing primers to adhere properly.

3.2.2.9.3. Ferrous Metal: Clean to SSPC-SP 1/2/3, to suit site conditions. Remove loose rust and prime bare metal with rust inhibitive steel primer. Touch-up damaged shop applied primer using compatible Product. Provide full coat primer only if damage is extensive. Treat weld areas with phosphoric acid (5% solution).

3.2.2.9.4. Structural Steel/Miscellaneous Steel (previously painted and exposed by alterations work): Remove oil, grease, dirt, rust scale, loose mill scale, loose paint or coating by brush-off blast cleaning to SSPC-SP 7.

3.2.2.9.5. Hot Dipped Galvanized Steel (Unweathered): Allow to weather minimum of 26 weeks and Xylene clean to SSPC-SP 1 specified herein prior to coating to remove dust, dirt, grease, oxides and other foreign material. Remove silicates or similar surface treatments or any deposits of white rust by sanding or similar abrasive methods (bronze wool). Use of acetic acid to prepare galvanized surfaces is not acceptable.

3.2.2.9.6. Galvanized Steel (Weathered): Remove dust, dirt, grease, oxides and other foreign material and clean to SSPC-SP 1 specified herein prior to coating.

3.2.2.9.7. Galvanized Steel (Pre-Treated)(Non-Crystal Appearance): Follow manufacturer's recommendations for preparation, priming and coating of pre-treated galvanized steel.

3.2.2.9.8. Light Zinc Coated or Satin Coated Products (ZF075) mostly found in environmentally controlled areas. Follow manufacturer's recommendations for preparation, priming and coating.

3.2.2.9.9. Heavy Coated Zinc Z275 (G90) for high humidity areas and as specified. Follow manufacturer's recommendations for preparation, priming and coating.

3.2.2.9.10. Metal Doors: Remove doors before painting to paint bottom and top edges and re-hang once dry. Do not paint stainless steel or bronze door butts. Paint or

finish top and bottom edges of doors. Touch-up or refinish tops and edges after fitting.

3.2.2.10. Previously Finished Surfaces:

3.2.2.10.1. Clean existing interior and exterior surfaces to be repainted or varnished to provide bond. Remove rust, scale, oil, grease, mildew, chemicals and other foreign matter. Remove loose paint and fill flush with suitable patching material. Clean off bubbled, cracked, peeling or otherwise defective paint by stripping with suitable environmental strippers or by burning. Do not burn off paints suspected of having lead content. Treat residue from stripping as Hazardous Waste.

3.2.2.10.2. Flatten gloss paint and varnish with sandpaper and wipe off dust. If previous coatings have failed so as to affect proper performance or appearance of coatings to be applied, remove previous coatings completely and prepare substrates properly and refinish as specified for new work.

3.2.2.10.3. Remove or set screws, nails, hooks, tacks, and fasteners. Make repairs to damaged surfaces.

3.2.2.10.4. Existing gypsum board: Repair cracks and fissures by cutting away broken, damaged or loose material to expose substrate. Fill crack or damaged area with suitable new material in accordance with Section 09 29 00 – Gypsum Board.

3.2.2.10.5. Leave entire surface suitable to receive designated finishes and in accordance with finish manufacturer's instructions.

3.2.2.11. Woodwork:

3.2.2.11.1. Verify and determine wood species, grain direction and structure, properties of finish, application method and exposure to elements. Check moisture content to avoid movement of wood caused by expansion and contraction due to changes in moisture content. Verify grain cut as it may interfere with adhesion of paint.

3.2.2.11.2. Apply wood finishing Product in following order and as needed for specific appearance and application specified herein. Sanding sealer to control penetration of subsequent coats to create more uniform finish. Stain to colour wood and highlight grain for final finish. Filler to fill pores of wood and control penetration of subsequent coats. Apply filler across grain forcing it into pores followed with rubbing and sanding when dried. For staining requirements mix stain with filler before applying for uniform finish. Finish coats to provide protection to wood.

3.2.2.11.3. Wood work for Opaque Coating: Seal knots and sapwood in surfaces to receive paint with alcohol-based primer-sealer. Seal door edges. Sand smooth rough surfaces of woodwork to be finished using No. 150 grit paper followed by a second sanding using No. 220 grit paper. Sand in direction of grain. Clean surfaces free of dust before applying first coat using brush, compressed air or tack rags. Fill nail holes, splits and scratches with non-shrinking filler after first coat is dry.

3.2.2.11.4. Prepare plywood surface by removing dirt and debris. Fill screw and nail holes or minor imperfections with recommended filler and sand properly to receive finish coating. Ensure plywood requiring stained or painted finish is primed with top quality alkyd primer. Use only penetrating quality stain over plywood.

3.2.2.11.5. Woodwork for Clear Finish or Stain: Sand smooth woodwork to be finished using No. 150 grit paper followed by a second sanding using No. 220 grit paper and clean surfaces free of dust using brush, compressed air or tack rags before applying first coat. Abrade surfaces with stiff brush to remove loose fibres and splinters. Fill nail holes, splits and scratches with non-shrinking filler tinted to

match local grain condition after first coat is dry. Sand lightly between coats with No. 220 grit sandpaper and remove dust.

3.2.2.11.6. Remove salt deposits that may appear on wood surfaces treated with fire retarder.

3.2.2.11.7. Obtain inspection of glue laminated beams by assigned painting inspector to ensure shop sealer has been applied. Where non-specified shop sealer has been applied to beams or columns, remove and refinish in accordance with manufacturer's written instructions.

3.2.2.11.8. Wood Doors: Remove doors before painting to paint bottom and top edges and re-hang once dry. Paint or finish top and bottom edges of doors to be painted or stained. Touch-up or refinish tops and edges after fitting.

3.2.2.12. Gypsum Board:

3.2.2.12.1. Examine and ensure gypsum board surfaces are without defects or deficiencies and suit able to receive painting applications. Commencement implies acceptance of gypsum board work. Examine surfaces after for imperfections showing through and fill small nicks or holes with patching compound and sand smooth. Examine surfaces after priming for imperfections showing through.

3.2.2.12.2. Clean surfaces dry, free of dust, dirt, powdery residue, grease, oil, wax or any other contaminants.

3.3. APPLICATION

3.3.1. Safety Precautions: When handling solvent coating materials, wear approved vapour/particulate respirator as protection from vapours. Dust respirators do not provide protection from vapours.

3.3.2. Material Compatibility: Provide primers and finish coat materials compatible with each other and substrate including fillers.

3.3.3. Obtain colour chart giving colour schemes and gloss value for various areas from Consultant. Ensure colour chart gives final selection of colours and surface textures of finishes and whether finishes are transparent (natural) or opaque (paint).

3.3.4. Provide finish uniform in sheen, colour and texture, free from streaks, shiners and brush or roller marks or other defects.

3.3.5. Apply materials in accordance with manufacturer's directions and specifications paying particular attention to appropriate time frame after cleaning when environmental conditions encourage flash-rusting, rusting, contamination or manufacturer's paint specifications require earlier applications. Do not use adulterants. Do any reduction of coating’s viscosity in accordance with manufacturer’s directions.

3.3.6. Use up paints within period of shelf life recommended by paint manufacturer.

3.3.7. Ensure successive coatings are harmonious chemical compositions and materials of same manufacturer.

3.3.8. Apply primer coat soon after surface preparation is completed to prevent contamination of substrate.

3.3.9. Primer/Sealers: Apply primer-sealer coats by brush or roller. Permit to dry in accordance with manufacturer’s recommendations before applying succeeding coats. Touch up suction spots and sand between coats with No. 120 sandpaper.

3.3.10. Sand and dust between each coat to provide an anchor for next coat and to remove defects visible from a distance up to 1 m (39").

3.3.11. Ensure each coat is dry and hard before a following coat is applied.

3.3.12. Continue through paint finish behind wall-mounted items (e.g. chalk and tack boards).

3.3.13. Finish listed surfaces indicated on Room Finish Schedule(s) and/or noted on Drawing(s) and as specified. Refer to Finish Room Schedule for type, location and extent of finishes required and include touch-ups and field painting necessary to complete work shown, scheduled or specified.

3.3.14. Finishes and number of coats specified in Room Finish Schedule are intended as minimum requirements guide only. Refer to manufacturer's recommendations for exact instructions for thickness of coating to obtain optimum coverage and appearance. Some materials and colours may require additional coats and deeper colours may require use of manufacturers' special tinted primers. Apply additional paint coats, beyond number of coats specified for any surface, to completely cover and hide substrate and to produce a solid, uniform appearance

3.3.15. Painting previously painted surfaces:

3.3.15.1. Paint entire plane of wall or ceiling.

3.3.15.2. Where there has been patching or repair work – paint entire plane of wall or ceiling. Patching is not acceptable.

3.3.16. Do not paint baked paint surface, chrome plated, stainless steel, aluminum or other surfaces finished with final finish in factory. Finish paint primed surfaces.

3.3.17. Metals:

3.3.17.1. Apply primer coat to unprimed ferrous metal surfaces. Where sandblast preparation is specified, apply specified primer immediately after blast cleaning.

3.3.18. Woodwork:

3.3.18.1. Fill open grain woods with filler tinted to match wood and work well into grain. Wipe excess from surface before filler sets.

3.3.18.2. Sand smooth paint and varnish undercoats prior to recoating.

3.3.18.3. Prime woodwork designated for painting as soon as possible after delivery to site and before installation. Prime cut surfaces, whether exposed or not, i.e. 6 edges of wood doors, before installation. Prime cut surfaces of woodwork to receive transparent finish with 1 coat of transparent finish reduced 25% or as directed by manufacturer.

3.3.18.4. Apply final coats on smooth surfaces by roller or brush. Hand brush wood trim surfaces.

3.3.19. Allow each coat of paint to cure and become dry and hard before application of succeeding coats (unless manufacturer's directions require otherwise).

3.3.20. Before finishing paint coats are applied, inspect and touch-up shop coats of primers previously applied by other trades or fabricators.

3.3.21. Provide paint coating thicknesses indicated, measured as minimum DFT.

3.3.22. Apply a minimum of 4 coats of paint where deep or bright colours are used to achieve satisfactory results.

3.3.23. Ledges: Finish projecting ledges, both above and below sight lines, as specified for adjacent surfaces.

3.3.24. Light Coves: Paint light coves white whether a light lens is installed or not, unless otherwise indicated.

3.3.25. Interior Columns: Finish interior columns same as walls of room unless otherwise indicated.

3.3.26. Mechanical and Electrical Services:

3.3.26.1. Co-ordinate painting of mechanical and electrical equipment, piping, conduit, system Identification with appropriate Mechanical and Electrical Specification Sections. Unless otherwise specified or noted, paint "unfinished" conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and texture to match adjacent surfaces, where exposed-to-view in exterior and interior areas.

3.3.26.2. Prime and paint exposed, unfinished electrical raceways, fittings, outlet boxes, junction boxes, pull boxes and similar items.

3.3.26.3. Take steps to protect gauges, identification plates and similar items from being painted over or paint splattered.

3.3.26.4. Remove grilles, covers, access panels for mechanical and electrical systems from installed location and paint separately, if these items are not factory finished. Paint adjacent surfaces after removal and reinstall when surfaces are dry.

3.3.26.5. Paint work to match surfaces they are seen against unless directed otherwise.

3.3.26.6. Paint interior surfaces of air ducts visible through grilles and louvres, with 1 coat of flat black metal paint to limit of sight line.

3.3.26.7. In unfinished areas leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

3.3.26.8. Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

3.3.26.9. Do not paint over nameplates.

3.3.26.10. Paint behind louvres grilles and diffusers for minimum of 460 mm (18”) or beyond sight line, whichever is greater, to be painted with primer and 1 coat of matt black (non-reflecting) paint.

3.3.26.11. Paint each surface inside of light valances.

3.3.26.12. Paint disconnect switches for fire alarm system and exit light systems in red enamel.

3.3.26.13. Paint or band fire protection piping and sprinkler lines in accordance with mechanical requirements. Keep sprinkler heads free of paint.

3.3.26.14. Paint yellow or band natural gas piping in accordance with mechanical requirements.

3.3.26.15. Back prime and paint face and edges of plywood service panels for telephone and electrical equipment before installation to match adjacent wall surface. Leave equipment in original finish except for touch-up as required and paint conduits, mounting accessories and other unfinished items.

3.4. SITE QUALITY CONTROL

3.4.1. Non-Conforming Work:

3.4.1.1. Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction to Consultant at no cost to Owner. Touch up small affected areas, repaint large affected areas or areas without sufficient DFT of paint. Remove runs, sags of damaged paint by scraper or by sanding prior to application of paint.

3.4.1.2. Following are considered non-conforming qualities:

3.4.1.2.1. Lack of Uniformity:

3.4.1.2.1.1. Brush/roller marks, streaks, laps, runs, sags, drips, heavy stippling, hiding or shadowing by inefficient application methods, skipped or missed areas and foreign materials in paint coatings.

3.4.1.2.1.2. Evidence of poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, corners and re-entrant angles.

3.4.1.2.1.3. Damage due to touching before paint is sufficiently dry or any other contributory cause.

3.4.1.2.1.4. Damage due to application on moist surfaces or caused by inadequate protection from weather.

3.4.1.2.1.5. Damage and/or contamination of paint due to blown contaminants (dust, spray paint, etc.).

3.4.1.2.2. Aesthetic Problems: If following are evident under final lighting source (including daylight) for interior surfaces:

3.4.1.2.2.1. Visible defects are evident on vertical surfaces when viewed at normal viewing angles from a distance of not less than 1 m (39”).

3.4.1.2.2.2. Visible defects are evident on horizontal surfaces when viewed at normal viewing angles from a distance of not less than 1 m (39”).

3.4.1.2.2.3. Visible defects are evident on ceiling, soffit and other overhead surfaces when viewed at normal viewing angles.

3.4.1.2.2.4. When final coat on any surface exhibits a lack of uniformity of colour, sheen, texture and hiding across full surface area.

3.5. CLEANING

3.5.1. Keep waste rags in covered metal drums containing water and remove from building at end of each Day. Remove other combustible rubbish materials and empty paint cans each Day from site and safely dispose of same in accordance with requirements of authorities having jurisdiction.

3.5.2. Clean equipment and dispose of wash water/solvents as well as other cleaning and protective materials (e.g. rags, drop cloths, masking papers, etc.), paints, thinners, paint removers/strippers in accordance with safety requirements of authorities having jurisdiction.

3.5.3. Clean containers used for storage, mixing and application of materials free of foreign materials and residue.

3.5.4. Keep work area free from an unnecessary accumulation of tools, equipment, surplus materials and debris.

3.5.5. Clean adjacent surfaces which have been painted, soiled or otherwise marred. Remove spilled, splashed, splattered or sprayed paint as work progresses using means and materials that are not detrimental to affected surfaces.

3.5.6. Remove masking and other protection provided under this Section.

3.5.7. Remove temporary protective wrappings provided by others for protection of work after completion of painting operations unless instructed otherwise.

3.5.8. Painting work will not be considered complete until spatters, drippings, smears and overspray have been cleaned and removed to satisfaction of Consultant.

3.5.9. Make Good any damage to structure building surfaces or furnishings resulting from painting operations at no cost to Owner.

3.5.10. Waste Management:

3.5.10.1. Dispose paint waste in accordance with local regulations.

3.5.10.2. Set aside and protect surplus and uncontaminated finish materials not required by Owner and deliver or arrange collection for verifiable re-use or re-manufacturing.

END OF SECTION