PLUMBING UPGRADES AND SUITE RENOVATIONS AT SHERIDAN VILLA, PROJECT 24110

Table of Contents – Servery Upgrades Renovations

1 GENERAL

1.1 Instructions

1.1.1 All sections of Division 1, General Requirements as well as the Contract between the Agency and the Vendor, apply to all trades working on the project.

1.1.2 Work is to be in accordance with the Contract Documents and the Contract Drawings.

1.2 References

1.2.1 CSA Z317.13-17 – Infection control during construction, renovation and maintenance of health care facilities.

1.3 Infection Prevention and Control

1.3.1 The Vendors working at the Long-Term Care (LTC) facilities in the Region of Peel are obliged to comply with the infection prevention and control guidelines and are required to attend a meeting with representatives from the Agency's Occupational Safety and Facilities Development and Infection Prevention and Control Department prior to start of construction activities.

1.3.2 The Vendor shall notify and seek the review and approval of the infection control measurements implemented prior to start of any construction activities.

1.3.3 Construction activities in health care facilities present a risk for patients of these facilities. Take measures to prevent and control construction related infections. Plan with the Agency and implement preventive measures throughout duration of the Contract. Educate all construction personnel on-site regarding planned construction activity, location and duration, population risk group to ensure preventive measures are identified, initiated and maintained. Ensure appropriate preventive measures are in place and establish clear line of communication among those involved in this Project.

1.3.4 The Vendor shall be aware at all times that ongoing operation and activities of the existing Long Term Care (LTC) facility will continue. The Agency staff may at any given time request that any Work be temporarily ceased without additional cost to the Agency if work is performed in a manner that poses a risk for the residents and staff.

1.3.5 Normal concentrations of Aspergillus and other related spores are present in the natural environment and thus are not a risk to healthy construction workers or LTC staff.

1.3.6 Aspergillus and related nosocomial (LTC acquired) fungal infections are caused by inhalation by immunocompromised persons of Aspergillus spores or other related spores. The spores are known to be prolifically present in construction dust and debris. Control of construction dust, debris as required in this Section is imperative to help prevent outbreaks of Aspergillus or related nosocomial fungal infections in immunocompromised persons.

1.3.7 Inhalation of Aspergillus spores or other fungal spores by

immunocompromised persons can lead to serious complications and even death. Infections are caused by inhalation of Aspergillus spores or related spores by immunocompromised persons.

1.3.8 Construction activity types are defined by CSA Z317.13-17 (refer to Table 3). Contact the Agency if any issue is questionable under this Standard.

.1 1 and 2 are type C construction activity.

1.3.9 Infection Prevention and Control Measures:

.1 Initiate, perform and adhere to “Preventive Measure I, II, III and IV” as applicable for the Work in accordance with Article 7 of CSA Z317.13-17.

.2 Any deviation/changes to this classification must be approved by the Agency in conjunction with Infection Control and/or Occupational Health and Safety staff.

.3 Any other Work required to be performed off site shall be coordinated and evaluated for “Preventive Measure” level with the Agency prior to the Work being performed.

1.4. Temporary Measures

1.4.1 In addition to the above requirements, provide:

.1 Temporary Ventilation:

.1 Provide temporary ventilation system within construction area and adjacent areas to ensure it is functioning properly, before commencing the Work, throughout construction period and at completion. Where possible disable ventilation system in Work area until construction is complete.

.2 Assess air flow, air pressure, and air exchange rates as well as examining, cleaning and evaluating integrity of filters and ducts.

.3 Cap and seal existing supply, return and exhaust duct openings at construction areas. Cap duct during construction. Immediately seal new ducts added and installed with plastic sheeting (re-seal as required) to minimize entry of dust and/or contaminants into ductwork.

.4 Ensure provision for exhaust fan to maintain space under negative pressure. Direct exhaust discharge without interruption to outside as designated by the Agency away from intake vents or filtered through a High Efficiency Particulate Air (HEPA) filter before being re-circulated. The existing window glazing may be removed and reinstated to allow for direct exhaust to the exterior.

.5 As an alternative, provide portable fan/filter unit to maintain space under negative pressure. Unit shall be complete with three stage filtration: ninety nine point ninety nine (99.99) per cent HEPA, 40 per cent pre-filter and 25mm thick fibreglass media prefilter. Fan shall discharge to suitable

location outside the construction zone. Be responsible for replacing filters as required to ensure proper operation. Replace fiberglass pre-filter on daily basis.

.2 Dust Control:

.1 Dust-Down Vestibules: Provide dust down vestibule having a minimum size to suit, sealed to floor and structure above (may be tarped to ceiling if ceiling is tarped), equipped with vacuum, walk-off mats, clothing hooks and lighting, and electricity. Ensure construction side of vestibule is provided with double flap inner end with minimum 0.762mm thick polythene sheet. Provide magnetic doors to suit unless noted otherwise. Provide two 914mm x 2032mm hollow metal doors with pressed steel frame, closer and lock on outer end.

.3 Temporary Dust Partitions and Dust Barrier Partition Wall between existing building and the Work:

.1 Provide temporary dust barrier partitions in work areas and dust barrier partition walls with studs and fully sealed poly tarps or dust barrier system to prevent dust infiltration into adjacent areas during alteration, repairs, and construction.

.2 Conform to the Occupational Health and Safety Act and all other pertaining regulations.

.3 Conform to infection prevention and control requirements for designated population risk group, geographical area, construction activity type and preventive measures.

.4 Conform to Class III & IV, Infection Control Dust Barrier Partition Enclosure as indicated on CSA Z317.13-17, figure A4.

.5 Seal edges and joints to achieve positive protection.

.6 Remove temporary dust partition and dust barriers promptly when no longer required and make good adjacent surfaces. Hoarding/temporary dust tight partitions are to remain in place unless noted otherwise.

.7 Provide temporary dust partitions beyond those required where risk of falling objects exists, to protect the public and the Agency's personnel.

.8 Block off supply and return to prevent dust infiltration into adjacent areas during construction.

.9 Conform to suit site conditions and subject to review and approval by the Consultant, erect impermeable temporary dust proof partitions from structure including plenum above ceiling to floor using temporary dust partitions and dust barrier partition wall.

.10 Ensure windows, doors, plumbing penetrations, electrical outlets, and intake and exhaust vents are properly sealed

with plastic and taped within construction areas. Vacuum Work area with HEPA filtered vacuums daily or more frequently if needed. Vacuum air ducts and spaces above ceiling if necessary.

.11 Ensure workers wear protective clothing that is removed each time they leave the construction area before going into patient care areas. Ensure all personnel entering construction areas is wearing shoe covers and remove at exit.

.12 Execute the Work by methods that minimize dust generation from construction activities; wet mop and vacuum as necessary. Provide means to minimize dust migration into atmosphere by using drop sheets, by water misting Work surface before cutting and by placing dust mat at entrance to and exit from Work areas.

.13 Do not remove temporary dust proof partitions until section of scope is complete and area has been cleaned thoroughly and inspected by the Agency.

.14 Remove dust barrier carefully to minimize spreading dust and other debris particles associated with construction.

.15 Maintain construction areas clean and clear of debris throughout Work. Remove debris at end of each day. Erect external chute if construction is not taking place on ground floor level.

1.5 Infectious Disease Screening

1.5.1 To prevent and control the transmission of infection (particularly communicable diseases) from the Vendors to the population within the LTC facility, the Vendor shall follow the Ministry of Health and Long-Term Care's compliance standards and visitor policy as outlined below:

.1 The Vendor will self-screen for symptoms of Febrile Respiratory Illness (FRI) using the infection control screening tool available at the reception desk.

.2 The Vendor will sign in and out of the building and record their contact information by using the sign in book so the centre can monitor individuals who have entered the building. To stop the spread of infection, the Vendor must use the hand sanitizer when signing in and out as indicated on the sign-in sheet.

.3 If FRI symptoms have been identified, the receptionist will contact the Infection Control Practitioner/Program Support Nurse or the Director of Care or the Charge Registered Nurse. The person will be required to leave the premises and not visit the centre until symptom free.

.4 If FRI symptoms are not identified, the Vendor can enter the centre for their intend purpose.

.5 The Infection Control Practitioner/Program Support Nurse will be

advised of all occurrences of FRI symptoms.

2 PRODUCTS – NOT APPLICABLE

3 EXECUTION

3.1 Disposal of Demolition Waste

3.1.1 Demolition materials will be disposed of directly to the exterior of the facility.

3.1.2 Dust control must be maintained to prevent dust from entering the occupied areas of the building.

3.2 Materials Handling

3.2.1 Construction materials to be delivered to the Vendor staging area at the loading dock ramp, in a way that ensures that they are not exposed to contaminants or moisture.

3.2.2 All materials entering the construction Work area will be clean and dry.

3.2.3 Materials that become damaged due to moisture or water infiltration shall be removed, disposed of and replaced with dry and good materials.

END OF SECTION

1. GENERAL

1.1 General

1.1.1 Work in this Specification is divided into descriptive Sections which are not intended to identify absolute contractual limits between subcontractors, nor between the Vendor and their subcontractors. The Vendor is responsible for organizing division of labour and supply of materials essential to complete the Contract.

1.1.2 The Specifications and Contract Drawings are complementary, and items mentioned or indicated on one may not be mentioned or indicated on the other.

1.1.3 Mention in the Specifications or indication on the Contract Drawings of materials, products, operations, or methods, requires that the Vendor provide each item mentioned or indicated of the quality or subject to the qualifications noted; perform according to the conditions stated each operation prescribed; and provide labour, materials, products, equipment and services to complete the Work in all respects.

1.1.4 Project Location: 2460 Truscott Drive, Mississauga.

1.2 Scope of Work

1.2.1 Work under this contract includes the supply and installation of all materials, equipment, and labour for the following work at Sheridan Villa – Long Term Care Centre located at 2460 Truscott Drive, Mississauga, ON: For detailed Scope of Work refer to all drawings in conjunction with specifications and other contract documents. Scope of work is as follows

.1 Replacement of flooring and millwork in the south serveries on the second, third and fourth floor.

.2 Replacement of flooring in Spruce Lane on the first-floor behavioural unit.

.3 Replacement of carpet and vinyl floor in select areas on the ground, second, third and fourth floor.

1.2.2 Provide all labour, material, products, equipment and services for the replacement of selected existing interior millwork, wall finishes and flooring as indicated on the Contract Drawings A101, A201 & A301 and specified in various sections of the Specification. Work under this Project includes, but is not limited to the following:

1.2.3 Selectively demolition in the existing Serveries on levels 2, 3 & 4 and removal of existing millwork and finishes and disposal off site in a legal manner. Metals shall be routed to a suitable recycle centre and documentary proof of disposal shall be provided to Agency.

1.2.4 Removal and replacement of the existing flooring and trims on level one in the selected areas as shown on the drawings and as specified.

1.2.5 Supply and installation of new millwork, and associated finishes including flooring, wall tiling and painting.

1.2.6 The Vendor is to carefully examine the Contract Documents including Contract Drawings to ensure a complete understanding of the detailed scope of work covered under this Project.

1.2.7 The Vendor is strongly advised to provide a copy of all Contract Drawings and Specifications to subcontractors to ensure coordination items are completely understood.

1.2.8 It is intended that the Work supplied under the Contract Documents shall be complete and fully operational in every detail for the purpose required. Include materials not herein mentioned, but which may be found necessary to complete or perfect any portion of the Work in accordance with the Contract Documents.

1.3 Submittals

Be prepared to submit the shop drawings, hydraulic calculations, operation and maintenance data, maintenance materials, samples of any or all specified materials if requested by the Consultant/Agency.

1.4 Job Conditions

1.4.1 Report in writing to the Consultant, prior to commencing work, any conditions or defects encountered on the site, upon which the Work depends and which may adversely affect the performance of the Work.

1.4.2 Do not commence work until such conditions or defects have been investigated and corrected.

1.4.3 Commencement of the Work implies acceptance of surfaces and conditions. No claim for damages or resulting extra work will be accepted except where such conditions cannot be determined prior to construction.

1.4.4 The Vendor is to be responsible for making good, repair and restoration of existing conditions. In all cases, blend with existing conditions.

1.4.5 Any item not specifically mentioned in the following Specifications or shown on the Contract Drawings but is implied or required to complete the Work will be considered to be included in the Contract Price.

1.4.6 Life safety system shall always be operational throughout the construction.

1.5 Utilities

The Vendor is responsible for all damage and subsequent repair to utilities resulting from their operations.

1.6 Site Inspection

1.6.1 During the mandatory site visit, determine all conditions, difficulties and limitations that may be encountered and may affect the performance of the Work.

1.6.2 Verify all dimensions and requirements that will affect the execution of the Work as specified.

1.6.3 Failure to follow this procedure does not relieve the Vendor from their responsibilities to carry out the Work in accordance with the Contract Documents at the awarded Contract Price.

1.6.4 Contract Drawings are, in part, diagrammatic and are intended to convey the Scope of Work and indicate general and approximate locations and arrangements of the Work. Contract Drawings do not show all details, construction types and all other building elements built into the existing project. The Consultant is not responsible for accurate presentation of the existing building construction. Obtain more accurate information about locations, arrangements and sizes from study and co-ordination of Contract Drawings and site conditions. Become familiar with each and every condition affecting these matters before proceeding with the Work.

1.6.5 Contract Drawings and Specifications complement each other, and neither is to be considered alone. Hence, any item omitted in one, but mentioned or implied in the other must be provided.

1.7 Vendor's Use of Site

1.7.1 Limit areas for work and storage as directed on site by the Agency.

1.7.2 Maintain free access route for ambulance, fire and garbage trucks.

1.7.3 Do not disconnect any services without prior written authorization by the Agency. Notify the Agency in writing at least 72 hours in advance of planned interruption to existing services. Restore all interrupted plumbing and electrical services at the end of each working day.

1.7.4 Garbage bins, if required, shall be arranged by Vendor and will be placed on site at the direction of the Agency.

1.7.5 Maintain existing fire main and water supplies at all times during construction.

1.7.6 Coordinate and provide necessary services, access, exiting and other facilities as required.

1.8 Applicable Standards

Ontario Building Code (OBC). All material shall meet current ASTM and ANSI Standards.

1.9 Warranty

1.9.1 Provide On-Site Warranty for two (2) years for parts, equipment and labour from the date of Substantial Performance of the Project. The Warranty service shall be provided during the normal business hours between 8:00am to 5:00pm with a guaranteed response time of three (3) working days.

1.9.2 Make good promptly, without any expense to the Agency, any defects which occur during the entire warranty period.

1.9.3 Prior to the end of the one-year and two-year warranty periods following the date of Substantial Performance of the Work, perform with the Agency inspections of the Work and review any defects or deficiencies which have

been observed and reported during that period. Perform appropriate repairs to the Work in accordance with the Contract Documents.

1.9.4 The warrantees shall in no way supplant any other warrantees of a longer period.

1.10 Work Schedule

1.10.1 For each workday, building occupants will be notified in advance so that the Vendor can carry out demolition work and the new construction in the designated areas only. The Vendor will co-ordinate the exact details of allocated work area during construction with the Agency.

1.10.2 Immediately upon award of Contract and pre-construction meeting, the Vendor will submit all the shop drawings within two weeks to the Consultant for approval and ordering before the start of construction.

1.10.3 All Work under this Project shall be carried out during the normal business hours between 8:00am to 4:00pm and in accordance with the City noise bylaws.

1.10.4 Work must be carried out and completed in a continuous time period. Be prepared to reschedule some work due to Agency's daily operations and activities without any additional cost to the Agency.

1.10.5 The construction work shall start upon award of contract and the Vendor will complete the total work under this Contract within 10 weeks from the date of award of contract. The Agency will conduct normal and uninterrupted business throughout the construction work. No extension of time will be allowed.

1.10.6 The Consultant will issue Substantial Performance Certificate (Form-9) upon Substantial Performance of Work.

1.10.7 Once the Work has started, it must be carried out and completed in a continuous time.

1.11 Qualifications of Vendors and Workers

1.11.1 Workers shall be skilled trades workers, thoroughly trained, possessing a document of apprenticeship in trade performing under this Contract.

1.11.2 At any time, should the Work be unsatisfactory in the Agency's opinion, such document of proof of the workers experience must be presented or the worker replaced.

1.11.3 Give particular attention to finished dimensions and elevations of the Work. Make finished work fit indicated spaces accurately. Make finished work flush, plumb, true to lines and levels and accurate in all respects.

1.12 Permits, Inspection and Approval Certificates

1.12.1 The Agency has not applied for the building permit for this Work. The Consultant is responsible to prepare and submit the final design and the calculations to the City of Mississauga in order to obtain the final permit (if required) before commencement of Work on site. The Vendor shall coordinate with the City of Mississauga if required and arrange for all the

required testing and inspections and shall also complete the necessary paper work to the close the permit (if required).

1.12.2 Comply with all laws, ordinances, rules and regulations relating to the Work and to the preservation of the public health.

1.12.3 Be responsible for the safety of all workers and equipment on the project in accordance with all applicable legislation.

1.13 Health and Safety

1.13.1 For the purpose of the Contract, the term "Constructor" as defined in the *Occupational Health and Safety Act* shall mean the Vendor who will be responsible for ensuring that the provisions of the statutes, regulations and by-laws pertaining to safe performance of the Work are to be observed.

1.13.2 The Vendor will ensure that all the measures and procedures prescribed in the following Acts and Regulations are carried out on site:

.1 The *Occupational Health and Safety Act*;

.2 The Regulations for Construction Projects;

.3 Workplace Hazardous Materials Information Systems WHMS Regulations;

.4 The *Environmental Protection Act* and Regulations;

.5 All other legislation, regulations and standards as applicable.

1.13.3 Every employer and every worker performing work on the Site must comply with the requirements above. Ensure that the health and safety of workers, employees of the Agency and general public are protected in relation to the Work performed on the Site.

1.13.4 Maintain on site for the entire duration of the project, a hazardous material log containing all required Material Safety Data Sheets (MSDS). Log shall be open for inspection by the Agency, Consultant and all personnel on the Site. Provide copies of MSDS for any controlled products prior to delivery to the site.

1.14 Regulatory Requirements

1.14.1 The Vendor will comply with acceptable standards of the materials and performance of Work in accordance with codes and standards referred to in the Specification.

1.14.2 Comply with all by-laws and regulations of authorities having jurisdiction. These codes and regulations constitute an integral part of the Contract Documents.

1.14.3 In the event of conflict between Contract Documents specified herein, execute the Work in accordance with the most stringent requirements.

1.15 Quality Control

1.15.1 The Vendor will be responsible for quality control methods and procedures to ensure performance of the Work in accordance with the Contract Documents.

1.15.2 The Vendor is responsible for layout and survey for setting out the Work. Prior to setting out the Work, verify dimensions and elevations shown on the Contract Drawings and report to the Consultant any unsatisfactory conditions that may adversely affect the proper completion of the Work.

1.15.3 The Vendor will set-up and maintain permanent reference points and be responsible for accuracy of such reference points. Establish lines and levels required for the performance of the Work.

1.16 Temporary Facilities and Controls

1.16.1 Hoarding, Fencing and Barriers:

.1 Prevent unauthorised entry to the construction site. Barricade, guard or lock access points to the satisfaction of the Consultant/Agency.

.2 Install signs for movement of the people and vehicles around the Site as required by the Consultant/Agency.

.3 Remove fencing, barriers and barricades upon Contract completion.

.4 Provide dust-tight hoardings to isolate work areas as required by the Agency.

1.16.2 Scaffolding, Hoists and other lifting devices:

.1 Select, operate and maintain scaffolding and hoisting equipment as required to perform the Work and as directed by the Consultant/ Agency.

.2 Design and construct scaffolding in accordance with CAN/CSA S269.2-M.

.3 Take precautions to prevent the overloading of formwork and scaffolding or other temporary structures during the progress of the Work.

1.16.3 First-Aid Facilities: Provide site equipment and medical facilities necessary to supply first-aid service to injured personnel in accordance with regulations of the *Workman's Compensation Act*. Maintain facilities for the entire duration of Contract.

1.17 Shop Drawings/Samples

1.17.1 Submit the shop drawings as reasonably requested by the Consultant. The shop drawings must indicate the names and phone numbers of the manufacturer. All the dimensions shall be in metric. Allow two (2) weeks for the Consultant's review of each submission.

1.17.2 Drawings submitted by the Vendor as required herein are the property of the Agency who may use and duplicate such drawings where required in association with the Work.

1.17.3 Submissions shall include one copy in electronic format (PDF is acceptable). However, in instances where catalogue items are specified, two (2) clean copies of the manufacturer's catalogue may be submitted.

1.17.4 Be prepared to submit samples of any or all specified materials if requested by the Agency.

1.18 Additional Work and Changes

1.18.1 Unless through written order reviewed by the Consultant and countersigned or otherwise approved by the Agency's representative, no additional work shall be undertaken by the Vendor.

1.19 Access to Place of Work

1.19.1 The Vendor shall co-ordinate with the Agency for access card and key requirements.

1.20 Vendor's Site Office

1.20.1 Office space and telephone will not be provided by the Agency unless agreed upon in advance.

1.21 Washroom Facilities

1.21.1 The Vendor may use washroom at the facilities as long as washrooms are kept reasonably neat and clean and agreed upon in adavance. Washrooms are not to be used for any construction activity or construction clean-up.

1.22 Parking

1.22.1 Limited parking will be allowed on site. Location and number of parking spots shall be at the direction of the Agency.

1.23 Power and Water

1.23.1 The Agency will provide temporary electric power and water for construction. The electric power will be supplied through existing 120V, 15A receptacles. If additional power source is required, Vendor shall coordinate with the Agency and arrange for at Vendor's expense. Standard 12.5mm exterior hose bibs are available for water. Some janitorial sinks are also available inside. No chemical and large debris to be dumped into sinks.

1.24 Site Signs

1.24.1 The Vendor's site signs are not permitted.

1.25 Safety Signs

1.25.1 Provide safety signs and boards for attention to staff and visitors.

1.26 Responsibility for Temporary Structures

1.26.1 1.26.1 The Vendor is responsible for erecting the temporary structures, as required on site, to perform the work on all the sites. The Vendor will take precautions to prevent the overloading of formwork and scaffolding and all the other temporary structures constructed during the progress of the Work.

The Vendor is responsible for removal of the temporary structure to the satisfaction of the Agency immediately after completion of the Work.

1.27 Fire Protection and Hot Work Permit

1.27.1 Take precautions to prevent fires. Provide and maintain temporary fire protection equipment of a type appropriate to the hazard anticipated in accordance with authorities having jurisdiction, governing codes, regulations, by-laws and to the satisfaction of the Consultant and insurance authorities.

1.27.2 Provide and maintain fire extinguishers and accessories as required on the site. All fire protection measures shall have the approval of all prevailing regulations.

1.27.3 Obtain hot work permit in advance from the Agency as and when required. Provide sufficient notice to the Agency in the event of fire alarm shut downs.

1.28 Project Supervision and Coordination

1.28.1 Take reasonable measures to control noise and dust during construction. Control execution of all work to minimize interference of occupants' use of the building. Be responsible for workers' activities while on the site.

1.28.2 Keep at the job site at least, one copy, including all amendments, of each of the following:

.1 Contract Drawings;
.2 Specifications;
.3 Change Orders;
.4 Daily records of all work performed;
.5 Proof of WHMIS training for all site personnel;
.6 Product data sheets to meet the WHMIS requirements;
.7 *Occupational Health and Safety Act*, latest edition; and
.8 Project Work Schedule.

1.28.3 Notify all staff and subcontractors that the Vendor is entirely responsible for site safety. No actions or lack of action by the Agency or the Consultant shall be deemed to be an instruction related to safety of the workplace.

1.28.4 The Contract Drawings are intended to convey the Scope of Work and indicate general and approximate locations and arrangement of Work. Verify all lines, levels and dimensions shown and report all discrepancies to the Consultant before commencing the Work.

1.29 Material Delivery and Storage

1.29.1 Deliver materials in original bundles, packages and containers. Take particular care that materials are carefully handled to prevent damage to new and existing work. Storage space will not be provided by the Agency.

1.29.2 Do not install damaged materials. Remove all damaged materials promptly from the project site.

1.29.3 Agency will not accept any delivery on behalf of the Vendor.

1.30 Cleaning and Isolation of Work Area

1.30.1 Remove all materials, equipment and debris from the property and leave the premises clean and tidy to the Agency's satisfaction. If the site is not kept clean, the Agency reserves the right to have the site cleaned at the Vendor's expense from the outstanding amount owed plus administration.

1.30.2 All debris must be removed from the premises and taken to an authorized disposal area at the Vendor's expense at the end of each day's work. Use of the Agency's garbage container is strictly prohibited.

1.31 Cutting, Patching and Remedial Work

1.31.1 Provide labour, products, equipment, services, and tools necessary for cutting, patching and remedial work affected by the Work.

1.31.2 Where existing work is to be made good, match new work exactly with the existing work in material, construction and finish to the satisfaction of the Agency.

1.31.3 Where existing work is to be made good, there shall be no visible difference in appearance, performance or aesthetics between the existing work and the new work at a distance of three metres from the surface being made good.

1.31.4 Properly prepare surfaces to receive patching, finishing and painting.

1.32 Fire Barriers

1.32.1 Where the conduit or devices are required to pass through fire rated separations, make penetrations and provide fire barrier seals with a fire resistance rating equivalent to the rating of the separation. Seal all the penetrations to the satisfaction of the Consultant.

1.32.2 Prior to installation, submit for review, proposed fire barrier seal materials, method of installation and ULC system number.

1.32.3 Acceptable Manufacturer: 3M. No substitution.

1.33 Sleeve and Formed Opening Location Drawings

1.33.1 Prepare and submit the drawings to the Consultant for review indicating all required sleeves. Such drawings shall be accurately dimensioned and shall relate sleeves, recesses and formed openings to suitable grid lines and elevation datum. The Vendor shall submit such drawings immediately upon the award of Contract.

1.33.2 Make all modifications to locations as directed by the Consultant at no extra cost to the Agency.

1.34 Final Cleaning

1.34.1 In addition to progress cleaning, work shall include final cleaning by skilled cleaning specialists on completion of the Project.

1.34.2 Final cleaning shall remove dust, stains, paint spots, soil, grease and accumulations of construction materials. Work shall be done in accordance with manufacturer's instructions for each material.

1.35 Pre-Construction Meetings

1.35.1 Attend a pre-construction meeting, arranged and conducted by the Agency and Consultant. Provide at the pre-construction meeting the baseline construction schedule developed using MS Project or Primavera for review and approval by the Consultant/Agency. Upon commencement, provide updated monthly schedules demonstrating any variances/delays.

1.36 Site Mobilization, Site Protection and Demobilization

1.36.1 Mobilization: Provide all the necessary labour, equipment, scaffolding, and materials necessary to mobilize and provide site safety and administration for the Work on site and to conform to all requirements in the Contract Documents. The Vendor is to provide safe access to all building entrances and exits for the duration of construction. The Vendor is to include for installing all required fencing and barricades, overhead protection at work area locations coinciding with pedestrian walkways, and signage as required by the Ministry of Labour (MOL).

1.36.2 Site Protection: The Vendor is to protect all Work areas from possible damage caused or incurred during the construction process. Any damages that are caused shall be repaired at the Vendor's expense. The Vendor is to provide protection to all areas as required to complete the specified work including roof.

1.36.3 Building Protections: Any damages to building equipment, roof and office finishes shall be repaired at the Vendor's expense.

1.36.4 Demobilization: Demobilization to include the removal of all tools and equipment necessary to conform to all requirements as specified in the Contract Documents. The demobilization also includes the thorough cleaning of the Work area prior to the Consultant and the Agency's final review for final acceptance of the Work. This includes the removal of all temporary protection, equipment, waste and surplus materials from site and leave in neat, tidy condition to the satisfaction of the Agency.

1.36.5 Carry out all the Work in strict accordance with *Occupational Health and Safety Act.*

1.37 Product Substitutions

Lump-Sum Contract Price must be based on specified products in the Contract Documents. Proposals for alternate products may be submitted in writing to the Consultant, only after award of the Contract. No alternates will be permitted without prior written approval from the Consultant and the Agency. The Contract price will be adjusted accordingly to all credits arising from any alternates, if accepted and approved, by the Consultant/Agency. Substitution of products are not encouraged on this Project.

1.38 Progress Meetings

Attend regularly scheduled on-site progress meetings approximately every two weeks to be held on site at times and dates that are mutually agreed to by the Agency, Consultant and the Vendor.

1.39 Progress Payments

The Vendor shall submit a complete breakdown of the Contract with each progress billing indicating percentage of work complete, in the form acceptable to the Agency/Consultant.

1.40 Red Line Drawings

1.40.1 Mark in coloured ink on a set of whiteprints, which will be provided, every change and deviation from other services where shown on Contract Drawings, so that on completion of the job the red line drawings shall indicate the changes as actually installed. Red line drawings shall be kept at the Project site and shall be kept up to date as the work progresses. Submit completed red line drawings before final certificate of job acceptance is issued.

1.40.2 Upon completion of the Work, the red line drawings shall be submitted to the Consultant for review.

1.41 Operation and Maintenance Plan

The Vendor shall submit a detailed operation and maintenance plan before closing out the project. Plan should include but not limited to:

1.41.1 Details of the equipment and components to be inspected.

1.41.2 Frequency of inspection.

1.41.3 List of Items that needs to be replaced periodically and frequency of the replacement.

1.41.4 Any preventive maintenance required to keep the equipment running and avoid any shutdown of the equipment.

1.41.5 List of the components that may require replacement, their make, model and supplier details.

1.42 Progress Photographs

1.42.1 Submit the progress photographs at the following milestones:

- .1 Existing conditions before the start of demolition work.
- .2 Demolition work at 50% completion.
- .3 Demolition work at 100% completion.
- .4 50% completion of the millwork, finishes and windows.
- .5 Installation of new window
- .6 Upon final completion of the Contract.

1.42.2 Photo Print Size: 100mm x 150mm (4” x 6”).

1.42.3 Provide one (1) digital set and one printed set. It should be mounted in clear plastic sleeves and placed in 3-ring binder, labelled on front and spine with

project description. Digital photos shall be included on a project close-out DVD.

1.43 Final Inspections and Close Out

1.43.1 Final acceptance of the Work will be given by the Agency and Consultant when:

.1 The complete system has been inspected, tested and accepted in writing by the Agency and the Consultant.

.2 Hand-over binder shall be submitted to the Consultant consisting of operation and maintenance manuals, copies of the approved shop drawings, the Vendor's record drawings, all test reports, completion and warranty One hand-over binder and one electronic copy shall be supplied to the Consultant.

1.43.2 Provide Consultant with all warranty certificates which will include:

.1 The proper name and address of the Agency and of the Project.

.2 The date the warranty commences, which corresponds to the date of Substantial Completion of this Project.

.3 The signature and seal of the company issuing the warranty and countersigned by the Vendor.

1.43.3 Make good all known deficiencies in the Work and notify Consultant of readiness for final field review after completion.

2. **PRODUCTS** Not Applicable

3. **EXECUTION** Not Applicable

1. GENERAL

1.1 Intent of Section

1.1.1 Section includes demolition, salvage, and modifications of existing structures, piping, and equipment as indicated on the Contract Drawings.

1.2 Code and Regulatory Requirements

1.2.1 Comply with applicable requirements of CSA S350-M1980 “Code of Practice for Safety in Demolition of Structures.”

1.2.2 Comply with applicable regulations of jurisdictional authorities governing waste management.

1.3 General

1.3.1 Coordinate the work with the Engineer, Operator, and the Agency to minimize disruptions to operations of the existing facility. Include the sequence of removals in the project schedule for review by the Engineer.

1.3.2 Do not begin removals except in accordance with the approved sequence of construction and until approval has been given by the Engineer in writing three (3) weeks prior to removal.

1.3.3 Except for items designated to be salvaged, all removed equipment, piping, materials, fixtures, hardware, supports, etc., to be disposed of by the Vendor unless marked in the field by the Agency. The Agency has the first right of refusal. The Vendor is to request that the Agency mark items to be salvaged, at least three (3) weeks prior to removal.

1.3.4 All equipment to be removed by the Vendor is to remain in good working order.

1.3.5 Materials to be turned over to the Agency shall be delivered and off loaded into storage anywhere within the facility boundaries.

1.3.6 All facilities in the work area which are not to be removed must remain in continuous use during the work.

1.3.7 Demolition and salvage work shall create a minimum of interference with the Agency’s operation and inconvenience to the Agency and to allow continuous, uninterrupted operation of the existing facility.

1.3.8 Perform non-destructive testing (NDT) (scanning and/or x-ray) of all concrete slabs and walls schedule for demolition. Verify that any pipes, electrical or communication cables have been properly terminated prior to demolition.

1.3.9 Perform non-destructive testing (NDT) scanning or x-ray on all portions of concrete walls or slabs that are specified to have holes/penetrations or sufficient modifications made to them.

1.3.10 Blasting will not be permitted.

1.3.11 Coordinate work and disposal requirements in accordance with the Designated Substance Survey (DSS) reports and all other applicable regulations.

1.3.12 The removal drawings may not present all items to be demolished. The Vendor removes all items, components, system, cables, piping, supports and equipment within the contract limit shown on the contract drawings except for them which specified not to remove or salvage.

1.4 References

1.4.1 CSA S350-M1980 (R2003) - Code of Practice for Safety in Demolition of Structures

1.4.2 OHSA O.Reg. 213/91 – Occupational Health and Safety Act for Construction

1.4.3 Refer to Appendices for Hazardous Material Survey Reports.

1.5 Submittals

1.5.1 Complete submittals in accordance with The General Requirements.

1.5.2 Submit for approval drawings, diagrams or details showing sequence of disassembly work or supporting structures and underpinning. Drawings for structural elements shall bear seal and signature of professional engineer licensed to practice in Ontario.

1.5.3 Prepare and submit a waste reduction work plan. Describe management of demolition wastes. Identify materials which can be reused, recycled, and indicate method proposed for reducing, reusing recycling wastes.

1.6 Protection

1.6.1 Prevent uncontrolled movement, any part of building being demolished; provide temporary shoring and bracing required.

1.6.2 Take steps to positively prevent uncontrolled falling of demolished materials.

1.6.3 Ensure that no part of existing structure is overloaded due to work carried out under this Section.

1.6.4 Prevent debris from blocking drainage systems.

1.6.5 Ensure the temporary guards, hoardings are provided during and upon completion of work in accordance with applicable safety regulations.

1.7 Examination

1.7.1 Visit the site and the existing building so as to fully understand all existing conditions and extent of work required. No increase in cost

or extension of performance time will be considered for failure to know conditions.

1.7.2 Take over buildings and structures to be demolished based on their condition at time of bid submission, except where indicated otherwise.

1.8 Coordination

1.8.1 Coordinate all demolition and modification work with any new work to be performed to facilitate completion. Demolition work cannot start until approved by Engineer. Coordination is required with the Engineer and the Agency's operation staff.

1.8.2 Coordinate modification work and demolition to allow continuous, uninterrupted operation of the existing facility.

2. PRODUCTS - NOT APPLICABLE

3. EXECUTION

3.1 Preparation

3.1.1 Ensure that affected building areas are unoccupied and discontinued in use and that required screens, partitions, hoardings are in place prior to start of demolition work.

3.1.2 Verify that existing services in areas affected by demolition are disconnected, capped or removed, prior to start of work.

3.1.3 Ensure that all process equipment within demolition areas, either to be removed or retained, is appropriately protected from damage, dust or anything else which may cause damage during the demolition works.

3.1.4 Coordinate work and disposal requirements in accordance with the Designated Substance Survey (DSS) including, but not limited to, Technical Appendices 7.7.3 and 7.7.4, and all other applicable regulations.

3.2 General Demolition Requirements

3.2.1 The general area in which the demolition work is to be performed shall be left clean and free of debris at the end of each shift; access routes must always be kept clear. If required, the general area shall be graded as required to provide a uniform appearance.

3.2.2 Demolish existing work as indicated and as required to accommodate new work.

3.2.3 Demolish work in a safe and systematic manner, from top to bottom.

3.2.4 Do not throw or drop demolished materials from heights. Use chutes, conveyors or hoisting equipment to lower materials.

3.2.5 Demolish in a manner to minimize dusting. Keep dusty materials wetted but prevent flooding or contaminated runoff.

3.2.6 Demolish masonry and concrete elements in small sections. Carefully remove and lower structural framing and other heavy and large objects.

3.2.7 At all times leave work in safe condition, so that no part is in danger of uncontrolled toppling or falling.

3.2.8 Install temporary supports as required to prevent uncontrolled collapse of structures. Design of support to be completed by Professional Engineer licensed in the Province of Ontario. Submit certified drawings for review.

3.2.9 Security of the facility and operation must always be provided.

3.3 Piping and Equipment Demolition

3.3.1 The Agency will drain and isolate the existing pipelines to be replaced. These activities shall be coordinated with the Agency and Engineer to determine timing. The Vendor shall pay for all transportation and temporary pumps, piping and its operation required to drain the existing pipeline to be removed.

3.3.2 The Vendor shall be responsible for the removal of process equipment, pumps and associated motors, piping, valves, and all other appurtenances associated with the item being removed as presented on the Contract Drawings.

3.3.3 Existing air, cold/hot water, sludge and chemical piping including duct shall be cut, removed, abandoned, disconnected, and/or salvaged as indicated on the drawings or as required by the Agency.

3.3.4 The Vendor will have access to the use of facility water for removals. No additional payment will be made for the removal and disposal of plant water or other materials used for the pipeline removal.

3.3.5 Piping and equipment shall be disconnected, dismantled and removed as required and in such a manner as to minimize disturbance or damage to adjacent construction.

3.3.6 At any point or location where new work is to be connected or installed, the removal of existing work shall be done so as to facilitate the new installation work to the maximum possible extent.

3.3.7 All hazardous chemical waste shall be disposed of by a company who is licensed in Ontario and trained to handle and remove them in accordance with the applicable regulations. The hazardous chemical waste, pipe and valves shall be disposed of off-site to an approved facility able to accept the hazardous waste with all applicable approvals and permits.

3.4 Site Work Demolition

3.4.1 The Vendor shall comply with specification Section 01 00 00 – General Requirements pertaining to the construction sequence guidelines that are recommended to maintain operations.

3.5 Repair of Existing Construction

3.5.1 Where structures to be demolished are connected to structures to remain, remove the existing construction in a careful manner so that adjacent construction, piping, or facilities to be left in place are not cracked or otherwise damaged.

3.5.2 The Vendor will be held responsible for any damage thereto because of his operations.

3.5.3 Use temporary supports designed by a Professional Engineer licensed in Ontario, where and as required for the support of existing facilities.

3.5.4 Holes and damage resulting from removal operations shall be filled, reconstructed, repaired, and finished to match and conform to adjacent surfaces and construction as determined by the Engineer.

3.6 Electrical Removal

3.6.1 Prepare drawings, stamped and signed by a licensed professional engineer, indicating temporary bracing and/or supporting structures required during the demolition as described herein.

3.6.2 In general, the demolition of the electrical systems comprises, but is not limited to:

.1 Removal of existing 600VAC, 347VAC, and 120/240/208VAC power distribution, power distribution equipment, miscellaneous low voltage wire, and redundant network/communications from the existing building interior area that is identified for the construction of the new training facility as required.

.2 Demolish electrical infrastructure to facilitate the construction of the new training facility and associated electrical distribution and communications systems.

.3 Disconnect power from all loads that are identified in the demolition area.

.4 Demolish infrastructure that is rendered redundant as a result of the new training facility construction works, including but not limited to low voltage wiring, raceways, wireways, lighting, communications wiring, security wiring, fittings, enclosures, and power distribution equipment.

3.6.3 Perform the demolition of electrical systems such that availability and continuity of supply to the surrounding are that is required to

remain in service, including monitoring and control of the common systems and auxiliaries are to remain functional and secured.

3.6.4 Perform the demolition of communication and security systems such that availability and continuity of operations to the surrounding area that is required to remain in service, including copper and fiber data communications including security and access control are to remain functional and secured.

3.6.5 Demolition procedures outlined herein are suggestions only. The Vendor is to take full responsibility for all procedures employed.

3.6.6 The electrical removal includes but not limited to lighting, receptacles, conduits, power cabling, miscellaneous low voltage wiring, communication, etc., back to source that will remain in service (such as a lighting panel, power distribution panel, patch panel, bix block termination, etc.) within the area identified to be retrofitted under this contract.

3.6.7 The lighting, receptacles, control stations, control panels, conduits, and other devices associated with the area to be renovated under this contract may not all be shown on the Contract Drawings. The Vendor is required to identify an isolate all services within the affected area

3.6.8 Prior to starting demolition, the Vendor shall inspect with the Agency and the Consultant the existing area identified for renovation to ascertain and confirm the limits of the works. Do not begin any demolition work until a complete survey is performed on the equipment, systems, services, and loads to be removed.

3.6.9 All the demolition work shall be done in a systematic fashion and in such a manner as not to damage other services and equipment and not to affect the use and function of any process equipment and any services (electrical power, lighting, communication, and heating) for the rest of the facility.

3.6.10 The Vendor to ensure that the facility operation is not affected due to loss of power to any part of the Toronto Maintenance Centre.

3.6.11 The electrical sub-contractor shall be responsible for the following items:

.1 Disconnecting electrical power sources from all equipment and devices to be moved or removed.

.2 Removing lighting, including but not limited to emergency lighting, lighting, and exit signs.

.3 Removing electrical conductors from the conduits serving the equipment to be moved or removed.

.4 Removing local starters, control stations, control panels and other local control devices not an integral part of the associated equipment to be moved or removed.

.5 Removing exposed conduit connecting equipment and devices to be moved or removed and the power sources.

.6 Where abandoned conduit not indicated to be retained for future use enters a structural surface above the operating floor, it shall be undercut 25mm with edges dovetailed and the structure tightly and neatly repaired to resemble the remaining surface.

.7 Where such a conduit enters a structural surface below the operating floor, it shall be cut flush with the floor or within 25mm of other surfaces, and those in floors and walls filled with expanding grout to a depth of one (1) diameter, but 50mm minimum.

.8 On any equipment to be reapplied or abandoned in place, unused conduit openings shall be plugged, and original identity nameplate shall be reversed or removed. Circuit lists and nameplates at sources of power shall be neatly corrected for changes in loads. Electrical items in motor control centres, control panels, panel boards, etc., separate from abandoned equipment shall be left as spares, unless indicated otherwise.

.9 Existing status and control panels shall be disconnected, removed, and returned to the Agency.

3.6.12 Demolition and disposal of Electrical Distribution

.1 Make safe all power distribution, to the first point of isolation/overcurrent protection located in distribution equipment that is outside of the demolition area and intended to remain in service.

.2 Remove power distribution and related distribution equipment that is rendered redundant as a result of the demolition scope.

.3 Unless noted otherwise all power distribution within the area for demolition is to be removed and disposed of from site.

.4 The Vendor shall correlate the demolition requirements on the electrical drawings with all other drawing drawings and disciplines to ensure that all power and control wiring distribution is removed for any equipment identified for demolition, including distribution that is rendered redundant as a result of structural/mechanical demolition works.

.5 Remove all power distribution and/or control wiring and related infrastructure that are rendered redundant as a result of the required equipment removals. Remove power distribution and make safe up to the first over current protection device that is to remain in service.

.6 Remove the equipment or material from site and dispose in accordance with all applicable regulations and codes. The Vendor is to pay all associated fees for disposal.

.7 The Vendor shall take all reasonable steps to ensure that equipment removed from site is reused or recycled.

.8 Remove surface-mounted conduits made obsolete by this project and remove from site. Tag, seal and cap unused, embedded conduits.

3.6.13 The Vendor is responsible for lock-out/tag-out procedures during demolition and for ensuring that equipment identified for demolition is deenergized. Once the associated loads are disconnected, remove the tags from all breakers feeding the load and retag the breaker, at the first point of distribution that is intended to remain in service, as 'SPARE', as required. Tags for distribution equipment that will be removed during the project shall be clearly legible and sufficiently permanent to last for the duration of the project. Tags written on tape are not deemed sufficiently permanent.

3.6.14 Remove abandoned power cable, electrical control panels, and power distribution equipment as required. Coordinate this Work with the Agency and the Consultant.

3.6.15 Abandoned conduits in good condition and at least as large as indicated for new circuits may be used as part of Contract installation.

3.6.16 Salvaged items to be reinstalled or delivered to the Agency's on-site storage shall be handled carefully.

3.6.17 Removed electrical equipment shall first be offered to the Agency and if the Agency refuses right to ownership, the equipment shall be disposed of off site by the Vendor.

3.7 Items to Be Salvaged By Vendor

3.7.1 All security cameras within the demolition area are to be salvaged by the Vendor, in consultation with Agency and with their written approval prior to removal.

3.7.2 Removal and salvage of any item of equipment or facility includes removal and salvage of all accessories, piping, wiring, supports, associated electrical starters and devices, base plates, and frames, and all other appurtenances, unless otherwise directed.

3.7.3 Existing materials and equipment removed, and not reused as a part of the work, shall become the Vendor's property, except for the items indicated by the Agency shall remain the Agency's property and shall be delivered to the Agency to a designated area by the Vendor in good condition.

3.7.4 Existing materials and equipment to be removed by the Vendor and reused as a part of the work shall remain the property of the Agency.

3.7.5 The Vendor shall carefully remove, in a manner to prevent damage, all materials and equipment specified herein or indicated to be salvaged and reused or to remain the property of the Agency.

3.7.6 The Vendor shall store and protect salvaged items specified or indicated to be reused in the work.

3.7.7 Any items damaged in removal, storage, or handling through carelessness or improper procedures shall be replaced by the Vendor in kind or with new items.

3.7.8 The Vendor may, at his option, furnish and install new items in lieu of those specified or indicated to be salvaged and reused, in which case such removed items will become the Vendor's property.

3.7.9 All other existing materials and equipment removed by the Vendor shall not be reused in the work, shall become the property of the Vendor, and shall be removed from the jobsite.

3.8 Instrumentation

3.8.1 Any mounting brackets, enclosures, stilling wells, piping, conduits, wiring, or holes that remain after removal of equipment and associated support hardware shall be removed or repaired in a manner acceptable to the Engineer.

3.8.2 Transmitters or switches containing mercury shall be removed and disposed of in an approved manner and by personnel knowledgeable about appropriate methods of handling mercury.

3.9 Select Concrete and Masonry Modifications

3.9.1 Remove existing concrete and masonry where such removal is indicated on the drawings or directed by the Engineer.

3.9.2 Remove all dust, grease, curing compounds, impregnations, waxes, foreign particles, and disintegrated material.

3.9.3 If chipping is necessary, the edges shall be perpendicular to the surface or slightly undercut. Feather edges will not be permitted.

3.9.4 Where existing concrete is to be removed, fill, repair, and finish the surfaces smooth and flush with adjacent undisturbed surfaces.

3.9.5 Any reinforcement bars the Engineer allows to be cut shall be cut off not less than 25 mm inside the finished and repaired surface. All anchor bolts, piping, and other hardware projecting from concrete surfaces after piping and equipment have been removed shall be cut 25 mm inside the finished or repaired surface. Reinforcement bars and other steel construction to be removed may be flame-cut.

3.9.6 Remove concrete bases of existing equipment that have been relocated or removed, down to the reinforcing steel of the supporting slab. Initiate removal of curb base with a concrete saw, cutting around the perimeter, taking care not to chip or spall the

surface of remaining structure. After existing materials have been removed, exposed reinforcing steel and structural slab shall be cleaned and filled with new concrete, finished to match the surrounding surface.

3.9.7 Where coring of concrete or masonry elements are necessary for installation of small pipes or conduit;

.1 Scan the floor or wall for electrical or process services prior to coring.

.2 Coring of holes shall be at 90 degrees to the concrete surface and made so that the cored hole is neat and clean on both sides of the element.

.3 Core holes must be at minimum 3-hole diameters from any other opening.

.4 Core holes must be a minimum of 150mm from any concrete edge.

.5 Core holes should not be oversized.

.6 Core holes must not be made in any beams, columns, or lintels without prior written approval of the Engineer.

.7 Core holes must be sealed in accordance with the general mechanical and electrical specifications.

.8 Square or rectangular openings to be placed by coring the corners with 100mm core prior to cutting the opening to avoid overcuts.

3.9.8 Concrete materials and placement shall be in accordance with the cast-in-place concrete section. Grouting shall be in accordance with the grouting section.

3.9.9 Provide dust control by water systems or vacuum systems and tarping to limit any dust migration during any concrete demolition works.

3.10 Disposal and Clean-Up

3.10.1 With the exception of items designated for salvage or reuse, all materials, rubbish, and debris resulting from demolition work shall become the Vendor’s property and shall be removed from site and legally disposed of unless specifically indicated otherwise.

3.10.2 Do not allow demolished materials to accumulate on site. Promptly, as work progresses, remove and legally dispose of materials away from site.

3.10.3 Separate and salvage materials suitable for reuse and/or recycling from general waste stream or non-salvageable items. Transport and dispose of non-salvageable items to licensed disposal facility.

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

3.10.5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

3.10.6 Collect, handle, store on-site and transport off-site, salvaged materials, salvaged for reuse and/or recycling in separate condition. Transport to authorized reuse/recycling location.

3.10.7 Burying, burning, selling waste materials on site is prohibited.

3.10.8 Disposal of liquid wastes into waterways, sewers is prohibited.

3.10.9 Clean-up work, storage, and waste collection areas as work progresses.

3.10.10 The Vendor shall be responsible for all cleaning of existing piping, equipment, and structures that is required to properly remove and dispose of items to be demolished.

3.11 Field Quality Control

3.11.1 Disassembly, removal of structural elements shall be carried out under the supervision of a professional engineer licensed to practice in Ontario.

END OF SECTION

1. GENERAL

1.1 Intent

1.1.1 This specification outlines requirements to remove asbestos-containing materials and work procedures necessary to remove the designated substances.

1.2 Scope of Work (Asbestos)

1.2.1 Work supplied under this section includes the removal and disposal of asbestos-containing materials in accordance with the Ministry of Labour, Ontario Regulation 278/05 requirements. The asbestos containing materials required for removal are described in the designated substance survey.

1.3 Scope of Work (Lead Based Paint)

1.3.1 Work supplied under this section includes the removal and disposal of lead-containing materials that will be impacted by the proposed contract work.

1.3.2 Prior to any renovations or demolition activities that may disturb materials identified to contain lead of any concentration, precautions must be taken as described in Ontario Regulation 213/91 as amended, Regulations for Construction Projects – made under the Occupational Health and Safety Act. This may include conducting an assessment of the potential exposure of airborne lead by a qualified person.

1.3.3 Exposure to lead-containing materials is regulated under the Revised Regulation of Ontario 843/90 as amended, Regulation respecting Lead - made under the Occupational Health and Safety Act.

1.3.4 Care must be taken to prevent lead-containing particles from becoming airborne during the disturbance of lead-containing surfaces (i.e., during renovation or demolition projects).

1.3.5 All lead abatement work must follow procedures outlined in the Guideline for Lead on Construction Projects, issued in September 2004 by the Occupational Health and Safety branch of the Ministry of Labour.

1.4 Scope of Work (Mercury)

1.4.1 Work supplied under this section includes replacing lighting fixtures that likely contain mercury.

1.4.2 All mercury-containing lighting fixtures removed from service are to be handled, stored and disposed of in accordance with Ontario Regulation 347, as amended to Ontario Regulation 461/05.

1.4.3 All mercury-containing materials/capsules located in thermostats or electrical equipment should be kept separate from all other waste to prevent damage to the glass capsule containing the mercury.

The mercury-containing capsules may be recycled and reused by qualified personnel or may be removed.

1.4.4 Certificates of disposal must be forwarded to the Agency or the Agency's representative.

1.4.5 Precautions must be taken to prevent mercury vapours becoming airborne during renovations or building demolition. Exposure to airborne mercury is regulated under the Revised Regulation of Ontario 844/90 as amended, Regulation respecting Mercury - made under the *Occupational Health and Safety Act*.

1.5 References

1.5.1 Comply with Provincial and local requirements pertaining to asbestos, provided that in any case of conflict among these requirements or with these specifications the more stringent requirement shall apply.

1.5.2 All work must be conducted in compliance with applicable guidelines and regulations, including, but not limited to:

.1 *Occupational Health and Safety Act* and Regulations, Ontario Ministry of Labour;

.2 R.R.O. 1990, Reg. 837, as amended;

.3 R.R.O. 2005, Reg. 278, as amended: Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations;

.4 *Transportation of Dangerous Goods Act*;

.5 R.R.O. 1990, Reg. 347, General – Waste Management;

.6 CSA Standard Z94.4.93 Selection, Care and Use of Respirators;

.7 CGSB 1-GP-205m Standard for: Sealer Application to Asbestos Fibre Releasing Materials.

1.6 Definitions

1.6.1 *Friable Material:* Material that when dry can be crumbled pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.

1.6.2 *Priority:* The priority assigned to an asbestos containing material is provided as an indication of priority to be given for the removal of the asbestos containing material (ACM). *Priority one* is an ACM that is highly recommended to be removed, repaired or encapsulated. *Priority two* is an ACM that could remain in place until system upgrading or renovations are to occur. *Priority three* is an ACM that could remain in place until eventual building demolition.

1.7 Quality Assurance

1.7.1 The Vendor shall ensure that:

.1 Measures and procedures prescribed under the Occupational Health and Safety Act and Regulations are carried out.
.2 Every employee and every worker on the project complies with the applicable Act and Regulations.
.3 The health and safety of workers and the public is to be protected.
.4 Policies and procedures of the City's Health and Safety program are to be complied with.
.5 All material handling, and associated equipment must conform with and be operated in accordance with "Workplace Hazardous Materials Information System" (WHMIS) and as required by the Ontario Ministry of Environment.
.6 All material disposal of contaminated waste is completed as required by the Ontario Ministry of Environment.
.7 Every employee and every worker on the project complies with the applicable Act and Regulations.
.8 The health and safety of workers and the public is to be protected.
.9 Policies and procedures of the City's Health and Safety program are to be complied with.
.10 All material handling, and associated equipment must conform with and be operated in accordance with "Workplace Hazardous Materials Information System" (WHMIS).
.11 Advise the Engineer whenever work is expected to be hazardous to employees and/or the public.

1.8 Site Specific Requirements (Asbestos)

1.8.1 The removal and disposal of asbestos containing materials is to be completed by an environmental abatement Vendor and is to dispose of the materials following Regulation 347/90 as amended under the *Environmental Protection Act* for Waste Management, transporting and disposal of hazardous waste. The (ACM) are to be wrapped in bags, sealed and properly identified as asbestos containing material (ACM). These are then to be removed from site.

1.8.2 The Vendor to notify the Engineer of this work two (2) weeks in advance for coordination.

1.8.3 Upon completion of the asbestos work activities, seal surfaces with a sealer in all areas from which asbestos has been removed and surfaces potentially contaminated with asbestos.

1.8.4 All work will be subject to inspection and air monitoring inside and outside the defined asbestos work area(s) by a Representative retained by the Agency. Any contamination of the surrounding areas, indicated by visual inspection or air monitoring, shall necessitate complete cleanup of affected areas by the Vendor, at

no cost to the Agency. The Vendor recognizes that time is of the essence in remedying any noted contamination or other deficiencies.

1.9 QUALITY ASSURANCE

1.9.1 Ensure work proceeds on schedule and meets all the requirements of this Section. Perform work so that airborne asbestos, asbestos waste, or water runoff do not contaminate areas outside the asbestos work enclosure.

1.9.2 Pay the cost to the Agency for the inspection and air monitoring performed as result of failure to perform work satisfactorily regarding quality, safety, or the schedule.

1.9.3 Use only skilled and qualified workers for all the trades required for this work.

1.10 SUBMITTALS

1.10.1 Make all submittals in accordance with specification section 01 33 00, Submittals before commencing work:

1.10.2 Obtain and submit all the necessary permits for transporting and disposal of asbestos waste. Submit verification that the abated materials have been disposed of as asbestos waste in an approved landfill.

1.10.3 Provide documentation that all personnel involved directly with the asbestos abatement activities are qualified for such work.

.1 Submit the name(s) of the supervisory personnel who will be responsible for the asbestos work area(s). One of these supervisors must remain on site at all times that asbestos removal or clean-up is occurring. Submit proof that supervisory personnel have attended a training course on asbestos control (2-day minimum duration) and have performed supervisory function on at least two (2) other asbestos removal projects of similar size to this project. Submit documentation that all employees have had instruction on: the potential health hazards of asbestos exposure; on the use, fitting and maintenance of respirators; on the use of protective dress; on the use of showers; on the use of entry and exit procedures from work areas; and on all aspects of work safety procedures and protective measures to be utilized on this project. All asbestos removal workers on this project must be able to provide proof of asbestos worker training. A copy of all of the asbestos removal workers' certification must be provided to the Agency's Representative. If requested, all asbestos removal workers on this project must provide evidence the medical monitoring requirement are met.

.2 Submit proposed schedule.

.3 Laws of the province of Ontario shall govern this work. The Vendor shall observe all such laws and shall obtain and/or pay all permits, notices, fees, taxes, duties as may be required. Likewise, it is the responsibility of the Asbestos subcontractor to comply with the Workers' Compensation and Occupational Health and Safety Acts and Regulations.

1.10.4 When required, not later than 72 hours before commencing asbestos work on this project, notify orally and in writing an inspector at the office of the Ministry of Labour nearest the workplace. Complete in accordance with Ontario Regulation R.R.O 2005, Reg 278, as amended.

2. PRODUCTS

2.1 Materials

2.1.1 Polyethylene: 0.15 mm (6 mil) minimum thickness unless otherwise specified; in sheet size to minimize joints.

2.1.2 Rip-Proof Polyethylene: 0.20 mm (8 mil) fabric made up from 0.13 mm (5 mil weave and 2 layers 0.04 mm (1.5 mil) poly laminate, in sheet size to minimize joints

2.1.3 **Tape:** Tape suitable for sealing polyethylene to surface encountered, under both wet conditions using amended water, and dry conditions. Nashua 398 Duct Tape or approved equivalent.

2.1.4 **HEPA Vacuum:** Vacuum with all necessary fittings, tools and attachments. Air must pass through HEPA filter before discharge.

2.1.5 **Protective Coveralls:** Disposable full body coveralls complete with elasticized hoods made of spun polyolefin material Tyvek by Dupont or non-woven material Kleenguard by Kimberley Clark, or Agency approved equivalent.

3. EXECUTION

3.1 General preparation

3.1.1 Establish barriers and asbestos warning signs to segregate the Asbestos Work Area.

3.1.2 Move equipment, tools, furnishings, and stored materials which can be moved without disturbing asbestos-containing materials. Coordinate with the Contract Administrator.

3.1.3 Turn off all air handling and ventilation systems supplying or exhausting from asbestos work area(s) and all fire detection and suppression systems in the asbestos work area(s). Obtain authorization from the Engineer prior to de-energizing any such systems.

3.1.4 Ducts that are to remain in service must be sealed to make airtight. Seal supply ducts with polyethylene sheeting to make airtight.

Perform work at appropriate time under contaminated conditions, if necessary.

3.1.5 Maintain emergency and fire exits from asbestos work area, or establish alternative exits satisfactory to authorities having jurisdiction.

3.2 Do Not Commence Asbestos Removal Work Until

3.2.1 Arrangements have been made for disposal of waste.

3.2.2 Tools, equipment and materials waste receptors are on hand.

3.2.3 Arrangements have been made with the Engineer for work area security.

3.2.4 Signs are displayed in areas where access to sealed asbestos work area is possible. Signs shall read:

CAUTION
Asbestos Hazard Area
No Unauthorized Entry
Wear assigned protective equipment
Breathing asbestos dust may cause serious bodily harm

3.2.5 If applicable, proof of Notification of Project to the Ministry of Labour has been submitted and an acknowledgment receipt received.

3.2.6 If applicable, post Proof of the Project Notification has been issued and received and post site-specific safe work procedures on the site.

3.2.7 The Agency's Representative has been notified of intention to proceed and has reviewed enclosures, equipment and procedures.

3.3 Tear Down of Protection

3.3.1 Remove barriers exposed during contaminated work.

3.3.2 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in asbestos waste receptors for disposal. Remove any remaining debris with HEPA vacuum or using wet wipe techniques.

3.3.3 Clean asbestos work area(s), equipment and other items that may have been contaminated during work.

3.3.4 Clean asbestos waste receptors and equipment used in work and remove from asbestos work area(s).

3.3.5 Remove hoardings, temporary lighting, equipment and facilities provided for work.

3.3.6 A final review may be carried out by the Agency's Representative to ensure that no dust or debris remains.

3.4 Re-Establishment of Objects and Systems

3.4.1 When clean-up is complete reconstruct items which are to remain and reinstall objects and items removed to facilitate asbestos removal operation in their proper positions. Reconstruction and

reinstallation shall be by tradesmen qualified in work being reinstalled or reconstructed.

3.4.2 Re-establish mechanical and electrical systems to remain operative in proper working order. Arrange for, and pay costs of, electrical or mechanical repairs needed due to work of this Section.

3.4.3 Make good all damage at completion of work not identified in pre-removal survey, including, but not limited to, damage to floors, carpets, walls or paint due to the use of, but not limited to, tape, spray glue or other adhesives.

3.5 Inspection

3.5.1 From commencement of work until completion of clean-up operations, the Agency's Representative will be present periodically or on a full-time basis, both inside and outside asbestos work area(s).

3.5.2 If asbestos work area(s) or adjacent areas are found unacceptable in accordance with standards specified or required by authorities having jurisdiction, correct such deficiencies at no cost to the Agency.

3.5.3 Pay cost to provide re-inspection of work found not in accordance with these specifications and requirements of authorities having jurisdiction.

3.6 Waste Transport and Disposal

3.6.1 Conform to requirements as detailed under the Ontario Regulation 347, As amended regarding the disposal of asbestos waste.

3.6.2 Ensure shipment of containers to the landfill is taken by waste hauler licensed to transport asbestos waste. Submit documentation to this effect.

3.6.3 Each load requires completion of bill of lading showing type and weight of hazardous waste being transported.

3.6.4 Co-operate with the Authorities having jurisdiction to carry out instructions for remedial work at landfill to maintain environment, at no additional cost to the Agency.

3.6.5 Ensure that the landfill operator is fully aware of hazardous material being dumped.

3.6.6 Removal of Building Materials Containing Lead-Based Paint (Type 1 Operation)

3.6.7 This procedure shall be used as a minimum standard when removing building materials with lead-based paint. This procedure shall be used in conjunction with procedures as detailed in Ontario Regulation 843, as amended to Ontario Regulation 109/04 and the Ministry of Labour publication, "Guideline Lead on Construction Projects".

3.6.8 The classification of lead related construction activities is based on presumed airborne lead concentrations during abatement activities. Based on the scope of work anticipated the work is classified as a Type 1 removal. The anticipated airborne lead concentration is expected to be less than 0.05mg/$m^{3.}$

3.6.9 During the abatement of lead-based materials, the following personal protective equipment must be used: a half –mask particulate respirator with N-R- or P Series filters and 95, 99 or 100% efficiency; disposable coveralls or full body work clothing; eye protection; and nitrile gloves.

3.6.10 All workers who may be exposed to lead should receive training from a competent person in the hazards of lead, including health effects and symptom recognition, personal hygiene, respiratory requirements, and work procedures, and the use, cleaning, and disposal of respirators and other protective equipment.

3.6.11 Workers who may be exposed to lead on a regular basis should undergo a pre-placement medical assessment, including blood test for lead, and periodic medical examinations.

3.6.12 Ensure all necessary equipment is on site including:

.1 Approved detergent for dust clean-up;
.2 HEPA filter equipped vacuum, (DOP Tested);
.3 Polyethylene sheets for drop sheets barriers, minimum thickness of 6 mil;
.1 6 mil thick disposal bags;
.2 Non-powered hand tools for removal and cleaning areas including rags;
.3 Fire extinguisher; and
.4 First aid kit.

3.6.13 Construct a barrier with warning signs and caution tape around the perimeter of the work area, (minimum of 6-10 ft buffer zone around work area).

3.6.14 Isolate work area, restrict access, and post sufficient number of warning signs as appropriate to warn of the potential lead hazard. At a minimum, signs should be posted at each entrance to the lead work area.

3.6.15 Signs should clearly indicate that access to the work area is restricted to authorized personnel; and that respirators must be worn in the work area.

3.6.16 Place polyethylene drop sheets below/adjacent to areas where removal of material is to occur.

3.6.17 It is recommended that the spread of dust be controlled by means of polyethylene barriers around the work area.

3.6.18 Respirators, as specified, must be worn during all removal activities.

3.6.19 Physically remove loose paint chips or dust by scraping or HEPA vacuum prior to removal of material.

3.6.20 Lead dust and waste must be cleaned and removed using HEPA filter equipped vacuums.

3.6.21 Surface clean all remaining building materials within the work area and areas surrounding the lead work area with approved lead detergent.

3.6.22 All waste materials must be treated as hazardous waste and disposal activities must be in general accordance with the requirements of R.R.O. 1990, Regulation 347, as amended to Ontario Regulation 461/05.

3.6.23 Leachate Analysis of non-metal lead paint waste may be required prior to acceptance of material at a landfill. Contact proposed landfill prior to work to determine analytical requirements, if any. The remaining metal building components found to have led-based paint should either be sent to a recycling facility or disposed of at a landfill regulated to accept lead-containing waste. If the materials are sent to a recycler, the facility should be made aware that the metal has been found to have led-based paint.

3.6.24 All led-based waste materials must be disposed of in a landfill licensed by the Ontario Ministry of Environment (MOE).

3.6.25 Final cleaning should be completed to verify all residual materials have been removed. A HEPA vacuum and or disposable rags should be used in the final cleaning. After vacuuming and wet wiping to remove remaining lead dust and debris, wet clean entire work area including equipment and access area, polyethylene sheeting and equipment used in process. Floor and wall surfaces, ducts, and similar items not covered with polyethylene sheeting must be wet cleaned. Wet cleaning practices shall not be used where a risk of electrocution exist.

3.6.26 Request visual inspection and acceptance from the Agency's representative.

3.6.27 When exiting the work area, dispose of contaminated disposable coveralls and booties as lead waste.

3.6.28 Wipe respirator, exposed face and hands with damp cloth provided. Remove respirator and proceed to washroom where a more thorough cleaning with soap and water is required. All persons in the work area must properly decontaminate themselves prior to leaving the work area.

END OF SECTION

1. GENERAL

1.1 General

1.1.1 Conform to the Conditions of the Contract and Supplementary General Conditions.

1.2 Related Sections

1.2.1 Section 06 66 00 - Plastic Laminates

1.3 References

1.3.1 American National Standards Institute (ANSI):
- .1 ANSI A208.2-2009 - Medium Density Fiberboard (MDF) for Interior Applications
- .2 ANSI/HPVA HP-1-2009 - American National Standard for Hardwood and Decorative Plywood

1.3.2 American Society for Testing and Materials (ASTM):
- .3 ASTM E1333-10 - Standard Test Method for Determining Formaldehyde Concentrations In Air and Emission Rates from Wood Products Using a Large Chamber
- .4 ASTM F1667-13 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples

1.3.3 Architectural Woodwork Institute (AWI) / Architectural Woodwork Manufacturers Association of Canada (AWMAC):
- .5 Architectural Woodwork Standards 2009

1.3.4 Canadian Standards Association (CSA):
- .6 CAN3-A172-M79 - High Pressure Paper Base, Decorative Laminates
- .7 CSA O151-09 - Canadian Softwood Plywood
- .8 CSA O153-M1980 - Poplar Plywood
- .9 CSA O141-05 - Softwood Lumber

1.3.5 National Hardwood Lumber Association (NHLA):
- .10 Rules for the Measurement & Inspection of Hardwood & Cyrpress (2011, Version 1.1)

1.3.6 National Lumber Grades Authority (NLGA):
- .11 Standard Grading Rules for Canadian Lumber (2014 Edition)

1.4 Delivery, Storage, and Handling

1.4.1 Protect millwork against dampness and damage during and after delivery.

1.4.2 Store millwork in ventilated areas, protected from extreme changes of temperature or humidity.

2. PRODUCTS

2.1 Materials

2.1.1 Softwood lumber: unless specified otherwise, S4S, moisture content 15% or less in accordance with following standards:

.1 CSA O141-05
.2 NLGA Standard Grading Rules for Canadian Lumber
.3 AWMAC premium grade, moisture content as specified

2.1.2 Machine stress-rated lumber is acceptable for all purposes.
2.1.3 Hardwood lumber: moisture content 7 percent or less in accordance with following standards:
.1 National Hardwood Lumber Association (NHLA).
.2 AWMAC premium grade, moisture content as specified.
2.1.4 Canadian Softwood plywood (CSP): to CSA O151-09, standard construction.
2.1.5 Hardwood plywood: to ANSI/HPVA HP-1-2009.
2.1.6 Poplar plywood (PP): to CSA O153-M1980, standard construction.
2.1.7 Birch plywood: to AWI / AWMAC Select White.
2.1.8 Laminated plastic: to CAN3-A172, Commercial Grade.
2.1.9 Nails and staples: to ASTM F1667-13.
2.1.10 Wood screws: stainless steel, type and size to suit application.
2.1.11 Splines: metal.
2.1.12 Sealant: Section 07 90 00 - Joint Sealers.

2.2 Manufactured Units

2.2.1 Casework
.1 Fabricate caseworks to AWMAC premium quality grade.
.2 Furring, blocking, nailing strips, grounds and rough bucks and sleepers.
.1 S2S is acceptable.
.2 Board sizes: "Standard" or better grade.
.3 Dimension sizes: "Standard" light framing or better grade.
.3 Framing white pine species, NLGA C grade.
.4 Case bodies (ends, divisions and bottoms)
.1 Melamine:
.2 Thickness: 19 mm
.3 Face veneer: white
.4 Back veneer: white
.5 Backs
.1 Melamine:
.2 Thickness: 6 mm
.3 Face veneer: white
.6 Shelving
.1 Melamine:
.2 Thickness: 19 mm
.3 Face veneer: white
.7 Edge banding: white
2.2.2 Drawers

.1 Fabricate drawers to AWMAC premium grade supplemented as follows.
.2 Sides and Backs
.1 Melamine:
.2 Thickness: 13 mm
.3 Face veneer: white
.3 Bottoms
.1 Hardwood plywood:
.1 Thickness: 6 mm
.2 Face veneer: Canadian White Birch species, Natural grade
.3 Core: Veneer
.2 Bond: Type II
.3 Sanding: regular sanding
.4 Fronts.
.1 Poplar plywood:
.1 Thickness: 19 mm
.2 Face veneer: P.Lam
.3 Edge banding: to match P.Lam of Face veneer
.5 Acceptable material: client to select from the following lines of samples provided by the Vendor.
.1 Wilsonart
.2 Formica
.3 Pionite
.4 Agency Approved Equivalent

2.2.3 Casework Doors
.1 Fabricate doors to AWMAC premium grade supplemented as follows.
.2 Poplar plywood:
.1 Thickness: 19 mm
.2 Face veneer: P.Lam
.3 Edge banding: to match P.Lam of Face veneer

2.2.4 Melamine overlaid panelboards:
.1 Melamine overlay, heat and pressure laminated with phenolic resin to 12.7 mm thick particleboard core.
.2 Overlay bonded to both faces where exposed two (2) sides and when panel material require surface on one (1) side only, reverse side to be overlaid with a plain (buff) balancing sheet.
.3 Edge finishing: matching melamine and polyester overlay edge strip with self-adhesive.

2.2.5 Countertops:
.1 High Pressure Laminate: refer to Section 06 66 00 – Plastic Laminates.
.2 Stainless Steel: As detailed on drawings.

.3 Solid Surface: Corian® or Formica® Solid Surface. Colour from standard selections, square nosing with integrated 100mm high backsplash.

2.3 Hardware

2.3.1 Cabinet Hardware: Products listed below are a standard of acceptance. Products by other manufacturers of equal quality and similar appearance may also be provided subject to review and approval by the Consultant.

.1 Hinges for 19 mm door: Blum 91-650, 170º with self-closing spring.
.2 Hinges for 35 mm doors: Hager 1279, 76 x 76 mm.
.3 Door and drawer pull: GSH 302 x 100 mm, CTC 7.5 mm outside diameter brushed stainless steel.
.4 Drawer slides: full extension for 45 kg load @ 500 mm, by K & V, Accuride or Agency approved equivalent.
.5 Drawer locks: Olympus 078 or National Cabinet Lock C8702 or Corbin CC1 02066, keyed as directed by the Consultant. Door locks shall conform to keying schedule prepared by the Consultant.
.6 Cabinet locks: Olympus 078 or National Cabinet Lock C8702 or Corbin CCL 02067, keyed as directed by the Consultant. Cabinet locks shall conform to keying schedule prepared by the Consultant.
.7 Slide bolt (inactive door of locked pair): 60 mm long barrel bolt, nickel plated: Hafele 252.70.722.
.8 Door locks for 38 mm doors:
.9 Pilaster and clips: KV 255, 256.
.10 Coat hooks: GSH 307 x 115 mm brushed stainless steel.
.11 Hardware finish: unless otherwise indicated chrome or nickel plated.

2.4 Fabrication

2.4.1 Set nails and countersink screws, apply stained wood filler to indentations, sand smooth and leave ready to receive finish.
2.4.2 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.
2.4.3 Shelving to cabinetwork to be adjustable unless otherwise noted.
2.4.4 Provide cut-outs for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.
2.4.5 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.

2.5 Finishing

2.5.1 All exposed work of this section shall be constructed of materials to receive natural transparent finish unless noted otherwise.

2.5.2 All millwork to be factory finished by millwork supplier. Site finishing is not acceptable.

2.6 Accessories

2.6.1 Nails and staples: to ASTM F1667; galvanized to ASTM A123 / A123M for exterior work, interior humid areas and for treated lumber, plain finish elsewhere.

2.6.2 Wood screws: to CSA B35.4 stainless steel, type, and size to suit application.

2.6.3 Splines: wood.

2.6.4 Adhesive: recommended by manufacturer.

3. EXECUTION

3.1 Installation

3.1.1 Do architectural woodwork to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.

3.1.2 Install pre-finished millwork at locations shown on drawings. Position accurately, level, plumb and straight.

3.1.3 Fasten and anchor millwork securely. Provide heavy duty fixture attachments for wall mounted cabinets.

3.1.4 Use draw bolts in countertop joints.

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

3.1.6 At junction of plastic laminate counter backsplash and adjacent wall finish, apply small bead of sealant.

3.1.7 Apply water resistant building paper or bituminous coating over wood framing members in contact with masonry or cementitious construction.

3.1.8 Fit hardware accurately and securely in accordance with manufacturer's directions.

3.1.9 Make provision for installation of hardware when fabricating work, as per manufacturer’s recommendations and templates.

3.1.10 Set, fit and adjust hardware according to manufacturer’s directions at heights later directed by Architect. Hardware shall operate freely. Protect installed hardware from damage and paint spotting.

3.1.11 Prepare work of this section to receive services, fittings and fixtures.

3.1.12 Provide grommets at locations where power/data/telephone outlets are located below counters/worktables. Locate grommets as directed by the Consultant.

3.1.13 Where access is required to valves and other mechanical and electrical components, located behind cabinetwork, provide removable plywood access panels of size required and secure with four (4) brass screws.

3.2 Cleaning

3.2.1 Clean millwork inside cupboards and drawers and outside surfaces.

3.3 Protection

3.3.1 Protect millwork from damage until final inspection.

END OF SECTION

1. GENERAL

1.1 General

1.1.1 This section describes the material and procedures for plastic laminates installed by trades including work in relation to horizontal and vertical substrates of casework in which the laminates will be applied to.

1.2 Related Specification Sections

1.2.1 Section 06 40 00 – Architectural Woodwork

1.3 References

1.3.1 CAN3-A172-M79 (R1996) - High Pressure Paper Base, Decorative Laminates
1.3.2 CSA O112.9-10 - Evaluation of Adhesives for Structural Wood Products (Exterior Exposure)
1.3.3 CSA O112.10-08 (R2013) - Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure)
1.3.4 CSA O121-08 - Douglas Fir Plywood
1.3.5 CSA O151-09 - Canadian Softwood Plywood
1.3.6 CSA O153-M1980 - Poplar Plywood
1.3.7 ASTM D4317-98 (2011) - Standard Specification for Polyvinyl Acetate-Based Emulsion Adhesives
1.3.8 ANSI A208.1-2009 – Particleboard

1.4 Samples

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

1.5 Quality Assurance

1.5.1 Provide Certificate of Quality Compliance upon completion of fabrication.
1.5.2 Provide Certificate of Quality Compliance upon satisfactory completion of installation.

1.6 Closeout Submittals

1.6.1 Provide maintenance data for laminate work for incorporation into manual for Closeout Submittals.

1.7 Storage and Protection

1.7.1 Deliver, handle, store and protect materials of this section in accordance with standard industry practise.
1.7.2 Maintain relative humidity between 25 percent and 60 percent at 22°C during storage and installation.

2. PRODUCTS

2.1 Materials

2.1.1 Laminated plastic for flatwork: to CAN3-A172, Grade GP Type HD 1.6 mm thick; based on solid colour range with satin finish.

2.1.2 Laminated plastic for post-forming work: to CAN3-A172, Grade PF, Type HD 0.75 mm thick, based on solid colour range with satin finish.

2.1.3 Laminated plastic backing sheet: Grade BK, Type HD 0.75 mm thick or same thickness and colour as face laminate.

2.1.4 Laminated plastic liner sheet: Grade GP, Type HD 0.75 mm thick, white colour.

2.1.5 Plywood core: to CSA O153-13 solid two sides, Grade Popular Plywood 19 mm thick.

2.1.6 Particle board core: to ANSI A208.1-2009, sanded faces, of thickness indicated.

2.1.7 Laminated plastic adhesive: urea resin adhesive to CSA 0112 SERIES-M1977 (R2006), contact adhesive to CAN/CGSB-71.20, resorcinol resin adhesive to CSA 0112 SERIES-M1977 (R2006), polyvinyl adhesive to CSA 0112 SERIES-M1977 (R2006), two (2) component epoxy thermosetting adhesive.

2.1.8 Sealer: water resistant sealer or glue acceptable to laminate manufacturer.

2.1.9 Sealants: silicone-based material to CGSB 19-GP-22M.

2.1.10 Draw bolts and splines: as recommended by fabricator.

2.2 Fabrication

2.2.1 Comply with CAN3-A172, Appendix 'A'.

2.2.2 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment, and other materials.

2.2.3 Ensure adjacent parts of continuous laminate work match in colour and pattern.

2.2.4 Veneer laminated plastic to core material in accordance with adhesive manufacturer’s instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 3000 mm. Keep joints 600 mm from sink cutouts.

2.2.5 Form shaped profiles and bends as indicated, using post-forming grade laminate to laminate manufacturer’s instructions.

2.2.6 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.

2.2.7 Apply laminate backing sheet to reverse side of core of plastic laminate work.

2.2.8 Apply laminated plastic liner sheet to interior of cabinetry.

3. EXECUTION

3.1 Installation

3.1.1 Install work plumb, true and square, neatly scribed to adjoining surfaces.

3.1.2 Make allowances around perimeter where fixed objects pass through or project into laminated plastic work to permit normal movement without restriction.

3.1.3 Use draw bolts and splines in countertop joints. Maximum spacing 450 mm on centre, 75 mm from edge. Make flush hairline joints.

3.1.4 Provide cut-outs for inserts, grilles, appliances, outlet boxes and other penetrations. Round internal corners, chamfer edges and seal exposed core.

3.1.5 At junction of laminated plastic counter backsplash and adjacent wall finish, apply small bead of sealant.

3.2 Protection

3.2.1 Cover finished laminated plastic veneered surfaces with heavy kraft paper or put in cartons during shipment. Protect installed laminated surfaces by approved means. Do not remove until immediately before final inspection.

END OF SECTION

1. GENERAL

1.1 General

1.1.1 Conform to sections of Division 1, General Requirements as applicable.

1.2 Section Includes

1.2.1 Labour, Products, equipment, and services necessary for sealants Work in accordance with the Contract Documents.

1.3 References

1.3.1 ASTM C510, Standard Test Method for Staining and Color Change of Single-or Multicomponent Joint Sealants.

1.3.2 ASTM C920, Standard Specification for Elastomeric Joint Sealants.

1.3.3 ASTM C1021, Standard Practice for Laboratories Engaged in Testing of Building Sealants.

1.3.4 ASTM C1184, Standard Specification for Structural Silicone Sealants.

1.3.5 ASTM C1193, Standard Guide for Use of Joint Sealants.

1.3.6 ASTM C1248, Standard Test Method for Staining of Porous Substrate by Joint Sealants.

1.3.7 ASTM C1330, Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.

1.3.8 ASTM D5893/D5893M, Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.

1.4 Submittals

1.4.1 Submit in accordance with Section 01330.

1.5 Shop Drawing(s):

1.5.1 Submit in accordance with Section 01330 indicating:

.1 Sealant type, composition, recommendations or directions for surface preparation, material preparation, and material installation.

1.6 Quality Assurance Submittal(s):

1.6.1 Submit pre-installation meeting reports.

1.6.2 Submit field quality control inspection and test report results.

1.7 Quality Assurance

1.7.1 Applicator qualifications:

.1 Execute Work by applicators trained and approved by the manufacturer and having five (5) years proven experience.

1.7.2 Independent inspection and testing agency:

.1 Qualification: In accordance with ASTM C1021.
.2 Conduct field inspection and testing of sealant with the manufacturer's representative for a minimum of 20% of joints, including mixing of materials, joint preparation, priming, joint profile and thickness, application, adhesion, cohesion, and tooling.
.3 Prepare and submit inspection and test report results after each inspection. Include confirmation by the manufacturer that installation has been satisfactorily completed.

1.7.3 Manufacturer's representative:
.1 Review Site conditions, joint design, and installer's qualifications. Report unsatisfactory conditions to the Agency.
.2 Check container labels, inspect preparation of substrate materials and review installation procedures 48 hours in advance of installation, and randomly test installed Work.

1.7.4 Mock-up:
.1 Construct mock-up for each type of sealant to show location, size, shape, colours, and depth of joints complete with bond breaker, joint backing, primer, and sealant. Accepted mock-up may become part of finished Work.
.2 Remove mock-ups that do not form part of Work from Site during final cleanup, or when directed by the Agency.
.3 Allow 24 hours for the Agency to review mock-up before proceeding with sealant Work.

1.7.5 Pre-installation meetings:
.1 Conduct meetings seven (7) Days in advance of sealant installation.
.2 Include the Agency, sealant manufacturer's representative, independent inspection and testing agency engaged by the Vendor, and parties who are directly affected by the Work of this Section.
.3 Verify Contract requirements, substrate conditions, joint conditions and profile, weather conditions, and the manufacturer's installation instructions.
.4 Within 72 hours following the pre-installation meeting, prepare a pre-installation meeting report and issue to all parties in attendance.
.1 Clearly indicate the recommendations made during the pre-installation meeting, the required actions, and by whom.

1.8 Delivery, Storage, And Handling

1.8.1 Deliver materials to the Site in their original, unopened containers, with Product labels intact.

.1 Product labels: Identify the manufacturer's name, brand name, date of manufacture, grade, and type, application directions, and expiry date or shelf life.

1.8.2 Store flammable materials in safe containers to eliminate fire hazards.

1.8.3 Store materials in accordance with manufacturer's recommendations.

1.8.4 Maintain materials to prevent deterioration or contamination by foreign materials.

1.8.5 Keep materials dry and free from snow, ice and frost.

1.9 Site Conditions

1.9.1 Do not proceed with installation of joint sealants when:

.1 Ambient air temperatures are less than 5°C.

.2 Joint substrates and recesses are wet or damp.

.3 Where contaminates which may interfere with adhesion have not been removed from joint substrates.

.4 Site conditions do not meet manufacturer's recommendations.

2. PRODUCTS

2.1 MATERIALS - SEALANTS

2.1.1 Type A:

.1 Single component, non-sag, non-paintable, silicone joint sealant, in accordance with ASTM C920, Type S, Grade NS, minimum Class 25, and non-staining when tested in accordance with ASTM C510 or ASTM C1248.

.2 Colour:

.1 To match adjacent substrate.

.3 Manufacturer's Products:

.1 Dow Corning Contractors Weatherproofing Sealant (CWS) by Dow Corning Corp.

.2 Tremsil 400 by Tremco (Canada) Ltd., division of RPM Company.

.3 Sikasil-N plus by Sika Canada Inc.

.4 GE SWS by Momentive Performance Materials.

.5 Pecora PCS by Pecora Corporation.

.6 Agency Approved Equivalent

2.1.2 Type B:

.1 Silicone joint sealant, in accordance with ASTM D5893/D5893M and non-staining when tested in accordance with ASTM C510 or ASTM C1248.

.2 Colour:

.1 To match adjacent substrate.

.3 Manufacturer's Products:

.1 Dow Corning Contractors Concrete Sealant (CCS) by Dow Corning Corp.
.2 Spectrum 900 SL by Tremco (Canada) Ltd., division of RPM Company.
.3 SikaSil 728 SL by Sika Canada Inc.
.4 Tosseal 817 by Momentive Performance Materials.
.5 300SL by Pecora Corporation.
.6 Agency Approved Equivalent

2.1.3 Type C:
.1 Anti-microbial (mildew-resistant), non-paintable, silicone joint sealant, in accordance with ASTM C920, Type S, Grade NS, minimum Class 25, and non-staining when tested in accordance with ASTM C510 or ASTM C1248.
.2 Colour:
.1 White.
.3 Manufacturer's Products:
.1 Dow Corning 786 Silicone Sealant by Dow Corning Corp.
.2 Tremsil 200 Silicone Sealant (with Fungicide) by Tremco (Canada) Ltd., division of RPM Company.
.3 Sikasil-GP by Sika Canada Inc.
.4 GE SCS1700 Sanitary by Momentive Performance Materials.
.5 898NST by Pecora Corporation.
.6 Agency Approved Equivalent

2.1.4 Type D:
.1 Silicone joint sealant, in accordance with ASTM C920, Type S, Grade NS, minimum Class 50, and non-staining when tested in accordance with ASTM C510 or ASTM C1248. Suitable for structural glazing in accordance with ASTM C1184.
.2 Colour:
.1 To match adjacent substrate.
.3 Manufacturer's Products:
.1 Dow Corning 795 Silicone Building Sealant by Dow Corning Corp.
.2 Spectrem 2 by Tremco (Canada) Ltd., division of RPM Company.
.3 Sikasil WS-295 by Sika Canada Inc.
.4 GE SCS2000 SilPruf Sealant by Momentive Performance Materials.
.5 Pecora 895NST by Pecora Corporation.
.6 Agency Approved Equivalent

2.1.5 Type E:

.1 Silicone joint sealant, in accordance with ASTM C920, Type S, Grade NS, minimum Class +100/-50, and non-staining when tested in accordance with ASTM C510 or ASTM C1248.

.2 Colour:

.1 To match adjacent substrate.

.3 Manufacturer's Products:

.1 Dow Corning 790 Silicone Building Sealant by Dow Corning Corp.

.2 Spectrem 1 by Tremco (Canada) Ltd., division of RPM Company.

.3 SikaSil WS-290 by Sika Canada Inc.

.4 GE SCS2700 SilPruf LM by Momentive Performance Materials.

.5 Pecora 890NST by Pecora Corporation.

.6 Agency Approved Equivalent

2.1.6 Type F:

.1 Low dirt pick-up, silicone joint sealant, in accordance with ASTM C920, Type S, Grade NS, minimum Class 50, and non-staining when tested in accordance with ASTM C510 or ASTM C1248.

.2 Colour:

.1 To match adjacent substrate.

.3 Manufacturer's Products:

.1 Dow Corning 756 SMS Building Sealant by Dow Corning Corp.

.2 Spectrem 3 by Tremco (Canada) Ltd., division of RPM Company.

.3 SikaSil WS-295 by Sika Canada Inc.

.4 GE SCS9000 Silpruf NB by Momentive Performance Materials.

.5 Pecora 864NST by Pecora Corporation.

.6 Agency Approved Equivalent

2.1.7 Type G:

.1 Silicone joint sealant, in accordance with ASTM C920, Type S, Grade NS, minimum Class 50, and non-staining in accordance with ASTM C510 or ASTM C1248. General purpose type.

.2 Colour:

.1 To match adjacent substrate.

.3 Manufacturer's Products:

.1 Dow Corning Contractors Weatherproofing Sealant (CWS) by Dow Corning Corp.
.2 Tremsil 200 Silicone Sealant (without Fungicide) by Tremco (Canada) Ltd., division of RPM Company.
.3 SikaSil WS-295 by Sika Canada Inc.
.4 GE SCS 1000 Contractors by Momentive Performance Materials.
.5 Pecora PCS by Pecora Corporation.
.6 Agency Approved Equivalent

2.2 ACCESSORIES

2.2.1 Primers:
.1 Type recommended by sealant manufacturer for substrate, to promote adhesion and to prevent staining of adjacent surfaces for conditions encountered.

2.2.2 Joint backing:
.1 Extruded, round, solid section, skinned surface, closed cell, soft polyethylene foam gasket stock, compatible with primer and sealant materials.
.2 30% to 50% oversized.
.3 Shore A hardness of 20, tensile strength 140 kPa to 200 kPa, in accordance with ASTM C1330.
.4 Bond breaker type surface.

2.2.3 Bond breaker tape:
.1 Polyethylene tape or other plastic tape recommended by sealant manufacturer to prevent sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint.
.2 Provide self-adhesive, pressure sensitive tape where applicable.
.3 Do not use material impregnated with oil, bitumen, non-curing polymer or similar deleterious material.

2.2.4 Cleaning agents:
.1 Recommended by sealant manufacturer.
.2 Free of oily residues or other substances capable of staining or harming joint substrates and adjacent surfaces.

2.2.5 Masking tape:
.1 Non-staining, non-absorbent material compatible with joint sealants and surfaces adjacent to joints.

3. EXECUTION

3.1 EXAMINATION

3.1.1 Verify substrate conditions and dimensions of previously installed Work upon which this Section depends.

3.1.2 Report defects to the Agency. Commencement of Work means acceptance of existing conditions.

3.2 PREPARATION

3.2.1 Ensure joint sealants, primers, joint backing, bond breaker and cleaning agents are compatible with one another and with joint substrates.

3.2.2 Prior to the commencement of sealant application, arrange for sealant manufacturer's representative to perform a site adhesion test on each substrate type to which each sealant will be applied.

3.2.3 Ensure surface preparation and primer recommendation is compatible with each substrate type.

3.2.4 Ensure masonry and concrete substrates have cured a minimum of 28 Days prior to proceeding with sealant Work.

3.2.5 Clean joints to receive sealants in accordance with the manufacturer's recommendations and as specified in this Section.

3.2.6 Remove foreign matter from joint substrates that could interfere with adhesion of joint sealant, including surface dirt, dust, old joint sealants, oil, grease, waterproofing, water repellents, water, sealers, curing compounds, mortar, loose material, frost, and other substances detrimental to sealant’s performance.

3.2.7 Remove paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer.

3.2.8 Remove lacquer or other protective coatings from metal surfaces, without damaging metal finish, using oil-free solvents.

3.2.9 Remove laitance and form-release agents from concrete.

3.2.10 Remove rust, mill scale, and coatings from ferrous metals.

3.2.11 Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.

.1 Remove loose particles remaining after porous joint cleaning operations by vacuuming or blowing out joints with oil-free compressed air.

.2 Porous joint substrates include, but are not limited to the following:

.1 Cast-in-place concrete.

.2 Unit masonry.

.3 Unglazed surfaces of ceramic tile.

3.2.12 Clean nonporous joint substrate surfaces with cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

.1 Wire brush, grinding, or sand blasting methods may be used on ferrous metals.

.2 Non-porous joint substrates include, but are not limited to the following:
.1 Metal.
.2 Glass.
.3 Porcelain enamel.
.4 Glazed surfaces of ceramic tile.

3.2.13 Joint priming:
.1 Prime joint substrates and apply primer in accordance with sealant manufacturer's recommendations.
.2 Confine primers to areas of joint-sealant bond.
.3 Spillage or migration to adjoining surfaces is not permitted.

3.2.14 Masking tape:
.1 Prior to performing Work, use masking tape of other means to protect adjacent exposed surfaces from damage including, but not limited to smearing and staining.
.2 Remove protection immediately upon completion and clean adjacent, exposed surfaces of any compound deposited upon such surfaces.

3.3 INSTALLATION

3.3.1 Perform Work in accordance with manufacturer's recommendations for Products and applications indicated, unless more stringent requirements apply.

3.3.2 Use Products without additives or adulteration. Use one manufacturer's Product for each location in accordance with Article 0.

3.3.3 Perform Work in accordance with ASTM C1193.

3.3.4 Joint backing:
.1 Install joint backing to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
.1 Depth of recess: Maintain 2:1 joint width to depth ratio, up to a maximum of 13 mm, and not less than 6 mm at centre of joint.
.2 Where recess is less than specified depth, cut back surface of recess to specified depth.
.2 Do not leave gaps between ends of joint backings.
.3 Do not stretch, twist, puncture, or tear joint backings.
.4 Remove absorbent joint backings that have become wet before sealant application and replace with dry materials.
.5 Support joint backing on horizontal surfaces against vertical movement which might result from pedestrian or vehicular traffic loads.

3.3.5 Install bond breaker tape between sealant and back of joints where joint backing is not used.

3.3.6 Apply sealant immediately after adjoining Work is in condition to receive sealant Work and as follows:

.1 Apply sealant in a continuous bead using gun with correctly sized nozzle. Use sufficient pressure to completely fill joint recess.

.2 Ensure sealant has full, direct uniform contact with, and adhesion to, side surfaces of recess. Superficial pointing with skin bead is not acceptable.

3.3.7 Tooling:

.1 Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified to form smooth, uniform sealant bead, free from ridges, wrinkles, sags, air pockets, embedded impurities, dirt, stains, or other defects.

.2 At recesses in angular surfaces, finish sealant with flat profile, flush with face of material at each side.

.3 At recesses in flush surfaces, finish sealant with concave face and flush with face of material at each side.

3.3.8 Immediately remove excess sealant and droppings.

3.3.9 Ensure sealant bead is uniform in colour.

3.3.10 Cure in accordance with the sealant manufacturer's recommendations. Do not cover up sealants until proper curing has taken place.

3.3.11 Remove defective sealant and reapply.

3.4 FIELD QUALITY CONTROL

3.4.1 Retain an independent inspection and testing agency to conduct field inspection and testing of sealant.

3.4.2 Prepare and submit inspection reports to the Agency.

3.5 CLEANING

3.5.1 Clean surfaces adjacent to joints. Immediately remove sealant smears or other soiling resulting from application of sealants.

3.5.2 Remove masking tape and another residue.

3.5.3 Do not mar or damage finishes on materials adjacent to joints. Repair or replace marred or damaged materials.

3.6 PROTECTION

3.6.1 Protect joint sealants:

.1 During and after curing period from contact with contaminating substrates.

.2 From damages by construction operations or other causes.

3.6.2 If damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated sealants immediately.

Sealant locations schedule

Sealant Locations Schedule

Type A	Above grade level, vertical applications
	- General perimeter caulking (window, doors and frames, louver frames, shelf angles, thresholds, bedding of mullions, precast and tilt-up panels). - Vertical expansion, control, lap joints application. - Painted metals. - Mullion joints. - Interior partition head to structure above. - Interior metal frames joints. - Exterior metal flashing. - Locations not indicated on Contract Drawings and required sealant for Work.

Type B	Above grade level, horizontal applications
	- Horizontal expansion joints. - Saw cut horizontal joints. - Precast slab horizontal joints. - Horizontal expansion and control joints in parking garages, plazas, terraces, decks, floors, and sidewalks.

Type C	Above grade level, horizontal and vertical applications
	- Around sinks, urinals, and bathroom fixtures. - Tiled areas' horizontal and vertical control and expansion joints. - Between vanity and mechanical fixtures/fittings. - Between access panels and tiles. - At corners of tiled walls.

Type D	Above grade level, horizontal and vertical applications
	- Structural glazing, horizontal and vertical. - Structural attachment of panel systems, horizontal and vertical. - Panel stiffener applications. - Suitable for wood, vinyl, and aluminum surfaces.

Type E	Above grade level, vertical applications
	- Precast wall vertical expansion joints. - Precast concrete panel vertical joints.

Type F	Above grade level, horizontal and vertical applications
	- Required non-staining to building materials.

	- Expansion and control joints in concrete panels, non-staining to building materials is required. - Metal curtain wall. - Porous surface including marble, granite, stone, and concrete, where non-staining to building materials is required. - EIFS. - Exterior and interior metal panels. - Masonry, where non-staining to building materials is required.

Type G	Above grade level, both vertical and horizontal
	- Glazing but not structural glazing. - Conventional glazing and replacement glazing of glass and plastic. - Aluminum sheet cover for insulation on metal pipes in exterior locations.

END OF SECTION

1. GENERAL

1.1 General

1.1.1 Conform to sections of Division 1, General Requirements as applicable.

1.1.2 This section describes the material and procedures for tile installed by trades including work in relation to horizontal and vertical substrates in which the tile system will be applied to.

1.2 Scope of Work

3.2.2 Work supplied under this section includes the installation of ceramic tiles and all associated accessories and materials to complete a finished tile floor system.

1.3 Related Specification Sections

3.2.3 In addition to the general project requirements in Division 1, general Requirements the following sections are referenced in this section:

.1 Caulking: Section 07 90 00 – Joint Sealants.

1.4 Code and Regulatory Requirements

3.2.4 All products shall conform to the following standards and regulations:

.1 American National Standards Institute (ANSI):

.1 ANSI A108.1 Specification for the Installation of Ceramic Tile

.2 CTI A118.3 Specification for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive

.3 CTI A118.4 Specification for Latex Cement Mortar (included in ANSI A108.1).

.4 CTI A118.5 Specification for Chemical Resistant Furan Resin Mortars and Grouts for Tile Installation (included in ANSI A108.1).

.5 CTI A118.6 Specification for Ceramic Tile Grouts (included in ANSI A108.1).

.6 ANSI A108.8 Specifications for Ceramic Tile Installed with Chemical-Resistant Furan Mortar and Grout.

.7 ANSI A108.9 Specifications for Ceramic Tile Installed with Modified Epoxy Emulsion Mortar/Grout.

.8 ANSI A108.10 Specifications for Installation of Grout in Tilework.

.9 ANSI A118.1 Standard Specification for Dry-Set Portland Cement Mortar.

.10 ANSI A118.3 Chemical-Resistant, Water-Cleanable, Tile-Setting and -Grouting Epoxy and Water-Cleanable Tile-Setting Epoxy Adhesive.
.11 ANSI A118.4 Latex-Portland Cement Mortar.
.12 ANSI A118.5 Chemical-Resistant Furan Mortar and Grout.
.13 ANSI A118.6 Standard Ceramic Tile Grouts.
.14 ANSI A118.7 Polymer Modified Cement Grouts
.15 ANSI A118.8 Modified Epoxy Emulsion Mortar/Grout.
.16 ANSI A118.9 Test Methods and Specifications for Cementitious Backer Units
.17 ANSI A118.10 Load bearing, Bonded, Waterproof Membranes for Thinset Ceramic Tile and Dimensional Stone.
.18 ANSI A118.11 Exterior Grade Plywood (EGP) Latex-Portland Cement Mortar.
.19 ANSI A136.1 Organic Adhesives for Installation of Ceramic Tile.
.20 ANSI A137.1 Specifications for Ceramic Tile.

.2 American Society for Testing and Materials (ASTM):
.1 ASTM C 50 Standard Practice for Sampling, Sample Preparation, Packaging, and Marking of Lime and Limestone Products.
.2 ASTM C144Standard Specification for Aggregate for Masonry Mortar.
.3 ASTM C207 Standard Specification for Hydrated Lime for Masonry Purposes.
.4 ASTM C 241 Standard Test Method For Abrasion Resistance of Stone Subjected to Foot Traffic.
.5 ASTM C 503 Standard Specification for Marble Dimension Stone.
.6 ASTM C 615 Standard Specification for Granite Dimension Stone.
.7 ASTM C 629 Standard Specification for Slate Dimension Stone.
.8 ASTM C847 Standard Specification for Metal Lath.
.9 ASTM C979/C979M-10 Standard Specification for Pigments for Integrally Coloured Concrete.
.10 ASTM C 1028 Standard Test method for Determining the Static Coefficient of Friction or Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull meter Method.

.11 ASTM D 4397 Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.

.3 Canadian General Standards Board (CGSB):
- .1 CAN/CGSB-25.20 Surface Sealer for Floors.
- .2 CAN/CGSB-51.34 Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .3 CGSB 71-GP-22M Adhesive, Organic, for Installation of Ceramic Wall Tile.
- .4 CGSB 71 GP 30M Adhesive, Epoxy and Modified Mortar Systems for Installation of Quarry Tiles.
- .5 CAN/CGSB 75.1 M Tile, Ceramic.

.4 Canadian Standards Association (CSA):
- .1 CAN/CSA-A5 M Portland Cement.
- .2 CSA A82.56 M Aggregate For Masonry Mortar.
- .3 CSA A123.3-05(R2010) Asphalt Saturated Organic Roofing Felt.
- .4 CSA A3000-13 Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.5 Terrazzo, Tile and Marble Association of Canada (TTMAC):
- .1 Tile Specification Guide 09 30 00 2012/2013, Tile Installation Manual.
- .2 Tile Maintenance Guide.

1.5 Quality Assurance

1.5.1 In addition to the requirements of 01450 – Quality Control, the following measures are required:

1.5.2 Perform work in accordance with the printed requirements of the [membrane] manufacturer and this specification. Advise Engineer of any discrepancies prior to commencement of the work.

1.5.3 Maintain one (1) copy of the specification and manufacturer's literature on site throughout the execution of the work.

1.5.4 Unless otherwise specified meet requirements of TTMAC Tile Insulation Manual 09300 – 1997.

1.5.5 Manufacturer's Field Reports: manufacturer's field reports specified.

1.5.6 The Vendors Qualifications:

.1 Work of this section shall be carried out by the Vendor or subcontractor specialized in the type of work specified herein. Use competent installers, experienced, trained and approved by material or system manufacturer for application of materials and systems being used. Installers shall have a minimum five (5) years of experience in installation and provide documentation of examples minimum of (5) five

previous projects completed more than (1) year since construction closeout upon request by Engineer.

1.5.7 Mock-up:

.1 For each type of tile required, submit sample consisting of a minimum of four (4) tiles bonded to rigid board back-up and joints filled with grout. Select tile to show full range of tile to be used. Resubmit sample if required until the range and grout colour is approved by the Engineer.

1.6 Submittals

1.6.1 Complete submittals in accordance with Specification HEREIN.

1.6.2 Product Data:

.1 Submit product data for each type of product specified including manufacturer's technical product data, installation instructions and recommendations for each type of roofing product required for the following items;

.1 Include manufacturer's information on:

.1 Ceramic tile, marked to show each type, size, and shape required.

.2 Chemical resistant mortar and grout (Epoxy and Furan).

.3 Cementitious backer unit.

.4 Dry-set cement mortar and grout

.5 Divider strip.

.6 Elastomeric membrane and bond coat.

.7 Reinforcing tape.

.8 Levelling compound.

.9 Latex cement mortar and grout.

.10 Commercial cement grout.

.11 Organic adhesive.

.12 Slip resistant tile.

.13 Waterproofing isolation membrane.

.14 Fasteners.

.2 Submit WHMIS MSDS - Material Safety Data Sheets for all material used in the installation of tile floor system.

1.6.3 Samples:

.1 For each type of tile required, submit sample consisting of a minimum of four (4) tiles bonded to rigid board back-up and joints filled with grout. Select tile to show full range of tile to be used. Resubmit sample if required until the range and grout colour is approved by the Engineer.

.2 Submit list of mortar mixes and grouts to be used. In each case products proposed must be suitable for the purpose

intended and they shall be capable to produce top quality work. Upon Engineer's request submit evidence of material manufacturer's endorsement of products proposed.

.3 Upon Engineer's request submit samples of bases, trim and fittings.

.4 Submit manufacturer's recommended maintenance procedures and materials for inclusion into operation and maintenance manual.

1.6.4 Maintenance materials. Provide extra 2 percent of each type and colour tile required. Obtain receipt.

.1 Maintenance material same production run as installed material.

1.7 Delivery Storage and Handling

1.7.1 Refer to Specification Section 01 11 00 - Summary of Work.

1.8 Environmental and Site Conditions

1.8.1 Refer to Specification Section 01610 - General Equip. Stipulations.

1.8.2 Maintain minimum air and structural base temperature as outlined in manufactures technical literature at ceramic tile installation area for 48 hours before, during installation and curing period, and 48 hours after, installation.

1.8.3 Do not install tiles at temperatures below or above ranges as outlined in manufactures technical literature.

1.8.4 Do not apply epoxy mortar and grouts at temperature below or above as outlined in manufactures technical literature.

1.8.5 Exclude construction traffic from areas to receive tile during installation and curing period.

1.8.6 Protect tile flooring subjected to construction traffic with non-staining protective covers.

2. PRODUCTS

2.1 Approved Manufacturers

2.1.1 Daltile Canada Inc., 7834 C.F. Hawn Fwy. P. O. Box 170130, Dallas, TX, USA 75217, Phone: (800)-933-TILE, e-mail: craig.horsley@daltile.com, URL: www.daltile.com.

2.1.2 Olympia Floor & Wall Tile Co., 1000 Lawrence Avenue West, Toronto, Ontario, Canada M6A 1C6, Phone: (800) 268-1613, URL: www.olympiatile.com.

2.1.3 Laticrete, One Laticrete Park North CT Rt 63, Bethany, CT, USA 06524-3423, Phone: (800) 243.4788 x219, e-mail: technicalservices@laticrete.com, URL: www.laticrete.com.

2.1.4 Bostik, Mapei, H.B. Fuller (TEC), 1105 S. Frontenac Road, Aurora, IL, USA, 60504, Phone: (800)-832-9002, URL: www.tecspecialty.com.

2.1.5 Agency Approved Equivalent.

2.2 Materials

2.2.1 Wall Tile:

.1 Ceramic tile: CAN/CGSB 75.1:

.1 Conforming to the following properties:

.1 Type: FT1

.2 Class MR 2

.3 100 mm x 100mm x 8 mm size

.4 Pattern as indicated on contract drawings.

.5 Colour indicated on room schedule.

.2 Acceptable products:

.1 Colour Wheel Series by Daltile Co. or Agency approved equivalent.

2.2.2 Base Tile:

.1 Base: coved; type, size, colour and texture to match adjacent flooring material.

2.2.3 Trim Shapes:

.1 Conform to applicable requirements of adjoining floor and wall tile.

.2 Use slip resistant trim shapes for horizontal surfaces of showers, overflow ledges, recessed steps, shower curbs, drying area curbs, and stools.

.3 Use trim shapes sizes conforming to size of adjoining field wall tile, including existing spaces, unless specified otherwise.

.4 Internal and External Corners: provide trim shapes as follows where indicated:

.1 Bullnose shapes for external corners including edges.

.2 Coved shapes for internal corners.

.3 Special shapes for:

.1 Base to floor internal corners to provide integral coved vertical and horizontal joint.

.2 Base to floor external corners to provide bullnose vertical edge with integral coved horizontal joint. Use as stop at bottom of openings having bullnose return to wall.

.3 Wall top edge internal corners to provide integral coved vertical joint with bullnose top edge.

.4 Wall top edge external corners to provide bullnose vertical and horizontal joint edge.

.5 Provide cove and bullnose shapes where indicated and required to complete tile work.

2.2.4 Mortar and Adhesive Materials:
- .1 Cement: to CSA-A3001, type GU.
- .2 Sand: to CSA A82.56-M1976.
- .3 Hydrated lime: to ASTM C207, Type N.
- .4 Latex additive: formulated for use in cement mortar and thin set bond coat.
- .5 Water: potable and free of minerals and chemicals which are detrimental to mortar and grout mixes.

2.2.5 Bond Coat:
- .1 Thin-set system (walls): CGSB 71-GP-30M, Type 2
  - .1 Acceptable products:
    - .1 Keralastic as manufactured by Mapei Canada Inc.
    - .2 Laticrete 4237 with 211 crete filler powder as manufactured by Laticrete International Inc.
    - .3 Agency Approved Equivalent
- .2 Organic adhesive: to ANSI A136.1:
  - .1 Maximum VOC limit 65 g/L to SCAQMD Rule 1168.
- .3 Latex Cement mortar: to ANSI A108.1, two-component universal dry-set mortar.
- .4 Epoxy bond coat: non-toxic, non-flammable, non-hazardous during storage, mixing, application, and when cured. To produce shock and chemical resistant mortars having the following physical characteristics:
  - .1 Compressive Strength: 246 kg/cm².
  - .2 Bond Strength: 53 kg/cm².
  - .3 Water Absorption: 4.0% Max.
  - .4 Ozone Resistance, 200 hours @ 200 ppm: no loss of strength.
  - .5 Smoke Contribution Factor: 0.
  - .6 Flame Contribution Factor: 0.
  - .7 Finished mortar and grout to be resistant to urine, dilute acid, dilute alkali, sugar, brine and food waste products, petroleum distillates, oil and aromatic solvents.
  - .8 Bond Coat: maximum VOC limit 65 g/L to SCAQMD Rule 1168.
- .5 Chemical-Resistant Bond Coat:
  - .1 Epoxy Resin Type: CTI A118.3.
  - .2 Furan Resin Type: CTI A118.5.
  - .3 Bond Coat: maximum VOC limit 65 g/L to SCAQMD Rule 1168.

2.2.6 Grout:
- .1 Floor and base: Portland Cement Based.

.1 Acceptable products:
.1 Keracolor Floor as manufactured by Mapei Canada Inc. or Agency approved equivalent.
.2 Laticrete Grout and Joint Filler as manufactured by Laticrete International Inc. or Agency approved equivalent.
.3 Flextile polymer modified floor grout.
.2 Wall application: Portland Cement Based:
.1 Keracolor Wall as manufactured by Mapei Canada Inc. or Agency approved equivalent.
.2 Laticrete Grout and Joint Filler with polymer additive as manufactured by Laticrete International Inc. or Agency approved equivalent.
.3 Flextile polymer modified wall grout.
.3 Grout Pigments: Colour to later selection
.1 Pure mineral pigments, limeproof and nonfading, complying with ASTM C979/C979M.
.2 Colouring pigments to be added to grout by manufacturer.
.3 Job coloured grout are not acceptable.
.4 Acceptable products:
.1 Northern Pigment Brand extra strong mortar colours by Harcros Pigments Canada or Agency approved equivalent.
.2 Laticrete 500 & 600 series by Laticrete International Inc or Agency approved equivalent.

2.2.7 Accessories:
.1 Reinforcing mesh: 50 x 50 x 1.6 x 1.6 mm galvanized steel wire mesh, welded fabric design, in flat sheets.
.2 Divider strips:
.1 Laminated strips, core 32 x 3 mm black neoprene, outsides (both sides) brass 32 x 1.29 mm complete with anchors, both sides spaced at 150 mm on centre.
.2 Zinc: 10 mm x 14 ga, complete with anchors, both sides spaced at 150 mm on centre.
.3 Cleavage plane: polyethylene film to CAN/CGSB-51-34.
.4 Metal lath: to ASTM C847 painted finish, 10 mm rib at 2.17 kg/m².
.5 Transition Strips: purpose made metal extrusion; zinc type.
.6 Reducer Strips: purpose made metal extrusion; zinc type; maximum slope of 1:2.
.7 Prefabricated Movement Joints: purpose made, having a Shore A Hardness not less than 60 and elasticity of plus or

minus 40 percent when used in accordance to TTMAC Detail 301EJ.

.8 Floor sealer and protective coating: to tile and grout manufacturers recommendations.

2.2.8 Mixes:

.1 Mortar and grout: Mix in accordance with material manufacturer's directions. Wherever possible use latex additive instead of water.

2.2.9 Patching and Levelling Compound:

.1 Cement base, acrylic polymer compound, manufactured specifically for resurfacing and leveling concrete floors. Products containing gypsum are not acceptable.

.2 Have not less than the following physical properties:

.1 Compressive strength - 25 MPa.

.2 Tensile strength - 7 MPa.

.3 Flexural strength - 7 MPa.

.4 Density - 1.9.

.3 Capable of being applied in layers up to 50 mm thick, being brought to feather edge, and being trowelled to smooth finish.

.4 Ready for use in 48 hours after application.

2.2.10 Cleaning compounds:

.1 As recommended by TTMAC and acceptable to tile manufacturer.

.2 Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and leveling compounds and elastomeric waterproofing membrane and coat.

.3 Materials containing acid or caustic material are not acceptable.

3. EXECUTION

3.1 General

3.1.1 Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 Examination

3.2.1 Examine surfaces to receive tile and report conditions which would adversely affect installation.

3.2.2 Verify that wall surfaces are free of substances which would impair bonding of setting materials, smooth and flat within tolerances specified in ANSI A137.1, and are ready to receive tile.

3.2.3 Verify that sub-floor surfaces are dust-free, and free of substances which would impair bonding of setting materials to sub-floor

surfaces and are smooth and flat within tolerances specified in ANSI A137.1.

3.2.4 Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

3.2.5 Finish on structural concrete slab for thin set tile application: Smooth trowel with slab tolerance maximum 3 mm in 3000 mm.

3.2.6 Verify that required floor-mounted utilities are in correct location.

3.3 Preparation

3.3.1 Commence installation only after unacceptable surface conditions are corrected.

3.3.2 Clean substrates to manufactures requirements to produce acceptable surface as directed by manufacturer.

3.3.3 Protect surrounding work from damage.

3.3.4 Remove any curing compounds or other contaminates.

3.3.5 Substrates shall have an ambient and sub straight temperature as outlined in manufactures technical literature.

3.3.6 Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

3.3.7 Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of dry-set mortar to a feather edge.

3.3.8 Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.3.9 Beginning of installation indicates acceptance of site conditions.

3.4 Installation - General

3.4.1 Do tile work in accordance with TTMAC Tile Installation Manual 2016/2017, "Ceramic Tile" and in accordance mortar/adhesive manufacturer’s directions, except where specified otherwise.

3.4.2 Lay tile to pattern indicated. Arrange pattern so that a full tile or joint is centered on each wall and that no tile less than 1/2 width is used. Do not interrupt tile pattern through openings.

3.4.3 Apply tile or backing coats to clean and sound surfaces.

3.4.4 Fit tile around corners, fitments, fixtures, drains and other built-in objects, leaving sealant joint space. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles.

3.4.5 Maximum surface tolerance 1:800.

3.4.6 Make joints between tile uniform and approximately 1.5 mm wide, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns. Make joints watertight, without voids, cracks, excess mortar, or excess grout.

3.4.7 Back up tile bases, curb and other vertical application solid with mortar.
3.4.8 Install ceramic accessories rigidly in prepared openings.
3.4.9 Install non-ceramic trim in accordance with manufacturer's instructions.
3.4.10 Sound tiles after setting and replace hollow-sounding units to obtain full bond.
3.4.11 Provide tile manufacturer's standard trim pieces at changes in direction and at terminations. Unless otherwise indicated provide the following corner and edge conditions:
.1 Make internal angles square, external angles bullnosed.
.2 Use bullnose edged tiles at termination of wall tile panels, except where panel abuts projecting surface or differing plane.
.3 Internal horizontal corners: coved.
.4 Install divider strips at junction of tile flooring and dissimilar materials.
3.4.12 Allow minimum 24 hours after installation of tiles, before grouting.
3.4.13 Clean installed tile surfaces after installation and grouting cured.
3.4.14 Make control joints at 5.0 m in each direction maximum, where tile abuts other hard materials, around periphery walls, columns, bases and directly over concrete slab expansion joints. Make joint width same as tile joints. Fill control joints with sealant in accordance with Section 07 90 00 – Joint Sealants. Keep building expansion joints free of mortar and grout.
3.4.15 Mix grout with polymer additive. Apply grout in accordance with manufacturer's printed instructions.
3.4.16 Commence grouting no earlier than 24 hours after setting tiles, unless otherwise directed by grout manufacturer.
3.4.17 Force grout into joint so as to fill them flush, leaving no voids.
3.4.18 Promptly as work progresses, remove excess grout from adjacent tile surfaces before grout establishes tight permanent adhesion.
3.4.19 Cure grout in accordance with manufacturer's directions.

3.5 Installation - Walls - Thin-Set Methods

3.5.1 Install tiles on walls in accordance with TTMAC using thin-set system with minimum of 95% mortar coverage.
3.5.2 Finished work shall be level, plumb or sloped as shown, true, square and free of defective, chipped, broken, discoloured or blemished tiles.
3.5.3 Extend tile full height vertically and across top of equipment bases and curbs as detailed.
3.5.4 Over interior concrete substrates, install in accordance with TTMAC detail A - 311F-2016-2017, dry-set or latex-portland cement bond coat, with standard grout, unless otherwise indicated.

.1 Where waterproofing membrane is indicated, install in accordance with TTMAC detail C - 311F-2016-2017, with latex-portland cement grout.
.2 Where epoxy bond coat and grout are indicated, install in accordance with TTMAC Detail B – 311F-2016-2017.

3.6 Base Tile

3.6.1 Install in accordance with TTMAC detail 302W-2016-2017, tile installed on cement mortar over masonry or concrete walls and Detail 303W-2016-2017, tile installed over masonry or concrete walls - thin-set method.

3.7 Floor Sealer and Protective Coating

3.7.1 Apply in accordance with manufacturer's instructions.

3.8 Field Quality Control

3.8.1 Inspection and Acceptance:
.1 At least 60 days after floor tile work has been completed it will be thoroughly inspected to ensure a continuous bond between base concrete and tile system has been achieved.
.2 Initial inspection: A hollow sound, in the opinion of the Contract Administrator, in any area will require verification of bond by testing. Core each such area as requested by the Contract Administrator to determine bonding adequacy.
.3 If delamination of tile has taken place remove tile over entire affected area and replace with thoroughly bonded tile. Pay for remedial work required to replace detective tile.
.4 Bond strength between base concrete and mortar bed including extent of delaminated areas will be determined by tests. Locate calibrated jack over centre of tile.
.5 Tests that meet specified strength requirement: Paid for by the Agency. Pay for tests that do not meet specified strength requirement.

3.8.2 In addition replace at no cost to the Agency defective or delaminated floor tile which is discovered within Guaranteed Maintenance Period.

3.9 Cleaning

.

3.9.1 Thoroughly clean tile surfaces in accordance with manufacturer’s recommendations.
3.9.2 Remove grout haze from tile surfaces; use acid wash method if required.
3.9.3 Polish after cleaning with clean, dry cloth.

3.9.4 Final cleaning: Upon completion, remove surplus materials, rubbish, tools, and equipment

3.9.5 Waste Management:

.1 Collect recyclable waste and dispose of or recycle field generated construction waste created during construction or final cleaning related to work of this Section.

.2 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.10 Protection of Finished Work

3.10.1 Do not permit traffic over finished floor surface for 72 hours after installation.

3.10.2 Cover floors with kraft paper and protect from dirt and residue from other trades.

3.10.3 Where floor will be exposed for prolonged periods cover with plywood or other similar type walkways

END OF SECTION

1. GENERAL

1.1 Includes

1.1.1 Flooring and accessories as shown on the drawings and schedules and as indicated by the requirements of this section.

1.2 Related Sections

1.2.1 Other Division 9 sections for floor finishes related to this section but not the work of this section.

1.3 Quality Assurance and Regulatory Requirements

1.3.1 Select an installer who is competent in the installation of Forbo Marmoleum® sheet flooring.

1.3.2 If required, provide types of flooring and accessories supplied by one (1) manufacturer, including levelling and patching compounds and adhesives.

1.3.3 If required, provide flooring material to meet the following fire test performance criteria as tested by a recognized independent testing laboratory:

.1 ASTM E648 - Critical Radiant Flux of 0.45 watts per sq. cm. or greater, Class I.

.2 ASTM E662 - (Smoke Generation) Maximum Specific Optical Density of 450 or less.

1.4 Submittals

1.4.1 Submit shop drawings, seaming plan, coving details and manufacturer’s technical data, installation and maintenance instructions for flooring and accessories.

1.4.2 Submit the manufacturer’s standard samples showing the required colours for flooring and applicable accessories.

1.4.3 If required, submit the manufacturer’s certification that the flooring has been tested by an independent laboratory and complies with the required fire test.

1.5 Environmental Conditions

1.5.1 Deliver materials in good condition to the job site in the manufacturer’s original unopened containers that bear the name and brand of the manufacturer, project identification and shipping and handling instructions.

1.5.2 Store materials in a clean, dry, enclosed space off the ground and protected from the weather and from extremes of heat and cold. Protect adhesives from freezing. Store flooring, adhesives and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

1.5.3 Maintain a minimum temperature in the spaces to receive the flooring and accessories of 18°C and a maximum temperature of 38°C for at least 48 hours before, during and not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 13°C in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators or other heating fixtures and appliances.

1.5.4 Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture test.

2. PRODUCTS

2.1 Resilient Sheet Flooring Material

2.1.1 Provide Forbo Marmoleum® linoleum sheet resilient floor covering in REAL Series, colour selected from the range currently available from Forbo. ASTM F1066, Class 2 – through pattern as manufactured by Forbo Flooring Systems Humboldt Industrial Park Hazleton, PA 18202.

2.2 Wall Base Materials

2.2.1 Provide 3.2 mm thick, high Armstrong Colour-Integrated Wall Base with a matte finish, conforming to ASTM F1861, Type TP – Rubber, Thermoplastic, Style B – Cove.

2.2.2 Adhesives

2.2.3 For Installation System, Full Spread: Provide low-VOC adhesive as recommended by the manufacturer. Use S-725 Wall Base Adhesive at the wall base as recommended by the wall base manufacturer.

2.3 Accessories

2.3.1 For patching, smoothing and levelling monolithic sub-floors (concrete, terrazzo, quarry tile, ceramic tile and certain metals), provide Armstrong S-184 Fast-Setting Cement-Based Patch and Skim Coat or approved alternate.

3. EXECUTION

3.1 Inspection

3.1.1 Examine sub-floors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.

3.1.2 Inspect sub-floors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mould, or mildew.

3.1.3 Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.

3.1.4 Failure to call attention to defects or imperfections will be construed as acceptance and approval of the sub-floor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.2 Preparation

3.2.1 Smooth concrete surfaces, removing rough areas, projections, ridges and bumps and filling low spots, control or construction joints and other defects with S-184 Fast-Setting Cement-Based Patch and Skim Coat or as recommended by the flooring manufacturer.

3.2.2 Remove paint, varnish, oils, release agents, sealers and waxes. Remove residual adhesives as recommended by the flooring manufacturer. Remove curing and hardening compounds not compatible with the adhesives used, as indicated by a bond test or by the compound manufacturer's recommendations for flooring. Avoid organic solvents.

3.2.3 Perform sub-floor Calcium Chloride Tests (and Bond Tests) as described in to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring.

3.2.4 Vacuum or broom-clean surfaces to be covered immediately before the application of flooring. Make sub-floor free from dust, dirt, grease and all foreign materials.

3.3 Installation of Sheet Flooring

3.3.1 Install flooring in strict accordance with latest edition manufacturers written instructions.

3.3.2 Install flooring wall-to-wall before the installation of floor-set cabinets, casework, furniture, equipment, movable partitions, etc. Extend flooring into toe spaces, door recesses, closets and similar openings as shown on the drawings.

3.3.3 If required, install flooring on pan-type floor access covers. Maintain continuity of colour and pattern within pieces of flooring installed on these covers. Adhere flooring to the sub-floor around covers and to covers.

3.3.4 Scribe, cut and fit to permanent fixtures, columns, walls, partitions, pipes, outlets and built-in furniture and cabinets.

3.3.5 Install flooring with adhesives, tools and procedures in strict accordance with the manufacturer's written instructions. Observe the recommended adhesive trowel notching, open times and working times.

3.4 Installation of Accessories

3.4.1 Apply top set wall base to walls, columns, casework and other permanent fixtures in areas where top-set base is required. Install base in lengths as long as practical, with inside corners fabricated from base materials that are mitred or coped. Tightly bond base to vertical substrate with continuous contact at horizontal and vertical surfaces.

3.4.2 Fill voids with plastic filler along the top edge of the resilient wall base or integral cove cap on masonry surfaces or other similar irregular substrates.

3.4.3 Place resilient edge strips tightly butted to flooring and secure with adhesive recommended by the edge strip manufacturer. Install edge strips at edges of flooring that would otherwise be exposed.

3.4.4 Apply butt-type metal edge strips were shown on the drawings, and at transitions to existing flooring materials before flooring installation. Secure units to the substrate, complying with the edge strip manufacturer's recommendations.

3.5 Cleaning and Protection

3.5.1 Perform initial maintenance according to the latest edition of manufacturers' written instructions.

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

END OF SECTION

1. GENERAL

1.1 General

1.1.1 Conform to sections of Division 1, General Requirements as applicable.

1.2 Intent

1.2.1 This section describes the materials and procedures for painting and coatings.

1.3 Scope of Work

1.3.1 Work under this section includes providing paint or coatings but not limited to:

.1 Surface preparation of substrate
.2 Provision of materials, labour, and equipment required to complete painting or coatings works
.3 Waste management and disposal of materials

1.4 References

1.4.1 The Master Painters Institute (MPI):

.1 MPI Architectural Painting Specification Manual 2005
.2 MPI Approved Products List, 2012

1.4.2 American Society for Testing and Materials (ASTM):

.1 ASTM D3960-05 (2013) - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
.2 ASTM D523-14 - Standard Test Method for Specular Gloss

1.4.3 Underwriters Laboratories of Canada (ULC):

.1 UL 2760 - Surface Coatings: Recycled Water-borne
.2 UL 2768 - Standard for Sustainability for Architectural Surface Coatings

1.4.4 Environmental Protection Agency (EPA):

.1 EPA SW-846 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods

1.4.5 Society of Protective Coatings

.1 SSPC-SP 1 - Solvent Cleaning
.2 SSPC-SP 2 - Hand Tool Cleaning
.3 SSPC-SP 3 - Power Tool Cleaning
.4 SSPC-SP 6/NACE No. 3 - Commercial Blast Cleaning
.5 SSPC-SP 7/NACE No. 4 - Brush-off Blast Cleaning

1.4.6 National Fire Code of Canada 2010

1.5 Submittals

1.5.1 Make submittals in accordance as described herein.

1.5.2 All paint systems to be submitted at same time for coordination and colour selection.

1.5.3 Provide on cover letter, listing all submitted products with MPI products numbers and categorized by MPI formula systems as outlined in this specification.

1.5.4 Submit full records of all products used. List each product in relation to finish formula and include the following:

.1 Finish formula designation
.2 Product type and use
.3 Manufacturer's product number
.4 Colour number
.5 Manufacturer's Material Safety Data Sheets (MSDS)
.6 Maximum VOC classification
.7 Eco-Logo certification.
.8 Submit manufacturer's application instructions for each product specified.

1.5.5 Product Data:

1.5.6 Subcontractor to receive well 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.

1.5.7 Subcontractor to receive written Product Data regarding chemical composition of coatings or treatments applied by others (pressure preservatives, admixtures and sealers, etc.) and their paintability.

1.5.8 Submit Product Data for concrete and concrete block primers.

1.5.9 SamplesSubmit physical samples of the standard colour range showing full range of available colours where colour availability is restricted.

.2 Submit samples 30 days before materials are required. Submit the following samples in sizes indicated:

.1 Three (3) copies of brushouts minimum 200mm x 250mm of each finish including colour, sheen and texture required 30 days prior to commencement of application. Identify each sample with job, finish, colour name, number, sheen and gloss values, substrate to be applied to, date and name of Subcontractor.

1.5.10 Surface Preparation

.1 Submit manufacturer's representative's written approval of surface preparation methods and any specific recommendations for alternative methods.

1.5.11 Scheduling

.1 Submit work schedule for various stages of painting to Engineer for approval. Submit schedule minimum of two (2) working days in advance of proposed operations.
.2 Obtain written authorization from Engineer for any changes in work schedule.

1.5.12 Progress Reports
.1 Arrange to have paint manufacturer's representative inspect work of this Section on a regular basis and prepare weekly reports. Submit a copy of the reports to the Engineer.

1.5.13 Closeout Submittals
.1 Submit three (3) copies of list of materials used, together with MSDS for each Product for incorporation into the Operations and Maintenance Manuals. Include maintenance information such as cleaning and full pigment information for future touch up.

1.5.14 Extra Materials
.1 Submit one (1) unopened four-litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish formula.Deliver to Engineer and store where directed.

1.5.15 Alternatives
.1 Submit requests for alternatives in accordance with Section 01200 – Alternatives.
.2 Submit letter from manufacturer that alternative product meet or exceed performance characteristics as outlined in MPI formula requirements and will be covered under all warranties outlined in contract documents.
.3 Provide comparison chart between specified product and proposed alternative demonstrating alternative meets or exceeds all testing codes.

1.6 Quality Assurance

1.6.1 Execute work of this Section by a firm which has adequate plant, equipment and skilled workers to perform work expeditiously and which is known to have been responsible, during immediate past 5 years, for installations similar to the scope of work contained herein. Ensure firm is fully conversant with applicable laws, bylaws, codes, fire, health and safety regulations and other regulations which govern.

1.6.2 Provide work of this Section executed by competent applicators with membership in good standing in OPCA and/or PDCA and have a minimum of 5 years experience in application of Products, systems, coatings and assemblies specified and with approval and training of Product manufacturers.

1.6.3 Retain purchase orders, invoices and other documents to prove that all materials utilized in this contract meet requirements of the specifications. Produce documents when requested by Engineer.

1.6.4 Retain the bat or lot number for each product.

1.6.5 Pre-installation meetings: Prior to the commencement of painting operations meet at the Site with the material supplier's representative and with the Engineer to review this Section, the painting Work to be done and the following related items:

.1 Equipment use and servicing
.2 Material storage and application techniques
.3 Surface preparation and ambient temperature
.4 Inspection requirements
.5 Inspection reports
.6 Hold points or check points
.7 Safety requirements during application
.8 Mock ups or samples of coatings in highly corrosive environments

1.6.6 Standard of Acceptance:

.1 Walls: No defects visible from a distance of 1000 mm at 90 degrees to surface.
.2 Ceilings: No defects visible from floor at 45 degrees to surface when viewed using final lighting source.
.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.7 Delivery, Storage and Handling

1.7.1 Deliver and store materials in original containers, sealed, with labels intact.

1.7.2 Indicate on containers or wrappings:

.1 Manufacturer’s name and address.
.2 Type of paint.
.3 Compliance with applicable standard.
.4 Colour number in accordance with established colour schedule.

1.7.3 Remove damaged, opened and rejected materials from site.

1.7.4 Provide and maintain dry, temperature controlled, secure storage. Store materials and supplies away from heat generating devices.

1.7.5 Store materials and equipment in a well-ventilated area with temperature range to meet the manufacturer’s specifications.

1.7.6 Provide minimum one (1) 9 kg dry chemical fire extinguisher adjacent to storage area.

1.7.7 Remove only in quantities required for same day use.

1.7.8 Fire Safety Requirements:

.1 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
.2 Handle, store, use and dispose of flammable combustible materials in accordance with the National Fire Code of Canada.

1.8 Environmental Requirements

1.8.1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials.

1.8.2 Ventilation:
.1 The Vendor to provide continuous ventilation during and after application of paint. Run ventilation system 24 hours per day during installation and for seven (7) days after completion of application of paint.

1.8.3 Substrate and ambient temperature must be within limits prescribed by manufacturer to approval of Engineer.

1.8.4 Maintain minimum substrate and ambient air temperature of 10ºC. Maximum relative humidity 85 percent. Maintain supplemental heating until paint has cured sufficiently. Provide temporary heating where permanent facilities are not available to maintain minimum recommended temperatures.

1.8.5 Apply paint finish only in areas where dust is no longer being generated by related construction operations, such that airborne particles will not affect the quality of the finished surface.

1.8.6 Apply paint only when surface to be painted is dry, properly cured and adequately prepared.

1.9 Warranty

1.9.1 Warrant work of this Section for a period of 2 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which became apparent within warranty period, to satisfaction of the Engineer and at no expense to the Agency. Defects include but are not limited to material and workmanship defects such as:
.1 Improper cleaning and preparation of surfaces.
.2 Entrapped dust and dirt.
.3 Material shrinkage, cracking, splitting and defective workmanship.

2. PRODUCTS

2.1 Materials

2.1.1 Paint materials for each coating formula to be products of a single manufacturer.

2.1.2 Regulatory Requirements:

.1 Conform to latest edition of Industrial Health and Safety Regulations issued by applicable authorities having jurisdiction in regard to site safe.

.2 Comply with more stringent of applicable laws, bylaws, codes, fire regulations, health and safety regulations of authorities having jurisdiction or requirements. Ensure standards used for work of this Section are considered a minimum.

.3 Where required, ensure paints and coatings meet flame spread and smoke developed ratings designated by local code requirements and/or authorities having jurisdiction.

.4 Conform to requirements of local authorities having jurisdiction in regard to storage mixing application and disposal of paint and related waste materials.

2.1.3 Low odour products: whenever possible, select products exhibiting low odour characteristics. If two (2) products are otherwise equivalent, select the product with the lowest odour.

2.1.4 Water based paints and coatings must maintain a minimum surface and ambient air temperature of between 18°C and 32°C during application and drying of paint and maintain until building occupancy occurs.

2.1.5 Solvent based paints and contains must maintain a minimum interior surface and ambient air temperature of between 7°C and 35°C during application and drying of paint and maintain until building occupancy occurs.

2.1.6 Where required, use only materials having minimum MPI “Environmental Friendly” E3 rating based on VIC (10 CFR 59)

2.1.7 Where indoor air quality (odour) is an issue, use only MPI listed materials having a minimum E3 rating.

2.1.8 Water-borne surface coatings must:

.1 Meet or exceed all applicable governmental and/or industrial safety and performance standards.

.2 Manufactured and transported in such a manner that all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, bylaws and regulations including, for facilities located in Canada, the Fisheries Act and the Canadian Environmental Protection Act (CEPA).

2.1.9 Water-borne surface coatings must not be formulated or manufactured with: aromatic solvents, formaldehyde, halogenated

solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

2.1.10 Water-borne surface coatings and recycled water-borne surface coatings must have a flash point of 61ºC or greater.

2.1.11 Water-borne surface coatings and recycled water-borne surface coatings must contain information describing proper disposal methods within their packaging.

2.1.12 Recycled water-borne surface coatings must not contain:

.1 Lead in excess of 600.0 ppm weight/weight total solids.

.2 Mercury in excess of 50.0 ppm weight/weight total product.

.3 Cadmium in excess of 1.0 ppm weight/weight total product.

.4 Hexavalent chromium in excess of 3.0 ppm weight/weight total product.

.5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

2.1.13 Substitution Limitations:

.1 Comparable Products from other manufacturer not listed herein will be accepted provided they meet requirements of MPI Approved paints and this Specification after full review by the Engineer.

2.2 Colours

2.2.1 The Vendor to provide available colour sample demonstrating full range from selected manufacturer after Contract award.

2.2.2 Engineer will provide colour schedule based upon the submitted colour sample.

2.2.3 Selection of colours will be from manufacturer's full range of colours.

2.2.4 Where specific products are available in a restricted range of colours, selection will be based on the limited range.

2.2.5 Perform all colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials allowed only with Engineer's written permission.

2.2.6 Second coat in a three-coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 Interior Paint Finishes / Coatings

2.3.1 Vertical / Ceiling Concrete Surfaces:

.1 INT 3.1A Latex MPI Gloss Level 3 – Egg Shell finish over alkali-resistant primer – premium grade; by the following manufacturers:

.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.2 INT 3.1B Latex MPI Gloss Level 3 – Egg Shell finish over flat latex aggregate – premium grade; by the following manufacturers:
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.3 INT 3.1E Latex MPI Gloss Level 3 – Egg Shell finish – premium grade; by the following manufacturers
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.4 INT 3.1L W.B. Light Industrial Coating MPI Gloss Level 3 – Egg Shell - premium grade; by the following manufacturers:
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.5 INT 3.1P Epoxy high build, low gloss finish – premium grade; by the following manufacturers:
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

2.3.2 Concrete Horizontal Surfaces:

.1 INT 3.2C Epoxy finish – premium grade; by the following manufacturers:
.1 Cloverdale Paint
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.2 INT 3.2L Epoxy high build, low gloss finish – premium grade; by the following manufacturers:

.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

2.3.3 Concrete Masonry Units (CMU's):

.1 INT 4.2A Latex MPI Gloss Level 3 – Egg Shell finish over latex block filler – premium grade; by the following manufacturers:
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.2 INT 4.2C: Alkyd MPI Gloss Level 3 – Egg Shell finish over latex block filler
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.3 INT 4.2F Epoxy tile-like finish (for dry environments) over latex block filler – premium grade; by the following manufacturers:
.1 Cloverdale Paint
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.4 INT 4.2G Epoxy tile-like finish (for wet environments) over epoxy block filler – premium grade; by the following manufacturers:
.1 Cloverdale Paint
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.5 INT 4.2K W.B. Light Industrial Coating MPI Gloss Level 3 – Egg Shell - premium grade; by the following manufacturers:
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.6 INT 4.2R Epoxy high build, low gloss finish over epoxy block filler – premium grade; by the following manufacturers:

.1 Cloverdale Paint
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

2.3.4 Structural Steel and Metal Fabrications:

.1 INT 5.1D Alkyd dry fall finish over alkyd metal primer; by the following manufacturers:
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.2 INT 5.1E Alkyd MPI Gloss Level 3 – Egg Shell finish:
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams

.3 INT 5.1L Epoxy finish over epoxy primer – premium grade; by the following manufacturers:
.1 Cloverdale Paint
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.4 INT 5.1P High build epoxy over epoxy zinc rich primer – premium grade; by the following manufacturers:
.1 Cloverdale Paint
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.5 INT 5.1Y Epoxy high build, low gloss finish over anti-corrosive epoxy primer – premium grade; by the following manufacturers:
.1 Cloverdale Paint
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

2.3.5 Steel – High Heat:

.1 INT 5.2B Heat resistant enamel, aluminum – maximum 800°F (427°C); by the following manufacturers:
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

2.3.6 Galvanized Metals:

.1 INT 5.3C Alkyd MPI Gloss Level 3 – Egg Shell finish over cementitious primer
.2 INT 5.3D Epoxy finish over epoxy primer
.1 Cloverdale Paint
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.3 INT 5.3E Epoxy finish over vinyl wash primer and epoxy primer
.1 Cloverdale Paint
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

2.3.7 Plaster and Gypsum Board:
.1 INT 9.2A Latex MPI Gloss Level 3 – Egg Shell finish over latex sealer:
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent
.2 INT 9.2C: Alkyd MPI Gloss Level 3 – Egg Shell finish over latex sealer, by the following manufacturers:
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent
.3 INT 9.2L W.B. Light Industrial Coating MPI Gloss Level 3 – Egg Shell - premium grade; by the following manufacturers
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

2.4 Exterior Paint Finishes / Coatings

2.4.1 Concrete Masonry Units (CMU's):
.1 EXT 4.2A Latex MPI Gloss Level 3/4 – Low Sheen finish over latex block filler – premium grade; by the following manufacturers:

.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.2 EXT 4.2B Latex MPI Gloss Level 3/4 – Low Sheen flat aggregate finish; by the following manufacturers:
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.3 EXT 4.2E Epoxy finish over epoxy block filler – premium grade; by the following manufacturers:
.1 Cloverdale Paint
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

2.4.2 Structural Steel and Metal Fabrications:
.1 EXT 5.1D Alkyd MPI Gloss Level 5 – Semi-Gloss finish over alkyd primer
.2 EXT 5.1F Epoxy finish over high build epoxy – premium grade; by the following manufacturers:
.1 Cloverdale Paint
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

2.4.3 Steel – High Heat:
.1 EXT 5.2B Heat resistant enamel, aluminum – max. 800°F (427°C); by the following manufacturers:
.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

2.4.4 Galvanized Metals:
.1 EXT 5.3C: Epoxy finish – premium grade; by the following manufacturers:
.1 Cloverdale Paint
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

.2 Wood Paneling: Plywood hoarding.
.1 EXT 6.4G: Latex MPI Gloss Level 3/4 – Low Sheen finish

(over alkyd primer) – premium grade; by the following manufacturers:

.1 Benjamin Moore
.2 PPG Architectural
.3 Sherwin-Williams
.4 Agency Approved Equivalent

3. EXECUTION

3.1 General

3.1.1 Perform all painting operations in accordance with MPI Architectural Painting Specification Manual, except where specified otherwise.

3.1.2 Apply all paint materials in accordance with paint manufacturer's written application instructions.

3.1.3 Commencement of work does not imply acceptance of surfaces except as qualified herein. Surfaces such as concrete, masonry, structural steel and miscellaneous metal, wood, gypsum board and plaster, is not responsibility of this Subcontractor. Commencement of work implies acceptance of previously completed work.

3.2 Preparation

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

3.2.2 Remove electrical cover plates, light fixtures, surface hardware on doors, door stops, bath accessories and all other surface mounted fittings and fastenings prior to undertaking any painting operations. Store for re-installation after painting is completed.

3.2.3 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

3.2.4 Prohibit traffic, where possible, from areas where painting is being carried out and until paint is cured.

3.2.5 As painting operations progress, place "WET PAINT" signs in occupied areas to approval of Engineer.

3.3 Protection

3.3.1 Protect existing building surfaces not to be painted from paint splatters, markings and other damage. If damaged, clean and restore such surfaces as directed by Engineer.

3.3.2 Cover or mask floors, windows and other ornamental hardware adjacent to areas being painted to prevent damage and to protect from paint drops and splatters. Use non-staining coverings.

3.3.3 Protect items that are permanently attached such as Fire Labels on doors and frames.
3.3.4 Protect factory-finished products and equipment.

3.4 Existing Conditions

3.4.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Engineer all damage, defects, unsatisfactory or unfavourable conditions before proceeding with work.
3.4.2 Investigate moisture content of surface to be painted, and report findings to Engineer. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
3.4.3 If substrate is steel, do not apply coatings over or when surface temperature is within 3°C of the dew point.
3.4.4 If the substrate is wood, do not stain or paint if moisture reading is higher than 15%. Inspect work to assure surfaces are smooth, free from machine marks and nail heads have been countersunk.
3.4.5 If substrate is new plaster or masonry, allow to cure for 30 to 90 days. Ensure moisture content is between 12% to 14% and test for alkalinity and neutralize (pH 6.5 – 7.5) before proceeding with priming.
3.4.6 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.
3.4.7 Where Room Finish Schedule indicates existing and/or new wall finishes to be painted, existing surfaces such as existing door and frames, mechanical supply and return air grilles (walls and ceilings), access doors and electrical panels which have been previously painted to be painted for a complete finish room. If Room Finish Schedule indicates “-“ it denotes entire room need not be painted, paint only patched areas.

3.5 Surface Preparation

3.5.1 Prepare substrate in accordance with the MPI Architectural Painting Specification Manual
3.5.2 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.
3.5.3 Previously Finished Surfaces:
.1 Clean existing interior 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. 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. Leave entire surface suitable to receive designated finishes and in accordance with manufacturer's instructions.

3.5.4 Gypsum Board:

.1 Examine and ensure gypsum board surfaces are without defects or deficiencies and suitable 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.

.2 Clean surfaces dry, free of dust, dirt, powdery residue, grease, oil, was or any other contaminants. Sand and dust as necessary prior to painting and between coats to provide an anchor for next coat and to remove defects visible from a distance up to 1m.

3.5.5 Fire Resistant Coatings:

.1 Coordinate with coating manufacturer for surface preparation requirements to ensure proper adhesion of finish.

3.6 Surface Preparation – Metal

3.6.1 Prepare aluminum and galvanized steel by acid etching using MPI Product #25. Rinse with clean water and thoroughly dry.

3.6.2 Clean new metal surfaces to be painted by: removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with the following, as described in each of the painting systems in the MPI Architectural Painting Specification Manual:

.1 Solvent cleaning: SSPC-SP-1.
.2 Hand tool cleaning: SSPC-SP-2.
.3 Power tool cleaning: SSPC-SP-3.
.4 Commercial blast cleaning: SSPC-SP-6.
.5 Brush-off blast cleaning: SSPC-SP-7.

3.6.3 Clean existing metal surfaces to be repainted by removing loose, cracked, brittle or non-adherent paint, rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance

with following, as described in each of the painting systems in the MPI Architectural Painting Specification Manual:

.1 Scrape edges of old paint back to sound material. Where remaining paint is thick and sound, feather exposed edges.
.2 Commercial blast clean rusted and bare metal surfaces where existing paint system has failed.
.3 Solvent cleaning: SSPC-SP-1.
.4 Hand tool cleaning: SSPC-SP-2.
.5 Power tool cleaning: SSPC-SP-3.
.6 Commercial blast cleaning: SSPC-SP-6.
.7 Brush-off blast cleaning: SSPC-SP-7.

3.6.4 Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes and vacuum cleaning.

3.6.5 Do not apply paint until prepared surfaces have been accepted by Engineer.

3.7 Mixing Paint

3.7.1 Unless otherwise specified herein or pre-approved, paint to be ready and factory tinted.

3.7.2 Mix ingredients in container before and during use and ensure breaking-up of lumps, complete dispersion of settled pigment and uniform composition.

3.7.3 Thin paint for spraying according to manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Engineer.

3.7.4 Do not use kerosene or any such organic solvents to thin water-based paints.

3.8 Application

3.8.1 Method of application to be as approved by Engineer. Apply paint by brush, roller, air sprayer or airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.

3.8.2 Safety Precautions:

.1 When handling solvent coating materials, wear approved vapour/particulate respirator as protection from vapours. Dust respirators do no provide protection from vapours.

3.8.3 Brush application:

.1 Work paint into cracks, crevices and corners. Paint surfaces not accessible to brushes by spray, daubers or sheepskins.
.2 Brush out runs and sags.
.3 Remove runs, sags and brush marks from finished work and repaint.

3.8.4 Spray application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied and equipped with suitable pressure regulators and gauges.
.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
.3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
.4 Brush out immediately all runs and sags.
.5 Use brushes to work paint into cracks, crevices and places that are not adequately painted by spray.

3.8.5 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Engineer.

3.8.6 Apply each coat of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

3.8.7 Allow surfaces to dry and properly cure, after cleaning and between subsequent coats, for minimum time period, as recommended by manufacturer.

3.8.8 Sand and dust between each coat to remove visible defects.

3.8.9 Finish tops of cupboards, cabinets and projecting ledges, both above and below sight lines as specified for surrounding surfaces.

3.8.10 Finish inside of cupboards and cabinets as specified for outside surfaces.

3.8.11 Finish closets and alcoves as specified for adjoining rooms.

3.8.12 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.8.13 Finish behind wall-mounted items.

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

3.8.15 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 optimal coverage and appearance.

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

3.8.17 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.

3.8.18 Apply primer coat soon after surface preparation is completed to prevent contamination of substrate
3.8.19 Provide paint coating thicknesses indicated, measured as minimum DFT.

3.9 Mechanical Electrical Equipment

3.9.1 In finished areas paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment. Colour and texture to match adjacent surfaces, except as noted otherwise.
3.9.2 In boiler room, mechanical and electrical rooms paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.
3.9.3 In other unfinished areas leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch-up scratches and marks.
3.9.4 Touch-up scratches and marks on factory-painted finishes and equipment with paint as supplied by manufacturer of equipment.
3.9.5 Do not paint over nameplates.
3.9.6 Keep sprinkler heads free of paint.
3.9.7 Paint disconnect switches for fire alarm system and exit light systems in Red enamel.
3.9.8 Paint all fire protection piping Red.
3.9.9 Paint all natural gas piping Yellow.
3.9.10 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish, except for touch-up, as required and paint conduits, mounting accessories and other unfinished items.

3.10 Field Quality Control

3.10.1 Field inspection of painting operations to be carried out by independent inspection firm as designated by Engineer.
3.10.2 As work progresses and upon completion of work, submit written reports and manufacturers' confirmation that materials and application methods conform to manufacturers' requirements.
3.10.3 Advise Engineer when each applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
3.10.4 Cooperate with inspection firm and provide access to all areas of the work.
3.10.5 Non-Conforming Work:
.1 Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction to the Consultant at no cost to the Agency. 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.

.2 Lack of uniformity – the following are considered non-conforming qualities:

.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.

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

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

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

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

3.11 Restoration

3.11.1 Clean and re-install all hardware items that were removed before undertaking painting operations.

3.11.2 Remove protective coverings and warning signs as soon as practical after operations cease.

3.11.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and splatter immediately as operations progress, using compatible solvent.

3.11.4 Protect freshly completed surfaces from paint droppings and dust to approval of Engineer. Avoid scuffing newly applied paint.

3.11.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Engineer.

3.12 Waste Management

3.12.1 Disposal of paint waste:

3.12.2 Be responsible for removal and disposal of material and waste generated.

3.12.3 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.) are hazardous Products and are subject to regulations for disposal. Obtain information on these controls from applicable authorities having jurisdiction.

3.12.4 Separate and recycle waste materials. Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility. Treat materials that cannot be reused as hazardous waste and dispose of in an appropriate manner.

3.12.5 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

3.12.6 To reduce amount of contaminants entering waterways, sanitary/storm drain systems or into ground adhere to the following procedures:

.1 Retain cleaning water for water-based materials to allow sediments to be filtered out. In no case clean equipment using free draining water.

.2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.

.3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.

.4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.

.5 Dry empty paint cans prior to disposal or recycling (where available).

.6 Close and seal tightly partly used cans of materials including sealants and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

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

3.13 Cleaning

3.13.1 Clean all surfaces to be painted as follows.

.1 Remove all dust, dirt and other surface debris by vacuuming and wiping with dry, clean cloths.

.2 Wash surfaces with solution of T.S.P. bleach and clean, warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.

.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

.4 Allow surfaces to drain completely and allow to dry thoroughly.

.5 To prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.

.6 Use trigger-operated spray nozzles for water hoses.

.7 Many water-based paints cannot be removed with water once dried. However, minimize the use of kerosene or any such organic solvents to clean-up water-based paints.

3.13.2 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply

primer, paint or pre-treatment as soon as possible after cleaning and before deterioration occurs.

3.13.3 Sand existing surfaces with intact, smooth, high gloss coatings to provide adequate adhesion for new finishes.

END OF SECTION