

**PF&R Painting Enhancement – Alderwood
Centre**

2 Orianna Dr, Toronto, ON M8W 4Y1

Architectural Specifications

Issued for Tender
November 2024

Project No. 2419

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- .1 Refer to Project Manual, Section 00 01 10 - Table of Contents, for indication of document responsibility (DR). Abbreviations for entity responsible for document preparation are as follows:
- .1 A - Denotes documents prepared by Architect.
- .2 O – Denotes documents prepared by Owner

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

Document	Title	Discipline	Pages
00 01 10	Table of Contents	A	1
00 31 00	Information Available to Bidders	A	1
	- Designated Substance Survey Report Alderwood Pool	O	20

DIVISION 01 - GENERAL REQUIREMENT

Document	Title	Discipline	Pages
01 10 10	General Requirements	A	53

DIVISION 02 - EXISTING CONDITIONS

Document	Title	Discipline	Pages
02 40 00	Demolition and Removals	A	8
02 80 00	Management of Designated Substances	A	3

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

Document	Title	Discipline	Pages
07 91 00	Sealants	A	8

DIVISION 09 - FINISHES

Document	Title	Discipline	Pages
09 91 00	Painting	A	19

END OF DOCUMENT

REPORT(S)

- 1.1 A copy of the following report(s) are appended under separate cover:
Designated Substance Survey
Prepared by CCI Group.
Alderwood Pool
520 Horner Avenue
April 28, 2014
- 1.2 The report(s), by their nature, cannot reveal all conditions that exist or can occur on the site. Should conditions be found to vary substantially from the report, immediately notify Consultant in writing and await instructions.
- 1.3 Contractor shall not be entitled to extra payment or extension of Contract Time for work which is required and which is reasonably inferable in the report(s) as being necessary.

END OF SECTION



CCI GROUP

SCIENCE • ENGINEERING • SOLUTIONS

7900 KEELE STREET SUITE 200 CONCORD ON L4K 2A3

DESIGNATED SUBSTANCE SURVEY

at

**Alderwood Pool
520 Horner Avenue
Toronto, Ontario**

Prepared for

**City of Toronto
Parks, Forestry, and Recreation**

CCI Project No: 135121

April 28, 2014

CONTENTS

Executive Summary.....	3
1.0 INTRODUCTION	3
2.0 REGULATORY REQUIREMENTS	3
3.0 SURVEY METHODOLOGY	5
4.0 SCOPE OF WORK	5
5.0 FIELD WORK AND FINDINGS	6
6.0 CONCLUSIONS AND RECOMMENDATIONS.....	15
7.0 GENERAL CONSIDERATIONS AND LIMITATIONS	17
 Appendix A – Lab Analysis	 19
Appendix B – Location Plan.....	20

EXECUTIVE SUMMARY

Material	Yes	No	Likely
Acrylonitrile		X	
Arsenic		X	
Asbestos		X	
Benzene			X
Coke Oven Emissions		X	
Ethylene Oxide		X	
Isocyanates			X
Lead			X
Mercury	X		
Silica			X
Vinyl Chloride			X
PCBs		X	
Ozone Depleting Substances	X		
Mould		X	

1.0 INTRODUCTION

In conjunction with the State-of-Good-Repair Audits, RFP 9117-13-5040, CCI Group Inc. carried out a Hazardous Materials Survey of the Alderwood Pool located at 520 Horner Avenue, Toronto.

The purpose of the survey was to determine the presence of building materials containing certain materials referred to as Designated Substances throughout the location, prior to any scheduled renovations and/or demolition work. Designated Substances are defined as any biological, chemical, or physical agent or combination thereof prescribed as a Designated Substance to which exposure of a worker is prohibited, regulated, restricted, limited or controlled.

2.0 REGULATORY REQUIREMENTS

In Ontario, there are a total of eleven Designated Substances. These substances have been regulated under Ontario Regulation 490/09 — *Designated Substances*, made under the Ontario Health and Safety Act, which applies to controlling designated substances in the work place.

The Occupational Health and Safety Act (OHSA), R.S.O. 1990, c.0.1, s.30 (1) specifies that:

“Before beginning a project, the owner shall determine whether any Designated Substances are present at the project site and shall prepare a list of all Designated Substances that are present at the site”.

Designated Substances are defined as any biological, chemical, or physical agent or combination thereof prescribed as a Designated Substance to which exposure of a worker is prohibited, regulated, restricted, limited or controlled.

Section 30 of The Act requires that the list of Designated Substances be provided to prospective contractors and subcontractors who may do work on a site and come into contact at the site with Designated Substances.

The Ministry of Labour has designated the following substances:

Acrylonitrile	Isocyanates
Arsenic	Lead
Asbestos	Mercury
Benzene	Silica
Coke Oven Emissions	Vinyl Chloride
Ethylene Oxide	

Ontario Regulation 278/05 (O. Reg. 278/05), the Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations, made under the Occupational Health and Safety Act (OHSA), requires owners of a building to identify Asbestos-containing Materials (ACMs) prior to potential disturbance of the materials.

In addition, an owner of a building is required to have an Asbestos Management Plan (AMP) if ACMs (friable or non-friable) are present in the building and are to remain in place. An inventory of ACMs must be kept on site. All ACMs must be routinely inspected to ensure no damage has occurred, and the inventory must be updated once in each 12-month period and as may be required based on expected changing site conditions, abatement and/or renovation activities. Removal of all asbestos containing materials is required prior to building demolition.

In addition to the Designated Substances, the building was also surveyed for the presence of other hazardous materials such as polychlorinated biphenyls (PCBs), radioactive materials, ozone depleting substances (ODSs), and mould.

We understand that this survey has been conducted to comply with the regulatory requirements of Ontario Regulation 278/05.

3.0 SURVEY METHODOLOGY

Samples may have been obtained to determine the presence of asbestos in building materials and/or lead in paint. Samples were obtained in typically inconspicuous locations so as not to reduce aesthetic qualities. Samples were not taken of materials which would damage the building envelope, such as window sealants and roof materials. When inaccessible areas were encountered during the survey (i.e. wall cavities) inferences were made based upon findings in adjacent spaces. Equipment such as motors, electrical panels, fire doors etc., were not de-energized or disassembled to examine internal components or materials. These items should be considered to contain hazardous materials until proven otherwise.

The survey included a visual assessment for the presence of asbestos, lead, mercury, other Designated Substances and Hazardous Materials. Photographs are included throughout the report.

4.0 SCOPE OF WORK

The Designated Substance survey entailed the following:

- Visual review of the building to identify materials which could contain Designated Substances,
- Recommendations for appropriate action where required.

This report details the hazardous substances found within the building, and was prepared for City of Toronto (the client). The assessment was directed on both the interior and exterior structure and finishes of the building. It does not report on possible contaminants in the soil under and surrounding the building, or contents of vessels, drums, etc. that may be concealed.

The survey was conducted on March 27, 2014. After that time, hazardous substances may have been removed from or added to the location. It is the owner's responsibility to disclose whether any hazardous substances have been added to or removed from the building.

This report should be made available to contractors tendering on any renovation or demolition work. In turn, all contractors requesting tenders from subcontractors shall furnish this report to subcontractors.

5.0 FIELD WORK AND FINDINGS

Property Description



The Survey Area consisted of a one (1) pool, which was constructed in 1959. An addition was constructed in 1998. The building does not include a basement. Floor finishes throughout the building include vinyl tiles, ceramic tiles, vinyl sheeting, rubber, and exposed concrete. Wall finishes include concrete block and ceramic tiles. Ceiling finishes include gypsum board, wood, lay-in ceiling tiles, and exposed roof structure. All domestic hot and cold water lines throughout the Survey Area appeared to be either uninsulated metal or PVC, or wrapped with fibreglass insulation and covered in PVC or canvas.

The following subsections detail our findings:

Asbestos

Background Information on Asbestos

Asbestos is a generic name that has been given to a group of naturally occurring fibrous minerals. In the past, asbestos was commonly used as a component in building materials such as insulation, fireproofing and acoustic or decorative panels. Although there are many types of asbestos, the three main forms of commercial importance in Ontario are chrysotile, amosite and crocidolite.

An Asbestos-Containing Material (ACM) is defined by O. Reg. 278/05 as a material that contains 0.5 % or more asbestos by dry weight. ACMs are placed into two general classes, “friable” and “non-friable” ACMs. Friable ACMs are those materials that when dry can be crumbled, pulverized and reduced to powder by hand pressure. Typical friable ACMs include acoustical or decorative texture coats, fireproofing, some ceiling tiles and thermal insulation. Non-friable ACMs are much more durable as they are held together by a binder such as cement, vinyl or asphalt. Typical non-friable ACMs include floor tiles, fire blankets, roofing materials and cementitious products such as wallboards, pipes or siding.

It has been recognized that hazardous situations may exist in buildings where asbestos-containing materials are found. This is especially true where asbestos fibres may become airborne as a result of material ageing, physical damage, and water damage or air movement.

In contrast, there is little reason for concern if the asbestos is in good condition, has not been damaged and is not in a location where it is likely to be disturbed.

Asbestos Survey Methodology

The asbestos survey included the identification of potential friable and non-friable asbestos-containing materials within the facility.

The likelihood of ACMs being present in inaccessible areas such as behind chases and bulkheads was determined by assessing the presence of asbestos-containing systems in adjacent areas.

Fiberglass insulation was not submitted for analysis as it can be identified visually as non-asbestos material.

Past Designated Substance Surveys (DSS) completed by Kleinfeldt Consultants Limited were referenced during this survey. Additional samples were taken where necessary to comply with O. Reg. 287/05. Past results are included in Appendix A where applicable.

Asbestos Survey Findings

No suspected ACMs were found during the survey. The building was extensively renovated in 1998; it is unlikely that ACMs would be found.

- Mechanical Piping Insulation

Mechanical pipe straight and fitting insulation was observed throughout the Survey Area and was observed to contain fibre glass material. Fibre glass is a non-asbestos containing material and thus was not sampled.



- Drywall Joint Compound

Gypsum board joint compound was previously sampled and found not to contain asbestos. Additional samples were not taken due to age.

- Lay-in Ceiling Tiles

Lay-in ceiling tiles were previously sampled and found not to contain asbestos. Additional samples were not taken due to age.

- Vinyl Floor Tiles

Vinyl floor tiles were previously sampled and found not to contain asbestos. Additional samples were not taken due to age.

- Exterior Door Caulking

Exterior door caulking was not sampled as it is not expected to contain asbestos.

- Roofing Material

To avoid damage and compromising the integrity of roofing material, no bulk samples of the roofing materials from roof sections were collected. The roofing materials are unlikely to contain asbestos.

- Storm Drainage Piping

Transite piping, which can contain asbestos, is frequently used in modern construction. The cementitious piping is often used for storm drainage piping. Storm drainage piping was not identified.

Lead

Background Information on Lead

Lead was a common additive in exterior and hard wearing paint applications. Lead was used to prolong shelf life of paint and to increase its flexibility and durability to wear and weather. Acute exposure to lead by inhalation or ingestion may cause headaches, fatigue, nausea, abdominal cramps and joint pain. Chronic exposures can cause reduced haemoglobin production and reduced lifespan. It has also been known to impact the body's central and peripheral nervous systems and brain function and has been linked to learning disabilities in children.

Currently in Ontario, there is no regulatory limit that determines what concentration of lead constitutes a "lead containing material". On October 21, 2010, Health Canada, under the *Hazardous Products Act*, stated that the lead content in surface-coating materials, furniture, toys and other articles for children, should not exceed 90mg/kg (0.009%, 90ppm). However, this is intended for the importation or sale of products within Canada. Therefore, this is not to be misconstrued as a limit established to define a lead-containing material or a limit with respect to lead on construction projects.

Exposure to lead-containing materials is regulated under Ontario Regulation 490/09, *Designated Substances* - made under the Occupational Health and Safety Act. 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). All lead abatement work must follow procedures outlined in the Guideline Lead on Construction Projects, issued in September 2004 (amended in April 2011) by the Occupational Health and Safety branch of the Ministry of Labour.

Lead is known to have been used in solder on copper plumbing fixtures, in lead conduit pipes, in lead-calcium battery plates, ammunition, and in nuclear and X-ray shielding devices. However, these materials were not sampled during this investigation, but were noted where applicable.

Lead Findings

Based on the age of this building, it is expected that lead-based paint be found below newer painted latex finishes. Paint samples were not taken so as not to damage paint finishes. Lead may be present in the soldered joints of copper piping found within this building.

Mercury

Mercury is known to cause poisoning in humans through the inhalation of vapours, ingestion of contaminated materials or skin absorption through direct contact with the liquid.

Precautions must be taken to prevent mercury vapours from becoming airborne during renovations or demolition of the building. Exposure to airborne mercury is regulated under the Revised O. Reg. 490/09 as amended – Regulation respecting Mercury – made under the Occupational Health and Safety Act; and under O. Reg. 558, which amended O. Reg. 347/90 (General - Waste Management), mercury is classified as a Schedule 2(b) Hazardous Waste Chemical. Its hazardous waste number is U151.

Mercury is found in products such as thermostats, temperature and pressure gauges, fluorescent lamps and batteries. Mercury in products can be released to the environment through breakage, or disposal at the end of a product's useful life. Improper disposal of these mercury products poses a health and environmental risk to everyone. In addition, the disposal of mercury-containing products can create wastes that are often classified as hazardous. Wastes that leach mercury in concentrations exceeding Ontario Regulation 347/90 (General - Waste Management) limits are also considered hazardous.

Thermostat Switches

The mercury in thermostat switch contains approximately 3-4 grams of mercury in a glass ampoule, typically attached to a metal coil. Mercury-containing switches have been used in thermostats for over 40 years.

CCI Group did not identify any mercury-containing thermostat switches within the Survey Area.

Fluorescent Light Tubes

Mercury is an essential component in fluorescent lamps and HID lamps. The mercury is in a vapour form and in the phosphor coating on the lamp tube. Estimates of the mercury content contained in compact, 4 foot, and 8-foot lamps are 10 mg and 23 mg respectively.

Most fluorescent lamps qualify as hazardous waste when removed from service and are therefore prohibited from disposal in the solid waste stream. Fluorescent lamps would be classified as 146T on your facility Generator Registration Report under O. Reg. 347/90 - General Waste Management, as amended by O. Reg. 558/00. Under this regulation, if the leachate results exceed 0.1 milligrams of mercury per litre for a given waste, then the facility must treat the waste as hazardous waste. Most fluorescent and HID lamps will exceed the leachate toxicity limit; therefore these wastes must be registered and treated as hazardous waste or sent for recycling.

CCI Group identified numerous HID and fluorescent light fixtures with tubes throughout the Survey Area. Mercury is likely to be present in vapor form in the fluorescent light tubes.

Silica

Silica is expected to be present in building materials such as concrete, brick, mortar and ceramic tiles located throughout the structures.

Precautions must be taken to prevent silica-containing particles from becoming airborne during the disturbance of silica-containing surfaces, such as during renovation or demolition projects. Exposure to airborne silica is regulated under Ontario Regulation 490/09, *Designated Substances* - made under the Occupational Health and Safety Act. All work being carried with silica containing materials should be conducted following the Guide Silica on Construction Projects issued September 2004 by the Occupational Health and Safety branch of the Ministry of Labour.

Vinyl Chloride

Vinyl chloride (monomer) is likely to be present in stable form within poly vinyl-chloride (PVC) piping and conduits and as a component of interior finishes.

Acrylonitrile

Acrylonitrile was not noted and would not be expected to be present in the Survey Area.

Arsenic

Arsenic or arsenic compounds were not noted and are not expected to be present in the Survey Area.

Benzene

Benzene may be present in stable form in roofing materials, paints and adhesives located throughout the subject facility.

Coke Oven Emissions

Coke oven emissions were not noted and would not be expected to be present in the Survey Area.

Ethylene Oxides

Ethylene oxide was not noted, and would not be expected to be present in the Survey Area.

Isocyanates

Isocyanates compounds may be present in stable form in paint finishes, varnishes, and polyurethane plastics, synthetic rubbers, foams and adhesives.

Polychlorinated Biphenyls (PCBs)

Polychlorinated Biphenyls (PCBs) were commonly used as dielectric insulating fluid in electrical equipment such as transformers and capacitors, and in the fluorescent and HID lamp ballasts. The production of PCBs in the North America started in 1929 and was banned at the beginning of 1979. After 1981, no manufacturers produced fluorescent and HID lamps with PCB-containing ballasts.

PCBs are not a designated substance under the Occupational Health and Safety Act.

PCB Regulations (SOR/2008-273)

The *PCB Regulations* (the Regulations) set specific deadlines for ending the use of PCBs in concentrations at or above 50 mg/kg; eliminating all PCBs and equipment containing PCBs currently in storage and limiting the period of time PCBs can be stored before being destroyed. The Regulations also establish sound practices for the better management of the remaining PCBs in use (i.e. those with content of less than 50 mg/kg), until their eventual elimination, to prevent contamination of dielectric fluids and dispersion of PCBs in small quantities into other liquids.

- Light Ballasts/Transformers

The building is illuminated using newer T-8 fluorescent and compact fluorescent bulbs. The ballasts are not expected to contain PCBs. The transformers are non-PCB type ballasts.

Ozone Depleting Substances (ODS)

Within Ontario, the general use of ozone depleting substances (ODS) is controlled through Regulation 463/10 of the Environmental Protection Act. Production of ODS in the form of hydro chlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs) ceased in Canada in 1993 as a result of their ozone-depleting characteristics. Importation of CFCs into Canada ceased in 1997 and total ban on their use from 2010. The use of these materials is still permitted in existing equipment, but equipment must be serviced by a licensed contractor such that CFCs are contained and not released to the environment during servicing or operation.

A visual assessment for equipment potentially containing ozone-depleting substances was conducted. **CCI Group** noted that the rooftop units use R-22 refrigerant (chlorodifluoromethane) which is currently regulated as ozone depleting substance, however strict controls over their manufacture and supply are in place. Under the management of a licensed contractor, equipment containing R-22 does not represent a significant threat to human health or the environment.

No other ODS-content equipment was observed in the subject units at the time of site visit.

Mould

CCI Group did not observe any signs of mould in the Survey Area.

6.0 CONCLUSIONS AND RECOMMENDATIONS

On the basis of our investigations, representative sampling and laboratory analysis of suspected asbestos and lead containing materials, as well as mould-affected materials; the following conclusions and recommendations are presented:

Lead

Maintain paint finishes in good condition. Provide water testing to confirm the presence of lead from copper solder in the water.

Mercury

Maintain HID and fluorescent fixtures and dispose of as per Ontario Regulations 844 and 347.

Silica

Precautions should be taken as required during major renovations and demolition projects on concrete (i.e. coring through concrete slabs, demolition of masonry, etc.) to ensure that workers' exposure levels to airborne silica does not exceed 0.05 mg/m^3 .

This can be achieved by:

- providing the workers with respiratory protection;
- wetting the surface of the materials to prevent dust emissions; and,
- Providing workers with facilities to properly wash prior to exiting the work area.
- Demolition work that is likely to impact silica-containing materials should be carried out in accordance with the requirement detailed in the Ontario Ministry of Labour document entitled "Guideline: Silica on Construction Projects", dated September 2004.

Ozone Depleting Substances (ODS)

A visual assessment for equipment potentially containing ozone-depleting substances was conducted. **CCI Group** noted that the rooftop units contain R-22 refrigerant. Under the management of a licensed contractor, equipment containing R-22 does not represent a significant threat to human health or the environment.

- Prior to the demolition/alteration/renovation of the units, all equipment containing ODS must be decommissioned by a licensed contractor such that ozone depleting substances are contained and not released to the environment during decommissioning

Other Designated Substances

Other Designated Substances (acrylonitrile, arsenic, coke oven emissions, ethylene oxide, isocyanates, benzene or vinyl chloride) are not expected to be present in the building in matrix or in sufficient quantities to cause an exceedence of Ministry of Labour exposure guidelines.

7.0 GENERAL CONSIDERATIONS AND LIMITATIONS

The information presented in this report is based on information provided by others, direct visual observation made by personnel with **CCI**, and the results of laboratory testing as identified herein.

It should be noted that there might be hazardous materials in locations not visible during our investigation. Prior to any demolition/dismantling of materials additional testing is recommended as a means of worker and occupant protection.

The findings detailed in this report are based upon the information available at the time of preparation of the report. No investigative method eliminates the possibility of obtaining imprecise or incomplete information. Professional judgement was exercised in gathering and analyzing the information obtained and in the formulation of our conclusions and recommendations.

CCI does not certify or warrant the environmental status of the property nor the building on the property.

Please note that the passage of time affects the information provided in the report. Environmental conditions of a site can change. Opinions relating to the site conditions are based upon information that existed at the time that the conclusions were formulated.

The client expressly agrees that it has entered into this agreement with **CCI**, both on its own behalf and as agent on behalf of its employees and principals.

The client expressly agrees that **CCI's** employees and principals shall have no personal liability to the client in respect of a claim, whether in contract, tort and/or any other cause of action in law. Accordingly, the client expressly agrees that it will bring no proceedings and take no action in any court of law against any of **CCI's** employees or principals in their personal capacity.

We trust that we have detailed our findings clearly and that we have satisfactorily addressed the scope of work you require at this time. In the event you wish us to review our findings with you, or require our services further in this regard, please do not hesitate to contact our office.

Sincerely,
CCI GROUP INC.

Prepared by:



Deirdre Roe, B.A.Tech., Dipl.Arch.Tech., FMP
Project Manager
Corporate Projects

APPENDIX A – LAB ANALYSIS



EMSL Analytical, Inc.

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Phone: (516) 997-7251 Fax: (516) 997-7528 Email: carleplacelab@emsl.com

ATTN: **Kleinfeldt Consulting**
2400 Meadowpine Blvd.
Suite 102
Mississauga, ON L5N 6S2

Fax: (905) 542-2729 Phone: (905) 542-1600
Project: **City of Toronto, #3025**

Customer ID: KLEI80
Customer PO:
Received: 06/16/08 9:45 AM
EMSL Order: 060810174

EMSL Proj:
Analysis Date: 6/20/2008
Report Date: 6/21/2008

Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Location	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
343.1 060810174-0006	LT ceiling at fitness room	Gray Fibrous Homogeneous	30% Glass	15% Ca Carbonate 55% Non-fibrous (other)	None Detected
343.2 060810174-0007	Grey vinyl tile in viewing pool room	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
343.3 060810174-0008	Gypsum ceiling compound at women's washroom/change	White Non-Fibrous Homogeneous		40% Ca Carbonate 60% Non-fibrous (other)	None Detected

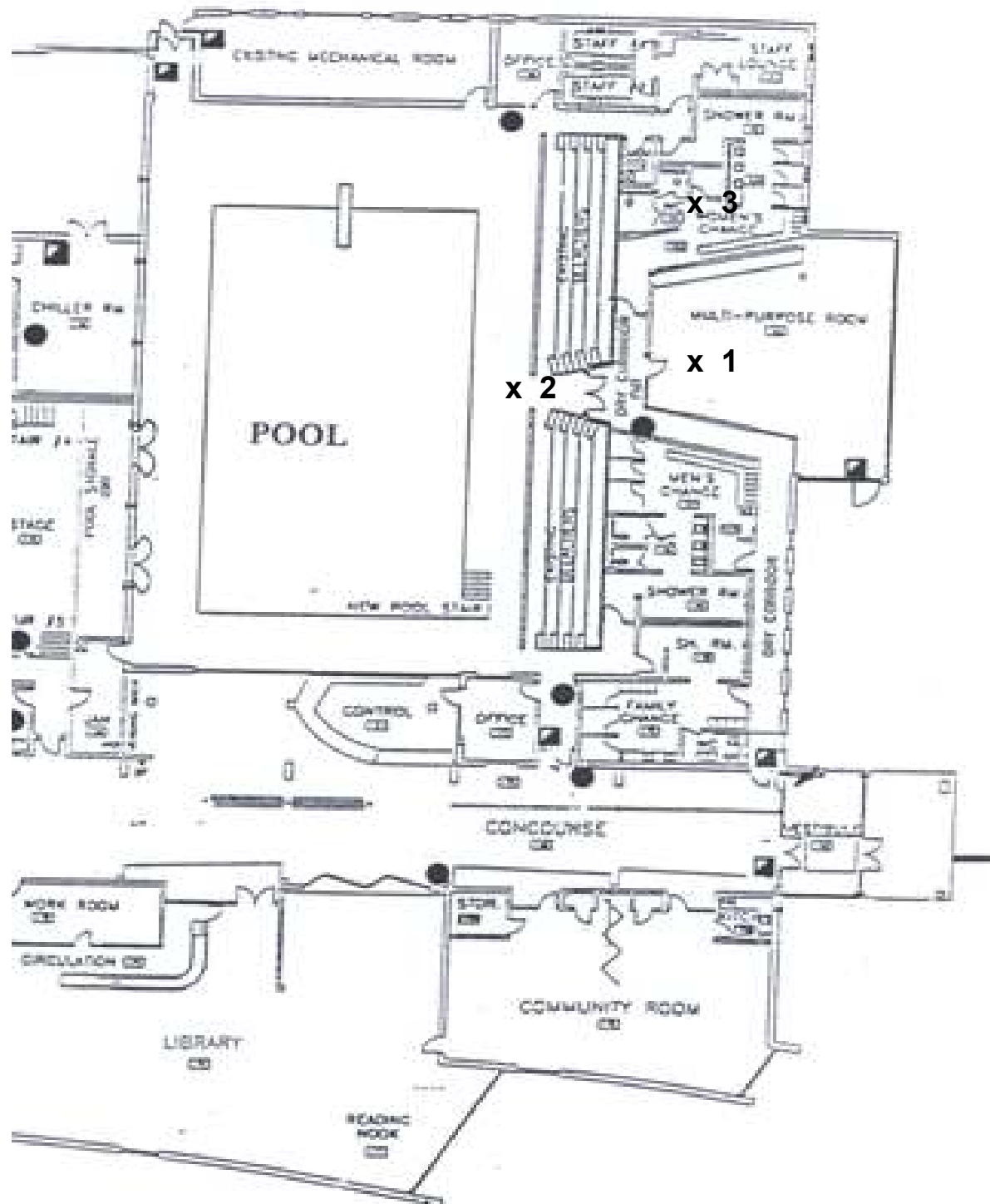
Analyst(s)

Enisa Lalic (3)

Michelle McGowan, Laboratory Manager
or other approved signatory

Due to magnification limitations inherent in PLM, asbestos fibers in dimensions below the resolution capability of PLM may not be detected. The limit of detection as stated in the method is 1%. The above test report relates only to the items tested and may not be reproduced in any form without the express written approval of EMSL Analytical, Inc. EMSL's liability is limited to the cost of analysis. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. AIHA IHLAP 102344, NVLAP Lab Code 101046-10, CA ELAP 2339, CT PH-0249, NY ELAP 11469, MA AA000200, LELAP 04144

APPENDIX B – LOCATION PLAN



x 2 at bleacher viewing office above.

1 GENERAL

- 1.1 The requirements of the Articles of Agreement, Conditions of the Contract, Division 1 apply to and form all Sections of the Contract Documents and the Work.
- 1.2 Work in this Specification is divided into descriptive sections which are not intended to identify absolute contractual limits between Subcontractors, nor between the Contractor and their Subcontractors. The Contractor is responsible for organizing division of labour and supply of materials essential to complete the Contract. The Consultant assumes no liability to act as an arbiter to establish subcontract limits between Sections or Divisions of Work.
- 1.3 It is intended that Work supplied under these Contract Documents shall be complete and fully operational in every detail for the purpose required. Provide all items, articles, materials, services and incidentals, whether or not expressly specified or shown on Drawings, to make finished Work complete and fully operational, consistent with the intent of the Contract Documents.
- 1.4 Work designated as "N.I.C." is not included in this Contract.
- 1.5 Specifications, Schedules and Drawings are complementary and items mentioned or indicated on one may not be mentioned or indicated on the others.
- 1.6 Contractors finding discrepancies or ambiguities in, or omissions from the Drawings, Specifications or other Contract Documents, or having doubt as to the meaning and intent of any part thereof shall contact the Consultant for clarification. If the Consultant is not contacted for clarification, execute the Work in accordance with the most stringent requirements.
- 1.7 Mention in the specifications or indication on the drawings of materials, products, operations, or methods, requires that the Contractor provide each item mentioned or indicated of the quality or subject to the qualifications noted; perform according to the conditions stated in each operation prescribed; and provide labour, materials, Products, equipment and services to complete the Work.
- 1.8 Where the singular or masculine is used in the Contract Documents, it shall be read and construed as if the plural, feminine or neuter had been used when the context or the statement so requires and as required to complete the Work, and the rest of the sentence, clause, paragraph, or Article shall be construed as if all changes in grammar, gender or terminology thereby rendered necessary had been made.
- 1.9 The terms "approved", "review", "reviewed", "accepted", "acceptance", "acceptable", "satisfactory", "selected", "directed", "instructed", "required", "submit", "permitted" or similar words or phrases are used in standards or elsewhere in Contract Documents, it shall be understood, that words "by (to) the Consultant" follow, unless context provides otherwise.
- 1.10 Where the words 'submit', 'acceptable' and 'satisfactory' are used in the Contract Documents, they shall be considered to be followed by the words 'to the Consultant' unless the context provides otherwise.
- 1.11 The terms "exposed" or "exposed to view" refers to surfaces that are within the line of vision of persons from any accessible viewpoint, both within and without the building. Where any part of a surface is exposed to view, all other portions of that surface shall also be considered as exposed to view.

- 1.12 Contractor to add The City of Toronto and Cherie Ng Architect Inc. as Additional Insured Names in the Contractor's Commercial General Liability insurance policy.
- 1.13 Contractor to forward a copy of their Commercial General Liability Insurance Certificate of Insurance with the Additional Insured Names to the architect at the Pre-Construction Meeting.

2 EXISTING SITE CONDITIONS

- 2.1 Make a careful examination of the site, and investigate and be satisfied as to all matters relating to the nature of the Work to be undertaken, as to the means of access and egress thereto and therefrom, as to the obstacles to be met with, as to the extent of the Work to be performed, any limitations under which the work has to be executed, and any and all matters which are referred to in the Contract Documents.
- 2.2 Report any inconsistencies, ambiguities, discrepancies, omissions, and errors between Site conditions and Contract Documents to the Consultant prior to the commencement of Work. If inconsistencies, ambiguities, discrepancies, omissions, and errors are not reported and clarified, the most stringent requirement shall govern, as determined by the Consultant. Ensure that each Subcontractor performing work related to the site conditions has examined it so that all are fully informed on all particulars which affect the Work thereon in order that construction proceeds competently and expeditiously.
- 2.3 Before commencing the Work of any Section or trade, carefully examine the Work of other Sections and trades upon which it may depend, examine substrate surfaces, and report in writing to the Consultant, defects which might affect new Work. Commencement of Work shall constitute acceptance of conditions and Work of other sections, trades, and Other Contractors upon which the new Work depends. If repair of surfaces is required after commencement of specific work it shall be included in the work of the trade providing the specific system or finish.

3 CONTINUITY OF EXISTING SERVICES

- 3.1 Shutdowns and planning of operations that may affect Owner's use of services shall be coordinated with and in accordance with the Owner's written directions. Provide notice for all required interruptions to utility, heating, cooling, mechanical, electrical, and life safety systems.
- 3.2 Make written requests for shutdown at least 5 working days in advance, unless specifically stated herein or as otherwise instructed by the Owner.
- 3.3 Shutdowns shall be scheduled in advance with Owner and shutdown period shall be minimized to Owner's convenience. Facilities in existing adjacent areas will be occupied during the Work.
- 3.4 Major shutdowns shall take place on weekends or at night by prior arrangement with and at no additional cost to the Owner.
- 3.5 Minimize disruption, vibration, noise and dust to the function of existing building.

- 3.6 These requirements are for security reasons and for the consideration of the Owner. Requirements shall not be construed as cause for elimination or restriction of Contractor's working schedule, claims for delay or work, nor additional cost.

4 ACCESS / PROPERTY CONSTRAINTS

- 4.1 Provide and maintain access facilities as may be required for access to the Work.
- 4.2 Minimize disruption, noise and dust to the functions of existing operational areas of existing buildings. Times of entry, routes of access and time required to complete the Work shall be arranged and scheduled in cooperation with the Owner.
- 4.3 Confine Work and operations of employees to limits indicated by the Contract Documents. Do not unreasonably encumber the premises with products.
- 4.4 Organize delivery of materials/equipment to and removal of debris and equipment from place of Work to permit continual progress of work and suitable for restricted site conditions.
- 4.5 Determine and make arrangement as required for loading and unloading of equipment and Products at times that will not affect public traffic flow and that will be permitted by the City of Toronto. Conform to City by-laws with regard to parking restrictions and other conditions.
- 4.6 Make provisions and arrangements and provide allowances if times for loading and unloading allowed by the City of Toronto are other than regular working hours.
- 4.7 All Products, materials and equipment required on Site shall be portable and/or size suitable for access and movement on Site and without causing damage to buildings.
- 4.8 Workers shall not enter existing building beyond construction areas except where required for connection or modification to existing services or other such work. Arrange such requirements with Owner prior to entering existing occupied areas.
- 4.9 Provide locked doors in barriers, permit access by Owner and Consultant to Work areas and to areas Contractor is responsible for.

5 SETTING OUT

- 5.1 Before commencing work, verify lines, levels and dimensions shown on the drawing and report discrepancies in levels or dimensions to the Consultant. Be responsible for work done prior to the receipt of the Consultant's decision regarding reported discrepancies

6 PARKING

- 6.1 Parking may be permitted on Site provided it does not disrupt the performance of Work, Site safety or the movement of vehicular or pedestrian traffic and is acceptable to the Consultant and permitted by the City of Toronto.

7 COORDINATION

- 7.1 Coordination of the Work of all Sections of the specifications as required to complete the Project is the responsibility of the Contractor.
- 7.2 Coordinate with removals/installations specified in other Divisions and Other Contracts.
- 7.3 Ensure that Subcontractors and trades cooperate with other subcontractors and trades whose work attaches to or is affected by their own work. Ensure that minor adjustments are made to make adjustable work fit fixed work.
- 7.4 Allow access of Owner's Other Contractors on site and to areas of Work. Cooperate and coordinate with such Other Contractors. Schedule work to complement work of such Other Contractors.
- 7.5 Entry by the Owner's own forces and by Other Contractors shall not mean acceptance of the Work and shall not relieve the Contractor of their responsibility to complete the Contract.
- 7.6 Existing equipment shall remain in present locations unless designated otherwise. Protect from damage. Remove, store and reinstall existing fixed equipment, fixtures and components which interfere with construction and which are scheduled for relocation.
- 7.7 Placing, installation, application and connection of work by the Owner's own forces or by Other Contractors on and to the Contractor's Work shall not relieve the Contractor of his responsibility to provide and maintain the specified warranties.
- 7.8 Pay particular attention to types of ceiling construction and clearances throughout, especially where recessed fixtures are required. Coordinate work with Other Contractors and Subcontractors wherever ventilation ducts or piping installations occur to ensure that conflicts are avoided.
- 7.9 Install ceiling mounted components in accordance with final ceiling plans. Inform Consultant of conflicting installations. Install as directed.
- 7.10 Install and arrange ducts, piping, tubing, conduit, equipment, fixtures, materials and products to conserve headroom and space with minimum interference and in neat, orderly and tidy arrangement. Run pipes, ducts, tubing and conduit, vertical, horizontal and square with building grid unless otherwise indicated. Install piping, ducts, and conduit as close to underside of structure as possible unless shown otherwise.
- 7.11 Make provision for unrestricted relocation of light fixtures to replace ceiling panels at grid spaces of the same size, without interference or restriction by items located within the ceiling space.
- 7.12 Where supports or openings are to be left for the installation of various parts of the Work furnish the necessary information to those concerned in ample time so that proper provision can be made for such items. Cutting, drilling and the subsequent patching required for failing to comply with this requirement shall be performed at a later date at no additional Cost to Owner.
- 7.13 Ensure that setting drawings, templates, and all other information necessary for the location and installation of materials, fixtures, equipment, holes, sleeves, inserts, anchors, accessories, fastenings, connections, and access panels are provided by each Section whose work requires cooperative location and installation by other

Sections, and that such information is communicated to the applicable installer. Cutting, fixing and 'making good' of the work of other Contractors, Subcontractors and trades and making up of lost time involved in failing to comply with this requirement shall be performed at no additional Cost to Owner.

- 7.14 Be responsible for coordinating products supplied in metric (SI) and imperial units into the overall layout.
- 7.15 Properly coordinate the work of the various Sections and trades, taking into account the existing installations to assure the best arrangement of pipes, conduits, ducts and refrigeration, mechanical, electrical and other equipment, in the available space. Under no circumstances will any extra payment be allowed due to the failure by the Contractor to coordinate the Work. If required, in critical locations, prepare interference and/or installation drawings showing the work of the various Sections as well as the existing installation, and submit these drawings to the Consultant for review before the commencement of Work.
- 7.16 Protect from damage. Remove, store and reinstall existing fixed equipment, fixtures and components which interfere with construction and which are scheduled for relocation.
- 7.17 Coordinate with structural, refrigeration, mechanical and electrical trades to ensure protecting, supporting, disconnecting, cutting off, capping, diverting, relocating or removing of existing services in areas of Work before commencement of alteration work.
- 7.18 In case of damage to active services or utilities, notify Consultant and respective authorities immediately and make all required repairs under direction of Consultant and respective authorities. Carry out repairs to such damaged services and utilities continuously to completion, including working beyond regular working hours.

8 METRIC DIMENSIONS

- 8.1 Measurements in this specification are expressed in metric (SI) units and depending on the progress made in the various sectors of the industry are either hard or soft converted units.
- 8.2 All metric units specified shall be taken to be the minimum acceptable unless otherwise noted.
- 8.3 It is the Contractor's responsibility to check and verify with manufacturers and suppliers on the availability of materials and products in either metric or imperial sizes. Be responsible for coordinating products supplied in metric (SI) and imperial units into the overall layout.
- 8.4 Where both metric and imperial sizes or dimensions are shown, the metric size or dimension shall govern.

9 BUILDING DIMENSIONS

- 9.1 Take necessary job dimensions for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions, and for coordination.

- 9.2 Verify that work, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out by requirements of the Drawings, and ensure that work installed in error is rectified before construction resumes.
- 9.3 Check and verify dimensions referring to the work and the interfacing of services.
- 9.4 Do not scale directly from the Drawings. If there is ambiguity or lack of information, immediately inform the Consultant. Changes required through the disregarding of this clause shall be the responsibility of the Contractor.
- 9.5 All details and measurements of any work which is to fit or to conform with work installed shall be taken at the building.
- 9.6 Advise Consultant of discrepancies and if there are omissions on Drawings, particularly reflected ceiling plans and jointing patterns for surfaces finishes, which affect aesthetics, or which interfere with services, equipment or surfaces. Do not proceed with work affected by such items without direction from the Consultant.
- 9.7 Provide written requirements for site conditions and surfaces necessary for the execution of respective work, and provide setting drawings, templates and all other information necessary for the location and installation of material, holes, sleeves, inserts, anchors, accessories, fastenings, connections and access panels. Inform respective contractors whose work is affected by these requirements and preparatory work.

10 INTERFERENCE AND COORDINATION DRAWINGS

- 10.1 Coordinate placement of equipment to ensure that components will be properly accommodated within the spaces provided prior to commencement of work.
- 10.2 Prepare interference and equipment placing drawings to ensure that all components will be properly accommodated within the spaces provided.
- 10.3 Prepare drawings to indicate coordination and methods of installation of a system with other systems where their relationship is critical. Ensure that all details of equipment apparatus, and connections are coordinated.
- 10.4 Take complete responsibility for any remedial work that results from failure to coordinate any aspect of the Work prior to its fabrication/installation.
- 10.5 Ensure that accesses and clearance required by jurisdictional authorities and/or for easy maintenance of equipment are provided in the layout of equipment and services.

11 CUTTING AND PATCHING

- 11.1 Execute Work to avoid damage to other Work.
- 11.2 Execute cutting, fitting and patching including excavation and fill to complete the Work.
- 11.3 Employ appropriate trades with skilled labour to perform cutting Work.
- 11.4 Fit Work segments together, to integrate with penetrations through surfaces and with other Work.

- 11.5 Remove and replace defective and non-conforming Work.
- 11.6 Do any drilling, cutting, fitting, patching and finishing that may be required to make the various classes and kinds of other Work fit together in a professional and finished manner. Make watertight connections with adjoining structures
- 11.7 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- 11.8 Execute Work by methods to avoid damage to other Work and which will provide proper surfaces to receive patching and finishing.
- 11.9 Cut Products using proper equipment and methods. On rigid materials, use a masonry saw or core drill. Pneumatic or impact tools are not allowed on masonry work without prior approval.
- 11.10 Where new Work connects with existing structures, cut, patch and make good existing work to match original condition.
- 11.11 Be responsible for correct formation and bridging of openings in masonry and structural walls as required.
- 11.12 Ensure compatibility between installed Products and ensure security of installation.
- 11.13 Restore Work with new Products in accordance with requirements of the Contract Documents.
- 11.14 Fit Work airtight to pipes, sleeves, ducts, conduits and other penetrations through surfaces.
- 11.15 Properly prepare surfaces to receive patching and finishing.
- 11.16 Refinish surfaces to match adjacent finishes; for continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

12 FIRE RATINGS

- 12.1 Where a material, component or assembly is required to be fire rated, the fire rating shall be as determined or listed by one of the following testing authorities acceptable to the authorities having jurisdiction:
- 12.2 Underwriters' Laboratories of Canada.
 - .1 Underwriters' Laboratories Inc.
 - .2 Factory Mutual Laboratories.
 - .3 The National Research Council of Canada.
 - .4 The National Board of Fire Underwriters.
 - .5 Intertek Testing Services.
- 12.3 Where reference is made to only one testing authority an equivalent fire rating as determined or listed by another of the aforementioned testing authorities is acceptable if approved by authorities having jurisdiction. Obtain and submit such approval of authorities, in writing when requesting acceptance of a proposed equivalent rating or test design.

13 FIRE SEPARATIONS

- 13.1 Conform to following requirements to maintain continuity of fire separations whether or not shown on the Contract Drawings.
- 13.2 Fire separations may be pierced by openings for electrical and similar service outlets provided such boxes are non-combustible and are tightly fitted and sealed with a ULC approved sealant for the assembly being sealed.
- 13.3 Construction that abuts on or is supported by a non-combustible fire separation shall be constructed so that its collapse under fire conditions will not cause the collapse of the fire separation.
- 13.4 At penetration through fire rated walls, ceilings or floors, completely seal voids with ULC approved firestopping material; full thickness of the construction element. In locations that require a smoke seal, provide appropriate ULC approved system installed in accordance with the manufacturer's recommendations.

14 CODES

- 14.1 Reference is made to standards in the specifications to establish minimum acceptable standards of materials, products and workmanship. Ensure that materials, products and workmanship meet or exceed requirements of the reference standards specified.
- 14.2 In the event of conflict between documents specified herein, execute the Work in accordance with the most stringent requirements.

15 STANDARDS

- 15.1 Where a material or product is specified in conjunction with a referenced standard, do not supply the material or product if it does not meet the requirements of the standard. Supply another specified material or product, or an acceptable material or product of other approved manufacture which does meet the requirements of the standard, at no additional cost to the Owner.
- 15.2 Where no standard is referred to, provide materials, products and workmanship which meet requirements of the applicable standards of the Canadian Standards Association, and Canadian General Standards Board.
- 15.3 If there is question as to whether a material, product or system is in conformance with applicable standards, the Consultant reserves the right to have such materials, products or systems tested to prove or disprove conformance. The cost for such testing will be paid by the Owner in the event of conformance with contract Documents or by the Contractor in the event of non-conformance.
- 15.4 Where application, installation and workmanship standards are cited, it is intended that referenced standards form the basis for minimum requirements of the specified item and specifications supplement the standards unless specified otherwise.
- 15.5 Matters may be dealt with in part by these specifications which are also dealt with, under the same or similar headings in cited standard. It is not intended that these

specifications take the place of the standards but supplement them, unless specified otherwise.

- 15.6 Where reference is made to manufacturer's directions, instructions or specifications they shall include full information on storing, handling, preparing, mixing, installing, erecting, applying, or other matters concerning the materials pertinent to their use and their relationship to materials with which they are incorporated.

16 PRE-CONSTRUCTION MEETING

- 16.1 Attend a pre-construction meeting, arranged and conducted by the Consultant.
- 16.2 Co-ordinate and organize attendance by representatives of major Subcontractors and parties in contract with the Contractor.
- 16.3 Consultant will arrange attendance of other interested parties not responsible to the Contractor.
- 16.4 Consultant will distribute copies of Agenda prior to meeting.
- 16.5 Be prepared to provide specific information relative to agenda items as they are pertinent to the Contract.
- 16.6 Record minutes of meeting and distribute type written copies to all participants and other interested parties, within one week of meeting date.

17 PROGRESS MEETINGS

- 17.1 Attend regularly scheduled progress meetings to be held on Site at times and dates that are mutually agreed to by the Owner, Consultant, and Contractor.
- 17.2 Co-ordinate and organize attendance of individual Subcontractors and material suppliers when requested. Relationships and discussions between Subcontractor participants are not the responsibility of the Consultant and do not form part of the meetings content.
- 17.3 Ensure that Contractor representatives in attendance at meetings have required authority to commit Contractor to actions agreed upon. Assign same persons to attend such meetings throughout the contract period.\
- 17.4 Inform the Consultant in advance of meetings regarding all items to be added to the agenda.
- 17.5 Consultant will distribute copies of Agenda prior to meeting.
- 17.6 Be prepared to provide specific information relative to agenda items at each meeting as they are pertinent to the Contract.
- 17.7 Agenda will include but not be limited to the following topics as are pertinent to the Contract.
- .1 Review and agreement of previous minutes.
 - .2 Construction safety.
 - .3 Status of submittals.
 - .4 Quality control.
 - .5 Co-ordination.

- .6 Contract Schedule.
 - .7 Work plan up to next scheduled meetings.
 - .8 Requests for information/clarification.
 - .9 Contemplated changes.
- 17.8 Record minutes of meeting and distribute type written copies to all participants and other interested parties, within one week of meeting date.
- 18 PRODUCT DATA**
- 18.1 Before delivery of Products to the Site, submit Product data as specified in each section or as requested by the Consultant.
- 18.2 Submit manufacturer's Product data for systems, materials, and methods of installation proposed for use. Such literature shall identify systems, each component, and shall certify compliance of each component with applicable standards
- 19 SAMPLES**
- 19.1 Before delivery of Products to the Site, submit samples of Products as specified or as requested by the Consultant. Label samples as to origin and intended use in the Work and in accordance with the requirements of the Specification Sections. Samples must represent physical examples to illustrate materials, equipment or work quality and to establish standards by which completed Work is judged.
- 19.2 Ensure samples are of sufficient size and quantity, if not already specified, to illustrate:
- .1 The quality and functional characteristics of Products, with integrally related parts and attachment devices.
 - .2 Full range of colours available.
- 19.3 Notify the Consultant in writing, at time of submission, of any deviations in samples from requirements of the Contract Documents, and state the reasons for such deviations.
- 19.4 Identify samples with Project name, Contract number, date, Contractor's name, number and description.
- 19.5 If samples are not acceptable, both samples will be returned. If samples are acceptable, one sample will be so indicated and returned. Be responsible for the cost of samples that are not accepted and for resubmission of samples.
- 19.6 Acceptable samples shall serve as a model against which the products incorporated in the work shall be judged.
- 19.7 Each Product incorporated in the Work shall be precisely the same in all details as the acceptable sample.
- 19.8 Should there be any change from the accepted sample, submit in writing for approval of the revised characteristics and resubmit samples of the Product for approval if requested.
- 19.9 When samples are very large, require assembly, or require evaluation at the Site, they may be delivered to the Site, but only with approval and as directed.

20 SHOP DRAWINGS

- 20.1 Arrange for the preparation of shop drawings as called for in the Contract Documents or as may be reasonably requested by the Consultant. The Contractor and each Subcontractor shall operate as experts in their respective fields and all shop drawings and samples shall conform to the requirements of the Contract Documents.
- 20.2 The term "shop drawings" means drawings, diagrams, schematics, illustrations, schedules, performance charts, brochures and other data which are required to illustrate details of the Work.
- 20.3 In addition to shop drawings specified in the specification sections, submit shop drawings required by jurisdictional authorities in accordance with their requirements.
- 20.4 Shop drawings shall indicate the following minimum criteria and any additional criteria indicated in the individual specification sections requiring shop drawings:
- .1 Clear and obvious notes of any proposed changes from the Contract Documents.
 - .2 Fabrication and erection dimension.
 - .3 Provisions for allowable construction tolerances and deflections provided for live loading.
 - .4 Details to indicate construction arrangements of the parts and their connections, and interconnections with other work.
 - .5 Location and type of anchors and exposed fastenings.
 - .6 Materials, physical dimensions including thicknesses, and finishes.
 - .7 Descriptive names of equipment.
 - .8 Information to verify that superimposed loads will not affect function, appearance, and safety of the work detailed as well as of interconnection work.
 - .9 Assumed design loadings, and dimensions and material specifications for loadbearing members.
- 20.5 Include in shop drawing submissions detailed information, templates, and installation instructions required for incorporation and connection of the Work.
- 20.6 Before submitting to the Consultant, review all shop drawings to verify that the Products illustrated therein conform to the Contract Documents. By this review, the Contractor agrees that it has determined and verified all field dimensions, field construction criteria, materials, catalogue numbers and similar data and that it has checked and coordinated each shop drawing with the requirements of the Work and of the Contract Documents. The Contractor's review of each shop drawing shall be indicated by stamp, date and signature of a qualified and responsible person possessing the appropriate authorization.
- 20.7 Be responsible for dimensions to be confirmed and correlated at the Site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of the Work of all subtrades.
- 20.8 Submit shop drawings for the Consultant's review with reasonable promptness and in orderly sequence so as to cause no delay in the Work nor in the work of Other Contractors. At the time of submission, notify the Consultant in writing of any deviations in the shop drawings from the requirements of the Contract Documents. The Contractor will be held responsible for changes made from the Contract

Documents which are not indicated or otherwise communicated in writing with the submission.

- 20.9 Drawings submitted by the Contractor as required herein are the property of the Owner who may use and duplicate such drawings where required in association with the Work.
- 20.10 Submit shop drawings, as indicated in each section of the Work, signed and sealed by a licensed Professional Engineer registered in the place of the Work.
- 20.11 Shop drawings shall have distinct, uniform letters, numerals and line thicknesses that will ensure the production of clear legible prints and also facilitate reduced reproduction.
- 20.12 Shop drawings shall contain the following identification:
- .1 Project name and Contract number.
 - .2 Applicable 6-digit Contract Specification number describing the item.
 - .3 Location (unit, level, room number, etc.).
 - .4 Name of equipment or Product.
 - .5 Name of Subcontractor or supplier.
 - .6 Signature of Contractor certifying that Shop drawing is in conformance with Contract Documents.
 - .7 On submissions subsequent to the first, the following additional identification:
 - .1 The revision number.
 - .2 Identification of the item(s) revised.
- 20.13 Dimensions and designations of elements shall be shown in the same system of measurement used on the applicable Contract Drawings.
- 20.14 Consultant reserves the right to refuse acceptance of drawing submissions not meeting the above requirements.
- 20.15 Consultant's review will be for conformity to the design concept and for general arrangement only and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the Contract Documents unless a deviation on the shop drawings has been approved in writing by the Consultant. Review does not mean that Consultant approves detail inherent in shop drawings, responsibility which shall remain with Contractor submitting same.
- 20.16 Contractor shall make any changes in shop drawings which the Consultant may require consistent with the Contract Documents and re-submit unless otherwise directed by the Consultant. When re-submitting the shop drawings, the Contractor shall notify the Consultant in writing of any revisions other than those requested by the Consultant.
- 20.17 Only drawings noted for revision and resubmission need be resubmitted.
- 20.18 File one copy of each submitted shop drawing at the Site.
- 20.19 Allow two weeks for the Consultant's review of each submission.

21 CERTIFICATES

- 21.1 Submit certificates that are required by authorities having jurisdiction or that are requested in the specification sections.
- 21.2 Clearly show on each certification the name and location of the Work, name and address of Contractor, quantity and date of shipment and delivery and name of certifying company.
- 21.3 Certificates shall verify that Products and/or methods meet the specified requirements and shall include test reports of acceptable testing laboratories to validate certificates.
- 21.4 Submit certificates in duplicate and signed by an authorized representative of the certifying company

22 CERTIFICATION OF TRADESPERSON

- 23 Provide certificates, at the request of the Consultant, to establish qualifications of personnel employed on the Work where such certification is required by authorities having jurisdiction, by the Consultant or by the Contract Documents.

24 EXTENDED WARRANTIES

- 24.1 Submit extended warranties as requested in sections of the Specifications showing title and address of Contract, warranty commencement date and duration of warranty.
- 24.2 Extended warranties shall commence on termination of the standard warranty specified in the conditions of the contract and shall be an extension of these provisions. Clearly indicate what is being warranted and what remedial action is to be taken under the warranty. Ensure warranty bears the signature and seal of the Contractor.
- 24.3 Submit each extended warranty on a form that is acceptable to the Owner and Consultant.

25 SAFETY

- 25.1 For the purposes of the Contract, the term "Constructor", as defined in the Occupational Health and Safety Act, shall mean the Contractor who shall be responsible for ensuring that the provisions of the statutes, regulations and by-laws pertaining to the safe performance of the Work are to be observed. The "Constructor" shall submit the Notice of Project.
- 25.2 In the event of conflict between any of the provisions of Statutes, Regulations and Bylaws, and other requirements of authorities, the most stringent provision applies.
- 25.3 The Contractor's representative shall be responsible for ensuring that the provisions of statutes, regulations and by-laws pertaining to safe performance of the Work and the work of Other Contractors and Owner's own forces working on the Site are observed and that the methods of performing the Work do not endanger the personnel employed thereon nor the general public, and are in accordance with the latest edition of the Occupational Health and Safety Act. Include on the Joint Health and Safety Committee representatives of Other Contractors working on Site.

25.4 Prior to the Contractor's representative being absent from the Site for an extended period during execution of the Work, the Contractor's representative will name, in writing to the Consultant, another person who is competent to assume these responsibilities. The Contractor shall advise the Consultant of change of the individual identified as the Contractor's representative.

25.5 At the discretion of the Consultant, the "Constructor" designation may be transferred to/from a Contractor at any time at no additional cost to the Owner.

26 PROJECT RESPONSIBILITIES

26.1 The Contractor's representative shall ensure that:

26.2 All measures and procedures prescribed by the following Acts and Regulations are carried out on Site:

- .1 The Occupational Health and Safety Act;
- .2 The Regulations for Construction Projects;
- .3 WHMIS Regulations;
- .4 The Environmental Protection Act and regulations,
- .5 COVID-19 Construction Practice
- .6 All other legislation, regulations and standards as applicable.

26.3 Every employer and every worker performing Work on the Site must comply with the requirements referred to above.

26.4 Ensure that the health and safety of workers, employees of the Owner and the general public are protected in relation to the Work performed on the Site.

27 WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

27.1 Be familiar with and comply with WHMIS regulations.

27.2 Properly label controlled products. Provide proper warning labels and training at the Site.

27.3 Maintain on site for duration of Contract a hazardous materials log containing all required MSDS. Log shall be open for inspection by Owner, Consultant and all personnel on Site.

27.4 Provide copies of material safety data sheets (MSDS) for any controlled products prior to delivery to the Site.

27.5 Be responsible for all applicable requirements of the regulations.

27.6 Before commencing any Work on Site, attend the pre-construction meeting and provide the Consultant with a proposal as to how hazardous materials will be stored and dispensed on Site. In addition, specifically outline the measures which will be undertaken to prevent damage or injury in the event of an accidental spill.

27.7 Provide "Handling Procedure for Hazardous Materials".

28 JOINT HEALTH AND SAFETY COMMITTEE

- 28.1 The Contractor shall be responsible for the establishment and operation of the Joint Health and Safety Committee as required by the Occupational Health and Safety Act.

29 SAFETY DELIVERABLES

- 29.1 The Contractor shall deliver to the Consultant:
- .1 The Contractor's Occupational Health and Safety Policy.
 - .2 The Contractor's safety program to implement the Occupational Health and Safety Policy for the Contract, which will effectively prevent and control accidents for the Contract.
 - .3 A copy of all communications with, and including all orders by, the Ministry of Labour or other occupational health and safety enforcement authority.
 - .4 A copy of all accident/injury investigation reports, not just the WSIB Form 7 Employer's Report of Injury Disease. Each report must contain a statement of actions that will be taken to prevent a recurrence.
 - .5 A copy of all inspection reports made by the Contractor in compliance with the employer's responsibility under the Occupational Health and Safety Act.
 - .6 A copy of all safety information pertaining to the Contract made and furnished by the Contractor's own "Safety Personnel" or outside consultants/advisers engaged for the purpose of inspecting the workplace for occupational health and safety.
 - .7 A verification that all workers in the employ of the Contractor on Site, have had a WHMIS training or refresher course within the last twelve months.
 - .8 A verification that all workers in the employ of the Contractor have had "Explosive Activated Tool Training" on the type of tools being used.
 - .9 A verification that the instruction manuals are on Site for all tools and equipment being used.
 - .10 A copy of the most recent workers compensation experience rating account, i.e. CAD-7, NEER, and/or an insurance carrier's experience rating account.
 - .11 Statistical information for the purpose of determining injury frequency and severity rates (hours worked, first-aid injuries, medical aid injuries, lost time injuries, restricted workday injuries, near-miss accident/incident and significant occurrence data), in a timely manner as required by the Consultant.
 - .12 The immediate reporting to the Consultant of all instances that are defined in the Occupational Health and Safety Act as "Notices of Injuries" and "Occurrences" and any occasion that a worker exercises their "Right to Refuse Unsafe Work".
 - .13 The Consultant reserves the right to require additional or amended deliverables pertaining to safety during the duration of the Work at no additional cost to the Owner.
 - .14 Items specified above shall be delivered to the Consultant prior to the Contractor commencing Work on the Site.

30 DUE DILIGENCE

- 30.1 The Contractor acknowledges that it has read and understands the measures and procedures relating to occupational health and safety as prescribed above. The Contractor acknowledges and understands its duties as therein set out and hereby

expressly undertakes and agrees to comply with all such requirements and standards in their entirety and at the Contractor's expense.

- 30.2 The Contractor further agrees to fully cooperate with all health and safety requirements, rules, regulations, standards and criteria set out in the Contract Documents, which agreement is in furtherance of the Contractor's duties and responsibilities under occupational health and safety legislation.
- 30.3 The Contractor agrees that if, in the opinion of the Consultant or Owner, the health and safety of a person or persons is endangered or the effective operation of the system put in place to ensure the health and safety of workers on the Site is not being implemented, the Consultant or Owner may take such action as it deems necessary and appropriate in the circumstances, including, without limitation, the following:
 - 30.4 Require the Contractor to remedy the condition forthwith at its own expense;
 - 30.5 Require that the Site be shut down in whole or in part until such time as the condition has been remedied;
 - 30.6 Remedy the problem and the Owner shall back-charge the Contractor for the cost of such remedial work, together with an appropriate overhead factor as determined by the Owner in its sole discretion; and
 - 30.7 Terminate the Contract without further liability in the event the Contractor fails to comply with these provisions.
- 30.8 If a lien is registered, in respect to any monies held back, back-charged or assessed in accordance with these paragraphs, the Contractor shall consent to an order vacating such registration and shall indemnify the Owner for any and all loss, whereby direct or consequential which the Owner may sustain as a consequence of such registration.

31 SITE SAFETY PERSONNEL

- 31.1 In the event the Consultant deems it necessary, because of the Work, the Contractor shall assign a "Competent Safety Person" to assist the Contractor's representative in the discharging of safety responsibility, at no additional cost to the Owner.

32 PROGRESS PHOTOGRAPHS

- 32.1 Concurrently with monthly application for payment submit digital pictures by online cloud storage illustrating the progress of the Work as follows:
 - .1 A minimum of 20 pictures that best illustrate the progress on the site.
 - .2 Pictures shall be in focus and properly illuminated; view shall be unobstructed.
 - .3 Pictures shall be taken with a minimum 5 megapixel camera or better such that quality and details can be discerned from photo.
 - .4 The Pictures shall either have an accurate date-stamp present in the photo, or be numbered and dated in the digital filename.
 - .5 The photo's shall be labeled with the following information: The project name, the period the pictures are taken in, the monthly application number which the pictures are associated with.

33 SCHEDULES

- 33.1 Be responsible for planning and scheduling of the Work. As a minimum, prepare and update the following schedules:
- .1 Contract Schedule.
 - .2 Detailed Construction Schedule.
- 33.2 Be responsible for ensuring that Subcontractors plan and schedule their respective portions of the Work. Subcontractor's schedules shall form part of the above mentioned schedules.
- 33.3 Contract Schedule:
- .1 Prepare and submit the Contract Schedule within two weeks following award of Contract. This schedule, once it is reviewed by the Consultant and if it meets the Consultant's project requirements, will become contractual.
 - .2 The Contract Schedule shall be developed using a logic network technique for planning and scheduling.
 - .3 The Contract Schedule shall be submitted for approval in its optimum levelled form. This presentation may be in either a time scaled network or a bar chart form. It shall be subdivided into either work areas or systems as applicable.
 - .4 The Contract Schedule shall include the following information:
 - .1 Starting and ending dates of each activity including the float periods;
 - .2 Manpower requirements for each activity;
 - .3 Interdependency with activities of other Contractors;
 - .4 Dates specified in the Contract Documents;
 - .5 Dates on which specific data will be required for submittal, i.e., Vendor data, drawings for review, etc.
 - .5 This schedule shall be reviewed and updated monthly by the Contractor so as to reflect any Contract changes as well as major changes to the schedule
- 33.4 Detailed Construction Schedule:
- .1 Prepare and submit a detailed construction schedule within two weeks of final review and acceptance of the Contract Schedule. This schedule, once it is reviewed and accepted by the Consultant, will be updated and submitted monthly with the Contract Schedule and weekly once the Contractor starts on Site.
 - .2 This schedule shall cover the construction period. It will show, in detail, activities on a daily basis indicating durations, manpower and constraints. The activities shown on this schedule shall further clarify or detail the activities shown on the Contract Schedule.
 - .3 The detailed construction schedule shall be presented in a bar chart form.

34 INSPECTION AND TESTING BY THE OWNER

- 34.1 The Consultant, on behalf of the Owner may appoint an independent inspection and testing company to carry out inspection and testing of the Work for conformance to the Contract Documents. Such costs for inspection and testing will be paid by the Owner.

However, any additional inspection and testing due to non-conformance to the Contract Documents shall be at the Contractor's expense.

- 34.2 Inspections and testing by the independent inspection and testing company will be promptly made. Uncover for examination any Work covered up prior to inspection or without approval of the Consultant. Make good such Work at no cost to the Owner.
- 34.3 The Owner may inspect and test Products during manufacture, fabrication, shop testing, installation, construction and testing phases of the Contract. The Consultant will ascertain the quantity and quality of testing to be performed. Inspection and testing may be performed at the place of manufacture/fabrication, storage, or at the Site as designated by the Consultant. Where inspection and testing is done either during manufacture, fabrication, or at Site, ensure that proper facilities and assistance are provided.

35 INSPECTION AND TESTING

- 35.1 Source and Field Quality Control specified in Other Sections:
- .1 This Section includes requirements for performance of inspection and testing specified under Source Quality Control and Field Quality Control in other Sections of the specifications.
 - .2 Do not include in work of this Section responsibilities and procedures that relate solely to an inspection and testing company's functions that are specified in another Section which is paid for directly by the Owner. Such information is included in this Section for Contractor's information only.

36 QUALIFICATIONS OF INSPECTION AND TESTING COMPANIES

- 36.1 Inspection and testing companies to be certified by the Standards Council of Canada (SCC) or Canadian Council of Independent Laboratories (CCIL).
- 36.2 Companies engaged for inspection and testing shall provide equipment, methods of recoding and evaluation, and knowledgeable personnel to conduct tests precisely as specified in reference standards.
- 36.3 If requested, submit affidavits and copies of certificates of calibration made by an accredited calibrator to verify that testing equipment was calibrated and its accuracy ensured within the previous twelve months.

37 RESPONSIBILITIES OF THE CONTRACTOR DURING INSPECTION AND TESTING PROCEDURES

- 37.1 Be responsible for quality control methods and procedures to ensure performance of the work in accordance with the Contract Documents.

38 RESPONSIBILITIES OF INSPECTION AND TESTING COMPANIES

- 38.1 Determine from specifications and Drawings the extent of inspection and testing required for Work of the Contract. Subcontractors shall notify Consultant of any omissions or discrepancies in the work inspected and/or tested.
- 38.2 Perform applicable inspection and testing described in the Specifications and as may be additionally directed.
- 38.3 Provide competent inspection and testing personnel when notified by the Contractor that applicable work is proceeding. Inspection personnel shall cooperate with the Consultant and Contractor to expedite the Work.
- 38.4 Subcontractors shall notify the Consultant and Contractor of deficiencies and irregularities in the Work immediately when they are observed in the course of inspection and testing.
- 38.5 Inspection and testing companies shall not perform or supervise any of the Contractor's work, and shall not authorize:
- 38.6 Performance of work that is not in strict accordance with the Contract Documents.
- 38.7 Approval or acceptance of any part of the Work.

39 INSPECTION AND TESTING PROCEDURES

- 39.1 Perform specified inspection and testing only in accordance with specified reference standards, or as otherwise approved.
- 39.2 Observe and report on compliance of the Work to requirements of Contract Documents.
- 39.3 Ensure that inspectors are on site or at fabricator's operations for full duration of critical operations, and as otherwise required to determine that the Work is being performed in accordance with the contract Documents.
- 39.4 Identify samples and sources of materials.
- 39.5 Review and report on progress of the work. Report on count of units fabricated and inspected at fabricator's operations.
- 39.6 Observe and report on conditions of significance to work in progress at time of inspection or at fabricator's operations. Include where applicable and if critical to the work in progress:
 - .1 Time and date of inspection.
 - .2 Temperature of air, materials, and adjacent surfaces.
 - .3 Humidity of air, and moisture content of materials and adjacent materials.
 - .4 Presence of sunlight, wind, rain, snow and other weather conditions.
 - .5 Include in reports all information critical to inspection and testing.
 - .6 Ensure that only materials from the work and intended for use therein are tested.
 - .7 Determine locations for work to be tested.

40 TOLERANCES FOR INSTALLATION OF WORK

- 40.1 Unless specifically indicated otherwise, Work shall be installed plumb, level, square and straight.

- 40.2 Unless acceptable tolerances are otherwise specified in specification sections or are otherwise required for proper functioning of equipment, site services, and mechanical and electrical systems:
- .1 "Plumb and level" shall mean plumb or level within 1 mm in 1 m.
 - .2 "Square" shall mean not in excess of 10 seconds lesser or greater than 90 degrees.
 - .3 "Straight" shall mean within 1 mm under a 1 m long straightedge.
 - .4 "Flush" shall mean within:
 - .1 6 mm for exterior concrete, masonry, and paving materials.
 - .2 1 mm for interior concrete, masonry, tile and similar surfaces.
 - .3 0.05 mm for other interior surfaces.
- 40.3 Allowable tolerances shall not be cumulative.

41 DEFECTS

- 41.1 Defective products, materials and workmanship found at any time prior to Contract Completion will be rejected regardless of previous inspections, testing, and reviews of the Work. Inspections, testing, and reviews shall not relieve the Contractor from their responsibility, but are a precaution against oversight or error. Remove and replace defective and rejected products, materials, systems, and workmanship. Be responsible for delays and expenses caused by rejection.

42 DOCUMENTS ON SITE

- 42.1 Maintain at job site, one copy of each of the following:
- .1 Contract Documents including Drawings, Specifications, Addenda, and other modifications to the Contract.
 - .2 'Reviewed' or 'Reviewed as Modified' Shop Drawing
 - .3 Project Construction and Shop Drawing Schedules. Site Instructions and Change Orders.
 - .4 Field Test Reports.
 - .5 Reports by Authorities having Jurisdiction. Building and other applicable permits.
 - .6 Daily log including:
 - .1 Weather conditions.
 - .2 Excavation conditions
 - .3 Start and finish date of each Trade Contractor.
 - .4 Erection and removal dates of formwork.
 - .5 Date, quantities and particulars of each concrete pour.
 - .6 Dates and quantities and particulars of roofing and waterproofing work. Visits to the Site by Owner, Consultants, Jurisdictional Authorities, Testing and Inspection companies, and material and equipment supplier representatives.
 - .7 Material Safety Data Sheet pursuant to WHMIS (Occupational Health & Safety Act).

- .8 As-built drawings recording as-built conditions, instructions, changes for structure, equipment, wiring, plumbing, etc., prior to being concealed.
- .9 Copies of applicable codes.
- .10 The above material shall be made available to the Consultant at their request.

43 DRAINAGE

- 43.1 Layout and construct work to ensure that positive drainage is provided to floor drains, ditches, site drains and catch basins, as set in their final position, preventing undrained areas and ponding.
- 43.2 Ensure that allowable construction tolerances and structural deflection do not cause ponding of water.
- 43.3 Report to Consultant in writing prior to executing work affected, in case adequate drainage cannot be provided.

44 REGULATORY REQUIREMENTS

- 44.1 The Building Code - Ontario Regulation 332/12, including all amendments, shall govern the construction of the Work.
- 44.2 The CSA B52 Standard – Mechanical Refrigeration Code
- 44.3 Comply with all By-Laws and regulations of authorities having jurisdiction. These codes and regulations constitute an integral part of the Contract Documents.
- 44.4 Owner shall apply and pay for Municipal Building Permit, and Contractor shall obtain and pay for all other permits, licenses, deposits, and certificates of inspection as part of the Contract Price as per Conditions of the Contract. Ensure that permits, licenses, deposits, and certificates included under specific Sections are provided as specified.
- 44.5 If required, pay for construction damage deposit required by authorities having jurisdiction.
- 44.6 Where permits, licences, and inspection fees are required by authorities having jurisdiction for specific trade functions, they shall be obtained by particular subtrade responsible for that work.
- 44.7 Arrange for inspection, testing of Work and acceptance required by the authorities having jurisdiction. Be responsible for necessary preparations, provisions and pay all associated costs.
- 44.8 Be responsible for ensuring that no work is undertaken which is conditional on permits, approvals, reviews, licences, fees, until all applicable conditions are met. No time extension will be allowed for delay in obtaining necessary permits.
- 44.9 Any additional work or changes to the materials due to Work not complying with the Ontario Building Code and Regulations as indicated by the Building Inspector shall be changed. All costs involved shall be borne by Contractor.
- 44.10 Obtain permit required to work on Municipal rights of way. Provide damage deposits for sidewalks, roads and services work, as applicable.

- 44.11 Give notice of completion of project prior to occupancy, as required by applicable legislation.

45 EXISTING PUBLIC SERVICE LINES

- 45.1 Where existing public services are indicated to be removed and/or relocated, perform Work in compliance with authorities having jurisdiction.
- 45.2 Make good public roads, walkways and curbs soiled or damaged due to construction to the requirements of local authorities.

46 CODES

- 46.1 Reference is made to standards in the specifications to establish minimum acceptable standards of materials, products and workmanship. Ensure that materials, products and workmanship meet or exceed requirements of the reference standards specified.
- 46.2 In the event of conflict between documents specified herein, execute the Work in accordance with the most stringent requirements.

47 STANDARDS

- 47.1 Where a material or product is specified in conjunction with a referenced standard, do not supply the material or product if it does not meet the requirements of the standard. Supply another specified material or product, or an acceptable material or product of other approved manufacture which does meet the requirements of the standard, at no additional cost to the Owner.
- 47.2 Where no standard is referred to, provide materials, products and workmanship which meet requirements of the applicable standards of the Canadian Standards Association, Canadian General Standards Board, Ontario Provincial standard specifications (OPSS), Ontario Provincial Standard Drawings (OPSD) and the applicable building code. References to "Measurement for Payment" and "Basis of Payment" in OPSS standard documents are not applicable to this Contract.
- 47.3 If there is question as to whether a material, product or system is in conformance with applicable standards, the Consultant reserves the right to have such materials, products or systems tested to prove or disprove conformance. The cost for such testing will be paid by the Owner in the event of conformance with contract Documents or by the Contractor in the event of non-conformance.
- 47.4 Where application, installation and workmanship standards are cited, it is intended that referenced standards form the basis for minimum requirements of the specified item and specifications supplement the standards unless specified otherwise.
- 47.5 Matters may be dealt with in part by these specifications which are also dealt with, under the same or similar headings in cited standard. It is not intended that these specifications take the place of the standards but supplement them, unless specified otherwise.
- 47.6 Where reference is made to manufacturer's directions, instructions or specifications they shall include full information on storing, handling, preparing, mixing, installing,

erecting, applying, or other matters concerning the materials pertinent to their use and their relationship to materials with which they are incorporated.

47.7 Where standards, specifications, associations, and regulatory bodies are listed in the Specifications by their abbreviated designations. These are but not limited to the following:

- .1 The Aluminium Association
- .2 Architectural Aluminium Manufacturers Association
- .3 American Association of State Highway and Transportation Officials
- .4 American Concrete Institute
- .5 Anti-Friction Bearing Manufacturer's Association
- .6 American Institute of Electrical Engineers
- .7 American Iron and Steel Institute
- .8 Air Movement and Control Association
- .9 Association of Municipal Electric Utilities
- .10 American National Standards Institute
- .11 Air-Conditioning and Refrigeration Institute
- .12 American Standards Association
- .13 American Society of Heating, Refrigeration and Air Conditioning Engineers
- .14 American Society of Mechanical Engineers
- .15 American Society of Testing and Materials
- .16 Architectural Woodwork Manufacturers Association of Canada American Water Works Association
- .17 Canadian Electrical Manufacturer's Association
- .18 Canadian Gas Association
- .19 Canadian General Standards Board
- .20 Canadian Institute of Steel Construction
- .21 Canadian Mortgage and Housing Corporation
- .22 Canadian Paint Manufacturers Association
- .23 Council of Forest Industries of British Columbia
- .24 Canadian Roofing Contractors Association
- .25 Canadian Standards Association
- .26 Canadian Sheet Steel Building Institute
- .27 Canadian Welding Bureau
- .28 Canadian Wood Council
- .29 Electrical and Electronic Manufacturers Association Canada Factory Mutual
- .30 Institute of Electrical and Electronic Engineers
- .31 Maple Flooring Manufacturers Association
- .32 Military Standards
- .33 Manufacturer's Standardization Society
- .34 Ministry of Transportation Ontario
- .35 National Association of Architectural Metal Manufacturers National Fire Protection Association
- .36 National Electrical Manufacturer's Association (U.S.A.) National Lumber Grades Authority
- .37 National Research Council of Canada
- .38 Ontario Concrete Block Association
- .39 Ontario Hydro Electrical Safety Code
- .40 Ontario Provincial Standard Specification
- .41 Porcelain Enamel Institute

- .42 Plumbing Drainage Institute
- .43 Public Health Act
- .44 Sheet Metal and Air Conditioning Contractors National Association
- .45 Steel Structures Painting Council
- .46 Tubular Exchange Manufacturer's Association
- .47 Terrazzo, Tile and Marble Association of Canada Underwriters Laboratories Inc. (U.S.)
- .48 Underwriters Laboratories of Canada

48 FIRE RATINGS, ASSEMBLIES AND SEPARATIONS

- 48.1 Where a material, component, assembly, or separation is required to be fire rated, the fire rating shall be as determined or listed by one of the following testing authorities acceptable to the authorities having jurisdiction:
- .1 Underwriters' Laboratories of Canada.
 - .2 Underwriters' Laboratories Inc.
 - .3 Factory Mutual Laboratories.
 - .4 The National Research Council of Canada.
 - .5 The National Board of Fire Underwriters.
 - .6 Intertek Testing Services.
- 48.2 Where reference is made to only one testing authority an equivalent fire rating as determined or listed by another of the aforementioned testing authorities is acceptable if approved by authorities having jurisdiction. Obtain and submit such approval of authorities, in writing when requesting acceptance of a proposed equivalent rating or test design.
- 48.3 Fire rated door assemblies shall include doors, frame, anchors, and hardware and shall bear label of fire rating authority showing opening classification and rating.
- 48.4 Material having a fire hazard classification shall be applied or installed in accordance with fire rating authorities printed instructions.
- 48.5 Fire rated assemblies shall be constructed in accordance with applicable fire test report information issued by fire rating authority. Deviation from fire test report will not be allowed.
- 48.6 Construct fire separations as continuous, uninterrupted elements except for permitted openings. Extend fire rated walls and partitions from floor to underside of structural deck above.
- 48.7 Fire separations may be pierced by openings for electrical and similar service outlets provided such boxes are non-combustible and are tightly fitted and sealed with a ULC approved sealant for the assembly being sealed.
- 48.8 Construction that abuts on or is supported by a non-combustible fire separation shall be constructed so that its collapse under fire conditions will not cause the collapse of the fire separation.
- 48.9 Do not use combustible members, fastenings, attachments and similar items to anchor electrical, mechanical or other fixtures to fire separations.
- 48.10 At penetration through fire rated walls, ceilings or floors, completely seal voids with ULC approved firestopping material; full thickness of the construction element. In

locations that require a smoke seal, provide appropriate ULC approved system installed in accordance with the manufacturer's recommendations.

49 TEMPORARY CONTROLS

- 49.1 Hoarding, fencing and barriers:
- .1 Before commencing operations, supply, erect and maintain hoarding, fencing, and barriers around work area. Paint outside of hoarding in a colour selected by the Consultant and mark with "POST NO BILLS" signs.
 - .2 Provide temporary enclosures as required to protect the building in its entirety or in its parts, against the elements, to maintain environmental conditions required for work within the enclosure, and to prevent damage to materials stored within.
 - .3 Provide lockable gates through hoarding, fencing, and barriers for access to Site by workers and vehicles.
- 49.2 Prevent unauthorized entry to the Site. Barricade, guard or lock access points to the satisfaction of the Consultant and post "NO TRESPASSING" signs.
- 49.3 Install signs for movement of people around Work Site as required and directed by the Consultant.
- 49.4 Provide secure, rigid guide rails and barricades around open shafts, open edges of floors and roofs as required for protection of Work, workers, and the public.
- 49.5 Remove hoarding, fencing, barriers, building enclosures, guide rails and barricades upon Contract Completion unless otherwise noted on the Contract Drawings or as directed by the Consultant.

50 SERVICE AND UTILITY SYSTEMS

- 50.1 Consult with utility companies and other authorities having jurisdiction to ascertain the locations of existing services on or adjacent to site.
- 50.2 Information as to the location of existing services, if shown on the Drawings, does not relieve the Contractor of his responsibility to determine the exact number and location of existing services.
- 50.3 Give proper notices for new services as may be required. Make arrangements with authorities and utilities for service connections required.
- 50.4 Pay any charges levied by utilities or authorities for work carried out by them in connection with this Contract, unless specified otherwise.
- 50.5 Operate and maintain all utility systems affected by work of this Contract, until the building or specific portions thereof have been accepted by the Owner.
- 50.6 Report existing unknown services encountered during excavation to Consultant for instructions; cut back and cap or plug unused services. Be responsible for the protection of all active services encountered and for repair of such services if damaged.
- 50.7 **SCAFFOLDING, HOISTS AND CRANES**

Select, operate, and maintain scaffolding, hoisting equipment and cranes as may be required.

- .1 Do not erect or operate equipment that will endanger existing structures, local municipalities hydro installations, or traffic signals.
- .2 Design and construct scaffolding in accordance with CAN/CSA S269.2-M.

50.8 **TEMPORARY WORKS**

- .1 Installation and Removal: Provide temporary utilities, facilities and controls in order to execute the Work expeditiously. Remove from Site all such Work after use.
- .2 Arrange for connections with Owner and pay all costs for installation, maintenance and removal.
- .3 Be responsible for the careful and reasonable use of Owner supplied water and power.
- .4 Temporary power and lighting systems:
- .5 Supply, install and maintain electrical power and necessary electrical equipment including overhead and underground feeders, transformers, motors, starters, panels, protective devices and equipment. Connections will be made available to any part of the Work within distance of a 30 m extension.
- .6 Provide temporary lighting inside and outside structure of adequate intensity to illuminate construction activities. Provide temporary pedestrian lighting for sidewalk areas affected by the Work.
- .7 Supply and install the type and quantity of minimum lighting equipment in each location to ensure adequate, continual illumination 24 hours per day, 7 days per week for the following:
 - .1 Emergency evacuation, safety and security throughout the Project at intensity levels required by jurisdictional authorities.
 - .2 General lighting for performance of the Work throughout the Project, evenly distributed, and at intensities to ensure that proper installations and applications are achieved.
 - .3 Performance of finishing trades in area as required evenly distributed, and of an intensity of at least 50 Lux.
- .8 In locations approved by the Consultant. install and support the electrical plant, distribution and temporary lighting systems including service equipment and local hydro authority meter energized by the local hydro circuits. Installations shall be approved by the Consultant and shall be carried out in a neat manner to avoid interference with the application of finish material and to facilitate removal when the installed permanent lighting system is in operation.
- .9 Make all necessary arrangements for and pay all costs for a temporary electrical service of sufficient capacity to supply temporary lighting, operation of power tools, cranes and equipment for all construction, implementation, and inspection and testing purposes. Supply and install necessary temporary cables and other electrical equipment and make all temporary connections as required.

- .10 Temporary power distribution wiring shall comply with Ontario Hydro Electrical Safety Code. Obtain inspection certificates for temporary electrical work.
- .11 Maintain the lighting systems in operation during the life of the Contract. Replace burned or missing lamps immediately.
- .12 Upon Contract Completion, remove electrical plant and temporary lighting from the Site.
- .13 Water Supply:
 - .1 Provide and pay for a continuous supply of potable water for construction use. Provide as a minimum one water connection on each floor level.
 - .2 Provide and maintain all temporary lines, extensions and hoses as required. Remove all temporary connections and lines on completion of the Work and make good any damage.
- .14 Temporary Heating:
 - .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
 - .2 Construction heaters used inside buildings must be vented to the outside or be flame less type. Solid fuel salamanders are not permitted.
 - .3 Maintain temperatures of minimum 10oC in areas where construction is in progress unless otherwise indicated in the Contract Documents. Protect exposed and adjacent services from freezing. Repair at no cost to the Owner any such services, buildings or other utilities disrupted by freezing.
 - .4 Ventilate heated areas and keep structures free from exhaust combustion gases.
 - .5 The permanent heating system of the building or portions thereof may be used when available only upon written permission by Consultant. If permission to use heating system is obtained:
 - .1 Before using air handling systems, ensure that dust/debris is removed from the premises and install temporary filters to prevent construction dust/debris from entering via return air or intake openings. Keep unused ducts sealed to prevent entry of dust/debris. Replace filters frequently during construction.
 - .2 On completion of work remove temporary filters and install new filters in accordance with Division 23. After temporary use of air handling system is complete and before turning over system to Owner, vacuum internally to ensure all dust/debris is removed.
 - .6 Elevators: Elevators may be used by construction personnel as permitted by the Owner.
 - .7 Temporary Telephone and Data: Provide and pay for separate telephones and Data services, for local call only, as required for own use and use of the Consultant and Owner. Long distance call shall be paid by party making call.

- .8 Sanitary Facilities: Provide sanitary facilities in accordance with occupational health and safety requirements in the place of the Work. Use of Owner's existing sanitary facilities or new sanitary facilities is not allowed.

51 SITE SECURITY

- 51.1 Provide and pay for security personnel to guard the Site and contents of the Site after working hours and during holidays as established by the Owner. Control of access shall be through hoarding and barricades during times work is in progress, and by locking hardware otherwise.
- 51.2 Any security service provided by the Owner is for the protection of the Owner's interest in the Work on the Site and shall not relieve the Contractor of the responsibility to protect the Site and the Work of the Contract.

52 PROTECTION

- 52.1 Protection of Public Area: Protect surrounding private and public property from damage during performance of the Work.
- 52.2 Take all necessary precautions to prevent damage to work affected by temperature, water, weather and other environmental conditions.
- 52.3 Protection of Building Finishes and Equipment:
 - .1 Provide protection for existing structure, finished and partially finished building finishes, waterproofing systems, and equipment during performance of the Work.
 - .2 Cover Owner's equipment and plant within the Site with 6 mil PVC sheet, or equal, taped to make it dust-tight. Equipment and existing work moved or altered to facilitate construction, movement of Products or equipment shall be stored, protected with dust-tight covers and subsequently returned to its original location.
 - .3 Obtain approval from the Consultant prior to the installation of temporary supporting devices into existing roof, ceiling, or wall members for the erecting of equipment or machinery. Repair roof, ceiling, and wall members used for this purpose to the satisfaction of the Consultant.
 - .4 Provide necessary screens, covers and hoarding as required.
 - .5 Any Products or equipment damaged while carrying out the Work shall be restored with new Products or equipment matching the original equipment. Damage shall include harm resulting from all construction work, such as falling objects, wheel and foot traffic, failure to remove debris, operation of machinery and equipment, and scaffolding and hoisting operations.
- 52.4 Fire Protection:
 - .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.

- .2 Excessive storage of flammable liquids and other hazardous materials is not allowed on Site. Flammable liquids must be handled in approved containers. Remove combustible wastes frequently.
- .3 Inspect temporary wiring, drop cords, extension cables for defective insulation or connections frequently.
- .4 Open burning of rubbish is not permitted on the Site.
- .5 Handle, transport, store, use and dispose of gasoline, benzine or other flammable materials with good and safe practice as required by authorities having jurisdiction.
- .6 Provide fire extinguishers of the non-freezing chemical type in each temporary building, enclosure and trailer. Use only fire-proofed tarpaulins.
- .7 A fire watch shall be required for each of the following activities regardless of the number, duration or size of the activity in operation:
 - .1 any open flame activities (e.g., soldering and welding);
 - .2 shutdown of fire detection system;
 - .3 shutdown of sprinkler system.
- 52.5 Maintain adequate cover over services as required by Utility Authorities.
- 52.6 Report any discharge of a contaminant to the Authorities having jurisdiction.

53 PEST CONTROL

- 53.1 Be responsible to provide control measures, restraining procedures, and treatments to prevent infestation and spread of insects, rodents and other pests deemed to be present at Site and/or noticed during course of the Work. Carry out fumigation, pest control procedure, and posting of warning signs, notices including contents of such notices in accordance with requirements of Pesticides Act and any other authorities having jurisdictions. Pesticides used shall be in accordance with Canada Pest Control Products Act, and provincial and municipal regulations.

54 FIRST-AID FACILITIES

- 54.1 Provide site equipment and medical facilities necessary to supply first-aid service to injured personnel in accordance with regulations of the Workmen's Compensation Act. Maintain facilities for duration of Contract.

55 USE OF NEW PERMANENT SERVICE & EQUIPMENT

- 55.1 Do not use any new permanent service or equipment without Owner's written approval.
- 55.2 Where permission is granted to use permanent services and equipment provide competent persons to operate services and equipment; inspect frequently and maintain facilities in proper operating condition at all times.
- 55.3 Permanent services and equipment shall be turned over to Owner in "as new" and perfect operating condition.

- 55.4 Use of permanent systems and equipment as temporary facilities shall not affect the warranty conditions and warranty period for such systems and equipment. Make due allowance to ensure that Owner will receive full benefits of equipment manufacturers warranty after project takeover.

56 PROJECT IDENTIFICATION

- 56.1 If required, obtain approvals from jurisdictional authorities for temporary signs.
- 56.2 Do not display signs without the Consultant's and Owners written consent.
- 56.3 Maintain signs in good condition for the duration of Contract.

57 SITE MAINTENANCE

- 57.1 Maintain the Site and adjacent premises in a clean and orderly condition, free from debris and other objectionable matter. Immediately remove rubbish and surplus Products, equipment and structures from the Site. If the Site is not cleaned (within 48 hours after the Contractor has been instructed to do so), the Consultant may clean the Site and retain the cost from monies due, or to become due, to the Contractor.
- 57.2 When the Work is substantially performed, remove surplus Products, tools, construction machinery and equipment not required for the performance of the remaining Work

58 SITE STORAGE AND OVER LOADING

- 58.1 Confine the Work and operations of employees to limits indicated by the Contract Documents. Do not unreasonably encumber the Site with Products.
- 58.2 Products shall be stored only in areas designated or approved by the Consultant, and shall not be left lying on streets, sidewalks, boulevards or elsewhere within public view. Products which the Consultant may permit to be stored elsewhere than in the Contractor's storage areas shall be neatly stacked or otherwise disposed and shall be so maintained.
- 58.3 Fabrication shops shall not be set up within the structure except as directed by or with the permission of the Consultant.
- 58.4 Do not load or permit to be loaded any part of the Work with a weight or force that it is calculated to bear safely. Be solely responsible and liable for damages resulting from violation of this requirement. Provide temporary supports as strong as permanent support.
- 58.5 Do not cut, drill or sleeve load bearing members unless shown on drawings or otherwise approved by the Consultant in writing for each location.
- 58.6 Site storage and loading requirements to be in accordance with the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.

59 PUBLIC CONVENIENCE AND SAFETY

- 59.1 Maintain sidewalks at and adjacent to the Site in a safe condition throughout the Contract. Promptly remove ice and snow.
- 59.2 Keep haul routes free at all times from Products spilled on highway or street surfaces and clean highways and streets of deposits due to performance of the Work to the satisfaction of the Consultant and the highway and street authorities. Clean highways and streets within 24 hours of Consultant's instruction.
- 59.3 The Consultant may inspect haul routes, the Site and adjacent premises daily and may halt operations, withhold payment or carry out such additional operations as necessary, deducting the cost from monies due, or to become due, to the Contractor.

60 ACCESS AND EGRESS TO SITE

- 60.1 Where construction requirements demand, construct access roads capable of withstanding construction equipment and haul traffic. Maintain access roads in good condition at all times. Remove access roads prior to completion of the Work unless otherwise noted and restore area as shown on the Contract Drawings.

61 PUBLIC TRAFFIC FLOW

- 61.1 Provide and maintain flag persons, Police Officers, traffic signals, barricades and illumination as required by Authorities having jurisdiction and/or as necessary to perform the Work and protect the public.
- 61.2 PUBLIC UTILITIES AND SERVICES
- 61.3 Verify limitations imposed on project work by presence of utilities and services, and ensure no damage occurs to them.
- 61.4 Notify service authorities concerned so that they protect, remove, relocate, or discontinue them, as they may require.
- 61.5 Make arrangements and pay for connection charges for services required for project work.
- 61.6 Locate poles, pipes, conduit, wires, fill pipes, vents, regulators, meters, and sanitary services work in inconspicuous locations. If not shown on Drawings, verify location of service work with Consultant before commencing installation.

62 ROADS, CURBS, GUTTERS, AND WALKS

- 62.1 Include all curb cuts and making good of existing curbs, walks and paving on Municipal property to provide fully paved and finished approaches to requirements of authorities having jurisdiction.

63 CONSTRUCTION PARKING

- 63.1 Parking will be permitted on Site provided it does not disrupt the performance of Work, Site safety or the movement of vehicular or pedestrian traffic and is acceptable to the Consultant.

64 SITE VISITORS

- 64.1 During the progress of the Work, afford access to visitors duly authorized by the Consultant and facilitate inspections or tests they may desire to make. Record site visitors in log book maintained on site.
- 64.2 Ensure Site visitors wear appropriate safety apparel.

65 EROSION AND SEDIMENTATION CONTROL

- 65.1 Control drainage on site to prevent flooding, erosion and run-off onto adjacent properties as a result of construction operations.
- 65.2 Dispose of water containing silt in suspension in accordance with requirements of jurisdictional authorities.
- 65.3 Conform to sedimentation and erosion control requirements of the conservation and/or municipal authority having jurisdiction. Provide and maintain until completion of work or until directed by Consultant to be removed, sediment control devices at catch basins, drainage courses and at other locations on site as directed. Comply with requirements of the local Conservation Authority.
- 65.4 Provide storm drain inlet protection consisting of a sediment control barrier or an excavated ponding area around storm drain inlet or curb inlet; add bracing where necessary to withstand high flow volumes and depth. Inspect inlet protection after each rainfall and repair damage. Sweep up accumulated sediment and dispose of in a controlled area. Remove inlet protection after area has been stabilized with permanent vegetation.
- 65.5 Prevent tracking of mud and dirt from site onto paved roads. Provide stabilized vehicle access/egress points, constructed of coarse granular material. Place additional granular material as required to maintain access/egress points in proper working order. Clean mud and dirt from paved roads at end of each day by shovelling or sweeping and subsequent washing. Dispose of mud dirt in a controlled disposal area.

66 TEMPORARY DRAINAGE AND DEWATERING

- 66.1 Drainage lines and gutters shall be kept open at all times. No flow of water shall be directed across or over pavements except through pipes or properly constructed troughs. Keep all portions of Work properly and efficiently drained during construction and until completion. Be responsible for all disturbances, dirt and damage which may be caused by or result from water backing up or flowing over, through, from or along any part of Work, or due to operations which may cause water to flow elsewhere.
- 66.2 Keep trenches and other excavations free of water at all times. Employ adequate means to remove water in a manner that will prevent loss of soil, and maintain the stability of excavation.

- 66.3 Dispose of such water in a manner that will not be dangerous to public health, private property or to any portion of Work completed or under construction, nor which causes an impediment to the use of streets by the public.
- 66.4 Drainage of trenches or other excavation through newly laid storm drainage pipe will be allowed only with the express permission of the authority having jurisdiction.
- 66.5 When drainage is directed to existing catch basins, regularly inspect and clean such catch basins of debris and sediment.

67 SNOW REMOVAL

- 67.1 Allow no accumulation of ice and snow on Site, and on roof deck when roofing operations are scheduled to take place.
- 67.2 Remove snow from road, Site circulation paths and elsewhere as required to permit access to Work, parking and uninterrupted construction progress.

68 POLLUTION (DUST, DEBRIS, AND NOISE) CONTROL

- 68.1 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- 68.2 Keep premises free of waste material.
- 68.3 Arrange and pay for removal of all waste generated by the work in manner acceptable to authorities having jurisdiction.
- 68.4 Limit noise levels in accordance with requirements of authorities having jurisdiction.
- 68.5 Maintain temporary erosion and pollution control features installed under this contract.
- 68.6 Control emissions from equipment and plant to local authorities emission requirements.
- 68.7 Prevent abrasive-blasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

69 TREE PROTECTIONS

- 69.1 All trees are to be protected in accordance with the City of Toronto, Urban Forestry, Tree Protection Policy.
- 69.2 Within Contractor's assigned work and storage areas and adjacent to designated access routes, protect existing trees and other plants scheduled to remain. Provide approved barrier consisting of snow fencing or plywood around Tree Protection Zone (TPZ).
- 69.3 Leave protection areas undisturbed; do not use areas for storage, stockpiling or any other purpose. Do not dump or flush any contaminants in areas of tree feeder roots.
- 69.4 Where limbs, roots or portions of plants are required to be removed to accommodate new work, they shall be removed with the approval of Urban Forestry and under the supervision of an experienced arborist.

- 69.5 Where root systems of protected trees adjacent to construction are exposed or damaged, they shall be neatly trimmed and the area backfilled with suitable material to prevent desiccation.
- 69.6 Where necessary give plants an overall pruning to restore the balance between roots and top growth and/or to restore appearance.
- 69.7 Except at locations where specific procedures are included in Contract Documents do not alter grades around existing trees/plants without first obtaining Consultant's consent and directions.

70 SUBSTITUTIONS

- 70.1 Requests for substitutions will not be accepted prior to the Notification of Award. Substitutions will be considered by the Consultant provided that:
- .1 The proposed substitutions have been investigated and complete data are submitted in accordance with the Specifications.
 - .2 Data relating to changes in the Contract Schedule, if any, and relation to other Work have been submitted.
 - .3 Same warranty is given for the substitution as for the original Product specified.
 - .4 All claims are waived for additional costs related to the substitution which may subsequently arise.
 - .5 Installation of the accepted substitution is co-ordinated into the Work and that full responsibility is assumed when substitutions affect other work. Make any necessary changes required to complete the Work. Revisions to the drawings for incorporation of the substitutions shall be made by the Consultant and all costs associated with the revisions shall be borne by the Contractor.
- 70.2 Substitutions to methods or process described in the Specifications or drawings, may be proposed for the consideration of the Consultant. Ensure that such substitutions are in accordance with the following requirements:
- .1 Time spent by the Consultant in evaluating the substitution shall not be the basis for a claim by the Contractor for extensions to the Contract Time.
 - .2 Clearly indicate how the proposed substitutions would be advantageous to the Owner or in the opinion of the Contractor would improve the operation of the installation.
 - .3 Be responsible for substitutions to methods or processes concerning such Work and ensure that the warranty covering all parts of the Work will not be affected.
 - .4 The cost of all changes in the work of Other Contractors, necessitated by the substituted methods or processes, if accepted, is borne by the Contractor.
 - .5 The substituted methods or processes fit into space allotted for the specified methods or processes. Revisions to the drawings for incorporation of the substitutions shall be made by the Consultant and all costs associated with the revisions shall be borne by the Contractor.
- 70.3 Substitutions will not be considered if:

- .1 They are indicated or implied on shop drawings or Product data without formal request.
- .2 Acceptance will require substantial revision of the Specifications and Drawings.
- 70.4 Do not substitute Products or methods or processes into the Work unless such substitutions have been specifically approved for the Work by the Consultant.
- 70.5 Approved substituted Products shall be subject to the Consultant's inspection and testing procedures. Approved substituted Products shall only be installed after receipt of the Consultant's written approval.
- 70.6 The Contract Price will be adjusted accordingly to any and all credits arising from the substitutions mentioned above.

71 APPROVAL OF PRODUCTS AND INSTALLATION METHODS

- 71.1 Wherever in the Specifications it is specified that Products and installation methods shall meet approval of Authorities having Jurisdiction, underwriters, the Consultant, or others, such approval shall be in writing.

72 PRODUCT DELIVERY CONTROL

- 72.1 It is the responsibility of the Contractor to ensure that the supplier or distributor of materials specified or alternatives accepted, which he intends to use, has materials on the site when required. The Contractor shall obtain confirmed delivery dates from the supplier.
- 72.2 The Contractor shall contact the Consultant immediately upon receipt of information indicating that any material or item, will not be available on time, in accordance with the original schedule, and similarly it shall be the responsibility of all subcontractors and suppliers to so inform the Contractor.
- 72.3 The Consultant reserves the right to receive from the Contractor at any time, upon request, copies of actual purchase or work orders of any material or products to be supplied for the work.
- 72.4 If materials and products have not been placed on order, the Consultant may instruct such items to be placed on order, if direct communication in writing from the manufacturer or prime suppliers is not available indicating that delivery of said material will be made in sufficient time for the orderly completion of the Work.
- 72.5 The Consultant's review of purchase orders or other related documentation shall in no way release the Contractor, or his subcontractors and suppliers from their responsibility for ensuring the timely ordering of all materials and items required, including the necessary expediting, to complete the work as scheduled in accordance with the Contract Documents.
- 72.6 In the event of failure to notify the Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, the Consultant reserves the right to direct the Contractor to take the following measures at no increase in Contract Price:
 - .1 Substitute more readily available Products of similar or better quality and character, or

- .2 Temporarily install another Product until such time as the specified Product becomes available, at which time the temporarily installed product shall be removed and the specified Product installed.

73 TRADEMARKS AND LABELS

- 73.1 Permanent labels, trademarks and nameplates on Products are not acceptable in the finished Work, except where required by authorities having jurisdiction, for operating instructions, or when located in service rooms.
- 73.2 Remove trademarks and labels by grinding, if necessary, painting out where the particular surface is being painted, or if on plated parts, replace with new plain plated or non-ferrous metal parts.

74 DELIVERY, STORAGE, HANDLING AND PROTECTION

- 74.1 Be responsible for handling and delivery of Products. Protect Products from damage during handling, storage and installation. Deliver store and handle items in accordance with manufacturer's instructions and as specified. Be responsible for all costs of delivery, loading and off-loading, and for transportation back to its origin for correction, if required, due to damage or defect. Reject materials and Products delivered to the Site which are damaged.
- 74.2 Manufacture, pack, ship, deliver, and handle Products so that no damage occurs to structural qualities and finish appearance, nor in any other way which is detrimental to their function and appearance.
- 74.3 Ensure that Products, while transported, are not exposed to an environment which would increase their moisture content beyond the maximum specified.
- 74.4 Organize delivery of materials, Products and equipment to, and removal of debris and equipment from, the site and surrounding property.
- 74.5 Schedule early delivery of Products to enable Work to be executed without delay. Before delivery, arrange for receiving at the Place of the Work.
- 74.6 Coordinate mechanical and electrical equipment and apparatus deliveries with the manufacturer's and suppliers such that equipment and apparatus is delivered to the site when it is required, or so that it can be stored within the building and protected from the elements.
- 74.7 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.
- 74.8 Deliver packaged Products, in original unopened wrapping or containers, with manufacturer's seals and labels intact.
- 74.9 Label packaged products to describe contents, quantity, and other information as specified.
- 74.10 Labels attesting that materials conform to specified reference standards will be acceptable as verification that contents meet specified requirements. In the absence of labels, submit affidavits to validate conformance of Product to reference standards, as requested by the Consultant.

- 74.11 Label fire-rated Products to indicate Underwriters' Laboratories approval.
- 74.12 Handle and store materials and products in such a manner that no damage is caused to the materials and products, the Work, the site and surrounding property.
- 74.13 Do not obstruct or disrupt local traffic flow during construction period.
- 74.14 Allocate an area within the limits of the Work acceptable to the Owner for storage of Products brought to the site by all trades. Keep storage area tidy at all times and do not use other parts of the property for storage. Arrange and pay for off-site storage when required.
- 74.15 Locate products on site in a manner to cause minimal interference with the Work and building activities.
- 74.16 Store Products off the ground, in a manner to prevent damage, adulteration, deterioration and soiling to the Products, other building components, assemblies, other products, the structure, the site and surrounding property, and in accordance with manufacturer's instructions when applicable.
- 74.17 Store packaged or bundled Products in original and undamaged condition complete with written application instructions. Keep manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in the Work.
- 74.18 Do not place or store materials and Products in corridors, public areas, streets, lanes, passageways or similar locations.
- 74.19 Store Products so as not to create any overloading conditions to any part of the building, structure, falsework, form work and scaffolding.
- 74.20 Store Products subject to damage from weather in weatherproof enclosures.
- 74.21 Store cementitious Products clear of earth or concrete floors, and away from walls.
- 74.22 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- 74.23 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- 74.24 Store and handle flammable liquids and other hazardous materials in approved safety containers and as otherwise prescribed by safety authorities. Store no flammable liquids or other hazardous material in bulk within the Work.
- 74.25 Store and mix paints in a heated and ventilated room or area assigned for this purpose. Keep this room or area locked when unattended. Remove oily rags and other combustible debris from the Place of the Work daily. Take every precaution necessary to prevent spontaneous combustion.
- 74.26 Protect prefinished metal surfaces by protective coatings or wrappings until time of final cleanup. Protection shall be easily removable under work of without damage to finishes. Do not permit strippable tape or coatings to become baked on surfaces which they protect.
- 74.27 Touch-up damaged factory finished surfaces to Consultant's satisfaction. Use primer and paint to match original.

- 74.28 Protect glass and other finishes against heat, slag and weld splatter by provision of adequate shielding. Do not apply Visible markings to surfaces exposed to view in finished state or that receive transparent finishes.
- 74.29 Protect surfaces of completed work exposed to view from staining, disfigurement and all other damage by restriction of access or by use of physical means suitable of the material and surface location.
- 74.30 Adequately protect trowelled concrete floors from damage. Take special measure when moving heavy loads or equipment on them.
- 74.31 Keep finished concrete floors free from oils, grease or other material likely to damage or discolour them or affect bond of applied finishes. Once building is enclosed, keep floors as dry as possible after curing.
- 74.32 Protect finished flooring from pedestrian traffic with reinforced kraft paper as a minimum, secured in place and with joints sealed by reinforced pressure sensitive tape. Maintain protection in place until contract completion.
- 74.33 Protect finished flooring from continuing construction work and delivery of products with plywood panels of minimum 6 mm thickness with joints between panels sealed with reinforced pressure sensitive tape. Maintain protection in place until work and deliveries are complete.
- 74.34 Make good or replace damaged materials to the satisfaction of the Consultant.
- 74.35 Hazardous Materials Information:
- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets (MSDS) in accordance with jurisdictional authorities.
 - .2 Deliver copies of Material Safety Data Sheets (MSDS) to the Consultant on all Products intended for use in the Work and designated as a "controlled product."

75 AVAILABILITY

- 75.1 If delays in supply of Products are foreseeable, notify the Consultant of such, in order that remedial action may be authorized in ample time to prevent delay in performance of Work.
- 75.2 In the event of failure to notify the Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, the Consultant reserves the right to direct the Contractor to take the following measures at no increase in Contract Price:
- .1 Substitute more readily available Products of similar or better quality and character, or
 - .2 Temporarily install another Product until such time as the specified Product becomes available, at which time the temporarily installed product shall be removed and the specified Product installed.

76 MANUFACTURER'S INSTRUCTIONS

- 76.1 Unless otherwise indicated in the Specifications, fabricate, install, apply, connect, install, erect, use, clean, and condition Products in accordance with manufacturer's instructions except where more stringent requirements are specified. Do not rely on labels or enclosures provided with Products. Obtain written instructions directly from manufacturers.
- 76.2 Notify the Consultant in writing, of conflicts between the Specifications and manufacturer's instructions, so that the Consultant may establish the course of action. If requested, make a copy of those instructions available at the Site.
- 76.3 In cases of improper installation or erection of Products, due to failure in complying with these requirements, the Consultant may direct removal and re-installation at no increase in Contract Price.

77 WORKMANSHIP

- 77.1 Workmanship shall be the best quality, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Consultant if required Work is such as to make it impractical to produce required results.
- 77.2 Do not employ any unfit person or anyone unskilled in their required duties. The Consultant reserves the right to require the dismissal from the Place of the Work, workers deemed incompetent, careless, insubordinate or otherwise objectionable.
- 77.3 Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with the Consultant, whose decision is final.
- 77.4 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.
- 77.5 In finished areas, conceal pipes, ducts, conduit and wiring in floors, walls, ceilings, chases, or behind furring except where indicated otherwise.
- 77.6 Ensure that service poles, fill-pipes, vents, regulators, metres and similar service installations are located in inconspicuous locations. If not indicated on drawings, verify location of service installations with Consultant prior to commencing installation.
- 77.7 Ensure that integrity of fire separations is maintained where they are penetrated.
- 77.8 Finish access panels and doors to match adjacent wall and/or ceiling finish unless otherwise specified or indicated.
- 77.9 Keep surfaces, on which finished materials will be applied, free from grease, oil, and other contamination which would be detrimental in any way to the application of finish materials.
- 77.10 Enforce fire prevention methods at site. Do not permit fires, open flame heating devices or accumulation or debris. Use flammable materials only if all safety precautions are taken. Provide and maintain in working order ULC labelled fire extinguishers of types suitable for fire hazard in each case, and locate them in prominent location and to approval of jurisdictional authorities.

- 77.11 Where flammable materials are being applied, ensure that adequate ventilation is provided, spark-proof equipment is used, and smoking and open flames are prohibited.

78 DIMENSIONS

- 78.1 Check all dimensions at the Site before fabrication and installation commences and report discrepancies to the Consultant.
- 78.2 Where dimensions are not available before fabrication commences, ensure that dimensions required are agreed upon between the parties concerned.
- 78.3 Prior to commencing work, ensure that clearances required by jurisdictional authorities can be maintained
- 78.4 Wall thicknesses and openings shown on the drawings may be nominal only; ascertain actual sizes at the Site.
- 78.5 Verify dimensions of shop fabricated portions of the Work at the Site before shop drawings and fabrications are commenced. The Owner will not accept claims for extra expense by reason of non-compliance with this requirement.
- 78.6 Fabricate and erect manufactured items, shop fabricated items, and items fabricated on or off site, to suit site dimensions and site conditions.
- 78.7 In areas where equipment is to be installed, check dimensional data on equipment to ensure that area and equipment dimensions are compatible with necessary access and clearance provided. Ensure that equipment supplied is dimensionally suitable for space provided.
- 78.8 Leave areas clear where space is indicated to be reserved for future equipment, including access to such future equipment.
- 78.9 Whether shown on the Drawings or not, leave adequate space and provision for servicing of equipment and removal and reinstallation of replaceable items such as motors, coils and tubes.

79 RELOCATION OF MECHANICAL AND ELECTRICAL ITEMS

- 79.1 The Owner and the Consultant reserve the right to relocate outlets at a later date, but prior to installation, without additional cost to Owner, assuming that the relocation per outlet does not exceed 3000 mm from the original location. No credits will be anticipated where relocation per outlet of up to and including 3000 mm reduces materials, products and labour.
- 79.2 Should relocations per outlet exceed 3000 mm from the original location the Contract Price will be adjusted in accordance with the provisions for changes in the Contract Documents.
- 79.3 Alter the location of pipes and other equipment, without additional cost to the Owner, if approved, provided the change is made before installation.
- 79.4 Make necessary changes, due to lack of coordination, as required and when approved, at no additional cost, to accommodate structural and building conditions.

80 EXPANSION, CONTRACTION, AND DEFLECTION

- 80.1 Conform to manufacturer's recommended installation temperatures. If items, components, assemblies, systems, and finishes are installed at temperatures different from operation or service temperatures, make provisions for expansion and contraction in service as acceptable to manufacturer and consultant. Repair all resulting damage should expansion provisions provide inadequate.
- 80.2 Make provisions for expansion and contraction due to temperature changes within components, Products and assemblies, and between adjacent components, Products and assemblies, and due to building movements including but not limited to creep, column shortening, deflection, sway and twist. Ensure provisions for expansion, contraction and building movements prevent damages from occurring to and within components, Products and assemblies.
- 80.3 Make adequate allowance at wall and partition heads for deflection of the structure above. Determine requirements from Consultant where additional information is required. Where partitions butt to underside of floor assembly, or structural framing, the clearance shall be based on the span of the members supporting the floor or structural framing. In making such allowance use methods which maintain the integrity of the wall or partition as a sound, and/or fire barrier.
- 80.4 Make provisions in pipes, plenums, ducts and vessels containing air and fluids as is necessary to prevent damage due to fluid and air induced pressure, surges and vibrations, to pipes, plenums, ducts and vessels and to adjacent components, assemblies and construction to which pipes, ducts, plenums and vessels are attached or pass through.

81 DIELECTRIC SEPARATION

- 81.1 Ensure that a dielectric separator is provided in a permanent manner over entire contact surfaces to prevent electrolytic action (galvanic corrosion) between dissimilar materials. Similarly, prevent corrosion to aluminum in contact with alkaline materials such as contained in cementitious materials.

82 FASTENINGS

- 82.1 Include in the work of each section necessary fastenings, anchors, inserts, attachment accessories, and adhesives. Where installation of devices is in work or other sections, deliver and locate devices in ample time for installation.
- 82.2 Do not install fibre, plastic or wood plugs or blocking for fastenings in masonry, concrete, or metal construction, unless specified or indicated on drawings.
- 82.3 Install work with fastenings or adhesives in sufficient quantity to ensure permanent secure anchorage of materials, construction, components and equipment under static conditions, and to resist building thermal movement, creep and vibration.
- 82.4 Provide metal fastenings and accessories in same material, texture, colour, sheen and finish as metal on which they occur, unless indicated otherwise.
- 82.5 Prevent electrolytic action between dissimilar metals and materials.

- 82.6 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior Work, and where attached to, or contained within, exterior walls and slabs, unless stainless steel or other material is specified. Leave steel anchors bare where cast in concrete.
- 82.7 Space anchors within their load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- 82.8 Conceal fasteners where indicated. Keep exposed fastenings to a minimum, space evenly and in an organized symmetrical pattern.
- 82.9 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

83 ADJUSTING

- 83.1 Ensure that all components of assemblies fit snugly, accurately and in true planes, and that moving parts operate positively and freely, without binding and scraping.
- 83.2 Verify that work functions properly and adjust it accordingly to ensure satisfactory operation. Lubricate Products as recommended by manufacturer.

84 DEMONSTRATION AND INSPECTION OF PRODUCTS AND SYSTEMS

- 84.1 Arrange for a demonstration of systems and operating Products upon the 100% completion of their installation and prior to certification for Substantial Performance.
- 84.2 Include in the arrangements for the attendance of the Consultant, Owner, jurisdictional authorities, and personnel assigned by the Owner for the operation of the systems and/or Products.
- 84.3 Demonstrations shall be conducted by the Subcontractor responsible for the installation of the systems and/or Product, assisted by representatives of the manufacturer or supplier. All personnel conducting the demonstration shall be completely knowledgeable of all conditions of the operating, functioning and maintenance of the systems and/or Products.
- 84.4 Owner's representative will acknowledge the successful completion of each demonstration on a form provided by the Contractor. The form shall be agreed to by the Owner, Consultant and Contractor prior to demonstration and testing.
- 84.5 Submit copies of letters from manufacturers of Systems and/or Products before making application for certificate of Substantial Performance to verify that the Products has been installed and connected correctly, and that it is operating in a satisfactory manner. The certification shall be based upon inspection and testing of the Products by competent technical personnel. Include in letter of certification the names of personnel conducting the testing and inspection, the methods of inspection utilized, and the location in the building of the Products certified.
- 84.6 Following submission of letters of certification and their acceptance by the Owner, the owner shall have the right to use the Products on a trial basis and for instructing their personnel in its use.

85 FINAL INSPECTIONS AND CLOSE OUT

- 85.1 Submit proposed closeout procedures and schedule of inspection to Consultant for approval before final demonstrations and inspections commence.
- 85.2 Arrange for, conduct and document final demonstrations, inspections, close-out and take-over at completion of the Work in accordance with procedures described in OAA/OGCA TAKE-OVER PROCEDURES, OAA/OGCA Document No. 100. Where "Architect" is referred to in Document No. 100 it shall mean Consultant.

86 CERTIFICATE OF COMPLIANCE

- 86.1 Submit Certificate of Compliance, prior to the application for Substantial Performance, for each of the following items.
- .1 An affidavit relative to the use of lead-free solder for all domestic water lines, regardless of location.
 - .2 Products for which Material Safety Data Sheets have been submitted and accepted.
 - .3 Other Work/Products identified in the Contract Documents as requiring a Certificate of Compliance.
- 86.2 Each Certificate of Compliance shall indicated names and addresses of the project, the Owner, the date of issue, product description including name, number, manufacturer, with a statement verifying that the Work/Product installed meets specified requirements and, if applicable, complies with the submitted and accepted Material Safety Data Sheets.
- 86.3 Each Certificate of compliance shall be issued on the subcontractor's letterhead, properly executed, under whose work the prospective Work/Product has been provided.
- 86.4 Each Certificate of Compliance shall be endorsed by the Contractor with his authorized stamp/signature. Ensure that submissions are made to allow sufficient time for review without delaying progress of scheduled completion.

87 GARBAGE DISPOSAL AND CLEANUP

- 87.1 Provide waste containers for the disposal of all waste materials resulting from performance of their work.
- 87.2 No hazardous or contaminated waste material shall be placed in Owner's waste containers and Subtrades shall make their own arrangements for the disposal off site of any such material resulting from performance of their work.
- 87.3 Remove all regular waste material and debris from their work areas and deposit in the waste containers at the end of each working day. Any clean up work not performed as requested will be carried out by the Owner with all resultant costs being charged to the Subtrade.

88 CLEANING

- 88.1 Progress cleaning:
- .1 Remove from finish work, spatters, droppings, labels, and debris, before they set up.
 - .2 Ensure that only cleaning materials are used which are recommended for the purpose by both the manufacturer of the surface to be cleaned and of the cleaning material.
 - .3 Maintain building work areas "broom clean" at least on a daily basis, but cleaning shall also be done immediately before finishing work.
 - .4 No waste material may be burned or buried at site. Remove waste as often as required to avoid accumulation, no less than, at the end of each working day.
 - .5 Remove packaging materials and debris from the site immediately after product and equipment is unwrapped or uncrated.
 - .6 Ensure that volatile fluid wastes are not disposed of in storm or sanitary sewers, in open drain courses, or anywhere on site.
 - .7 Do not allow waste material and debris to accumulate in an unsightly or hazardous manner. Sprinkle dusty accumulations with water. Provide containers in which to collect waste material and debris. Dispose of hazardous products in accordance with requirements of jurisdictional authorities.
 - .8 Ensure that cleaning operations are scheduled to avoid deposits of dust or other foreign matter on surfaces during finishing work and until wet or tacky surfaces are cured.
 - .9 Provide instructions for final cleaning of finishing work, and for inclusion in Maintenance and Operating Manuals.
- 88.2 Final cleaning:
- .1 Before final inspection, replace glass and mirrors broken, damaged, and etched during construction, or which are otherwise defective.
 - .2 In addition to requirements for progress cleaning, Work shall include final cleaning by skilled cleaning specialists on completion of construction.
 - .3 Remove temporary protections and make good defects before commencement of final cleaning.
 - .4 Final cleaning shall remove dust, stains, paint spots, soil, grease, fingerprints, and accumulations of construction materials, interior and exterior to the building for all new work throughout new and existing Building. Work shall be done in accordance with manufacturer's instructions for each material.
 - .5 Maintain cleaning until Owner has taken possession of building or portions thereof.

89 PROGRESS RECORDS

- 89.1 Maintain on site, permanent written records of daily progress of the Work. Records shall be open to review by Consultant and Owner at all times and a copy shall be furnished to Consultant on a weekly basis.
- 89.2 Records shall show dates of commencement, progress and completion of various trades and items of work. Particulars pertaining to number of employees of various

trades and type and quantity of equipment employed daily, temperature, protection methods and other such data shall be noted.

90 RECORD DRAWINGS

- 90.1 Complete appended Electronic File Release Agreement and submit complete with required fee. Final record drawings to be submitted in both CAD and PDF format.
- 90.2 Authorized deviations from drawings shall be marked in red accurately on one set of drawing prints in a neat, legibly printed manner and shall be dated. Prior to final inspection, neatly transfer the recorded information to a second set of drawing prints of the most recent revision to the drawings and submit both sets to the Consultant.
- 90.3 Maintain record drawings up to date as Work progresses. Status of maintained record drawings may be considered as a condition for validation of applications for payment.
- 90.4 Identify each record drawing as "Contract Record Copy" and maintain the record drawings in good condition. Make record drawings available to the Consultant at all times.
- 90.5 Record drawings shall include accurate dimensioned record of deviations and changes in Work from drawings.
- 90.6 Record drawings shall be signed and dated by Contractor.
- 90.7 Submit record drawing to Consultant for review and make corrections as directed by Consultant.
- 90.8 Record accurately all deviations in the Work.
- 90.9 Accurately record locations of concealed structure, mechanical and electrical services and similar Work not clearly in view, the location of which is required for maintenance, alteration Work and future additions. Do not conceal such Work until the location has been recorded.
- 90.10 Accurately record locations of equipment bases, anchors, concrete pads and roof curbs, sleeves, piping, conduits, ducts, maintenance holes and valves, etc. located either below, outside or within structure.
- 90.11 Where piping, conduits and ducts are underground, underfloor, embedded in concrete or otherwise in unaccessible locations, accurately record with respect to structure column lines or walls and elevations with respect to finished floor levels or grades referenced to the centre line of components.
- 90.12 Accurately record any components which will be in inaccessible locations for Consultant's review before the component is covered, or buried, or made inaccessible.

91 OPERATION AND MAINTENANCE MANUALS

- 91.1 Hand over to the Consultant two (2) copies of a comprehensive operations and maintenance manual and material suitable for the Owner's maintenance employees. Manuals shall cover all Products supplied and installed under the Contract.

- 91.2 Submit draft of the operation and maintenance manuals for the Consultant's review at least 15 days before testing systems and equipment. Incorporate alterations and additions, as found to be necessary during testing, and prepare the final version of the manual from the corrected draft.
- 91.3 Submit final version of operation and maintenance manuals prior to Contract Completion.
- 91.4 Testing of systems and equipment will not be deemed to be complete until the requisite number of copies of the final version of the manuals has been handed over to the Consultant.
- 91.5 If standard literature is incorporated into the operations and maintenance manual, any irrelevant information shall be deleted, or suitably noted.
- 91.6 The manuals shall have sufficient detail in order that the Owner can totally maintain the equipment without outside help.
- 91.7 Submit all material in English.
- 91.8 Operation and maintenance manuals shall contain the following minimum information and data:
- 91.9 Table of contents: Provide title of Contract; names, addresses, and telephone numbers of Consultants and Contractor with name of responsible parties; schedule of Products and systems, indexed to content of the volume.
- 91.10 For each Product or system: List names, addresses and telephone numbers of Subcontractors, suppliers and service representatives, including local source of replacement supplies and parts including telephone numbers.
- 91.11 Warranties: Warranties are between the Contractor and Owner. Warranties shall include, as a minimum:
- .1 Description of warranty coverage.
 - .2 Date warranty starts (being date of Contract Completion).
 - .3 Date warranty expires.
 - .4 Contact name, address and phone number (the Contractor shall also be responsible for advising the Owner of changes in contact information during the warranty period).
 - .5 Equipment and components performance curves.
 - .6 Hydro certificates.
- 91.12 Reports: For each Product or system provide the following:
- .1 Manufacturer's certified reports
 - .2 Factory test reports.
 - .3 Field testing reports.
- 91.13 Details of design, construction and/or fabrication features, component function and maintenance requirements, to permit effective start-up, operation, maintenance, repair, modification, extension and expansion of any portion or feature of the installation.
- 91.14 Technical data, Product data, supplemented by bulletins, component illustrations, detailed views, technical descriptions of items and parts lists.
- 91.15 Schematics, interconnection lists: Manuals shall be complete with schematic and wiring diagrams, wiring interconnection lists and diagrams fully cross referenced and

coordinated, printed circuit board layouts including the component identification, component parts list with electronic substitution equivalent. Provide cross referenced components lists and sequence of operations.

- 91.16 Trouble shooting and fault location guide: Instructions to facilitate quick return of malfunctioning equipment to operation.
- 91.17 Routine servicing and preventative maintenance schedule for Products and/or estimated hours required for routine servicing and preventative maintenance tasks.
- 91.18 List of recommended spare parts and recommended quantity of each item to be stocked based on spare part availability and re-order time.
- 91.19 Complete set of reviewed shop drawings.
- 91.20 Product data: Mark each sheet to clearly identify specific Products and component parts, and data applicable to installation; delete inapplicable information.
- 91.21 Drawings: Supplement Product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams and as required in the Specifications.
- 91.22 Typed text: As required to supplement Product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions and as required in the Specification.

92 AS-BUILT DRAWINGS

- 92.1 Prepare all required drawings on CAD (.dwg), using CAD Version 2020 or higher.
- 92.2 Prepare CAD drawings to meet the requirements of the Owners or Consultant's CAD Standards and Procedures.
- 92.3 Supply and hand over to the Consultant one CD of drawings for each final drawing prepared under this Contract, including but not limited to circuit drawings, equipment layout drawings, and shop drawings.
- 92.4 The final size of drawings shall be 560 mm x 860 mm. Half size reproductions (280 mm x 430 mm) shall also be provided.
- 92.5 Prior to Contract Completion, supply and hand over to the Consultant, one complete set of .dwg Drawing Files in CAD format on storage media acceptable to Consultant for each final drawing prepared under this Contract, including but not limited to circuit drawings, equipment layout drawings, and shop drawings.
- 92.6 Text files shall be written in word processing program acceptable to Owner.
- 92.7 Authorized deviations from drawings shall be marked in red accurately on one set of drawing prints in a neat, legibly printed manner and shall be dated. Prior to final inspection, neatly transfer the recorded information to a second set of drawing prints of the most recent revision to the drawings and submit both sets to the Consultant.

- 92.8 Maintain as-built drawings up to date as Work progresses. Status of maintained as-built drawings may be considered as a condition for validation of applications for payment.
- 92.9 Identify each as-built drawing as "As-Built Copy" and maintain the as-built drawings in good condition. Make as-built drawings available to the Consultant at all times.
- 92.10 As-built drawings shall include accurate dimensioned record of deviations and changes in Work from drawings.
- 92.11 As-built drawings shall be signed and dated by Contractor.
- 92.12 Submit as-built drawing to Consultant for review and make corrections as directed by Consultant.
- 92.13 Record accurately all deviations in the Work.
- 92.14 Accurately record locations of concealed structure, mechanical and electrical services and similar Work not clearly in view, the location of which is required for maintenance, alteration Work and future additions. Do not conceal such Work until the location has been recorded.
- 92.15 Accurately record locations of equipment bases, anchors, concrete pads and roof curbs, sleeves, piping, conduits, ducts, maintenance holes and valves, etc. located either below, outside or within structure.
- 92.16 Where piping, conduits and ducts are underground, underfloor, embedded in concrete or otherwise in inaccessible locations, accurately record with respect to structure column lines or walls and elevations with respect to finished floor levels or grades referenced to the centre line of components.
- 92.17 Accurately record any components which will be in inaccessible locations for Consultant's review before the component is covered, or buried, or made inaccessible.
- 92.18 CAD drawings of Contract Drawings can be obtained from Consultant at a cost of \$750.00 plus HST per sheet drawing and with a signed CAD Wavier.
- 92.19 Clearly and prominently mark each drawing "AS-BUILT DRAWING prepared by _____ (name of Contractor)"

93 TRANSMITTAL

- 93.1 Transmittal shall contain the list of file names contained on the storage media.
- 93.2 Data forwarded to the Owner shall contain the following files in addition to the design information:
- .1 Library parts/cells used in the design

- .2 Level convention used for each design file.
- .3 Plotting instructions used to prepare hard copies including colour tables, pen tables and plot scale.
- .4 Working units of the design files.
- .5 Font library, if the standard is not used.

94 PHASED CONSTRUCTION

- 94.1 The Work shall be conducted in multiple phases, with each phase focusing on a single room.
- 94.2 Construction activities shall be planned and executed in phases, with each phase focusing on a single room.
- 94.3 No subsequent phase shall commence until the current room is fully completed and returned to service.
- 94.4 The Contractor shall submit a detailed construction schedule indicating the start and completion dates for each room.
- 94.5 The schedule must be approved by the Consultant and the Owner before any work commences.
- 94.6 The Contractor shall coordinate with the facility management to ensure that only one room is out of commission at any given time.
- 94.7 The Contractor shall ensure that access to and from rooms not under construction remains unobstructed.
- 94.8 Construction materials and debris must be confined to the room under construction and shall not impede the operation of adjacent areas.
- 94.9 The room will be considered complete when all punch list items are resolved and the room is fully operational.
- 94.10 Once a room is approved and back in commission, the contractor may commence work on the next room as per the approved schedule.

95 MOVING, STORING, AND REINSTALLING EXISTING FURNITURE AND FITNESS / GYM EQUIPMENT

- 95.1 Furniture: Includes all movable articles within the room such as desks, chairs, tables, cabinets, etc.
- 95.2 Fitness or Gym Equipment: Includes all exercise machines, weights, mats, and other related apparatus.

- 95.3 Contractor shall coordinate with the Owner to schedule the moving and reinstallation activities to minimize disruption.
- 95.4 Work shall be conducted in phases, ensuring that each room's furniture and equipment are handled separately.
- 95.5 No room shall have furniture or fitness equipment moved, stored, or reinstalled without prior approval from the Owner.
- 95.6 Prior to moving, all furniture and equipment shall be inventoried and documented, including photographs and descriptions.
- 95.7 Contractor shall be responsible for the unloading of all furniture and equipment supplied to the work site. The Contractor shall be responsible for any damage occurring during these operations.
- 95.8 Any existing damage shall be noted, documented by photographs and communicated to the Consultant and Owner.
- 95.9 Furniture and equipment shall be carefully disassembled, if necessary, and moved using appropriate equipment to prevent damage.
- 95.10 Items shall be labeled clearly to ensure correct reinstallation.
- 95.11 Contractor is responsible for providing all secured storage containers required for the furniture and equipment.
- 95.12 A secure, dry, clean and secure storage area shall be designated for the temporary storage of furniture, equipment and stored on the site of the work in a manner satisfactory to the Owner.
- 95.13 Items shall be stored in an organized manner, with protective coverings to prevent dust and damage.
- 95.14 Stored items shall be protected from environmental conditions and potential impacts.
- 95.15 Regular inspections shall be conducted to ensure the integrity of stored items.
- 95.16 After painting is completed and fully cured, the room shall be prepared for reinstallation.
- 95.17 Contractor shall verify that the room is clean and free of any debris or dust.
- 95.18 Furniture and equipment shall be carefully moved back into the room and reassembled as necessary.
- 95.19 Items shall be positioned according to the original layout unless otherwise directed by the Owner.

- 95.20 Once reinstallation is complete, the contractor shall conduct a final inspection with the Owner.
- 95.21 Any issues or discrepancies shall be addressed promptly.
- 95.22 Upon completion of each phase, a final inspection shall be conducted to ensure all furniture and equipment are properly reinstalled and the room is ready for use.
- 95.23 Contractor shall provide a final inventory and condition report of all moved items.
- 95.24 Any damage or issues noted during the process shall be documented and remedied at the Contractor's expense.
- 95.25 Store all materials and equipment in a secure and protected manner, which will not overload the structure and shall prevent vandalism or unauthorized use.
- 95.26 Be responsible for the security of all materials and equipment. Make no claims for theft or damage to the Owner.

96 OCCUPIED BUILDING

- 96.1 This is an occupied building and normal building routine will have to carry on while this work is being done. There may be instances where the Contractor will be asked to complete certain types of work after hours or on weekends. This will not constitute an extra fee.
- 96.2 Take proper care to avoid unnecessary noise, clutter or obstruction in pedestrian areas, and arrange for storage of materials and tools where they will cause minimum inconvenience.
- 96.3 Where excessive noise or obstruction is in certain cases unavoidable, advise the Owner ahead of time and make suitable arrangements.
- 96.4 The Owner will allow access to the building and to the work site at times designated by the Owner.
- 96.5 The Owner will not assign storage space, for materials and tools. Contactor shall provide secure storage containers on site on designated parking lot space or stored in a location acceptable to the building Owner.
- 96.6 Perform work which interferes with the public comfort at the times specified by the Owner.
- 96.7 The Owner to be notified up to 2 weeks in advance of deliveries of any major equipment and materials arriving on site during normal working hours. Otherwise, all deliveries are to be made prior to 8:00 a.m. and after 7:00 p.m.

97 TEMPORARY ENCLOSURE AND PROTECTION

97.1 Provide and maintain, signs, guardrails, barrier, warning lights and other protection as required by authorises having jurisdiction for safety of the Place of the Work. Be responsible for adequacy of protection.

97.2 Plant, Machinery and Scaffolding:

- .1 Provide formwork, scaffolding, equipment, tools, machinery and incidental appurtenances necessary for the proper execution of the Work.
- .2 Erect plant machinery and scaffolding to permit access to building and the Work.
- .3 Use scaffolds in such manner as to interfere as little as possible with other trades' operations
- .4 Support scaffolds from finished surfaces only after taking precautions to prevent damage. No supports, clips, brackets, or similar devices shall be welded, bolted, or otherwise affixed to any finished member or surface without prior permission.

97.3 Maintain temporary barriers and enclosures in good condition for the duration of the Work.

97.4 Remove temporary barriers and enclosures from Place of the Work when no longer required.

97.5 PROTECTION OF THE PUBLIC

- .1 Provide fencing, barricades, hoarding, notices and warning boards and maintain lights and signals for protection of workers engaged on the Work, for protection of adjoining property and for protection of the public.
- .2 Where any special hazard exists from which it is not possible to protect the public safety by other means, watchpersons shall be employed to preserve public safety until the area of special hazard no longer poses a risk to public safety.

97.6 Fire Routes

- .1 Maintain fire access routes, including overhead clearances, for use by emergency response vehicles.

98 COVID-19 SITE PROTOCOL

98.1 the Owner and Authorities having jurisdiction over the project site. Including but not limited to screening and PPE requirements.

98.2 The Owner and Consultant reserves the right to request disclosure from the General Contractor regarding the wellness of all site personnel with respect to the COVID-19 novel coronavirus. The General Contractor should make it known to the Owner and

Consultant if any worker or visitor to the site has been placed in self-isolation and/or is in a medical or travel-imposed quarantine.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Labour, Products, equipment and services necessary for demolition and removals Work in accordance with the Contract Documents.
- .2 Work included: Requirements for demolishing, salvaging and removing wholly or in part the various items designated on the drawings or required to be removed or partially removed for the receipt of the Work of this Contract, including not necessarily limited to:
 - .1 Alteration and renovations to existing building.
 - .2 Cutting and removing of walls, floors, ceilings, doors and frames, in the existing buildings as indicated on Drawings.
 - .3 Patching, making good openings and chases in walls, floors, ceilings, including the supply and installation of lintels, channels and finishes.
 - .4 Removal of rubbish, debris, demolished fixtures, fittings and items not scheduled to remain the Owner's property, resulting from the demolition and preparatory work.
 - .5 Remove abandoned services such as conduits, pipes, wiring, ducts, fixtures, equipment, etc. where required for the work or indicated on the drawings.
 - .6 Removal of all mechanical items including plumbing fixtures, services etc. where required for the work or indicated on drawings and or where not required to be relocated.
 - .7 Removal of existing electrical items including fixtures, etc. where required for the work or indicated on the drawings and not required to be relocated.
 - .8 Dust control during the operations of the work of this Section.
 - .9 Removal shall mean removal from site and safe disposal in a legal manner

1.2 REFERENCES

- .1 CSA S350-M, Code of Practice for Safety in Demolition of Structures.
- .2 OPSS, Ontario Provincial Standard Specification.

1.3 SUBMITTALS

- .1 Where required by Authorities having jurisdiction, submit a Fire Plan to local fire department for review and approval.
- .2 Submit shop drawings, diagrams and details in accordance with Section 01 10 10.
- .3 30 calendar days prior to start of demolition and removals work, submit for review, drawings, diagrams or details showing sequence of disassembly work and shoring of supporting structures in accordance with authorities having jurisdiction.
- .4 Submit for approval, a plan showing impacts, interruptions and delays to Owners operations
- .5 Submit Dust Control Plan conforming to requirements of the City of Toronto's Public Health Services.

- .6 Have submissions signed and sealed by Professional Engineer licensed in Province of Ontario.
- .7 Submit to Consultant, details of where rubble, debris and other materials are to be disposed or reused. Include each disposal/reuse site location, operator's name and business address, type of license under which site operates, and criteria used by site to assess suitability of rubble, debris and other materials for disposal.
- .8 Give notice to Utility Authorities controlling services and appurtenances which will be affected by demolition work.

1.4 QUALITY ASSURANCE

- .1 Prepare waste audits, waste reduction workplans, source separation programs and recycling programs as required by jurisdictional authorities and update programs and implement such programs as required.
- .2 Perform the work of this section in accordance with the 'Environmental Protection Act' including Ontario Regulation 102 and the 'Environmental Assessment Act' including Ontario Regulation 103.
- .3 Conform to Fire Code, Regulation under the Fire Marshals Act.
- .4 The demolition contractor must engage a registered professional engineer who holds a certificate of authorization and an appropriate level of liability insurance to prepare demolition procedures.
- .5 As part of the contract requirements, the engineer for the demolition contractor should be required to sign the general review commitment required by city building departments.

1.5 SITE CONDITIONS

- .1 Interruptions to Owners operations will not be permitted.
- .2 Perform operations, machine and equipment movements, deliveries and removals at time or times that will permit uninterrupted operations in and around structures, including parking, deliveries, and Site access and egress.
- .3 Take over structures to be demolished based on condition on date that Tenders close.
- .4 Contractor shall photo document all existing conditions prior to demolition and make such material available to Cons

2 Products

2.1 MATERIALS

- .1 All materials requiring removal shall become the Contractor's property and shall be removed and disposed of from the site, as the work progresses, unless indicated otherwise.
- .2 Salvaged material:
 - .1 Salvage and stockpile Products, materials, and equipment as specified herein, indicated on Site or indicated on drawings.
 - .2 Coordinate items to be salvaged with Owner. Dispose of items Owner deems to be of no further use.

- .3 Salvaged materials shall not be chipped, cracked, split, stained or damaged.
- .4 Store items off of moist surfaces.

3 Execution

3.1 GENERAL

- .1 Schedule skylight removal work to coincide with commencement of new roofing system installation.
- .2 Clean up rubble and debris, resulting from work promptly and dispose at end of day or place in waste disposal bins. Empty bins on regular basis.
- .3 Stockpiling of rubble, debris, and surplus Products on Site will not be permitted.
- .4 Remove, handle and transport Products indicated to be salvaged and stored for future use. Transport Products to storage area(s) designated by Consultant. Perform work to prevent any damage to Products during removal and in storage. Products damaged during removal, will be inspected by Consultant. Consultant will determine extent of damage and accept or refuse Products.
- .5 List and description of items to be removed and stored or reused:
 - .1 Items as indicated on the drawings or by the Consultant.
- .6 Tag and log all items to be salvaged to the satisfaction of the Consultant. Ensure identification tags do not damage items to be salvaged and are non-permanent, removable and durable.
- .7 Communicate Dust Control Plan procedures to all appropriate personnel on site and their head offices and due diligence measures to be maintained to control all fugitive emissions.
- .8 Take precautions to guard against movement, settlement or collapse of adjacent services, sidewalks, driveways, or trees. Be liable for such movement, settlement or collapse caused by failure to take necessary precautions. Repair promptly such damage when ordered.

3.2 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
- .2 Examine adjacent structures and other installations prior to commencement of demolition and removals work.

3.3 PRESERVATION OF REFERENCES

- .1 Record location and designation of survey markers and monuments located within demolition area, prior to removal. Store and restore markers and monuments upon completion of Work or relocate as directed by Consultant.

3.4 PROTECTION

- .1 Prevent movement or damage of adjacent structures, services, walks, paving, trees, landscaping, adjacent grades, and parts of existing structure to remain. Supply and

install bracing and shoring as required. Make good damage caused by demolition to acceptance of Consultant.

- .2 Protect adjacent structures and property against damage which might occur from falling debris or other causes. Repair or replace damage caused from work of this Section to acceptance of Consultant.
- .3 Do not interfere with use of adjacent structures and Work areas. Maintain free, safe passage to and from adjacent structures and Work areas.
- .4 Take precautions to support affected structures. If safety of structure being demolished, adjacent structures or services are endangered, cease demolition operations and take necessary action to support endangered item. Immediately inform Consultant. Do not resume demolition until reasons for endangering have been determined and corrected and action taken to prevent further endangering.
- .5 If movement or settlement occurs, install additional bracing and shoring as necessary and make good damage to acceptance of Consultant.
- .6 Hang tarpaulins where debris and other materials are lowered. Build in around openings with wood and plywood at locations used for removal of debris and materials.
- .7 Prevent debris from blocking surface drainage system, elevators, mechanical, and electrical systems which are required to remain in operation.
- .8 Pay particular attention to prevention of fire and elimination of fire hazards which would endanger Work or adjacent structures and premises.
- .9 Supply and install adequate protection for materials to be re-used, set on ground and prevent moisture pick-up. Cover stockpiles of materials with tarpaulins.
- .10 Close off access to areas where demolition is proceeding by barricades and post warning signs.
- .11 Supply, install and maintain legal and necessary barricades, guards, railings, lights, warning signs, security personnel and other safety measures, and fully protect persons and property.
- .12 Dust/weather partitions:
 - .1 Prior to demolition work proceeding in existing structures, temporarily enclose Work areas, access and supply and install dustproof and weatherproof partitions. Design partitions to prevent dust and dirt infiltration into adjoining areas, prevent ingress of water, and to resist loads due to wind.
 - .2 Prevent dust, dirt and water from demolition operations entering operational areas.
 - .3 Adjust and relocate partitions as required for various operations of work.
 - .4 Upon completion of work, remove and dispose of partitions from Site.
- .13 Dust protection:
 - .1 Perform dust control procedures in accordance with approved Dust Control Plan and work of this Section.

- .2 Clean water to be applied to hard and soft surfaces and on open excavation faces on Site daily to eliminate dust.
 - .3 Roadways and sidewalks to be cleaned daily or as required.
 - .4 A designated truck loading area on granular material or existing asphalt to be used to mitigate tracking of potentially contaminated soil and demolition debris off Site. Contaminated loading points to be cleaned or re-established.
 - .14 Removed skylights:
 - .1 Provide temporary protective sheeting over removed skylights.
 - .2 Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights or temporary fasteners.
 - .3 Provide for surface drainage from sheeting to roof drains.
 - .4 Do not permit traffic over unprotected or repaired deck surface.
 - .15 Blasting is not permitted
- 3.5 **PREPARATION**
- .1 Disconnect and/or re-route electrical data, communication and telephone service lines entering structures to be demolished. Remove abandoned lines as indicated on Contract Drawings. Post warning signs on electrical lines and equipment which is required to remain energized.
 - .2 Disconnect and cap designated mechanical services:
 - .1 Natural gas supply lines: As indicated on drawings, to be removed by qualified workers in accordance with gas company instructions.
 - .2 Sewer and water lines: Remove and dispose of as indicated on Contract Drawings.
 - .3 Other underground services: Remove and dispose of as indicated on Contract Drawings.
 - .3 Disassemble and remove mechanical equipment, ductwork and piping complete with supports and associated components.
 - .4 Do not disrupt active or energized utilities designated to remain undisturbed
 - .5 Perform rodent and vermin control to comply with health regulations
- 3.6 **DEMOLITION**
- .1 Perform demolition with extreme care. Confine effects of demolition to those parts which are to be demolished.
 - .2 Perform work and prevent inconvenience to persons outside those parts which are to be demolished.
 - .3 Carry out demolition in accordance with the requirements of CSA S350-M.
 - .4 Demolish parts of structure to permit remedial work as indicated
 - .5 Demolition shall proceed safely in systematic manner from roof to grade and as necessary to accommodate remedial work indicated. Work on each floor level shall be

complete before commencing work on supporting structure and safety of its supports are impaired. Parts of building which would otherwise collapse prematurely shall be securely shored. Walls and piers shall not be undermined.

- .6 Do not overload floor or wall with accumulations of material or debris or by other loads.
- .7 Perform work to minimize dusting. Keep work area wetted down with fog sprays to prevent dust and dirt rising. Supply and install temporary water lines and connections that may be required. Upon completion, remove installed temporary water lines. Use covered chutes, water down.
- .8 Do not sell or burn materials on Site.
- .9 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as Work progresses.
- .10 At end of day's work, leave Work in safe condition with no part in danger of toppling or falling. Protect interiors of parts not to be demolished from exterior elements.
- .11 Drainage and sewer system protection:
 - .1 Ensure that no dust, debris or slurry enters drainage and sewer system on Site.
 - .2 Remove and dispose of debris and slurry promptly from Site.
 - .3 Comply with City of Toronto Sewer Use By-Law.
- .12 Concrete:
 - .1 Demolish concrete by methods which avoid impact loads on items which are not to be demolished.
 - .2 Where only part or parts of a concrete floor, wall, or other items are to be demolished, use saw cuts to isolate areas which are to be demolished except where existing reinforcing steel is to be left in place. Prior to such isolating, install suitable support to prevent premature movement of area(s) being isolated and undesirable transfer of loads as cutting progresses. If necessary, remove area(s) to be demolished by successively isolating small sections.
 - .3 Where reinforcing steel is to be left in place, use saw cuts from surface of concrete around perimeter(s) of area(s) to be demolished, chip concrete without damaging reinforcing steel. Retouch damaged epoxy coating of existing reinforcing steel.
- .13 Steel: Where only part or parts of structure is to be demolished, dismantle and maintain structure stable. Do not place excessive loads on components. Install adequate temporary guys and supports to ensure stability and to prevent excessive loading. Support each component being disconnected from structure, and lower, do not drop, component after it is disconnected.
- .14 Cut openings through existing walls, partitions and floors. Establish exact location of steel reinforcing in existing concrete slabs or walls before cutting. Be responsible for damage to existing steel reinforcing and be liable for structural failure. Make good surfaces disturbed with materials to match existing.
- .15 Cladding:

- .1 Remove cladding, girts, channels, and additional components as indicated or necessary for new cladding work, unless otherwise indicated.
- .2 Form openings in cladding such that edges are left straight, clean and not ragged. Where openings abut flashings, ducts or similar items projecting through, or forming integral part of cladding system, preserve and support as required unless otherwise shown.
- .3 Take care to not damage existing cladding material that is to remain.
- .4 Where doors are scheduled to be removed, include removal of door frames and door hardware.
- .5 Remove interior partitions, fittings, fixtures and accessories as indicated on drawings. Partitions and walls shall be removed full height to structure above.
- .6 Remove interior finishes, such as ceiling and floor finishes, where new finishes are indicated on Contract Drawings.
- .7 Removal of existing ceilings shall include complete removal including bulkheads and suspension system.
- .8 Removal of adhesive applied finishes shall include complete removal to substrate including adhesive. Take adequate care to prevent damage to substrate.
- .9 Remove existing floor finishes, include mortar bed, underlayment or other cleavage membranes, underpad, base, floor moulding and transition strips.
- .16 Demolish all other items indicated or required.
- .17 Cut openings through existing walls, partitions, roofs and floors. Establish exact location of steel reinforcing in existing concrete slabs or walls before cutting. Be responsible for damage to existing steel reinforcing and be liable for structural failure. Make good surfaces disturbed with materials to match existing.
- .18 Where doors are scheduled to be removed, include:
 - .1 Removal in re-usable condition of door hardware.
 - .2 Removal of doors and door frames.
- .19 Remove interior partitions, fittings, fixtures and accessories as indicated on drawings. Partitions and walls shall be removed full height to structure above.
- .20 Remove interior finishes, such as ceiling and floor finishes, where new finishes are indicated on Room Finish Schedule.
 - .1 Removal of existing ceilings shall include complete removal including bulkheads and suspension system.
 - .2 Removal of adhesive applied finishes shall include complete removal to substrate including adhesive. Take adequate care to prevent damage to substrate.
- .21 Remove existing floor finishes, include mortar bed, underlayment or other cleavage membranes, base, floor moulding and transition strips.
- .22 Demolish all other items indicated or required.

3.7 DISPOSAL OF MATERIALS

- .1 Remove from Site, rubble, debris, and other materials resulting from demolition and removals work in accordance with Authorities having Jurisdiction, except where specified or indicated on Contract Drawings to be reused.
- .2 Conform to requirements of municipality's Works Department regarding disposal of waste materials.
- .3 Materials prohibited from municipality waste management facilities shall be removed from Site and dispose of at recycling companies specializing in recyclable materials.

3.8 RESTORATION

- .1 Where demolition removed a structure or installation, rough grade and restore area in accordance with Authorities having Jurisdiction.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Labour, Products equipment and services necessary for the management of designated substances work in accordance with the Contract Documents.

1.2 DEFINITIONS

- .1 Hazardous Materials: Designated Substances as covered by the Ontario Occupational Health and Safety Act as well PCBs, CFCs, HCFCs, and Fuel Oil.
- .2 PCBs: Polychlorinated Biphenyls.
- .3 PCB equipment: Equipment designed or manufactured to operate with PCB liquid or to which PCB liquid was added or drums or other containers used for the storage of PCB liquid.
- .4 PCB liquid: Material containing PCBs at a concentration of more than 50 mg/kg
- .5 PCB material: Material containing PCBs at a concentration of more than 50 mg/kg whether the material is liquid or not
- .6 PCB waste: PCB equipment, PCB liquid, or PCB material, but does not include:
 - .1 PCB material or PCB equipment after it has been decontaminated pursuant to guidelines issued by the Ministry of Environment or instructions issued by the director.
 - .2 PCB equipment that is:
 - .1 An electrical capacitor that has never contained over one kilogram of PCBs.
 - .2 Electrical, heat transfer or hydraulic equipment or a vapour diffuser pump that is being put to the use for which it was originally designed or is being stored for such use by a person who uses such equipment for the purpose for which was originally designed.
 - .3 Machinery or equipment referred to in Clause 1.2.6.3.1.
 - .3 PCB liquid that:
 - .1 Is at the site of fixed machinery or equipment, the operation of which is intended to destroy the chemical structure of PCB's by using the PCB's as a source of fuel or chlorine for purposes other than the destruction of PCB's or other wastes and with respect to which a certificate of approval has been issued under Section 9 of the Act after the 1st day of January 1981 specifying the manner in which PCB liquid be processed in the machinery or equipment.
 - .2 Is in PCB equipment referred to in subclause (b) (2) Ontario Regulation 11/82.
 - .3 HCFC: Hydrochlorofluorocarbons.
 - .4 CFC: Chlorofluorocarbons.

1.3 REGULATORY AGENCIES

- .1 Comply with Federal, Provincial, and local requirements pertaining to the handling, management, haulage, and/or disposal of Hazardous Materials including but not limited to the following:
 - .1 Ontario Regulation 356, Highway Traffic Act.
 - .2 R. R. O. 1990, Regulation 347, General - Waste Management.

1.4 SUBMITTALS

- .1 Submit proof satisfactory to the Consultant that suitable arrangements have been made to dispose of Hazardous Materials in accordance with requirements of authorities having jurisdiction.
- .2 Submit notifications to applicable authorities having jurisdiction regarding the handling, storage, haulage, and/or disposal of Hazardous Materials as required by Regulations.
- .3 Submit proof satisfactory to the Consultant that the Hazardous Waste materials were appropriately disposed of.

1.5 EXISTING CONDITIONS

- .1 Information pertaining to the presence of Hazardous Materials to be handled; removed, or otherwise disturbed during this project is identified in the report: Section A1000 Removal and Disposal of Designated Substance dated 2020-07-10 prepared by Fisher Environmental
- .2 Assessment:
 - .1 Employ an Asbestos Abatement Consultant to confirm the presence of asbestos in the materials being demolished and to remove hazardous materials in accordance with authorities having jurisdiction.
 - .2 Submit Asbestos Abatement Consultant's certificate that hazardous materials have been removed in accordance with Authorities having Jurisdiction

1.6 INSTRUCTION AND TRAINING

- .1 Before commencing work, provide to the Consultant satisfactory proof that every worker has had instruction and training in the hazards of handling and storage of Hazardous Materials, in personal hygiene and work practices, and in the use, cleaning, and disposal, of respirators and protective clothing as required.
- .2 Instruction and training related to respirators shall include instruction and training related to:
 - .1 The limitations of the equipment.
 - .2 The inspection and maintenance of the equipment.
 - .3 The fitting of the equipment.
 - .4 The disinfecting of the equipment.

1.7 WORKER PROTECTION

- .1 Respirators: Provide workers with personally issued and marked as to efficiency and purpose non-powered reusable or replaceable filter type air purifying respirators suitable for the materials being handled and acceptable to the Provincial Authority having jurisdiction (as required).
- .2 Protective Clothing: Provide workers with full body disposable type coveralls (as required).
- .3 Eating, drinking, chewing, and smoking are not permitted in the work area.
- .4 Store protective clothing in clean plastic bag for reuse or if protective clothing is not to be reused, dispose of as contaminated waste.
- .5 Workers shall wash hands and face when leaving the work area and before eating or drinking.

2 Products

2.1 MATERIALS

NOT USED

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 ASBESTOS CONTAINING MATERIALS

- .1 Conform to and Manage and dispose of asbestos containing materials in accordance with Regulation Designated Substance - Asbestos on Construction Projects And In Buildings And Repair Operations R.R.O. 1990, Reg. 838, made under Occupational Health and Safety Act as amended by O.Reg. 278/05 and O.Reg 837 as amended by O.Reg. 279/05.

END OF SECTION

1 General

1.1 DESCRIPTION

- .1 This section provide the elastomeric sealants and their implementation that are used to seal building joint assemblies.
- .2 Labour, Products, equipment and services necessary for sealant Work in accordance with the Contract Documents.
- .3 Work of this Section does not include sealants in firestopping and smoke sealed assemblies.
- .4 Work of this Section does not include sealant work identified in individual specification sections.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C 919-[08], Standard Practice for Use of Sealants in Acoustical Applications.
 - .2 ASTM C834, Specification for Latex Sealants.
 - .3 ASTM C920, Specification for Elastomeric Joint Sealants.
 - .4 ASTM C1330, Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 19-GP-5M-[1984], Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
 - .2 CAN/CGSB-19.13-[M87], Sealing Compound, One-component, Elastomeric, Chemical Curing.
 - .3 CGSB 19-GP-14M-[1984], Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
 - .4 CAN/CGSB-19.17-[M90], One-Component Acrylic Emulsion Base Sealing Compound.
 - .5 CAN/CGSB-19.24-[M90], Multi-component, Chemical Curing Sealing Compound.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Product data: Submit copies of Product data in accordance with Section 01 10 10 describing type, composition and recommendations or directions for surface preparation, material preparation and material installation.
 - .3 Manufacturer's product to describe:

- .1 Caulking compound.
 - .2 Primers.
 - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
 - .2 Samples:
 - .1 Submit samples of each type of material and colour.
 - .2 Cured samples of exposed sealants for each colour where required to match adjacent material.
 - .3 Two samples of sealant/caulking, for colour selection. Two samples of back-up material and primer for physical characteristics.
 - .3 Manufacturers' Instructions
 - .1 Submit instructions to include installation instructions for each product used.
- 1.4 **DELIVERY, STORAGE AND HANDLING**
 - .1 Arrange delivery of materials in original, unopened packages with labels intact, including batch number, and ensure that on-site storage is kept to a minimum. Do not store materials on site where there exists any danger of damage from moisture, direct sunlight, freezing and other contaminants.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
 - .3 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .4 Storage and Handling Requirements:
 - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect joint sealants from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- 1.5 **QUALITY ASSURANCE**
 - .1 Qualifications: Work of this Section shall be executed by trained applicators approved by sealant manufacturer and having a minimum of 5 years proven experience.
- 1.6 **EXTENDED WARRANTY**
 - .1 Submit an extended warranty for Sealant Work in accordance with General Conditions, except that warranty period is extended to 2 years from date of Substantial Performance of the Work.
 - .1 Warrant against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion and staining adjacent surfaces.
 - .2 Coverage: Complete replacement including affected adjacent Work.
- 1.7 **SITE CONDITIONS**

- .1 Do not install materials when ambient air temperature is less than 5 degrees Celsius, when recesses are wet or damp, or to manufacturer's recommendations.
- .2 Ambient Conditions:
 - .1 Proceed with installation of joint sealants only when:
 - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.
 - .2 Joint substrates are dry.
 - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
 - .3 Joint-Width Conditions
 - .1 Proceed with installation of joint sealants only where joint widths are as allowed by joint sealant manufacturer for applications indicated.
 - .4 Joint-Substrate Conditions:
 - .1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.
- 2 Products**
- 2.1 SEALANT MATERIALS**
 - .1 All materials under Work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.
 - .2 Use materials as received from manufacturers, without additives or adulterations. Use one manufacturer's Product for each kind of Product specified.
 - .3 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.
 - .4 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.
 - .5 Where sealants are qualified with primers use only these primers.
 - .6 Where exposed the colours shall match the substrate, as approved by the Owner.
- 2.2 Sealant Type A: ASTM C920, Type S, Grade NS, Class 25; One-part, non-sag type, silicone sealant, in standard colours selected.**
 - .1 'DC CWS' by Dow Corning Inc.
 - .2 'Sikasil 305CN' by Sika.
 - .3 'Tremsil 400' by Tremco.
- 2.3 Sealant Type B: ASTM C920, Type S, Grade NS; One-part mildew-resistant silicone, in standard colours selected.**
 - .1 '786 Mildew Resistant Silicone Sealant' by Dow Corning Inc.
 - .2 'Sikasil GP Mildew Resistant' by Sika.

- .3 'Tremsil 200 Silicone Sealant' by Tremco Ltd.
- 2.4 Sealant Type C: ASTM C834; Pure acrylic siliconized sealant; in standard white colour (paintable).
 - .1 '950A Siliconized Acrylic Latex Caulk' by Sherwin Williams.
 - .2 'Tremflex 834 Siliconized Sealant' by Tremco Ltd.
 - .3 Sealant Type D: Urethanes one part: Non-sag: to CAN/CGSB-19.13, Type 2, approved products include:
 - .1 Dymonic by Tremco;
 - .2 SikaFlex 15LM by Sika;
 - .3 or approved alternate.
 - .4 Preformed compressible and non-compressible back-up materials:
 - .1 Polyethylene, urethane, neoprene or vinyl foam:
 - .1 Extruded closed cell foam backer rod.
 - .2 Size: oversize 30 %.
 - .2 Neoprene or butyl rubber:
 - .1 Round solid rod, Shore A hardness 70.
 - .3 High density foam:
 - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m³ density, or neoprene foam backer, size as recommended by manufacturer.
 - .4 Bond breaker tape:
 - .1 Polyethylene bond breaker tape which will not bond to sealant.
- 2.5 **ACCESSORIES**
 - .1 Primers: Type recommended by material manufacturers for various substrates, primers to prevent staining of adjacent surfaces encountered on project.
 - .2 Joint backing: ASTM C1330; Round, solid section, closed cell, skinned surface, soft polyethylene foam gasket stock, compatible with primer and sealant materials, 30 to 50% oversized, Shore A hardness of 20, tensile strength 140 to 200 kPa. Bond breaker type surface.
 - .3 Bond breaker: Type recommended by material manufacturers.
 - .4 Void filler around the window frames to be one part expanding polyurethane foam.
 - .5 Cleaning agents: As recommended by material manufacturer, non-staining, harmless to substrates and adjacent finished surfaces.
- 2.6 **MIXING**
 - .1 Follow manufacturers instructions on mixing, shelf and pot life.
- 2.7 **JOINT CLEANER**

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.
- .2 Primer: in accordance with sealant manufacturer's written recommendations.
- 3 Execution**
- 3.1 EXAMINATION**
 - .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence prior to sealant installation.
 - .2 Inform the Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied. Proceeding with the installation will be the acceptance of the substrate by the Contractor.
- 3.2 SURFACE PREPARATION**
 - .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
 - .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other
 - .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
 - .4 Ensure joint surfaces are dry and frost free.
 - .5 Prepare surfaces in accordance with manufacturer's directions.
 - .6 Prepare joints to receive sealants to manufacturer's instructions. Ensure that joints are clean and dry and ferrous surfaces are free from rust and oil.
 - .7 Clean recesses to receive sealant, to be free of dirt, dust, loose material, oil, grease, form release agents and other substances detrimental to sealant's performance.
 - .1 Remove lacquer or other protective coatings from metal surfaces, without damaging metal finish, using oil-free solvents. Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sand blasting. Ensure recess is dry.
 - .2 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings. Remove incompatible coatings as required.
 - .8 Ensure that all materials in contact with sealant are compatible. Test substrate for adhesion.
 - .9 Depth of recess: Maintain depth to ½ joint width up to a maximum of 13 mm and not less than 6 mm at centre of joint. For greater depth, use joint backing under. Where recess is less than specified depth, cut back surface of recess to specified recess depth.

- .10 Install polyethylene backing rod in joints 6 mm or more in width. Roll backing rod into joint. Do not stretch or bend backing rod. Install bond breaker to back of recess.
- .11 Prime sides of recess, in accordance with sealant manufacturer's instructions.
- .12 Condition products for use in accordance with manufacturer's recommendations.

3.3 **INSTALLATION**

- .1 Apply sealant immediately after adjoining Work is in condition to receive such Work. Apply sealant in continuous bead using gun with correctly sized nozzle. Use sufficient pressure to evenly fill joint.
- .2 Ensure sealant has full uniform contact with, and adhesion to, side surfaces of recess. Superficial painting with skin bead is not acceptable. Tool sealant to smooth surface, free from ridges, wrinkles, sags, air pockets, embedded impurities, dirt, stains or other defects.
 - .1 At recesses in angular surfaces, finish sealant with flat profile, flush with face of material at each side.
 - .2 At recesses in flush surfaces, finish compound with concave face, flush with face of material at each side.
- .3 Make sealant bead uniform in colour.
- .4 Cure sealants in accordance with sealant manufacturer's instructions. Do not cover up sealants until proper curing has taken place.
- .5 Immediately remove excess compound or droppings which would set up or become difficult to remove from adjacent finished surfaces, using recommended cleaners, as work progresses. Do not use scrapers, chemicals or other tools which could damage finished surfaces. Remove defective sealant.
- .6 Clean recesses and re-apply sealant.
- .7 Remove masking tape immediately after joints have been sealed and tooled.

3.4 **PRIMING**

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.5 **BACKUP MATERIALS**

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.6 **APPLICATION**

- .1 Sealant:
 - .1 Apply sealant in accordance with manufacturer's written instructions to achieve the required minimum and maximum sealant depths.

- .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
- .3 Apply sealant in continuous beads.
- .4 Apply sealant using gun with proper size nozzle to achieve a minimum 6mm depth over the joint profile and adhesive to substrate a minimum of 9mm, and 10mm minimum joint width, while maintaining a consistent depth-to-width ratio.
- .5 Use sufficient pressure to fill voids and joints solid.
- .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
- .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .8 Remove excess compound promptly as work progresses and upon completion.
- .9 Apply multiple application of sealant to build up the required joint-to-width ratio for joints in excess of 19mm wide, and within the manufacturer's recommendations.
- .2 Curing:
 - .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until proper curing has taken place.

3.7 **CLEANING**

- .1 Clean surfaces adjacent to joints, remove sealant smears or other soiling resulting from application of sealants. At metal surfaces, remove residue. Do not mar or damage finishes on materials adjacent to joints. Repair or replace marred or damaged materials.
- .2 Leave Work area clean at end of each day.
- .3 Clean adjacent surfaces immediately.
- .4 Remove excess and droppings, using recommended cleaners as work progresses.
- .5 Remove masking tape after initial set of sealant.
- .6 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.8 **PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by joint sealants installation.

3.9 **SCHEDULE OF LOCATIONS**

- .1 Following sealant location schedule is included for convenience and may not be complete. Examine Contract Drawings and other specification sections and determine entire extent of Work of this Section. Generally seal following locations:

- .1 Concrete, masonry, wood and stone to metal. Wood to masonry, concrete and stone.
- .2 Metal to metal.
- .3 All dissimilar materials.
- .4 Where 'sealant' or 'caulking' is indicated on drawings.
- .2 Sealant Type A:
 - .1 Exterior joints between masonry and steel or aluminum.
 - .2 Exterior joints between masonry and shelf angle.
 - .3 Exterior joints between steel or aluminum and concrete or masonry. Interior and exterior control joints, except in floors.
 - .4 Door frames, louvre frames, interior and exterior side.
 - .5 Protrusions through interior and exterior walls and floors, interior and exterior side, except where fire rated seals are required.
 - .6 Seal thresholds.
- .3 Sealant Type B:
 - .1 Between mechanical fixtures/fittings. Between access panels.
- .4 Sealant Type C:
 - .1 Perimeter of interior windows.
 - .2 Junction between drywall and masonry.
- .5 Sealant Type D:
 - .1 Exterior joints between roof and mechanical fixtures/fittings
 - .2 Perimeter of roof.

END OF SECTION

- 1 General**
- 1.1 SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for painting work in accordance with the Contract Documents.
- 1.2 REFERENCES**
 - .1 CAN/CGSB 85.10, Protective Coatings for Metals.
 - .2 CAN/CGSB-85.100, Painting.
 - .3 Master Painters Institute (MPI), Painting Specification Manual.
 - .4 SSPC Steel Structures Painting Council, Standards.
 - .5 AMPP Association for Materials Protection & Performance, Standards.
- 1.3 SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 10 10 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .3 Product name, type and use.
 - .4 Manufacturer's product number.
 - .5 Colour numbers.
 - .6 MPI Environmentally Friendly classification system rating.
Manufacturer's WHMIS Safety Data Sheets (SDS).
 - .2 Submit listing of manufacturer's Product types, Product codes, and Product names, number of coats, and dry film thicknesses, corresponding to each Painting Schedule code; submit listing minimum of 8 weeks before materials are required.
 - .2 Samples:
 - .1 Submit following samples in accordance with Section 01 10 10.
 - .1 Four 300 x 150 mm draw downs of each colour minimum 4 weeks before paints are required.
 - .2 Identify each sample with Contract number and title, colour reference, sheen, date, and name of applicator.
 - .3 Certificates:
 - .1 Submit certification from paint manufacturer, on company letterhead, indicating each product proposed for use is Manufacturer's premium grade, first line Product.

- .2 Submit certified documentation to confirm each airless spray painter has minimum of 5 years experience on applications of similar complexity and scope.
- .3 Submit certified documentation to confirm each worker has Provincial Tradesman Qualification certificate of proficiency.
- .4 Reports:
 - .1 Submit written field inspection and test report results after each inspection.
 - .2 Submit Field Quality Control test result reports for alkali content, substrate moisture, and dry film thickness.
 - .3 Submit electronic moisture meter manufacturer's specifications including tolerances. Submit record of latest meter calibration to meet manufacturer's recommendations.

1.4 QUALITY ASSURANCE

- .1 Finishing work: Perform work to MPI requirements for premium grade.
- .2 Supervision: Have work supervised by a full-time qualified foreperson who has 10 years minimum experience on Contracts of similar complexity and scope
- .3 Mock-up:
 - .1 Construct three 2 square metre mock-ups of different Paint Schedule code systems, selected by Consultant, in locations acceptable to Consultant to demonstrate installation workmanship, colour, and hiding power of Products.
 - .2 Obtain Consultant's acceptance in writing before proceeding with the work of this Section.
 - .3 Mock-ups may remain as part of the Work if acceptable to Consultant and will serve as a standard for similar code systems.
 - .4 Repaint over mock-ups which do not form part of the Work.

1.5 EXTRA MATERIALS

- .1 Submit one - four litre can of each type and colour of primer and finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Install correct, safe temporary storage for paint, thinner, solvents, and other volatile, corrosive, hazardous, and explosive materials in accordance with requirements of authorities having jurisdiction.
- .2 Post hazard warning signage in areas of storage and mixing. Install and maintain sufficient CO2 fire extinguishers of minimum 9 kg capacity, accessible in each storage mixing and storage areas.
- .3 Maintain storage enclosures at minimum 10 degrees Celsius ambient temperature and to manufacturer's instructions.

- .1 Labels shall clearly indicate:
 - .1 Manufacturer's name and address.
 - .2 Type of paint or coating.
 - .3 Compliance with applicable standard.
 - .4 Colour number in accordance with established colour schedule.

1.7 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces.
 - .2 Perform no painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10°C for 24 hours before, during and after paint application until paint has cured sufficiently.
 - .3 Where required, provide continuous ventilation for seven days after completion of application of paint.
 - .4 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities shall be provided by General Contractor.
- .2 Apply coatings under the following conditions:
 - .1 Exterior coatings (except Latex): 5 degrees Celsius minimum.
 - .2 Exterior latex coatings: 10 degrees Celsius minimum.
 - .3 24 hours minimum after rain, frost, condensation, or dew.
 - .4 When no condensation is possible (unless specifically formulated against condensation).
 - .5 Interior coatings: 7 degrees Celsius minimum.
 - .6 Relative humidity: 85% maximum.
 - .7 Not in direct exposure to sun light.
- .3 Maintain temperature conditions indicated above for 24 hours before, during and 24 hours after painting.
- .4 Install clean plywood sheets to protect floors and walls in storage and mixing areas, from paint drips, spatters, and spills.
- .5 Surface and Environmental Conditions:
 - .1 Apply paint finish only in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
 - .2 Apply paint only to adequately prepared surfaces and to surfaces within moisture limits noted herein.
 - .3 Apply paint only when previous coat of paint is dry or adequately cured.

- .4 Apply paint finishes only when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.
 - .5 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of Owner such that painted surfaces will have dried and cured sufficiently before occupants are affected.
 - .6 Apply sufficient masking, clean drop cloths, and protective coverings for full protection of work not being painted including, but not limited to, the following:
 - .1 Light fixtures, fire and smoke detectors.
 - .2 Sprinkler heads.
 - .3 Non-Prepainted diffusers and registers.
 - .4 Non-Prepainted equipment.
 - .5 Fire rating labels and equipment specification plates.
 - .6 Finished surfaces.
 - .7 Nameplates.
- 1.8 **ENVIRONMENTAL PERFORMANCE REQUIREMENTS**
 - .1 Provide paint products meeting MPI "Green Performance Standard GPS-1-05".
- 1.9 **WASTE MANAGEMENT AND DISPOSAL**
 - .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .2 Place materials defined as hazardous or toxic in designated containers.
 - .3 Ensure emptied containers are sealed and stored safely.
 - .4 Unused paint, coating materials must be disposed of at official hazardous material collections site as approved by Owner.
 - .5 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal.
 - .6 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
 - .7 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
 - .8 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
 - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
 - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.

- .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
- .4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
- .5 Empty paint cans are to be dry prior to disposal or recycling (where available).

1.10 MAINTENANCE

- .1 Deliver to Owner's place of storage on completion of work, sealed containers of each finish painting material applied, and in each colour. Label each container as for original, including mixing formula. Provide the following:
 - .1 1 L of extra materials when less than 50 L are used for Project;
 - .2 3.78 L of extra stock when 50 to 200 L are used;
 - .3 7.57 L of extra stock when over 200 L are used.

1.11 SCHEDULE OF WORK

- .1 Submit work schedule for various phases of painting to Consultant for approval. Submit schedule minimum of 1 week in advance of proposed operations.
- .2 Obtain written authorization from Consultant for any changes in work schedule.
- .3 Schedule painting operations to prevent disruption of occupants in and about the building.

2 Products

2.1 MATERIALS

- .1 Paint:
 - .1 All materials under work of this Section, including but not limited to, primers, stains, and paints are to have low VOC content limits.
 - .2 Products in accordance with the MPI Painting Specification Manual, and MPI Maintenance Repainting Manual, Exterior and Interior Systems;
 - .1 For each MPI paint code, manufacture's premium grade, first line Products is to be use.
 - .2 Uniform dispersion of pigment in a homogeneous mixture.
 - .3 Ready-mixed and tinted whenever possible.
- .2 Products within each MPI paint system code: From single manufacturer.
- .3 Acceptable manufacturers:
 - .1 Benjamin Moore.
 - .2 Dulux Paints/PPG.
 - .3 Sherwin Williams.

2.2 COLOUR SCHEDULE

- .1 Consultant will select choice of colours and gloss when compiling a Colour Schedule after award of Contract; allow for colour selection beyond paint manufacturer's standard colour range.
- .2 Second coat in a three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.
- .3 Refer to Colour Schedule for selected colour references. Allow for 12 different colours, an additional deep and ultra-deep colours; 4 coats may be required.
- .4 Conform to gloss reflectance definitions listed in MPI Specification Manual.

2.3 PAINTING AND FINISHING SCHEDULE

- .1 Refer to Table 1, MPI Painting and Finishing Schedule coded systems, comply with MPI Painting Specification Manual.

Table 1: Exterior Painting and Finish Schedule				
EXTERIOR SUBSTRATES	Typical substrates (Including but not limited to)	MPI Manual Ref.	MPI Finish System Code	Topcoat
Galvanizes steel	HM doors & frames miscellaneous fabrications	REX 5.3	REX 5.3J	Spot Prime - PPG Pitt-Tech Plus EP Acrylic Primer 90-1912 Topcoat: PPG Pitt-Tech Plus EP DTM Acrylic Semi-Gloss 90-1610

Table 2: Interior Painting and Finish Schedule				
TYPICAL INTERIOR SUBSTRATES (unless otherwise noted in Table 3 and Table 4 below)	Typical substrates (Including but not limited to)	MPI Manual Ref.	MPI Finish System Code	Primer/Topcoat (PPG)
Concrete Masonry Units	Concrete walls – Common Areas (Corridors, Offices, Gyms, Activity Rooms)	RIN 4.2	RIN 4.2A	Spot Prime – Dulux Gripper Universal Acrylic Primer/ Sealer 60000A Topcoat- Dulux Ultra Interior Latex Eggshell 949000
Concrete Masonry Units	Concrete walls – Wet Areas (Washrooms, Restrooms, Change rooms)	RIN 4.2	RIN 4.2F	Spot Prime – PPG Aquapon WB EP Epoxy Semi-Gloss Topcoat- PPG Aquapon WB EP Epoxy Semi-Gloss
Concrete Masonry Units	Concrete walls – Wet Areas – Showers (non-tiled)	RIN 4.2	RIN 4.2D	Spot Prime – PPG Amerlock 600 Epoxy Topcoat – PPG Amerlock 600 Epoxy
Concrete Vertical Surfaces	Concrete walls & ceilings – Common Areas (Corridors, Offices)	RIN 3.1	RIN 3.1A	Spot Prime – Dulux Gripper Universal Acrylic Primer/ Sealer 60000A Topcoat- Dulux Ultra Interior Latex Semi-Gloss 948000
Concrete Vertical Surfaces	Concrete walls & ceilings – Wet Areas (Restrooms, Change rooms, Shower Rooms)	RIN 3.1	RIN 3.1F	Spot Prime – PPG Aquapon WB EP Epoxy Semi-Gloss Topcoat- PPG Aquapon WB EP Epoxy Semi-Gloss

Concrete Horizontal Surfaces	Floors and Stairs, Stand/Bleacher (Risers and Treads)	RIN 3.2	RIN 3.2C	Spot Prime – PPG Amerlock 600 Epoxy Topcoat – PPG Amerlock 600 Epoxy
Clay Masonry Units (including pressed and extruded brick)			INT 4.1A LATEX (over w.b. alkali-resistant primer)	Primer – Dulux Gripper 60000A Top-Coat – Topcoat-Dulux Ultra Interior Latex Eggshell 949000 or Semi-Gloss # 948000
Concrete Floors	Low traffic – non severe/ dry areas:	MPI RIN 3.2 CONCRETE HORIZONTAL SURFACES	RIN 3.2A – Latex Floor Enamel	Surface preparation – clean with a concrete etch cleaning product or mild muriatic acid solution – followed by thorough rinse and allow to dry fully. 2 coats direct – Dulux Water-Based Polyurethane Floor Enamel 247010 Series.
Concrete Floors	High Traffic and Wet Areas	MPI RIN 3.2 CONCRETE HORIZONTAL SURFACES	RIN 3.2C	Minimum Surface preparation – clean with a concrete etch cleaning product or mild muriatic acid solution – followed by thorough rinse and allow to dry fully. For best results, mechanical abrasion, scarification or blasting should be considered. EPOXY (Low Gloss) – 2 coats direct – Amerlock 600 Epoxy Coating

Concrete Floors	Shower areas or areas that remain consistently wet.	Non- MPI System		Prepare concrete surfaces according to ICRI 310.2R. PPG Flooring Primer - 912 LV Epoxy Primer/Sealer Base Coat - 610 SL Self-Leveling Epoxy Top-Coat – 2550 WB Urethane – Flat finish
Gypsum Board	Walls & ceilings – Common Areas (Corridors, Offices, Gyms, Community Rooms)	RIN 9.2	RIN 9.2A	Spot Prime – Dulux Ultra Interior Latex Primer/ Sealer 976000 Topcoat- Dulux Ultra Interior Latex Eggshell 949000
Gypsum Board	Walls & ceilings – Wet Areas (Restrooms, Change rooms, Shower Rooms, Pool)	RIN 9.2	RIN 9.2F	Spot Prime – Dulux Gripper Universal Acrylic Primer/ Sealer 60000A Topcoat- PPG Aquapon WB EP Epoxy Semi-Gloss
Plastic	Stands/ Bleacher – seats, Toilet Partitions	RIN 6.8	RIN 6.8B	Spot Prime - Dulux Gripper Universal Acrylic Primer/ Sealer 60000A Topcoat - PPG HPC Industrial Alkyd Enamel 4308H
Wood	Railings	RIN 6.3	RIN 6.3B	Spot Prime - PPG HPC Industrial Alkyd Enamel 4308H Topcoat - PPG HPC Industrial Alkyd Enamel 4308H

SECTION 09 91 00
PAINTING
PF&R PAINTING ENHANCEMENT
 CHERIE NG ARCHITECT INC.

PAGE 09 91 00.10
NOVEMBER 2024

Project 2419

Wood	Walls, Trim	RIN 6.3	RIN 6.3B	Spot Prime - PPG HPC Industrial Alkyd Enamel 4308H Topcoat - PPG HPC Industrial Alkyd Enamel 4308H
Stucco	Textured Walls	MPI # 137	MPI # 54	Dulux Gripper Universal Acrylic Primer/ Sealer 60000A Dulux Ultra Interior Latex Semi-Gloss 948000
Stucco	Textured Ceilings	MPI # 137	MPI # 53	Dulux Gripper Universal Acrylic Primer/ Sealer 60000A Dulux Ultra Interior Latex Flat 945000
Galvanized Metal/ Aluminum	HM Doors & Frames, Window Frames & Mullions, Toilet Partitions - All Areas	RIN 5.3	RIN 5.3J	Spot Prime – PPG Pitt-Tech Plus EP Acrylic Primer 90-1912 Topcoat – PPG Pitt- Glaze WB1 Precatalyzed Acrylic Epoxy Semi-Gloss 16- 1510
Galvanized Metal	Ducts, Pipes, Metal Deck – Dry Areas	RIN 5.3	RIN 5.3G	Spot Prime – Spraymaster DTM Latex Dryfall Flat 10112 Topcoat – Spraymaster DTM Latex Dryfall Flat 10112
Galvanized Metal	Ducts, Pipes – Wet Areas	RIN 5.3	RIN 5.3B	Spot Prime – PPG Pitt-Tech Plus EP Acrylic Primer 90-1912 Topcoat - PPG Pitt- Glaze WB1 Precatalyzed Acrylic Epoxy Semi-Gloss 16- 1510

Structural Steel	Columns, beams, joists – Dry Areas	RIN 5.1	RIN 5.3RR	Spot Prime – PPG Pitt-Tech Plus EP Acrylic Primer 90-1912 Topcoat – PPG Pitt-Glaze WB1 Precatalyzed Acrylic Epoxy Semi-Gloss 16-1510
Structural Steel	Columns, beams, joists – Wet Areas	RIN 5.1	RIN 5.3RR	Spot Prime – PPG Pitt-Tech Plus EP Acrylic Primer 90-1912 Topcoat – PPG Pitt-Glaze WB1 Precatalyzed Acrylic Epoxy Semi-Gloss 16-1510
Steel	Railings – Hand and Guard	RIN 5.1	RIN 5.1A	Spot Prime – PPG Speedhide LV Alkyd Metal Primer 6-208N Topcoat – PPG HPC Industrial Alkyd Enamel 4308H
Metal	Heat Exchanges/ Radiators	MPI # 107 RIN 5.3	RIN 5.3RR	Prime - PPG Pitt-Tech Plus EP Acrylic Primer 90-1908 Series Topcoat – PPG Pitt-Glaze WB1 Precatalyzed Acrylic Epoxy Semi-Gloss 16-1510
Metal	Lockers	MPI # 101 MPI # 72		Primer – for spot priming of bare areas – MPI # 101 – Amerlock 600 Epoxy Top-Coat – MPI # 72 – Pitthane Ultra Urethane Enamel Gloss 95-812 Series

Table 3: POOL - Painting and Finish Schedule				
TYPICAL POOL INTERIOR SUBSTRATES	Typical substrates (Including but not limited to)	MPI Manual Ref.	MPI Finish System Code	Primer/Topcoat (PPG)
POOL CEILING – Galvanized Metal	Duct and Ceiling Deck – Full removal of existing coating to bare (Abrasive Blast SSPC SP-7).	Non-MPI System	Custom System	Pitt-Tech EDF Int/ Ext Acrylic Semi-Gloss Dry Fog 90-812 – Applied Direct.
POOL CEILING – Steel	Beam, Joists & Columns - Full removal of existing coating to bare (Abrasive Blast SSPC SP-7).	Non-MPI System	Custom System	Primer – Multiprime Universal Alkyd Metal Primer 4360 or Speedhide Alkyd Metal Primer 6-208N Topcoat - Pitt-Tech EDF Int/ Ext Acrylic Semi-Gloss Dry Fog 90-812

3 Execution

3.1 EXAMINATION

- .1 Verify condition of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 CONDITION OF SURFACES:

- .1 Prior to commencement of repainting work, thoroughly examine (and test as required) all interior conditions and surfaces scheduled to be repainted and report in writing to the Consultant any conditions or surfaces that will adversely affect work of this section.
- .2 The degree of surface deterioration (DSD) shall be assessed using the assessment criteria indicated in the MPI Maintenance Repainting Manual. In general, the MPI DSD ratings and descriptions are as follows:

CONDITION	DESCRIPTION
DSD-0	Sound Surface (may include visual (aesthetic) defects that do not affect film's protective properties).
DSD-1	Slightly Deteriorated Surface (may show fading; gloss reduction, slight surface contamination, minor pin holes scratches, etc.) / Minor cosmetic defects (runs, sags, etc.).
DSD-2	Moderately Deteriorated Surface (small areas of peeling, flaking, slight cracking, staining, etc.).
DSD-3	Severely Deteriorated Surface (heavy peeling, flaking, cracking, checking, scratches, scuffs, abrasion, small holes and gouges).
DSD-4	Substrate Damage (repair or replacement of surface required by Contractor).

- .3 Other than the repair of DSD-1 to DSD-3 defects included under this scope of work, structural and DSD-4 substrate defects discovered prior to and after surface preparation or after first coat of paint shall be made good and sanded by others ready for painting, unless otherwise agreed to by the Consultant and painter to be included in this Work.
- .4 No repainting work shall commence until all such DSD-4 adverse conditions and defects have been corrected and surfaces and conditions are acceptable to the Painting Subcontractor. The Painting Subcontractor shall not be responsible for the condition of the substrate or for correcting defects and deficiencies in the substrate, which may adversely affect the painting work except for minimal work normally performed by the Painting Subcontractor and as, indicated herein. It shall always, however, be the responsibility of the Painting Subcontractor to see that surfaces are properly prepared before any paint or coating is applied. It shall also be the Painting Subcontractor's responsibility to paint the surface as specified providing that the Wwner accepts responsibility for uncorrected DSD-4 substrate conditions.

3.3 PREPARATION

- .1 General:
 - .1 Clean substrate surfaces free from, dust, grease, soiling, or extraneous matter, which are detrimental to finish.
 - .2 Patch, repair, and smoothen minor substrate defects and deficiencies e.g. machine, tool and sand paper marks, shallow gouges, marks, and nibs.
 - .3 Clean, sweep, and vacuum floors and surfaces to be painted, debris and dustfree prior to painting.
 - .4 Refer to MPI Painting Specification Manual for surface preparation requirements of substrates not listed here.

- .2 Where finish hardware has been installed remove, store, re-install finish hardware, to accommodate painting. Do not clean hardware with solvent that will remove permanent lacquer finishes.
- .3 Alkali Content tests and neutralization:
 - .1 Test for ph level using litmus paper on dampened substrate.
 - .2 Neutralize surfaces over 8.5 ph with 4% solution of Zinc Sulphate for solvent based systems and tetrapotassium pyrophosphate for latex based systems, to below 8.0 ph, and allow to dry.
 - .3 Brush-off any residual Zinc Sulphate crystals.
 - .4 Coordinate paint system primer / sealer to be alkali-resistant.
- .4 Substrate moisture tests:
 - .1 Test for moisture content over entire surface to be painted, minimum one test/2 m2 in field areas and one test/600 mm along inside corners including at ceiling to wall juncture.
 - .2 If any test registers above 10% allow entire substrate surfaces, within the plane, to dry further before paint system application. Install temporary drying fans if necessary.
 - .3 Re-test employing same criteria.
- .5 Mildew removal: Scrub with solution of trisodium phosphate and sodium hypochlorite (Javex) bleach, rinse with water, and allow to dry completely.
- .6 Cementitious and masonry (existing): Clean existing surfaces by pressure washing where indicated on drawings with a TSP solution and pressure range of 1500 - 4000 PSI at 150 mm - 300 mm. Rinse areas with clean water and allow to thoroughly dry. Provide for collection and disposal of water.
- .7 Cementitious and masonry (Concrete, block):
 - .1 Allow 28 days cure before painting.
 - .2 Coordinate repair of protrusion-chipping and grinding, and honeycomb filling with responsible trades.
 - .3 Remove dirt, loose mortar, scale, powder, efflorescence, and other foreign matter.
 - .4 Remove form oil and grease with trisodium phosphate, rinse, and allow to dry thoroughly.
 - .5 Prepare surfaces in accordance with CAN/CGSB-85.100.
 - .6 Remove rust stains with solution of sodium metasilicate after thorough wetting;
 - .1 allow to dry thoroughly.
- .8 Metal Fabrications (existing): Scrape and either hand or power wire brush surfaces to remove mill and scale.
- .9 Galvanized steel sheet:
 - .1 Z275 (Satin & Spangled Sheet): SSPC SP7 brush blast.

- .2 ZF075 (Wiped Coat): Remove contamination, wash with Xylene solvent.
- .3 Touch-up damaged galvanized areas with organic zinc rich primer.
- .10 Galvanized iron and steel: Prepare galvanized and ungalvanized metal surfaces as follows:
 - .1 Z275 (Satin & Spangled Sheet): SSPC SP7 brush blast.
 - .2 ZF075 (Wiped Coat): Remove contamination, wash with Xylene solvent.
 - .3 Touch-up damaged galvanized areas with organic zinc rich primer.
- .11 Galvanized iron and steel: Prepare galvanized and ungalvanized metal surfaces as follows:
 - .1 Unpassivated, unweathered and weathered: Remove contamination, wash with Xylene or Toluol solvent, allow to dry thoroughly. Make paint system primer/sealer an etching type primer.
 - .2 Manufacturer pre-treated (including passivated): SSPC SP7.
 - .3 Touch-up damaged galvanized areas with organic zinc rich primer.
- .12 Structural steel and miscellaneous metal fabrications:
 - .1 Coordinate the following with the responsible trades:
 - .1 Rust, mars, mill scale, and weld-burn touch-ups.
 - .2 Oil, grease, weld flux and other residue removal.
 - .2 Prime paint items, not otherwise indicated to be primed as part of another Section.
 - .3 Touch-up damaged galvanized areas with organic zinc rich primer
- .13 Factory primed surfaces:
 - .1 Touch up damaged areas.
 - .2 Clean as required for top coat.
- .14 Gypsum board (existing):
 - .1 Remove dust, dirt, oil, grease, glue and all foreign material. Clean with stiff fibre brush prior to applying primer coat.
 - .2 Coordinate repairs and touch-ups with the responsible trade.
 - .3 Lightly sand surface to smooth out ridges and provide neat smooth surface.
- .15 Gypsum board:
 - .1 Apply primer/sealer paint to reveal defects and deficiencies and to equalize absorption areas.
 - .2 Coordinate repairs and touch-ups with the responsible trade.
 - .3 Re-prime repairs.
- .16 Coordinate with other trades to prevent:
 - .1 Damage, and inadvertent activation of fire and smoke detectors.

- .2 Odour and dust distribution by permanent HVAC systems including fouling of ducts and filters.
 - .17 Field-mix Products in accordance with manufacturer's written instructions.
- 3.4 **APPLICATION**
- .1 Apply painting systems in accordance with the MPI Painting Specification Manual. Apply each Product to manufacturer's recommended dry film thickness.
 - .2 Method of application to be as approved by Consultant. Apply paint by brush, roller, air sprayer, airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
 - .3 Brush and Roller Application:
 - .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple.
 - .4 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
 - .5 Remove runs, sags and brush marks from finished work and repaint.
 - .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 which are not adequately painted by spray.
 - .5 Painting systems listed are required minima, apply additional coats if necessary to obtain substrate hiding acceptable to the Consultant.
 - .6 Tint intermediate coats lighter than final top coats for identification of each succeeding coat and to facilitate inspections. Include only manufacturer's recommended reducing and tinting accessories. Do not add adulterants.
 - .7 Primer to be specialized primer coating system as required by manufacturer for selected colour. Standard primer being tinted shall be tinted to a maximum of 1.5% by volume.
 - .8 Sand lightly between coats to achieve a tooth or anchor for subsequent coats.

- .9 Apply paint uniformly in thickness, colour, texture, and gloss, as determined by the Consultant under adequate illumination and viewed at a distance of 1500 mm. Apply finishes free of defects in materials and application which, in the opinion of the Consultant, affect appearance and performance. Defects include, but are not limited to:
 - .1 Improper cleaning and preparation of surfaces.
 - .2 Entrapped dust, dirt, rust.
 - .3 Alligatoring, blisters, peeling.
 - .4 Scratches, blemishes.
 - .5 Uneven coverage, misses, drips, runs, and poor cutting in.
- .10 Do not apply coatings on substrates which are not sufficiently dry. Unless indicated otherwise, allow each painting system coat to cure dry and hard before following coats are applied.
- .11 Repaint entire areas of damaged or incompletely covered surfaces, to the nearest inside or outside corner; patching will not be permitted.
- .12 Miscellaneous painting requirements:
 - .1 Paint projecting ledges, and tops, bottoms and sides of doors both above and below sight lines to match adjacent surfaces.
 - .2 Paint door frames, access doors and frames, door grilles, prime coated butts, and prime coated door closers to match surface in which they occur.
 - .3 Finish closets and alcoves as specified for adjoining rooms.
 - .4 Paint light coves white whether a light lense is installed or not, unless otherwise indicated.
 - .5 Paint interior columns to match walls of room.
 - .6 Allow for:
 - .1 2 wall colours per room, one ceiling colour per room.
 - .2 Different door colours in each functionally different area.
 - .3 Different colours on both sides of same door.
- .13 Mechanical, electrical, refrigeration and other painting coordination:
 - .1 Coordinate painting of pipes, ducts, and coverings with the work to precede pipe colour banding, flow arrows, and other pipe identification labeling installation.
 - .2 Paint exposed conduit, pipes, hangers, ductwork, grilles, gratings, louvres, access panels, fire hose cabinets, registers, convactor and radiator covers, enclosures, and other mechanical and electrical equipment including services concealed inside cupboard and cabinet work; apply colour and sheen to match adjacent surfaces, except as noted otherwise.
 - .3 Paint portions of surfaces such as duct interiors, piping, ductwork, hangers, insulation, walls, and similar items, visible through grilles, louvres, convactor covers etc., colour as noted on drawings.

- .4 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .5 Remove the following to accommodate painting, carefully store, clean, then reinstall on completion of each area and when dry:
 - .1 Switch and receptacle plates, fittings and fastenings, grilles, gratings, louvres, access panels, convector covers, and enclosures.
- .6 Unless otherwise specified, paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
- .7 Boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.
- .8 Paint fire protection piping red.
- .9 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .10 Paint natural gas piping yellow.
- .11 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.

3.5 **FIELD QUALITY CONTROL**

- .1 Dry film thickness tests:
 - .1 Test for film thickness over entire surface to be painted, minimum one test 2m2 in field areas and one test/600 mm along inside corners including at ceiling to wall juncture.
 - .2 If any test registers below specified thickness, re-apply paint to entire surface to nearest inside and outside corners.
 - .3 If test registers more than 50% above specified thickness, consult with paint manufacturer, determine if problem exists, offer solutions to Consultant, and repair as directed.
 - .4 Re-test employing same criteria after repair.

3.6 **RESTORATION**

- .1 Clean and re-install all door hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.
 - .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative.
- 3.7 **CLEANING**
- .1 Remove spilled, splashed, and spattered paint promptly as work proceeds and on completion of work. Clean surfaces soiled by paint spillage and paint spatters. Repair or replace damaged work, as directed by Consultant.
- 3.8 **PROTECTION**
- .1 Post Wet Paint signs during drying and restrict or prevent traffic where necessary.
 - .2 Post sign, after Consultant's inspection and acceptance of each room, reading:
PAINTING COMPLETE - NO ADMITTANCE WITHOUT CONTRACTOR'S PERMISSION.

END OF SECTION