



JACK DARLING COMFORT SATION

CITY OF MISSISSAUGA

SPEFICICATIONS – VOLUME 1

ISSUED FOR TENDER

October 9, 2025

PROCUREMENT NO. **PRC005197**

PROJECT# 24-053

Cellucci+Pace
ARCHITECTURE | PLANNING | PROJECT MANAGEMENT

PROJECT MANUAL

PROJECT:

**JACK DARLING MEMORIAL PARK
COMFORT STATION
1180 LAKESHORE ROAD WEST
MISSISSAUGA, ONTARIO L5H 3G7**

OWNER:

**THE CORPORATION OF
THE CITY OF MISSISSAUGA**

CONSULTANT:

**CELLUCCI+PACE
510 ROWNTREE DAIRY RD. UNIT 3C
WOODBIDGE, ONTARIO L4L 8H2**

TEL: 416-855-2260

CONSULTANT'S PROJECT NO:

24-053

DATE:

JANUARY 15, 2025

SECTION 00 01 03 - PROJECT DIRECTORY

1.1 OWNER

The Corporation of the City of Mississauga

1.2 CONSULTANT

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Woodbridge, ON L4L 8H2
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1.3 STRUCTURAL

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Tel: 416-635-9970

1.4 MECHANICAL

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Etobicoke, ON M8Z 5G4
Tel: 416-798-8770

1.5 ELECTRICAL

JLK Engineering
26 Cobblestone Court
Brampton, ON L6R 2S1
Tel: 416-455-5254

1.6 CIVIL

BaseTech Consulting Inc.
309 Roywood Crescent
Newmarket, ON L3Y 1A6
Tel: 905-251-7720

1.7 LANDSCAPING

Henry Kortekaas & Associates Inc.
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Ajax, ON L1S 7P9
Tel: 905-839-5599

1.8 ENVIRONMENTAL

Pinchin Environmental
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Mississauga, ON L5N 7W2
Tel: 905-363-0678

1.9 SOILS

Forward Engineering & Associates Inc.
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SECTION 00 01 03 - PROJECT DIRECTORY

1.10 DOOR HARDWARE

ABDP Consulting Ltd.
1910 Port Davidson Road
Smithville, ON L0R 2A0
Tel: 1-905-327-1374

END

CATEGORY	SEAL & SIGNATURE
ARCHITECTURAL This seal governs all Documents and Sections of these Specifications except for Section 00 31 00 – Existing Conditions,, and all Sections/Divisions listed below.	
STRUCTURAL This seal governs: Section 03 30 00 – Structural Cast-in-Place Concrete Section 05 12 23 – Structural Steel Framing Section 05 31 23 – Structural Roof Decking	
LANDSCAPING This seal governs: Section 03 33 11 – Concrete for Landscaping Section 32 14 23 – Asphalt and Paving Section 32 90 00 – Planting Section 32 92 23 – Sodding and Topsoil	
CIVIL This seal governs: Section 31 10 00 – Site Clearing and Removals Section 31 23 00 – Excavation, Filling, Grading Section 32 13 13 – Concrete Curbs and Paving Section 33 90 00 – Site Services	

END

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03 33 11	Concrete for Landscaping

04 00 00 MASONRY

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PROJECT NO. 24-053

06/10/2025

WESPEC

**COMFORT STATION AT
JACK DARLING MEMORIAL PARK, MISSISSAUGA, ONTARIO
00 01 10-1**

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REPORTS

Geotechnical Report
HMIS Asbestos Assessment
Soil Chemical Test Report

END

DOCUMENT 00 31 00 - EXISTING CONDITIONS

1.1 HAZARDOUS MATERIALS

- .1 A hazardous materials survey has been carried out by Pinchin Environmental who have issued the following reports included with these specifications:
 - .1 "HMIS Asbestos Assessment Jack Darling Park Comfort Station West-JDP2 1180 Lakeshore Road West, Mississauga, Ontario", February 26, 2009, Pinchin file 48689.
 - .2 "Hazardous Building Materials Assessment (Preconstruction): Jack Darling Memorial Park Comfort Station, 1180 Lakeshore Road West Mississauga ON; Pinchin File: 349292.000." Dated: December 5, 2024.
- .2 Reports are hereby offered in good faith for general information and guidance. Owner and Consultant assume no responsibility for accuracy and completeness of reports.
- .3 Contractor shall not be entitled to extra payment and/or performance time for work which is required and which is reasonably inferable in reports as being necessary.
- .4 In case of discrepancies between recommendations contained in reports and requirements of Contract Documents, the latter shall govern. Advise Consultant in writing of any discrepancies discovered.

1.2 GEOTECHNICAL CONDITIONS

- .1 A soil investigation has been carried out by Forward Engineering and Associates Inc. who have issued the following reports included with these specifications:
 - .1 "Report Geotechnical Investigation Proposed Comfort Station Building Replacement at Jack Darling Memorial Park, 1 Waterfront Trail, Mississauga, Ontario", Ref. No. G7407, dated September 12, 2024. Address listed above is incorrect; it should read "1180 Lakeshore Road West Mississauga, ON, L5H 3G7".
 - .2 "Soil Chemical Testing Report Comfort Station, Huron Park, Mississauga, Ontario", dated October 7, 2024, Ref. No. 7407.
- .2 Report is hereby offered in good faith for general information and guidance. Owner and Consultant assume no responsibility for accuracy and completeness of reports.
- .3 Contractor shall not be entitled to extra payment and/or performance time for work which is required and which is reasonably inferable in reports as being necessary.
- .4 In case of discrepancies between recommendations contained in reports and requirements of Contract Documents, the latter shall govern. Advise Consultant in writing of any discrepancies discovered.
- .5 During excavation of soil at the Project Areas should any visual or olfactory observations be made that may suggest that the soil being excavated may be impacted the following should be completed:
 - Soil excavation in the Project Area must cease upon the observation being made until the City/project leader directs that soil excavation may resume;
 - The City/project leader must be notified immediately by the contractor that impacted soil may have been encountered during construction activities;
 - The City/project leader should ensure that potentially impacted soil is segregated from other excavated soil in the project area, the limits of the project area that may be impacted is determined and any excess soil from the portion of the project area that is potentially impacted is disposed of in accordance with O.Reg. 406/19.
 - The City/project leader will retain a Qualified Person under O.Reg. 153/04 to assist with ensuring impacted soil is segregated from other excavated soil in the project area, the limits of the project area that may be impacted is determined and any excess soil from the portion of the project area that is potentially impacted is disposed of in accordance with O.Reg. 406/19.

END

**HMIS Asbestos Assessment
Jack Darling Park
Comfort Station West-JDP2
1180 Lakeshore Road West
Mississauga, Ontario**



Prepared for:
City of Mississauga
950 Burnhamthorpe Road West
2nd Floor, FPM – West Entrance
Mississauga, ON
L5C 3B4

Attention: Andrew Mills

February 26, 2009

Pinchin File: 48689

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SUMMARY

Pinchin Environmental Ltd. (Pinchin) was retained by City of Mississauga (Client) to conduct an asbestos-containing building materials assessment of the Jack Darling Park Comfort Station West located at 1180 Lakeshore Road West in Mississauga, Ontario. The objective of the assessment was to establish the location, condition and type of asbestos-containing materials (ACM) that are present. The full report must be referenced for the complete results of the assessment.

Summary of Findings

Asbestos was confirmed as not being present in the building.

Summary of Recommendations

No action is required as asbestos was not found.

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1.0 INTRODUCTION AND SCOPE

Pinchin Environmental Ltd. (Pinchin) was retained by City of Mississauga (Client) to conduct an asbestos-containing building materials assessment of the Jack Darling Park Comfort Station West located at 1180 Lakeshore Road West in Mississauga, Ontario. This assessment was performed for the purposes of long term management of the asbestos, and not for construction or renovations purposes. Additional intrusive testing may be required prior to using this information for construction or renovation.

This report was prepared to fulfil the Owner's requirements under Ontario Ministry of Labour (MOL) Regulation 278/05 (O.Reg 278/05).

The assessment was performed by Bob Young of Pinchin on December 1, 2008. The surveyor was accompanied by Dave Noyes of City of Mississauga during the assessment.

1.1 Facility Description

The facility was constructed in 1973. The following provides a basic description of the building systems.

System	Description
Structure	Wood
Exterior Cladding	Concrete block
HVAC	Not found
Roof	Asphalt shingles
Flooring	Dirt, ceramic tile
Interior Walls	Concrete block
Ceilings	Not found

1.2 Scope of Work

The objective of the assessment was to establish the location, condition and type of friable and a non-friable asbestos-containing building materials (ACM). The assessment included a search for ACM incorporated in the structure and its finishes. Not included, was an assessment of owner or occupant articles within the structure(s) (i.e. stored items, furniture, etc.), sampling of materials that could result in damage to the building (specific exclusions are described below), or

subsurface materials or equipment (vessels, drums, underground storage tanks, pipes, etc.) or possible contaminants in the soil and groundwater on the site.

2.0 ASSESSMENT METHODOLOGY AND CRITERIA

2.1 Methodology

The surveyor entered each room, corridor, service area, etc. where access was possible. The surveyor inspected for the presence of ACM, and relevant information was recorded where ACM were present, including approximate quantity, location, condition, sample and test locations. As-built drawings were referenced where provided.

Concealed locations such as spaces above solid ceilings, shafts and pipe chases were accessed via existing access panels only. Our investigation did not include demolition of drywall or plaster walls, or removal of finishes to view concealed conditions. Structural items or exterior building finishes were not removed to determine the presence of concealed materials. Wall spaces and concealed chases (e.g. at washrooms) were not demolished or accessed during this assessment. The investigation was limited to non-intrusive testing at request of the client.

The surveyor inspected for the presence of friable and non-friable asbestos-containing materials (ACM). Typical examples of friable ACM include sprayed fireproofing, acoustic/texture finish, and mechanical insulation. Typical examples of non-friable ACM include asbestos cement sheets or pipes, vinyl floor tiles, vinyl sheet flooring, drywall compound and asbestos textile products (curtains, vibration dampers). Typical examples of non-friable ACM, which might become friable during construction, include plaster and acoustic ceiling tiles.

2.2 Asbestos Assessment Exclusions

A number of possible non-friable materials which might contain asbestos were not sampled during our assessment. The materials, listed below, must be assumed to be asbestos-containing and are best sampled immediately prior to commencing renovation. These non-friable materials could not be sampled without causing significant damage to the material or building.

- components or wiring within motors or lights
- high voltage wiring
- mechanical packing, ropes and gaskets
- roofing, roofing felt and building paper

- mastics, adhesives and tar
- vermiculite above solid ceilings, inside masonry or other wall assemblies
- underground services or piping
- paper products used under flooring or under metal or slate roofing
- concrete levelling compound (for floors)

2.3 Asbestos Sampling Strategy and Frequency

Samples were collected at a rate that was in compliance with the requirements of O.Reg. 278/05, which states a minimum number of samples are to be collected and analyzed (1, 3, 5, or 7 depending on quantity, application and friability) from each area of homogeneous material for the material to be considered non-asbestos. This frequency is indicated in the table below. A homogeneous sampling area is defined by the U.S. Environmental Protection Agency (EPA) as containing material that is uniform in texture and appearance, was installed at one time and is unlikely to consist of more than one type or formulation of material. The surveyor used information obtained on site by visual examination, available information on the phases of the construction and information on renovations obtained from the client to determine the extent of each homogeneous area and the number of samples required.

Type of Material	Size of Area of Homogeneous Material	Minimum Number of Samples
Surfacing material, including without limitation material that is applied to surfaces by spraying, by troweling or otherwise, such as acoustical plaster on ceilings, fireproofing materials on structural members and plaster	Less than 90 square metres	3
	90 or more square metres, but less than 450 square metres	5
	450 or more square metres	7
Thermal insulation, except as described below	Any size	3
Thermal insulation patch	Less than 2 linear metres or 0.5 square metres	1
Other material	Any size	3

2.4 Basis of Evaluation and Recommendation

The condition of any ACM found was evaluated as well as the potential for disturbance of the ACM. These evaluation criteria were based on the conclusions of published studies, particularly the “Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario”, existing Ontario regulation, and our experience involving buildings that contain ACM.

An asbestos-containing material was considered damaged (Fair or Poor condition) if it is sprayed material that is delaminating, mechanical insulation with damaged/missing insulation or jacketing, non-friable materials that have been pulverized, exposed underpad on vinyl sheet flooring, etc., which causes it to become friable.

The priority for remedial action is based not only on the evaluation of condition but is also based on several other factors which include:

- Accessibility or potential for direct contact and disturbance which can cause release of asbestos to the air,
- Practicality of repair (for example will damage to the ACM continue even if it is repaired); and
- Efficiency of the work (for example if damaged ACM is being removed in an area it may be most practical to remove all ACM in the area even if it is in good condition).

Recommendations also include those that are mandatory regulated requirements, such as some provincial requirements for institution of an Asbestos Management Program, training, record keeping etc.

Refer to Appendix VII for a full description of the hazard assessment criteria and hazard assessment matrix.

2.5 Hazardous Materials Inventory System (HMIS) Data Sheets

Pinchin Environmental Ltd. collected information on a separate Hazardous Materials Inventory System (HMIS) field data collection sheet at each Location. This information was entered into our HMIS database.

On the HMIS data sheets, building materials found within the area or room are listed as being part of each of the following Building Systems:

- Floor,

- Ceiling,
- Wall,
- Structure,
- Pipe,
- Duct,
- Mechanical; and
- Other.

Each system is then categorized into particular Components of the Building System (e.g. Domestic Hot Water (Pipe), Exhaust Air (Duct)). Each Component is then sub-categorized to provide information under the following headings:

- *Item* that makes up the component e.g. pipe elbow or pipe fitting,
- *Material* that is present on or as the component,
- *Accessibility* of the component (ranks ranging from “accessible to all” to “inaccessible”, A-D),
- *Visible* within the room or obscured by other finishes (Yes or No),
- The *Covering* if present on the component (e.g. canvas jacket on pipe insulation),
- The *Condition* of the material (Good, Fair or Poor),
- Approximate *Quantity* of the material as appropriate (number of elbows, linear feet of pipe, square feet of material or percentage of material),
- The *Units* that apply to the quantity,
- The *Sample Number* that relates to the material,
- The *Type of Asbestos* in the Material,
- The *Action* required regarding the asbestos-containing material based on the action matrix provided in Appendix VII; and
- The *Friability* of the material (whether friable or non-friable). Refer to Appendix I for a definition.

The information presented in Appendix V is the collection of data sheets from the HMIS All Data Report. Appendix VI is a list of Asbestos Materials Requiring Remedial Action. Refer to

Appendix VII for a full description of the hazard assessment criteria, definitions of Condition, Access and Visibility, and the hazard assessment matrix.

2.6 Photographs

Photographs were not taken.

2.7 Drawings

The surveyor completed an HMIS field data collection sheet for each inspected room or homogenous area. Each room or area was identified with a uniquely assigned Location Number which is necessary to identify each part of the building, as not all rooms or areas have room numbers or documented names. Drawings detailing the Location Number that corresponds with the data sheet for each area or room have been provided in Appendix VIII. This allows the data sheet to be easily found by referencing the drawing for the Location Number, and eliminates the possibility of data being mistakenly attributed to incorrect areas.

Refer to the drawings in Appendix VIII for the area or room that corresponds with each Location Number.

3.0 FINDINGS

This section of the report summarizes the types of asbestos-containing materials present in the building. For full information on location, condition, access, etc. refer to HMIS Assessment - All Data Report presented in Appendix V.

All rooms or areas of the building were accessible to the surveyor.

3.1 Sprayed Fireproofing and Thermal Insulation

Sprayed fireproofing or sprayed thermal insulation was not found.

3.2 Texture Finishes (Acoustic/Decorative)

Texture finishes were not found.

3.3 Pipe Insulation

Parging cement was not found.

Non-asbestos fibreglass insulation is present on straight runs pipes in the building. There was no asbestos parging noted on the seams of the insulation at the locations inspected.

3.4 Duct Insulation

Ducts were not found.

3.5 Mechanical Equipment Insulation

Mechanical equipment was not found.

3.6 Acoustic Ceiling Tiles

Acoustic ceiling tiles were not found.

3.7 Vermiculite

Loose fill vermiculite was not found. Demolition of concrete block walls was not performed.

3.8 Plaster

Plaster finishes were not found.

3.9 Drywall Compound

Drywall and drywall compound was not found.

3.10 Asbestos Cement Products

No asbestos cement products were found.

3.11 Vinyl Sheet Flooring

Vinyl sheet flooring was not found.

3.12 Vinyl Floor Tile

Vinyl floor tiles were not found.

4.0 RECOMMENDATIONS

4.1 Remedial Recommendations

There are no materials requiring remedial action.

4.2 Long Term Recommendations

There are no long term recommendations.

5.0 LIMITATIONS

This report details the hazardous building materials found within or forming part of the building envelope. The assessment only included inspections of the structure and finishes, including mechanical equipment. The assessment did not include inspection of current or past owner or occupant articles within the building (i.e. process materials or equipment, portable equipment, curriculum items, etc.) and does not report on possible contaminants in the soil and groundwater of the site, underground storage tanks, buried piping, inside drums, vessels, production equipment, or in areas not accessed by the surveyor.

The work performed by Pinchin was conducted in accordance with generally accepted engineering or scientific practices current in this geographical area at the time the work was performed. The Client acknowledges that subsurface and concealed conditions may vary from those encountered or inspected. Pinchin can only comment on the environmental conditions observed on the date(s) the assessment is performed. The work is limited to those materials or areas of concern identified by the Client or outlined in our proposal. Other areas of concern may exist but were not investigated within the scope of this assignment.

Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issue, regulatory statutes are subject to interpretation and these interpretations may change over time. Pinchin accepts no responsibility for consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

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6.0 CLOSURE

Should there be any questions regarding the contents of this report, please contact Anthony Rakic at (905) 363-1370.

Yours Truly,

Pinchin Environmental Ltd.

Prepared by:

Reviewed by:

Original signed by...

Original signed by...

per: Bob Young
Project Manager
Hazardous Materials Group
byoung@pinchin.com

per: Anthony Rakic
Project Manager
Hazardous Materials Group
arakic@pinchin.com

J:\48000s\48689\Properties Phase 1\Reports\Park Buildings\48689 CofMiss Jack Darling Park Comfort Station West JDP2 HMIS Asbestos Assessment Report Feb 26 2009.doc

APPENDIX I

FRIABILITY AND REGULATIONS

1.0 FRIABILITY

As per regulation 278/05, a “friable material” means material that, (a) when dry, can be crumbled, pulverized or powdered by hand pressure, or (b) is crumbled, pulverized or powdered. Asbestos-containing materials (ACM) that are friable have a much greater potential than non-friable ACM to release airborne asbestos fibres when disturbed. The most common friable ACM used in the past are surfacing materials (usually sprayed fireproofing, texture, decorative or acoustic plaster) and thermal insulations on mechanical systems. Asbestos-containing manufactured materials include vinyl floor tiles, ceiling tiles, gasket materials, asbestos cement pipe or board, and asbestos textiles. Depending on the formulation these may be friable or non-friable. Note that though a product may be considered non-friable when new, if the product releases fine dust due to deterioration or during removal, the free dust is considered friable. For example, lay-in acoustic ceiling tiles or plaster may release significant dust at the time of removal.

2.0 REGULATIONS - ONTARIO

Each province has issued regulations or guidelines for control of work around asbestos in buildings and for the packaging and disposal of asbestos waste. The applicable regulations governing asbestos in *Ontario* are as follows:

The disturbance of asbestos-containing materials (ACM) on construction projects is controlled by Ontario Ministry of Labour Regulation 278/05 made under the Occupational Health and Safety Act (Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations). The Regulation classifies all disturbances as Type 1, Type 2, or Type 3, each of which has defined work practices. All ACM are subject to special handling and disposal, and must be removed before partial or full demolition. The Ministry of Labour must be notified prior to any project involving removal of more than a minor amount of friable ACM (Type 3 or Glove Bag abatement).

In addition to the requirements under the Occupational Health and Safety Act, Section 6 of the Ministry of Labour Regulations for Construction Projects (Regulation 213/91 as amended to O.Reg. 631/94) requires the contractor to report any Designated Substances likely to be used (asbestos is a Designated Substance), handled or disturbed during the project. This information is required when submitting the Notice of Project form.

Waste disposal is controlled by Ministry of the Environment Regulation, R.R.O. 1990 Reg. 347 as amended by 461/05.

APPENDIX II

RESULTS OF BULK SAMPLE ANALYSIS FOR ASBESTOS

NO INFORMATION FOR THIS APPENDIX

APPENDIX III
PHOTOGRAPHS

NO INFORMATION FOR THIS APPENDIX

APPENDIX IV
LOCATION SUMMARY

Client: City of Mississauga
Building Number(s): JDP2

Site: 48689

Location List

Building#	Loc #	Floor	Room Prefix	Room Number	Room Suffix	Room Name	No Access	Square Feet	Survey Date	Surveyor	Notes
JDP2	1	1				Pipe Chase		100	2008-12-01	Bob Young	
JDP2	2	1				Men's Washroom		300	2008-12-01	Bob Young	
JDP2	3	1				Women's Washroom		300	2008-12-01	Bob Young	

APPENDIX V

HMIS ASSESSMENT - ALL DATA REPORT

Building #: JDP2		Building Name: Jack Darling Park - Comfort Station West		Surveyor: Bob Young		Survey Date: 2008-12-01										
Location #: 1		Location Name: Pipe Chase		Floor: 1		Room #:		Square ft: 100								
System	Component	Material	Item	Covering	Access	Visible	Condition, Quantity & Action						Units	Sample	Hazard	Friability
							Good		Fair		Poor					
Floor		Dirt				A	Y							None		
Ceiling		None Found												None		
Walls		Masonry				A	Y							None		
Structure	Beam, Deck	Wood				C	Y							None		
Piping one	Domestic Water (Hot & Cold)	Fibreglass				A	Y							None		
Piping two	Drain	Not Insulated				A	Y							None		
Duct		None Found												None		
Mechanical Equipment		None Found												None		
Other		None Found												None		



Client: City of Mississauga

Site: 48689

Building Number(s): JDP2

All Data Report

Building #: JDP2		Building Name: Jack Darling Park - Comfort Station West		Surveyor: Bob Young		Survey Date: 2008-12-01									
Location #: 2		Location Name: Men's Washroom		Floor: 1		Room #:				Square ft: 300					
System	Component	Material	Item	Covering	Access	Visible	Condition, Quantity & Action					Units	Sample	Hazard	Friability
							Good		Fair		Poor				
Floor		Ceramic Tiles			A	Y								None	
Ceiling		None Found												None	
Walls		Masonry			A	Y								None	
Structure	Beam, Deck	Wood			C	Y								None	
Piping		None Found												None	
Duct		None Found												None	
Mechanical Equipment		None Found												None	
Other		None Found												None	

Building #: JDP2		Building Name: Jack Darling Park - Comfort Station West		Surveyor: Bob Young		Survey Date: 2008-12-01										
Location #: 3		Location Name: Women's Washroom		Floor: 1		Room #:				Square ft: 300						
System	Component	Material	Item	Covering	Access	Visible	Condition, Quantity & Action					Units	Sample	Hazard	Friability	
							Good		Fair		Poor					
Floor		Ceramic Tiles				A	Y									None
Ceiling		None Found													None	
Walls		Masonry				A	Y									None
Structure	Beam, Deck	Wood				C	Y									None
Piping		None Found													None	
Duct		None Found													None	
Mechanical Equipment		None Found													None	
Other		None Found													None	

All Data Report

Legend:

Action			Access		Condition		Sample Number		
(1)	Clean Up of ACM Debris	(2)	Precautions for Access Which may Disturb ACM Debris	A	Accessible to all building occupants	Good	No visible damage or deterioration.	S####	Sample collected
(3)	ACM removal	(4)	Precautions for Work Which may Disturb ACM in Poor Condition	B	Accessible to maintenance and operations staff without a ladder	Fair	Minor, repairable damage, cracking or deterioration.	V####	Material is visually identified to be identical to S###
(5)	Proactive ACM removal (Minimum repair required for fair condition)	(6)	ACM repair	C	Accessible to maintenance and operations staff with a ladder. Also rarely entered, locked areas	Poor	Irreparable damage or deterioration with exposed and missing material	V0000	Known non-asbestos material
(7)	Management program and surveillance			D	Not normally accessible or without demolition	NOTE: See report for full definitions of action, access and condition		V9000	Material is visually identified to contain asbestos
								V9500	Material is presumed to contain asbestos
NOTE: Actions in round brackets () are auto-calculated. Actions in square brackets [] are manual								Note: Presumed various materials identified in the report are ACM if not sampled.	

Units

SF - Square feet

LF - Linear feet

EA - Each

% - Percentage

APPENDIX VI

**HMIS ASSESSMENT DATA – ASBESTOS MATERIALS REQUIRING REMEDIAL
ACTION**

NO INFORMATION FOR THIS APPENDIX

APPENDIX VII

HMIS ASBESTOS ASSESSMENT MATRIX

1.0 EVALUATION CRITERIA AND BASIS OF RECOMMENDATIONS

The detailed asbestos assessment provides information regarding the location, condition, accessibility and friability of the Asbestos-Containing Materials (ACM) used in the construction of the building. In order to make recommendations for compliance with current regulations, Pinchin Environmental Ltd. (Pinchin) developed the ACM evaluation criteria based on the conclusions of published studies, particularly the "Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario", and our experience involving buildings that contain ACM.

2.0 EVALUATION OF CONDITION

2.1 Friable Spray Applied Fireproofing, Insulation and Texture Finishes (Surfacing Materials)

To evaluate the condition of ACM sprayed or trowelled fireproofing, sprayed or trowelled thermal insulation (non-mechanical), or texture, decorative or acoustic finishes, the following criteria are applied:

Good	Surface of material shows no significant signs of damage, deterioration or delamination. Good condition includes unencapsulated or unpainted fireproofing or texture finishes, where no delamination or damage is observed, or encapsulated fireproofing or texture finishes where the encapsulant or paint has been applied after the damage or fallout occurred.
Poor	A sprayed material that shows signs of significant damage or is significantly delaminating or deteriorating. This may be limited to surface delamination or some portion of the substrate may be exposed.

In observation areas where damage exists in isolated locations, both good and poor condition may be applicable. The extent or percentage of each condition will be recorded. Fair condition is not utilized in the evaluation of ACM sprayed or trowelled fireproofing, sprayed or trowelled thermal insulation (non-mechanical), or texture, decorative or acoustic finishes.

The evaluation of sprayed or trowelled fireproofing, sprayed or trowelled thermal insulation (non-mechanical insulation), or texture, decorative or acoustic finishes which are present above ceilings, may be limited by the number of observations made, and by building components such as ducts or full height walls that obstruct the above ceiling observations.

2.2 Friable Mechanical Insulation (Thermal System Insulation (TSI))

To evaluate the condition of ACM mechanical insulation (on vessels, boilers, breeching, ducts, pipes, fan units, equipment etc.) the following criteria are applied:

Good	Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor damage (i.e. scuffs or stains), but the jacketing is not penetrated.
Fair	Minor penetrating damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that had never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges from minor to none. Damage can be repaired.
Poor	Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired. Includes components where TSI may have been removed incompletely.

The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. It is often not possible to observe each foot of mechanical insulation from all angles.

2.3 Potentially Friable Materials (Miscellaneous Friable Materials)

Potentially friable ACM are products that are basically non-friable while in place, but have the potential to generate friable dust upon removal or if significantly disturbed without appropriate procedures. These products may become friable, but are not used as Spray Applied Fireproofing, Insulation or Texture Finishes or Mechanical Insulation. Potentially Friable Materials include materials such as acoustic ceiling tiles and plaster. The use of the description Fair with regard to a potentially friable ACM may reflect their physical condition and not their tendency to release fibres to the air under normal use. To evaluate the condition of Potentially Friable Materials, the following criteria are applied:

Good	No significant damage or deterioration. Condition is at or near to the condition when it was installed. Still serving its intended use as a building material or finish.
Fair	Showing signs of some cracking or breakage, but is not deteriorating (e.g. cracked plaster, broken but in place ceiling tile, etc). The condition is such that it is still serving its intended use as a building material or finish but may require repair for mainly cosmetic purposes.

Poor	Significant deterioration or breaking apart of the material. Material has deteriorated to the point it is not serving its intended use as building material or finish. Material has deteriorated to a point it has become friable. Normally potentially friable ACM in Poor condition is not repairable and requires at least localized removal and replacement.
-------------	--

2.4 Non-friable Materials

Non-friable ACM cover a wide range of products with a wide variation in their tendency to release dust or asbestos fibres to the air. Many of these materials, (particularly where the matrix is an unweathered bitumen, asphalt or tar material) do not release fibres except in very unusual circumstances or during significant disturbance (e.g. use of power tools). Others with a cementitious matrix (asbestos-cement products) can more readily release dust due to abrasion, demolition, weathering, etc. The potential for asbestos release from non-friable ACM is always lower than from friable ACM. Therefore the use of the descriptions Fair or Poor in regard to a non-friable ACM reflects only their physical condition and not their tendency to release fibres to the air under normal use or when disturbed. To evaluate the condition of Non- Friable Materials, the following criteria are applied:

Good	No significant damage or deterioration. Condition is at or near to the condition when it was installed. Still serving its intended use as a building material or finish.
Fair	Showing signs of some cracking or damage but has not deteriorated. Such change in condition may be repairable. The condition is such that it is still serving its intended use as a building material or finish and does not require repair or removal from an asbestos hazard perspective.
Poor	Significant deterioration or breaking apart of the material to the point at which it cannot be repaired and it will require at least local removal. Material has deteriorated to the point it is not serving its intended use as building material or finish. Material may have deteriorated to a point where traffic or disturbance may cause it to become friable. Non-friable ACM in poor condition may, but does not necessarily, indicate the material is friable, or pose a risk of fibre release if disturbed.

2.5 Evaluation of ACM Debris

The identification of the exact location or presence of debris on the top of ceiling tiles is limited by the number of observations made and the presence of building components such as ducts or full height walls that obstruct observations.

The presence of fallen or dislodged ACM is noted separately from the ACM source and is referred to as Debris. Debris may be friable if from a friable ACM source or a badly deteriorated non-friable ACM source. Debris may also be non-friable (such as fallen pieces of transite sheet or mastic fittings, or broken, dislodged floor tiles).

Debris	Debris may be friable or non-friable, but is always identified as debris.
---------------	---

2.6 Evaluation of Presumed Asbestos-Containing Material (PACM)

Presumed Asbestos-Containing Materials (PACM), are building materials that may contain asbestos but were not sampled or analyzed due to inaccessibility or the need to perform destructive testing to obtain a reasonable sample set. Evaluation of these materials is based on the assumption that these PACM are asbestos-containing.

A list of PACM is provided in this Report and they are generally not included in the detailed room by room reports. Typically they are excluded because they are inaccessible or present in very small quantities. If PACM are evaluated, Pinchin used the criteria that correspond with the type (and friability) of the material listed above.

3.0 EVALUATION OF ACCESSIBILITY

The accessibility of building materials known or suspected of being ACM is rated according to the following criteria:

Access (A)	Common areas of the building within reach of all building users (approximately 8' - 9' from floor or standard ceiling height). Includes other areas where occupant activities may result in disturbance of material that is not normally within reach from floor level, but may be disturbed by common activities (e.g. gymnasiums, workshops, warehouses)
Access (B)	Areas of the building accessed primarily by Maintenance/Caretaking/Janitorial Staff and within reach without use of a ladder. Includes areas within reach in Boiler Rooms, Electrical Rooms, Janitors Closets, Elevator Rooms, Mechanical Rooms, etc. Includes materials within reach from fixed ladders or catwalks, mezzanines, and accessible pipe chases.

Access(C) and Visible	Areas of the building above 8'-9' where use of a ladder or scaffold is required to reach the ACM. Only includes ACM that are visible to view without the removal or opening of other building components such as ceiling tiles or service access panels. Visible column on HMIS sheets will say YES.
Access (C) and not Visible	Areas of the building above 8'-9' where use of a ladder or scaffold is required to reach the ACM. Includes ACM that are not visible to view and require the removal of a building component, such as ceilings tiles or access panels to view and access. Includes rarely entered crawl spaces, attic spaces, etc. Observations will be limited to the extent visible from the access points. Visible column on HMIS sheets will say NO.
Access (D)	Areas of the building behind inaccessible solid ceiling systems, walls or equipment etc. where demolition of the ceiling, wall or equipment etc. is required to reach the ACM. Material inaccessible due to height or location or is only reached under unusual situations. Evaluation of condition and extent of ACM is limited or impossible, depending on the surveyor's ability to visually examine materials in access D.

4.0 ACTION MATRIX AND DEFINITIONS

Pinchin's evaluation of the viability of a specific asbestos control option is based on the consideration of the friability, condition, accessibility and visibility of a material. The logic used is that damaged ACM located in an area frequently accessed by all building occupants is of a higher priority than damaged ACM located in an infrequently accessed service area. The action matrix considers the potential for fibre release (primarily from friable ACM) and the possible concerns from regulatory bodies and many building occupants to all damaged ACM (including non-friable).

In any building with asbestos, many current regulations require an Asbestos Management Program be implemented. Depending on the condition and the accessibility, more active measures such as repair or removal may be recommended. The following matrix provides guidance for recommended Actions in the absence of renovation or demolition. In the event of construction or maintenance activity which will disturb ACM more aggressive control or removal will be required.

4.1 Action Matrix

The following tables outline the **action** decisions based on the relationship of **access** and **condition**. Table I applies to friable ACM. Table II applies to non-friable ACM.

Table I Decision Matrix for Friable ACM

Access	Condition			Debris
	Good	Fair	Poor	
(A)	Action 5 ¹	Action 5 ²	Action 3	Action 1
(B)	Action 7	Action 6 ³	Action 3	Action 1
(C) Visible	Action 7	Action 6	Action 3	Action 2
(C) Not Visible	Action 7	Action 7	Action 4	Action 2
(D)	Action 7	Action 7	Action 7	Action 7

Table II Decision Matrix for Non-Friable ACM

Access	Condition			Debris
	Good	Fair	Poor	
(A)	Action 7	Action 7 ⁴	Action 3	Action 1
(B)	Action 7	Action 7	Action 3	Action 1
(C) Visible	Action 7	Action 7	Action 4	Action 2
(C) Not Visible	Action 7	Action 7	Action 4	Action 2
(D)	Action 7	Action 7	Action 7	Action 7

¹ If friable ACM in access (A)/Good condition is not proactively removed Action 7 (Manage) is recommended.

² If friable ACM in access (A)/Fair condition is not proactively removed repair is recommended.

³ If friable ACM in access (B)/Fair condition is likely to be disturbed after repair proactive removal is recommended.

⁴ Action 7 is recommended for all non-friable ACM in Fair condition however some clients may wish to repair or take some action primarily for cosmetic reasons

4.2 Action Definitions

The following are the definitions in the Action Matrix Table presented above:

ACTION DEFINITIONS	
Action 1	<p>Clean-Up of ACM Debris</p> <p>Restrict access that is likely to cause a disturbance of the ACM Debris and clean up ACM Debris. Utilize appropriate asbestos precautions.</p>
Action 2	<p>Precautions for Access Which may Disturb ACM Debris</p> <p>Use appropriate means to isolate the debris or to limit entry to the area which may disturb the material. At locations where ACM Debris can remain in place in lieu of removal or clean-up (e.g. Debris on top of ceiling tiles or behind lockable door), Utilize appropriate asbestos precautions to enter the area if this will disturb debris. The precautions will be required until the ACM Debris has been cleaned up.</p>
Action 3	<p>ACM Removal</p> <p>Remove ACM. Utilize asbestos procedures appropriate to the scope of the removal work. Until it is removed, restrict access to the material so it is not disturbed.</p>
Action 4	<p>Precautions for Work Which may Disturb ACM in Poor Condition</p> <p>Utilize appropriate asbestos precautions if ACM may be disturbed by work on or near ACM. This does not require restricting access to the area, only control of work which may contact or disturb the ACM. Removal is the only viable option if work will disturb ACM.</p>
Action 5	<p>Proactive ACM Removal</p> <p>Remove friable ACM where the presence of friable asbestos in Good condition is not desirable. If friable ACM in Fair condition is not removed then Repair friable ACM</p>
Action 6	<p>ACM Repair</p> <p>Repair friable ACM in Fair condition which is not likely to be damaged again or disturbed by normal use of the area or room. Pinchin recommends proactive removal if friable ACM is likely to be damaged or disturbed during normal use of the area or room</p>
Action 7	<p>Asbestos Management Program with Routine Surveillance</p> <p>Implement an Asbestos Management Program, including routine surveillance of ACM. Reassess materials regularly (typically once per year).</p>

APPENDIX VIII

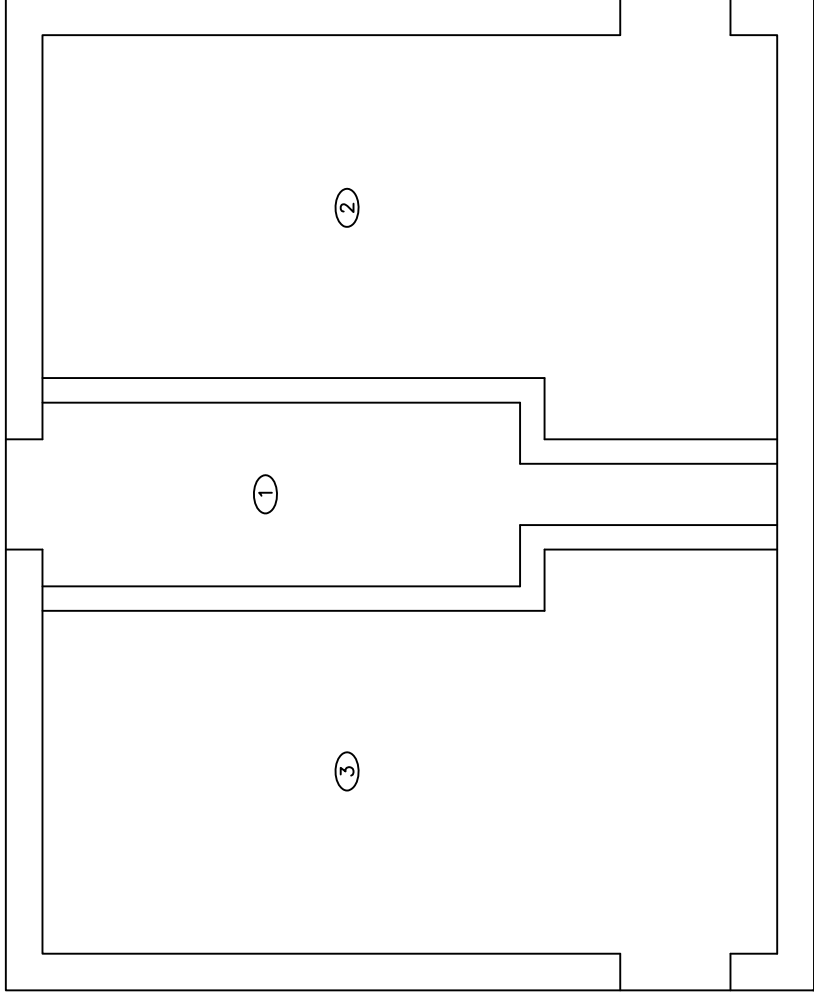
DRAWINGS



LEGEND



PINCHIN LOCATION NUMBER



2470 Milltower Court
Mississauga, Ontario
Phone: 1 888 767 3330

PROJECT NAME

CITY OF MISSISSAUGA
JDP2-JACK DARLING
COMFORT STATION WEST

DRAWING NAME

GROUND FLOOR

PROJECT NUMBER 48689
REVISION NUMBER —

DRAWN BY AXR
CHECKED BY —
SCALE NTS
DRAWING NUMBER

DATE 2009/01/09
1 of 1



December 5, 2024

City of Mississauga
300 City Centre Drive
Mississauga, Ontario, L5C 3B1

Re: Hazardous Building Materials Assessment (Preconstruction)

Jack Darling Memorial Park Comfort Station, 1180 Lakeshore Road West, Mississauga, ON
Pinchin File: 349292.000

City of Mississauga (Client) retained Pinchin Ltd. (Pinchin) to conduct a hazardous building materials assessment of Comfort Station in Jack Darling Memorial Park located at 1180 Lakeshore Road West, Mississauga, Ontario.

Pinchin performed the assessment on November 1, 2024 and completed testing of roofing materials on December 4, 2024. The assessor was unaccompanied during the assessment. The assessed area was vacant at the time of the assessment.

The objective of the assessment was to identify specified hazardous building materials in preparation for demolition activities. The proposed work as identified by the Client includes complete demolition of the building.

The **assessed area** consisted of all areas of the building.

1.0 SUMMARY OF FINDINGS

- Asbestos-containing materials were not identified.
- No lead-containing paints and coatings were identified.
- Crystalline silica is present in concrete and other materials such as masonry.
- Mercury vapour is present in lamp tubes
- PCBs may be present in light ballasts.
- No mould or water damage was identified.

2.0 RECOMMENDATIONS

2.1 General

If suspected hazardous building materials are discovered during the planned work, which are not identified in this report, do not disturb, and arrange for further testing and evaluation.



Provide this report to the contractor prior to bidding or commencing work.

Retain a qualified consultant to specify, observe and document the successful removal of hazardous materials.

2.2 Remedial Work

Remedial work is not required.

2.3 Project Work

The following recommendations are made regarding demolition involving the hazardous materials identified.

2.3.1 Silica

Construction disturbance of silica-containing products may result in excessive exposures to airborne silica, especially if performed indoors and dry. Cutting, grinding, drilling or demolition of materials containing silica should be completed only with proper respiratory protection and other worker safety precautions that comply with applicable regulations and guidelines.

2.3.2 Mercury

Do not break lamps. Recycle and reclaim mercury from fluorescent lamps when taken out of service. Mercury is classified as a hazardous waste and must be disposed of in accordance with applicable regulations.

2.3.3 PCBs

Prior to demolition, remove light fixtures and examine light ballasts for PCB content. If ballasts are not clearly labelled as “non-PCB” or are suspected to contain PCBs, package, and ship ballasts for destruction at a federally permitted facility.

3.0 BACKGROUND INFORMATION

3.1 Assessed Area Description Summary

Description Item	Details
Building Use	Public Washrooms
Floors Above Grade	1
Floors Below Grade	N/A
Total Area (square feet)	700
Year of Construction	1979
Additions	N/A



Description Item	Details
Structure	Masonry
Exterior Cladding	Brick
HVAC	N/A
Roof	Sloped Shingled Roof
Flooring	Concrete with Epoxy
Wall and Ceiling Finishes	Wood, Concrete Block

3.2 Existing Reports

Pinchin reviewed the following reports and included relevant results as appropriate:

- “HMIS Asbestos Assessment Jack Darling Park Comfort Station West- JDP2” 1180 Lakeshore Road West, Mississauga, Ontario. Dated February 26th, 2009, Pinchin File:48689

4.0 FINDINGS

Any quantities listed in this report or data tables are estimated based on visual approximations only and are subject to variation.

4.1 Asbestos

The following table summarizes the materials evaluated for asbestos in the assessed area. For details on approximate quantities, condition, friability, accessibility, and locations of hazardous building materials; refer to the Hazardous Material Summary / Sample Log and All Data Report in Appendices V and VI.

Sample Number	Material Description	Type of Asbestos	Confirmed Hazard	Total Quantity Present
S0001 ABC	Wall Paint On block wall	None Detected	No	1000 SF
S0002 ABC	Floor Epoxy	None Detected	No	2000 SF
S0003 ABC	Other Caulking Off white	None Detected	No	75 LF
S0004ABC	Other Tar Paper On roof under shingles	None Detected	No	700 SF

4.1.1 Excluded Asbestos Materials

The following is a list of materials which may contain asbestos and were excluded from the assessment.



These materials are presumed to contain asbestos until otherwise proven to be non-asbestos by sampling and analysis:

- Ropes and gaskets in cast-iron bell and spigot joints
- Sealants on pipe threads

4.2 Lead

Refer to the Hazardous Material Summary / Sample Log and All Data Report in Appendices V and VI for details on locations, condition and approximate quantities on paints sampled and their locations.

The following table summarizes the analytical results of paints sampled.

Sample Number	Material Description	Concentration	Confirmed Hazard	Total Quantity Present
L0001	Wall Masonry Off white	0.0063%	No	2000 SF

General Notes:

Paints containing lead less than 0.009% (90 mg/kg) are assumed to be insignificant relating to potential exposure from construction disturbance.

4.2.1 Lead Products and Applications

Lead Products and Applications were not identified during the assessment.

4.2.2 Excluded Lead Materials

Lead may be present in a number of materials which were not assessed and/or sampled. The following materials, where found, should be considered to contain lead: electrical components, including wiring connectors, grounding conductors, and solder.

4.3 Silica

Crystalline silica is a presumed component of the following materials:

- Poured and pre-cast concrete
- Masonry and mortar

4.4 Mercury

Refer to the Hazardous Material Summary / Sample Log and All Data Report in Appendices V and VI for details on mercury-containing products including their locations and quantities.



Sample Number	Material Description	Confirmed Hazard	Total Quantity Present
V9500	Light Fixture	Yes	6 EA

General Notes:

Items identified as Sample Number V9500 were observed to be present but could not be definitively determined to contain mercury (e.g., inaccessible lamps and thermostats).

4.5 Polychlorinated Biphenyls

Refer to the Hazardous Material Summary / Sample Log and All Data Report in Appendices V and VI for details on PCB-products including their locations and quantities.

Sample Number	Material Description	Concentration	Confirmed Hazard	Total Quantity Present
P0001	Caulking Off White	<0.2mg/kg	No	50 LF
V9500	Light Ballasts		Yes	6 EA

General Notes:

PCBs were banned in 1980; however, are found to be present in caulking and sealants until 1985.

Caulking highlighted in the table above is considered non-PCB solid based on the threshold (50 mg/kg or ppm).

Materials identified as Sample Number V9500 were either observed to be present or based on the construction of the building/equipment are likely present in concealed locations. These materials have not been sampled and are presumed to contain PCBs based on historical known use (e.g. concealed ballasts of fluorescent fixtures with T12 tubes). Sampling of these materials may be completed prior to disturbance.

4.6 Mould and Water Damage

Visible mould growth and water damage was not found during the assessment.

5.0 METHODOLOGY

For the purpose of the assessment and this report, hazardous building materials are defined as follows:

- Asbestos
- Lead
- Silica
- Mercury

- Polychlorinated Biphenyls (PCBs)
- Mould and Water Damage
- Ozone Depleting Substances (ODS)

Arsenic, acrylonitrile, benzene, coke oven emissions, ethylene oxide, isocyanates and vinyl chloride monomer are not typically found in building materials in a composition/state that is hazardous and were not included in this assessment.

Pinchin conducted a room-by-room assessment to identify the hazardous building materials as defined in the scope.

The assessment was performed to establish the type of specified hazardous building materials, locations and approximate quantities incorporated in the structure(s) and its finishes.

The assessment included demolition of wall and ceiling finishes Concrete Block to view concealed conditions at representative areas as permitted by the current building use. Destructive testing of flooring was conducted where possible (Epoxy flooring, demolition of exterior building finishes, masonry walls (chases, shafts etc.), and structural surrounds was conducted as permitted by the current building use.

Limited demolition of masonry block walls (core holes) was conducted to investigate for loose fill vermiculite insulation. Sampling of roofing materials was conducted.

For further details on the methodology including test methods and evaluation criteria, refer to Appendix III.

6.0 REFERENCES

The following legislation and documents were referenced in completing the assessment and this report:

1. Asbestos on Construction Projects and in Buildings and Repair Operations, Ontario Regulation 278/05.
2. Designated Substances, Ontario Regulation 490/09.
3. Lead on Construction Projects, Ministry of Labour Guidance Document.
4. The Environmental Abatement Council of Canada (EACC) Lead Guideline for Construction, Renovation, Maintenance or Repair.
5. Ministry of the Environment Regulation, R.R.O. 1990 Reg. 347 as amended.
6. Ministry of the Environment Regulation, R.R.O. 1990 Reg. 362 as amended.
7. Silica on Construction Projects, Ministry of Labour Guidance Document.
8. Alert – Mould in Workplace Buildings, Ontario Ministry of Labour.
9. PCB Regulations, SOR/2008-273, Canadian Environmental Protection Act.



10. Surface Coating Materials Regulations, SOR/2016-193, Canada Consumer Product Safety Act.
11. Consolidated Transportation of Dangerous Goods Regulations, including Amendment SOR/2019-101, Transportation of Dangerous Goods Act.
12. Mould Guidelines for the Canadian Construction Industry, Standard Construction Document CCA 82 – 2004 (Revised 2018), Canadian Construction Association.
13. Ozone-depleting Substances and Halocarbon Alternatives Regulations, SOR/2016-137.

7.0 LIMITATIONS

This work was performed subject to the Terms and Limitations presented or referenced in the proposal for this project.

Information provided by Pinchin is intended for Client use only. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law. Any use by a third party of reports or documents authored by Pinchin or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.

8.0 CLOSURE

The data presented in the appendices is prepared by Pinchin's Hazardous Materials Inventory System (HMIS). The information can be made available for your real-time access through our secure web-based platform. Please contact your Pinchin representative to discuss HMIS solutions for management of your asbestos (and other hazardous materials) inventory.

Contact the Project Manager, Anthony Rakic at 905.363.1370 or arakic@pinchin.com should you have any questions.

Sincerely,

Pinchin Ltd.

Prepared by:

Project Managed Reviewed by:

Conor Keay
Project Technologist

Anthony Rakic, PMP, EP
Senior Client Manager



Reviewed by:

Trudy Kim, M. Sc., EP

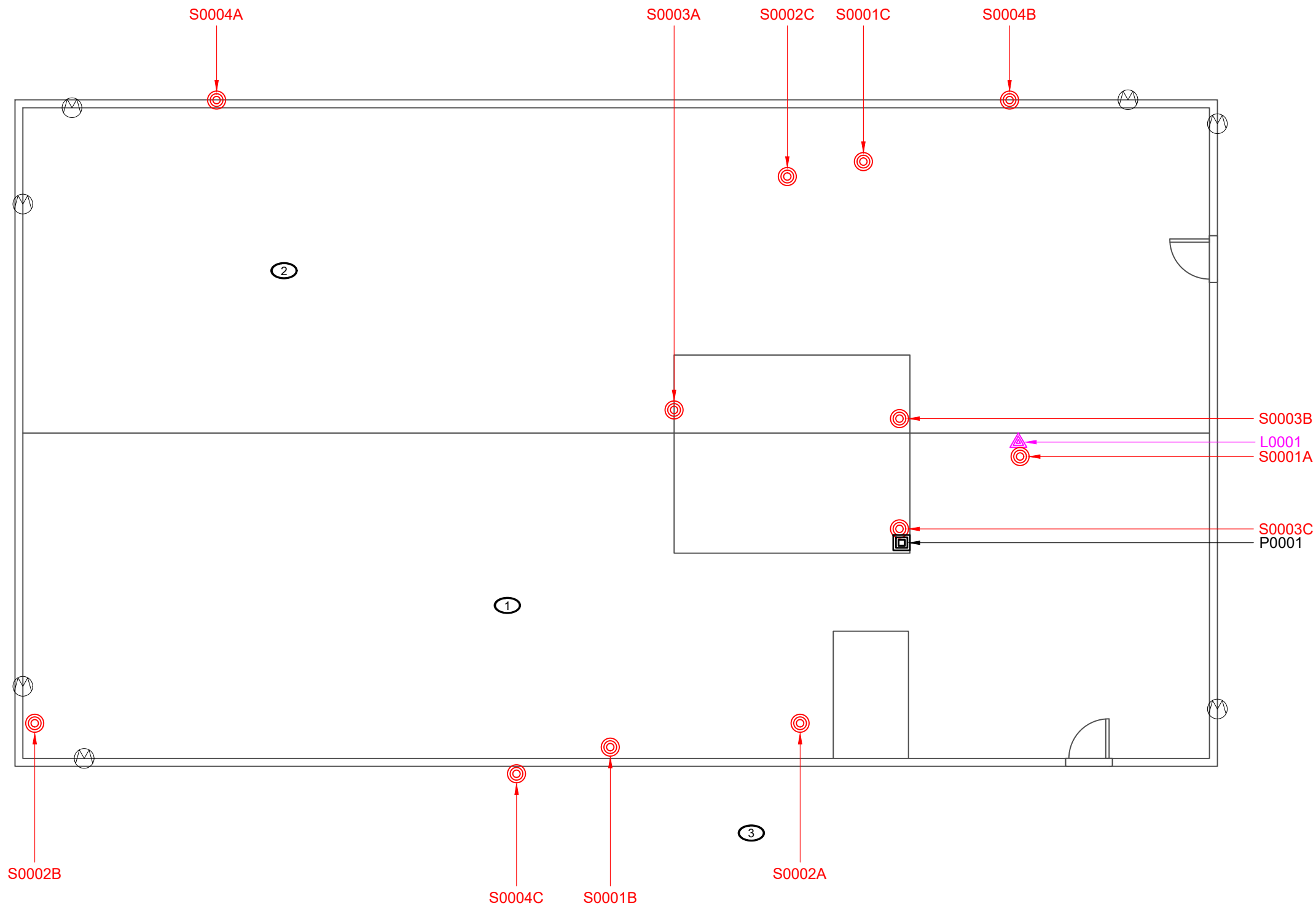
Team Leader / Senior Project Manager

Encl:	APPENDIX I	Drawings
	APPENDIX II-A	Asbestos Analytical Certificates
	APPENDIX II-B	Lead Analytical Certificates
	APPENDIX II-C	PCB Analytical Certificates
	APPENDIX III	Methodology
	APPENDIX IV	Location Summary Report
	APPENDIX V	Hazardous Materials Summary Report / Sample Log
	APPENDIX VI	All Data Report
	APPENDIX VII	Photographs






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Template: Master Template HBMA PreConstruction, HMIS, HAZ, August 15, 2024

APPENDIX I
Drawings



LEGEND

-  PINCHIN LOCATION NUMBER
-  ASBESTOS BULK SAMPLE
-  LEAD BULK SAMPLE
-  PCB BULK SAMPLE
-  VERMICULITE DRILLHOLE

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.



PROJECT NAME:
PRE DEMOLITION
HAZARDOUS BUILDING
MATERIALS ASSESSMENT

CLIENT NAME:
CITY OF MISSISSAUGA

PROJECT LOCATION:
1180 LAKESHORE ROAD WEST,
MISSISSAUGA, ONTARIO

FIGURE NAME:
MAIN FLOOR

PROJECT NUMBER: 349292	SCALE: NOT TO SCALE
---------------------------	------------------------

DRAWN BY: KU	REVIEWED BY: CK
-----------------	--------------------

DATE: NOVEMBER 2024	FIGURE NUMBER: 1 OF 1
------------------------	--------------------------

APPENDIX II-A
Asbestos Analytical Certificates



Pinchin Ltd. Asbestos Laboratory *Certificate of Analysis*

Project Name: City Of Mississauga , Ontario
Project No.: 0349292.000
Prepared For: C. Keay

Lab Reference No.: b327028
Analyst(s): C. Luong

Date Received:	November 5, 2024	Samples Submitted:	9
Date Analyzed:	November 11, 2024	Phases Analyzed:	13

The Pinchin Ltd. Mississauga asbestos laboratory is accredited by the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP Lab Code 101270-0) for the 'EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples,' and the 'EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials'; and meets all requirements of ISO/IEC 17025:2017. The Pinchin asbestos laboratory uses the aforementioned methods of analysis for all bulk materials. Please be advised that bulk materials do not include debris, dust, and tape-lift samples, and the analysis and reporting of these materials does not conform with Pinchin Ltd.'s NVLAP accreditation.

Bulk samples are checked visually and scanned under a stereomicroscope. Slides are prepared and observed under a Polarized Light Microscope (PLM) at magnifications of 40X, 100X or 400X as appropriate. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the percentage of asbestos present. A reported concentration of less than (<) the regulatory threshold indicates the presence of confirmed asbestos in trace quantities, limited to only a few fibres or fibre bundles in an entire sample. This method complies with provincial regulatory requirements where applicable. Multiple phases within a sample are analyzed and reported separately.

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three months. Samples may be retrieved, upon request, for re-examination at any time during that period.

This report relates only to the items tested.

This report relates only to the items tested and is valid only when signed with a protected, authorized, electronic signature. This report may not be reproduced, except in full, without the written approval of Pinchin Ltd. The client may not use this report to claim product endorsement by NVLAP or any agency of the U.S. Government. Internal verification studies, quality assurance / control data and laboratory documentation on measurement uncertainty are available upon request.



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: City Of Mississauga , Ontario
Project No.: 0349292.000
Prepared For: C. Keay

Lab Reference No.: b3 27028
Date Analyzed: November 11, 2024

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S0001A Wall,Paint,On Block Wall,Loc:1,Wome n's Washroom	Non-homogeneous , grey and yellow, coating material.	None Detected	Non-Fib rous Material > 75%
S0001B Wall,Paint,On Block Wall,Loc:1,Wome n's Washroom	Non-homogeneous , grey and yellow, coating material.	None Detected	Non-Fib rous Material > 75%
S0001C Wall,Paint,On Block Wall,Loc:2,Men's Washroom	Non-homogeneous , grey and yellow, coating material.	None Detected	Non-Fib rous Material > 75%
S0002A FloorLoc:1,Women's Washroom	2 Phases: a) Homogeneous, multicoloured, consolidated , flooring material.	None Detected	Non-Fib rous Material > 75%
	b) Homogeneous, black, consolidated material under coating material.	None Detected	Non-Fib rous Material > 75%
Comments:	Ceramic tile is present on the surface of this sample .		
S0002B FloorLoc:1,Women's Washroom	3 Phases: a) Homogeneous, dark grey, hard, cementitious material.	None Detected	Non-Fib rous Material > 75%
	b) Homogeneous, multicoloured, consolidated , flooring material.	None Detected	Non-Fib rous Material > 75%
	c) Homogeneous, black, consolidated material under coating material.	None Detected	Non-Fib rous Material > 75%
Comments:	Ceramic tile is present on the surface of this sample .		



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: City Of Mississauga , Ontario
Project No.: 0349292.000
Prepared For: C. Keay

Lab Reference No.: b3 27028
Date Analyzed: November 11, 2024

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S0002C FloorLoc:2,Men's Washroom	2 Phases: a) Homogeneous, multicoloured, consolidated, flooring material.	None Detected	Non-Fibrous Material > 75%
	b) Homogeneous, black, consolidated material under coating material.	None Detected	Non-Fibrous Material > 75%
Comments:	Ceramic tile is present on the surface of this sample.		
S0003A Caulking, Off White,Loc:2,Men's Washroom	Homogeneous, white, rubbery, caulking material.	None Detected	Non-Fibrous Material > 75%
S0003B Caulking, Off White,Loc:2,Men's Washroom	Homogeneous, white, rubbery, caulking material.	None Detected	Non-Fibrous Material > 75%
S0003C Caulking, Off White,Loc:1,Women's Washroom	Homogeneous, white, rubbery, caulking material.	None Detected	Non-Fibrous Material > 75%

Reviewed by:

Digitally signed by
Pinchin Ltd.
Date: 2024.11.12
13:09:52-05'00'

Page 3 of 3

Reporting Analyst:

Digitally signed
by Pinchin Ltd.
Date: 2024.11.12
13:10:01-05'00'

Analyzed by: 

Reviewed by:

Report Sent by:

Pinchin Ltd. - Asbestos Laboratory Internal Asbestos Bulk Sample Chain of Custody

Special Instructions:

Client Name:	City Of Mississauga	Project Address:	Ontario
Portfolio/Building No:		Pinchin File:	349292
Submitted by:	Conor keay	Email:	ckeay@pinchin.com
CC Results to:	Anthony Rakic	CC Email:	arakic@pinchin.com
Date Submitted:	November 4 2024	Required by:	November 10 2024
# of Samples:	9	Priority:	5 Day Turnaround
Year of Building Construction (Mandatory, Years ONLY):	1979		
Do NOT Stop on Positive (Sample Numbers):			
Pinchin Group Company (Mandatory Field):	Pinchin		
HMIS2 Building Reference #:	141556/202410164176990		
To be Completed by Lab Personnel Only: 6327628			
Lab Reference #:		Time:	24 hour clock
Received by:	NOV 8 5 2024	Date:	Month Day Year
Name(s) of Analyst(s):			NOV 11 2024
Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0001	A	Wall,Paint,On Block Wall,Loc:1,Women's Washroom NO
S	0001	B	Wall,Paint,On Block Wall,Loc:1,Women's Washroom NO
S	0001	C	Wall,Paint,On Block Wall,Loc:2,Men's Washroom NO
S	0002	A	FloorLoc:1,Women's Washroom a) NO b) NO
S	0002	B	FloorLoc:1,Women's Washroom a) NO b) NO c) NO
S	0002	C	FloorLoc:2,Men's Washroom a) NO b) NO

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0003	A	Caulking, Off White, Loc:2, Men's Washroom NO
S	0003	B	Caulking, Off White, Loc:2, Men's Washroom NO
S	0003	C	Caulking, Off White, Loc:1, Women's Washroom NO



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: City of Mississauga, ON
Project No.: 0349292.000
Prepared For: J. Greco

Lab Reference No.: b328654 Revision 1
Analyst(s): N. Barinque

Date Received:	December 4, 2024	Samples Submitted:	3
Date Analyzed:	December 5, 2024	Phases Analyzed:	18

The Pinchin Ltd. Mississauga asbestos laboratory is accredited by the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP Lab Code 101270-0) for the 'EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples,' and the 'EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials'; and meets all requirements of ISO/IEC 17025:2017. The Pinchin asbestos laboratory uses the aforementioned methods of analysis for all bulk materials. Please be advised that bulk materials do not include debris, dust, and tape-lift samples, and the analysis and reporting of these materials does not conform with Pinchin Ltd.'s NVLAP accreditation.

Bulk samples are checked visually and scanned under a stereomicroscope. Slides are prepared and observed under a Polarized Light Microscope (PLM) at magnifications of 40X, 100X or 400X as appropriate. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the percentage of asbestos present. A reported concentration of less than (<) the regulatory threshold indicates the presence of confirmed asbestos in trace quantities, limited to only a few fibres or fibre bundles in an entire sample. This method complies with provincial regulatory requirements where applicable. Multiple phases within a sample are analyzed and reported separately.

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three months. Samples may be retrieved, upon request, for re-examination at any time during that period.

This report relates only to the items tested.

Revision History:

Revision 1 (2024-12-05)	Changed sample numbers S0001A-C to S0004A-C.
-------------------------	--

This report relates only to the items tested and is valid only when signed with a protected, authorized, electronic signature. This report may not be reproduced, except in full, without the written approval of Pinchin Ltd. The client may not use this report to claim product endorsement by NVLAP or any agency of the U.S. Government. Internal verification studies, quality assurance / control data and laboratory documentation on measurement uncertainty are available upon request.



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: City of Mississauga, ON
Project No.: 0349292.000
Prepared For: J. Greco

Lab Reference No.: b328654 Revision 1
Date Analyzed: December 5, 2024

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S0004A Roof, Tar Paper, Loc:4, Exterior	6 Phases: a) Homogeneous, shiny black, tar material.	None Detected	Tar and other Non- Fibrous Material > 75%
	b) Homogeneous, black, tar- impregnated, compressed, fibrous material.	None Detected	Man-Made Vitreous Fibres 25-50% Tar and other Non- Fibrous Material 50-75%
	c) Homogeneous, black, tar with brown and beige gravel.	None Detected	Tar and other Non- Fibrous Material > 75%
	d) Homogeneous, dull black, tar material.	None Detected	Tar and other Non- Fibrous Material > 75%
	e) Homogeneous, black, tar- impregnated, compressed, fibrous material.	None Detected	Man-Made Vitreous Fibres 25-50% Tar and other Non- Fibrous Material 50-75%
	f) Homogeneous, black, tar with brown gravel.	None Detected	Tar and other Non- Fibrous Material > 75%
Comments:	Due to the condition of the sample, the order of phases reported may not reflect the actual order in situ. Plastic is present on the surface of this sample.		



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: City of Mississauga, ON
Project No.: 0349292.000
Prepared For: J. Greco

Lab Reference No.: b328654 Revision 1
Date Analyzed: December 5, 2024

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S0004B Roof, Tar Paper, Loc:4, Exterior	6 Phases: a) Homogeneous, shiny black, tar material.	None Detected	Tar and other Non- Fibrous Material > 75%
	b) Homogeneous, black, tar- impregnated, compressed, fibrous material.	None Detected	Man-Made Vitreous Fibres 25-50% Tar and other Non- Fibrous Material 50-75%
	c) Homogeneous, black, tar with brown and beige gravel.	None Detected	Tar and other Non- Fibrous Material > 75%
	d) Homogeneous, dull black, tar material.	None Detected	Tar and other Non- Fibrous Material > 75%
	e) Homogeneous, black, tar- impregnated, compressed, fibrous material.	None Detected	Man-Made Vitreous Fibres 25-50% Tar and other Non- Fibrous Material 50-75%
	f) Homogeneous, black, tar with brown gravel.	None Detected	Tar and other Non- Fibrous Material > 75%
Comments:	Due to the condition of the sample, the order of phases reported may not reflect the actual order in situ. Plastic is present on the surface of this sample.		



Pinchin Ltd. Asbestos Laboratory Certificate of Analysis

Project Name: City of Mississauga, ON
Project No.: 0349292.000
Prepared For: J. Greco

Lab Reference No.: b328654 Revision 1
Date Analyzed: December 5, 2024

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S0004C Roof, Tar Paper, Loc:4, Exterior	6 Phases:		
	a) Homogeneous, shiny black, tar material.	None Detected	Tar and other Non-Fibrous Material > 75%
	b) Homogeneous, black, tar-impregnated, compressed, fibrous material.	None Detected	Man-Made Vitreous Fibres 25-50% Tar and other Non-Fibrous Material 50-75%
	c) Homogeneous, black, tar with brown and beige gravel.	None Detected	Tar and other Non-Fibrous Material > 75%
	d) Homogeneous, dull black, tar material.	None Detected	Tar and other Non-Fibrous Material > 75%
	e) Homogeneous, black, tar-impregnated, compressed, fibrous material.	None Detected	Man-Made Vitreous Fibres 25-50% Tar and other Non-Fibrous Material 50-75%
	f) Homogeneous, black, tar with brown gravel.	None Detected	Tar and other Non-Fibrous Material > 75%
Comments:	Due to the condition of the sample, the order of phases reported may not reflect the actual order in situ. Plastic is present on the surface of this sample.		

Reviewed by:

Digitally signed
by Pinchin Ltd.
Date: 2024.12.05
14:07:07-05'00'

Reporting Analyst:

Digitally signed
by Pinchin Ltd.
Date: 2024.12.05
14:07:24-05'00'

Analyzed by: 7/13/24-12-05
 Revised by: [Signature]
 Report Sent by: [Signature]

Pinchin Ltd. - Asbestos Laboratory
Internal Asbestos Bulk Sample Chain of Custody

Special Instructions:

Client Name:	City of Mississauga	Project Address:	ON
Portfolio/Building No:		Pinchin File:	0349292.000
Submitted by:	Juliano Greco	Email:	jvgreco@pinchin.com
CC Results to:	Anthony Rakic	CC Email:	Arakic@Pinchin.com
Date Submitted:	December 04 2024	Required by:	December 5 2024
# of Samples:	3	Priority:	Rush Turnaround
Year of Building Construction (Mandatory, Years ONLY):	1979		
Do NOT Stop on Positive (Sample Numbers):			
Pinchin Group Company (Mandatory Field):	Pinchin		
HMIS2 Building Reference #:	143083/202411368118194		

To be Completed by Lab Personnel Only:

Lab Reference #:	b328654	Time:	24 hour clock
Received by:	DEC 04 2024	Date:	Month Day Year
Name(s) of Analyst(s):			

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
S	0001	A	Roof, Tar Paper, Loc:4, Exterior a)ND b)ND c)ND d)ND e)ND f)ND
S	0001	B	Roof, Tar Paper, Loc:4, Exterior a)ND b)ND c)ND d)ND e)ND f)ND
S	0001	C	Roof, Tar Paper, Loc:4, Exterior a)ND b)ND c)ND d)ND e)ND f)ND

APPENDIX II-B
Lead Analytical Certificates



Your Project #: 349292
Your C.O.C. #: N/A

Attention: Conor Keay

Pinchin Ltd
160 Charlotte Street
Suite 204
Peterborough, ON
CANADA K9J 2T8

Report Date: 2024/11/07
Report #: R8395262
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB#: C4Y8376

Received: 2024/11/05, 09:45

Sample Matrix: Paint
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Metals in Paint	1	2024/11/06	2024/11/07	CAM SOP-00408	EPA 6010D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



Your Project #: 349292
Your C.O.C. #: N/A

Attention: Conor Keay

Pinchin Ltd
160 Charlotte Street
Suite 204
Peterborough, ON
CANADA K9J 2T8

Report Date: 2024/11/07
Report #: R8395262
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB#: C4Y8376

Received: 2024/11/05, 09:45

Encryption Key



**AUTHORIZED REPORT
RAPPORT AUTORISÉ**

Bureau Veritas

07 Nov 2024 16:39:05

Please direct all questions regarding this Certificate of Analysis to:

Nilushi Mahathantila, Project Manager

Email: Nilushi.Mahathantila@bureauveritas.com

Phone# (905) 817-5700

=====

This report has been generated and distributed using a secure automated process.

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental Laboratory operations.

Total Cover Pages: 2

Page 2 of 8

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.



Bureau Veritas Job #: C4Y8376
Report Date: 2024/11/07

Pinchin Ltd
Client Project #: 349292
Sampler Initials: CK

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Bureau Veritas ID		AHYZ64		
Sampling Date				
COC Number		N/A		
	UNITS	L0001, OFF WHITE, LOC:1, WOMEN'S WASHROOM	RDL	QC Batch
Metals				
Lead (Pb)	%	0.0063	0.00026	9749540
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



Bureau Veritas Job #: C4Y8376
Report Date: 2024/11/07

Pinchin Ltd
Client Project #: 349292
Sampler Initials: CK

TEST SUMMARY

Bureau Veritas ID: AHYZ64
Sample ID: L0001, OFF WHITE, LOC:1, WOMEN'S WASHROOM
Matrix: Paint

Collected:
Shipped:
Received: 2024/11/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Paint	ICP	9749540	2024/11/06	2024/11/07	Medhat Nasr



Bureau Veritas Job #: C4Y8376
Report Date: 2024/11/07

Pinchin Ltd
Client Project #: 349292
Sampler Initials: CK

GENERAL COMMENTS

Sample AHYZ64 [L0001, OFF WHITE, LOC:1, WOMEN'S WASHROOM] : Metals Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Results relate only to the items tested.



Bureau Veritas Job #: C4Y8376
Report Date: 2024/11/07

Pinchin Ltd
Client Project #: 349292
Sampler Initials: CK

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9749540	MEN	Matrix Spike	Lead (Pb)	2024/11/07		88	%	75 - 125
9749540	MEN	QC Standard	Lead (Pb)	2024/11/07		102	%	75 - 125
9749540	MEN	Method Blank	Lead (Pb)	2024/11/07	<0.00010		%	
9749540	MEN	RPD	Lead (Pb)	2024/11/07	24		%	35

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



Bureau Veritas Job #: C4Y8376
Report Date: 2024/11/07

Pinchin Ltd
Client Project #: 349292
Sampler Initials: CK

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Louise Harding, Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental Laboratory operations.



NONT-2024-11-632



6740 Campobello Road, Mississauga, Ontario L5N 2L8
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266
CAM FCD-01191/6

CHAIN OF CUSTODY RECORD

Page ____ of ____

Invoice Information		Report Information (if differs from Invoice)		Project Information (where applicable)		Turnaround Time (TAT) Required	
Company Name: Pinchin Ltd.		Company Name: _____		Quotation #: _____		<input checked="" type="checkbox"/> Regular TAT (5-7 days) Most analyses	
Contact Name: Conor Keay		Contact Name: _____		P.O. #/ A/E/R: _____		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS	
Address: 677 Neal Drive, Peterborough Ontario		Address: _____		Project #: 349292		Rush TAT (Surcharges will be applied)	
Phone: 705.772.0206 Fax: _____		Phone: _____ Fax: _____		Site Location: _____		<input type="checkbox"/> 1 Day <input type="checkbox"/> 2 Days <input type="checkbox"/> 3-4 Days	
Email: ckeay@pinchin.com		Email: _____		Site #: _____		Date Required: _____	
MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY				Site Location Province: AB		Rush Confirmation #: _____	
Sampled By: Conor Keay							
Regulation 153		Other Regulations		Analysis Requested		LABORATORY USE ONLY	
<input type="checkbox"/> Table 1 <input type="checkbox"/> Res/Park <input type="checkbox"/> Med/ Fine <input type="checkbox"/> Table 2 <input type="checkbox"/> Ind/Comm <input type="checkbox"/> Coarse <input type="checkbox"/> Table 3 <input type="checkbox"/> Agri/ Other <input type="checkbox"/> Table _____ FOR RSC (PLEASE CIRCLE) Y / N		<input type="checkbox"/> CCME <input type="checkbox"/> Sanitary Sewer Bylaw <input type="checkbox"/> MISA <input type="checkbox"/> Storm Sewer Bylaw <input type="checkbox"/> PWQO <input type="checkbox"/> Region _____ <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> REG 558 (MIN. 3 DAY TAT REQUIRED) <input type="checkbox"/> REG 406 Table _____		FIELD FILTERED (CIRCLE) Metals / μg / CW BTEX/ PHC F1 PHQ F2 - F4 VOCs REG 133 METALS & INORGANICS REG 133 ICNMS METALS REG 133 METALS (Hg, Cr VI, ICNMS Metals, HWS - 8) Lead (Pb) in Paints PCBs HOLD- DO NOT ANALYZE		CUSTODY SEAL Y / N Present Intact COOLER TEMPERATURES N/A COOLING MEDIA PRESENT: Y / N COMMENTS	
Include Criteria on Certificate of Analysis: Y / N		SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS					
SAMPLE IDENTIFICATION		DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX			
L0003, Off White, Loc:1, Women's Washroom				BULK			
RELINQUISHED BY: (Signature/Print)		DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	BV JOB #
				<i>SA SUGAR SALVANI</i>	2024/11/05	09:45	

APPENDIX II-C
PCB Analytical Certificates

Certificate of Analysis

Conor KeayPinchin Ltd. (Peterborough - Amour Rd.)
380 Amour Road, Suite 101, Peterborough, ON K9H 7L7

Date of Issue: Nov 15, 2024

Report Description: 1 solid sample was submitted for the following chemical analysis**Project Name:****Project No.:** 349292**Site Location:****Date Sampled:****Date Tested:** Nov 13, 2024**Sampled by:** Conor K**Report Number: 24-1423**

No.	Analyte	Result	Units	MDL	Comments	Technique / Test Method
1	<u>Sample ID:</u> P0001 Caulking, Off White, Loc:2, Men's Washroom					
	PCBs in Solid	<0.2	mg/Kg	0.2		LAB-M06 (EPA 3550C/8082A modified)

Results apply to the sample(s) as received.

Approved By:

Son C.H. Le, (Chem.)

Lab Manager

Phone: (519) 740-1333 Ext.: 1030

Fax: (519) 740-2320

Email: SonLe@aevitas.ca

The Analytical Chemistry Laboratory of Aevitas Inc. (Ayr) is accredited for specific tests in accordance with the recognized International Standard ISO/IEC 17025:2017, by the Canadian Association for Laboratory Accreditation (CALA) Inc. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017). The laboratory quality management system of Aevitas Inc. (Ayr) also operates in accordance with the principles of ISO 9001.

All Analytical data is subject to uncertainty which, may vary with sample matrices, sample preparation techniques and instrumental parameters. As a general guideline, uncertainty may be expressed as approximately +/- 50% of the reported value at or near the Method Detection Limit (MDL) and +/-10% or less, of the reported result that is greater than 10 times the MDL. Method Detection Limits are defined as approximately 3 times the standard deviation value (at 99% confidence level), which is obtained from replicate analysis of a low-level standard as per the Ontario MOE - MISA Protocol for the Sampling and Analysis of Industrial / Municipal Wastewater (2016). MDL determination is based on undiluted samples with relatively low matrix interferences. Where dilutions are required, the reported MDL value will be scaled proportionally.

All testing procedures follow strict guidelines and quality assurance / quality control (QA/QC) protocols. QA/QC data is available for review at any time upon client's request.

APPENDIX III

Methodology



1.0 GENERAL

An investigation was conducted to identify the type of Hazardous Building Materials incorporated in the structure and its finishes.

Information regarding the location and condition of hazardous building materials encountered and visually estimated quantities were recorded. The locations of any samples collected were recorded on small-scale plans. As-built drawings and previous reports were referenced where provided.

Sample collection was conducted in accordance with our Standard Operating Procedures.

1.1 Asbestos

The investigation for asbestos included friable and non-friable asbestos-containing materials (ACM). A friable material is a material that when dry can be crumbled, pulverized, or powdered by hand pressure, or a material that has already become crushed, pulverized, or powdered.

A separate set of samples was collected of each type of homogenous material suspected to contain asbestos. A homogenous material is defined by the US EPA as material that is uniform in texture and appearance, was installed at one time, and is unlikely to consist of more than one type or formulation of material. The homogeneous materials were determined by visual examination and available information on the phases of construction and prior renovations.

Samples were collected at a rate that is in compliance with the requirements of local regulations and guidelines. The sampling strategy was also based on known ban dates and phase out dates of the use of asbestos; sampling of certain building materials is not conducted after specific construction dates. In addition, to be conservative, several years past these dates are added to account for some uncertainty in the exact start / finish date of construction and associated usage of ACM. In some cases, manufactured products such as asbestos cement pipe were visually identified without sample confirmation.

The asbestos analysis of select materials was completed using a stop-positive approach. Only one result meeting the regulated criteria was required to determine that a material is asbestos containing, but all samples must be analyzed to conclusively determine that a material is non-asbestos. The laboratory stopped analyzing samples from a homogeneous material once a result equal to or greater than the regulated criteria is detected in any of the samples of that material. All samples of a homogeneous material were analyzed if no asbestos is detected. In some cases, all samples were analyzed in the sample set regardless of result.

The analysis was performed in accordance with Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, July 1993.

Analytical results were compared to the following criteria:

Jurisdiction	Friable	Non-Friable
Ontario	0.5%	0.5%

Where building materials are described in the report as “non-asbestos” or “does not contain asbestos,” this means that either no asbestos was detected by the analytical method utilized in any of the multiple samples or, if detected, it is below the lower limit of an asbestos-containing material in the applicable regulation. Additionally, these terms are used for materials which historically are known to not include asbestos in their manufacturing.

Asbestos materials were evaluated in order to make recommendations regarding any remedial work. The priority for remedial action was based on several factors:

- Friability (friable or non-friable)
- Condition (good, fair, poor, debris)
- Accessibility (ranking from accessible to all building users to inaccessible)
- Visibility (whether the material is obscured by other building components)
- Efficiency of the work (for example, if damaged ACM is being removed in an area, it may be most practical to remove all ACM in the area even if it is in good condition)

For a complete description of the Evaluation Criteria and Basis of Recommendations, refer to Annex A.

1.2 Lead

Samples of distinctive paint finishes, and surface coatings present in more than a limited application, where removal of the paint is possible were collected. The samples were collected by scraping the painted finish to include base and covering applications.

Analysis for lead in paints or surface coatings was performed in accordance with EPA Method No. 3050B/Method No. 7420; flame atomic absorption.

Analytical results were compared to the following criteria.

Jurisdiction	Units (%)	Units (ppm) / (mg/kg)
Ontario	0.009	90

Other lead building products (e.g. batteries, lead sheeting, flashing) were identified by visual observation only.

1.3 Silica

Building materials known to contain crystalline silica (e.g. concrete, cement, tile, brick, masonry, mortar) were identified by visual inspection only. Pinchin did not perform sampling of these materials for laboratory analysis of crystalline silica content.

1.4 Mercury

Building materials, products, or equipment (e.g. thermostats, barometers, pressure gauges, lamp tubes), suspected to contain mercury were identified by visual inspection only. Dismantling of equipment suspected of containing mercury was not performed. Sampling of these materials for laboratory analysis of mercury content was not performed.

1.5 Polychlorinated Biphenyls

The potential for light ballast and oil filled transformers to contain PCBs was based on the age of the building, a review of maintenance records, and examination of labels or nameplates on equipment, where present and accessible. The information was compared to known ban dates of PCBs and Environment Canada publications.

Dry type transformers were presumed to be free of dielectric fluids and hence non-PCB.

Fluids (mineral oil, hydraulic, Aroclor or Askarel) in transformers or other equipment were not sampled for PCB content.

Caulking, sealants, or paints were sampled and submitted for PCB analysis following EPA 3550C/8082A.

Sample results are compared to the criteria of 50 mg/kg for solids as stated in the PCB Regulation, SOR/2008-273.

1.6 Visible Mould

The presence of mould or water damage was determined by visual inspection of exposed building surfaces. If any mould growth or water damage was concealed within building cavities it was not addressed in this assessment.

Template: Methodology for Hazardous Building Materials Assessment, HAZ, November 13 2024

METHODOLOGY ANNEX A EVALUATION CRITERIA

1.0 EVALUATION CRITERIA AND BASIS OF RECOMMENDATIONS

The detailed asbestos assessment provides information regarding the location, condition, accessibility, and friability of the asbestos-containing materials (ACM). In order to make recommendations for compliance with current regulations, Pinchin developed the following criteria.

2.0 EVALUATION OF CONDITION

2.1 Friable Sprayed or Trowelled Fireproofing, Thermal Insulation and Texture Finishes (Surfacing Materials)

To evaluate the condition of ACM sprayed or trowelled on fireproofing, sprayed, or trowelled thermal insulation (non-mechanical), or texture, decorative or acoustic finishes, the following criteria are applied:

Good	Surface of material shows no significant signs of damage, deterioration, or delamination. Good condition includes unencapsulated or unpainted fireproofing or texture finishes, where no or limited delamination or damage is observed, or encapsulated fireproofing or texture finishes where the encapsulant or paint has been applied after the damage or fallout occurred.
Poor	A sprayed material that shows signs of significant damage or is significantly delaminating or deteriorating. This may be limited to surface delamination, or some portion of the substrate may be exposed.

In Locations where damage exists in isolated areas, both good and poor condition may be applicable. The extent of each condition will be recorded. Fair condition is not utilized in the evaluation of ACM sprayed or trowelled fireproofing, sprayed or trowelled thermal insulation (non-mechanical), or texture, decorative or acoustic finishes.

The evaluation of the above products above ceilings may be limited by the number of observations and by building components such as ducts or full height walls that obstruct the above ceiling observations.

2.2 Friable Mechanical or Thermal System Insulation (TSI)

To evaluate the condition of mechanical insulation on vessels, boilers, breeching, ducts, pipes, fan units, equipment etc. the following criteria are applied:

Good	Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor damage (i.e. scuffs or stains), but the jacketing is not penetrated.
-------------	---

Fair	Minor penetrating damage to jacketed insulation (cuts, tears, nicks, deterioration, or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges from minor to none. Damage can be repaired.
Poor	Original insulation jacket is missing, damaged, deteriorated, or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired. Includes components where insulation may have been removed incompletely.

The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. It is often not possible to observe each foot of mechanical insulation from all angles.

2.3 Potentially Friable Materials and Miscellaneous Friable Materials

Potentially friable ACM are products that are basically non-friable while in place but have the potential to generate friable dust upon removal or if significantly disturbed without appropriate procedures. These products may become friable if damaged. Potentially friable materials include materials such as acoustic ceiling tiles and plaster. To evaluate the condition of potentially friable materials, the following criteria are applied:

Good	No significant damage or deterioration. Still serving its intended use as a building material or finish.
Fair	Showing signs of some cracking or breakage, but is not deteriorating (e.g. cracked plaster, broken but in place ceiling tile, missing tile, or section of plaster etc.). The condition is such that it is still serving its intended use as a building material or finish but may require repair for mainly cosmetic purposes.
Poor	Significant deterioration or breaking apart of the material. Material has deteriorated to the point it is not serving its intended use as building material or finish. Material has deteriorated to a point it has become friable. Normally potentially friable ACM in Poor condition is not repairable and requires at least localized removal and replacement.

2.4 Non-Friable Materials

Non-friable ACM cover a wide range of products with a wide variation in their tendency to release dust or asbestos fibres to the air. Many of these materials, (particularly where the matrix is an unweathered bitumen, asphalt, or tar material) do not release fibres except in very unusual circumstances or during significant disturbance (e.g. use of abrasive power tools). Others with a cementitious matrix (asbestos-cement products) can more readily release dust due to abrasion, demolition, weathering, etc.

The potential for asbestos release from non-friable ACM is always lower than from friable ACM. To evaluate the condition of non-friable Materials, the following criteria are applied:

Good	No significant damage or deterioration. Still serving its intended use as a building material or finish.
Fair	Showing signs of some cracking or breakage but is not deteriorating (e.g. cracked vinyl floor tile, missing piece of tile or transite, etc.). The condition is such that it is still serving its intended use as a building material or finish but may require repair for mainly cosmetic purposes.
Poor	Significant deterioration or breaking apart of the material to the point at which it cannot be repaired, and it will require at least local removal. Material has deteriorated to the point it is not serving its intended use as building material or finish. Material may have deteriorated to a point where traffic or disturbance may cause it to become friable.

2.5 Evaluation of ACM Debris

The identification of the exact location or presence of debris on the top of ceiling tiles is limited by the number of observations made and the presence of building components such as ducts or full height walls that obstruct observations.

The presence of fallen or dislodged ACM is noted separately from the ACM source and is referred to as Debris. Debris may be friable if from a friable ACM source or a badly deteriorated non-friable ACM source. Debris may also be non-friable (such as fallen pieces of transite sheet or mastic fittings, or broken, dislodged floor tiles).

Debris	Debris may be friable or non-friable but is always identified as “debris” as the component of an observation and quantified as Poor condition.
---------------	--

2.6 Evaluation of Presumed Asbestos-Containing Material (PACM)

Presumed asbestos-containing materials (PACM), are building materials that may contain asbestos but were not sampled or analyzed due to inaccessibility or the need to perform destructive testing to obtain a reasonable sample set. Evaluation of these materials is based on the assumption that these PACM are asbestos containing.

A list of PACM is provided in the report and they are generally not included in the detailed room by room reports. Typically, they are excluded because they are inaccessible or present in very small quantities. If PACM are evaluated, Pinchin uses the criteria that correspond with the type (and friability) of the material listed above.

3.0 EVALUATION OF ACCESSIBILITY

The accessibility of building materials known or suspected of being ACM is rated according to the following criteria:

Access (A)	Common areas of the building within reach of all building users (approximately 8'-9' from floor or standard ceiling height). Includes other areas where occupant activities may result in disturbance of material that is not normally within reach from floor level but may be disturbed by common activities (e.g. gymnasiums, workshops, warehouses.)
Access (B)	Areas of the building accessed primarily by Maintenance/Caretaking/Janitorial Staff and within reach without use of a ladder. Includes areas within reach in Boiler Rooms, Electrical Rooms, Janitors Closets, Elevator Rooms, Mechanical Rooms, etc. Includes materials within reach from fixed ladders or catwalks, mezzanines, and accessible pipe chases.
Access (C) and Visible	Areas of the building above 8' - 9' where use of a ladder or scaffold is required to reach the ACM. Only includes ACM that are visible to view without the removal or opening of other building components such as ceiling tiles or service access panels.
Access (C) and not Visible / Limited Visibility	Areas of the building above 8' - 9' where use of a ladder or scaffold is required to reach the ACM. Includes ACM that are not visible or partially visible to view and require the removal of a building component to see, such as ceilings tiles or access panels to view and access. Includes rarely entered crawl spaces, attic spaces, etc. Observations will be limited to the extent visible from the access points.
Access (D)	Areas of the building behind inaccessible solid ceiling systems, walls, or equipment etc. where demolition of the ceiling, wall or equipment etc. is required to reach the ACM. Material inaccessible due to height or location or is only accessed under unusual situations. Evaluation of condition and extent of ACM is limited or impossible, depending on the surveyor's ability to visually examine materials in Access D.

4.0 ACTION MATRIX AND DEFINITIONS

Pinchin's evaluation of the viability of a specific asbestos control option is based on the consideration of the friability, condition, accessibility, and visibility of a material. The logic used is that damaged ACM located in an area frequently accessed by all building occupants is of a higher priority than damaged ACM located in an infrequently accessed service area. The action matrix considers the potential for fibre release (primarily from friable ACM) and the possible concerns from regulatory bodies and many building occupants to all damaged ACM (including non-friable).

In any building with asbestos, many current regulations require an Asbestos Management Program be implemented. Depending on the condition and the accessibility, more active measures such as repair or removal may be recommended. The following matrix provides guidance for recommended Actions in the absence of renovation or demolition. In the event of construction or maintenance activity which will disturb ACM more aggressive control or removal will be required.

4.1 Action Matrix

The following tables outline the action decisions based on the relationship of assessed factors. Table I applies to friable ACM. Table II applies to non-friable ACM.

Table I Decision Matrix for Friable ACM

Access	Condition			Debris
	Good	Fair	Poor	
(A)	Action 5 ¹	Action 5 ²	Action 3	Action 1
(B)	Action 7	Action 6 ³	Action 3	Action 1
(C) Visible	Action 7	Action 6	Action 3	Action 2
(C) Not Visible / Limited Visibility	Action 7	Action 7	Action 4	Action 2
(D)	Action 7	Action 7	Action 7	Action 7

Table II Decision Matrix for Potentially Friable and Non-Friable ACM

Access	Condition			Debris
	Good	Fair	Poor	
(A)	Action 7	Action 7 ⁴	Action 3	Action 1
(B)	Action 7	Action 7	Action 3	Action 1
(C) Visible	Action 7	Action 7	Action 4	Action 2
(C) Not Visible / Limited Visibility	Action 7	Action 7	Action 4	Action 2
(D)	Action 7	Action 7	Action 7	Action 7

¹ If friable ACM in access (A)/Good condition is not proactively removed Action 7 (Manage) is recommended.

² If friable ACM in access (A)/Fair condition is not proactively removed repair is recommended.

³ If friable ACM in access (B)/Fair condition is likely to be disturbed after repair proactive removal is recommended.

⁴ Action 7 is recommended for all non-friable ACM in Fair condition however some clients may wish to repair or take some action primarily for cosmetic reasons.

4.2 Action Definitions

The following are the definitions in the Action Matrix Table presented above:

Action Definitions	
Action 1	Clean-Up of ACM Debris Restrict access that is likely to cause a disturbance of the ACM Debris and clean up ACM Debris. Utilize appropriate asbestos precautions.
Action 2	Precautions for Access Which may Disturb ACM Debris Use appropriate means to isolate the debris or to limit entry to the area which may disturb the material. At locations where ACM Debris can remain in place in lieu of removal or clean-up (e.g. Debris on top of ceiling tiles or behind lockable door), Utilize appropriate asbestos precautions to enter the area if this will disturb debris. The precautions will be required until the ACM Debris has been cleaned up.
Action 3	ACM Removal Remove ACM. Utilize asbestos procedures appropriate to the scope of the removal work. Until it is removed, restrict access to the material so it is not disturbed.
Action 4	Precautions for Work Which may Disturb ACM in Poor Condition. Utilize appropriate asbestos precautions if ACM may be disturbed by work on or near ACM. This does not require restricting access to the area, only control of work which may contact or disturb the ACM. Removal is the only viable option if work will disturb ACM.
Action 5	Proactive ACM Removal Remove friable ACM where the presence of friable asbestos in Good condition is not desirable. If friable ACM in Fair condition is not removed, then Repair friable ACM.
Action 6	ACM Repair Repair friable ACM in Fair condition which is not likely to be damaged again or disturbed by normal use of the area or room. Pinchin recommends proactive removal if friable ACM is likely to be damaged or disturbed during normal use of the area or room.
Action 7	Asbestos Management Program with Routine Surveillance Implement an Asbestos Management Program, including routine surveillance of ACM. Reassess materials regularly (typically once per year).

Master Template: Methodology Annex A to Appendix I Evaluation Criteria, HAZ, April 3, 2024

APPENDIX IV
Location Summary Report

Client:City of Mississauga
Building Name: Washroom In Jack Darling Memorial Park
Survey Date:
Building Phases: A: 1979

Site: 1180 Lakeshore Road West, Mississauga, ON
Last Re-Assessment:

Location No.	Name or Description	Area ft ²	Floor No.	Bldg. Phase	Notes
1	Women's Washroom	500		A	
2	Men's Washroom	500		A	
3	Exterior	0		A	

APPENDIX V
Hazardous Materials Summary Report / Sample Log

Client:City of MississaugaSite: 1180 Lakeshore Road West, Mississauga, ONBuilding Name: Washroom In Jack Darling Memorial ParkSurvey Date:

HAZMAT	Sample No	System/Component/Material/Sample Description	Locations	Bldg. Phase	LF	SF	EA	%	Type	Positive	Friability
Asbestos	S0001 ABC	Wall Paint On Block Wall	1,2	A	0	1000	0	0	None Detected	No	
Asbestos	S0002 ABC	Floor	1,2	A	0	2000	0	0	None Detected	No	
Asbestos	S0003 ABC	Other Caulking Off White	1,2	A	75	0	0	0	None Detected	No	
Paint	L0001	Wall Masonry Off White	1,2	A	0	2000	0	0		No	-
PCB	P0001	Caulking Off White	1,2	A	50	0	0	0	-	No	-
PCB	V9500	Light Ballasts	1,2	A	0	0	6	0	Presumed PCB	Yes	-
Hg	V9500	Light Fixture	1,2	A	0	0	6	0	Presumed Hg	Yes	-

Legend:

Sample number		Units		
S####	Asbestos sample collected	SF	Square feet	NF Non Friable material.
L####	Paint sample collected	LF	Linear feet	F Friable material
P####	PCB sample collected	EA	Each	PF Potentially Friable material
M####	Mould sample collected	%	Percentage	
V####	Material visually similar to numbered sample collected			
V0000	Known non Hazardous Material			
V9000	Material is visually identified as Hazardous Material			
V9500	Material is presumed to be Hazardous Material			
[Loc. No.]	Abated Material			

APPENDIX VI
All Data Report

ALL DATA REPORT

Client: City of Mississauga

Site: 48689

**Building Name: JDP2 : Jack Darling Park - Comfort
Station West**

Location: #1 : Pipe Chase

Floor: 1

Room #:

Area (sqft): 100

Survey Date: 2008-12-01

Last Re-Assessment:

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		None Found														
Duct		None Found														
Floor		Dirt			A	Y										
Mechanical Equipment		None Found														
Other		None Found														
Piping one	Domestic Water (hot And Cold)	Fibreglass			A	Y										
Piping two	Drain	Not Insulated			A	Y										
Structure	Beam, Deck	Wood			C	Y										
Wall		Masonry			A	Y										

ALL DATA REPORT

Client: City of Mississauga

Site: 48689

Building Name: JDP2 : Jack Darling Park - Comfort

Station West

Location: #2 : Men's Washroom

Floor: 1

Room #:

Area (sqft): 300

Survey Date: 2008-12-01

Last Re-Assessment:

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		None Found														
Duct		None Found														
Floor		Ceramic Tiles			A	Y										
Mechanical Equipment		None Found														
Other		None Found														
Piping		Not Insulated														
Structure	Beam, Deck	Wood			C	Y										
Wall		Masonry			A	Y										

Client: City of Mississauga

Site: 48689

Building Name: JDP2 : Jack Darling Park - Comfort

Station West

Location: #3 : Women's Washroom

Floor: 1

Room #:

Area (sqft): 300

Survey Date: 2008-12-01

Last Re-Assessment:

ASBESTOS																
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard	Friable
Ceiling		None Found														
Duct		None Found														
Floor		Ceramic Tiles			A	Y										
Mechanical Equipment		None Found														
Other		None Found														
Piping		Not Insulated														
Structure	Beam, Deck	Wood			C	Y										
Wall		Masonry			A	Y										

Client: City of Mississauga

Site: 48689

Building Name: JDP2 : Jack Darling Park - Comfort

Station West

Location: #3 : Women's Washroom

Floor: 1

Room #:

Area (sqft): 300

Survey Date: 2008-12-01

Last Re-Assessment:

PAINT									
System	Item	Good	Poor	Unit	Sample	Sample Description	Amount	Hazard	
Other	Paint	1		EA	L0001	Off White Paint Women's Washroom	Pb: 0.0063 %	No	

Legend:

Sample number	Units	Other
S#### Asbestos sample collected	SF Square feet	A Access
L#### Paint sample collected	LF Linear feet	V Visible
P#### PCB sample collected	EA Each	AP Air Plenum
M#### Mould sample collected	% Percentage	F Friable material
V#### Material is visually identified to be identical to S####	LF Linear feet	NF Non Friable material
V0000 Known non hazardous material		PF Potentially Friable material
V9000 Material visually identified as a Hazardous Material		Pb Lead
V9500 Material is presumed to be a hazardous material		Hg Mercury
		As Arsenic
		Cr Chromium

Access
A Accessible to all building occupants
B Accessible to maintenance and operations staff without a ladder
C Accessible to maintenance and operations staff with a ladder. Also rarely entered, locked areas
D Not normally accessible

Condition
Good No visible damage or deterioration
Fair Minor, repairable damage, cracking, delamination or deterioration
Poor Irreparable damage or deterioration with exposed and missing material

Visible
Y The material is visible when standing on the floor of the room, without the removal or opening of other building components (e.g. ceiling tiles or access panels).
N The material is not visible to view when standing on the floor of the room and requires the removal of a building component (e.g. ceilings tiles or access panels) to view and access. Includes rarely entered crawlspaces, attic spaces, etc. Observations will be limited to the extent visible from the access points.
L The material is partially visible to view when standing on the floor of the room and requires the removal of a building component (e.g. ceiling system or access panels) to view completely and access. Includes partially viewed access points to crawlspaces, attic spaces, etc. without entering. Observations are limited to the extent visible from the access points.

Air Plenum
Yes or No The material is in a return air plenum or in a direct airstream or there is evidence of air erosion (e.g. duct for heating or cooling blowing directly on or across an ACM). This field is only completed where Air Plenum consideration is required by regulation.

Colour Coding
 The material is a hazardous material, either by analytical results or by visible identification.
 The material is presumed to be a hazardous material, based on visual appearance, and was not sampled due to limited access or the non-destructive nature of sampling.

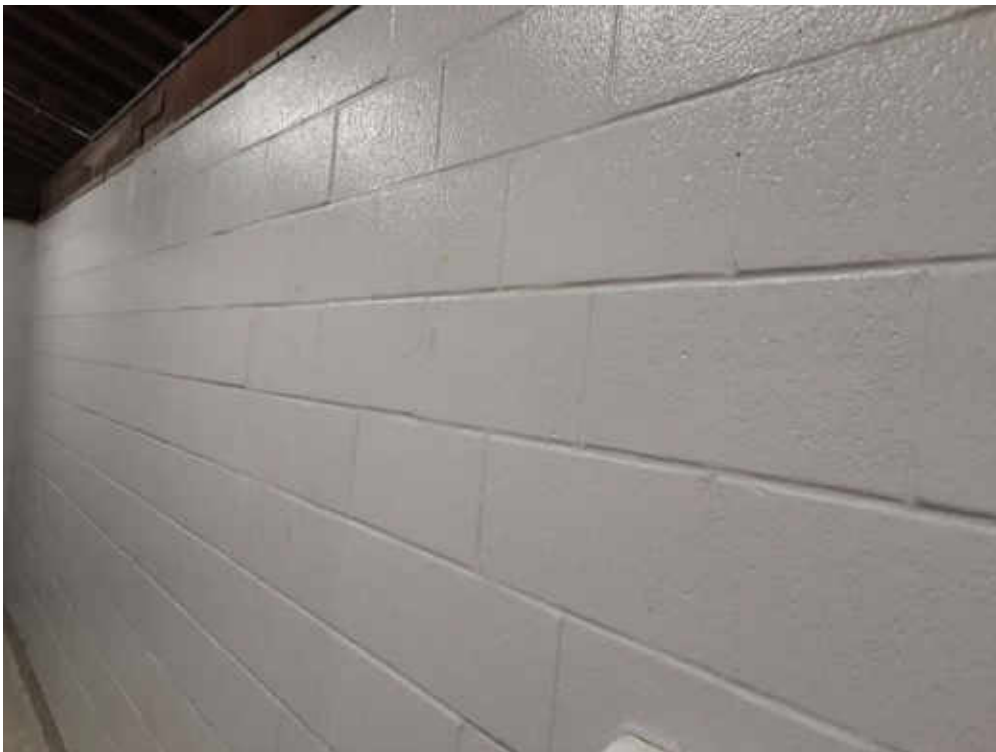
Action					
(1)	Clean up of ACM Debris	(2)	Precautions for Access Which may Disturb ACM Debris	(3)	ACM removal
(4)	Precautions for Work Which may Disturb ACM in Poor Condition	(5)	Proactive ACM removal (Minimum repair required for fair condition)	(6)	ACM repair

(7) Management program and surveillance

APPENDIX VII
Photographs



S0001A (None), On block wall, Wall, Paint, Women's Washroom (Location #: 1)



S0001C (None), On block wall, Wall, Paint, Men's Washroom (Location #: 2)



S0002B (None), Floor, Epoxy, Women's Washroom (Location #: 1)



S0002C (None), Floor, Epoxy, Men's Washroom (Location #: 2)



S0003B (None), Off white, Other, Caulking, Men's Washroom (Location #: 2)
Around sink



Wall, Vermiculite Investigation, Exterior (Location #: 3)
no vermiculite overserved



L0001(Lead, None), Off white, Wall, Women's Washroom (Location #: 1)



Mercury, V9500(Presumed), Light Fixture, Women's Washroom (Location #: 1)



PCB, V9500(Presumed), Light Ballasts, Women's Washroom (Location #: 1)



PCB, P0001(No), Caulking, Off white, Around sink, Men's Washroom (Location #: 2)

FORWARD ENGINEERING
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REPORT
GEOTECHNICAL INVESTIGATION

PROPOSED
COMFORT STATION BUILDING REPLACEMENT
AT
JACK DARLING MEMORIAL PARK
1 WATERFRONT TRAIL
MISSISSAUGA, ONTARIO

PREPARED FOR:
CITY OF MISSISSAUGA

c/o

CELLUCCI+PACE
3C-510 Rowntree Dairy Road
Woodbridge, Ontario
L4L 8H2

September 12, 2024
Ref. No. G7407

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LOG OF BOREHOLE SHEET (BH-1-3) – APPENDIX A

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INTRODUCTION

This report presents the results of the geotechnical investigation carried out by Forward Engineering & Associates Inc. for the proposed Comfort Station Building Replacement at Jack Darling Memorial Park, located at [One] 1 Waterfront Trail, Mississauga, Ontario.

The location of the proposed comfort station Site Plan relation to the existing features and adjacent Road is shown on Drawing No. 1. The approximate location of the borehole conducted during this investigation is also presented on Drawing No. 1.

This investigation was authorized by CELLUCCI+PACE, on behalf of the City of Mississauga.

PURPOSE AND SCOPE

The objectives (purpose) of this investigation were to determine the following:

- The extent, depth and properties of the predominant fill/soil strata as they affect the design and construction of the proposed new washrooms.
- The short-term groundwater levels, if encountered.
- The appropriate geotechnical design criteria for the new comfort station building foundations, underground walls, excavations, backfill, slab construction and permanent drainage.

To achieve the above noted objectives, the field program of this investigation consisted of three [3] borehole drilled to a depth ranging from 1.52 to 6.55 m below the **Existing Ground Surface Level (EGSL)**.

On completion of the field and laboratory work, an engineering analysis was carried out and this summary report was prepared.

PROPOSED DEVELOPMENT

We understand that the proposed development is to consist of a replacement of the existing comfort station building, with no basement.

The remainder of the site will be occupied with access roads/driveways, parking spaces and landscape areas.

The existing building is to be demolished.

FIELD AND LABORATORY TESTING

Field Works:

Borehole Investigation:

The field work for the borehole investigation consisted of three [3] boreholes (BH-1, BH/MW-2, and BH-3), drilled on August 13, 2024, under the supervision of a member of our staff.

Boreholes BH-1 and BH/MW-2 were located on the outside of the existing comfort station building, while BH-3 was located inside of the building, within the “men’s” section. The drilled boreholes were located at the approximate locations shown on Drawing No. 1 and extended to a depth ranging from about 1.52 to 6.55 m below the EGSL. The boreholes were relocated in the field from originally intended/planned locations due to existing underground utility services and landscape features.

One [1] of the boreholes (BH/MW-2) was equipped with a Water Monitoring Well (WMW) to facilitate future measurements of the water level.

Soils in boreholes BH-1 and BH/MW-2 were sampled in the boreholes following the Standard Penetration Test (SPT) method using a GeoProbe 7822DT Auger Drill Rig, using Rotary Drilling with Split Spoon Samplers.

Prior to drilling BH-3, the floor slab was cored, and observations were made of any potential voids underneath the slab on grade. Soils were then sampled in BH-3 following the Standard Penetration Test (SPT) method using a Manual Hammer, with split spoon samplers.

The samples in all the boreholes were logged in the field and appropriately stored in plastic bags and re-examined in more detail in the laboratory. The samples will be

stored for a period of three months and then discarded, unless we are instructed differently.

Groundwater observations were made in the open boreholes, during and upon completion of the drilling operation. The results are recorded on the Log of Borehole sheets.

Elevations referred to in this report are metric and geodetic. The ground level elevations at the borehole locations were interpolated from the Jack Darling Comfort Station Topographical Drawing, by City of Mississauga, dated May 2024, and provided to us by the Client.

Test Pit Investigation:

The field work for the test pit investigation consisted of one [1] test pit (TP-1) carried out on August 16, 2024. The test pit was located at the approximate location shown on Drawing No. 1 and extended to a depth of about 1.4 m below the EGSL.

The test pit findings were documented, and results are summarized in the Sub Surface conditions section of this report and recorded in the Test Pit Observation sheets attached to Appendix B.

Laboratory Testing:

Laboratory testing consisted of determination of the in-situ moisture content of the retrieved and representative soil samples.

SITE CONDITIONS

Surface Conditions

Jack Darling Memorial Park is located at 1 Waterfront Trail, Mississauga, Ontario.

For this description it will be assumed that the north bearing is parallel to the nearest arterial, which is Southdown Road, and to coincide with Project North.

The *subject site* (the area of the proposed new comfort station), where the borehole and test pit investigation took place, is located at the southwestern most point of the park.

The *subject site* conditions as observed during our site visit on August 13, 2024, are presented in Table 1:

Table 1-Observed Subject Site Conditions

East Boundaries:	Open areas of Park followed by Lake Ontario.
North Boundaries:	Treed areas of Park, followed by residential dwellings.
West Boundaries:	Open areas of Park.
South Boundaries:	Park playground and walkways followed by Lake Ontario.
Surface Coverage:	The surface of the subject site is asphalt walkway and grassy landscaping.
Ground Level:	The subject site is relatively flat with a minor downward grade towards Lake Ontario.
Existing Structures:	One-storey building with no basement.
Ditches:	None.
Berms:	None.
Stockpiles:	None.

Subsurface Conditions

The subsurface condition encountered at the borehole location is shown on the Log of Borehole sheet, presented in Appendix A, and can be summarized as follows:

Floor Slab	<p>The floor slab encountered at the surface of borehole BH-3, located inside of the comfort station, consisted sequentially of about ± 4 mm vinyl, ± 8 mm brick/ceramic base, ± 35 mm grout and ± 160 mm concrete.</p> <p>The concrete was underlaid by a sand and gravel base with a thickness of about ± 160 mm.</p>
Topsoil/Organic Soil	<p>A layer of topsoil/organic soil was encountered at the surface of boreholes BH-1 and BH/MW-2, with a thickness ranging from about 130 to 280 mm.</p> <p><i>It should be noted that the measurements of this layer were taken from limited 50 mm diameter Split Spoons and are not considered accurate to be used for estimate purposes.</i></p>

Fill/Disturbed Soil	<p>A layer of fill/disturbed soil was encountered below the floor slab or topsoil layer in all the boreholes and extended to a depth of about 0.89 to 1.52 m below the EGSL. Some pieces of polystyrene foam were encountered within the upper zone of this stratum.</p> <p>This layer consisted of silt, clayey silt and fine sand found in loose to compact state of packing and in moist state.</p> <p>For more accurate description of this layer, and for a more accurate depth, test pits are required.</p>
Silt/Sandy Silt	<p>Compact to dense, brown, and moist Silt/Sandy Silt stratum was encountered below the fill/disturbed soil layer in BH-1 and extended to a depth of about 4.57 m below the EGSL.</p>
Silt/Clayey Silt	<p>Silt/Clayey Silt was encountered below the fill/disturbed soil and silt/sandy silt stratum in all the boreholes and extended to the maximum explored depth of the investigation.</p> <p>This stratum was observed to be generally brown, moist and stiff to very stiff in the upper zone, however, with increased depth it became grey, firm to stiff, and wet.</p>
Groundwater	<p>Groundwater level observations were made during and immediately upon the completion of the drilling investigation. The results are summarized in the following <i>Table 2a</i>, as shown:</p>

Table 2a: Groundwater & Cave-in Observations Upon Completion of Drilling

Borehole No.	Borehole Depth (m)	Cave-in Depth Below EGSL (m)	Groundwater Depth Below EGSL (m)
BH-1	6.55	5.9	5.8
BH/MW-2	6.55	6.1	5.6
BH-3	1.52	Open	Dry

The water level in borehole/monitoring well BH/MW-2, which was equipped with a flush mounted monitoring well, was measured several days after the completion of the drilling operation and our observations are recorded and presented in the following *Table 2b*, as shown.

Table 2b: Groundwater Observation Several Days after Completion of Drilling

Date of GWL Measurement	BH/MW-1 Groundwater Depth Below EGSL & (Elevation)
<i>August 19, 2024</i>	1.47 m (76.91 m)

It should be noted, however, that the groundwater levels are subject to seasonal fluctuations. Consequently, definitive information on the long-term groundwater levels could not be obtained at the present time.

Test Pit Investigation Observations/Findings:

Detailed findings of the test pit investigation can be found within the Test Pit Observation sheet, presented in Appendix B attached to this report.

The Test Pit investigation findings can be summarized in the following *Table 3* as shown:

Table 3 – Test Pit Observation and Existing Footing Dimensions

Test Pit No.	Depth from EGSL to Top of Footing (mm)	Footing Thickness (mm)	Footing Projection (mm)	Test Pit Ground Surface Elevation (m)	Founding Soil Material
TP-1	1100	190	90	78.55	Native Silt/Clayey Silt

- The foundation system consisted of concrete block foundation wall and formed concrete footing.
- The test pits remained dry during and upon completion of the excavation.
- No weeper was encountered at the test pit location.

GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS

Foundations

Based on the findings of this borehole investigation, the proposed new comfort station building structure can be supported on conventional strip/spread footings established within the native silt/clayey silt and/or silt/sandy silt strata, at or below the depths and elevations outlined in Table 3, shown below.

The size of the strip/spread footings can be proportioned to the following bearing resistances.

Factored Bearing Resistance at Ultimate Limit State (ULS) = 225 kPa

Bearing Resistance at Serviceability Limit State (SLS) = 150 kPa

Table 3 - Foundation Depth and Elevation (at or below) for Strip/Spread Footing

Borehole No.	BH Ground Surface Elevation (m)	Founding Depth Below EGSL (m) (at/or Below)	Founding Elevation (m) (at/or Below)
1	78.38	1.25	77.13
2	78.30	2.25	76.05

Foundation Notes:

It should be noted that due to the variations between the founding conditions at the location of boreholes BH-1 and BH/MW-2, in terms of the anticipated founding depths and founding subgrade materials, additional boreholes are recommended after the existing building demolition and removal.

It should be noted that the as-built vertical/horizontal alignment and conditions of existing underground services and buried structures should be established prior to the design/construction stage.

In the areas of existing service trenches, the footings should be established below the invert of the existing services, in the original undisturbed soils, or could potentially, if practical, be bridged over the trench backfill (subject to review by a structural engineer).

Adjacent footings, founded at different elevations, should be stepped at 10 horizontal to 7 vertical. If this condition cannot be complied with or met, underpinning of the existing adjacent footings will be required.

For frost protection requirements, all exterior footings must have a minimum soil cover of 1.2 m.

Total settlements of the proposed footings designed and constructed in accordance with the above recommended resistances at SLS should be less than the tolerable limits of 25mm. The differential settlements are expected to be less than 19mm.

More specific information, with respect to founding conditions between the boreholes will become available when the proposed construction is underway. Therefore, the encountered founding conditions must be verified in the field, and all footings must be inspected by this office before placement of concrete.

Earthquake Considerations

For structural design seismic consideration, the seismic provisions of the Ontario Building Code (OBC 2012) outline the Classification of sites for Seismic Site Response in Table 4.1.8.4.A. of the Code, based on the average properties of the soil/rock ground profile for site under consideration.

According to Table 4.1.8.4.A. of the code and this investigation finding, the subject site Class is “D”.

Underground Walls

Underground walls should be designed to resist a pressure "p", at any depth, "h" below the surface, as given by the expression:

$$p = 0.45[\gamma h + q]$$

Where:

0.45 is the earth pressure coefficient considered applicable

$\gamma = 21.0 \text{ kN/m}^3$ is the unit weight of backfill

q = an allowance for surcharge

The above equation assumes that perimeter drains will be provided and that the backfill against the subsurface walls would be a free draining granular material.

Excavation and Backfill

No major problems should be encountered for the anticipated depth of excavation. The excavation shall be back sloped at 45 degrees or flatter in accordance with the current Ontario Occupational Health and Safety Act.

The anticipated water seepage, if any, into the excavations from the more permeable seams/lenses or surface run-off can be handled by conventional pumping methods.

The material to be used for backfilling shall be suitable for compaction, i.e., free of organics and any other deleterious materials and with a natural moisture content which is within 2 percent of the optimum moisture content. The backfill material shall be compacted to at least 98 percent of the Standard Proctor Maximum Dry Density (SPMDD).

The backfill against the subsurface walls, and confined spaces, should be free draining granular fill, preferably conforming to the OPSS for granular base course, Granular B.

Slab Construction and Permanent Drainage

The new washroom and entrance floor slabs can be constructed following the standard slab-on-grade technique, provided that the base is thoroughly proof-rolled. Any soft spots revealed during proof-rolling shall be sub-excavated, backfilled, and adequately compacted.

It should be noted that BH-3 (drilled inside the existing slab on grade area) indicated that the surficial fill/disturbed soil layer was found in loose state of packing, and therefore thorough densification of entire layer, under the new slab on grade area, with heavy vibratory roller is required

The floor slabs shall rest on a well compacted layer of “19 mm clear stone” at least 200 mm thick when compacted. The stone bed would act as a barrier and prevent capillary rise of moisture from the subgrade to the pit slab.

No perimeter drainage will be required, if the floor slab is at least 150 mm above the exterior grade, which slopes away from the building at an inclination of 1 to 2 percent, to prevent surface ponding of water close to exterior walls. If this condition cannot be complied with, then perimeter drainage as shown on Drawing No. 2 should be provided.

Underground Utilities

The problem areas of pavement settlement largely occur adjacent to manholes, catch basins and service crossings. The on-site materials would generally be difficult to compact in these areas, and it is therefore recommended that a sand backfill be used in confined areas.

The upper 1.0 m of the trench backfill should be compacted to 98 % SPMDD. Below this zone, a 95 % SPMDD compaction is considered acceptable.

Pavement Design

In the proposed pavement areas any vegetation, topsoil/organic soil and/or fill with noticeable amount of organics should be removed, and the base should be thoroughly proof-rolled. Any soft spots revealed during proof-rolling should be sub-excavated and backfilled with suitable materials, compacted to at least 98 % SPMDD.

The subgrade soil is frost susceptible. The design of pavement is therefore mainly influenced by the need to minimize the effects of freezing and thawing. Consequently, the ground must not be unnecessarily disturbed.

The subgrade should be sloped to facilitate drainage towards catch basins and the final subgrade should be compacted before pavement is constructed.

It should be noted that the subgrade should be dry and firm, not spongy, during compaction and during the construction of the [sub] base. Soft or spongy subgrade areas should also be sub-excavated and properly replaced with suitable approved backfill compacted to 98 % SPMDD.

The subgrade will suffer strength regression if water is allowed to infiltrate into the mantle. Therefore, sub-drains should be installed along the edge of all pavement areas to prevent surface water from infiltrating into the subgrade.

Within the parking lots, sub-drains radiating from the catch basins should also be installed. These sub-drains should be at least 3 m long in each direction and have inverts at least 0.75 m below the pavement surface.

All granular materials used in the construction of pavement should be compacted to 98 % of Standard Proctor maximum dry density.

Based on the engineering properties of the subgrade soil, climatic conditions and the anticipated use of the pavement, typical flexible asphaltic pavement designs for this development are as shown in the following Table:

Table 4 - Typical Flexible Asphaltic Pavement Design

<i>Pavement Components</i>	<i>Heavy Duty</i>	<i>Medium Duty</i>
<i>Asphaltic Concrete</i>	<i>40 mm HL3</i>	<i>40 mm HL3</i>
	<i>60 mm HL8</i>	<i>40 mm HL8</i>
<i>19 mm Crushed Limestone</i>	<i>150 mm</i>	<i>150 mm</i>
<i>Granular B Sub-base</i>	<i>300 mm</i>	<i>200 mm</i>

If the proposed pavements are to be constructed during wet seasons, the moisture content in the subgrade will probably be above the optimum, and this will render its shear strength inadequate to support paving equipment traffic. In this case, the granular sub/base should consist of 50 mm Crusher-Run Limestone.

General Comments

This geotechnical report is provided on the basis of the terms of reference provided above, and on the assumption that the design will be in accordance with the applicable codes and standards.

If there is any change in the design features relevant to the geotechnical analyses, or if any questions arise regarding the geotechnical aspects of the codes and standards, this office should be contacted to review the design.

The comments given in this report are intended only for the guidance of design engineers.

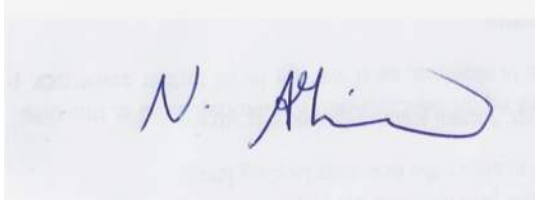
Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own interpretations of the factual borehole results. This concern specifically applies to the classification of the fill/organic/topsoil cover and the potential reuse of these soils on/off site.

The prospective contractors must draw their own conclusions as to how the near surface and subsurface conditions may affect them.

We trust this report contains information requested at this time. However, if any clarification is required, or if we can be of further assistance, please contact this office.

Yours truly,

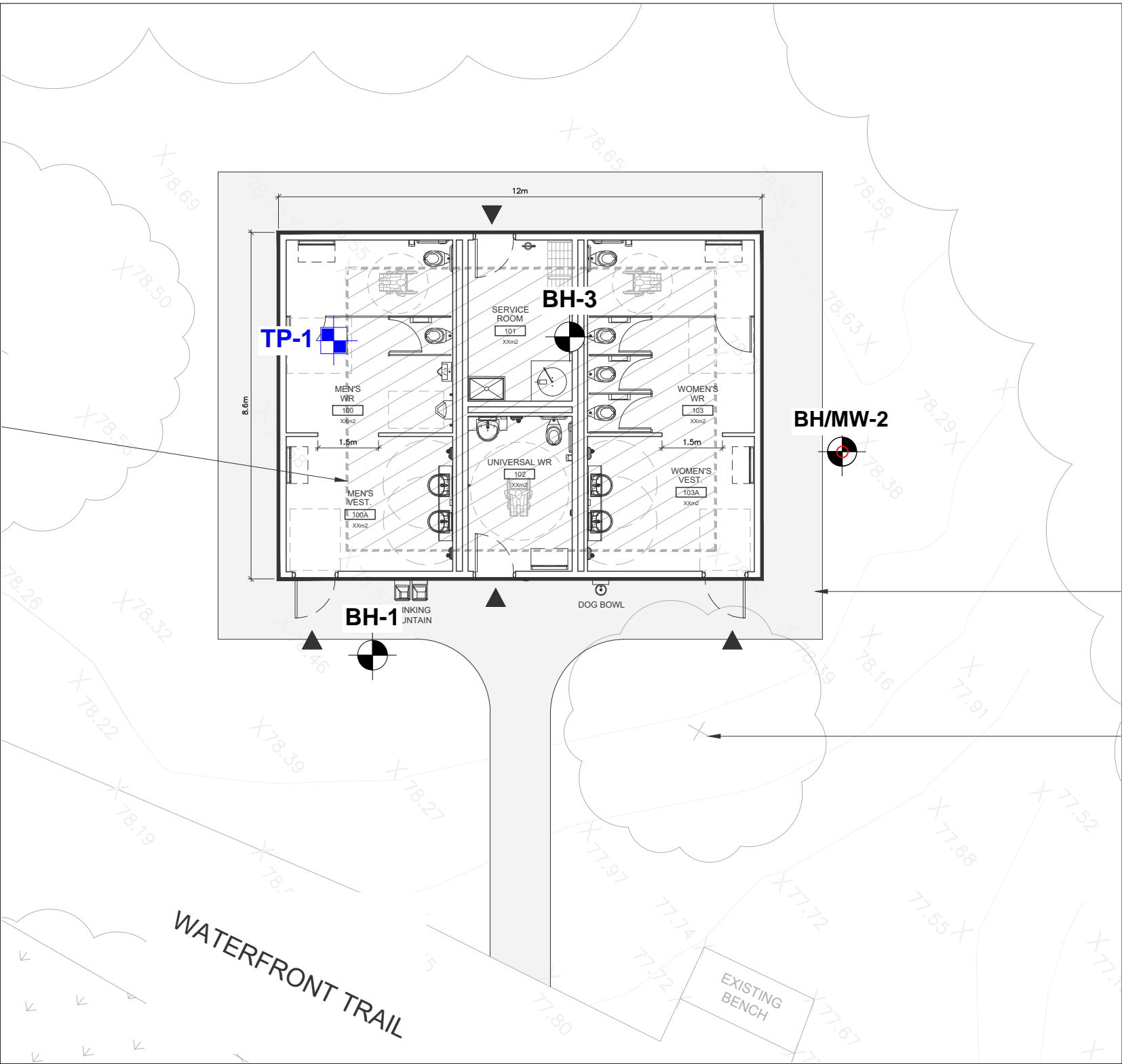
Forward Engineering & Associates Inc.




Nasser Abdelghani, M.Sc., P.Eng.
Project Geotechnical Engineer





G. S. Semaan, M.Eng., P.Eng.
Principal

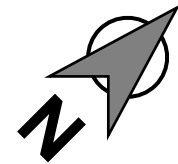


NOTES:

BH
 = BOREHOLE LOCATION

BH/MW
 = BOREHOLE/ MONITORING WELL LOCATION

TP
 = TEST PIT LOCATION



DRAWING No. 1

BOREHOLE & TEST PIT LOCATION PLAN

04	
03	
02	
01	
Rev.	DATE REVISION / ISSUE

Project Name: PROPOSED COMFORT STATION REPLACEMENT

Address: JACK DARLING PARK-1 WATERFRONT TRAIL, MISSISSAUGA, ON.

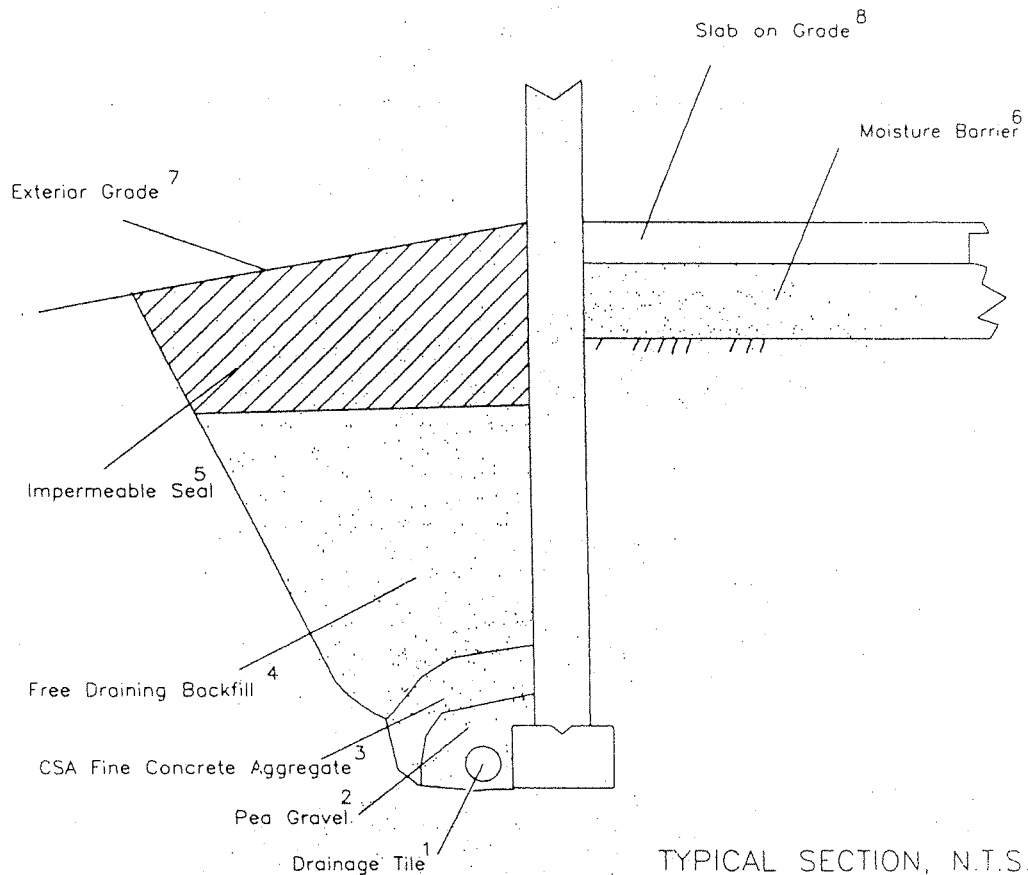
PROJECT No.	:7407
DESIGN BY	:P.R.
DRAWING DATE	:AUG 30, 2024
DRAWN BY:	P.R. PAGE 1 of 1
CHECKED BY:	G.S.



Forward Engineering & Associates Inc.
 244 Brockport Drive, Unit 15
 Toronto, Ontario M9W 6X9
 Tel: 416-798-3500 Fax: 416-798-8481

DRAINAGE AND BACKFILL RECOMMENDATIONS

(Not to Scale)



NOTES:

1. Drainage tile to consist of 100 (4") diam. Weeping tile or equivalent perforated pipe leading to a positive sump or outlet. Invert to be minimum 150mm (6") below underside of floor slab.
2. Pea gravel 150mm (6") top and sides of drain. If drain is not on footing, 100 mm (4") of pea gravel below drain. Clear 20mm (3/4") crushed stone may be used provided it is covered by an approved porous membrane (TerraFix 270R or equivalent).
3. C.S.A. Fine aggregate to act as filter material. Minimum 300 mm (12") top and sides of tile drain. This may be replaced by an approved porous plastic membrane as indicated in 2.
4. Free draining backfill - Class B pit-run gravel or equivalent compacted to 93 - 95 % Standard Proctor Maximum Dry Density (SPMDD).
5. Impermeable backfill seal compacted clay, day silt or equivalent. If original soil is free draining seal may be omitted.
6. Moisture barrier to consist of 20mm (3/4") compacted crushed stone. Layer to be 200mm (8") thick.
7. Exterior grade to slope away from wall.
8. Slab on grade should not be structurally connected to wall footing.
9. If the 20mm (3/4") stone requires surface blinding, use 6mm (1/4") stone chips.

APPENDIX A

BOREHOLE LOG SHEETS

(1 – 3)

Project No: 7407

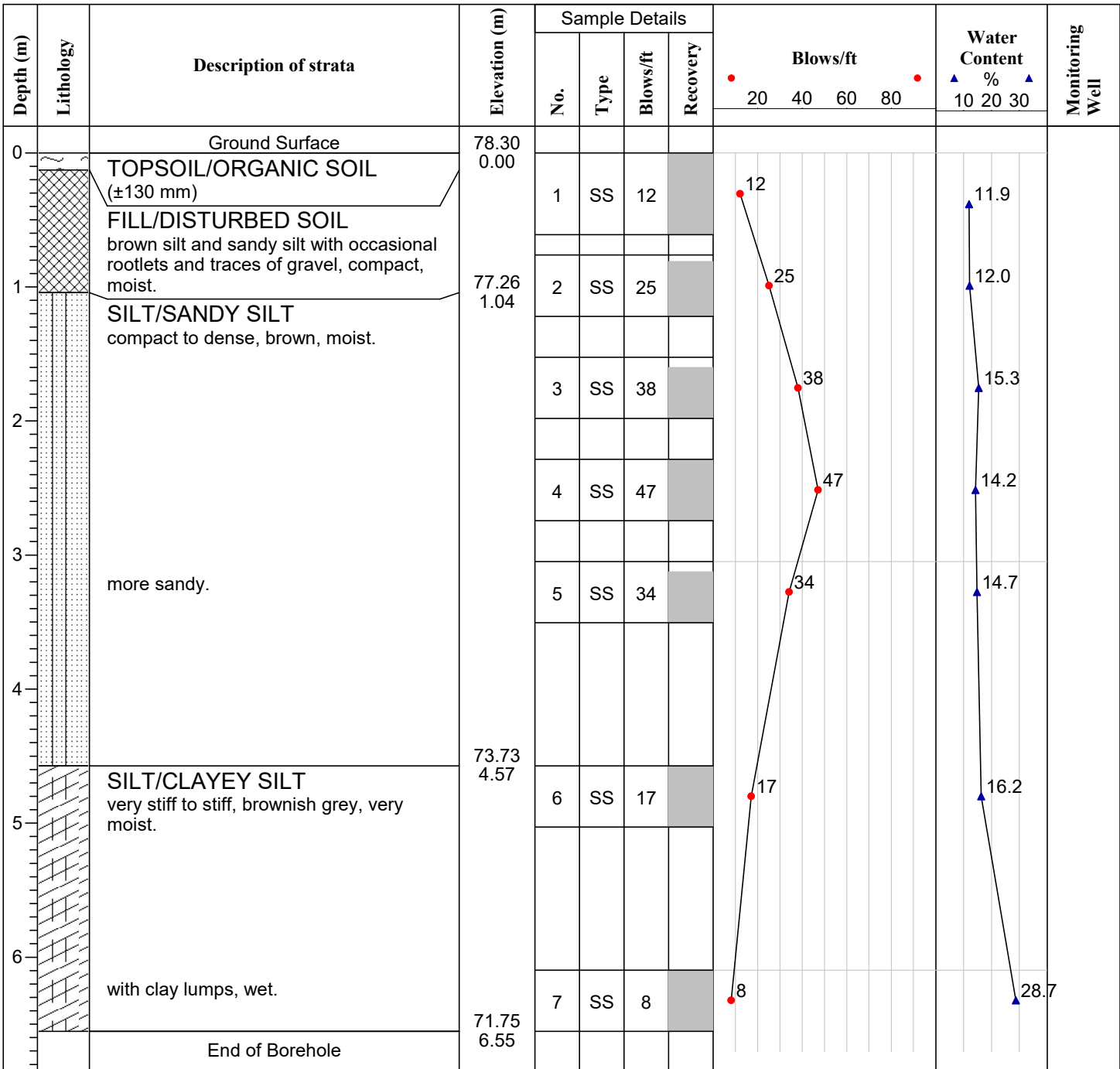
Log of Borehole BH-1

Project: PROPOSED COMFORT STATION REPLACEMENT

Client: CELLUCCI+PACE

Enclosure: 2

Location: JACK DARLING MEMORIAL PARK - 1 WATERFRONT TRAIL, MISSISSAUGA, ONTARIO



Remarks: Upon completion of drilling, the borehole was open to 5.9 m and the water level was measured at 5.8 m below EGSL.

Drill Method: GEO PROBE
Drill Date: 13 AUGUST 2024
Datum: GEODETIC

Engineer: P.R.
Checked by: G.S.
Sheet No. 1 of 1

Project No: 7407

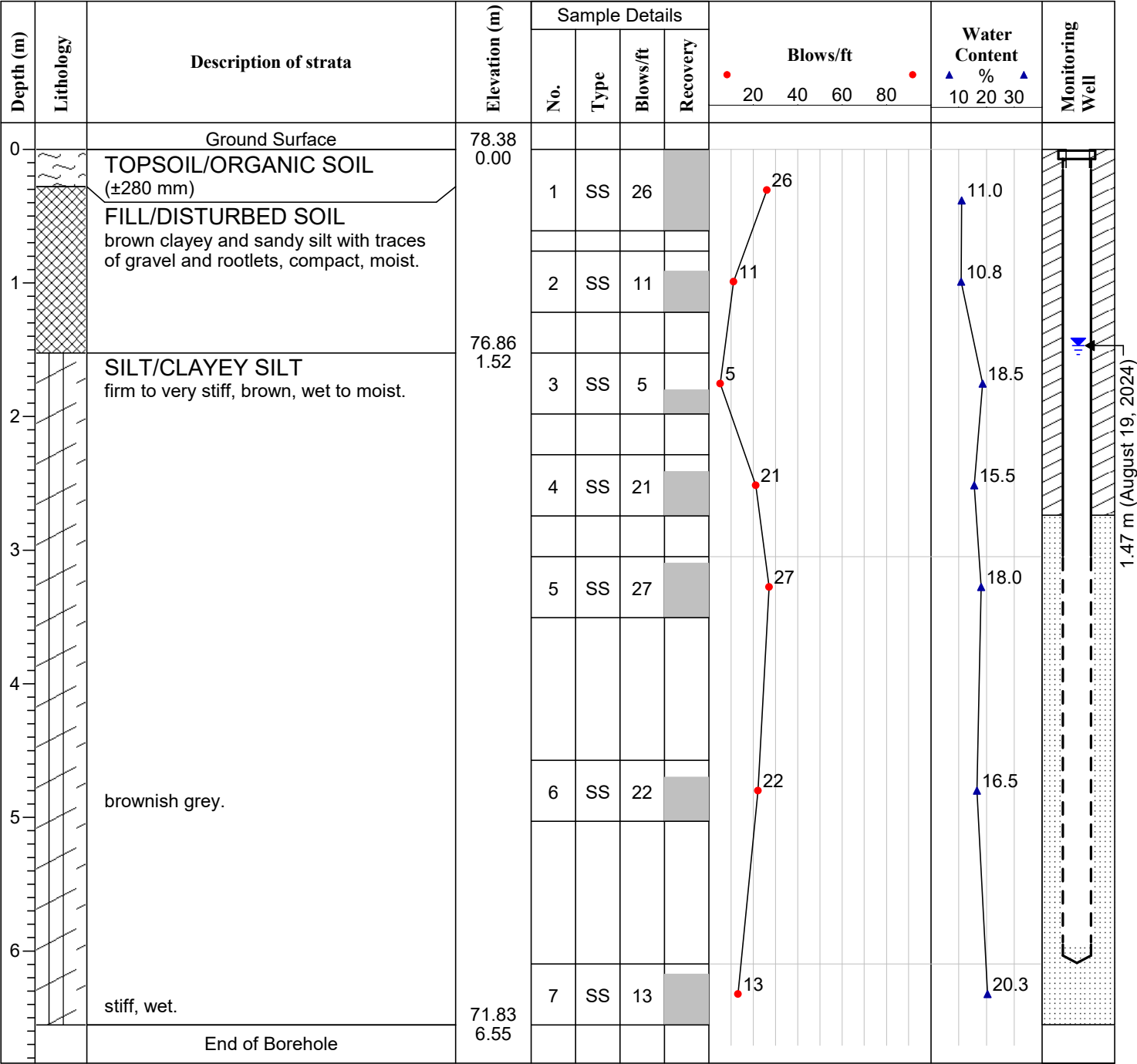
Log of Borehole BH/MW-2

Project: PROPOSED COMFORT STATION REPLACEMENT

Client: CELLUCCI+PACE

Enclosure: 3

Location: JACK DARLING MEMORIAL PARK - 1 WATERFRONT TRAIL, MISSISSAUGA, ONTARIO



Remarks: Upon completion of drilling, the borehole was open to 6.1 m and the water level was measured at 5.6 m below EGSL. On August 19, 2024, the water level in the installed well was measured at 1.47 m below EGSL.

Drill Method: GEO PROBE
Drill Date: 13 AUGUST 2024
Datum: GEODETIC

Engineer: P.R.
Checked by: G.S.
Sheet No. 1 of 1

Project No: 7407

Log of Borehole BH-3

Project: PROPOSED COMFORT STATION REPLACEMENT

Client: CELLUCCI+PACE

Enclosure: 4

Location: JACK DARLING MEMORIAL PARK - 1 WATERFRONT TRAIL, MISSISSAUGA, ONTARIO

Depth (m)	Lithology	Description of strata	Elevation (m)	Sample Details				Blows/ft	Water Content %	Monitoring Well
				No.	Type	Blows/ft	Recovery			
0		Ground Surface	78.70							
		FLOOR SLAB*	0.00							
		FILL/DISTURBED SOIL ±115 mm of brown sand and gravel with polystyrene foam piece, followed by fine sand and clayey silt/silt, loose, moist.		1	SS	6		6	9.1	
1		SILT/CLAYEY SILT stiff, brown, moist.	77.81 0.89	2	SS	10		10	17.3	
		End of Borehole	77.18 1.52							
2										
3										
4										
5										
6										

* Floor slab consists of:
±4 mm Vinyl surface
±8 mm Brick/Ceramic
±35 mm Grout
±160 mm concrete

Remarks: Upon completion of drilling, the borehole was open and dry.

Drill Method: MANUAL HAMMER

Drill Date: 13 AUGUST 2024

Datum: GEODETIC

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

APPENDIX B

TEST PIT OBSERVATION SHEET

Test Pit No.	a mm	b mm	c mm	h mm	Founding Material	Water Comment	Test Pit Ground Surface Elevation (m)
TP1	90	190	N/A	1100	Silt/Clayey Silt	No water No weeper	78.55



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244 Brockport Drive, Unit 15
Toronto, Ontario M9W 6X9
Tel: 416-798-3500 Fax: 416-798-8481

www.forwardengineering.ca

TEST PIT OBSERVATIONS

Project Name: PROPOSED COMFORT STATION REPLACEMENT
- JACK DARLING MEMORIAL PARK
Address: 1 WATERFRONT TRAIL,
MISSISSAUGA, ONTARIO

PROJECT No. : 7407

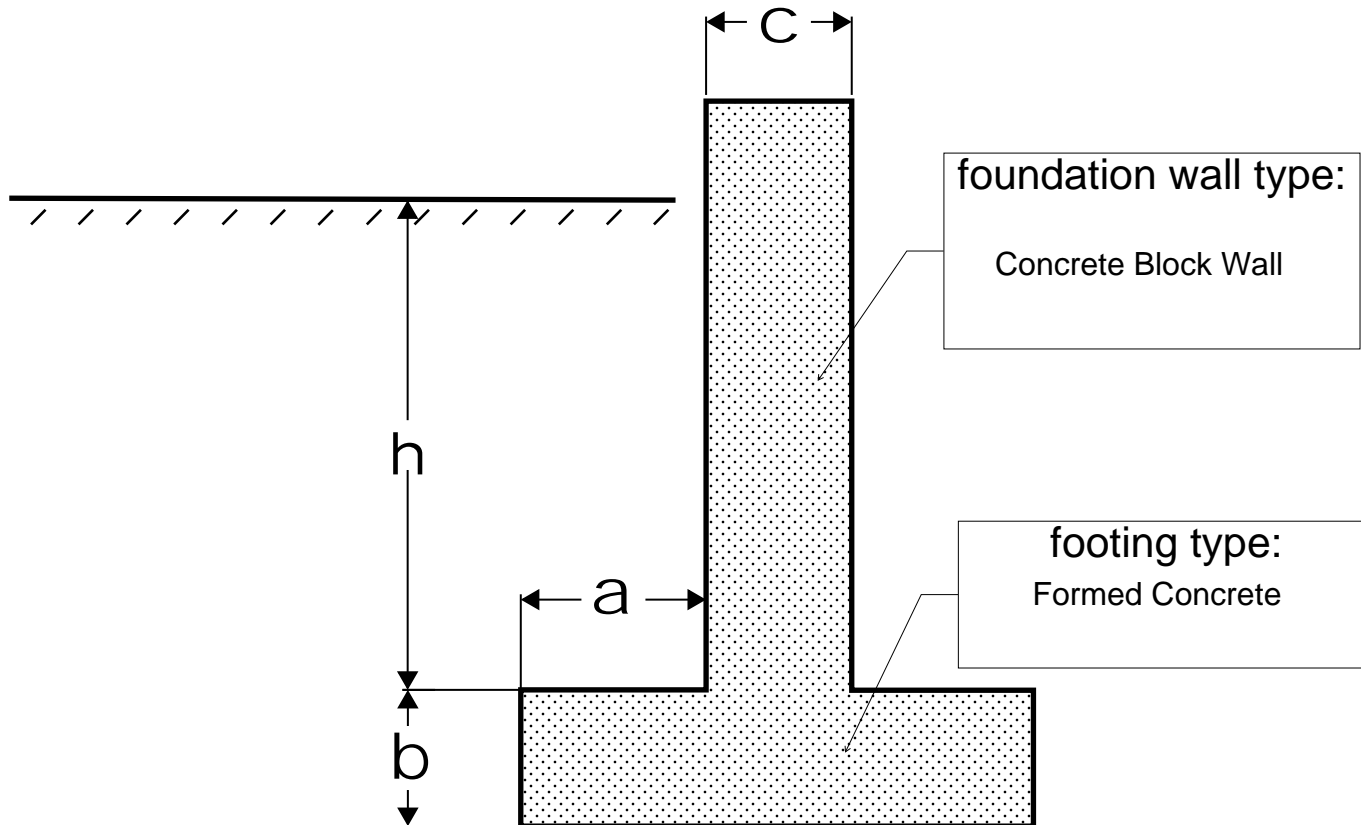
DESIGN BY : P.R.

DRAWING DATE : SEPT. 3, 2024

DRAWN BY: P.R. PAGE 1 of 1

CHECKED BY: G.S.

NOTES:





7407

October 7, 2024

Cellucci+Pace
3C-510 Rowntree Dairy Road
Woodbridge, Ontario
L4L 8H2

Attention: Mr. Claudio Cellucci B. Arch, MRAIC
Principal

Dear Sir:

Re: Soil Chemical Testing Report
Comfort Station, Jack Darling Memorial Park
Mississauga, Ontario

1.0 INTRODUCTION

As requested, Forward Engineering & Associates Inc. (**Forward**) conducted a chemical testing program for the above project site.

The report of the chemical testing program is to be used for Characterization of the materials for disposal purposes only.

2.0 BACKGROUND

The purpose of this program is to test the materials to be excavated during the construction of the proposed school.

3.0 FIELD WORKS

3.1 Sampling

The field sampling was carried out from the boreholes drilled in August 2024.

Examination of the soil samples did not indicate visual and/or olfactory evidence of contamination.

Three [3] representative samples, obtained from the boreholes, were prepared for laboratory chemical testing.



4.0 ANALYTICAL TESTING PROGRAM

4.1 Soil Testing

The samples were prepared, and chemically tested, as presented in the following table:

Laboratory Sample ID	Field Sample ID	Tested Parameters
2439448-01	1/1B	Metals and Inorganics, PHCs F1-F4 + BTEX
2439448-02	2/1B	Metals and Inorganics, PHCs F1-F4 + BTEX
2439448-03	3/1C	Metals and Inorganics, PHCs F1-F4 + BTEX

*1/1B stands for sample taken from Borehole No. 1, Split Spoon No. (1B).

The soil samples were submitted to PARACEL Laboratories, Mississauga, Ontario, which are independent laboratories and are certified by the Canadian Association of Environmental Analytical Laboratories (CAEAL).

5.0 FINDINGS AND DISCUSSIONS

5.1 Soils Type and Condition

The tested materials consisted of fine texture materials (sandy to Clayey Silt).

5.2 Analytical Testing Results

5.2.1 Results Compared to Table 1 Residential/Parkland/ Industrial/Commercial Criteria

The results, enclosed in Appendix B, were compared to *Reg 406/19-Table1 Residential/Parkland/Industrial/Commercial/Community* Criteria.

The results met the above Table 1 Criteria with no exceptions.

For disposal purpose, it should be noted that the acceptance of fill materials depends on the discretion of the receiving site.



We trust this report meets our terms of reference. However, if any clarification is required, or if we can be of further assistance, please contact this office.

Sincerely yours,

FORWARD ENGINEERING & ASSOCIATES INC.

Juan Chahine, P. Eng.
Senior Project Manager



APPENDIX A

Laboratory Chemical Testing Results Compared to Table 1 Residential/Parkland/Industrial/Commercial /Community Criteria

TABLE 1		CLIENT: Forward Engineering & Associates Inc.				
PARACEL LABORATORIES LTD.		ATTENTION: George Semaan				
WORKORDER: 2439448		PROJECT: 7407				
REPORT DATE: 10/02/2024		REFERENCE: Standing Offer - ENV				
Parameter	Units	MDL	Regulation	Sample		
				1/18 2439448-01	2/18 2439448-02	3/1C 2439448-03
Sample Date (m/d/y)			Reg 406/19 -T1 Res/Park/Ind/Com	09/26/2024 09:00 AM	09/26/2024 09:00 AM	09/26/2024 09:00 AM
Physical Characteristics						
% Solids	% by Wt.	0.1		87.0	87.3	86.6
General Inorganics						
SAR	N/A	0.01	2.4	0.08	0.08	0.46
Conductivity	mS/cm	0.005	0.57	0.141	0.132	0.147
Cyanide, free	ug/g dry	0.03	0.051	<0.03	<0.03	<0.03
pH	pH Units	0.05		6.90	6.97	7.00
Metals						
Antimony	ug/g dry	1.0	1.3	<1.0	<1.0	<1.0
Arsenic	ug/g dry	1.0	18	3.1	2.1	3.2
Barium	ug/g dry	1.0	220	33.7	22.3	37.7
Beryllium	ug/g dry	0.5	2.5	<0.5	<0.5	<0.5
Boron, available	ug/g dry	0.5		0.7	0.7	0.8
Boron	ug/g dry	5.0	36	<5.0	<5.0	5.2
Cadmium	ug/g dry	0.5	1.2	<0.5	<0.5	<0.5
Chromium (VI)	ug/g dry	0.2	0.66	<0.2	<0.2	<0.2
Chromium	ug/g dry	5.0	70	11.7	8.4	12.4
Cobalt	ug/g dry	1.0	21	4.2	3.0	4.9
Copper	ug/g dry	5.0	92	11.2	7.9	12.5
Lead	ug/g dry	1.0	120	10.6	6.9	9.6
Mercury	ug/g dry	0.1	0.27	<0.1	<0.1	<0.1
Molybdenum	ug/g dry	1.0	2	<1.0	<1.0	<1.0
Nickel	ug/g dry	5.0	82	8.9	6.2	10.2
Selenium	ug/g dry	1.0	1.5	<1.0	<1.0	<1.0
Silver	ug/g dry	0.3	0.5	<0.3	<0.3	<0.3
Thallium	ug/g dry	1.0	1	<1.0	<1.0	<1.0
Uranium	ug/g dry	1.0	2.5	<1.0	<1.0	<1.0
Vanadium	ug/g dry	10.0	86	19.2	14.0	19.9
Zinc	ug/g dry	20.0	290	39.7	26.0	40.0
Volatiles						
Benzene	ug/g dry	0.02	0.02	<0.02	<0.02	<0.02
Ethylbenzene	ug/g dry	0.05	0.05	<0.05	<0.05	<0.05
Toluene	ug/g dry	0.05	0.2	<0.05	<0.05	<0.05
m/p-Xylene	ug/g dry	0.05		<0.05	<0.05	<0.05
o-Xylene	ug/g dry	0.05		<0.05	<0.05	<0.05
Xylenes, total	ug/g dry	0.05	0.05	<0.05	<0.05	<0.05
Hydrocarbons						
F1 PHCs (C6-C10)	ug/g dry	7	25	<7	<7	<7
F2 PHCs (C10-C16)	ug/g dry	4	10	<4	<4	<4
F3 PHCs (C16-C34)	ug/g dry	8	240	19	11	15
F4 PHCs (C34-C50)	ug/g dry	6	120	<6	<6	<6

Certificate of Analysis

Forward Engineering & Associates Inc.

244 Brockport Dr., Unit 15
Toronto, ON M9W 6X9
Attn: George Semaan

Client PO:
Project: 7407
Custody:

Report Date: 2-Oct-2024
Order Date: 26-Sep-2024

Revised Report

Order #: 2439448

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

Paracel ID	Client ID
2439448-01	1/1B
2439448-02	2/1B
2439448-03	3/1C

Approved By:



Milan Ralitsch, PhD
Senior Technical Manager

Certificate of Analysis

Report Date: 02-Oct-2024

Client: Forward Engineering & Associates Inc.

Order Date: 26-Sep-2024

Client PO:

Project Description: 7407

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.8 - ICP-MS	1-Oct-24	1-Oct-24
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	30-Sep-24	1-Oct-24
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	30-Sep-24	1-Oct-24
Conductivity	MOE E3138 - probe @25 °C, water ext	1-Oct-24	1-Oct-24
Cyanide, free	MOE E3015 - Auto Colour, water extraction	30-Sep-24	30-Sep-24
Mercury by CVAA	EPA 7471B - CVAA, digestion	30-Sep-24	1-Oct-24
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	27-Sep-24	27-Sep-24
PHC F1	CWS Tier 1 - P&T GC-FID	30-Sep-24	1-Oct-24
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	27-Sep-24	2-Oct-24
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	1-Oct-24	1-Oct-24
SAR	Calculated	1-Oct-24	1-Oct-24
Solids, %	CWS Tier 1 - Gravimetric	30-Sep-24	1-Oct-24

Certificate of Analysis

Report Date: 02-Oct-2024

Client: Forward Engineering & Associates Inc.

Order Date: 26-Sep-2024

Client PO:

Project Description: 7407

Client ID:	1/1B	2/1B	3/1C	-
Sample Date:	26-Sep-24 09:00	26-Sep-24 09:00	26-Sep-24 09:00	-
Sample ID:	2439448-01	2439448-02	2439448-03	-
MDL/Units	Soil	Soil	Soil	-

Physical Characteristics

% Solids	0.1 % by Wt.	87.0	87.3	86.6	-
----------	--------------	------	------	------	---

General Inorganics

SAR	0.01 N/A	0.08	0.08	0.46	-
Conductivity	0.005 mS/cm	0.141	0.132	0.147	-
Cyanide, free	0.03 ug/g dry	<0.03	<0.03	<0.03	-
pH	0.05 pH Units	6.90	6.97	7.00	-

Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	3.1	2.1	3.2	-
Barium	1.0 ug/g dry	33.7	22.3	37.7	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Boron	5.0 ug/g dry	<5.0	<5.0	5.2	-
Boron, available	0.5 ug/g dry	0.7	0.7	0.8	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	11.7	8.4	12.4	-
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	-
Cobalt	1.0 ug/g dry	4.2	3.0	4.9	-
Copper	5.0 ug/g dry	11.2	7.9	12.5	-
Lead	1.0 ug/g dry	10.6	6.9	9.6	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Nickel	5.0 ug/g dry	8.9	6.2	10.2	-
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Vanadium	10.0 ug/g dry	19.2	14.0	19.9	-
Zinc	20.0 ug/g dry	39.7	26.0	40.0	-

Volatiles

Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	-

Certificate of Analysis

Report Date: 02-Oct-2024

Client: Forward Engineering & Associates Inc.

Order Date: 26-Sep-2024

Client PO:

Project Description: 7407

Client ID:		1/1B	2/1B	3/1C	-
Sample Date:		26-Sep-24 09:00	26-Sep-24 09:00	26-Sep-24 09:00	-
Sample ID:		2439448-01	2439448-02	2439448-03	-
MDL/Units		Soil	Soil	Soil	-
Toluene-d8	Surrogate	103%	105%	103%	-

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	-
F3 PHCs (C16-C34)	8 ug/g dry	19	11	15	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	-

Certificate of Analysis

Report Date: 02-Oct-2024

Client: Forward Engineering & Associates Inc.

Order Date: 26-Sep-2024

Client PO:

Project Description: 7407

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	ND	0.01	N/A						
Conductivity	ND	0.005	mS/cm						
Cyanide, free	ND	0.03	ug/g						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	7.91		ug/g			98.9		50-140	

Certificate of Analysis

Report Date: 02-Oct-2024

Client: Forward Engineering & Associates Inc.

Order Date: 26-Sep-2024

Client PO:

Project Description: 7407

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	0.17	0.01	N/A	0.18			5.7	30	
Conductivity	0.0550	0.005	mS/cm	0.0524			4.8	5	
Cyanide, free	ND	0.03	ug/g	ND			NC	35	
pH	6.32	0.05	pH Units	6.34			0.3	10	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	25	8	ug/g	23			7.7	30	
F4 PHCs (C34-C50)	38	6	ug/g	42			8.2	30	
Metals									
Antimony	ND	1.0	ug/g	ND			NC	30	
Arsenic	1.9	1.0	ug/g	2.3			14.6	30	
Barium	29.8	1.0	ug/g	33.1			10.5	30	
Beryllium	ND	0.5	ug/g	ND			NC	30	
Boron, available	ND	0.5	ug/g	ND			NC	35	
Boron	ND	5.0	ug/g	5.1			NC	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Chromium	10.8	5.0	ug/g	12.6			15.3	30	
Cobalt	2.8	1.0	ug/g	3.1			10.3	30	
Copper	6.3	5.0	ug/g	6.8			7.6	30	
Lead	6.0	1.0	ug/g	6.5			9.4	30	
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	ND	1.0	ug/g	ND			NC	30	
Nickel	5.9	5.0	ug/g	6.5			10.3	30	
Selenium	ND	1.0	ug/g	ND			NC	30	
Silver	ND	0.3	ug/g	ND			NC	30	
Thallium	ND	1.0	ug/g	ND			NC	30	
Uranium	ND	1.0	ug/g	ND			NC	30	
Vanadium	19.8	10.0	ug/g	22.8			14.2	30	
Zinc	36.3	20.0	ug/g	25.6			NC	30	
Physical Characteristics									
% Solids	88.8	0.1	% by Wt.	87.6			1.4	25	
Volatiles									
Benzene	ND	0.02	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
Surrogate: Toluene-d8	9.72		ug/g		100	50-140			

Certificate of Analysis

Report Date: 02-Oct-2024

Client: Forward Engineering & Associates Inc.

Order Date: 26-Sep-2024

Client PO:

Project Description: 7407

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Cyanide, free	0.259	0.03	ug/g	ND	71.2	70-130			
Hydrocarbons									
F1 PHCs (C6-C10)	75	7	ug/g	ND	88.7	0-200			
F2 PHCs (C10-C16)	89	4	ug/g	ND	89.1	60-140			
F3 PHCs (C16-C34)	238	8	ug/g	23	95.4	60-140			
F4 PHCs (C34-C50)	224	6	ug/g	42	112	60-140			
Metals									
Antimony	51.7	1.0	ug/g	ND	103	70-130			
Arsenic	52.1	1.0	ug/g	ND	102	70-130			
Barium	59.6	1.0	ug/g	13.3	92.7	70-130			
Beryllium	55.6	0.5	ug/g	ND	111	70-130			
Boron, available	4.99	0.5	ug/g	ND	99.8	70-122			
Boron	53.3	5.0	ug/g	ND	102	70-130			
Cadmium	49.6	0.5	ug/g	ND	99.0	70-130			
Chromium (VI)	4.2	0.2	ug/g	ND	64.0	70-130			QM-01
Chromium	55.7	5.0	ug/g	5.0	101	70-130			
Cobalt	53.4	1.0	ug/g	1.2	104	70-130			
Copper	53.7	5.0	ug/g	ND	102	70-130			
Lead	52.6	1.0	ug/g	2.6	99.9	70-130			
Mercury	1.52	0.1	ug/g	ND	102	70-130			
Molybdenum	52.0	1.0	ug/g	ND	104	70-130			
Nickel	54.4	5.0	ug/g	ND	104	70-130			
Selenium	50.4	1.0	ug/g	ND	100	70-130			
Silver	47.7	0.3	ug/g	ND	95.4	70-130			
Thallium	47.5	1.0	ug/g	ND	94.9	70-130			
Uranium	46.8	1.0	ug/g	ND	93.1	70-130			
Vanadium	59.7	10.0	ug/g	ND	101	70-130			
Zinc	64.7	20.0	ug/g	ND	109	70-130			
Volatiles									
Benzene	4.85	0.02	ug/g	ND	98.9	50-140			
Ethylbenzene	4.75	0.05	ug/g	ND	97.0	50-140			
Toluene	3.97	0.05	ug/g	ND	81.1	50-140			
m,p-Xylenes	10.1	0.05	ug/g	ND	103	50-140			
o-Xylene	5.13	0.05	ug/g	ND	105	50-140			
Surrogate: Toluene-d8	8.65		ug/g		89.1	50-140			

Certificate of Analysis

Client: Forward Engineering & Associates Inc.

Client PO:

Report Date: 02-Oct-2024

Order Date: 26-Sep-2024

Project Description: 7407

Qualifier Notes:

QC Qualifiers :

[1] : QM-01 : The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.

Spike QC Qualifiers :

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision-1: This report includes an updated Project, as per COC.

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.



Parcel ID: 2439448

Lastest 602
Parcel X16 6.28
© 1997
paracel.com
info@paracel.comParcel Order Number
(Lab Use Only)

2439448

Chain Of Custody
(Lab Use Only)

Client Name: Forward Engineering & Associates Inc.	Project Ref: 7407	Page 1 of 1
Contact Name: George Semaan	Quote #:	Turnaround Time <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular
Address: 244 Brockport Dr., Unit 15 Toronto ON M9W 6X9	PO #:	
Telephone: (416) 798-3500	E-mail: george@forwardengineering.ca	
		Date Required: _____

<input type="checkbox"/> REG 153/04 <input checked="" type="checkbox"/> REG 406/19	Other Regulation	Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)	Required Analysis												
<input type="checkbox"/> Table 1 <input type="checkbox"/> Res/Park <input type="checkbox"/> Med/Fine <input type="checkbox"/> Table 2 <input type="checkbox"/> Ind/Comm <input type="checkbox"/> Coarse <input type="checkbox"/> Table 3 <input type="checkbox"/> Agri/Other <input type="checkbox"/> Table _____ For RSC: <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> REG 558 <input type="checkbox"/> PWQO <input type="checkbox"/> CCME <input type="checkbox"/> MISA <input type="checkbox"/> SU - Sanl <input type="checkbox"/> SU - Storm Mun: _____ <input type="checkbox"/> Other: _____	Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	Metals+Inorganics	PCBs
Sample ID/Location Name						Date	Time								
1	1/18	S		2	Sept 24	4:30	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	2/18	S		2	↓	↓	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	3/18	S		2	↓	↓	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:		Method of Delivery: Rubber	
Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print):	Date/Time: 26-Sept-24 1340	Date/Time: 9/27/24 1500	Date/Time: 26 Sept 24 1630
Date/Time: 26 Sept 24	Temperature: 26.5 °C	Temperature: 8.5	pH Verified: <input type="checkbox"/> By:

SECTION 01 19 00 - GENERAL REQUIREMENTS

1.1 GENERAL REQUIREMENTS

- .1 Division 1 requirements apply to all Sections of Work.

1.2 SUMMARY OF WORK

- .1 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.
- .2 Provide all work indicated in Contract Documents, regardless whether located within or outside Owner's property lines.
- .3 The following work is not included in this Contract:
 - .1 Work identified N.I.C.

1.3 PRODUCTS SUPPLIED BY OWNER

- .1 The following products will be supplied only by the Owner for incorporation into work of this Contract:
 - .1 Selected washroom accessories (Refer to Section 10 28 00 – Washroom Accessories; products supplied only by Owner are labelled OS/CI)
 - .2 Other products indicated accordingly.
- .2 Owner will provide manufacturer's installation instructions for each product if available.
- .3 Contractor's duties:
 - .1 Unload and handle products at site. Promptly inspect delivered products, and give written report to Consultant on condition of all items received. Pay demurrage charges if unloading is delayed.
 - .2 Store and protect products until required for installation.
 - .3 Install, connect and finish products as required.
 - .4 Remove packaging material from site and clean products.

1.4 DIVISION OF WORK

- .1 Work specified in the Specification has been divided into technical Sections for the purpose of ready reference. Division of work among Subcontractors and suppliers is solely the Contractor's responsibility and Consultant assumes no responsibility to act as an arbiter to establish subcontract limits between Sections or Divisions of work.

1.5 METRIC PROJECT

- .1 This project is based on The International System of Units (SI). Measurements 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.
- .2 All metric units specified shall be taken to be the minimum acceptable unless otherwise noted.
- .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.
- .4 Where a material or product cannot be obtained in the metric size specified, provide the next larger imperial size available.
- .5 Where both metric and imperial sizes or dimensions are shown, the metric size or dimension shall

SECTION 01 19 00 - GENERAL REQUIREMENTS

govern.

1.6 SAFETY AND SECURITY

- .1 Be responsible for security of all areas affected by work of this Contract until taken over by Owner. Take steps to prevent entry to the Work by unauthorized persons and guard against theft, fire and damage by any cause.
- .2 Provide suitable surveillance equipment and/or employ guard services, as required to adequately protect the Work.
- .3 Maintain fire protection for work. Store paints and volatile substances in a separate and controlled location and inspect frequently. Inspect temporary wiring, drop cords, extension cables for defective insulation or connections frequently. Remove combustible wastes frequently. Prohibit smoking in areas where volatile and flammable substances are used.
- .4 Do not cut, bore or sleeve through any loadbearing member, new or existing without Consultant's written authorization, unless specifically indicated on Drawings.

1.7 USE OF SITE

- .1 Accept full responsibility for assigned access, work, staging and storage areas from the time of Contract award until Substantial Performance of the Work.
- .2 Check means of access and egress, rights and interests which may be interfered with. Do not block lanes, roadways, entrances or exits. Direct construction traffic and locate access to site as directed by municipality.
- .3 Where encroachment beyond property limits is necessary make arrangement with respective property owners.

END

SECTION 01 21 00 - ALLOWANCES

1.1 GENERAL

- .1 Comply with GC 4.1 CASH ALLOWANCES and GC 4.2 CONTINGENCY ALLOWANCE.
- .2 Cash allowances are designated for additional work and services deemed to be necessary by Owner, from time to time, throughout the execution of the Work. Where a cash allowance refers to an item or category of work already included in Contract Documents, it shall be assumed to cover work or services in addition to that indicated, unless specifically indicated otherwise.
- .3 Contractor may be required from time to time to assist in tendering of certain items of work covered by allowance, as directed by Consultant.

1.2 AUTHORIZATION

- .1 Expenditures from allowances included in the Contract must be authorized in writing by the Consultant.
- .2 Work covered by allowances shall be performed for such amounts and by such persons as directed by the Consultant.

1.3 CASH ALLOWANCES

- .1 Cash allowances include supply and installation unless specifically indicated otherwise.
- .2 Supply only allowances shall include:
 - .1 Net cost of products
 - .2 Delivery to site
 - .3 Applicable taxes and duties (not including HST)
- .3 Supply and install allowances shall include:
 - .1 Net cost of products
 - .2 Delivery to site
 - .3 Unloading, storing, handling of products on site
 - .4 Installation, finishing and commissioning of products
 - .5 Applicable taxes and duties (not including HST)
- .4 Inspection and testing allowances shall include:
 - .1 Net costs of inspection/testing services
 - .2 Applicable taxes (not including HST)
- .5 Other costs related to work covered by allowances including overhead and profit are not covered by the allowance but shall be included separately in Contract.
- .6 Include in the Contract a cash allowance in the amount of \$60,000.00 (sixty thousand dollars) for the following items:
 - .1 Testing and inspections of soil compaction and buried services
 - .2 Testing and inspection of steel construction, testing and inspection of reinforcing, welding and anchorages

SECTION 01 21 00 - ALLOWANCES

- .3 Testing of asphalt and concrete paving
- .4 Inspections of masonry
- .5 Roofing inspections
- .6 Testing of air barrier
- .7 Building envelop inspection and testing

1.4 CONTINGENCY ALLOWANCE

- .1 Include in this Contract a contingency allowance in the amount of \$70,000.00 (seventy thousand dollars).

END

SECTION 01 31 00 - PROJECT COORDINATION

1.1 PRE-CONSTRUCTION MEETING

- .1 Immediately prior to construction, upon notification attend at location of Owner's choice, pre--construction meeting, along with authoritative representatives of certain key subcontractors as specifically indicated in the conference notice.
- .2 Purpose of meeting is as follows:
 - .1 Review project communications procedures.
 - .2 Review contract administration requirements including submittals, payment and change order procedures.
 - .3 Identify all critical points on construction schedule for positive action.
 - .4 Identify any product availability problems and substitution requests.
 - .5 Establish site arrangements and temporary facilities.
 - .6 Review Consultant's inspection requirements.
 - .7 Review any points which, in Owner's, Consultant's and Contractor's opinion, require clarification.
- .3 The Consultant shall organize and chair the pre-construction meeting. Consultant shall record minutes of pre-construction meeting and distribute a copy to each participant within ten days of meeting.

1.2 SITE MEETINGS

- .1 Prior to the commencement of the Work, the Contractor together with the Consultant shall mutually agree to a sequence for holding bi-weekly site meetings.
- .2 Contractor shall chair site meetings. Ensure that persons, whose presence is required, are present and that relative information is available to allow meetings to be conducted efficiently.
- .3 Once a month or more often if directed by Consultant include review with Consultant and Owner of construction schedule and application for progress payment, during or immediately following site meeting.
- .4 Record minutes of each meeting and promptly distribute copies to be received by all participants not later than seven days after meeting has been held. Distribute minutes of meetings to all major Subconsultants, whether in attendance or not.

1.3 SUPERVISION

- .1 Employ an experienced and qualified supervisor who shall be in complete charge of the work from commencement to final completion of the Work and who shall be present at the site whenever work is being carried out. A working foreperson will not be acceptable. The supervisor shall not be changed after commencement of work without the Consultant's approval.
- .2 Supervise, direct, manage and control the work of all forces carrying out the work, including subcontractors and suppliers. Carry out daily inspections to ensure compliance with the Contract Documents and the maintenance of quality standards. Ensure that the supervisory staff includes personnel competent in supervising all Sections of Work required.
- .3 Arrange for sufficient number of qualified assistants to the supervisor as required for the proper and efficient execution of the Work.

1.4 DOCUMENTS ON SITE

PROJECT NO. 24-053

06/01/2025
WESPEC

**COMFORT STATION AT
JACK DARLING MEMORIAL PARK, MISSISSAUGA, ONTARIO
01 31 00-1**

SECTION 01 31 00 - PROJECT COORDINATION

- .1 Contractor's field office shall at all times contain a complete set of Contract Documents (Drawings and Specifications) with all addenda, site instructions, change orders, reviewed shop drawings and samples, colour schedule, paint materials schedules, hardware list, progress reports and meeting minutes.
- .2 Keep building permit documents in field office for duration of work.

1.5 INTERFERENCE AND COORDINATION DRAWINGS

- .1 Prepare interference and equipment placing drawings to ensure that all components will be properly accommodated within the spaces provided.
- .2 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.
- .3 Ensure that clearances required by jurisdictional authorities and clearances for proper maintenance are indicated on drawings.
- .4 Upon Consultant's request submit copies of interference drawings to Consultant.

1.6 SLEEVING AND INSERT SETTING DRAWINGS

- .1 Prepare sleeving drawings for work of Division 21 to 28, showing size and location of all penetrations through load bearing elements. Submit sleeving drawings to Consultant for review not less than 15 days prior to construction of affected elements.
- .2 Prepare insert setting drawings for work to be cast into concrete and/or mortared into masonry elements. Submit insert setting drawings to Consultant for review not less than 15 days prior to construction of affected elements.

END

SECTION 01 32 00 - PROJECT PROGRESS DOCUMENTATION

1.1 CONSTRUCTION SCHEDULE

- .1 Within 21 days of Contract award, submit in format acceptable to Consultant, minimum four copies of Contractor's critical path construction schedule, using suitable computer scheduling software, such as "MS Project" or "Primavera".
- .2 Schedule proposed by the Contractor shall be based on the following assumptions:
 - .1 Critical path base line is considered by Contractor as reasonable and achievable.
 - .2 Schedule is based on resources which have been committed for this project by Contractor and will be readily available when needed.
 - .3 Schedule is based on normal average weather conditions, as documented by official weather records.
 - .4 Float belongs to Project.
- .3 Set up format to permit plotting of actual construction progress against scheduled progress.
- .4 Schedule shall show:
 - .1 Commencement and completion dates of Contract.
 - .2 Commencement and completion dates of construction stages/phases, if any.
 - .3 Commencement and completion dates of each trade. Major trades shall be further broken down as directed by Consultant; generally follow Specification format.
 - .4 Order and delivery dates for major or critical equipment.
 - .5 Critical dates for shop drawing/sample submissions.
 - .6 Any other information relating to orderly progress of Contract, considered by Contractor or Consultant to be pertinent.
- .5 Submit copy of schedule showing actual progress, to Consultant once a month, concurrently with application for payment. Consultant, together with Contractor, shall review construction progress once a month during or immediately following regular site meeting, or more often as directed by Consultant.
- .6 Update construction schedule, whenever changes occur, in manner and at times acceptable to Consultant. Include with each update a written report of activity progress reflected in the revised critical path schedule, and the corrective actions which have been or are to be taken to maintain progress on the schedule in the future, anticipated delay, resource availability, schedule changes, and work to be completed in the next 2 month period.
- .7 Plot actual construction progress on schedule at least once a week.

1.2 CASH FLOW CHART

- .1 Within 21 days after award of Contract, submit, in form approved by Consultant, cash flow chart broken down on a monthly basis in an approved manner. Cash flow chart shall indicate anticipated Contractor's monthly progress billings from commencement of work until completion.
- .2 Update cash flow chart whenever changes occur to scheduling and in manner and at times satisfactory to Consultant.

1.3 PROGRESS RECORD

- .1 Maintain on site, permanent written record of progress of work. Record shall be open to inspection by Consultant at all times and copy shall be furnished to Consultant upon request.

SECTION 01 32 00 - PROJECT PROGRESS DOCUMENTATION

- .2 This record shall show weather conditions, dates of commencement, progress and completion of various trades and items of work. Particulars pertaining to erection and removal of forms, pouring of concrete, installation of roofing and other critical or major components as well as number of employees of various trades and type and quantity of equipment employed daily, shall be noted.
- .3 Display a copy of the construction schedule in the site office from start of construction to completion. Superimpose actual progress of work on schedule at least once each week.

1.4 AS-BUILT DRAWINGS

- .1 Obtain and keep on site at all times a complete and separate set of black line white prints.
- .2 Note clearly, neatly, accurately and promptly as the work progresses location of services, piping, conduits, ductwork embedded in concrete/masonry, concealed in ceilings, walls and furring and underground services below building.
- .3 As-built drawings shall be available for review at each site meeting.
- .4 Refer to Section 01 77 00 for requirements on submission of as-built drawings.

1.5 PROGRESS PHOTOGRAPHS

- .1 Concurrently with monthly application for payment submit coloured progress photographs as follows:
 - .1 Up to four photographs shall be taken from positions determined by Consultant.
 - .2 Photographs shall be properly exposed and in focus; views shall be unobstructed.
 - .3 Identify each photograph on back stating name of project, name of photographer, description of view and date of photograph taken.
 - .4 Submit digital files in jpeg format.

1.6 PRODUCT DELIVERY CONTROL

- .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.
- .2 Provide equipment delivery schedule, coordinated with construction and submittals' schedule, showing delivery dates for major and/or critical equipment.
- .3 The Contractor shall contact the Consultant immediately upon receipt of information indicating that any material, 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.
- .4 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.
- .5 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.
- .6 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.

END

SECTION 01 33 00 - SUBMITTALS

1.1 GENERAL

- .1 Unless specified or directed otherwise, make all submissions to the Consultant at his office.
- .2 Make all submissions required by the Contract Documents with reasonable promptness and in orderly sequence so as to cause no delay in the work.
- .3 Arrange and pay for delivery to and return from Consultant of all submittals.
- .4 Submit the following prior to start of work:
 - .1 Insurance certificates
 - .2 Bonds
 - .3 Workplace Safety and Insurance Board Certificate

1.2 RELATED REQUIREMENTS

- .1 Make the following submissions in accordance with requirements specified elsewhere:
 - .1 Applications for payment: GC 5.2
 - .2 Workplace safety and insurance board certificates of clearance: GC 10.4
 - .3 Insurance certificates: GC 11.1
 - .4 Bonds: GC 11.2
 - .5 Interference drawings, sleeving and insert drawings: Section 01 31 00
 - .5 Construction schedule: Section 01 31 00
 - .6 Cash flow chart: Section 01 31 00
 - .7 Progress photographs: Section 01 31 00
 - .8 Equipment delivery schedule: Section 01 32 00
 - .10 Purchase order documentation: Section 01 32 00
 - .11 Certified site plan: Section 01 32 00
 - .12 Waste audit and reduction plans: Section 01 41 00
 - .13 Maintenance and operations data: Section 01 77 00
 - .14 As-built drawings: Section 01 77 00
 - .15 Maintenance materials: Section 01 77 00

1.3 SCHEDULE OF VALUES

- .1 Submit schedule of values in accordance with requirements of GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT, not less than 15 days prior to first application for payment.
- .2 Follow specifications table of contents as basis for degree of breakdown required. Show breakdown for different construction phases/stages if required by Consultant.
- .3 Break down cost for large items of work directed by Consultant.
- .4 Provide additional cost breakdown information if requested by Consultant.

1.4 SCHEDULE OF SUBMITTALS

- .1 Within 21 days of submission of construction schedule submit a schedule of submittals for shop drawings, samples, lists of materials and other documentation requiring Consultant's review.
- .2 For each item requiring submission and review show anticipated date of submission and critical date for return of reviewed submission.
- .3 Design sequence of submissions to reflect requirements of construction schedule.

SECTION 01 33 00 - SUBMITTALS

- .4 Allow up to 15 days for Consultant's review for each submission. Stagger submissions as much as possible to permit adequate review time for each item submitted. If several submissions are made at the same time or within a short time of each other, indicate order of priority in which submissions should be reviewed.
- .5 Include sufficient time to permit corrections and resubmission, if necessary, without affecting construction schedule.

1.5 PRODUCT DATA

- .1 Submit product data sheets, required by Contract Documents, and others as may be reasonably required by Consultant.
- .2 Submit product data sheets in digital or printed hardcopy form and in accordance with the following requirements:
 - .1 Show detailed comprehensive information on products to be used.
 - .2 Clearly identify product/model number on data sheets containing multiple products.
 - .3 Supplement manufacturers/distributor's standard schematics, diagrams, brochures data sheets, catalogue sheets, charts and other descriptive data as required to give a clear understanding of the properties of the product and how product is to be incorporated into project.

1.6 SHOP DRAWINGS

- .1 Submit shop drawings required by Contract Documents, in accordance with requirements of GC 3.11 SHOP DRAWINGS.
- .2 Prepare shop drawings in metric measurements only. Shop drawings containing imperial measurements will be rejected.
- .3 Provide shop drawings bearing seal and signature of professional engineer licensed to practise in Ontario where required. Shop drawings submitted without required seal and signature will be rejected and returned to Contractor without review.
- .4 Unless otherwise directed by the Consultant, submit a digital file or the following number of prints for each shop drawing required:
 - .1 Architectural shop drawings: 3 prints
 - .2 Structural, mechanical, electrical shop drawings: 4 prints
- .5 After review Consultant will return a marked up digital file or print to the Contractor. Contractor shall obtain and distribute the necessary number of copies for each shop drawing.
- .6 Shop drawings which require the approval of a legally constituted authority having jurisdiction shall be submitted by Contractor to such authority for approval. Such shop drawings shall receive final approval of authority having jurisdiction before Consultant's final review.
- .7 No work requiring a shop drawing submission shall be commenced until the submission has received Consultant's final review. Do not use any shop drawing, erection drawing or setting drawing which does not bear the stamp and signature of the Consultant.
- .8 The Consultant's review is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that the Consultant approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and this review shall not relieve the Contractor of his responsibility for meeting the requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site for information that pertains solely to fabrication processes or to techniques of construction and

SECTION 01 33 00 - SUBMITTALS

installation and for coordination of the work of all subtrades.

1.7 SAMPLES

- .1 Submit samples required by Contract Documents and as directed by the Consultant.
- .2 Unless indicated otherwise submit samples in duplicate.
- .3 Where colour selection is required submit manufacturer's full colour range for specified product line.
- .4 Submit samples with identifying labels bearing material or component description, manufacturer's name and brand name, Contractor's name, project name, location in which material or component is to be used, and date.
- .5 Prepay any shipping charges involved for delivering samples to destination point and returning to point of origin if required.
- .6 No work requiring a sample submission shall be commenced until the submission has received Consultant's final review.

1.8 REQUESTS FOR INFORMATION (RFI'S)

- .1 Submit RFI's only after a thorough review has determined that the required information is not included in the Contract Documents.
- .2 Submit RFI's in a timely manner so as not to cause any delay and leaving sufficient review time for the Consultant.
- .3 The Consultant will identify each RFI with the time and date received and assign an anticipated review time of one to five working days depending on the complexity of the matter under review, applied consecutively.
- .4 The Consultant will review RFI's in the order received, unless, upon Contractor's request, the Consultant agrees to prioritize the review of a particular RFI, adjusting the review time accordingly.
- .5 The Consultant will advise the Contractor within the assigned review time with one of the following responses:
 - .1 Information requested is included in the Contract Documents.
 - .2 A site instruction will be issued.
 - .3 A change notice will be issued.
 - .4 A change directive will be issued.

END

SECTION 01 35 00 - SPECIAL PROJECT REQUIREMENTS

1.1 OPERATIONAL LIMITATIONS

- .1 Contractor's use of site and access to it is limited to areas indicated.
- .2 Working hours on site are 7:00 a.m. to 5:00 p.m., Monday to Friday.
- .3 At all times restrict access, parking, material deliveries, execution of work, operations and procedures to agreed locations and times and do not deviate from agreed procedures without prior approval by Consultant.
- .4 Periodically review proposed construction operations with the Owner and Consultant and co-operate as required to ensure that the Owner's interests and requirements are not unduly compromised.
- .5 Do not execute work adjacent and/or above occupied areas except where it can be demonstrated that adequate protective devices are in place.
- .6 Enclose assigned work, staging and storage with a chain link or wire mesh fence, minimum 18 m high.
- .7 Do not use fuel powered machines and tools inside building.
- .8 Prevent spread of dust and noxious fumes, odours to occupied areas and beyond.

1.2 EXISTING SERVICES

- .1 Locate and protect existing services required for new buildings.
- .2 Should existing services be accidentally disrupted, make complete restoration immediately and ensure adequate protection to avoid future disruption.

1.3 PROTECTION

- .1 Keep area of work safe and secure at all times, denying access to unauthorized personnel.
- .2 Protect existing work from damage. Make good any damage caused.
- .3 Ensure that no part of the existing structure is overloaded due to work executed under this Contract.
- .4 Provide adequate guards, barricades and other temporary protection to prevent injury to persons.
- .5 Protect existing building interiors from damage by weather, when executing work which affects integrity of exterior walls and roof. Schedule activities during dry periods and/or provide temporary weatherproof closures to protect openings made in exterior walls and roof. At no cost to the Owner, replace interior finishes damaged by weather as a result of the Work of this Contract.
- .6 Prevent spread of dust and noxious fumes, odours to unassigned areas. Comply with Consultant's directions concerning noise and dust control.

1.4 TEMPORARY USE OF EXISTING FACILITIES

- .1 Existing facilities such as water and electrical power may be utilized by Contractor for temporary use; make arrangements with the Owner and follow Owner's directions with regard to such use.
- .2 Provide power cords, hoses and other devices as required to convey power/water from points where it is required to location where it is available.

SECTION 01 35 00 - SPECIAL PROJECT REQUIREMENTS

1.5 TEMPORARY WASHROOMS

- .1 Temporary washroom facilities specified herein are for use by park visitors only and not by construction personnel.
- .2 During the warm season (March to October 2026) provide, in location directed by the Owner, temporary washroom facilities consisting of one new and undamaged portable washroom units for male users and one new and undamaged portable washroom units for female users. Clearly identify washrooms as to their intended users.
- .3 Anchor portable washroom units to asphalt apron so as to achieve solid and lasting securement free of vibration and movement.
- .4 At all times during use of temporary washroom units provide hand sanitizers, toilet seat covers and toilet paper. Replenish washroom supplies daily.
- .5 Carry out once-a-day cleaning of all temporary washrooms, including on weekends.
- .6 Remove sanitary wastes, minimum twice a week or more often if necessary.
- .7 Inspect portable washroom units regularly to ensure that they are structurally sound and free of movement. Make repairs promptly, as required.
- .8 Remove temporary washroom facility when directed by Owner. Make good asphalt pavement where damaged by temporary washrooms.

1.6 CARBON & WASTE REDUCTION OPPORTUNITY - HIGH MATERIAL RECOVERY POTENTIAL

- .1 This project has a high potential to demonstrate measurable reductions in carbon emissions and construction waste.
- .2 This project involves deconstruction, renovation, or retrofitting. Diversion rates and subsequent material reuse or recovery (internal to project or external reuse) should be achieved.
- .2 The contractor is to provide a list of materials that can and will be recycled during the demolition process. Submit the list of recyclable materials to the design team architect for review.
- .3 At the end of the project, the contractor is to submit a certified letter from the receiving site/s, with a list and quantities of all materials that were received by the receiving site, along with the detailed list of recycled materials.

END

SECTION 01 41 00 - REGULATORY REQUIREMENTS

1.1 PERMITS, LICENCES, FEES

- .1 Comply with requirements of GC 10.2.
- .2 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.
- .3 Review building permit set with Consultant immediately following receipt of building permit and jointly determine whether or not changes to Contract are required.
- .4 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.
- .5 Report to the Consultant in writing any condition which would prohibit granting of any permit or approval before work affecting such items is commenced.
- .6 Give notice of completion of project prior to occupancy, as required by applicable legislation.

1.2 BUILDING CODE, BY-LAWS, REGULATIONS

- .1 Carry out work in accordance with requirements of the Ontario Building Code, latest issue, including all amendments and revisions.
- .2 Comply with requirements, regulations and ordinances of other jurisdictional authorities.
- .3 Where it is necessary to carry out work outside property lines, such as sidewalks, paving or concrete curbs, comply with applicable municipal and/or regional requirements.
- .4 Promptly submit written notice to Consultant, of observed variance of Contract Documents from requirements of Building Code and authorities having jurisdiction. Assume responsibility for work known to be contrary to such requirements and performed without notifying Consultant.

1.3 CONSTRUCTION SAFETY

- .1 Comply with requirements of GC 3.6.
- .2 Be governed by pertinent safety requirements of Federal or Provincial Governments and of municipal bodies having authority, particularly the Ontario Construction Safety Act, and regulations of Ontario Ministry of Labour, and work in conjunction with proper safety associations operating under the authority of Workplace Safety and Insurance Act.
- .3 Do not, in the performance of the work, in any manner endanger the safety or unlawfully interfere with the convenience of the public.
- .4 Notify the Ontario Ministry of Labour of intended work of this Contract as required by the Occupational Health and Safety Act. One copy of the "Notice of Project" shall be handed to Consultant.

1.4 FIRE PROTECTION

- .1 Refer to technical sections of Specifications and Drawings for fire protection requirements.
- .2 Test methods used to determine fire hazard classification and fire endurance rating shall be as required by Ontario Building Code.
- .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.
- .4 Materials having a fire hazard classification shall be applied or installed in accordance with fire rating authority's printed instructions.

SECTION 01 41 00 - REGULATORY REQUIREMENTS

- .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.
- .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.
- .7 Fill and patch voids and gaps around openings and penetrations in and at perimeter of assemblies so as to maintain continuity and to produce a fire resistant smoke tight seal, acceptable to jurisdictional authorities and Consultant.

1.5 HAZARDOUS MATERIALS

- .1 Comply with provisions of the Occupational Health and Safety Act as amended to include WHMIS (Workplace Hazardous Materials Information System).
- .2 Ensure that Safety Data Sheets (SDS) are available on site prior to first delivery to site of any controlled material or substance.
- .3 Maintain on site for duration of Contract a hazardous materials log containing all required SDS.
- .4 Log shall be open for inspection for Owner, Consultant and all personnel on site.
- .5 Ensure that workers are instructed in the purpose and content of SDS.

1.6 WASTE MANAGEMENT

- .1 Comply with applicable regulations of the authorities having jurisdiction governing waste management.
- .2 Prepare and submit waste audit and waste reduction plan in accordance with applicable requirements of regulatory agencies.
- .3 Prepare and submit source separation plan in accordance with applicable requirements of regulatory agencies.

END

SECTION 01 42 00 - ABBREVIATIONS

1.1 ABBREVIATIONS

- .1 The abbreviations, acronyms and initialisms listed below, when used in the Contract Documents, shall have the meanings shown.
- .2 See Drawing and Room Finish Schedule Abbreviations for additional abbreviations.

ABBREVIATION MEANING

AA	ALUMINUM ASSOCIATION
AAMA	ARCHITECTURAL ALUMINUM MANUFACTURERS' ASSOCIATION
AASHO	AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS
ACI	AMERICAN CONCRETE INSTITUTE
AGA	AMERICAN GAS ASSOCIATION
AIA	AMERICAN INSTITUTE OF ARCHITECTS
AIMA	ACOUSTICAL & INSULATING MATERIALS ASSOCIATION
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
AMCA	AIR MOVING AND CONDITIONING ASSOCIATION INC.
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIRCONDITIONING ENGINEERS
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWI	ARCHITECTURAL WOODWORK INSTITUTE (USA)
AWMAC	ARCHITECTURAL WOODWORK MANUFACTURERS ASSOCIATION OF CANADA
AWS	AMERICAN WELDING SOCIETY
CCA	CANADIAN CONSTRUCTION ASSOCIATION
CCRC	CANADIAN CODE FOR RESIDENTIAL CONSTRUCTION
CEC	CANADIAN ELECTRICAL CODE
CFUA	CANADIAN FIRE UNDERWRITERS ASSOCIATION
CGA	CANADIAN GAS ASSOCIATION
CGSB	CANADIAN GENERAL STANDARDS BOARD
CIQS	CANADIAN INSTITUTE OF QUANTITY SURVEYORS
CISC	CANADIAN INSTITUTE OF STEEL CONSTRUCTION
CITC	CANADIAN INSTITUTE OF TIMBER CONSTRUCTION
CLA	CANADIAN LUMBERMEN'S ASSOCIATION
CMHC	CANADA MORTGAGE & HOUSING CORPORATION
COFI	COUNCIL OF FOREST INDUSTRIES OF BRITISH COLUMBIA
CPCI	CANADIAN PRESTRESSED CONCRETE INSTITUTE
CRCA	CANADIAN ROOFING CONTRACTORS ASSOCIATION
CSA	CANADIAN STANDARDS ASSOCIATION
CSC	CONSTRUCTION SPECIFICATIONS CANADA
CSI	CONSTRUCTION SPECIFICATIONS INSTITUTE (USA)
CSPI	CORRUGATED STEEL PIPE INSTITUTE
CSSBI	CANADIAN SHEET STEEL BUILDING INSTITUTE
CUA	CANADIAN UNDERWRITERS' ASSOCIATION
CWB	CANADIAN WELDING BUREAU
CWC	CANADIAN WOOD COUNCIL
DND	DEPARTMENT OF NATIONAL DEFENCE, CANADA
FM	FACTORY MUTUAL ENGINEERING CORPORATION
FS	FEDERAL SPECIFICATION (USA)
IES	ILLUMINATING ENGINEERING SOCIETY
IGMAC	INSULATED GLASS MANUFACTURERS ASSOCIATION OF CANADA
LTIC	LAMINATED TIMBER INSTITUTE OF CANADA
MIA	MARBLE INSTITUTE OF AMERICA
MPI	MASTER PAINTERS INSTITUTE
MPMDD	MODIFIED PROCTOR MAXIMUM DRY DENSITY
NAAMM	NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (USA)
NBFU	NATIONAL BOARD OF FIRE UNDERWRITERS
NBC	NATIONAL BUILDING CODE OF CANADA
NBS	NATIONAL BUREAU OF STANDARDS (USDC)
NEMA	NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION

SECTION 01 42 00 - ABBREVIATIONS

NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NHLA	NATIONAL HARDWOOD LUMBER ASSOCIATION (USA)
NLGA	NATIONAL LUMBER GRADES AUTHORITY
NRC	NATIONAL RESEARCH COUNCIL
OBC	ONTARIO BUILDING CODE
OHSA	OCCUPATIONAL HEALTH AND SAFETY ACT
OPSS	ONTARIO PROVINCIAL STANDARD SPECIFICATIONS
OS/CI	OWNER SUPPLIED/CONTRACTOR INSTALLED
PCA	PORTLAND CEMENT ASSOCIATION
PCI	PRESTRESSED CONCRETE INSTITUTE
RAIC	ROYAL ARCHITECTURAL INSTITUTE OF CANADA
SDI	STEEL DECK INSTITUTE
SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
SPMDD	STANDARD PROCTOR MAXIMUM DRY DENSITY
SSPC	STEEL STRUCTURES PAINTING COUNCIL
TTMAC	TERRAZZO, TILE & MARBLE ASSOCIATION OF CANADA
ULC	UNDERWRITERS' LABORATORIES OF CANADA
ULI	UNDERWRITERS' LABORATORIES, INC. (USA)
USAS	UNITED STATES OF AMERICA STANDARDS INSTITUTE
WSIB	WORKPLACE SAFETY AND INSURANCE BOARD

END

SECTION 01 45 00 - QUALITY CONTROL

1.1 INDEPENDENT INSPECTION AND TESTING

- .1 Requirements specified herein apply to independent inspection and testing specified under technical Specification Sections, Divisions 2 to 33. Owner will pay separately for independent inspection and testing services.
- .2 Requirements specified herein do not apply to the following:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations and orders of public authorities.
 - .2 Testing, adjustment and balancing of mechanical and electrical systems and equipment.
 - .3 Inspection and testing performed exclusively for Contractor's convenience.
 - .4 Tests specified in Division 2 to 33 inclusive, to be included in Contract such as mill tests, certificates of compliance and testing to be carried out by Contractor under direction of Consultant.
- .3 Failure by independent inspection and testing agency to detect defective work or materials shall not in any way prevent later rejection, when such defect is discovered, nor shall it obligate Consultant for final acceptance.
- .4 Independent inspection and testing agency (hereinafter referred to as testing agency) is expected to do the following:
 - .1 Act on a professional and unprejudiced basis and carry out inspection and testing functions to establish compliance with requirements of Contract Documents.
 - .2 Check work as it progresses and prepare reports stating results of tests and conditions of work and state in each report whether specimens tested conform to requirements of Contract Documents, specifically noting deviations.
 - .3 Distribute reports as follows:
 - .1 Owner: 2 copies
 - .2 Consultant: 2 copies
 - .3 Subconsultants affected: 1 copy
 - .4 Contractor: 2 copies
 - .5 Building Department: 1 copy
- .5 Testing agency is not authorized to amend or release any requirements of Contract Documents, nor to approve or accept any portion of work.
- .6 Contractor shall do the following:
 - .1 Notify testing agency minimum 48 hours in advance of operations to allow for assignment of personnel and scheduling of tests without causing delay in work.
 - .2 Provide testing agency with access to work at all times.
 - .3 Supply material samples for testing.
 - .4 Supply casual labour and other incidental services required by testing agency.
 - .5 Provide facilities for site storage of samples.
 - .6 Make good work disturbed by testing agency.
- .7 When initial inspection and testing indicates non-compliance with Contract Documents, any

SECTION 01 45 00 - QUALITY CONTROL

subsequent reinspection and retesting occasioned by non-compliance shall be performed by same testing agency and cost thereof borne by Contractor.

1.2 MOCK UPS

- .1 Where required by Contract Documents construct mock-ups of work on site, in size and at location directed by Consultant.
- .2 Construct mock-ups prior to start of affected work. Allow sufficient time for Consultant's review. Work affected by mock-ups may not commence prior to acceptance of mock-up.
- .3 Construct mock ups to include all related specified materials and workmanship. Make revisions as directed by Consultant, in accordance with intent of Contract Documents, until mock-ups are acceptable.
- .4 Mock ups, reviewed and accepted by Consultant, shall become the standard of quality against which installed work will be measured.
- .5 Mock ups, by prior arrangement, may be incorporated into finished work if approved by Consultant.

1.3 TOLERANCES

- .1 Unless specific tolerances are required by a Section of the Specifications or a referenced standard, meet the following non-cumulative tolerances for installed work:
 - .1 "plumb" shall mean plumb within ± 3 mm in 3 m of true plumb.
 - .2 "level" shall mean level within ± 3 mm in 3 m of true level
 - .3 "square" shall mean within ± 30 seconds of true 90° .
 - .4 "straight" shall mean within ± 3 mm in 3 m under a 3 m straightedge.

1.4 BUILDING ENVELOPE

- .1 Requirements specified herein apply to all elements of the exterior building envelope.
- .2 Provide control joints in exterior building components of design and spacing which will permit expansion and contraction of components without causing distortion, failure of joint seals, undue stress, cracking, bowing or other defects detrimental to appearance and performance. Review design and location of control joints with Consultant prior to start of work and follow directions given by Consultant.
- .3 Anchor exterior cladding components to structure in manner suitable to accommodate structural deflection and creep. Design anchorage to withstand expected wind loads, positive and negative, in accordance with applicable regulations.
- .4 Ensure that air spaces on the outside of vertical air barrier/vapour retarder (walls) are constructed with adequate drainage provisions to the exterior.

1.5 DRAINAGE

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

END

SECTION 01 50 00 - TEMPORARY FACILITIES

1.1 GENERAL

- .1 Provide all temporary facilities and controls required for the proper execution of the work.
- .2 Provide and maintain temporary systems in accordance with applicable regulations and requirements. Arrange for, obtain and pay for any permits required.
- .3 Upon completion of the Work or when no longer required remove temporary facilities from site.

1.2 TEMPORARY ELECTRICITY AND LIGHTING

- .1 Provide temporary electrical lighting and power system for use by all Sections.
- .2 Arrange, obtain and pay for service, including meter, of sufficient size to allow use of required tools and equipment and to ensure adequate lighting levels for the proper execution of work.
- .3 Install and maintain temporary electrical systems in accordance with the Ontario Electrical Code and other authorities having jurisdiction.

1.3 TEMPORARY HEATING

- .1 Furnish equipment, labour and fuel to provide temporary heat as required for proper execution of work.
- .2 Heat enclosed building to minimum 15°C at all times until taken over by Owner. Provide intermittent heating up to 21°C as required for proper execution of work.
- .3 Use propane or natural gas heaters of a type where the flame is not exposed. Open flame heaters are not permitted.
- .4 Uniformly distribute heat to avoid hot and cold areas and to prevent excessive drying.

1.4 TEMPORARY VENTILATION

- .1 Provide minimum 1 air change per hour for enclosed areas receiving architectural finishes.
- .2 Prior to commencement of work where hazardous or volatile adhesives, coatings or substances are used, install adequate mechanical ventilation.
- .3 Do not allow excessive build-up of moisture inside building.

1.5 TEMPORARY COMMUNICATIONS

- .1 Make provisions on site to send and receive e-mails until Substantial Performance.

1.6 TEMPORARY WATER

- .1 Provide temporary water supply, for use by all Sections.
- .2 Water shall be clean and non-staining.

1.7 TEMPORARY SANITARY FACILITIES

- .1 Provide temporary male and female toilet facilities, including handwash facilities, for all personnel and visitors on site.
- .2 Keep facilities clean and sanitary and provided with required supplies at all times.
- .3 Except where temporary sanitary facilities are connected to municipal sewer system, periodically remove wastes from site.

1.8 TEMPORARY FIRST-AID FACILITIES

- .1 Provide site equipment and medical facilities necessary to supply first-aid service to injured personnel

SECTION 01 50 00 - TEMPORARY FACILITIES

in accordance with regulations of the Workplace Safety and Insurance Act. Maintain facilities for duration of Contract.

1.9 TEMPORARY FIRE PROTECTION

- .1 Provide and maintain in proper working order at least two fire extinguishers on each floor, prominently placed, until completion of work.
- .2 Fire extinguishers shall be minimum 9 kg 4A 60BC type.
- .3 Remove fire extinguishers from site, upon completion of work or when directed by Consultant.
- .4 Where gas welding or cutting is to be done within 3 m or above combustible material, or above space that may be occupied by persons, interpose shields of non-combustible material. Tanks supplying gases for welding or cutting shall be placed at no greater distance from the work than is necessary and shall be securely fastened in an upright position. Such tanks shall be free from exposure to the sun or high temperature.

1.10 TEMPORARY USE OF NEW PERMANENT SERVICE AND EQUIPMENT

- .1 Do not use any new permanent service or equipment without Owner's written approval.
- .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.
- .3 Permanent services and equipment shall be turned over to Owner in "as new" and perfect operating condition.
- .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.

1.11 CONSTRUCTION AIDS

- .1 Provide temporary steps, ladders, ramps required for movement and placing of materials, equipment and personnel.
- .2 Provide mechanical hoisting equipment and fully qualified operators as required during construction.
- .3 Erect required scaffolding independent of walls, arranged to avoid interference with work of other Sections as much as possible.
- .4 Provide and maintain required shoring and bracing in accordance with Construction Safety Act and other applicable regulations.
- .5 Shoring and all false work over one tier in height shall be designed and shall bear the stamp of a registered professional engineer, having experience in this field.
- .6 The use of explosive power tools must be approved in writing by jurisdictional authorities. The use of explosive power tools will not be permitted under any circumstances unless equipped with a device which positively prevents free flight of the stud.

1.12 BARRIERS

- .1 Protect public and workers from injury.
- .2 Provide and maintain required hoardings, barricades, guardrails, and lights in accordance with applicable regulations.
- .3 Provide and maintain around assigned work and storage areas 1.8 m high fencing, as follows:
 - .1 Steel pipe or tee posts driven into ground minimum 1 m at maximum 2400 mm o.c.

SECTION 01 50 00 - TEMPORARY FACILITIES

- .2 50 mm hot dip galvanized chain link mesh wire tied to posts.
- .3 Where required, for construction access, hinged, lockable chain link gates.
- .4 Welded wire mesh fence panels, such as Instafence may be used in lieu of chain link fence.

1.13 TEMPORARY CONTROLS

- .1 Provide protective coverings to protect work against damage caused by weather, including but not necessarily limited to rain, snow, ice, wind, frost and excessive heat.
- .2 Provide wind breaks and sun shades to allow proper setting and curing of cementitious materials.
- .3 Protect built components from freezing until fully cured.
- .4 Prevent sprayed materials from contaminating air beyond application area, by providing temporary enclosures.
- .5 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.
- .6 Prevent tracking of mud and dirt from site onto paved surfaces. Maintain stabilized vehicle egress point (mud mat), 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 and dirt in a controlled disposal area.

1.14 PEST CONTROL

- .1 Provide rodent control and other pest control programs during construction, in accordance with requirements of jurisdictional authorities.

1.15 TEMPORARY DRAINAGE

- .1 Provide and maintain adequate temporary pumping and drainage systems to keep excavations and structures free of water. Prevent flow of surface water into excavations. Locate sumps away from foundations. Prevent pumped water from carrying soil in suspension in sufficient quantity to cause settlement of adjacent earth. Provide sufficient standby equipment to ensure continuity of pumping systems.
- .2 Control drainage on site to prevent flooding, erosion and run-off onto adjacent properties as a result of construction operations.
- .3 Dispose of water containing silt in suspension in accordance with requirements of jurisdictional authorities.
- .4 Conform to sedimentation and erosion control requirements of the conservation 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.

1.16 SIGNS

- .1 Except as specified here do not erect any signs unless approved by the Consultant.
- .2 Erect signs relating to safety on the work, or mandatory regulation notices.
- .3 Prior to commencement of work wherein hazardous or volatile cements, coatings, or substances are used, barricade entire area and post adequate number of "NO SMOKING" signs.
- .4 Mount Owner's and Consultants' signs outside construction hoarding at location directed by

SECTION 01 50 00 - TEMPORARY FACILITIES

Consultant.

1.17 FIELD OFFICE AND SHEDS

- .1 Maintain, until completion of Contract, for Contractor's use, a temporary office as required for work, large enough to accommodate site administrative activities and site meetings, complete with light, heating and cooling equipment to maintain 21°C, ventilation, telephone, fax machine (on separate line), copier (not combination fax/copier), table and chairs. Do not store materials, tools, equipment in meeting area; keep clean and tidy.
- .2 Provide temporary covers, sheds and platforms of weatherproof construction as may be required for protection and preservation of materials, small tools, equipment which may be susceptible to damage.

END

SECTION 01 60 00 - PRODUCT REQUIREMENTS

1.1 PRODUCT QUALITY

- .1 Products supplied for work shall be new and as far as possible and unless otherwise specified, of Canadian manufacture.
- .2 Materials used for temporary facilities are not required to be new, provided they are structurally sound and in suitable and safe operating condition.

1.2 STANDARDS AND TERMINOLOGY

- .1 Where a standard has been adopted by these Specifications, incorporate minimum requirements of such standard into the work. Where requirements of Specifications are more stringent than those of the standard, follow more stringent requirements.
- .2 Reference to standards, specifications, handbooks and manufacturer's catalogues refer to latest edition thereof and all amendments or revisions applicable at bid closing date, unless date suffix is included with document number.
- .3 Wherever words "acceptable", "approved", "satisfactory", "selected", "directed", "designated", "permitted", "inspected", "instructed", "required", "submit", or similar words or phrases are used in standards or elsewhere in Contract Documents, it shall be understood, that "by (to) the Consultant" follow, unless context provides otherwise.
- .4 Where the word "provide" is used in these Contract Documents, it shall be taken to mean "supply and install" unless specifically noted otherwise.

1.3 CERTIFICATION

- .1 Building materials, components and elements specified without the use of trade or proprietary names shall meet requirements specified.
- .2 If requested by Consultant, submit evidence of meeting requirements specified. Evidence shall consist of certification based on tests carried out by an independent testing agency.
- .3 Certification based on previous tests for same materials, components or elements is acceptable. Certification shall be in form of written test reports prepared by testing agency.

1.4 AVAILABILITY AND SUBSTITUTIONS

- .1 Contractor may make substitution requests for specified products during bid period not later than 5 working days prior to the bid submission date.
 - .1 Submit technical and performance data, including available finishes, for both the specified product and the proposed substitution.
 - .2 Clearly show any differences between the specified products and the proposed substitution. State the reason for any substitution.
 - .3 Poorly documented substitutions will not be reviewed.
- .2 Products which are specified by their proprietary names or by part or catalogue number form the basis for Contract. No substitutes for these may be used without Consultant's approval in writing.
- .3 Where it is found that specified materials have become unavailable for incorporating into work, notify Consultant immediately of proposed substitution.
- .4 Proposed substitution shall be any top quality product considered by Consultant to be of equal quality and value to that specified, and suitable for purpose intended.
- .5 Products proposed as substitutions, and which are considered by Consultant to be suitable for purpose intended, but which are in his opinion of lesser value and quality than those specified shall

SECTION 01 60 00 - PRODUCT REQUIREMENTS

only be accepted as substitution if reasonable credits are allowed for their use.

- .6 In order to substantiate equivalency of proposed materials, products or processes, submit samples, printed product descriptions, test data, installation instructions, standards, certification, sample, - guarantee/warranty forms, list of successful projects incorporating such proposals, and similar information requested by Consultant.
- .7 Whenever a substitute is proposed, any change to contract price as a result of acceptance of proposed product shall include any adjustments to adjacent structure or space in order to accept minor differences in size or weight between proposed items and corresponding specified items.
- .8 Prevent any substitution or request for substitution from delaying construction progress in any way.
- .9 Requests for substitution resulting from failure to place orders in time will not be entertained. Be responsible for ordering products in time to ensure their required delivery; bear all costs for failure to comply with these requirements.

1.5 PRODUCT HANDLING AND STORAGE

- .1 Suitably pack, crate and protect products during transportation to site to preserve their quality and fitness for the purpose intended.
- .2 Store products in original, undamaged condition with manufacturer's labels and seals intact until they are being incorporated into completed work.
- .3 Handle and store materials in accordance with manufacturer's and supplier's recommendations and so as to ensure preservation of their quality, appearance and fitness for work.
- .4 Arrange materials so as to facilitate prompt inspection, and remove faulty, damaged or rejected materials immediately from site.

END

SECTION 01 70 00 - EXECUTION REQUIREMENTS

1.1 EXAMINATION

- .1 Examine the site, existing premises and surrounding areas and be fully informed as to the conditions and limitations under which the work has to be executed. Claims for additional costs will not be entertained with respect to conditions which could reasonably have been ascertained by an inspection prior to bid closing.
- .2 Prior to commencement of work, make careful examination of previously executed work, existing conditions, levels, dimensions and clearances. Promptly advise Consultant of unsatisfactory preparatory work and substrate conditions; commencement of work implies acceptance of conditions.

1.2 PROTECTION

1. Ensure that no damage is caused to existing structures, buildings, foundations, pavement, fences, curbs, grounds, plants, property, utilities, services, finishes during the progress of Work. Repair and make good any damage caused at no extra cost to Owner to the complete satisfaction of the respective property owners and authorities having jurisdiction. Do not proceed with repairs or remedial work without written permission of the Consultant. Only trades specifically capable of performing the work will be allowed to make remedial or repair work.
- .2 Keep surfaces to receive finished flooring dry and free from oil and grease. Stockpiling of damp or wet building materials and use of mixing boxes or water buckets without protecting floors from moisture gain by approved means, is prohibited.
- .3 Keep municipal roads clean of mud and debris resulting from construction traffic.
- .4 Prevent soiling of pavement due to spillage, mixing of material or any other cause. Make good any damage caused.
- .5 Protect new work from damage with suitable protective coverings.
- .6 Protect work during periods of suspension, regardless of reason for suspension.

1.3 SERVICES AND UTILITY SYSTEMS

- .1 Consult with utility companies and other authorities having jurisdiction to ascertain the locations of existing services on or adjacent to site.
- .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.
- .3 Give proper notices for new services as may be required. Make arrangements with authorities and utilities for service connections required.
- .4 Pay any charges levied by utilities or authorities for work carried out by them in connection with this Contract, unless specified otherwise.
- .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.
- .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.

1.4 SLEEVES, SUPPORTS, AND FASTENERS

- .1 Unless specified in other Sections, furnish, set and secure inserts, hangers, sleeves, fasteners, adhesives, anchors and other supports and fittings required for proper installation of work.
- .2 Use exposed metal fastenings and accessories of same texture, colour and finish as base metal on which they occur.

SECTION 01 70 00 - EXECUTION REQUIREMENTS

- .3 Select appropriate type of anchoring and fastening devices and in sufficient quantity and in such manner as to provide positive permanent anchorage of unit to be anchored in position. Keep exposed fasteners to a minimum, evenly spaced and neatly laid out.
- .4 Fasteners shall be of permanent type. Do not use wood plugs.
- .5 Fasteners which cause spalling or cracking of material to which anchorage is being made shall not be used.
- .6 Fasteners in contact with preservative pressure treated wood shall be stainless steel unless otherwise approved by Consultant.

1.5 CONCEALMENT

- .1 Conceal piping, conduit and wiring located in finished areas, in ceiling spaces and furred construction unless specifically noted to be exposed.
- .2 If any doubt arises as to means of concealment, or intent of Contract Documents in this connection, request clarification from Consultant before proceeding with portion of work in question.

1.6 CUTTING AND PATCHING

- .1 Regardless of which Section of work is responsible for any portion of cutting and patching, in each case tradesmen qualified in work being cut and patched shall be employed to ensure that it is correctly done.
- .2 Any cost caused by omission or ill-timed work shall be borne by party responsible therefore.
- .3 Do not endanger any work by cutting, digging or otherwise altering, and do not cut nor alter any loadbearing element without written authorization by Consultant. Provide bracing, shoring and temporary supports as required to keep construction safely supported at all times.
- .4 Cut holes carefully and not larger than required after they are located by Sections requiring them, using suitable equipment and tools.
- .5 Patching and making good work shall be undetectable in finished work.

1.7 WORKMANSHIP

- .1 All work shall be carried out in accordance with the best trade practice, by mechanics skilled in the type of work concerned.
- .2 Products, materials, systems and equipment shall be applied, installed, connected, erected, used cleaned and conditioned in accordance with the applicable manufacturer's printed directions.
- .3 Where specified requirements are in conflict with manufacturer's written directions, follow manufacturer's directions, but inform Consultant in writing prior to proceeding with affected work. Where specified requirements are more stringent than manufacturer's directions, comply with specified requirements.

1.8 LINES AND LEVELS

- .1 Verify all elevations, lines, levels and dimensions as indicated and report errors, any conflicts, or inconsistencies to the Consultant before commencing work or as soon as discovered.
- .2 Arrange to have building base lines laid out by an Ontario Land Surveyor.
- .3 Accurately lay out work and establish lines and levels in accord with requirements of Contract Documents.

SECTION 01 70 00 - EXECUTION REQUIREMENTS

- .4 Set up, maintain and protect permanent reference points and provide general dimensions and elevations for all Sections of Work.

1.9 DIMENSIONS

- .1 Check and verify dimensions wherever referring to work. Dimensions, when pertaining to work of another Section, shall be verified with Section concerned. Details and measurements of work which is to fit or conform with work installed shall be taken at site.
- .2 Do not scale Drawings. If there is ambiguity, lack of information or inconsistency, immediately consult Consultant for directions. Be responsible for extra costs involved through the disregarding of this notice.
- .3 Walls, partitions and screens shall be considered as extending from floor to underside of structural deck unless specifically indicated otherwise on Drawings.

1.10 LOCATION OF FIXTURES

- .1 Location of fixtures, apparatus, equipment, fittings, outlets, conduits, pipes and ducts shown or specified, but not dimensioned, shall be considered approximate.
- .2 Request direction from Consultant to establish exact location. Any relocation caused by Contractor's failure to request direction from Consultant shall be done by Contractor at no extra cost. Where job conditions require reasonable changes in indicated locations and arrangements, make changes at no additional cost.
- .3 Conserve space and coordinate with work of other Sections to ensure that ducts, pipes, conduits and other items will fit into allocated wall and ceiling spaces, while ensuring adequate space for access and maintenance.
- .4 Where ducts, piping and conduits are permitted to be exposed they shall be neatly and uniformly laid out parallel to adjacent building lines and parallel to each other where they run in the same direction. Review exposed installations with Consultant prior to start of work. At no cost to Owner make changes to exposed work as directed by the Consultant where such work is not installed in accordance with Consultant's prior review.
- .5 Except where locations are specifically noted on Drawings, install exposed mechanical and electrical fixtures including outlets, switches, thermostats, panels and other items, located on walls, in orderly and neatly laid out manner, lining up with each other and grouped together where possible. Review installation with Consultant prior to start of rough-in work. Relocate at no cost to Owner any work which does not meet this requirement.

END

SECTION 01 74 00 - CLEANING

1.1 GENERAL

- .1 Be responsible for cleanliness of assigned work areas to satisfaction of Consultant. Maintain work areas in neat and orderly condition at all times.
- .2 Periodically, or when directed by the Consultant, remove from work areas rubbish and waste materials.
- .3 Burning or burying of rubbish and waste materials on site is not permitted.
- .4 Use only cleaning materials recommended by manufacturer of surface to be cleaned.
- .5 Use cleaning material only on surfaces recommended by cleaning material manufacturer.

1.2 CLEANING DURING CONSTRUCTION

- .1 Remove debris, packaging and waste materials frequently.
- .2 Keep dust and dirt to an acceptable level, as directed.
- .3 Remove oily rags, waste and other hazardous substances from premises at close of each day, or more often if required.
- .4 Clear sidewalks of snow and ice, adjacent to construction site.

1.3 FINAL CLEANING

- .1 Upon completion of work, or, where work is phased, upon completion of each phase, thoroughly clean all surfaces and components. Provide professional cleaning by a recognized, established cleaning company, to allow Owner to occupy without further cleaning except where specifically indicated otherwise.
- .2 Remove stains, dirt and smudges from finished surfaces.
- .3 Clean exposed finished surfaces in accordance with respective material manufacturer's recommendations.
- .4 Clean mechanical and electrical fixtures and other fittings of labels, wrappings, paper and other foreign material.
- .5 Replace heating, ventilation and air conditioning filters if units were operated during construction. Clean inside of ducts, blowers and coils.
- .6 Remove from work areas all waste and surplus materials from all areas, including roofs and ceiling spaces.
- .7 Steam clean existing masonry which becomes an interior exposed wall surface.
- .8 Remove snow and ice from driveways, parking areas and walks.
- .9 Power wash paved surfaces.

1.4 WASTE COLLECTION AND DISPOSAL

- .1 All waste materials and debris resulting from the work of this Contract shall belong to the Contractor and shall be removed from the site and legally disposed.
- .2 Periodically, or when directed by the Consultant remove waste material and debris.
- .3 Separate and salvage materials suitable for recycling from general waste stream and transport to recognized recycling facility.

SECTION 01 74 00 - CLEANING

- .4 Burying, burning, selling waste materials on site is prohibited.
- .5 Disposal of liquid wastes into waterways, sewers is prohibited.

END

SECTION 01 77 00 - PROJECT CLOSEOUT

1.1 REFERENCE STANDARD

- .1 Comply with provisions of OAA / OGCA Document No. 100, 2018 "Takeover Procedures", except as modified in these Specifications.

1.2 OPERATING AND MAINTENANCE MANUALS

- .1 Provide operation and maintenance manuals. Data shall be contained in D-ring binders with soft vinyl covers. Binders shall have clear plastic pocket at back of spine identification containing label "Operation and Maintenance Manual" and project name and volume number, if applicable. Each manual shall contain a title sheet listing project name, date and volume number and names and addresses of Contractors and Subcontractors, Consultant and Subconsultants. Also provide a digital copy of the entire manual on a CD or Pen Drive.
- .2 Provide operating and maintenance data, prepared on 8 1/2" X 11" sheets in printed or typewritten form.
- .3 Data shall be assembled in systematic order, generally following the specification format. Provide labelled, celluloid covered tabs fastened to hard paper dividers to identify different Sections.
- .4 Provide the following material as applicable to work of this Contract:
 - .1 List of contents. If more than one volume is required, provide a cross-reference contents page at front of each volume.
 - .2 Complete list of subcontractors and suppliers, showing name, address, telephone/fax numbers, name of contact person and description of work done.
 - .3 Complete list of products used in the work showing product name, part number or code and manufacturer for each listing; follow specification format.
 - .4 Copy of finish hardware list, complete with all amendments and revisions.
 - .5 Schedule of paints and coatings. Include sufficient explanation to fully identify each surface with the applicable paint or coating used. Enclose copy of colour schedule.
 - .6 Maintenance instructions for all finished surfaces.
 - .7 Brochures, cuts of all equipment and fixtures.
 - .8 Operating and maintenance instructions for all equipment.
 - .9 Valve manual.
 - .10 Controls schematics.
 - .11 Extended warranties.
 - .12 Maintenance contracts.
 - .13 Other data required elsewhere in Contract Documents or deemed necessary by Consultant.

1.3 EXTENDED WARRANTIES

- .1 Submit extended warranties as part of "Operating and Maintenance Manuals".
- .2 Arrange extended warranties in systematic order matching Specification format. Include a table of contents listing warranties in same order.
- .3 Each warranty must show:

SECTION 01 77 00 - PROJECT CLOSEOUT

- .1 Name and address of Project
- .2 Name of Owner
- .3 Section Number and Title
- .4 All extended warranties must be presented under Contractor's letterhead, seal and signature and must bear similar wording to that specified in Contract Documents.
- .5 Submit manufacturers' Product warranties in accordance with GC 12.3.6.

1.4 AS-BUILT DRAWINGS

- .1 Prior to final payment submit as-built drawings specified in Section 01 32 00.
- .2 Clearly and prominently mark each drawing "AS-BUILT DRAWING prepared by _____
_____ (name of Contractor).

1.5 MAINTENANCE MATERIALS

- .1 Deliver maintenance materials as required elsewhere in these Specifications. Obtain receipt for delivered materials and submit copy of receipt to Consultant.
- .2 Package materials so that they are protected from damage and loss of essential properties.
- .3 Label packaged materials for proper identification of contents and project name.

1.6 OPERATING AND MAINTENANCE INSTRUCTIONS

- .1 Prior to requesting Substantial Performance, at a time acceptable to Owner and Consultant, but not before operating and maintenance data has been reviewed and accepted by Consultant, instruct designated Owner's representatives in the operation and maintenance of all systems and equipment.
- .2 Arrange training sessions for each type of operating system and equipment. Sessions shall be conducted by qualified instructors and shall be of sufficient duration and depth to adequately instruct participants.
- .3 Throughout the training sessions make reference to reviewed operation and maintenance manuals to familiarize participants with the data provided.
- .4 Prepare an attendance record for each training session, to be signed by each participant upon conclusion of session. Show date and time of session, subject of session and name, title and organization of each participant. Submit a copy of each record to Consultant.
- .5 Subcontractor whose work is subject of training session and Contractor shall be represented during training session by qualified personnel.

1.7 INSPECTION AND ACCEPTANCE OF WORK

- .1 Prior to requesting Substantial Performance submit the following:
 - .1 4 copies of operating and maintenance manuals (one complete set of manuals must be submitted for Consultant's review minimum 6 weeks prior to requesting Substantial Performance).
 - .2 Inspection and acceptance certificates required from regulatory agencies.
 - .3 Written statement from each subcontractor / supplier verifying that all work provided by them is asbestos-free.
- .2 Advise the Consultant in writing, when work has been substantially completed. If Consultant agrees that this stage has been reached, prepare a complete list of deficiencies and submit this list to Consultant.

SECTION 01 77 00 - PROJECT CLOSEOUT

- .3 On receipt of the above deficiency list in a satisfactory form, the Consultant, accompanied by Subconsultants, the Contractor and the Owner, if deemed desirable, will carry out an inspection of the Project.
- .4 Add to the deficiency list, in accordance with Consultant's directions, any additional deficiencies which are identified during inspection and reissue updated deficiency list.
- .5 Upon completion, inspection and acceptance of work, Owner will take over and occupy completed work. Refer to Supplementary Conditions for procedures relating to certification of Substantial Performance and release of holdback.

1.8 FINAL SUBMISSION

- .1 Prior to claiming Final Payment do the following:
 - .1 Submit set of as-built drawings.
 - .2 Submit complete set of reviewed shop drawings, folded to 8 1/2" X 11" size, contained in heavy duty manila envelopes, numbered and labelled. Follow specification format with no more than one Section per envelope.
 - .3 Submit maintenance materials.
 - .4 Submit a final accounting of all approved changes to the Contract Price, including adjustments to cash allowances.

1.9 WARRANTY INSPECTION

- .1 The Contractor shall organize a warranty inspection to take place two weeks prior to the expiration of the standard one-year warranty. The Consultant, subconsultants, the Contractor, sub-contractors and the Owner's representatives shall attend.

END

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Disconnecting of mechanical and electrical services: Divisions 21 to 28

1.3 REGULATORY REQUIREMENTS

- .1 Obtain and pay for necessary permits for work of this Section. Give required notices, and make submissions required by regulatory agencies.
- .2 Hire and pay for a registered professional engineer licensed to practice in Ontario to oversee demolition procedures and methodology.
- .3 Comply with applicable requirements of jurisdictional authorities and CSA S350-M1980 (R2003) "Code of Practice for Safety in Demolition of Structures".
- .4 Comply with applicable regulatory requirements governing waste management. Comply with requirements of O.Reg 103/94.

1.4 SUBMITTALS

- .1 Prior to start of work submit written proposal outlining proposed demolition procedures.
- .2 Where required by authorities having jurisdiction, submit for approval, drawings, diagrams or details showing sequence of disassembly work or supporting structures and underpinning. Drawings for disassembly of structural elements shall bear stamp of qualified professional engineer.

1.5 TEMPORARY CONTROLS

- .1 Temporary drainage:
 - .1 Use appropriate retention methods to prevent flooding, surface run-off, erosion.
 - .2 Prevent debris from blocking drainage systems.
- .2 Mud, dirt and dust:
 - .1 Prevent tracking of mud, dirt and refuse from site onto roads.
 - .2 Comply with municipal dust control regulations. Cover or wet down dry materials and rubbish to prevent blowing dust and debris, but prevent contaminated run-off.

1.6 PROTECTION

- .1 Prevent uncontrolled movement, settlement, or damage. Provide shoring and bracing required.
- .2 Take steps to positively prevent uncontrolled falling of demolished materials.
- .3 Ensure that no part of existing structure is overloaded due to work carried out under this Section.
- .4 Prevent debris from blocking drainage systems.
- .5 Ensure that temporary guards, hoardings are provided in accordance with applicable safety regulations.
- .6 Maintain at all times clear access to and from existing buildings in accordance with applicable regulatory requirements and to satisfaction of Owner.

SECTION 02 41 16 - DEMOLITION

1.7 EXAMINATION

- .1 Visit the site and the existing building so as to fully understand all existing conditions, limitations and circumstances, and extent of work required. No increase in cost or extension of performance time will be considered for conditions, limitations and circumstances which could reasonably be determined prior to submission of bid.
- .2 Take over buildings and structures to be demolished based on their condition prior to submission of bid, except where indicated otherwise.

1.8 COORDINATION

- .1 Refer to Divisions 21 to 28 to determine demolition work covered by them and coordinate as required.

PART 2 - PRODUCTS Not Applicable

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Ensure that affected building areas are unoccupied and discontinued in use and that required separations between assigned and unassigned areas are in place prior to start of demolition work.
- .2 Verify that existing services in areas affected by demolition work are disconnected, capped, removed or relocated, prior to start of work.

3.2 SALVAGE

- .1 Prior to start of general demolition carefully remove and temporarily store in protected location items scheduled for salvage.

3.3 DEMOLITION

- .1 Demolish and remove parts of existing building as shown and as required to accommodate new work. Completely remove structures, including foundations, slabs on grade and inactive underground work.
- .2 Use appropriate methods and equipment so as to minimize damage to existing work designated to remain; make good any damage caused.
- .3 Demolish work in a safe and systematic manner, from top to bottom.
- .4 Do not throw or drop demolished materials from heights. Use chutes, conveyors, or hoisting equipment to lower materials.
- .5 Demolish in a manner to minimize dusting. Keep dusty materials wetted but prevent flooding or contaminated runoff.
- .6 Demolish masonry and concrete elements in small sections.
- .7 Carefully remove and lower in controlled manner structural framing members and other heavy or large objects.
- .8 At all times leave work in safe condition, so that no part is in danger of uncontrolled toppling or falling.

3.4 DISPOSAL AND CLEAN-UP

- .1 All materials, rubbish and debris resulting from demolition work shall become the Construction Manager's property and shall be removed from site and legally disposed of unless specifically indicated otherwise.

SECTION 02 41 16 - DEMOLITION

- .2 Separate recyclable/reusable materials to maximum extent possible from general waste stream and transport to recognized recycling/reuse facilities.
- .3 Do not allow demolished materials to accumulate on site. Promptly, as work progresses, remove and legally dispose of materials away from site.
- .4 Selling, burning and burying of materials on site is not permitted.
- .5 Do not dispose of liquid waste or volatile materials into watercourses, storm or sanitary sewers.
- .6 Leave site in clean condition with all required guards in place.

END

PART I – GENERAL

1.1. Description

- .1 The work covered by this section includes the furnishing of all labour, materials, equipment and incidentals for the inspection and construction of concrete paving as shown on the Construction Drawings and as described by the Contract Specifications.
- .2 Comply with the requirements of the Tender Document and General Conditions.

1.3. Quality Assurance

- .1 The contractor must have a minimum of 5 years experience in concrete work.
- .2 All materials must conform to CSA A23.1-94. A copy must be kept on site at all times during construction.
- .3 Furnish the Landscape Architect with a certificate prepared by the Ready-Mix concrete suppliers stating that all requirements regarding strength, slump, air entrainment, mix, materials and ratio have been met and maintained.
- .4 Prior to pouring concrete, obtain the approval of the Landscape Architect of all form work, placement of reinforcing steel, consolidation of subgrade and placement and consolidated of granular base.
- .5 When required by the Landscape Architect, have all concrete tested for compressive strength, slump and air content, in accordance with CSA A23.2-94. Submit test reports in duplicate and pay all costs incurred.
- .6 Ensure work complies with the Ontario Building Code and all pertinent local by-laws and regulations. These shall govern in case of conflict with the specification. Obtain and pay for all necessary permits before starting work.

1.4. Product Delivery, Storage and Handling

- .1 Store all materials in accordance with CSA A23.1-94 latest edition.
- .2 Store reinforcing steel on racks or skids. Protect from contamination by dirt or other materials.
- .3 Store forms off the ground and sufficiently supported to prevent warping or distortion. Protect from contaminations by oil, grease, water, earth, etc.
- .4 All concrete is to be ready mixed at plant and transported to the site by truck in accordance with CSA A23.1-94. Hand mixed concrete is not allowed unless approved in writing by the Landscape Architect prior to the start of work.
- .5 Convey concrete from the mixer to the place of final deposit as rapidly as possible, with as little rehandling as is practical. Avoid segregation and/or loss of material.
- .6 Place concrete in final position and at such a rate that it remains plastic at all times and flows readily between reinforcement, into all corners and crevices and around all embedded fixtures. Pour in a continuous operation between expansion joints.

SECTION 03 33 11 – CONCRETE

- .7 Thoroughly clean all equipment, used for mixing or transporting of concrete, of all hardened concrete and foreign material prior to placing concrete.
- .8 Do not allow concrete to be contaminated by foreign materials. Do not use retempered concrete unless approved in writing, by the Landscape Architect.
- .9 Obtain the approval of the Landscape Architect of the type, number and method of use of mechanical vibrators. Do not operate a vibrator for longer than 10 seconds in any one location.
- .10 Maintain constant control to ensure that finished concrete is dense, uniform, free of air holes or honeycombs and that no segregation of aggregates and cement paste occurs.

1.5. Job Conditions

- .1 Protect all concrete surfaces from damage or harmful effects of weather, water, mechanical shock or trespassers until concrete is properly cured.
- .2 If temperature is expected to drop below 5°C, place and protect concrete in accordance with AC1.605.

1.5. Inspection

- .1 Obtain the approval of the Landscape Architect of the layout, compacted sub-grade, compacted granular base, formwork and reinforcing before proceeding with subsequent work.

PART II – PRODUCTS

2.1. Materials

- .1 Granular A and Granular B: granular material conforming in all respects to OPSS 1010, latest edition.
- .2 Portland cement: standard grey portland cement, conforming to CAN/CSA-A5/A8/A362-93 type 10 normal.
- .3 Aggregates: nominal size as specified and conforming to CSA A23.1-94.
- .4 Water: clear and free of deleterious substances or efflorescing salts.
- .5 Air entraining admixtures: conforming to ASTM C 260-94 and of approved manufacturer.
- .6 Reinforcing steel: conforming to CSA G-30.12-M77 for bars, CSA G30.5-M83 for welded steel wire mesh and OPSS 1440.
- .7 Expansion joint filler: premoulded bituminous impregnated fibre board conforming to ASTM D1751-73 of thickness and depth specified.
- .8 Curing Compounds: clear liquid chlorinated rubber to ASTM C309 and OPSS 1315.
- .9 Formwork: conforming to CSA A23.1-94 and AC1- 347 and of sound wood, in good condition and equal or better than No. 2 grade construction spruce and/or 19mm Douglas

SECTION 03 33 11 – CONCRETE

Fir plywood, with the surface treated to produce a smooth concrete finish. Plywood to be CSA 0/2/.

2.2. Mixes

- .1 Mix concrete materials in accordance with CSA CAN3-A23.1M-77, in the proper proportions and ratios to provide a finished product as specified. Concrete mix shall meet the following requirements: Compressive strength 32 MPa at 28 days; 100mm slump at point of deposit; air entrainment 6% (+ or - 1%). Unless noted otherwise on the drawings or details, all concrete is to be 32 MPa strength.
- .2 With the exception of air entraining agents, other mixtures may only be used with the written approval of the Landscape Architect. The use of agents to lower the freezing point of the mix will not be permitted.

PART III – EXECUTION

3.1. Preparation

- .1 Excavate to the minimum specified depths, after compaction, as shown on the drawings. Maintain sub-grade parallel to finished grade in all cases.
- .2 Fine grade subgrade eliminating uneven areas and filling low spots. Remove all debris. Excavate all soft and unstable areas in subgrade and backfill with Granular “B”.
- .3 Compact subgrade uniformly to ninety-eight percent (98%) Standard Proctor Maximum Dry Density. Arrange for testing of fill materials and compaction. When required and as directed by the Landscape Architect, the Contractor shall, at his own expense, sprinkle water to assist in compaction.
- .4 The Granular “B” base shall be applied in maximum 50mm layers, graded, rolled and compacted to ninety-eight percent (98%) Standard Proctor Maximum Dry Density.
- .5 In the event of delay between completion of subgrade and commencement of application of stone base, the Contractor shall re-grade and re-compact subgrade at his own expense if so ordered.
- .6 Keep materials clean and free of deleterious materials at all times.
- .7 Maintain final grade of granular base course parallel to finished grade.
- .8 Submit written test reports.
- .9 Contractor to ensure that all concrete columns are vibrated to eliminated all voids.

3.2. Granular Base

- .1 Spread the specified granular materials in horizontal layers not exceeding 100mm loose depth and compact to 98% Standard Proctor Maximum Dry Density. In areas where compaction by roller is not possible, compact with approved mechanical or hand tamping devices to the specified density.
- .2 Build up thickness of each material to the minimum compacted thickness as specified on the drawings.
- .3 Ensure that granular does not become contaminated by deleterious material.
- .4 Correct all irregularities or depressions resulting from rolling and compact until the granular surface is smooth, uniform and true to line and grade.
- .5 When required by the Landscape Architect, have the compaction of the granular materials tested by an approved, independent testing firm. Submit 2 copies of the test results to the Landscape Architect and obtain his approval prior to pouring concrete. Pay testing costs incurred.

3.3. Form Work

- .1 Erect forms in such a manner as to facilitate dismantling and removal without damaging concrete.
- .2 Erect forms true to line and level in accordance with the drawings, and sufficiently braced to maintain their form and alignment when concrete is placed.
- .3 Prior to each pouring operation, coat affected form surfaces with an approved form separating material.
- .4 Provide for all openings, sleeves, hangers, anchors and ties to be cast into the concrete.
- .5 Do not use treated plywood for exposed surfaces more than 5 times. Do not use plywood if surface is damaged.
- .6 Obtain the approval of the Landscape Architect of all form work before proceeding

3.4. Reinforcement

- .1 Before placing reinforcement, clean all loose scale, dirt and any other coating that would destroy or reduce bonding to concrete.
- .2 Place all reinforcement accurately in accordance with the drawings and/or approved shop drawings. Use approved chairs, spacers, hangers or ties to secure the reinforcing in position.
- .3 Unless directed otherwise, provide the following minimum concrete cover over reinforcing:
 - a) 75mm where concrete is deposited against soil.
 - b) 50mm for bars larger than 10m and 40mm for bars smaller than 10m where concrete is exposed to weather.

- .4 Obtain the approval of the Landscape Architect of all reinforcing before proceeding.

3.5. Joints

- .1 Locate expansion joints as shown on the drawings or at max. intervals of 6.0m, between new concrete and all new or existing rigid structures, and either side of all driveway sections. Joints must be cast in place.
- .2 Execute construction joints in accordance with AC1-301 and as detailed on the drawings. Thoroughly clean the joint surface of all laitance and wet thoroughly and slush with a coat of cement grout immediately before placing new concrete.
- .3 Except for expansion joints, continue reinforcing uninterrupted through joints, unless shown otherwise on the drawings or directed by the Landscape Architect.
- .4 Stop reinforcing on each side of expansion joints. Where dowels are indicated, cast one half into one side of the joints. The exposed half shall be machined smooth and heavily greased before placing adjoining sections.
- .5 Locate control joints as shown on the drawings or at a max. spacing of 2.0m. Ensure joints are to a minimum depth of 1/4 the thickness of the concrete. Make joints by one of the following methods:
 - a) Sawed joints
 - b) Hand formed and hand tooled
 - c) Inset joints placed in plastic concrete
- .6 No offsets will be allowed between adjacent sections of joint fillers and no plugs of concrete will be permitted anywhere within an expansion joint.
- .7 Apply joint sealant in accordance with the manufacturer's directions. Ensure joints are clean and free of any foreign substances before sealing. Clean any sealant spilled on concrete surface immediately.

3.6. Placing of Concrete

- .1 Place concrete by approved means and using approved equipment.
- .2 Do not place concrete until formwork and grades have been inspected by the Owner or Landscape Architect.
- .3 Transport concrete from mixer to point of deposit, and place in final position as quickly as possible to prevent separation and loss of materials.
- .4 While placing concrete, compact thoroughly and uniformly by approved means to ensure a dense homogeneous structure free of air pockets, and honeycombs and closely bonded with reinforcement.

3.7. Finishing

- .1 Treat and finish all surfaces as directed or specified and in accordance with CSA CAN3-A23-1-M77.

- .2 Strike off and float all exposed paving surfaces as soon as possible after consolidation and in accordance with recommendations of the Portland Cement Association. Execute final finishing as specified on the drawings or as directed by the Landscape Architect.
- .3 Ensure finished surface is true to line and level as shown on the drawings. Walks are to be sloped as per grading plans.
- .4 All irregularities greater than 6mm under a 3000mm straight edge, operated parallel to the centre line, must be repaired.
- .5 Obtain the approval of the Landscape Architect of finished surfaces before starting curing operations.
- .6 Immediately after stripping formwork, obtain the approval of the Landscape Architect before commencing patching, finishing or curing operations.
- .7 The extent, method and type of mix for patching shall have the approval of the Landscape Architect before commencing work. Ensure patching mix contains an approved bonding and waterproofing agent and that it is installed in accordance with the manufacturer's specifications.

3.8. Curing

- .1 Keep concrete moist for at least 3 days after placement, in accordance with CSA CAN-A231-M77.
- .2 Method of curing shall be as specified or by one of the following approved methods if not specified:
 - a) Moist curing
 - b) Waterproofing paper or white polyethylene sheeting
 - c) White liquid membrane compound
 - d) Combination of above methods
- .3 Moist curing: use burlap or approved equal. Ensure it is thoroughly wet when applied and kept continuously wet and in full contact with the surface during the curing period.
- .4 Waterproof paper or white polyethylene sheeting: ensure sheet is large enough to cover entire concrete surface. Secure to prevent displacement during curing period. Immediately repair any tears or holes.
- .5 White liquid membrane compound: apply at the rate of 1 litre per 5 square meters after final finishing and all free water has disappeared. Keep membrane compound agitated to prevent settling of compound. Apply membrane compound to edges immediately after formwork is removed. Ensure a continuous and unbroken membrane cover is applied.

3.9. Clean-up

- .1 Clean and remove all concrete spills from the site and make good any disturbance.

End of Section

SECTION 04 05 13 - MORTAR

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Concrete fill for block lintels and reinforced masonry: Section 03 30 00
- .2 Masonry, including mortar joint workmanship: Section 04 20 00

1.3 QUALITY ASSURANCE

- .1 Quality Standards: meet requirements of CSA A179-14.
- .2 Source of Material: for mortar to remain exposed in finished project, brands of cementitious materials and source of supply of sand, shall remain the same for duration of work.
- .3 Owner may arrange and pay out of allowance carried in Section 01 21 00 for testing of mortar and grout by an independent testing agency.

1.4 SUBMITTALS

- .1 Submit detailed product data for each product required.

1.5 PRODUCT HANDLING

- .1 Store cementitious materials so as to prevent moisture absorption from any source. Do not use material affected by moisture.
- .2 Store mortar aggregate materials to prevent contamination. Do not use contaminated materials.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Water: potable and non-staining.
- .2 Sand: ASTM C144-17.
- .3 Portland cement: CSA-A3001-18, Type GU.
- .4 Masonry cement: CSA-A3002-18.
- .5 Lime: ASTM C207, Type S.
- .6 Colour pigment to ASTM C979, pure concentrated mineral pigments from "Premium Group" by Davis Colour or equivalent product by Solomon or as recommended by mortar producer. Colours selected by Consultant.

PART 3 - EXECUTION

3.1 PROPORTIONING AND MIXING

- .1 Mix mortar in accordance with CSA A179-14 except as specified herein.
- .2 Place an experienced and competent person in direct charge of proportioning and mixing operations.
- .3 Accurately premeasure ingredients for each batch prior to being deposited into mixer. Use measuring boxes or other method acceptable to Consultant. Depositing materials directly into mixer from

SECTION 04 05 13 - MORTAR

stockpiles without premeasuring is not permitted.

- .4 Except where specified otherwise do not add admixtures of any kind to mixes.
- .5 Mix coloured mortar in colours selected by Consultant. Make adjustments in colour as directed by Consultant. Use white cement where required to obtain required colour.
- .6 All mortar shall be mixed for a period of not less than 3 minutes and not more than 10 minutes.

3.2 TIME LIMITS AND RETEMPERING

- .1 Use and place mortar in final position within following time limits after mixing:
 - .1 Air Temp. above 25°C - 2 hours.
 - .2 Air Temp. below 25°C - 2.5 hours.
- .2 Standard mortar that has stiffened within above time limits because of evaporation of water may be retempered by adding water as frequently as needed to restore required consistency. Discard mortar not used within above time limits.
- .3 Do not retemper coloured mortar. Discard coloured mortar not used within time limits specified.

3.3 MORTAR SCHEDULE

- .1 Exterior masonry veneer 1-1-6 cement/lime mortar.
- .2 Non-bearing walls: Type N mortar.
- .3 Below grade walls: Type M mortar.
- .4 Provide coloured mortar at exterior locations with architectural block and clay brick. Provide up to 3 different coloured mortar.

END

SECTION 04 20 00 - MASONRY

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Supply of reinforcing steel and concrete for block lintels and reinforced masonry: Division 3
- .2 Mortar: Section 04 05 13
- .3 Supply of loose steel lintels: Section 05 50 00
- .4 Air barriers: Section 07 27 00
- .5 Caulking of control joints: Section 07 92 00
- .6 Supply of steel door frames: Section 08 11 13

1.3 WORK INSTALLED BUT SUPPLIED BY OTHERS

- .1 Build into masonry elements inserts, anchors, bolts, sleeves and other items supplied by other Sections and which are required for installation and performance of work of other Sections.
- .2 Install loose steel lintels required for support of masonry elements.
- .3 Install steel door frames and access doors occurring in masonry elements.
- .4 Install reinforcing steel and concrete fill into block lintels and reinforcing steel grouted into masonry walls as shown on the structural drawings.
- .5 Build architectural precast components into masonry where required.

1.4 QUALITY ASSURANCE

- .1 Meet requirements of CSA A370-14 (2018), CSA A371-14 (2016) and CSA S304.1-14 (2019).
- .2 Ensure that work is executed under the continuous supervision and direction of a competent foreperson.
- .3 Provide standard tests carried out by an approved testing company on the actual production run of clay brick showing compression, absorption and saturation coefficient. Provide 50-cycle freeze-thaw resistance test.

1.5 SUBMITTALS

- .1 Prior to start of work submit product data and duplicate samples of all masonry accessories including horizontal reinforcement, masonry anchors, membrane flashings, control joint filler, weep holes, mortar dropping control device.
- .2 Prior to start of work submit drawings showing proposed locations of exterior and interior masonry control joints.

1.6 MOCK-UPS

- .1 Construct sample panel, minimum 600 x 600 mm, of each type of masonry requiring coloured mortar to determine acceptability of each mortar colour. Make adjustments as directed by Consultant and repeat procedure until each mortar colour is approved.

SECTION 04 20 00 - MASONRY

- .2 Construct sample panel of an exterior wall incorporating masonry veneer and including reinforcement, flashings and weep holes, minimum 1.2 x 1.2 m in size. Build panel in stepped fashion to expose each material used.
- .3 Locate panels where directed by Consultant. Exterior wall mock-up may not be incorporated into finished work and shall be removed upon completion of masonry work, when directed by Consultant.
- .5 Construct panels to meet project requirements. Select masonry units to represent maximum texture and colour variations.
- .6 Do not begin masonry work until panels are approved by Consultant. Approved panel shall represent minimum standard of quality for project masonry.

1.7 PRODUCT HANDLING AND STORAGE

- .1 Deliver and handle masonry units so as to prevent soiling and chipping.
- .2 Store masonry units above and off ground on level platforms which permit air circulation under stacks.
- .3 During storage, protect masonry units against moisture absorption, damage and staining.

1.8 PROTECTION

- .1 When work is not in progress, cover tops of completed masonry elements exposed to weather with non-staining weatherproof covers. Covers shall be at least 600 mm wider than masonry elements and shall be well secured against displacement.
- .2 Protect finished work at corners, sills, projections and other areas likely to be damaged, with suitable coverings until completion of building.
- .3 Adequately brace masonry walls and partitions to resist effects of wind and other lateral forces.

1.9 HOT AND COLD WEATHER WORK

- .1 Comply with requirements of CSA A371-14 (2016).
- .2 When outside temperature is below or likely to go below 5°C provide heat to maintain temperature of materials and surrounding air at 5°C or better during laying and for 72 hours thereafter. Submit for approval the proposed method of protecting masonry against low temperatures. Salamanders will not be permitted.
- .3 Keep units completely free from ice and frost. Preheat mortar materials and mortar boards. Temperature of mortar to be between 21°C and 48°C. Protect mortar from frost. Do not use admixtures or antifreezes in mortar.
- .4 Maintain dry beds for masonry and use dry masonry units only. Do not wet masonry units in winter.
- .5 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Concrete block: to CSA A165 Series-14 (R2019). Cure concrete block using carbon capturing technology/carbon reducing technologies, converting gaseous CO₂ to calcium carbonate nano crystals (CaCO₃). Acceptable products: Carboclave Concrete Block by Bampton Brick or "Carbon Capturing" block by Richvale York or Day & Campbell Limited or "CarbonCure" distributed by Bampton Brick and Permacon.
 - .1 Normal weight block: H/15/A/M and S/15/A/M unless otherwise indicated.

SECTION 04 20 00 - MASONRY

- .2 Size: unless indicated 190 x 390 mm x thickness shown.
- .3 Exposed concrete block units shall be uniform in size, free of perceptible warp or twist, without chipped, ragged or broken edges; have a uniform surface texture, free of cracks, blemishes or defects detrimental to appearance or performance.
- .2 Precast Concrete Sills: 424 Tapestry Tex Stone by Shouldice.
 - .1 Size: 90 mm thick x 190 mm high.
- .3 Clay Masonry Units: ASTM C216, Grade SW.
 - .1 Size: 90 mm D x 57 mm H x 290 mm L.
 - .2 Product: Sundance Smooth, Ironspot by Meridian.
- .4 Metal Reinforcement:
 - .1 Material: high tensile strength steel wire meeting ASTM A82, by Blok-Lok or Dur-O-Wall.
 - .2 Finish: hot dip galvanized after fabrication to ASTM A153, Class B.
 - .3 Horizontal reinforcement, exterior walls: Ladder type with 4.8 mm diameter hot dip galvanized steel side and cross rods; side rods centred on concrete block face shells; prefabricated corner and intersection assemblies: BLOK-TRUS BL11 ladder reinforcement by Blok-Lok or equivalent product by Dur-O-Wal.
 - .4 Horizontal reinforcement for interior walls and partitions: truss type with minimum 3.66 mm thick side and cross rods unless otherwise indicated; width 50 mm less than wall thickness; mill galvanized: BLOK-TRUS BL10 ladder reinforcement.
- .5 Connectors, anchors and ties:
 - .1 Materials:
 - .1 Steel: hot dip galvanized to ASTM A123.
 - .2 Wire materials: high tensile strength steel wire meeting ASTM A82, hot galvanized
- .6 Cavity wall connectors at walls with concrete block back-up: one of the following types:
 - .1 Fero Thermal Block Shear Connector, Holed, consisting of 1.6 mm thick steel connector plate of length to suit insulation and concrete block thickness, steel wire V-tie 4.8 mm diameter by Form & building Supply (Toronto) Inc.
 - .2 BLOK-LOK Shear Anchor, holed, with wire ties: BL507S.
- .7 Provide lateral support angles at top of non-loadbearing masonry partition/walls. Anchor angles to structural deck or beam at 10 x partition/wall thickness each side of partition and maximum 0.6 mm from end of partition/wall.
- .8 Membrane Flashing/Dampproof Course: TWF by Bakor.
- .9 Membrane flashing back-up: minimum 0.9 mm thick hot dip galvanized sheet steel; Z275 zinc coating designation.
- .10 Premoulded Joint Filler: Mineral fibre board by Rockwool or Fibrex.
- .11 Control Joint Filler: Emseal 25V Expanding Foam Sealant.
- .12 Weep and vent hole inserts: Cell Vent by Dur-O-Wall.

- .13 Mortar dropping control device (cavity drainage mat): high density polyethylene or nylon mesh in trapezoidal configuration designed to facilitate effective drainage of moisture to weep holes; thickness to suit air space: "The Mortar Net" by Mortar Net Solutions.

PART 3 - EXECUTION**3.1 ERECTION - GENERAL**

- .1 Lay masonry work in uniform manner. No one portion of any section of work shall rise more than 750 mm above general level. Do not lay more than 1500 mm in height of any wall in any working day.
- .2 Unless otherwise noted, all walls and partitions shall extend to the underside of the structural deck.
- .3 Cut exposed masonry units with power driven table model masonry saw only. Ragged or chipped edges will not be permitted.
- .4 Consult with other Sections to avoid cutting and patching. Co-operate in setting and aligning built-in items. Build in conduit and piping so that they are not exposed. Do not break masonry bond to accommodate concealed built-in items.
- .5 Grout solid with mortar all spaces around built-in items.
- .6 Build in metal nailing plugs, grounds, inserts, anchor bolts, bearing plates, loose and miscellaneous items of steel and iron, isolated beams, lintels and shelf angles, sleeves, blocking and items furnished by other Sections.
- .7 Do not shift or tap masonry units after mortar has taken its initial set.
- .8 At masonry openings less than 450 mm wide, unless otherwise detailed, use mild steel plates, minimum 6 mm thick, of width 25 mm less than supported masonry thickness and with minimum 100 mm end bearing each side.
- .9 Construct structurally reinforced masonry elements in accordance with requirements indicated on structural drawings.

3.2 CHASES, SLEEVES, OPENINGS AND HOLES

- .1 Chases, sleeves and openings shall be built in during erection of masonry work, and purpose-made chased units shall be built into proper position.
- .2 Openings in masonry work exceeding 450 mm shall be provided with lintels in accord with lintel schedule.
- .3 Chasing of completed walls or formation of holes shall only be carried out with Consultant's prior approval, and then only with a tool designed to cleanly cut masonry units.
- .4 Chases shall be plumb and shall be minimum of one unit length from jambs of openings.
- .5 Horizontal or diagonal chases are not permitted.

3.3 MASONRY BEARING

- .1 Masonry bearing shall extend full thickness of wall.
- .2 Unless otherwise indicated, provide at least 200 mm of bearing for lintels and beams.
- .3 Bearings of block masonry walls: use minimum 2 courses of solid or grouted block units except where concrete bearing pads are required.
- .4 Bearings in brick masonry walls: use solid face brick where exposed to view.

- .5 Build masonry neatly around beam, and lintel bearings.

3.4 CONSTRUCTION JOINTS

- .1 Where fresh masonry joins partially or totally set masonry, clean exposed surfaces of set masonry and remove loose mortar and foreign material prior to laying fresh masonry.
- .2 If necessary to stop off a horizontal run of masonry, rack back one-half masonry unit length in each course. Toothing will not be permitted unless approved by the Consultant.

3.5 BLOCKWORK

- .1 Blockwork shall be laid up in running bond except where shown otherwise. Provide stack bond where shown. Unless otherwise indicated, blocks shall be of thickness required to produce total wythe thickness.
- .2 Do not wet blocks before laying.
- .3 Units shall be laid with webs aligning one over the other in full bed of mortar over entire laying surface including webs.
- .4 Exposed faces shall be full units laid out to minimize cutting with not less than 100 mm any at vertical edge or corner.
- .5 Top course of block walls shall be laid with semi-solid blocks at door and window sills, at wall changes to brick and where shown. Top course of freestanding block walls shall be bullnosed all sides.
- .6 Provide solid block roof parapets or fill hollow block with grout.
- .7 Use solid block for at least two courses under all point bearing loads.
- .8 Form exposed external block foundation corners with end units.
- .9 Provide bullnose block at all exposed vertical and horizontal block corners. Where directed by Consultant provide square corner block at first course above floor; grind corner above base to match bullnose above.
- .10 Provide minimum 400 mm solid or grouted block for jambs of openings and at ends of walls. Provide return corner block where shown.
- .11 Cut with power saw exposed units to accommodate flush mounted electrical outlets, grilles and other components. Leave maximum 5 mm clearance. Cover plates and flanges must cover cut edges.
- .12 Blockwork scheduled to be left exposed or painted shall be laid and pointed with utmost care. Distribute units of varying colour and texture evenly to achieve homogeneous blend. Replace at no extra cost to Contract, block units which in the opinion of the Consultant are too contrasting in appearance for satisfactory blending.
- .13 Take special care to prevent mortar or other substances from staining exposed block faces. Replace stained blocks as directed by the Consultant at no extra cost to Contract.

3.6 BLOCK LINTELS

- .1 Build block lintels; install reinforcement and concrete fill. Unless otherwise detailed make lintels 200 mm high.
- .2 Lintels shall have minimum 200 mm bearing, with care taken in layout of wall to ensure that lintel jointing coincides with regular bond of wall.
- .3 Provide building paper in joint at bearings and at vehicle joint at ends of block lintels to break bond.

3.7 JOINT WORK

- .1 Make joints uniform and 10 mm thick unless otherwise shown.
- .2 Joints in exposed and painted surfaces, and in masonry behind wall mounted and built-in fixtures, lockers and cabinetwork shall be tooled when thumbprint hard with a 25 mm o.d. plastic tool to produce a concave joint.
- .3 Joints in unparged masonry below grade shall be pointed tight with a trowel.
- .4 Joints directly behind resilient base, rigid insulation, ceramic tile and gypsum board shall be struck flush.

3.8 VENEER WALLS

- .1 Coordinate with Section 07 27 00 to install air barrier at exterior face of interior wythe of masonry.
- .2 After review and acceptance of air barrier by Consultant, construction exterior wythe of masonry.
- .3 Maintain 25 mm deep air space between interior and exterior wythes of masonry.
- .4 Install membrane flashings and weep holes to maintain proper drainage conditions.

3.9 ANCHORING AND REINFORCEMENT

- .1 Unless otherwise indicated reinforce all walls and partitions with continuous horizontal metal reinforcement, installed at 400 mm o.c. vertically.
- .2 At wall openings place continuous reinforcement in first and second mortar joints above and below openings. Additional reinforcement at openings shall extend 610 mm beyond both sides of openings.
- .3 Install prefabricated corner assemblies at corners.
- .4 Lap continuous reinforcement 150 mm at splices. Cut reinforcement at control joints.

3.10 CONTROL JOINTS

- .1 Provide control joints at masonry walls supported by foundation walls at approximately 7.5 m o.c. and at masonry walls supported on framed slabs at approximately 4 m o.c., and where shown. Confirm actual locations of control joints with Consultant before starting work.
- .2 Control joints must be constructed during erection of masonry, and may not be sawcut later.

3.11 MEMBRANE FLASHINGS / DAMPPROOF COURSE

- .1 Install dampproof course on top of foundation walls above grade.
- .2 Install membrane flashing where shown, and at the following locations:
 - .1 Door heads
 - .2 Window heads
 - .3 Immediately above horizontal interruptions within exterior walls.
- .3 Lap membrane flashing 100 mm at joints; seal lap with adhesive.

3.12 WEEP AND VENT HOLES

SECTION 04 20 00 - MASONRY

- .1 Form weep holes by inserting weep/vent hole inserts into exterior wythe mortar joint immediately above all membrane flashings, and at other locations where shown. Space weep holes at 610 mm o.c. horizontally.
- .2 Form vent holes by inserting weep/vent hole insert into exterior wythe mortar joint near top of each cavity compartment and at other locations, where indicated. Space vent holes at 610 mm o.c. horizontally.
- .3 Keep face of weep/vent hole inserts back from face of brick minimum 6 mm. keep weep holes free of mortar.

3.13 STEEL DOOR FRAMES

- .1 Install steel frames in masonry walls. Build in frames rigid, true and plumb. Fill voids between frames and masonry with grout. Fill fixed centre mullions at double doors with grout.
- .2 Brace frames solidly in position while being built in. Provide temporary horizontal wood spreader at mid-height of frames to ensure maintenance of required frame width until masonry work is completed. For frames over 1200 mm width provide temporary vertical support at centre of head.
- .3 Comply with installation requirements specified under Section 08110.

3.14 PATCHING AND CLEANING

- .1 At completion of work, holes and other defects in masonry joints shall be repaired, and masonry surfaces shall be thoroughly cleaned.
- .2 Holes in masonry joints shall be filled with mortar and suitably tooled. Cut out and repoint defective joints. Use coloured mortar to match existing.
- .3 Dry brush masonry surfaces at end of each day's work and after all final pointing.
- .4 Remove mortar smears and droppings from concrete block masonry surfaces after such smears and droppings have dried. When mortar joints are dry and hard, clean block masonry surfaces by rubbing down with abrasive blocks and stiff fibre brushes.
- .5 Remove efflorescence from masonry surfaces by wet cleaning in accordance with manufacturer's recommendations.

END

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Concrete formwork: Section 03 30 00

1.3 QUALITY ASSURANCE

- .1 Lumber shall bear the grading stamp of an agency certified by The Canadian Lumber Standards Administration Board.
- .2 All lumber shall be sound, straight, dressed all sides and kiln dried, and moisture content at any time during shipment and storage shall not exceed 19%.

1.4 PRODUCT HANDLING

- .1 Store materials on site to prevent deterioration, loss or impairment of their structural and other essential properties. Prevent excessive moisture gain of materials.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Lumber:
 - .1 Meet requirements of CAN/CSA-086-19 Strength Group D (spruce-pine-fir) and CAN/CSA 0141-05 and National Lumber Grading Authority (NLGA) Standard Grading Rules.
 - .2 Blocking, Copings, Nailers, Curbs: NLGA 122c "Standard" S-P-F.
- .2 Plywood:
 - .1 All locations except backboards: Douglas Fir plywood to CSA 0121-17 Unsanded Sheathing Grade.
 - .2 Backboards: Canadian Softwood plywood to CSA 0151-17, Sanded grade, solid two sides, fire retardant pressure treated.
- .3 Fasteners and Connecting Hardware:
 - .1 Nails: to CSA B111-1974 (R2003), hot dip galvanized steel for exterior work including components located in exterior walls and roofs; bright finish steel in all other locations. Unless otherwise indicated use common spiral flathead nails.
 - .2 Bolts, nuts, washers: ASTM A307, hot dip galvanized steel.
 - .3 Connectors, anchors, brackets, spikes: hot dip galvanized structural quality steel.
 - .4 Screws: zinc, cadmium or chrome plated.
 - .5 Fasteners in contact with preservative pressure treated wood shall be stainless steel, unless otherwise approved by Consultant.

2.2 WOOD TREATMENT

- .1 Preservative pressure treated components: to CSA-080 Series 15, arsenic free using copper and azole.

SECTION 06 10 00 - ROUGH CARPENTRY

- .2 Fire retardant pressure treated components: to CSA 080- Series 15 for maximum flame spread of 25 and labelled by ULC.
- .3 Surface cut, bore and trim components to sizes required as much as possible prior to pressure treatment.

PART 3 - EXECUTION

3.1 GENERAL

- .1 Erect work plumb, level, square and to required lines. Ensure that materials are rigidly and securely attached to each other and to adjacent building elements and will not be loosened by work of other Sections.
- .2 Where other materials and components are to be applied directly over wood members recess heads of fastening devices below wood surfaces.
- .3 Where work remains exposed to view, fasteners shall be uniformly and evenly spaced and neatly installed.

3.2 NAILERS, BLOCKING, GROUNDS, BUCKS

- .1 Provide wood nailers, blocking, strapping, bucks, grounds and other rough carpentry components to sizes and in locations required for satisfactory support of fabricated items and other work.
- .2 Unless otherwise indicated, provide minimum 38 mm thick materials. Grounds may be 21 mm thick material unless otherwise indicated.

3.3 ANCHORS AND FASTENERS

- .1 Provide rough hardware including nails, screws, bolts, washers, brackets, hangers, and fastening devices of all types.
- .2 Unless otherwise indicated, attach wood members at maximum 600 mm o.c. as follows:
 - .1 To concrete and solid masonry with expansion or friction type anchor bolts.
 - .2 To hollow masonry with toggle bolts.
 - .3 To heavy gauge metal with bolts.
 - .4 To light gauge metal with screws or bolts.

3.4 PRESSURE TREATED COMPONENTS

- .1 Use preservative pressure treated lumber and plywood within exterior wall and roof systems and at other locations indicated.
- .2 Where it is necessary to cut, bore or otherwise alter pressure treated components in the field, treat cut surfaces with heavy coat of wood preservative.

END

SECTION 07 11 13 - BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Concrete foundation walls: Division 3
- .2 Underslab vapour retarder: Section 07 26 16
- .3 Water repellent sealer: Section 07 19 00

1.3 QUALITY ASSURANCE

- .1 Meet applicable requirements of CAN/CGSB-37.3-M89 and CGSB 37-GP-36M.

1.4 SUBMITTALS

- .1 Submit detailed product data for each product required.

1.5 PRODUCT HANDLING AND STORAGE

- .1 Deliver materials to site in unopened and undamaged sealed original containers.
- .2 Store solvent based liquids away from excessive heat and open flame. Store asphalt emulsions in temperature not lower than 5°C, nor higher than 30°C.

1.6 JOB CONDITIONS

- .1 Do not apply materials during periods of precipitation or when precipitation is imminent.
- .2 Protect materials against freezing and against contact with water from any source until applied and completely cured.
- .3 Protect surrounding surfaces from damage and overspray.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Dampproofing material for use above 5°C: emulsified asphalt to CAN/CGSB-37.2-M88; one of the following products:
 - .1 700-01 by Henry Company.
 - .2 520 Sealmastic by W.R. Meadows.
 - .3 Master Seal 610 by Master Builders Solutions Canada Inc.
- .2 Dampproofing material for use below 5°C: solvent based cutback asphalt to CAN/CGSB-37.16-M89; one of the following products:
 - .1 710-11 by Henry Company.
 - .2 501 Sealmastic by W.R. Meadows.
 - .3 Master Guard 700 by ChemMasters.
- .3 Protection board: 3.2 mm thick asphaltic core with asphalt impregnated fibreglass mat at each face:

SECTION 07 11 13 - BITUMINOUS DAMPPROOFING

Vibraflex PC No. 70 by W.R. Meadows.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Examine surfaces to receive bituminous dampproofing and ensure that they are reasonably smooth, free of cracks, holes and projections which might cause puncture of membrane, free of dirt, oil, grease and other foreign matter and cured to the point, where moisture continued therein will not adversely affect membrane.
- .2 Do not apply dampproofing to a frozen or partly frozen substrate.
- .3 Remove dirt and dust from substrates and spray apply primer at rate recommended by manufacturer. Protect primed surfaces from rain and frost until it is cured.

3.2 MEMBRANE APPLICATION

- .1 Provide bituminous dampproofing at exterior face of foundation walls, at retaining walls in contact with soil and at other locations indicated.
- .2 Start dampproofing at outside edge of footing or at bottom of grade beam or wall and extend to 100 mm below finish grade.
- .3 Brush or spray apply bitumen t rate recommended by manufacturer and so as to ensure that dampproofing extends over entire application area, fully covering substrate.

3.3 PROTECTION BOARD

- .1 Except where thermal insulation or panel drains are required, protect bituminous dampproofing with protection board.
- .2 Prior to placing backfilling, adhere protection board to dampproofing with adhesive recommended by protection board manufacturer.

END

SECTION 07 19 00 - WATER REPELLENT SEALER

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Concrete foundation walls: Division 3
- .2 Concrete block foundation walls: Section 04 20 00

1.3 QUALITY ASSURANCE

- .1 Applicator shall be fully trained and approved by material manufacturer.

1.4 SUBMITTALS

- .1 Submit complete and detailed product data including MSDS's prior to start of work.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- .1 Deliver and store materials in original, undamaged containers with manufacturer's labels intact.
- .2 Store materials in dry, protected area, with containers closed and away from heat, sparks and open flames.

1.6 JOB CONDITIONS

- .1 Apply materials in strict accordance with manufacturer's directions and within environmental conditions stated by manufacturer including but not limited to:
 - .1 Substrate temperature: minimum -5°C, maximum 35°C.
 - .2 Surface condition: dry.
 - .3 Weather: without precipitation and/or high winds.
- .2 Use protective equipment when applying materials in accordance with manufacturer's recommendations.
- .3 Take steps to intercept, collect and legally dispose of excess sealer during application.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Water repellent sealer: Silane based, clear penetrating, breathable liquid compound; one of the following products:
 - .1 Chem-Trete PB by Dre Industries Inc.
 - .2 Rain-Shield Clear SX WB by W.R. Meadows.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Examine substrates scheduled to receive water repellent sealer to ensure that conditions are acceptable. Start of work shall imply acceptance of conditions.
- .2 Clean substrates to remove dirt, dust, grease, oil and any other substance which would inhibit proper application and performance of sealer.

SECTION 07 19 00 - WATER REPELLENT SEALER

- .3 Mask adjacent surfaces, not scheduled to receive sealer, from overspray, overcoating.

3.2 APPLICATION

- .1 Apply sealer to exposed concrete surfaces and at below building foundations.
- .2 Apply sealer in accordance with manufacturer's directions by spray, roller or brush.
- .3 Apply sealer in a flooding application from bottom up and so as to achieve coverage rates recommended by manufacturer.

END

SECTION 07 21 13 - RIGID BOARD INSULATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Metal roofing: Section 07 61 00
- .2 Roof insulation: Section 07 61 00

1.3 SUBMITTALS

- .1 Submit detailed and complete product data for each product required.

1.4 PRODUCT STORAGE AND HANDLING

- .1 Deliver insulation to site in sealed wrappings bearing manufacturer's name, product name and RSI or KSI value.
- .2 Store materials in a dry area protected from the elements.

1.5 PROTECTION

- .1 Temporarily protect installed insulation from damage and action of the elements until it is permanently concealed or protected.
- .2 Protect polystyrene insulation from sunlight.

PART 2 - PRODUCTS

2.1 INSULATION

- .1 Rigid board insulation: extruded, polystyrene with shiplapped edges: CAN/ULC-S701-11: Styrofoam SM by Dupont de Nemours Inc., or Foamular C-300 XPS by Owens Corning.
- .2 Adhesive: compatible with insulation, as recommended by insulation manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Substrates to receive rigid board insulation, shall be sound, dry and free of dirt, oil, grease and other foreign substances.
- .2 Clean substrates as required. Remove concrete surface ridges and deposits.

3.2 INSULATION INSTALLATION - GENERAL

- .1 Provide continuous uniform thermal insulation over insulated areas.
- .2 Where insulation is interrupted by construction elements, neatly fit insulation around such elements and pack spaces around elements with same insulation.
- .3 Moderately butt insulation boards against each other so that there are no gaps.
- .4 Stagger joints at multiple layer installations.

3.3 FOUNDATION INSTALLATION

SECTION 07 21 13 - RIGID BOARD INSULATION

- .1 Provide rigid board insulation at building foundation.
- .2 Provide perimeter insulation below grade, within foundation walls, as indicated, to minimum 1200 mm below finished grade or lower where shown. Unless otherwise indicated provide 75 mm thick insulation bonded to substrate with spot adhesive or bead application.
- .3 Provide rigid board insulation below slabs on grade where indicated. Place insulation board on prepared, level subgrade with joints tightly butted. Unless noted, use 75 mm thick insulation.

3.4 ROOF INSULATION

- .1 Provide rigid board insulation at metal roof.

END

SECTION 07 21 16 - BLANKET INSULATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Sprayed foam insulation: Section 07 21 19
- .2 Acoustical insulation inside gypsum board elements: Section 09 21 16
- .3 Duct and pipe insulation: Division 22 and 23

1.3 SUBMITTALS

- .1 Submit detailed and complete product data for each product required.
- .2 Submit duplicate, minimum 300 x 300 mm samples of each type and thickness of insulation required. Submit duplicate sample of impale clip.
- .3 Submit test report from a recognized testing agency showing compliance with specified requirements.

1.4 PRODUCT STORAGE AND HANDLING

- .1 Deliver insulation to site in sealed wrappings bearing manufacturer's name, product name and RSI or KSI value.
- .2 Store materials in a dry area protected from the elements in manufacturer's original packaging until required for installation.

1.5 PROTECTION

- .1 Do not install insulation during inclement weather.
- .2 Temporarily protect installed insulation from damage and action of the elements until it is permanently concealed or protected.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Blanket insulation for exterior stud walls and soffits: non-combustible, semi-rigid mineral wool insulation to CAN/ULC-S702, Type 1: Rockwool Comfortbatt, meeting the following requirements:
 - .1 Blanket thickness: match stud depth unless shown otherwise.
 - .2 Density: 32 kg/m³
 - .3 Flame spread: 0.
 - .4 Smoke developed: 0.
 - .5 RSI-value (per 25.4 mm) at 24°: 0.72 m² K/W.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Examine existing conditions to ensure that they are satisfactory to receive the work of this Section.

SECTION 07 21 16 - BLANKET INSULATION

- .2 Start of installation shall imply acceptance of conditions.

3.2 INSULATION

- .1 Provide continuous uniform thermal insulation over insulated areas.
- .2 Where insulation is interrupted by construction elements, neatly fit insulation around such elements and pack spaces around elements with same insulation.
- .3 Moderately butt insulation boards against each other so that there are no gaps.
- .4 Stagger joints at multiple layer installations.
- .5 Do not cover any dampproofing, waterproofing and air barrier/vapour retarder before Consultant's review and acceptance with such coatings.
- .6 Completely fill stud spaces with insulation, leaving no gaps or voids. Do not compress insulation to fit into stud spaces.
- .7 Fit insulation closely around electrical boxes, pipes, ducts and other components entering or passing through insulation space.

END

SECTION 07 21 19 - SPRAYED FOAM INSULATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Through-wall flashing membrane at masonry walls: Section 04 20 00
- .2 Blanket insulation: Section 07 21 16

1.3 REFERENCE STANDARDS

- .1 BASF Canada Quality and Training Program-Raising Performance to New Heights, June 2005.
- .2 BASF Canada Installer Training Manual, June 2005.
- .3 CAN/ULC S705.1-15 Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification.
- .4 CAN/ULC S705.2-05 Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density, Installation.
- .5 DEMILEC Air Barrier System Training Program – August 2017.
- .6 DEMILEC Air Barrier System Training Manual – August 2017.
- .7 CAN/ULC S718: 2018 Standard for Site Quality Assurance Program for Spray Applied Polyurethane Foam.
- .8 CAN/ULC S770-15 Standard Test Method for Determination of Long-Term Thermal Resistance of Closed Cell Thermal Insulating Foams.

1.4 SUBMITTALS

- .1 Submit detailed and complete product data for each product required.
- .2 Complete reports from on-site inspector during installation as per CAN/ULC-S705.2-05.

1.5 QUALITY ASSURANCE

- .1 Applicator's Qualifications:
 - .1 Certified and approved by material manufacturer/distributor as a Qualified Applicator.
 - .2 Certified applicators shall carry their certification cards, available for presentation upon request. The certification card shall bear a polyurethane foam applicator number and a certified air barrier system applicator number.
- .2 Maintain one copy of installation manual on site.
- .3 Installers of insulation system shall perform daily on-site testing as recommended by material manufacturer.
- .4 Material manufacturer/distributor shall provide on-site quality assurance program. Submit one copy of quality assurance program within first week of application.

SECTION 07 21 19 - SPRAYED FOAM INSULATION

1.6 MOCK-UP

- .1 Provide mock-up of insulation materials in accordance with Section 01 45 00.
- .2 Construct a mock-up minimum 5 m² including inside and outside corners, control joint and transition membrane.
- .3 Locate mock-up where directed by Consultant.
- .4 Mock-up may remain as part of the work if approved by Consultant.
- .5 Conduct the following tests on mock-up panel and enter results in CCMC report form:
 - .1 Insulation core density
 - .2 Adhesion between transition membrane and substrate
 - .3 Cohesion / adhesion between insulation and substrate.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

- .1 Deliver and store materials in their original containers and packaging leaving manufacturer's and products name, quantity, CCMC numbers and expiry date.
- .2 Store materials in manner recommended by material manufacturer.

1.8 JOB CONDITIONS

- .1 Maintain temperature and humidity recommended by the materials manufacturer before, during, and after installation.
- .2 Take steps to positively prevent overspray and drifting of foam particles caused by wind. Provide wind screens if required. Do not spray when wind speed exceeds 40 km/hr.

1.9 WARRANTY

- .1 At no cost to Owner remedy any defects in the work of this Section due to faults in materials and/or workmanship, appearing within 2 years from Substantial Performance.
- .2 All work provided under this Section shall be covered by the third party warranty program as set forth by the manufacturer's quality assurance program.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Sprayed foam insulation: closed cell, medium density spray applied polyurethane foam insulation and air barrier, listed under CAN/ULC-S705.1, one of the following products:
 - .1 BASF Walltile v.5 by BASF Canada (CCMC Evaluation Listings: CCMC 14100-L for insulation).
 - .2 Demilec Heatlok Soya by Demilec Inc. (CCMC Evaluation Listings: 14078-L for insulation).
- .2 Primer: as recommended by insulation manufacturer.
- .3 Transition membrane: one of the following products, or other products recommended by insulation

SECTION 07 21 19 - SPRAYED FOAM INSULATION

manufacturer:

- .1 Blueskin SA by Henry
 - .2 Sopraseal Stick 1100 by Soprema
 - .3 Modiflex MP-180-FS-BASE by IKO.
 - .4 ExoAir 110 or 110 LT by Tremco.
- .4 Cavity compartment seals/fire stops: minimum 0.9 mm thick sheet steel formed to profile required, hot dip galvanized ASTM A653, zinc coating designation Z275.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verify that surfaces and conditions are ready to accept the work of this Section. Start of work shall be deemed acceptance of existing work and existing conditions. Report in writing defects in substrates which may adversely affect the performance of the foam insulation.

3.2 PREPARATION

- .1 Surfaces to receive foam insulation shall be free of frost, loose or foreign matter which might impair adhesion of materials.
- .2 Prepare surface by brushing, scrubbing, scraping, or grinding to remove loose mortar, dust, oil, grease, oxidation, mill scale and other contaminants which will affect adhesion and integrity of the foam insulation system. Wipe down metal surfaces to remove release agents or other non-compatible coatings, using clean sponges or rags soaked in a solvent compatible with the foam insulation. Ensure surfaces are dry before proceeding.
- .3 Provide transition membrane at control joints, at all wall penetrations and openings, and at junctions with other building elements such as steel framing members and roof system and at open joints in substrates. Ensure that membrane is fully secured to substrate. Do not allow applied membrane to deteriorate by leaving it exposed to weather. Cover with foam insulation before any deterioration can occur. Seal at any ripples or "birds mouths" in the membrane, prior to applying foam.
- .4 Install cavity wall compartment seals near wall corners, at masonry exterior wythe control joints and at locations shown. Securely fasten compartment seals to interior wythe. Where width of cavity air space exceeds 25 mm provide fire stops in accordance with OBC requirements.

3.3 APPLICATION

- .1 Apply foam insulation in strict accordance with manufacturer's written instructions.
- .2 Apply foam insulation only when surfaces and ambient temperatures are within limits prescribed by the material manufacturer. Apply insulation to a minimum thickness of 75 mm, unless otherwise shown.
- .3 Apply foam insulation to within a tolerance of +6 mm/-6 mm of thicknesses required.
- .4 Finished sprayed foam insulation shall have uniform texture and thickness and shall be free of voids and imbedded foreign materials.
- .5 Do not allow foam insulation to cover or mark adjacent surfaces. Use masking materials if necessary.
- .6 Remove masking materials immediately after foam has cured to hard surface film.

SECTION 07 21 19 - SPRAYED FOAM INSULATION

- .7 Clean and make good surfaces soiled or damaged by work of this Section. Consult with Section of work soiled before cleaning to ensure methods used will not damage their work.

3.4 FIELD QUALITY CONTROL

- .1 Comply with requirements of CAN/LC-S718: 2018 and CAN/ULC-S770-15, unless shown otherwise.
- .2 Authorized material manufacturer's representative shall visit the site periodically, inspect the work and issue reports, verifying that work meets material manufacturer's quality requirements. Costs for all such inspections shall be included in the Contract.
- .3 Throughout application of sprayed insulation system, on a daily basis, conduct field tests in accordance with procedures established by manufacturer and enter results in manufacturer's daily report forms. Testing shall include but not necessarily be limited to:
 - .1 Thickness
 - .2 Core density
 - .3 Cohesion
 - .4 Adhesion to substrate (including transition membranes)
- .4 Conduct testing in accordance with manufacturer's technical guidelines for installation of air barrier system. Costs for testing shall be included in the Contract.
- .5 Conduct testing in accordance with CAN/ULC-S705.2-05 to ensure insulation installed can be considered as an air barrier. Failure to do so will result in removal of installed insulation and reinstallation as per CAN/ULC-S705.2-05 at no additional cost to the Owner.

END

SECTION 07 26 16 - UNDERSLAB VAPOUR RETARDER

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Granular base below slabs on grade: Section 31 23 36
- .2 Concrete slabs on grade: Section 03 30 00
- .3 Bituminous dampproofing: Section 07 11 13

1.3 REFERENCES

- .1 ASTM E1745 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
- .2 ASTM E1643 Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

1.4 SUBMITTALS

- .1 Submit full set of test results from a recognized independent testing agency as per paragraph 8.3 of ASTM E1745.
- .2 Submit manufacturer's samples, product literature and installation instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Vapour retarder: Stego Wrap Vapour Barrier 15 Mil, Class A by Stego Industries or Perminator 15 by W.R. Meadows; meeting the following requirements:
 - .1 Permeance: max 0.01 perms {0.6 ng (Pa.s.m²)}, when tested after conditioning (ASTM E1745).
 - .2 Strength: Class A (ASTM E1745).
 - .3 Thickness: 0.38 mm (15 mils) minimum.
- .2 Termination tape: Stegotrack Tape by Stego Industries or equivalent product by W.R. Meadows or Henry.
- .3 Seam and repair tape: Stego Crete Claw Tape 3" and 6" or equivalent product by W.R. Meadows or Henry.
- .4 Mastic: as recommended by vapour retarder manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Examine existing conditions to ensure they are acceptable to receive the work of this Section.
- .2 Start of work shall imply acceptance of conditions.

3.2 INSTALLATION

SECTION 07 26 16 - UNDERSLAB VAPOUR RETARDER

- .1 Provide underslab vapour retarder below concrete slabs on grade unless shown otherwise. Follow product manufacturer's installation instructions.
- .2 Install vapour retarder in accordance with manufacturer's instructions and ASTM E1643. Secure vapour retarder at grade beams with a termination tape, as recommended by tape manufacturer.
- .3 Unroll vapour retarder with the longest dimension parallel with the direction of the pour.
- .4 Extend vapour retarder minimum 100 mm up the grade beams and seal to grade beams. Secure edge of vapour retarder with a termination tape.
- .5 Overlap joints 150 mm and seal with manufacturer's seam tape.
- .6 Seal all penetrations with mastic in accordance with manufacturer's instructions
- .7 No penetration of the vapour retarder is allowed except for permanent pipes and utilities.
- .8 Request Consultant's inspection and acceptance of the underslab vapour retarder prior to casting slab on grade concrete.
- .9 Repair damaged areas by cutting patches of vapour retarder, overlapping damaged area 150 mm and taping all four sides with seam tape. Cover installed vapour retarder as soon as possible with slab on grade.
- .10 Do not use any area covered with an underslab vapour retarder as a working platform.

END

SECTION 07 27 00 - AIR BARRIER

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Board insulation: Section 07 21 13
- .2 Metal roof system: Section 07 61 13

1.3 QUALITY CONTROL

- .1 Owner may appoint and pay separately for inspection and testing of work provided under this Section, by independent inspection agency, as directed by Consultant. Comply with requirements of Section 01 45 00.

1.4 SUBMITTALS

- .1 Submit detailed and complete product data for each product to be used.

1.5 PRODUCT HANDLING

- .1 Handle and store membrane materials to prevent tearing, puncturing and other damage.
- .2 Store roll goods in upright position and protected from the weather.

1.6 JOB CONDITIONS

- .1 Apply membrane during dry weather and to dry substrates only.
- .2 Apply materials only within acceptable application temperature range determined by manufacturer. Select a membrane system which is best suited for expected application conditions. Use the same system throughout entire project.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Vapour permeable, self adhesive, modified bitumen membrane, one of the following products:
 - .1 Blueskin VP160 by Henry.
 - .2 Perm-A-Barrier VPS by W.R.Grace.
 - .3 Sopraseal Stick VP by Soprema.
- .2 Low permeance, vapour retardant, self adhesive, modified bitumen membrane; one of the following products:
 - .1 Blueskin SA by Henry.
 - .2 Perm-A-Barrier by W.R. Grace.
 - .3 Sopraseal Stick 1100 by Soprema.
- .3 Primer: as recommended by membrane manufacturer.
- .4 Adhesives, mastics, joint backing: as recommended by membrane manufacturer.
- .5 Metal backing: cold rolled sheet steel, hot dip galvanized to ASTM A653, zinc coating designation Z275; unless otherwise shown, 0.9 mm thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Examine substrates to ensure conditions are satisfactory to receive work of this Section.
- .2 Start of work shall imply acceptance of conditions.
- .3 Substrates shall be sound, reasonably smooth, dry, clean, free of frost, grease, oil and other substances which would adversely affect membrane adhesion.

3.2 PREPARATION

- .1 Clean substrates as required.
- .2 Remove sharp projections and repair defective areas in substrate.
- .3 Prime substrates if recommended by membrane manufacturer.
- .4 At open joints in substrate, exceeding 3 mm width, and at other locations shown, provide v-shaped metal backing for air barrier membrane, securely fastened each side of joint.

3.3 SHEET MEMBRANE INSTALLATION

- .1 Install membrane system at locations required, in accordance with manufacturer's installation instructions.
- .2 Provide vapour permeable air barrier where thermal insulation or a major portion of it is located on the inside of air barrier. Provide low permeance air barrier where thermal insulation or a major portion of it is located outside of air barriers.
- .3 Apply membrane to exterior face of interior wythe of cavity walls, to exterior wall sheathing at lightweight steel framed exterior walls and, if indicated, in other locations.
- .4 Completely cover substrates. Start at low point and proceed up the wall, overlapping subsequent sheets minimum 50 mm in the direction of water flow. Lap end joints minimum 100 mm.
- .5 Apply primer with roller, brush or spray equipment. Do not apply more primer than that which can be covered, on the same working day, with air barrier membrane. Recoat primed areas which are not covered with membrane the same day.
- .6 Position membrane for alignment, with protective film in place. Roll membrane back, remove film and press membrane in place.
- .7 Roll completed membrane, including seams, with suitable roller, to ensure full contact with substrate.
- .8 At masonry wall ties and at other penetrations through sheet type membrane, accurately cut, fit and seal membrane around penetrating component.
- .9 At wall openings return membrane into rough openings. Provide saddle membrane to ensure that corners of openings are sealed.
- .10 Coordinate with Section 07 61 13 to ensure continuity of air barrier at junction with roof systems.

3.4 FIELD QUALITY CONTROL

- .1 Make arrangements and pay for membrane manufacturer to provide periodic site inspection and technical assistance to ensure work is properly executed.
- .2 Upon completion of membrane installation membrane manufacturer shall issue a report verifying that membrane installation is complete and satisfactory.

SECTION 07 27 00 - AIR BARRIER

- .3 Prior to allowing membrane to be covered with other work, request Consultant's review and acceptance.

END

SECTION 07 46 19 - STEEL CLADDING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Aluminum composite panel cladding: Section 07 42 16
- .2 Metal roofing: Section 07 61 13
- .3 Metal flashings and trim except as specified herein: Section 07 62 00

1.3 QUALITY ASSURANCE

- .1 Reference Standards: comply with applicable requirements of CSSBI S8-2008 and CSSBI 20M-2017, except where specified otherwise herein.
- .2 Erector's qualifications: manufacturer's forces or forces approved by manufacturer.

1.4 DESIGN PERFORMANCE REQUIREMENTS

- .1 Appearance: exposed surfaces free of perceptible distortion, twist, waves, buckles and oil canning; no exposed fasteners.
- .2 Structural loads: resist positive and negative wind pressures expected in this geographical area with a maximum allowable deflection of 1/180 of span. Components shall not vibrate or rattle when subjected to the effects of wind.
- .3 Moisture control: prevent infiltration of water and snow into system. Provide means of draining space behind exterior skin.
- .4 Thermal movement: accommodate expansion and contraction of component parts without causing buckling, failure of joint seals, undue stress on fasteners and other detrimental effects. Thermally isolate transmission through system.
- .5 Structural movement: accommodate movement between wall system and building structure caused by structural movement, without permanent distortion, racking of joints, breakage of seals or water penetration.

1.5 SUBMITTALS

- .1 Submit duplicate minimum 100 x 100 mm size samples of cladding material for confirmation of colour selected by Consultant.
- .2 Submit detailed shop drawings. Indicate dimensions, cladding profiles, attachment methods, wall elevations, trim and closure pieces, and related work.

1.6 PRODUCT DELIVERY, HANDLING AND STORAGE

- .1 Deliver, store and handle materials to prevent damage, distortion and corrosion.
- .2 Store components off the ground and under cover.

PART 2 - PRODUCTS

2.1 SYSTEMS

- .1 Steel cladding: Bellara Mountain Cedar 18-2772 by VicWest.

SECTION 07 46 19 - STEEL CLADDING

2.2 MATERIALS

- .1 Prepainted, galvanized sheet steel: approximately 15 mm deep profile, with concealed fasteners; pretreated, primed and finish coated.
- 2 Galvanized sheet steel: ASTM A653, zinc coating designation Z275.
- .3 Subgirts, clips, spacers: minimum 1.2 mm thick formed galvanized steel: ASTM A653, zinc coating designation Z275.
- .4 Fastening devices: stainless, cadmium plated or galvanized steel; colour match exposed fasteners with metal on which they occur.
- .5 Sealants:
 - .1 Concealed locations: tape or compound, nonskinning, non-drying, butyl rubber.
 - .2 Exposed locations: one part silicone to ASTM C920.
 - .3 Primer: as recommended by sealant manufacturer.
- .6 Isolation coating: bituminous paint CAN/CGSB-1.108 or separation tape recommended by system manufacturer.
- .7 Breathing type, water shedding sheet membrane, UV resistant: Air Outshield UV BLACK by SRP Canada.

2.3 FABRICATION

- .1 Wall cladding: 0.45 mm (26 ga) thick, 15 mm deep profile, concealed fasteners, complete with colour matching manufacturer's standard trim at terminations, corners and control joints.
- .2 Flashings, trim, closures: fabricated to profiles indicated and as required to meet design and performance requirements. Use same material as exterior skin where exposed. Use galvanized sheet steel in concealed locations. Double back exposed edges.

2.4 FINISHES

- .1 Exposed surfaces: prepainted sheet steel/ Kynar 70% PVDF polyvinyl fluoride resin; colour selected by Consultant.
- .2 Concealed surfaces: galvanized.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Prior to start of erection, examine existing work and report to Consultant any unsatisfactory conditions.
- .2 Start of work shall imply acceptance of conditions.

3.2 ERECTION

- .1 Install steel cladding system in accordance with manufacturer's directions at exposed surfaces of roof soffits, fascias and perimeter of metal roof.

SECTION 07 46 19 - STEEL CLADDING

- .2 Install cladding support brackets at required location and securely fasten to back-up construction, in accordance with reviewed shop drawings.
- .3 Install subgirts at spacing as shown on reviewed shop drawings by system manufacturer, and anchor securely to cladding support brackets.
- .4 Install water shedding breathable sheet membrane, lapped at joints in direction of water flow; secure membrane at girts.
- .5 Fasten girts to clips at required spacing. Provide additional framing at terminations, openings and penetrations.
- .6 Install exterior wall skin with joints accurately aligned and tight fitting. Provide cladding panels in longest available lengths. Intermediate joints are not permitted unless indicated on shop drawings and approved by Consultant.
- .7 Unless indicated to be responsibility of another Section, provide sill and cap flashings and other flashings required at junction with other building elements.
- .8 Unless otherwise detailed provide metal closures to close off flutes at terminations.
- .9 Provide sealants, flashings, closures, covers and trim as indicated and as required to render work complete and finished in accordance with specified requirements.
- .10 Leave steel cladding system in clean and neat condition; touch up minor surface damage; replace components which cannot be satisfactorily touched up.

END

SECTION 07 61 13 - METAL ROOFING SYSTEM

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 DESCRIPTION

- .1 This section includes an insulated metal roof system, comprising but not limited to the following:
 - .1 Structural liner.
 - .2 Thermal barrier.
 - .3 Air/vapour barrier.
 - .4 Rigid insulation.
 - .5 Roof panel and support system.
 - .6 Water barrier.
 - .7 Accessories including associated flashings, closures, sealants.
 - .8 Gutters and down pipes.

1.3 RELATED WORK

- .1 Steel roof deck: Division 5
- .2 Structural steel framing: Division 5
- .3 Downlights: Division 26

1.4 STANDARDS AND REFERENCES

- .1 Design of cladding system in accordance with the latest edition of:
 - .1 CSA-S136 for the design of cold formed steel structural members.
 - .2 Canadian Sheet Steel Building Institute Standards 10M, 20M, B11.
 - .3 Ontario Building Code.

1.5 QUALITY ASSURANCE

- .1 Fabricator/installer qualifications: minimum 5 years of experience in type of work specified herein.
- .2 Reference standards: comply with applicable requirements of the following, except where specified otherwise herein:
 - .1 CSSB1 S8-2008, Quality and Performance Specification for Prefinished Sheet Steel Used for Building Products.
 - .2 CSSB1 S11-15, Insulated Sheet Steel roof Assemblies.
 - .3 CSSB1 20 M-2016, Standard for Sheet Steel Cladding for Industrial, Commercial and Institutional Building Applications.

1.6 DESIGN REQUIREMENTS

- .1 Design roof system to resist:

SECTION 07 61 13 - METAL ROOFING SYSTEM

- .1 Snow loads and snow build-up and rain load, expected in this geographical region climatic data, 50 year probability.
 - .2 Wind loads, positive and negative, expected in this geographical region climatic data, 50 year probability.
 - .3 Dead load of roof system.
 - .4 If the roof system is to be designed as a shear diaphragm, then the factored shear design loads "Q" and the flexibility factors "F" must be shown on the structural drawings.
- .2 Deflection of the roof system is not to exceed 1/240th of the span for the specified live loading.
- .3 Thermal movements: allow for thermal movements from ambient and surface temperature changes by preventing buckling, overstressing of components, failure of connections, and other detrimental effects. Base calculation on surface temperatures of materials due to both solar heat gain and night time sky heat loss.
- .1 Temperature change range: 20°C ambient; 40°C material surfaces.

1.7 SAMPLES

- .1 Submit duplicate, minimum 150 x 150 mm samples of coloured metal roof sheet for review by the Consultant prior to fabrication.

1.8 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00.
 - .1 Indicate arrangement of pre-finished roof sheet, including joints, types and locations of supports, fasteners, flashing, butters, mitres, and all metal components related to the roof installation. Include for structural liner, thermal barrier, membrane air/vapour barrier, insulation as part of the roof system.
 - .2 Drawings shall be signed and sealed by a Professional Engineer licensed to practice in Ontario, attesting to the ability of the metal panels assembly to withstand the specified loads.

1.9 MAINTENANCE DATA

- .1 Provide maintenance data for cleaning and maintenance of panel finishes for incorporation into manual specified in Section 01 77 00.

1.10 PRODUCT DELIVERY, HANDLING AND STORAGE

- .1 Store components and materials in accordance with panel manufacturer's recommendation and protect from elements.
- .2 Protect prefinished steel during fabrication, transportation, site storage and erection, in accordance with CSSBI Standards.

1.11 WARRANTY

- .1 Furnish panel manufacturer's written warranty covering failure of factory-applied exterior finish within the warranty period. Warranty period for finish: 40 years from date of Substantial Performance. The values below are based on normal environments and exclude any aggressive atmospheric conditions.
- .2 Siliconized polyester will not crack, chip or peel (lose adhesion) for 40 years from date of installation, 40.5 years from application. This does not include minute fracturing that may occur during the normal fabrication process. WeatherXL Siliconized Polyester will not chalk in excess of a number 6 rating, in accordance with ASTM D-4214-98 method D659 at any time for 30 years from date of installation, 30.5 years from application; will not change colour more than 8.0 Hunter Δ E units as determined by ASTM

SECTION 07 61 13 - METAL ROOFING SYSTEM

method D-2244-02.

PART 2 - PRODUCTS

2.1 ACCEPTABLE SYSTEM

- .1 Tradition 100-4: System 3000 by VicWest.

2.2 FABRICATION

- .1 Fabricate roof components to comply with dimensions, profiles, gauges and details as shown on the shop drawings, including fascia and soffit panels and all companion flashing.
- .2 Fabricate all components of the system in the factory, ready for field installation.
- .3 Provide roof sheet and all accessories in longest practicable length to minimize field lapping of joints.

2.3 ROOF SYSTEM COMPONENTS

- .1 Structural liner: Vicwest steel roof deck, fabricated from ASTM A653M structural quality Grade 230 galvanized steel, with zinc coating of ZF75 Galvaneal, Z275 galvanized, as designated by ASTM A653M having a nominal core thickness 1 mm.
- .2 Thermal barrier: exterior grade gypsum sheathing to CSA A82.27, 12 mm thick.
- .3 Air/vapour retarder: Sopraseal Stick 1100T by Soprema Inc. or Ice and Water Shield Bituthene 3000 by W. R. Grace or an equivalent product approved by the Consultant.
- .4 Insulation: rigid mineral fibre by Rockwool or Fibrex, with compressive strength of 60 psf (2.9 kPa).
- .5 Water barrier: barrier shall be Lastobond Shield by Soprema Inc. or an equivalent product approved by Consultant.
- .6 Clip and subgirt system:
 - .1 Thermally responsive clips to be fabricated from a minimum of 0.91 mm (0.036") steel, with minimum Z275 galvanized coating designed to accommodate expansion and contraction of the roof sheet.
 - .2 Continuous hat bar and zee clips made from galvanized steel thickness to suit design parameters, to accommodate depth of insulation.
 - .3 Roof fasteners: provide by manufacturer, to resist wind uplift and sliding snow forces.
- .7 Prefinished roof sheet, exposed to exterior.
 - .1 Profile: Tradition 100-4, with I-style ribs at 400 mm spacing.
 - .2 Panel: Z275 galvanized sheet steel conforming to ASTM A653M structural quality Grade 230 having a nominal core thickness 0.76 mm.
- .8 Snap cap
 - .1 Provide 25 mm high snap caps for full length of roof panel and retained by panel clips, fabricated from Z275 galvanized sheet steel conforming to ASMT A653M structural quality Grade 230 having a nominal core thickness of 0.76 mm. Finish and colour to match roof sheet.

2.4 ACCESSORIES

- .1 Flashings, gutters and trim: formed from same materials as the roof sheet. Custom fabricated to suit architectural details, as required.

SECTION 07 61 13 - METAL ROOFING SYSTEM

- .2 Provide gutters and down pipes made of hot dip galvanized steel, finish coated with 70% Kynar PVDF in colour selected by Consultant.
- .3 Closures: foam and metal closures to suit profiles selected, to manufacturer's recommendations.
- .4 Sealants: in accordance with manufacturer's recommendation and Section 07 92 00.

2.5 FINISHES

- .1 Interior face of roof panels: galvanized finish.
- .2 Exterior face of roof panels: factory painted with WeatherXL siliconized polyester, in colour selected by Consultant.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Examine work of other Sections upon which work of this Section depends.
- .2 Report all discrepancies to Consultant before beginning work on the roof system.

3.2 INSTALLATION

- .1 Thermal and moisture protection:
 - .1 Structural liner: install structural liner in accordance with Section 05 31 00 Steel Deck. Ensure installation is complete before starting roof work.
 - .2 Thermal barrier: install exterior grade gypsum board thermal barrier perpendicular to flutes of structural liner. Fasten using manufacturer's recommended fasteners, with spacing to suit wind loading conditions.
 - .3 Clip support: install 125 mm wide galvanized support plate at clip locations if required. Thickness to suit design parameters.
 - .4 Air/vapour retarder: install membrane air/vapour retarder in accordance with manufacturer's recommendations. Ensure all joints are properly lapped, sealed and tied in to ensure airtight construction.
 - .5 Provide a continuous seal at all openings in the roof system.
 - .6 Clip and subgirts: attach Tradition clips, hat bar, and zee clips using fasteners as recommended by the manufacturer, to suit the substrate.
 - .7 Insulation: install rigid insulation in one layer, as shown on the drawings. Tightly butt against support clips. Insulation should be continuous.
- .2 Roof panel installation:
 - .1 Install exterior prefinished roof panels on panel support clips, using manufacturer's proper construction procedure. Ensure metal roofing sheet side-lap is positively retained by clips, and proper sheet coverage is maintained.
 - .2 Install the snap-cap at all side laps as shown on the approved shop drawings. Mitre snap-cap as required to resist water entry.
 - .3 Where indicated on approved shop drawings, secure the end-lap of metal roofing sheets in accordance with manufacturer specifications and details to provide a weather-tight seal. Exposed fasteners to match colour the roof sheet.

SECTION 07 61 13 - METAL ROOFING SYSTEM

- .4 Provide notched and formed closures, sealed against weather penetration, at changes in pitch, and at ridges and eaves, where required.
- .5 Install all companion flashings, gutters, ventilators and trim as shown on the shop drawings. Use concealed fasteners when possible. Exposed fasteners shall match colour of roof sheet.

3.3 CLEAN-UP

- .1 Clean exposed panel surfaces in accordance with manufacturer's instructions.
- .2 Repair and touch up with colour matching high grade enamel minor surface damage, only where permitted by the Consultant and only where appearance after touch-up is acceptable to Consultant.
- .3 Replace damaged panels and components, which in the opinion of the Consultant cannot be satisfactorily repaired.

END

SECTION 07 92 00 - SEALANTS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Caulking relating to metal cladding: Section 07 46 19
- .2 Caulking related to metal flashings: Section 07 62 13
- .3 Caulking related to aluminum windows: Section 08 51 13

1.3 DEFINITION

- .1 Caulking = Sealant.

1.4 QUALITY ASSURANCE

- .1 Sealants must be installed by qualified caulking contractor with minimum five years' experience and proven record of being able to produce good quality work.
- .2 Upon Consultant's request arrange for sealant manufacturer's technical representative to visit the site, investigate conditions and make recommendations in connection with work of this Section.

1.5 PRODUCT HANDLING

- .1 Deliver sealants to site in sealed containers bearing manufacturer's name, brand name of sealant and reference standard to which sealant complies.
- .2 Store materials in a dry area having an ambient temperature within limitations recommended by material manufacturer.

1.6 JOB CONDITIONS

- .1 Unless otherwise specified, apply sealants when air temperature is between 10°C and 25°C. When air temperature is above 25°C or below 10°C follow sealant manufacturer's recommendations regarding application.

1.7 WARRANTY

- .1 At no cost to Owner remedy any defects in work, including work of this and other Sections, due to faults in materials and workmanship provided under this Section appearing within a period of 2 years from date of Substantial Performance.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Sealants:
 - .1 Exterior vertical joints: two-part medium modulus silicone sealant with joint movement capability of $\pm 50\%$; custom colour selected by Consultant: ASTM C920, Type S, Grade NS, Class 25, uses NT, G, A, O; standard of acceptance: Dow Corning 790 Silicone Building Sealant.
 - .2 Interior vertical joints: one part acrylic latex with joint movement capability of $\pm 7 \frac{1}{2}\%$, paintable; ASTM C834 Type OP, Grade -18°C standard of acceptance: Tremflex 834.
 - .3 Exterior and interior horizontal joints: multi-component, self-levelling, chemically curing

SECTION 07 92 00 - SEALANTS

- polyurethane: ASTM C920, Type M, Grade P, Class 25; standard of acceptance Tremco THC-900.
- .4 Interior wet locations: mildew-resistant silicone formulated with fungicide: ASTM C920, Type S, Grade NS, Class 25, uses NT, G, A: standard of acceptance: Dow Corning 786 Mildew Resistant Silicone Sealant.
 - .5 Colours: selected by Consultant, from manufacturer's standard colours.
 - .2 Primers, thinners, cleaners: as recommended by sealant manufacturer, non-staining type.
 - .3 Premoulded backup for sealant: compressible non-gassing foam rope: Sof-Rod by Tremco or Cera Rod by W.R. Meadows.
 - .4 Bond breaker: closed cell polyethylene or vinyl foam tape, self-adhering one side.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Examine joints to be caulked and report in writing to the Consultant any defects in work of other Sections which would impair installation, performance and warranty of sealants.
- .2 Do not commence installation of sealants until conditions are acceptable.
- .3 Start of work implies acceptance of conditions.

3.2 PREPARATION

- .1 Clean and prepare joints to be caulked to produce clean sound surfaces for sealant adhesion.
- .2 Remove dust, oil, grease, water, frost, loose mortar and other foreign matter. Remove loose particles by blowing joint out with compressed air.
- .3 Chemically clean non-porous surfaces such as metal and glass, taking care to wipe solvents dry with a clean cloth. Use solvents recommended by sealant manufacturer.
- .4 Clean porous surfaces such as masonry, concrete and stone by mechanical abrading.
- .5 Surfaces adjacent to joints to be primed and which may be stained by primer shall be masked with tape before primer is applied.
- .6 Prime joints in accordance with sealant manufacturer's recommendations. Apply primer before installing premoulded backup.
- .7 Install premoulded backup in joints 6 mm and more in width. Roll rope type backup into joint, do not stretch or braid. Install bond breaker in joints less than 6 mm in width.
- .8 Protect adjacent surfaces from stains and contamination. Make good any damage caused.

3.3 APPLICATION

- .1 Apply sealants under pressure using suitable equipment. Gun nozzle shall be of proper size to fit, and seal joint.
- .2 Force sealant into joints in full bead, making certain that void free contact is made with sides of joint. Tool joints to produce a slightly concave surface.
- .3 Caulking must appear as a concave recessed joint, free of ridges, wrinkles and embedded foreign matter. Caulking shall not spread or bulge beyond surfaces on each of joint.
- .4 Apply sealants in accordance with following table:

SECTION 07 92 00 - SEALANTS

<u>Joint Width</u>	<u>Sealant Depth</u>
5 mm	5 mm
10 mm	7 mm
15 mm	10 mm
20 mm	12 mm
25 mm	15 mm

- .5 Vent exterior joints in accordance with Consultant's directions.

3.4 CLEANING

- .1 As work progresses, remove sealant smears and stains from adjacent surfaces. Use cleaning method recommended by sealant manufacturer.
- .2 Leave adjacent surfaces in neat and clean condition.

3.5 SCHEDULE

- .1 Apply sealant at the following exterior locations:
- .1 Between dissimilar materials in exposed locations except where specifically indicated otherwise.
 - .2 Control joints in masonry elements.
 - .3 Below door thresholds (double bead).
 - .4 Perimeter of door, screen and louvre frames.
 - .5 Penetrations through exterior building elements.
 - .6 Where indicated.
- .2 Apply sealant at the following interior locations:
- .1 Between dissimilar materials in exposed locations except where specifically indicated otherwise.
 - .2 Perimeter of exterior door, louvre and screen frames.
 - .3 Perimeter of interior door frames.
 - .4 Control joints in masonry elements, and joints between bearing and non-bearing masonry walls.
 - .5 Ceramic tile control joints.
 - .6 Perimeter of firehose cabinets, access panels, and control panels.
 - .7 Between interior door frame and flooring.
 - .8 Where shown.
- .3 At interior locations use acrylic emulsion sealant except:
- .1 At floor control joints use self-levelling polyurethane.
 - .2 Where expected joint movement exceeds movement capability of sealant, use sealant specified for exterior locations as directed by Consultant.

END

SECTION 08 11 13 - STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Caulking at frame perimeters: Section 07 92 00
- .2 Door hardware: Section 08 71 00
- .3 Glass and glazing: Section 08 80 00
- .4 Metal louvres: Section 08 91 00
- .5 Painting: Section 09 91 00

1.3 QUALITY ASSURANCE

- .1 Acceptable manufacturers for interior doors and frames:
 - .1 Artek Door (1985) Ltd.
 - .2 Daybar Industries Ltd.
 - .3 Fleming (Assa Abloy)
 - .4 Metal Doors Ltd.
- .2 Reference standards: unless otherwise indicated, meet requirements of "Canadian Manufacturing Specification for Steel Doors and Frames" and "Recommended Dimensional Standards for Commercial Steel Doors and Frames" published by the Canadian Steel Door Manufacturers' Association.

1.4 SUBMITTALS

- .1 Prepare and submit detailed shop drawings. Include door and frame schedules, door and frame types, typical details, materials and finishes, hardware preparations and frame anchorage details.

1.5 PRODUCT HANDLING

- .1 Tag doors and frames at shop with identification marks indicating proper location for installation.
- .2 Deliver, store and handle components so as to prevent damage, distortion and corrosion. Store components off the ground and under cover in a dry protected area. Stack doors and frames to prevent twisting. Do not enclose components in plastic covers without venting.
- .3 Upon delivery to site doors and frames shall be removed from packaging. Store doors and frames with spacers/blocking to allow air to circulate. Do not store under tarpaulins, plastic film or other wrapping materials that may retain moisture or create a humidity tent.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Sheet Steel: galvanized cold rolled steel with stretcher level degree of flatness, meeting requirements of ASTM A924 and A653; minimum zinc coating designation ZF120.
- .2 Core Material:
 - .1 Exterior doors: polyisocyanurate to CSA/ULC 704.1-2017.

SECTION 08 11 13 - STEEL DOORS AND FRAMES

- .3 Interior doors: resin impregnated paper honeycomb.
- .3 Finishing Materials:
 - .1 Touch up paint: zinc rich paint CAN/CGSB-1.181-99.
 - .2 Metal filler: two component epoxy type.

2.2 HARDWARE PREPARATION

- .1 Prepare for mortised and cylindrical hardware in accordance with ANSI A115 Series standards, except where specified otherwise. Provide mortise lock preparation to ANSI A115.1, including integral reinforcement channel, mounting tabs, and lock support. Provide cylindrical lock preparation to ANSI A115.2, including integral latch case support.
- .2 Blank, reinforce, drill and tap doors and frames for concealed and mortised hardware. Provide door closer reinforcement at all steel doors and frames whether closer is required by hardware list or not.

2.3 DOORS

- .1 Provide all doors of seamless construction with no visible seams or joints on faces.
- .2 Exterior doors shall be of hollow steel construction with all spaces filled with insulation. Skins shall be minimum 1.34 mm thick. Join door faces at vertical door edges by continuous weld, extending full height of door; grind, fill and dress smooth.
- .3 Interior high traffic doors shall be of steel stiffened construction with 1.7 mm thick door faces, joined at door edges with continuous weld, ground, filled and dressed smooth. Provide high traffic doors at the following locations:
 - .1 Interior vestibule doors
 - .2 Stair doors
 - .3 Cross corridor doors
 - .4 Where shown
- .4 Provide condensation weep holes at bottom edge of exterior doors.
- .5 Provide flush watertight galvanized steel end closures at top edge of exterior doors and where required for attachment of hardware and weatherstripping.
- .6 Hardware reinforcements shall be minimum 3.4 mm thick, not including door skin thickness. Provide reinforcement at all hardware fastening points.
- .7 Surround openings in flush doors with minimum 1 mm thick steel edge channels, welded to both face sheets.
- .8 Provide removable bevelled glazing stops of zinc coated steel channels mitred at corners, accurately fitted into position and fastened with Phillips, oval head screws.
- .9 Glazing stops at outside of exterior doors shall be rendered non-removable.
- .10 Coordinate the work of this section with that of Section 08 80 00 and 08 91 00 respectively.

2.4 FRAMES

- .1 Unless otherwise shown provide welded frames of 1.7 mm thick sheet steel to profiles shown. Door stops and glass stops shall be formed integrally with frame and not added as a separate profile.
- .2 Assemble components with accurately cut joints. Mitre outside corner joints of frames. Continuously

SECTION 08 11 13 - STEEL DOORS AND FRAMES

- weld joints on inside of profile; grind welds, flush and sand to smooth uniform surface. Tabbed and spotwelded construction is not acceptable.
- .3 Fit and assemble work in the shop wherever possible, eliminating field joints.
 - .4 Glazing stops shall be minimum 0.9 mm thick steel, mitred at corners, drilled and secured with oval head screws. Glazing stops at outside of exterior frames shall be rendered non-removable.
 - .5 Side light and transom framing shall be of same thickness metal as adjacent door frame.
 - .6 Countersink frames at anchor locations to accommodate 10 mm screw fasteners for frames installed into concrete openings. Provide steel sleeves between frame and wall.
 - .7 Drill interior door frames for rubber bumpers. Drill strike jamb of each single door frame for 3 bumpers. Drill head member of double door frames for 2 bumpers.
 - .8 Provide angle or channel head reinforcement for door frames wider than 915 mm.
 - .9 Tack weld two removable minimum 1.2 mm thick steel spreader channels to inside faces of door frames at base.
 - .10 Provide adjustable base clips for anchorage to floor at bottom of each door jamb.
 - .11 Protect hardware reinforcements at frames located in masonry elements with 0.9 mm thick guard boxes.
 - .12 Hardware reinforcements shall be minimum 3.4 mm thick, not including frame thickness. Provide reinforcement at all hardware fastening points. Provide high frequency (angle type) reinforcement at hinges.
 - .13 Where indicated provide removable mullions.
 - .14 Provide welded on drip at head of exterior door frames.
 - .15 Provide special head members to accommodate automatic door operators coordinate with Division 26 to permit access for wiring and equipment
 - .16 Prepare exterior door frames for security system contacts.

2.5 FINISHES

- .1 Fill seams, corner joints and other depressions with filler and sand smooth.
- .2 Clean and remove all traces of oil, grease and other foreign substances to ensure proper bond of touch up after fabrication.
- .3 Touch up damaged zinc coating with zinc rich paint.
- .4 Insulate, where necessary to prevent electrolysis, metal surfaces in contact with dissimilar metals or cementitious materials.

PART 3 - EXECUTION

3.1 FRAME AND SCREEN INSTALLATION

- .1 Allowable limit of distortion shall be 1.5 mm out of plumb at each jamb, measured on face of frame, resulting in maximum twist of frame of 3 mm measured from upper corner to lower diagonal corner.
- .2 Generally, anchorage of frames shall be by means of standard anchors. At masonry walls, use T-strap anchors; wire anchors not acceptable. Where standard anchors cannot be used, provide special anchors to ensure proper installation. Method of anchorage shall not be visible when frames are installed.

SECTION 08 11 13 - STEEL DOORS AND FRAMES

- .3 Provide minimum 3 anchors at each jamb. At frames exceeding 2150 mm in height provide one additional anchor for each additional 610 mm, or part thereof.
- .4 Anchor intermediate vertical frame members to structure above as required to ensure stability. Where required, provide steel frame extensions. Provide flexible connection at structure to allow for deflection.
- .5 Remove steel shipping spreaders; install wood installation spreaders at sill and at third points of frame rabbet height to maintain constant frame width. Remove wood spreaders only after frames are securely anchored in place.
- .6 Intermediate field joints shall be continuously welded or tack welded, filled and ground smooth.

3.2 DOORS

- .1 Install steel doors.
- .2 Install hardware in accordance with hardware supplier's instructions.
- .3 Adjust operable parts to ensure proper operation.

3.3 TOUCH-UP

- .1 Patch damaged finishes. Remove rust, sand damaged and abraded surfaces and touch-up with zinc rich paint.

END

SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes: Mechanical and electrified door hardware
- B. Related Sections:
 - 1. Division 01 Section "Alternates" for alternates affecting this section.
 - 2. Division 06 Section "Rough Carpentry"
 - 3. Division 06 Section "Finish Carpentry"
 - 4. Division 08 sections for doors and frames with hardware specified in this section.
 - 5. Division 09 sections for touchup, finishing or refinishing of existing openings modified by this section.
 - 6. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
 - 7. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

1.02 REFERENCES

- A. DHI - Door and Hardware Institute
 - 1. Sequence and Format for the Hardware Schedule
 - 2. Recommended Locations for Builders Hardware
 - 3. Keying Systems and Nomenclature
 - 4. Installation Guide for Doors and Hardware
- B. NFPA – National Fire Protection Association-Current Editions
 - 1. NFPA 80 – Standard for Fire Doors and Other Opening Protectives
- C. ANSI - American National Standards Institute
 - 1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
 - 2. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 SUBMITTALS

- A. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
 - 1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
 - 2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
 - 3. Door Hardware Schedule: Submit with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI. Indicate complete

designations of each item required for each door or opening, include all notes and operational descriptions from hardware groups.

4. Templates: After final approval of hardware schedule, provide for doors, frames and other work specified to be factory or shop prepared for door hardware installation.
5. Inspection and Testing: Submit written reports of the results of functional testing and inspection for fire door assemblies, in compliance with NFPA 80.

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Supplier: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project.
2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.

B. Certifications:

1. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80, and requirements of authorities having jurisdiction.
2. Accessibility Requirements: This project must comply with all Local and Provincial Codes and Standards.

C. Pre-Installation Meetings

1. Pre-installation Conference: Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays. Coordinate door hardware with other related suppliers.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping. Deliver keys to manufacturer of key control system for subsequent delivery to Owner
- B. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.

1.06 COORDINATION

- A. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- B. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant. Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

- C. Existing Openings: Where existing doors, frames and/or hardware are to remain, field verify existing functions, conditions and preparations and coordinate to suit opening conditions and to provide proper door operation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Provide products from manufacturers listed in hardware groups. Additional alternate products require prior written approval from Owner and are contingent upon those products providing all functions, features, and meeting all requirements of scheduled manufacturer's product.

2.02 MATERIALS

- A. Provide hardware with options specified in the hardware sets, fasteners provided by hardware manufacturer, strikes provided by hardware manufacturer, drop plates, special templates, and other devices necessary for proper hardware installation.
- B. Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations. When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.
- C. Provide each electrified hardware item and wire harnesses with enough and wire gauge with standardized Molex plug connectors to accommodate electric function of specified hardware.

2.03 HINGES: IVES 5BB SERIES

- A. Provide 5-knuckle plain bearing hinges conforming to ANSI/BHMA A156.1. Provide hinges in the size, quantity, weight, and base metal according to manufacturer's published recommendations. Provide non-removable pins at out-swinging lockable doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.

2.04 MORTISE LOCKS: SCHLAGE L9000 SERIES

- A. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3-hour fire doors.

2.05 ELECTRIC STRIKES: VON DUPRIN 6000 SERIES

- A. Provide electric strikes designed for use with type of locks shown at each opening, UL Listed as burglary resistant and tested to a minimum endurance test of 1,000,000 cycles. Provide transformers and rectifiers for each strike as required. Verify voltage with electrical contractor.

2.06 POWER SUPPLIES: SCHLAGE/VON DUPRIN PS900 SERIES

- A. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with

consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.

2.07 CYLINDERS

- A. Provide Schlage small format construction core cylinders for use during the construction period.
- B. Retain the services of Royal Security Solutions, attention Svetoslav Velikov (905-840-0522, EXT 232) to remove the Schlage SFIC cylinders and replace with keyed Medeco X4 SFIC cylinders prior to substantial completion.

2.08 KEYING:

- A. Owner supplier, Royal Security Solutions will pin Medeco X4 SFIC cylinders to the City of Mississauga keying system.

2.09 SURFACE CLOSERS: LCN 4040XP SERIES

- A. Provide cast iron door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory.

2.10 ELECTRO-MECHANICAL AUTOMATIC OPERATORS: LCN 9540 SERIES

- A. Supply and install low energy automatic operator units that are electro-mechanical design complying with ANSI/BHMA A156.19. Locate actuators and other controls as directed by Architect.

2.11 ACTUATORS: LCN

- A. Provide actuators as specified in the hardware groups.

2.12 PROTECTION PLATES: IVES

- A. Provide protection plates with beveled four edges as scheduled. Size plates to suit door width.

2.13 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS: GLYNN-JOHNSON

- A. Provide overhead stop at doors where specified and where conditions do not allow for a wall stop or floor stop presents tripping hazard.

2.14 THRESHOLDS, WEATHERSTRIPPING, AND GASKETING: ZERO INTERNATIONAL

- A. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items. Where smoke- and draft-control door

assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

2.15 DOOR POSITION SWITCHES, RELAYS, TIMER: SCHLAGE, ALTRONIX

- A. Provide door position switches as specified. Coordinate door and frame preparations with door and frame suppliers.
- B. Provide relays and seven-day timer to control openings with auto door operators.

2.16 FINISHES

- A. Provide hardware with finishes as indicated in hardware sets.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.
- B. Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.

3.02 PREPARATION

- A. Where on-site modification of doors and frames is required, prepare hardware locations and reinstall in accordance with installation requirements for new door hardware and with:
 - 1. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.

3.03 INSTALLATION

- A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Installation Guide for Doors and Hardware: DHI TDH-007-20
- B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.

- C. Install hardware in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- D. Lock Cylinders: Install construction cores to secure building and areas during construction period. Owner will replace construction cores with Medeco permanent cores.
- E. Coordinate Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for wiring and connections of related components.
- F. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors.

3.04 FIELD QUALITY CONTROL

- A. Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
- B. Clean adjacent surfaces soiled by door hardware installation. Clean operating items per manufacturer's instructions to restore proper function and finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.05 DOOR HARDWARE SCHEDULE

- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
- B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.
- C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.
- D. Hardware Sets:

END OF SECTION

Comfort Station Jack Darling Memorial Park

Legend:
























-  Link to catalog cut sheet
-  Electrified Opening

Hardware Group No. 01

For use on Door #(s):

101 104

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 127X114MM NRP		630	IVE
1	EA	STOREROOM LOCK	L9080HD LLL 17B LLL L283-150		630	SCH
1	EA	PERMANENT CORE CYLINDER	MEDECO X4 SFIC SUPPLIED AND INSTALLED BY OWNER		626	MED
4	EA	CUT CONST. KEY	48-310			SCH
2	EA	CUT CONTROL KEY	48-311			SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON		 630	VON
1	EA	DOOR PULL	CBH 6039-1 24" LONG, 16" CTC #6 MTG		630	CBH
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURF. AUTO OPERATOR	9542 MS AS REQ (120/240 VAC)		 ANCL R	LCN
1	EA	WEATHER RING 6" DIA	8310-802		 PLA	LCN
2	EA	ACTUATOR, TOUCH	8310-852T		630	LCN
2	EA	ESCUTCHEON	8310-876		630	LCN
1	EA	MOUNTING PLATE	9540-18 X LENGTH		689	LCN
1	EA	KICK PLATE	8400 325MM X 40MM LDW B-CS		630	IVE
1	SET	GASKETING	8303AA-S (1X HD/2 X JB)		AA	ZER
1	EA	DOOR SWEEP	8192AA X DOOR WIDTH		AA	ZER
1	EA	THRESHOLD	625A X FR WIDTH		A	ZER
1	EA	WIRE HARNESS	CON-6W			SCH
1	EA	DOOR CONTACT	679-05HM		 BLK	SCE
1	EA	7 DAY TIMER	DPT724A			ALT
1	EA	DPDT RELAY	RB1224			ALT
1	EA	POWER SUPPLY	PS902 BBK 120/240 VAC		 LGR	SCE

NOTE: AUTO DOOR OPERATOR AND ELECTRIC STRIKE CONTROLLED BY A TIMER LOCATED IN THE SERVICE AREA OF THE BUILDING.

















Comfort Station Jack Darling Memorial Park

Hardware Group No. 02

For use on Door #(s):

102

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 127X114MM NRP		630	IVE
1	EA	STOREROOM LOCK	L9080HD LLL 17B LLL L283-150		630	SCH
1	EA	CONST MORTISE CYL	30-001 118 KA-1		626	SCH
1	EA	PERMANENT CORE CYLINDER	MEDECO X4 SFIC SUPPLIED AND INSTALLED BY OWNER		626	MED
1	EA	ELECTRIC STRIKE	6211 FSE CON	 ⚡	630	VON
1	EA	DOOR PULL	CBH 6039-1 24" LONG, 16" CTC #6 MTG		630	CBH
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURF. AUTO OPERATOR	9542 MS AS REQ (120/240 VAC)	 ⚡	ANCL R	LCN
1	EA	MOUNTING PLATE	9540-18 X LENGTH		689	LCN
2	EA	ILLUMINATED ACTUATOR	CM-46/4/GRF/SFE1			CAM
1	EA	AURA PUSH TO LOCK	CM-46/8/GRF/SFE1			CAM
1	EA	KICK PLATE	8400 325MM X 40MM LDW B-CS		630	IVE
1	SET	GASKETING	8303AA-S (1X HD/2 X JB)		AA	ZER
1	EA	DOOR SWEEP	8192AA X DOOR WIDTH		AA	ZER
1	EA	THRESHOLD	625A X FR WIDTH		A	ZER
1	EA	ADVANCED LOGIC RELAY	CX-33			CAM
1	EA	WIRE HARNESS	CON-6W		⚡	SCH
1	EA	DOOR CONTACT	679-05HM	 ⚡	BLK	SCE
1	EA	MOMENTARY RESET SWITCH	CM-8010/13	 ⚡		CAM
1	EA	EMERG CALL KIT UNIV RESTRMS	CX-WEC12 - C/W PUSH BUTTON RESET		⚡	CAM
1	EA	7 DAY TIMER	DPT724A		⚡	ALT
1	EA	DPDT RELAY	RB1224		⚡	ALT
1	EA	POWER SUPPLY	PS902 BBK 900-8F 120/240 VAC	 ⚡	LGR	SCE

NOTE: AUTO DOOR OPERATOR AND ELECTRIC STRIKE CONTROLLED BY A TIMER LOCATED IN THE SERVICE AREA OF THE BUILDING BY OTHERS.











Comfort Station Jack Darling Memorial Park

Hardware Group No. 03

For use on Door #(s):

103

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 127X114MM NRP		630	IVE
1	EA	STOREROOM W/DEADBOLT	L9480HD LLL 17B LLL L583-363 L283-150		630	SCH
1	EA	CONST MORTISE CYL	30-001 118 KA-1		626	SCH
1	EA	PERMANENT CORE CYLINDER	MEDECO X4 SFIC SUPPLIED AND INSTALLED BY OWNER		626	MED
1	EA	PUSH/PULL PLATE	CBH 380 127 X 508 CFC		630	CBH
1	EA	SURFACE CLOSER	4040XP SHCUSH ST-3068		689	LCN
1	EA	KICK PLATE	8400 325MM X 40MM LDW B-CS		630	IVE
1	SET	GASKETING	8303AA-S (1X HD/2 X JB)		AA	ZER
1	EA	DOOR SWEEP	8192AA X DOOR WIDTH		AA	ZER
1	EA	THRESHOLD	625A X FR WIDTH		A	ZER
1	EA	DOOR CONTACT	679-05HM	 ⚡	BLK	SCE

SECTION 08 80 00 - GLASS AND GLAZING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Steel doors and frames: Section 08 11 13
- .2 Metal louvres: Section 08 91 00

1.3 SUBMITTALS

- .1 Submit detailed product data for each product to be used.
- .2 Submit detailed shop drawings for the work of this Section, showing sizes, configurations, materials, finishes, anchorages. Coordinate with Section 08 91 00 – Louvres.
- .3 Submit duplicate, minimum 100 x 100 mm samples of shop applied finish for window frames.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Framing components:
 - .1 Aluminum extrusions: ASTM B221, AA 6063-T5 alloy/temper.
 - .2 Aluminum plate and sheet: ASTM B209 AA 1100 alloy.
 - .3 Screws, bolts, nuts, washers, rivets and other fasteners, incorporated into aluminum sections: aluminum or ANSI Series 300 stainless steel or hot dip galvanized steel.
 - .4 Anchoring devices: aluminum, non-magnetic stainless steel or hot dip galvanized steel.
- .2 Glass and glazing materials:
 - .1 Setting blocks: neoprene, Shore 'A' durometer hardness of 70 to 90 points; spacer shims, 40 to 50 points, as recommended by glass manufacturer.
 - .2 Glazing compound: non-hardening modified oil type meeting requirements of CAN/CGSB-19.2-M87.
 - .3 Glazing sealant: one part polysulphide or one part silicone to ASTM C920.
 - .4 Glazing tape: polyisobutylene tape; acceptable product: Tremco 440 tape.
 - .5 Glazing gasket: Tremco Vision Strip; colour selected by Consultant.
 - .6 Glass: laminated, Lexan polycarbonate, minimum 19 mm total thickness with high impact resistance and with a translucent PVB interlayer, selected by Consultant.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Examine existing condition to ensure that they are satisfactory to receive the work of this section. Start of work on site shall imply acceptance of conditions.

3.2 GLASS INSTALLATION GENERAL

SECTION 08 80 00 - GLASS AND GLAZING

- .1 Do not glaze when ambient or surface temperature is less than 5°C. Ensure that glazing rabbets, stops and glass are dry, free of frost, grease, oil, dust, rust or other substances detrimental to adhesion of compounds and sealants.
- .2 Provide clearance at perimeter edge of glass on all four sides, minimum equal to glass thickness. Accurately cut glass to fit openings, allowing for expansion in accordance with glass manufacturer's recommendations.
- .3 Provide sealer space between face of glass and glazing stops of minimum 3 mm.
- .4 Clean sealing surfaces at perimeter of glass and sealing surfaces of rabbets and stop beads before applying glazing tapes, gaskets and compounds. Use solvents and cleaning agents recommended by manufacturer of sealing materials.
- .5 Install glazing tapes uniformly with accurately formed corners and bevels. Ensure that proper contact is made with glass and rabbet interfaces.
- .6 Set glass on setting blocks, spaced as recommended by glass manufacturer. Provide at least one setting block at quarter points from each corner.
- .7 Centre glass in glazing rabbet to maintain specified clearances at perimeter on all four sides. Maintain centered position of glass in rabbet and provide the required sealer thickness on both sides of glass.
- .8 Use spacers and shims in accordance with glass manufacturer's recommendations.
- .9 Carefully remove glazing stops and reinstall after glazing.

3.3 CLEANING

- .1 Remove dirt, scum, plaster, paint spatter, and other harmful and deleterious matter from glass promptly and completely, before they establish tight adhesion.
- .2 Avoid using abrasives, steel wool, razor blades, solvents, alkaline or other harsh cleaning agents.
- .3 Remove glazing compound droppings promptly from all surfaces as the work progresses.
- .4 Replace scratched or otherwise damaged glass.

END

SECTION 08 91 00 - METAL LOUVRES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Caulking: Section 07 92 00
- .2 Grilles and registers except as specified herein: Division 23

1.3 PERFORMANCE REQUIREMENTS

- .1 Deflection: louver members shall deflect not more than 1/180 of span between supports when subjected to positive and negative wind loads based on OBC 50 year probability.
- .2 Vibration: louver members shall not vibrate or rattle.

1.4 SUBMITTALS

- .1 Submit detailed shop drawings, showing profiles, sizes, materials, finishes, anchorage and installation details.
- .2 Submit two minimum 100 x 200 mm samples of louver finish in colour selected.

PART 2 - PRODUCTS

2.1 ACCEPTABLE PRODUCT

- .1 CS 4" (101.6 mm) deep storm resistant fixed horizontal louver, Model RS-4700 by Construction Specialties or equivalent product by McGill or TenPlus.

2.2 MATERIALS AND FABRICATION

- .1 Aluminum:
 - .1 Extrusions: ASTM B211, allow 6063-T5 or T6.
 - .2 Sheet: ASTM B211, alloy 1100, 3003 or 5050.
- .2 Fastenings: aluminum or stainless steel for aluminum louvers; hot dip galvanized steel for steel louvers.
- .3 Bird screen: 16 mm mesh, 1.27 mm expanded and flattened aluminum wire; extruded aluminum frame, corners mitred.
- .4 Sill extensions: extruded aluminum, depth to suit wall condition, concealed clip anchors, drip deflectors at sill ends.
- .5 Insulated blank off panels: 50 mm thick rigid core, faced both sides with 0.8 mm thick aluminum sheet. Perimeter of panel framed with extruded aluminum sections. Closed cell perimeter gaskets.
- .6 Finish: all exposed exterior surfaces, including blank off panels, unless otherwise shown: three coat fluoropolymer system; colour selected by Consultant.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Provide louvers in sizes and locations indicated in Contract Documents.

SECTION 08 91 00 - METAL LOUVRES

- .2 Install louvres plumb and level and securely fasten to adjacent building elements.
- .3 Allow for expansion and contraction of components without detrimental effects.
- .4 Dissimilar metals and metals in contact with cementitious elements shall have contact surfaces coated with bituminous paint or other means approved by Consultant.
- .5 Install bird screens at all exterior aluminum louvres.
- .6 Install sill extensions. Where shown, install trim matching louvre material and finish.
- .7 Install insulated blank off panels at unused portions of louvres, except where louvres are required to be left open.

END

SECTION 09 67 29 - EPOXY FLOORING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Waterproof flooring: Section 09 67 33
- .2 Epoxy wall coating: Section 09 96 56

1.3 QUALITY ASSURANCE

- .1 Applicator's qualifications: licensed or certified by system manufacturer, regularly engaged in application of polymer floor systems for the past 5 years and having successfully executed at least 5 projects of similar size and complexity.
- .2 Work of this section shall be carried out in strict accordance with system manufacturer's directions. Keep manufacturer's current installation instruction on site throughout installation.
- .3 Obtain all materials used from or through the same manufacturer.
- .4 Manufacturer's representative shall periodically inspect work in progress and upon completion of work, issue a written statement certifying that floor system as installed meets specified requirements.

1.4 SUBMITTALS

- .1 Submit full range of standard colours and textures for selection by Consultant.
- .2 Submit duplicate samples, minimum 300 x 300 mm representative of finished work.
- .3 Product data: submit manufacturer's technical information, including basic materials analysis and installation instructions for each material specified. List each material and cross-reference to the specific coating and finish system and application. Identify by manufacturer's catalogue number and general classification.
- .4 Submit maintenance instructions for inclusion into operations and maintenance manual specified in Section 01 77 00.

1.5 MOCK-UP

- .1 Provide an epoxy flooring mock-up, minimum 10 m² including a coved integral wall base, in colour and texture and at location directed by Consultant.
- .2 Provide coved base condition in conjunction with mock-up for epoxy wall coating. Coordinate with Section 09 96 56.
- .3 Mock-up, once approved by Consultant, may be incorporated into finished work.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials in original packaging and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.
- .2 Store materials to prevent deterioration caused by moisture, heat, cold, direct sunlight and other detrimental effects.
- .3 Materials to be used shall be factory pre-weighted and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighting or volumetric measurements allowed.

1.7 JOB CONDITIONS

SECTION 09 67 29 - EPOXY FLOORING

- .1 Maintain substrates and ambient air temperature within limits recommended by system manufacturer, prior, during and after installation of flooring.
- .2 Provide adequate ventilation during installation and curing.
- .3 Lighting: provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
- .4 Close spaces to traffic during resinous flooring application and for not less than 24 hours after application, unless manufacturer recommends a longer period.
- .5 Install flooring prior to installation of floor mounted fixtures and equipment and prior to painting and caulking work in areas affected.
- .6 Protect adjacent surfaces from damage. If necessary, mask or cover surfaces.

1.8 WARRANTY

- .1 At no cost to Owner repair or replace any work of this Section, including areas showing cracks, blisters, delamination from substrate, excessive wear and other defects due to materials and workmanship, for a period of 3 years from date of Substantial Performance.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Epoxy flooring system and integral base: 3 mm thick system consisting of penetrating moisture tolerant two-component epoxy primer and a multi-component epoxy trowelled mortar and a two-component 100% solids epoxy coating; up to 5 colours selected by Consultant; 3 of the colours to be custom matching provided RAL colours selected by Consultant: one of the following systems:
 - .1 Mapefloor EP19/Mapefloor I 302 SL by Mapei.
 - .2 Stonclad GS/Stonkote GS4 by Stonhard.
 - .3 Sikafloor Morritex/Sikafloor 261 by Sika.
- .2 Fillers, underlayment, primer, sealer and other materials: as recommended by system manufacturer.
- .3 Patching compound: Stoneset PM5 by Stonhard or equivalent product by Sika or Mapei.
- .4 Concrete crack treatment: CTG5 by Stonhard or equivalent product by Sika or Mapei.
- .5 Joint filler: Stonflex MP7 by Stonhard or equivalent product by Sika or Mapei.
- .6 Slip resistant aggregate: as recommended by flooring manufacturer.
- .7 Waterproofing membrane: Stoneproof ME7 by Stonhard or equivalent product by Sika or Mapei.

2.2 MIXING

- .1 Mix materials in accordance with system manufacturer's directions.
- .2 Use factory pre-weighed and packaged materials only.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Examine substrate prior to start of work. Start of work implies acceptance of conditions.
- .2 Ensure substrates are sound, dry, free of dust, dirt, grease, oil, paint and other foreign substances. Repair damaged/deteriorated substrates as recommended by flooring manufacturer. Prepare all

SECTION 09 67 29 - EPOXY FLOORING

substrates by mechanical means with a shotblast machine. Use dust accumulator or other containment measures to prevent dust from spreading to other areas.

- .3 Substrate variations shall not exceed 3 mm in 3 m when measured in any direction with a 3 m straight-edge. Excessive deviations and defective concrete shall be corrected prior to start of work.
- .4 Substrate moisture and alkalinity content must be within limitations specified by manufacturer. New concrete shall be cured at least 30 days. Test substrate for moisture and alkalinity prior to application of coating system.

3.2 INSTALLATION

- .1 Apply primer to suitably prepared substrates as recommended by system manufacturer.
- .2 Apply epoxy flooring in accordance with system manufacturer's directions in colour and textures selected by Consultant.
- .3 Apply single mortar coat with metal trowel. Hand or power trowel and grout to fill voids. When cured, sand to remove trowel marks and roughness.
- .4 Where indicated, provide 150 mm high integral cove base at junction with walls.
- .5 Apply topcoat over cured mortar coat, in colour selected by Consultant. Provide contrasting colour selected by Consultant at cove base. Broadcast slip resistant aggregate into topcoat to achieve light slip resistant texture as directed by Consultant.
- .6 Where required, chase edges to lock flooring into concrete at terminations and so as to achieve flush transition to abutting flooring.
- .7 At substrate control joints provide joint in epoxy flooring and apply joint filler in accordance with flooring manufacturer's direction.
- .8 Curbs shall be integral with floor and shall be coved with a 20 mm radius. Tops of curbs shall be bullnosed.
- .9 Provide slip resistant finish by broadcasting slip resistant aggregate into top coat as directed by Consultant.
- .10 Cure and protect floor to manufacturer's directions prior allowing traffic on floor. Provide temporary covering until directed to be removed by Consultant.
- .11 Immediately prior to takeover by Owner remove temporary covering and thoroughly clean floor as recommended by system manufacturer.
- .12 Finished flooring shall be uniform in thickness, colour, texture, pattern and sheen, free of defects detrimental to performance and appearance.

3.3 FIELD QUALITY CONTROL

- .1 Owner may engage service of an independent testing laboratory to sample materials being used on the jobsite. Samples of material will be taken, identified and sealed, and certified in presence of Contractor.
- .2 Testing laboratory will perform tests for any of characteristics specified, using applicable testing procedures referenced herein, or if none referenced, in manufacturer's product data.
- .3 If test results show materials being used do not comply with specified requirements, Contractor may be directed by Consultant to stop work; remove non-complying materials; pay for testing; reapply flooring materials to properly prepared surfaces which had previously been coated with unacceptable materials.

END

SECTION 09 67 29 - EPOXY FLOORING

PROJECT NO. 24-053

06/01/2025

WESPEC

**COMFORT STATION AT
JACK DARLING MEMORIAL PARK, MISSISSAUGA, ONTARIO
09 67 29-4**

SECTION 09 91 00 - PAINTING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Epoxy wall covering: Section 09 96 56

1.3 ACCEPTABLE MANUFACTURERS

- .1 Unless otherwise specified, materials shall be manufactured and supplied by one of the following:
 - .1 Benjamin-Moore
 - .2 Dulux (ICI)
 - .3 Sico
 - .4 Sherwin-Williams

1.4 LIST OF MATERIALS, SAMPLES

- .1 List of Materials:
 - .1 Before ordering materials, submit written request in form acceptable to Consultant, for approval of paint materials. List each of the materials proposed and surfaces to be covered. State manufacturer's name and brand name of materials.
 - .2 List of materials shall be endorsed by manufacturer as being the best material for the applicable condition.
 - .3 Do not order material or commence work until list of materials is approved by Consultant.
- .2 Samples:
 - .1 Submit two 200 mm x 250 mm colour chips of each paint colour coated with manufacturer's paint system to confirm colour match with colour chips supplied by Consultant.
 - .2 Submit sample of natural and stained finishes on each species and grade of wood to receive such finishes.
 - .3 Prepare full size samples showing each type of door finish.
 - .4 Prepare sample panels of each wall and ceiling paint system specified, as directed by Consultant.
- .3 Maintenance Materials:
 - .1 Upon completion of work provide one sealed and properly identified 1 L can of each type and colour paint used on this project.
 - .2 Only top coating paints used in building interior are required.

1.5 PRODUCT HANDLING

- .1 Deliver paint materials to site in sealed original labelled containers bearing manufacturer's name, brand name, type of paint and colour designation.
- .2 Store materials in accordance with manufacturer's recommendations.
- .3 Store paints, stains, varnishes, equipment in designated area inside building. Maintain separate

SECTION 09 91 00 - PAINTING

workshop/storage area for duration of work by this Section.

1.6 JOB CONDITIONS

.1 Environmental Conditions:

- .1 Maintain temperature in interior areas to receive coatings between 15°C and 25°C for at least 24 hours before, during application and until coatings have cured after application. Apply exterior coatings only when temperature is above 10°C.
- .2 Do not apply exterior coatings during periods of precipitation nor when precipitation is imminent.
- .3 Do not apply coatings under direct sunlight during hot weather.
- .4 Adequately ventilate areas where coatings are being applied. Maintain a reasonably dust-free atmosphere for duration of work.

.2 Protection:

- .1 Protect adjacent surfaces not scheduled to receive coatings from damage.
- .2 Remove electrical plates, surface hardware, fittings and fastenings prior to painting operations. These items shall be carefully stored, cleaned and replaced on completion of work in each area. No solvent shall be used to clean hardware that will remove permanent lacquer finish on these items.
- .3 Mask labels and specification plates occurring on equipment to be painted.
- .4 Post "wet coating" signs while work is in progress and while coatings are curing.
- .5 Keep oily rags, wastes and other combustible materials in closed metal containers and remove at end of each work day. Take every precaution to avoid spontaneous combustion.

.3 Work Schedule:

- .1 Unless otherwise permitted, apply coatings only after all other Sections have completed their work.
- .2 Co-ordinate work of this Section with that of Section 07900 and review order of installation with Consultant where sealants are installed adjacent to painted surfaces.
- .3 If it becomes necessary for the Owner to occupy areas of the building prior to their completion, schedule work of this Section to hours when occupants have vacated building.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Materials shall be "top line quality" products and shall be supplied by a single manufacturer except for specialty products not available from paint manufacturer.
- .2 Materials wherever possible shall be low odour products, free or low in VOC content.
- .3 Paints shall be factory mixed unless otherwise specified.
- .4 Primers shall be as specified by manufacturer and fully compatible with finish coats.
- .5 Stains shall be of the rapid dry, alkyd base type or pigment oil type.
- .6 Varnishes shall be synthetic type.

SECTION 09 91 00 - PAINTING

- .7 Shellac shall be pure white gum in pure grain alcohol.
- .8 Thinners, cleaners: as recommended by paint manufacturer.

2.2 FINISHES

- .1 Paint colours and other finishes will be selected by Consultant. Do not start work until after receiving colour schedule.
- .2 Colours selected by the Consultant will not necessarily be from manufacturer's standard colours.
- .3 A variety of colours may be used. Some colours may be deep tones.
- .4 Confirm gloss levels for all surfaces with Consultant before starting work. Unless otherwise indicated, allow for semi-gloss.

PART 3 - EXECUTION

3.1 CONDITIONS OF SUBSTRATES

- .1 Sound, non-dusting, and free of grease, oil, dirt, and other matter detrimental to adhesion and appearance of coatings.
- .2 Temperature: minimum 13°C.
- .3 Moisture content: maximum 12%. Test for moisture content using moisture meter.
- .4 Alkalinity: test cementitious substrates for alkalinity. Use method recommended by coating manufacturer.

3.2 PREPARATION OF SUBSTRATES

- .1 All substrates: clean as required to produce an acceptable surface. If wood, metal or any other surface to be finished cannot be put in proper condition for finishing by cleaning, sanding and filling as specified, notify Consultant in writing or assume responsibility for an rectify any unsatisfactory finish resulting.
- .2 Bare ferrous metal: remove rust and scale; wash with solvent; chemically clean; apply coat of metal primer.
- .3 Zinc coated metal: wash and etch to dull paint receptive surface using an approved crystalline zinc phosphate or vinyl pretreatment.
- .4 Unit masonry & concrete: fill minor cracks, holes and fissures with Polyfilla and smooth to a flush surface. Texture filled areas to match surrounding surface.
- .5 Alkaline surfaces: wash and neutralize using proper type of solution compatible with paint to be used.

3.3 APPLICATION OF COATINGS

- .1 Apply paint by brush or roller, except on metal surfaces where paint shall be applied by brush only.
- .2 Applied and cured coatings shall be uniform in thickness, sheen, colour and texture and free of brush or roller marks, sags, crawls and other defects detrimental to appearance and performance.
- .3 Regardless of the number of coats specified for any surface, apply sufficient paint to completely cover and hide substrate and to produce a solid uniform appearance.
- .4 Thoroughly mix materials before application. Use same brand of paint for primer, intermediate and finish coats.
- .5 Touch up suction spots after application of first coat. Sand lightly between coats with fine sandpaper.

SECTION 09 91 00 - PAINTING

- .6 Each coat of finish shall be dry and hard before succeeding coats are applied with a minimum of 24 hours between coats, unless manufacturer's instructions state otherwise. Do not proceed with any coat until the last preceding coat is approved by the Consultant.

3.4 SCHEDULE OF FINISHES

- .1 General Requirements:
- .1 Paint exposed surfaces of building materials, services and equipment, except those which are prefinished in factory and except those which are located in areas designed as not requiring painting.
 - .2 Comply with the following requirements except in areas designated as not requiring painting.
 - .1 Paint behind surface mounted fixtures on walls and ceilings with full coats of paint.
 - .2 Finish tops of doors, trim, projections and other work as specified for surrounding work whether above site lines or not.
 - .3 Finish edges of doors to match face of door. Refinish edges of doors after fitting.
 - .4 Paint interior of ducts at grilles and diffusers with two coats of flat black paint, so that duct interior is not visible when grilles and diffusers are installed.
 - .5 Paint piping, ducts and conduits in colours matching background wall or ceiling colours, unless otherwise directed by the Consultant.
 - .3 Where finishing formula for surfaces requiring painting is not included hereunder, follow recommendations of MPI Architectural Painting Specification Manual, latest issue.
- .2 Interior Finishing:
- .1 Concrete and concrete block:
1 coat block filler and primer, latex or PVA based
2 coats acrylic latex semi-gloss
 - .2 Metal, prime painted:
spot prime with alkyd metal primer
2 coats acrylic latex semi-gloss
 - .3 Metal, zinc coated:
1 coat galvanized primer
2 coats acrylic latex semi-gloss
 - .4 Exposed piping and conduit, unwrapped:
1 coat alkyd metal primer
2 coats acrylic latex semi-gloss
- .3 Exterior Finishing:
- .1 Metal, zinc coated (hot dip galvanized):
1 coat epoxy primer
2 coats aliphatic polyurethane
 - .2 Metal, zinc coated (inorganic zinc rich primer):
1 coat epoxy primer
2 coats aliphatic polyurethane

END

SECTION 09 96 56 - EPOXY WALL COATING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Epoxy flooring: Section 09 67 29
- .2 Painting: Section 09 91 00

1.3 DEFINITION

- .1 Epoxy coating = Epoxy paint = High build glazed coating.

1.4 QUALITY ASSURANCE

- .1 Applicator qualifications: licensed by coating manufacturer.
- .2 Upon Consultant's request verify film thickness of completed coating in presence of Consultant with s coating inspection gauge.

1.5 SUBMITTALS

- .1 Submit detailed product data for each product to be used.
- .2 Submit duplicate 200 x 250 mm draw-downs of each colour coating selected by Consultant.

1.6 MOCK-UP

- .1 Provide mock-up of epoxy coating minimum 5 m² applied to wall at location directed by Consultant.
- .2 Mock-up, once approved by Consultant, may be incorporated into finished work.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

- .1 Deliver and store materials undamaged, in original containers, with manufacturer's labels and seals intact.
- .2 Store materials in a single designated area having ambient temperature of minimum 10°C.

1.8 JOB CONDITIONS

- .1 Maintain temperature in areas to receive coatings at minimum 10°C for at least 24 hours before, during application and until coatings have cured.
- .2 Adequately ventilate areas where coatings are being applied. Maintain a reasonably dust-free atmosphere for duration of work.
- .3 Protect adjacent surfaces not scheduled to receive coatings from damage and overspray.
- .4 Post "wet coating" signs while work is in progress and while coatings are curing.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Coating system: cross-linked, water based, low odour, high gloss epoxy coating: one of the following:
 - .1 Carboline Sanitile 555 by Stonhard.
 - .2 Sikagard Duroplast 150 by Sika.

SECTION 09 96 56 - EPOXY WALL COATING

- .2 Fill coats, primers, thinners and cleaning agents: as recommended by coating manufacturer.
- .3 Colours: selected by Consultant, not necessarily from manufacturer's standard range.

PART 3 – EXECUTION

3.1 PREPARATION

- .1 Substrate shall be sound, non-dusting, and free of grease, oil, dirt and other matter detrimental to adhesion and appearance of coating. Minimum temperature 10°C; with moisture content: 30 to 85% and as follows:
 - .1 Concrete block: mortar joints cured for minimum 15 days at 24°C and 50% RH.
 - .2 Concrete: cured for minimum 28 days at 24°C and 50% RH, free of laitance, form oils curing agents, sealers removed.
 - .3 Steel: shop primed with primer as recommended by coating manufacturer.
- .2 Clean and prepare substrates to produce acceptable surface. Do the following:
 - .1 General: remove any oil, grease, grime, dirt and any other substance which would inhibit proper bond of coating system.
 - .2 Concrete: apply medium build fill coat entire surface to produce smooth void-free surface.
 - .3 Concrete block masonry: apply high build fill coat over entire surface to produce smooth void-free surface.
 - .4 Steel: remove rust and touch up primer.

3.2 APPLICATION OF WALL COATINGS

- .1 Over prepared and filled substrates apply glazed coating with roller or back rolled spray in accordance with manufacturer's printed directions.
- .2 Apply epoxy coating in 2 coats, each 0.075 to 0.1 mm thick (3 mils to 4 mils).
- .3 Applied and cured coatings shall be high-gloss, uniform in thickness, sheen, colour and texture and be free of defects detrimental to appearance and performance.
- .4 Do not apply coating over caulked joints, unless compatibility between coating and sealant is confirmed.

END

SECTION 10 21 19 - SOLID PHENOLIC PARTITIONS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Washroom accessories: Section 10 28 13

1.3 SUBMITTALS

- .1 Submit detailed shop drawings. Clearly indicate fabrication details, plans, elevations, hardware, and installation details.
- .2 Upon Consultant's request, submit duplicate 300 x 300 mm samples of panel showing finish on both sides, two finished edges and core construction.
- .3 Submit duplicate representative samples of each hardware item, including brackets, fastenings and trim.
- .4 Submit duplicate minimum 50 x 100 mm plastic laminate samples of full range of available products.

1.4 PROTECTION

- .1 Protect finished surfaces during shipment and installation by approved means. Do not remove until immediately prior to final inspections.

1.5 WARRANTY

- .1 At no cost to Owner, remedy any defects in work of this Section due to delamination and warping of components for a period of 2 years from date of Substantial Performance.

PART 2 - PRODUCTS

2.1 SYSTEM

- .1 Partition System: Floor mounted, overhead braced, solid phenolic.
- .2 Acceptable Products:
 - .1 1082 Series by Bobrick
 - .2 Equivalent product by Ampco, Bradley, Decolam, Global.

2.2 MATERIALS

- .1 Melamine surface sheets: to ANSI/NEMA LD3-2005 high pressure type with solid colour, satin finish; colour: selected by Consultant.
- .2 Core material: solid phenolic core, 19 mm thick.
- .3 Wall and connection brackets: stainless steel.
- .4 Stainless steel sheet metal: to ASTM A666, type 302 or 304 with polished finish.
- .5 Fasteners: stainless steel tamperproof type screws and bolts.
- .6 Pilaster shoes: stainless steel.
- .7 Shower dressing compartment seats: melamine faced solid phenolic core.

SECTION 10 21 19 - SOLID PHENOLIC PARTITIONS

- .8 Hardware for toilet partitions:
 - .1 Hinges: heavy duty stainless steel, self-closing type, adjustable to hold door open at any angle up to 90°.
 - .2 Slide bolt and keeper: stainless steel, equipped for emergency access.
 - .3 Door stop: stainless steel with rubber insert.
 - .4 Wall and connecting brackets: stainless steel.
 - .5 Door pull: stainless steel, type suited for outswinging doors.
- .9 Overhead brace: extruded aluminum channel with colour anodized finish; anti grip profile; complete with stainless steel curtain hooks at shower compartments.

2.3 FABRICATION

- .1 Fabricate shower and drying compartments to layouts shown.
- .2 Fabricate panels of door and pilasters of solid phenolic core 19 mm thick with melamine surface sheets fixed to core under high temperature and pressure.
- .3 Fabricate panels and doors 1500 mm high, fabricate pilasters extending from finish floor to headrail.
- .4 Panel and pilaster edges shall be black.
- .5 Provide jack levelling bolt at floor. Fabricate pilaster shoe of formed stainless steel sheet 75 mm high, with concealed fastening.

PART 3 - EXECUTION

3.1 PARTITION ERECTION

- .1 Install partitions secure, plumb and square.
- .2 Attach pilasters to floor with pilaster supports, and level installation with levelling device. Secure pilaster shoes in position.
- .3 Provide maximum 3 mm space between doors and pilasters. Leave max 6 mm space between wall and panel or end pilaster.
- .4 Attach fixing brackets securely to solid masonry and concrete walls using friction or expansion type screw anchors and to hollow walls using bolts and toggle type anchors.
- .5 Attach panel and pilaster to brackets with through type sleeve bolt and nut.
- .6 Set doors in closed partition level with panels.
- .7 Equip each door with hinges, latch set, and door stop. Adjust and align hardware for easy, proper function. Set door open position at 30° to front.
- .8 Equip outswinging doors with door pulls inside and outside. Provide door stop outside.

END

SECTION 10 28 00 - WASHROOM ACCESSORIES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Toilet partitions: Section 10 21 14
- .2 Hand dryers: Division 26

1.3 SUBMITTALS

- .1 Submit manufacturer's catalogue cut of each component required.
- .2 Submit a washroom accessories schedule indicating all accessories required, on a room by room basis, showing model number, finish and mounting height.

1.4 WARRANTY

- .1 At no cost to Owner, replace mirrors should defects in silvering occur within a period of 5 years from date of Substantial Performance.

PART 2 - PRODUCTS

2.1 FABRICATION - GENERAL

- .1 Fabricate work true to dimensions, square and plumb.
- .2 Thickness of metal shall be adequate for the various conditions, and intended uses.
- .3 Finished work shall be free from warping, open seams, weld marks, rattles and other defects. Drilling shall be reamed and exposed edges finished smooth.
- .4 Fastenings shall be concealed or theftproof type where possible. Exposed fastenings shall be neatly executed and shall be of the same material and finish as the base metal on which they occur.
- .5 Accessories required, in each case, are specified by a reference to a particular product by one manufacturer. The products listed shall serve to establish a standard of acceptance. Accessories of the same materials, construction and finishes, similar in function, design appearance and conforming to the standard of those specified, manufactured by the following are acceptable:
 - .1 Bobrick
 - .2 Bradley
 - .3 Frost
 - .4 ASI

2.2 WASHROOM ACCESSORIES

- .1 Toilet tissue dispenser (TTD): double roll, surface mounted: 09655 Noir Mini-Max JBT: supplied only by Owner; installed by Contractor (OS/CI).
- .2 Sanitary napkin disposal (SND): surface mounted: Frost 620; supplied only by Owner, installed by Contractor (OS/CI).
- .3 Soap dispenser (SD): Stoko WRM ILDS supplied only by Owner; installed by Contractor (OS/CI).
- .4 Waste receptacle (WR): recessed welded stainless steel, equipped with interior hooks for optional vinyl liner, capacity of 45.4L: Bobrick B-3644.

SECTION 10 28 00 - WASHROOM ACCESSORIES

- .5 Frameless mirror (FM): welded stainless steel construction with bright polished finish; with a 6 mm thick tempered Masonite backing; size 445 x 750 mm; Bobrick B-1556.
- .6 Tilted mirror (TM): 6 mm thick, tilted fixed mirror; of welded stainless steel construction and with galvanized steel back; size: 455 x 760 mm: Bradley 7405.
- .7 Grab bars (GB): 38 mm diameter stainless steel pipe with a peened surface: Frost Code 1001NP30 and 1003NP 30 x 30.
- .8 Swing-up grab bar (SGB): satin finish welded stainless steel construction: Bobrick B4998.
- .9 Stainless steel shelf (SS): 205 mm deep x 455 mm long; stainless steel construction; with 2 mounting brackets.
- .10 Coat hook (CH): 2 mm thick stainless steel mounting plate; vandal resistant design; hook shall release at a load of 40 lbs and greater: Bobrick B983.
- .11 Toilet backrest (TB): 32 mm diameter stainless steel tube and 16 mm solid white plastic laminate backrest: Frost Code 1028.
- .12 Baby change station (BCS): injection moulded polypropylene with a stainless steel finish front surface; concealed pneumatic cylinder to control speed at opening and closing. Dual cavity liner dispenser, holding up to 50 bed liners: KB 300 – SS Baby Station, colour: Graphite Gray.
- .13 Adult change station (ACS): fixed height, safety rail; provide mounting kit: Pressalit SCT 3000 Shower/Change Table.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Install components at locations shown. Where location is not given install as directed by Consultant.
- .2 Fastenings shall be non-corrosive type.
- .3 Provide mounting and anchorage devices to be built into walls and other construction elements as required to securely anchor components in place.
- .4 Securely anchor components in place. Method of fastenings shall ensure that components will be capable of withstanding expected loads without movement.
- .5 Install mirrors with concealed wall hangers and lock in place with theftproof screws.
- .6 Insulate accessory surfaces to prevent electrolysis due to contact with dissimilar metal surfaces. Use bituminous paint or other approved means.

3.2 CLEANING AND ADJUSTMENT

- .1 Upon completion of work or when directed, remove all traces of protective coatings or paper.
- .2 Test mechanisms, hinges, locks and latches and where necessary, adjust and lubricate and ensure that accessories are in perfect working order.

END

SECTION 31 10 00 - SITE CLEARING AND REMOVALS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Excavation, Filling, Grading Section 31 23 00

1.3 PROTECTION

- .1 Prevent damage to adjacent property and to areas scheduled to remain unchanged. Make good any damage caused by site clearing operations.

PART 2 - PRODUCTS

- .1 Approved topsoil to be imported to site.

PART 3 - EXECUTION

3.1 EXAMINATION PREPARATION

- .1 Visit the site and examine existing conditions and so as to understand the extent of work required. No increase in cost will be considered out of failure to know existing conditions.
- .2 Erect protective tree hoarding prior to commencing removal operations. No heavy machinery, storage or vehicular access is allowed within this area during construction.

3.2 CLEARING AND REMOVALS OPERATIONS

- .1 Notwithstanding requirements specified herein, retain existing items specifically indicated on Drawings to be retained.
- .2 Remove existing elements regardless whether shown on the Drawings to be removed or not, but request Consultant's review prior to removal.
- .3 Take care to protect and preserve the root systems of plants designated to remain.
- .4 Keep all heavy equipment away from trees, shrubs and store only in designated area(s)..
- .5 Remove all plants including roots, that affect installation of work.
- .6 Topsoil is to be stripped and stored for reuse.
- .7 Contractor shall inspect the site conditions and satisfy himself of the required removals to complete the work. No extra compensation will be made for removals work.
- .9 Take care to protect all elements to remain within the construction area.

3.3 DISPOSAL OF MATERIAL

SECTION 31 10 00 - SITE CLEARING AND REMOVALS

- .10 Remove all garbage, building materials, concrete, asphalt, excess fill, topsoil and other excavated material as a result of removals in preparation of site for construction. Do not bury any materials on site.

END

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Site Clearing and Removals Section 31 10 00

1.3 QUALITY CONTROL

- .1 Owners may appoint, and pay for inspection and testing by independent agency out of allowance carried under Section 01000 General Requirements.
- .2 Testing agencies may do any or all of the following as directed by the Consultant in accordance with requirements of Section 01000:
 - .1 Determine at what depth existing soil are capable of supporting fill, granular, paving and superimposed loads without deleterious settlement.
 - .2 Carries out grain size analysis on samples of each type of granular fill to ensure that proper material is being placed.
 - .3 Determine the quantity of water to be added to or removed from each type of fill to attain correct moisture content for compaction and maximum density.
 - .4 Determine the in-situ density and moisture content of compacted fills.

1.4 EXAMINATION

- .1 Visit and examine the site and note all characteristics and features affecting the work of this Section. No allowance will be made for difficulties encountered or expense incurred resulting from conditions known or visible at the time of tendering.

1.5 SOIL CONDITIONS

- .1 Soil conditions and recommendations for excavating and backfilling are contained in a Geotechnical Investigation by Forward Engineering and Associates dated September 12, 2024.

1.6 TESTING

- 1. Compaction test required for subgrade and granular fill.
- 2. Payment under cash allowance.

1.7 PROTECTION

- .1 Protect excavations in accord with applicable regulations. Provide and maintain in safe condition lining, bracing and shoring required.
- .2 Prevent damage to existing structures and buried services. Make good any damage caused.

- .3 Protect bottoms and sides of all excavations from exposure to wet weather, snow and frost, and from drying out; prevent softening or weathering of any bearing surface. Take special care when excavating for walkways and stairs.

1.8 JOB CONDITIONS

- .1 If excavation reveals unexpected subsurface conditions, advise Consultant immediately.
- .2 Do not place fill material when temperature is at or below 0°C, nor while either fill material or subgrade is frozen.
- .3 Stockpile each type of fill material separately to prevent integration. Stockpile granular materials so as to prevent segregation.
- .4 As much as possible schedule excavation and backfilling operations during dry periods only.
- .5 Minimize deterioration of subgrade, particularly when operating during unfavorable weather conditions or when working in wet soil. Use only designated work areas as determined on site by the client.

1.9 BASIS OF EXCAVATION

- .1 Estimate excavation using existing grades.
- .2 All paving to be restored to existing grades.
- .3 Excavate to levels specified or indicated on drawings.

PART 2 - PRODUCTS

2.1 FILL MATERIAL

- .1 Topsoil to be removed and stored for re-use.
- .2 Any excavated material for re-use to be approved by a Geotechnical Engineer.

PART 3 - EXECUTION

3.1 EXCAVATION

- .1 Carry out excavation to the extent, and depth required for the construction of the work, and for a sufficient distance beyond to permit proper construction, shoring, curing and inspection of work.
- .2 Do all excavation required for work of this project, unless it is specifically covered in other Sections.
- .3 Take precautions when excavating adjacent to buried services; use hand tools only in locating services.
- .4 Unless otherwise indicated excavate to specified depths

SECTION 31 23 00 - EXCAVATION, FILLING, GRADING

- .5 Excavate and remove from site: debris, boulders, roots, concrete, asphalt, precast pavers where encountered in the execution of the work.
- .6 Where excavation is carried below the required depth use approved concrete fill.
- .7 After completion of excavation and prior to forms being erected, concrete, precast or stone work being installed, notify the Consultant for inspection and testing of exposed surfaces. Make good soft or spongy areas are located, as directed by Consultant and carry down the excavations to a greater depth until a suitable bearing is obtained.
- .8 Do not over excavate areas unless so instructed by the Consultant.

3.2 BACKFILLING

- .1 Backfill behind precast curbs and next to paving as required.
- .2 Do not place backfill materials until all sub grades, forms or paving has been inspected and approved by the Consultant.
- .3 Remove all debris, rubbish and temporary bracing before commencing backfilling.
- .4 Take care to avoid damage to or displacement of walls and other work. Wherever temporary unbalanced earth pressures are liable to develop in walls, provide and place the necessary bracing to counteract the imbalance and leave bracing members in place until their removal is approved by the Consultant. Make good, at no cost to the Owner,
- .5 Place fill material in layers not exceeding 150 mm uncompacted thickness and compact each layer providing the following minimum densities:
 - .1 Below paved areas: 98% SPMDD.
 - .2 Below landscaped areas: 90% SPMDD.
- .6 Remove and replace fill until compaction test reports by the independent inspection agency are satisfactory to the Consultant.

3.3 GRADING

- .1 Cut and fill to levels required for paved, areas. Make allowance for depth of finishes and base courses.
- .2 Establish and maintain line and grade stakes for duration of grading operations.
- .3 Conform to match existing grades. Uniformly slope grade between existing elevations unless otherwise directed.
- .4 Smoothly slope top and toe of slopes.
- .5 Proof roll existing subgrade below paved areas, after excavation with a heavy roller. Compact subsoil below paved areas to minimum 98% SPMDD. Sub-excavate loose, soft and excessively wet areas and areas containing organic material, and fill with suitable fill capable of being compacted to required density.

SECTION 31 23 00 - EXCAVATION, FILLING, GRADING

- .6 Establish subgrade parallel to the finished grades and shape in such a manner to permit drainage. Shape subgrade below paved areas to drain to perimeter drains or catch basins.
- .7 Fill, where required, in accordance with requirements for backfilling specified hereinbefore.

3.4 COMPLETION

- .1 Upon completion, remove all surplus excavated and graded materials from the site, and leave site clean and tidy.

END

SECTION 32 90 00 – PLANTING

PART I – GENERAL

1.1. Description

- .1 The work covered by this section includes the furnishing of all labour, materials, equipment and incidentals for the inspection, maintenance and planting of trees, shrubs, ground covers and perennials as shown on the Construction Drawings and as described by the Contract Specifications.
- .2 Comply with all requirements of the General Requirements – Section 01 00 00.

1.2. Quality Assurance

- .1 Planting work is to be carried out by experienced personnel under the direction of skilled foreman and in strict accordance with the Specifications and best horticultural practice.

1.3. Product Delivery, Storage and Handling

- .1 Supply manufactured items such as super phosphate, fertilizer tablets, mulch, etc., in standard containers, clearly indicating contents, weight, component analysis, and the name of the manufacturer.
- .2 Store manufactured materials, subject to deterioration, in a weatherproof place on site and in such a manner that their effectiveness is not impaired.
- .3 Supply plant materials as specified on the plant list. Confirm quantities as specified on the drawings, plant list and bid form. Report any discrepancies.
- .4 Dig materials specified “B.R.” (bare root) on the plant list, while in a dormant state and with the majority of the root system intact. Immediately after digging, wrap the roots in wet burlap and keep burlap wet during transport and storage.
- .5 Provide all material, specified “B. & B.” (balled and burlapped) on the plant list, with a solid, earth root ball, wrapped in burlap.
- .6 Provide all material, specified “WB” (wire basket) on the plant list, with a solid, earth root ball, bound by a wire basket.
- .7 Do NOT plant material with broken or abraded trunks or branches, or with broken or cracked root balls, or plants which are strongly desiccated, as they will be subject to rejection upon arrival on the project site.
- .8 Provide root balls of the following minimum sizes to meet the corresponding tree size. Ensure the root ball is large enough to accommodate at least 75% of the fibrous root system.

Deciduous Trees Caliper	Minimum Root Ball Diameter
50 mm	75 cm
60 mm	80 cm
70 mm	85 cm
80 mm	90 cm
90 mm	100 cm

SECTION 32 90 00 – PLANTING

1.00 m	60 cm
1.50 m	60 cm
Coniferous Tree Height	Minimum Root Ball Diameter
1.75 m	65 cm
2.00 m	70 cm
2.25 m	75 cm
2.50 m	80 cm

- .9 Cut all roots cleanly when digging plants. Split roots are not acceptable. Cut roots even with the edges of the root ball.
- .10 Protect all plant material from damage and breakage. Protect all parts of the plant material from drying out from the time of digging until they are installed.
- .11 Do not transport plant material in an open truck unless it is adequately protected from sun and wind.
- .12 Carefully tie in all branches before transporting.
- .13 Pad all points of contact between plant material and equipment.
- .14 Heel in any plant material that cannot be planted during the current day's operations.
- .15 Keep all roots and root balls moist prior to planting.
- .16 Do not remove labels attached to plants, until after final inspection.

1.4. Soil Testing

- .1 If required by the Landscape Architect, the soil shall be tested for N, P, K and minor element values, soluble contents, organic matter and pH value.
- .2 Arrange for, and assume all costs for such testing. Testing shall be carried out by a reputable firm, approved by the Landscape Architect.
- .3 The Contractor shall submit the soil analysis report to the Consultant prior to the commencement of work. When the source of such topsoil is exhausted, topsoil from a new source shall not be used until it is tested, and approved by the Landscape Architect.

1.5. Job Conditions

- .1 Proceed with planting operations during suitable weather conditions.

1.6. Substitutions

- .1 Supply and install plant material as specified on the plant list. Substitutions with other plant material will only be allowed with the written approval of the Landscape Architect.
- .2 Give timely notice, in writing, to the Landscape Architect when applying for substitutions.

1.7. Inspections

SECTION 32 90 00 – PLANTING

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- .1 Make plant material available for inspection at source of supply and/or upon arrival on the site by the Landscape Architect. Notify Landscape Architect of delivery date and notify prior to shipment.
 - .2 Approval of plant material at source will not impair the right of the Owner or Landscape Architect to inspect plants upon arrival on the site or during the course of construction and to reject plants which have been damaged, or which, in any way, do not conform to the specifications.
 - .3 If partial acceptance is desired, give timely notice to the Landscape Architect in writing.
 - .4 Partial acceptance will be given when planting work has been delayed due to circumstances beyond the control of the contractor or where planting would be in conflict with good horticultural practices and would jeopardize the performance.
 - .5 Planting of materials, prior to inspection by the Landscape Architect will be the Contractor's responsibility.
 - .6 Remove all rejected materials from the site immediately.
 - .7 Furnish all inspection certificates as may be required by federal, provincial and other applicable regulations.
 - .8 Labels shall indicate variety, grade and size of each plant specimen or bundle. Do not remove any labels from plants until final or partial approval by the Landscape Architect, or as directed.
 - .9 Final inspection of all plant material will be made at the end of the specified guarantee period. All plants must be in a healthy growing condition at the time of this inspection.
 - .10 The contractor is to provide the Landscape Architect with a full scale marked plan showing any substitutions or changes in colour.

1.8. Maintenance

- .1 Prepare and present to the Landscape Architect, two copies of a maintenance schedule prior to the beginning of the guarantee period.
- .2 All plant materials shall be maintained by the Contractor immediately after any planting has been installed and shall continue until the date of final acceptance.
- .3 Maintenance shall include all measures necessary to establish and maintain all plants in a vigorous and healthy growing condition, including but not limited to:
 - a. Weeding of planting beds and tree pits. Use herbicides in accordance with the manufacturer's directions. Make good any damage, resulting from herbicide use at no extra cost.
 - b. Watering when required and in sufficient quantities to saturate the root system.
 - c. Pruning, including the removal of dead or broken branches, and treatment of pruning wounds with approved dressing.

SECTION 32 90 00 – PLANTING

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- d. Disease and insect control when required. Use chemical methods in accordance with the manufacturer's directions. Make good any damage at no extra cost.
 - e. Keep all accessories in good condition and properly adjusted. Repair or replace accessories when required at no extra cost.
- .4 The Contractor shall be responsible for making monthly inspections of all plantings during the guarantee period and submit a written report of each inspection to the Landscape Architect.
 - .5 The Contractor shall instruct the Landscape Architect in writing of any corrective or preventative measures necessary to ensure healthy plant growth. Any damage to plants shall be reported in writing to the Landscape Architect.
 - .6 At the time of acceptance, all material must be in a healthy vigorous growing condition. Beds and tree pits must be free of weeds, rubbish or debris.

1.9. Guarantee

- .1 Submit written guarantee that all caliper plant materials shall be guaranteed for a period of twelve (12) months (or as specified in the warranties section, whichever is greater), commencing on the date of acceptance of substantial performance or client acceptance, whichever is later.
- .2 The guarantee period for approved "collected plants" shall extend for a period of one (1) year beyond the period stated above.
- .3 During the guarantee period, the Contractor shall make monthly inspections and replace all plants which are dead, missing or which are not in a healthy vigorous growing condition.
- .4 Supply and plant all replacements in strict accordance with Contract Documents and guarantee replacement as specified.
- .5 Tag or mark, in a permanently visible manner, all replacement plant material and notify the Landscape Architect, in writing of the date on which replacements were planted. Include a sketch showing location of replaced plants.
- .6 Plant replacements at a time which is in accordance with good horticultural practice.
- .7 Remove all accessories and cut at grade, those trees which are to be replaced at a later date. Remove plants, which are to be replaced, when found, or when notified by the Landscape Architect.

PART II – PRODUCTS

2.1. Plant Material

- .1 All plant material must be nursery grown and meet the specifications set out in the latest Guide Specifications for Nursery Stock prepared by the Canadian Nursery Trade Association (CNTA) for quality and method of cultivation.
- .2 Nomenclature of specified plants shall conform to the International Code of Nomenclature for Cultivated Plants and the latest edition of Standardized Plant Names.

SECTION 32 90 00 – PLANTING

- .3 Any plant material not conforming to 2.1.1 above will be designated as collected plants.
- .4 Collected plants may only be used when approved in writing, by the Landscape Architect.
- .5 Plant Material: true to name and type, structurally sound, well branched; healthy and vigorous and free from disease, insect infestations, rodent damage, sun scald, frost cracks, and other abrasions to the bark and densely foliated with a healthy, well developed root system. Pruning wounds must show vigorous bark on all edges and all parts must show live and green cambium tissue when cut.
- .6 All material must conform to the sizes shown on the plant list, except that larger material may be used when approved by the Landscape Architect. Use of larger plants will not increase the contract price.
- .7 Plant material sizes must conform to the following standards:
 - a. caliper – diameter of the trunk measured 150 mm above the normal grade around the plant.
 - b. height – measured from the normal grade around the plant to the top of the main foliage mass.
 - c. spread – the diameter of the main foliage mass, at its widest point.

2.2. Other Material

- .1 Topsoil: a fertile, friable, natural loam; mechanically screened, containing not less than 4% organic matter for clay loams and not less than 4% organic matter for sandy loams to a maximum of 15% and capable of sustaining vigorous plant growth, free of subsoil contamination, roots and stones over 25mm diameter, reasonably free of weeds (as determined by the Landscape Architect) and having a pH ranging from 6.0 to 7.5.
- .2 Peat moss: partially decomposed fibrous form of cellular stems and leaves of sphagnum moss, free of woody substance and harmful mineral matter, having a pH range of 4.5 to 6.0 and furnished in air dry state packed in standard bags of bales showing the name of the manufacturer.
- .3 Tree Wrap: 225 g burlap supplied in strips 150 mm minimum to 250 mm maximum width or heavy, waterproof crepe paper 100 mm to 150 mm wide.
- .4 Anchor stakes: metal 'T' bars: 51 x 51 x 5mm – 2500mm long, or
Wood stakes: 50 x 50mm - 2130mm long (as specified)
- .6 Wire: #10 galvanized wire for trees 75mm caliper or larger and #11 gauge galvanized wire for smaller trees. Alternative: Use 19mm (3/4") Hemp Rope if specified.
- .7 Hose: two ply, reinforced, 20mm diameter, new, black rubber garden hose.
- .8 Mulch: as specified on details.
- .9 Rodent Guards: 300mm Big 'O' pipe, 200mm MIN Height.

SECTION 32 90 00 – PLANTING

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- .10 Rodent Wrap Tree Protectors : spiral, plastic tree wrap.
 - .11 Fertilizer Tablets: as per details.

2.3. Mixes

- .1 Provide standard planting soil mix as follows: 6 parts dark loam topsoil, to 2 parts well-rotted cow manure and 1 part peat moss. (Mix thoroughly and provide sample prior to planting.)
- .2 Add bone meal at the rate of .58 kg per cubic metre and mix thoroughly for each tree or planting bed.
- .3 Be prepared to adjust the above rate in response to the soil analysis report.

2.4 Planter Soil Mixes

- .1 Provide soil mix equal as per drawings, or approved.

PART III – EXECUTION

3.1. Preparation

- .1 Obtain the approval of the Landscape Architect of all planting excavations
- .2 Apply topsoil to a depth of 450 mm for shrub and ground cover beds.

3.2. Installation of Plant Material

- .1 Planting shall be done during periods suitable with respect to weather conditions and locally accepted practice and to the Landscape Architect's approval.
- .2 Ensure width of all planting excavations is 3 times the diameter of the root ball.
- .3 Place plant plumb in the centre of the planting pit with a minimum of 150mm of compacted planting soil mixture under the root ball. Face the plant to give the best appearance or relationship to adjacent structures. Cut away any ropes which might girdle the tree. Remove all rope, wire, and burlap from top 1/3 of the root ball.
- .4 Place bare root plants so that the roots lie in a natural position.
- .5 Backfill with planting soil in 150mm layers and firmly tamp each layer to ensure the plant remains plumb. Ensure no air pockets remain around the roots.
- .6 Water thoroughly when hole is 1/2 full of tamped soil mixture and again when the operation is complete.
- .7 Except for plants in planting beds, construct an earth saucer around each plant equal to the diameter of the rootball and 100mm minimum depth to retain water around the roots.

3.3. Installation of Planting Accessories

SECTION 32 90 00 – PLANTING

- .1 Wrap all trees over 50mm caliper. Apply wrapping in a spiral manner from grade to above the second branch. Secure wrapping with suitable cord.
- .2 Stake or guy all trees as outlined in the drawings and detail.

3.4. Pruning

- .1 Prune plants after planting to compensate for root loss and in such a manner that the natural shape and character are retained. Do not cut a leader. Use only clean and sharp tools, conforming to proper horticultural practice.

3.5. Mulching

- .1 Where a mulch is called for, place a minimum 100mm depth of shredded bark mulch over the planting area. Use only specified mulch. No other type of mulch is acceptable unless approved in writing by the Landscape Architect.
- .2 Cut and spread a 1200 x 1200 mm piece of approved landscape cloth around the base of each tree and shrub before mulch is spread.

3.6. Clean-up

- .1 At the completion of planting operations, remove all surplus material from the site at no extra cost.
- .2 Make good all damage resulting from planting operations at no extra cost.
- .3 Maintain all areas neat and tidy at all times until final acceptance.

End of Section

SECTION 32 92 23 - SODDING AND TOPSOIL

0PART I - GENERAL

1.1. Description

- .1 The work covered by this section includes the furnishing of all labour, materials, equipment and incidentals for inspection and placement of sod over topsoil as shown on the Construction Drawings and as described by the Contract Specifications.
- .2 Comply with all requirements of the General Requirements – Section 01 00 00.

1.3. Quality Assurance

- .1 The contractor must have 5 years experience in sodding work.

1.4. Product, Delivery, Storage and Handling

- .1 Deliver sod to site within 24 hours of being harvested and lay sod within 48 hours thereafter, depending on suitable weather conditions and in accordance with good horticultural practice.
- .2 Small irregular or broken pieces of sod will not be accepted.
- .3 Prevent sod from drying out on site.

1.5. Sample

- .1 Complete the installation of one sample panel of sod of a minimum 25 m² (one side minimum 2.0m) and have inspected and approved by the Contract Administrator prior to proceeding with the balance of sodding operations. All other work shall conform to this approved sample.

1.6. Soil Testing

- .1 If required by the Contract Administrator, the soil shall be tested for N, P, K and minor element values, soluble salt contents, organic matter content, and pH value.
- .2 If required by the Contract Administrator, in-situ soil shall be tested for compaction levels with a soil compaction meter (penetrometer) in pounds-per-square-inch (psi).
- .3 Arrange for, and assume all costs for such testing. Testing shall be carried out by a reputable firm, approved by the Contract Administrator.
- .4 The contractor shall submit the soil analysis report to the Contract Administrator prior to the commencement of the works. When the source of such topsoil is exhausted, topsoil from a new source shall not be used until it is tested, and approved by the Contract Administrator.

1.7. Inspection

- .1 The Contractor shall verify that the final site grades are in accordance with the grading plan. Obtain the approval of the Contract Administrator of the finished topsoil surface before proceeding with sodding.
- .2 The Contractor shall give timely notice, in writing, that all work has been completed and maintenance period is to begin.

SECTION 32 92 23 - SODDING AND TOPSOIL

1.8. Acceptance

- .1 Maintain sod in good condition until acceptance.
- .2 At the time of acceptance, the grass must not be more than 50mm high. Minimum acceptable cut height is 45mm. All sod must have a healthy and even stand of grass, free of thin, poor or burned-out patches.
- .3 Acceptance will be given when the sod is properly rooted, free of bare and dead spots and reasonably free of weeds in the opinion of the Contract Administrator.
- .4 Acceptance will not be given if the topsoil and/or sod layer are excessively compacted (compaction exceeding 200 PSI).
- .5 Replace any deteriorated sod with new sod at the direction of the Contract Administrator.
- .6 The Contractor is responsible for a minimum of one cut of grass or as many cuts as required until acceptance.

1.9. Guarantee

- .1 Submit written guarantee that all sodding shall be guaranteed for a period of one (1) year commencing on the date of acceptance of substantial performance.
- .2 During the guarantee period, the Contractor shall make monthly inspections and replace all sod which is dead, or is not in a healthy vigorous growing condition.
- .3 Soil testing for N, P, K and minor element values, soluble salt contents, organic matter content, pH value and compaction shall be conducted if issues with sod growth and/or health are widespread or persistent. Arrange for, and assume all costs for such testing. Testing shall be carried out by a reputable firm, approved by the Contract Administrator. Perform remedial actions as recommended by the soil testing results and approved by the Contract Administrator.

PART II - PRODUCTS

2.1. Materials

- .1 Grass sod: Certified No.1 grade cultivated turf grass sod with a composition of 50% Kentucky Blue Grass and 50% Blue Cultivar either "Fylking" or "Baron" or as specified on the drawings, grown and sold in accordance with NSGA classifications. At the time of sale it must have a strong, fibrous root system and be free of stones and burned or bare spots. Damaged and broken pieces shall not be laid and shall be removed from the site immediately.
- .2 Sod pegs: 25mm x 25mm x 230mm (minimum length). Ensure pegs are long enough to securely anchor sod.
- .3 Topsoil: a fertile, friable, natural loam; containing not less than 4% organic matter for clay loams and not less than 2% organic matter for sandy loams to a maximum of 15%. Topsoil must be capable of sustaining vigorous plant growth, free of subsoil contamination, roots and stones over 25mm diameter, reasonably free of weeds (as determined by the Contract Administrator), and having a pH ranging from 6.0 to 7.5.

PART III - EXECUTION

3.1. Preparation

- .1 Rototill all areas that are to receive new sod. Cultivate to a minimum depth of 100mm. Remove all rocks, roots and grass or weed clumps from the surface.
- .2 Compact surface to 85% Standard Proctor Dry Density.
- .3 Scarify to a depth of 25mm before placing additional topsoil or sod.

3.2. Spreading of Topsoil

- .1 Spread dry topsoil during dry weather over approved, dry, unfrozen subgrade where sod is to be installed.
- .2 Keep topsoil 25mm below finished grade for sodded areas.
- .3 Fine grade topsoil eliminating rough and low areas and to ensure positive drainage.
- .4 Roll topsoil with a 50 kg roller to compact and retain surface. Finished depth of prepared, compacted topsoil to be minimum 150mm. Do not overcompact soil.
- .4 Provide a finished topsoil surface that is smooth and firm against footprints with a fine, loose texture before sod is placed. Topsoil level shall not be compacted beyond 200 PSI.

3.3. Installation

- .1 Lay sod with tight butt joints. Do not leave any open joints or overlap adjacent pieces of sod. Alternate joints on each row of sod.
- .2 Ensure finished sod surface is flush with adjoining grass areas, pavement or top surface of curbs.
- .3 On slopes steeper than 4:1, lay sod perpendicular to the slope and peg each row at intervals of not more than 600mm on each side of the sod strip. Drive pegs flush with surface of sod.
- .4 Immediately after installation, water the sod with sufficient quantity of water to penetrate the sod and the top 50mm of the underlying topsoil.
- .5 Apply 8-32-16 slow release commercial fertilizer at the rate of 22 kg per 1000 square metres.
- .6 When sod has dried sufficiently to prevent damage, roll all sodded areas to ensure a good bond between sod and topsoil. Imperfections in the surface should be corrected prior to the laying of the sod and not by rolling with a heavy roller.
- .7 Protect all newly sodded areas with warning signs or barricades.

3.4. Protection after Completion

SECTION 32 92 23 - SODDING AND TOPSOIL

- .1 Assume full responsibility for protection of all sodded areas from all sources until performance acceptance.
- .2 Erect protective barriers and post signs where necessary and maintain same until performance acceptance.
- .3 Remedy all damages, wash-outs and eroded areas resulting from weather, improper protection, excessive compaction, or other causes.

3.5. Clean Up

- .1 The Contractor must leave the site in a neat and orderly condition upon completion of work on a daily basis, all to the satisfaction of the Contract Administrator.

End of Section

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements of Division 1.

1.2 RELATED WORK

- .1 Excavation, backfilling, grading Section 31 23 00
- .2 Subdrainage: Section 33 46 00

1.3 DESCRIPTION OF WORK

- .1 The supply and installation of all watermain, sanitary sewers, storm sewers and appurtenances shall be as detailed by these specifications and as shown on the Contract Drawings.
- .2 The price tendered for watermain, sanitary sewers, storm sewers and appurtenances shall include the supply, excavation, bedding, cover material, backfilling, restoration, including associated materials and testing as specified on the Contract Drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Storm and Sanitary Sewer bedding:
The subgrade of trenches must be inspected and approved by qualified field personnel from the soils engineering company.
The bedding and backfilling of trenches is to be carried out as per OPSD 802.010 and 802.03 Class B.
- .2 PVC Gravity Storm Sewer Pipe: PVC gravity storm sewer pipe shall Conform to CSA Specification B182.1 or B182.2, or the latest revisions thereof. Dimension ratio (DR) of PVC sewer pipe shall be 35.
Concrete pipe shall conform to the requirements of CSA Specification A257-M 1982 for the classes shown below:
 - a) Non-reinforced Concrete Pipe, CSA Standard A257.1 Class 1, 2 and 3.
 - b) Reinforced Concrete Pipe, CSA Standard A257.2 Strength Class 50-D, 65-D, 100-D and 140-D.

Watertight bell and spigot connections will be required for all pipe joints.

- .3 Catchbasins: Catchbasins to be as per OPSD 705.010.
- .4 All PVC gravity sanitary sewer pipe shall conform to CSA Specification B182.1 or B182.2, or the latest revision thereof. Dimension ratio (DR) of PVC sewer pipe shall be 35.

SECTION 33 90 00 - SITE SERVICES

- .5 Sewer Connections: Sewer connections to manholes shall be done by means of a PVC manhole adaptor.
- .6 Manholes: All manholes to be OPSD 701.010.
- .7 All watermain piping, hydrants and valves to be tested in accordance with ULC or equivalent testing. All watermain piping, fittings and appurtenances shall be ULC labeled.
- .8 Bedding shall conform to OPSD 802.010 and 802.030.
Contractor shall use bedding with cover material to 300 mm above the top of the pipe. Bedding material should consists of 20mm crusher-run limestone meeting the OPS Granular 'A' specifications. Cover material shall be select granular materials free of stones in excess of 35 mm. Bedding and cover materials shall be mechanically compacted to a minimum density of 98% Standard Proctor Density.
- .9 Watermain piping to be PVC manufactured in accordance with the latest edition of AWWA C900. Minimum Class 150 (DR18) shall be used. When using PVC watermain, a tracer wire shall be provided along the top of all watermains. The wire is to be secured to the top of the watermain at every fitting and valve and at intervals not to exceed 3.0 metres. All tracing wire shall be 12 gauge, standard copper wire complete with outer plastic coating. Tracer wire shall be connected to valves in chambers and the tracer wire is to be carefully extended along the bottom of the chamber, up the backside of the steps along the chamber wall and securely fastened to the top rung with fiberglass tape. Tracer joints is to be continuous with no jounts. Where joints are needed (between rolls) they are to be soldered together plus wrapped in dielectric tape over wrapped with vinyl tape.
- .10 Hydrants and Valves – as per OPSD 1105.01. All hydrants are to be self-draining (unless in areas with high water table). All hydrants are to be equipped with one (1) four inch (4”) pumper port. Hydrants are Canada Valve (CanVal) or other approved equipped with one (1) 100 mm pumper port with manufacturer’s “Stortz” nozzle facing the street.
- .11 All bends and tees must be OPSD 1103.01 and 1103.02 and blocked to undisturbed ground.
- .12 All mechanical connections to be protected against corrosion through the use of corrosion protection duration nuts. Nuts to be used on 50% of all T-bolts per connection and are to be used in addition to standard fastening nuts, **not** in place of standard nuts.
- .13 When watermain does not have sufficient cover the watermain must be insulated.
- .14 Backfill Material: Select subgrade material in accordance with Section 31 23 00 – Excavation, Backfilling, Grading from top of pipe cover to underside of granular subgrade in paved areas from top of pipe cover to underside of topsoil in landscaped areas.

PART 3 - EXECUTION

3.1 LAYOUT

- .1 Clean pipes and fittings of debris and water before installation and remove defective materials from site.
- .2 Establish grades and inverts from appropriate benchmarks. Lay out lines as shown.

3.2 TRENCHING

- .1 Trench excavation shall conform to the requirements of the Occupational Health and Safety Act and Regulations for Construction Projects, Regulation 691/80.
- .2 Do trenching work in accordance with OPSS 410.
- .3 Do not allow contents of any sewer or sewer connection to flow into trench.
- .4 Trench alignment and depth to approval of Consultant prior to placing bedding material and pipe.

3.3 GRANULAR BEDDING AND COVER

- .1 Place bedding in unfrozen condition.
- .2 Place granular bedding and cover material in uniform layers not exceeding 150mm compacted thickness. Minimum bedding thickness is 150mm, cover material to 300mm above top of pipe.
- .3 Shape bed true to grade and to provide continuous, uniform bearing surface for pipe. Do not use blocks when bedding pipes.
- .4 Shape transverse depressions as required to suit joints.
- .5 Compact each layer full width of bed to at least 98% Standard Proctor Maximum Dry Density.
- .6 Fill excavation below bottom of specified bedding adjacent to manholes or catch basins with compacted bedding material.

3.4 INSTALLATION

- .1 Lay and join pipe in accordance with OPSS 410 and manufacturer's recommendations.
- .2 Reaction blocking to be placed at all bends, tees, etc. on watermain.

3.5 BACKFILL

- .1 Place backfill material in unfrozen condition.

SECTION 33 90 00 - SITE SERVICES

- .2 Place backfill material above pipe cover in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.
- .3 Under paving and walks, compact backfill to at least 98% Standard Proctor Maximum Dry Density. In other areas, compact to at least 90% Standard Proctor Maximum Dry Density.

3.6 FIELD TESTING

- .1 Leakage testing/deflection testing if required, shall be done in accordance with OPS Specification No. 410.
- .2 Watermain piping shall be hydrostatically tested at 200 psi for two hours and in accordance with OPS Specifications No. 701.
- .3 All new main storm and sanitary sewers shall be inspected by a closed circuit television camera (CCTV) after the maintenance holes are raised to grade. The sewer pipes will be flushed prior to starting the CCTV survey. CCTV inspections shall be performed in accordance with OPSS 409. Video recordings will be provided on DVDs in a format satisfactory to the engineer. An inspection report will be prepared detailing the sections of pipe between manholes and describing the condition of the pipe. Any defects or obstructions will be noted.

3.7 DISINFECTION OF PIPES AND INSERTED FITTINGS

1. Responsibility

- .1 Disinfection of water distribution system shall be the responsibility of the General Contractor.

2. Disinfection

- .1 Before new piping systems for potable water which can be completely filled and isolated are taken into service, observe following procedures:
 - .1 Clean and flush to Engineer's approval.
 - .2 Fill tanks or piping systems with potable water containing 50 mg/L residual chlorine, ensure even distribution and leave for 24 hours. If a residual of less than 25 mg/L remains at end of 24 hours period, repeat.
 - .3 Drain chlorinated water and dispose of as specified below.
 - .4 Flush system and fill with potable water.
 - .5 Obtain one or more samples, as directed by Engineer, and submit for bacteriological testing.
 - .6 When test results indicate that water is of acceptable quality, piping systems may be connected and taken into service.
- .2 Before piping sections that cannot be isolated, or fittings to be inserted into existing pipe lines, are taken into service, observe following procedure:
 - .1 Clean and flush to Engineer's approval.
 - .2 Swab or wash all surfaces in contact with potable water with 250 mg/L residual chlorine solution.
 - .3 Have all persons handling above equipment wear sterilized gloves.

- .4 Complete insertion or connection under supervision of Engineer.
- 3. Discharge of Chlorinated Water
 - .1 Chlorinated water used for disinfection is toxic to plants and wildlife and fish.
 - .2 Permissible disposal methods are:
 - .1 Discharge to storm sewer or stream only if concentration at edge of mixing zone is below 0.002 mg/L.
 - .2 Open drainage ditch, well separated from receiving stream. Presence of weeds, sunlight and high temperature is required. Monitor rate of discharge.
 - .3 If above disposal method conditions cannot be met, dechlorinate as follows:
 - .1 Use any of chemicals listed.
 - .2 Determine quantity required from:
"excess chlorine residual x Factor = dosage required".
 - .3 Hydrogen Peroxide (Factor = .479). Most recommended. Overdose will add more oxygen to stream.
 - .4 Sulphur Dioxide (Factor = .901). Will lower pH in receiving water.
 - .5 Sodium Thiosulphate (Factor = 2.225). Will cause harmless sulphur turbidity.
 - .6 Sodium Sulphate (Factor = 1.775). Excess will lower dissolved oxygen content in stream.
 - .7 Sodium Pyrosulphate (Sodium Metabisulphite) (Factor = 1.338). Excess will lower dissolved oxygen content.
 - .8 Example: 11,000 L of 21 mg/L to be discharged at 1.0 mg/L residual, using Hydrogen Peroxide. Dosage required $20 \times 0.479 = 9.6$ mg/L. Total amount needed $9.6 \times 10^{-3} \times 11,000 = 105.6$ g of H_2O_2 . For 35% commercial grade, total quantity required is $100/35 \times 105.6 = 302$ g.

END