BLANTYRE PARK IMPROVEMENTS

180 FALLINGBROOK ROAD
Toronto, ON

Architectural | Structural | Mechanical | Electrical | Aquatic | Civil | Landscape | Specifications

Issued for Permit and Tender
October 2024

Project No. 2211

CHERIE NG ARCHITECT INC.
Tel: 416-898-1979
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Consulting Engineers

Structural Consultant
Blackwell Structural Engineers

Mechanical and Electrical Consultant
JDX Advance Engineering Services Inc.

Pool Consultant
Aqua Plans Aquatic Consultant Inc.

Civil Consultant
Urban Watershed Group Ltd.

Landscape Consultant
Victor Ford and Associates Inc.

.1 Refer to Project Manual, Section 00 01 10 - Table of Contents, for indication of document responsibility (DR). Abbreviations for entity responsible for document preparation are as follows:

.1 A - Denotes documents prepared by Architect.
.2 S - Denotes documents prepared by Structural Engineer.
.3 HC - Denotes documents prepare by Hardware Consultant.
.4 M - Denotes documents prepared by Mechanical Engineer.
.5 E - Denotes documents prepared by Electrical Engineer.
.6 LA – Denotes documents prepared by Landscape Architect
.7 P – Denotes documents prepared by Pool Consultant.
.8 C – Denotes documents prepared by Civil Engineer
.9 O - Denotes documents prepared by Owner.

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 01 - GENERAL REQUIREMENT

DIVISION 26 – ELECTRICAL

DIVISION 27 – COMMUNICATIONS

DIVISION 31 – EARTHWORK

DIVISION 32 – EXTERIOR IMPROVEMENTS

DIVISION 33 – UTILITIES

APPENDICES

END OF DOCUMENT

REPORT(S)

1.1 A copy of the following report(s) are appended under separate cover:

Assessment of Past Uses
Blantyre Park, 180 Fallingbrook Road, Scarborough, Ontario
Prepared by AllRock Consulting Ltd
March 21, 2024

Sampling and Analysis Plan
Blantyre Park, 180 Fallingbrook Road, Scarborough, Ontario
Prepared by AllRock Consulting Ltd
March 21, 2024

Soil Characterization Report
Blantyre Park, 180 Fallingbrook Road, Scarborough, Ontario
Prepared by AllRock Consulting Ltd
March 21, 2024

Functional Servicing Report
Blantyre Park, 180 Fallingbrook Road
Prepared by Urban Watershed Group Ltd.
August 8th, 2024

Stormwater Management Report
Blantyre Park, 180 Fallingbrook Road
Prepared by Urban Watershed Group Ltd.
October 24, 2024

Arborist Report
Blantyre Park, 180 Fallingbrook Road
Prepared by Urban Forest Innovations Inc.
May 23, 2024

1.2 The report(s), by their nature, cannot reveal all conditions that exist or can occur on the site. Should conditions be found to vary substantially from the report, immediately notify Consultant in writing and await instructions.

1.3 Contractor shall not be entitled to extra payment or extension of Contract Time for work which is required and which is reasonably inferable in the report(s) as being necessary.

END OF SECTION

AllRock Consulting Ltd

Assessment of Past Uses

Blantyre Park,
180 Fallingbrook Road,
Scarborough, Ontario

Prepared For:
CHERIE NG ARCHITECT INC.
2662 Bloor Street West, Suite 907
Toronto, ON M8X 2Z7

March 21, 2024
AllRock File: 23376

AllRock Consulting Ltd.
24 Brydon Drive, Unit #5
Toronto, ON M9W 5R6

Version 1.0

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EXECUTIVE SUMMARY

AllRock Consulting Limited (AllRock) was retained by Cherie NG Architect Inc. (Client) to conduct an Assessment of Past Uses (APU) for the proposed Blantyre Park upgrades, located at 180 Fallingbrook Road, Scarborough, Ontario (hereafter referred to as the 'Site' or 'Project Area').

At the time of the Site reconnaissance, the Project Area was developed with one (1) single storey building located on the northern portion of the Project Area associated with the pool facility (hereafter referred to as 'Site Building A'). In addition, one (1) single storey washroom facility was located at the southwest portion of the Project Area adjacent to the baseball field and horseshoe pit (hereafter referred to as 'Site Building B'). The central portion of the Project Area was undeveloped, with the exception of the central east boundary which was developed with a playground.

This APU was prepared in general accordance with *Ontario Regulation 406/19* made under the *Environmental Protect Act (EPA) – On-Site and Excess Soil Management* (Excess Soil Regulation), the document entitled "*Rules for Soil Management and Excess Soil Quality Standards"* dated November 19, 2019 (Excess Soil Rules), as well as the applicable sections and Schedule D of *Ontario Regulation 153/04* made under the EPA – *Record of Site Condition* (Ontario Regulation 153/04).

The purpose of an APU is to develop a preliminary determination of the likelihood that one or more contaminants have affected soil or rock that is to be excavated from the Project Area. The scope of work for this APU consisted of a review of readily available historical information, an examination of regulatory records, a reconnaissance of the Site, interviews, a review of surrounding properties, an evaluation of information and the preparation of an APU report.

AllRock identified a total of three (3) PCAs on the Project Area (On-Site), and eight (8) PCAs within the Study Area (Off-Site), of which a total of six (6) APECs were identified. The APECs are detailed below:

APEC	*PCA Description*	*Location of PCA (on-Site or off-Site)*
APEC #1	**Item #58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners** Based on the historical records review, the Project Area functioned as a landfill circa 1970.	On-Site
APEC #2	**Item #N/S – De-icing Activities** Based on the municipal use of the Project Area, it is anticipated that seasonal de-icing salts would have been used.	On-Site
APEC #3	**Item #30 – Importation of Fill Material of Unknown Quality** Based on the 2023 Geotechnical Investigation, fill material of unknown quality was identified in all boreholes, to a depth of approximately 3.05 meters below ground surface (mbgs).	On-Site

APEC #4	**Item #28 – Gasoline and associated products in fixed tanks.** A single underground storage tank (UST) was located at 207 Blantyre Ave. This property is located immediately south of the Project Area.	Off-Site
APEC #5	**Item #28 – Gasoline and associated products in fixed tanks.** A retail fuel outlet (RFO) was apparent at 1210 Kingston Road with two (2) USTs. This property is located 20 m southeast of the Project Area.	Off-Site
	Item #28 – Commercial Autobody Shops An autobody shop, occupied 1210 Kingston Road from circa 1995 to 2000. This property is located 20 m southeast of the Project Area.	Off-Site
APEC #6	**Item #37 – Operation of Dry Cleaning Equipment** A dry-cleaning operation was identified at 1208 Kingston Road. This property is located 20 m southeast of the Project Area.	Off-Site

Based on the findings of this APU, AllRock recommends completing a sampling and analysis plan (SAP) as well as a soil characterization report (SCR) to determine the soil quality beneath the Project Area.

1.0 INTRODUCTION

AllRock Consulting Limited (AllRock) was retained by Cherie NG Architect Inc. (Client) to conduct an Assessment of Past Uses (APU) for the proposed Blantyre Park upgrades, located at 180 Fallingbrook Road, Scarborough, Ontario (hereafter referred to as the 'Site' or 'Project Area').

This APU was prepared in general accordance with Ontario Regulation 406/19 made under the Environmental Protect Act (EPA) – On-Site and Excess Soil Management (Excess Soil Regulation), the document entitled "Rules for Soil Management and Excess Soil Quality Standards" dated November 19, 2019 (Excess Soil Rules), as well as the applicable sections and Schedule D of Ontario Regulation 153/04 made under the EPA – Record of Site Condition (Ontario Regulation 153/04).

1.1 Person(s) Involved with the Project

The person(s) involved with the project are provided in *Table 2-1*, illustrated below:

Table 1.1 Person(s) Involved with the Project

Role	Information
Client	Cherie Ng, M.Arch Cherie NG, Architect Inc. Email: cng@cherieng.com Tel: (416) 898-1979
Qualified Person	Scott Allen, P.Eng., QP_{ESA} AllRock Consulting Ltd. 24 Brydon Drive, Unit #5, Toronto, Ontario, M9W 5R6 Email: scott.allen@allrockconsulting.com Tel: (416) 452-8998

1.2 Project Area Information

The Project Area is an approximate 2.57 hectares (6.34 acres) irregular shaped parcel surrounded by Blantyre Avenue, Clonmore Drive, and Fallingbrook Road, approximately 50 meter north of the intersection between Kingston Road and Fallingbrook Road, in Scarborough, Ontario. The surrounding area predominantly consists of residential and commercial land uses. Figures of the Project Area and surrounding area are included in ***Appendix A***.

Additional details pertaining to the Project Area are provided in *Table 2-2*, illustrated below:

Table 1.2 General Property Information

Role	Information
Municipal Address(es)	180 Fallingbrook Road, Scarborough, Ontario
Legal Description	PT LT 35 CON A SCARBOROUGH AS IN SC49537 & SC49536 EXCEPT PL 4285, TB185490, SC202143, CA495836, CA393195, TB858173, CA562911, TB919548 &
Property Owner	Scarborough Township

Table 1.2 General Property Information

Role	Information
Legal Instruments	It is AllRock's understanding that no legal instruments (e.g., Environmental Compliance Approvals, by-law or permits issued, etc.) are applicable to the Project Area.
Record of Site Condition (RSC)	Environmental Risk Insurance Services (ERIS) completed a search of the MECP Brownfield Environmental Site Registry for the Project Area. Based on AllRock's review, an RSC has not been filed for the Project Area.
Risk Assessment (RA)	It is AllRock's understanding that a Risk Assessment (RA) has not been previously submitted for the Project Area, and there are no plans at this time to submit a RA.

2.0 SCOPE OF INVESTIGATION

The purpose of an Assessment of Past Uses (APU) is to develop a preliminary determination of the likelihood that one or more contaminants have affected soil or rock that is to be excavated from the Project Area. An APU assess the Project Area and surrounding properties situated within a 250 m radius of the Project Area boundaries (hereafter referred to as the "Study Area") to identify any potentially contaminating activities (PCAs), and if any of the PCAs could have resulted in an Area of Potential Contamination (APEC) at the Project Area. The scope of work for this APU consisted of the following:

- Conduct a Site reconnaissance;
- Interview person(s) knowledgeable of the Project Area;
- Review historical information from publicly available sources (e.g., aerial photographs, city directories, topographic maps, etc.) and contacting Opta Information Intelligence (Opta) for historical information on-file relating to the Project Area and the Study Area;
- Submit a freedom of information request to the Ministry of the Environment, Conservation and Parks (MECP) for information on file with respect to the Project Area;
- Contact Environmental Risk Information Service Ltd. (ERIS) to have a search completed for the Project Area and Study Area for select databases;
- Review and evaluate documents provided from the Client or Site contact; and
- Prepare a report based on the information obtained from the records review, interview, and Site reconnaissance. Outlining evidence of PCAs and APECs that have the potential to affect soil or rock that is to be excavated at the Project Area.

3.0 RECORDS REVIEW

3.1 General

3.1.1 Project Area and APU Study Determination

For the purpose of this APU, the Study Area is the area within a 250 m radius of the Project Area boundaries. Based on the historical and current records review and observations of the surrounding properties during the Site reconnaissance, it was AllRock's opinion that no significant PCAs were identified at a distance greater than 250 m that would warrant any additional evaluation.

3.1.2 First Developed Use Determination

AllRock notes that based on review of the aerial photographs, FIPs and review of available historical information and records, the first developed land use was King's College in May 1835. The surrounding area was generally developed for residential land use since circa 1934. Based on aerial photographs the Project Area was developed as parkland use since circa 1960.

3.1.3 Fire Insurance Plans

AllRock contacted Opta Information Intelligence (Opta) to obtain copies of Fire Insurance Plans pertaining to the Project Area and Study Area, as well as Property Underwriters Reports and Property Underwriter Plans associated with the Site. Opta provided copies of FIPs dated 1934, 1939, and 1956. A copy of Opta's report is provided in ***Appendix C***. Based on AllRock's review of the FIPs, the following salient information was noted:

Table 3.1 – Fire Insurance Plans

Year	Location	
	Project Area	**Study Area**
1934	- Only a portion of the Project Area is available from the 1934 FIP, however, the Project Area appears to consist of vacant undeveloped land	- An underground storage tank (UST) was apparent at 207 Blantyre Avenue (**28. Gasoline and Associated Products in Fixed Tanks**). This property is located immediately south of the Project Area, resulting in an APEC at the Project Area. - A laundry (inferred dry cleaning operation) is approximately located at present-day 289 Blantyre Ave (**37. Operation of Dry Cleaning Equipment**). This property is located approximately 211 m north-northwest of the property and is situated hydraulically upgradient of the Project Area. - A garage (inferred auto repair shop) is approximately located at present day 1120 Kingston Road (**10. Commercial Autobody Shops)**. Two (2) underground storage tanks (UST) were apparent on the southern portion of the property along Kingston Road (**28. Gasoline and Associated Products in Fixed Tanks**). This property is located approximately 125 m southwest of the Project Area and situated

Table 3.1 – Fire Insurance Plans

Year	Location	
	Project Area	Study Area
		hydraulically transgradient relative to the inferred groundwater flow direction. - The surrounding properties primarily consisted of predominately residential and commercial land use. - Some text details were unclear due to the FIP quality.
1939	- Only a portion of the Project Area is available from the 1939 FIP, however, the Project Area is similar to the 1934 FIP.	- A RFO was apparent at inferred present-day 1121 Kingston Road. Two (2) USTs were apparent on the south portion of the property (**28. Gasoline and Associated Products in Fixed Tanks**). This property is located approximately 60 m southwest of the Project Area and situated hydraulically transgradient relative to the inferred groundwater flow direction. - An RFO was apparent at 1161 Kingston Road. Two (2) USTs were apparent on the northeast portion of the property (**28. Gasoline and Associated Products in Fixed Tanks**). This property is located approximately 60 m south of the Project Area and situated hydraulically downgradient relative to the inferred groundwater flow direction. - The surrounding properties primarily consisted of predominately residential and commercial land use.
1956	-Only a portion of the Project Area is available from the 1956 FIP, however, the Project Area is developed with a one storey building recorded as a dressing room on the southwest portion of the Project Area.	- A retail fuel outlet (RFO) was apparent at 1210 Kingston Road. Two (2) USTs were apparent on the east portion of the property (**28. Gasoline and Associated Products in Fixed Tanks**). This property is located 20 m southeast of the Project Area, resulting in an APEC in the Project Area. - The RFO located at 1161 Kingston Road identified in the 1939 FIP is also apparent in the 1956 FIP. - The RFO located at 1121 Kingston Road identified in the 1939 FIP is also apparent in the 1956 FIP. - The surrounding properties primarily consisted of predominately residential and commercial land use.

PCAs are identified in **BOLD.**

3.1.4 Chain of Title

A chain of title search was not completed as part of this APU. It is AllRock's opinion that a chain of title search would not provide additional salient information pertaining to the environmental condition at the Project Area. The available historical review of previous environmental reports, aerial photographs, city directories, and FIPs, were sufficient to determine the date of first developed use.

3.1.5 Environmental Reports

The following previous reports were provided as by the Client and were reviewed by AllRock:

- "*Phase One Environmental Site Assessment, Former SC Kingston Fallingbrook Station, 160 Fallingbrook Road, Toronto, Ontario, M1B 5X6"* prepared by OHE Consultants. and dated March 1, 2017 (2017 OHE Phase Two ESA); and
- "*Phase Two Environmental Site Assessment, former Fallingbrook Station, 160 Fallingbrook Road, Toronto, Ontario, M1B 5X6"* prepared by OHE Consultants. and dated March 1, 2017 (2017 OHE Phase Two ESA).

2017 OHE Phase One ESA – RSC#223608

The OHE Phase One ESA was completed in accordance with requirements outlined in O.Reg.153/04, to assess the likelihood of soil and/groundwater contamination resulting from historical or present activities at 160 Fallingbrook Road, present-day 170 Fallingbrook Road. This property is located immediately south adjacent to the Project Area and was developed as a Toronto Hydro Transformer Station (industrial) since circa 1939. Based on the findings of this Phase One ESA six (6) PCAs were identified for the Project Area and of which, a total of four (4) APECs were identified.

Based on the findings of the Phase One ESA, a Phase Two ESA was recommended.

2017 OHE Phase Two ESA – RSC#223608

The OHE Phase Two ESA was completed in accordance with requirements outlined in O.Reg.153/04, as amended. A total of seven (7) boreholes were advanced to a maximum depth of approximately 15.6 metres below ground surface (mbgs). Four (4) of the boreholes were instrumented with monitoring wells for the purpose of groundwater sampling and long-term monitoring. Soil samples were submitted for laboratory analysis of metals and inorganics, petroleum hydrocarbons (PHCs) in the F1-F4 fraction ranges (F1-F4), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs). The following salient information was noted:

- The depth to groundwater ranged approximately between 12.48 and 14.71 mbgs;
- A groundwater elevation survey was conducted at the Project Area. Groundwater is anticipated to flow in a southwest direction. Groundwater flow direction can be influenced by seasonal fluctuation, utility services, and other subsurface features and can only be confirmed with long term monitoring.
- Various soil samples collected and submitted for laboratory analysis exceeded the applicable Table 3 (Residential/Parkland/Institutional) Site Condition Standards for coarse grained soils (*Table 3 RPI Standards)* for arsenic, EC and SAR from grade to 16.0 mbgs;
- A remediation program was completed, and all arsenic, EC and SAR contaminated soil was removed by way of an excavation remediation. A total of 4,236 tonnes of soil was excavated and removed from the property;

- Following the initial remediation, a delineation soil investigation was completed to provide vertical and horizontal delineation with respect to the arsenic, EC and SAR exceedances. A total of twelve (12) testpits, three (3) hand augerholes, five (5) delineation boreholes, and two (2) monitoring wells, were advanced within the property from January 2016 to September 2016;
- Subsequently, four (4) remedial excavation areas were completed on the property in order to removed associated contaminated soil. All arsenic contaminated soil was excavated and removed from the property. EC and SAR impacted soil was identified at depths greater than 1.5 mbgs; and
- At the completion of remediation, all electrical equipment had been removed, and the property building foundation and driveway had been demolished.

Based on a review of the RSC database, this property is currently zoned as parkland use. The former use of an electrical transformer station with PCB use and storage adjacent to the Project Area would be considered a PCA (**Item 55- Transformer Manufacturing, Processing and Use**), however, based on the remediation excavation and delineation activities conducted, this operation is not considered an APEC with respect to the Project Area.

3.2 Environmental Source Information

3.2.1 EcoLog Environmental Risk Information System

AllRock submitted a request to ERIS for a review of all federal, provincial, and private source databases relating to the Project Area and Study Area. A copy of the ERIS report is provided in ***Appendix D*** of this report. These databases are detailed in the below sub-sections.

3.2.1.1 Inventory of PCB Storage Sites

The MECP maintains an Inventory of PCB Storage Sites (OPCB) within the province, select regulations requires the registration of inactive PCB storage equipment and/or disposal sites of PCB waste. This database contains information relating to the waste quantities, major and minor sites storing liquid or solid wastes, and waste storage inventory. AllRock reviewed the OPCB database, and no records were found at within the Project Area and/or the Study Area.

3.2.1.2 National PCB Inventory

The National PCB Inventory (NPCB) includes federal, provincial and private facilities. Federal and federally regulated industries out-of-service PCB containing equipment and PCB waste are also included. The database also includes some information on provincial and private PCB storage sites. AllRock reviewed the NPCB database, and no records were found within the Project Area and/or the Study Area.

3.2.1.3 Certificates of Approval, Permits to Take Water, Certificates of Property Use, or Similar Instruments

Select provincial databases including the Certificate of Approval (CoA), Environmental Activity and Sector Registry (EASR), Environmental Compliance Approval (ECA), The Permit to Take Water (PTTW), and

Certificates of Property Use (CPU) were searched by ERIS. The databases pertain to emissions, air and noise, industrial sewage, municipal and private sewage, waste management systems and renewable energy approvals. AllRock reviewed the above-referenced databases, and the following salient information was noted:

- Lot 34, Conc. A Anndale Road and Fallingbrook Road was registered in the CA database for Municipal sewage. This property is located approximately 125 m southeast of the Project Area and is situated hydraulically downgradient of the Project Area relative to the inferred groundwater flow direction.

3.2.1.4 Inventory of Coal Gasification Plants and Coal Tar Sites

The Inventory of Coal Gasification Plants and Coal Tar Sites database (COAL) is comprised of two documents entitled "*Inventory of Coal Gasification Plant Waste Sites in Ontario*" and "*Inventory of Industrial Sites Producing or Using Coal Tar Related Tars in Ontario"* prepared by Interra Technologies Inc., for the MECP and dated April 1987 and November 1988, respectively. AllRock reviewed the COAL database, and no records were found within the Project Area and/or the Study Area

3.2.1.5 Environmental Incidents, Orders, Offences, Spills, Discharges of Contaminants/Inspections

Select federal and provincial databases including the TSSA Historic Incidents (HINC), Fuel Oil Spills and Leaks (INC), Pipeline Incidents (PINC), Ontario Spills (SPL), and Orders (ORD) were searched by ERIS. These databases pertain to historical incidences of spills and leaks of petroleum type products, as well as hazardous and/or non-hazardous wastes. The type, quantity, location, nature of impact and explanation of release are typically included. AllRock reviewed the above-referenced databases, no records were identified for the Project Area however the following salient information was identified for the Study Area:

Table 3.2.1.5 - Environmental Incidents, Orders, Offences, Spills, Discharges of Contaminants/Inspections

Database	Summary
HINC	Two (2) records were identified in the HINC database for near miss natural gas release in private dwellings in 2007. These properties are located approximately 130 m from the Project Area.
INC	Four (4) records were identified in the INC database for natural gas releases from multi-unit residential and private dwellings from 2011 to 2014. There properties are located from approximately 140 m to 185 m from the Project Area.
PINC	Eight (8) records were identified in the PINC database for various pipeline hits from 2012 to 2017. These properties are located from approximately 65 m to 247 m from the Project Area.
SPL	Fifteen (15) spills were identified in the SPL database within the Study Area, as summarized below:

Table 3.2.1.5 - Environmental Incidents, Orders, Offences, Spills, Discharges of Contaminants/Inspections

Database	Summary
	▪ Enbridge Gas Distribution Inc. was registered for a natural gas pipeline strike in 2012, located at 244 Blantyre Avenue, approximately 45 m west of the Project Area. ▪ The City of Toronto was registered for a hydraulic oil spill in 2008, located at 14 Elmview Drive, approximately 85 m east of the Project Area. ▪ Two (2) spills were recorded at 1161 Kingston Road, approximately 65 m southeast of the Project Area. - B Plus Service Station was registered for a gasoline spill in 1989; and - Pioneer Petroleums Ltd. was registered for a 20L gasoline spill in 2001. ▪ 1239 Kingston Road was registered for an 90L diesel fuel spill in 2001, located approximately 105 m southeast of the Project Area. ▪ Scarborough Hydro was registered for a 1L mineral oil spill in 1988 at 17 Meadow Acres located approximately 130 m west-southwest of the Project Area. ▪ 171 Courcelette Road was registered for a natural gas leak in 2017, located approximately 165 m south-southeast of the Project Area. ▪ Enbridge Gas Distribution Inc. was registered for a natural gas spill in 2012, located at 56 Winston Ave, approximately 180 m west-northwest of the Project Area. ▪ 40 Winston Ave, was registered for a natural gas leak in 2010, located approximately 200 m west-northwest of the Project Area. ▪ Consumers Gas CO. LTD. was registered for a natural gas pipeline leak in 1995, located at the intersection of Meadow Avenue and Kingston Road/Victoria Park, approximately 230 m west-southwest of the Project Area. ▪ Toronto Transit Commission was registered for a 5L engine oil leak in 2014, located at the intersection of Meadow Ave and Victoria Park Ave, approximately 215 m west-southwest of the Project Area. ▪ 5 Lynndale Road was registered for an oil spill in 2007, located approximately 230 m southeast of the Project Area. ▪ 149 Courcelette Road was registered for a natural gas spill in 2023, located approximately 240 m south-southeast of the Project Area. ▪ Enbridge Gas Distribution Inc. was registered for a natural gas spill in 2012, located at 2 Northview Avenue, approximately 240 m west of the Project Area. ▪ 31 Annedale Road was registered for an 80L hydraulic oil spill in 2019, located approximately 245 m east of the Project Area. ▪ Enbridge Gas Distribution Inc. was registered for a natural gas spill in 2014, located at 27 Lynndale Crescent, approximately 250 m ease-southeast of the Project Area.
ORD	No records were associated for the Project Area or within the Study Area.

3.2.1.6 Waste Management Records

Ontario Regulation 347 Waste Generators Summary

The Ontario Regulation 347 Waste Generators Summary (GEN) includes any site, equipment or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated wastes is required to register the site and each waste produced, collected, handled or stored. The database contains the registration number, company name an address of registered generators including the type of hazardous wastes generated. Data on the type of facility is also include, such as drycleaners, waste treatment and disposal facilities, machine shops, electric power distribution, etc. The information is a summary of all years subsequent to 1986 to the most current available data. AllRock reviewed the GEN database, and no records were found for the Project Area; however, the following records were found for the adjacent properties:

- Greenwin Property Management located at 1140 Kingston Road was registered in the *Ontario Regulation 347 Waste Generators Summary* database as a generator (Generator #ON1662416) for heavy fuels, in 2005. This property is located immediately south of the Project Area and is situated hydraulically downgradient relative to the inferred groundwater flow direction. Based on AllRock's review of an internal Hazardous Waste Information Network (HWIN) database, approximately 3,000 kg of heavy fuels was generated in 2005. Based on the limited quantity of waste generated over the registration period, as well as the inferred groundwater flow direction, it is AllRock's opinion that this operation is not considered a PCA with respect to the Project Area.
- Rent-A-Wreck located at 1210 Kingston Road was registered in the *Ontario Regulation 347 Waste Generators Summary* database as a generator (Generator #ON0299800) for oil skimmings and sludges, and waste oils and lubricants from 1988 to 2001. This property is located 20 m southeast of the Project Area and is situated hydraulically downgradient relative to the inferred groundwater flow direction. Based on AllRock's review of an internal Hazardous Waste Information Network (HWIN) database approximately 13,825 kg of waste oils and lubricants, and 6,835 kg of oil skimmings and sludges were generated at this property from 1986 to 1992. Based on the limited quantity of waste generated over the registration period, as well as the inferred groundwater flow direction, it is AllRock's opinion that this operation is not considered a PCA with respect to the Project Area.
- Upper Beaches Dental located at 1120 Kingston Road, Unit 4, was registered in the *Ontario Regulation 347 Waste Generators Summary* database as a generator (Generator #ON8629110) for pathological wastes as of October 2022. This property is located 45 m southwest of the Project Area and is situated hydraulically transgradient relative to the inferred groundwater flow direction. Based on AllRock's review of an internal Hazardous Waste Information Network (HWIN) database,

no waste was generated by this registration number. Based on the fact that no waste was generated by this registration number, as well as the inferred groundwater flow direction, it is AllRock's opinion that this operation is not considered a PCA with respect to the Project Area.

Ontario Regulation 347 Waste Receivers Summary

The Ontario Regulation 347 Waste Receivers Summary (REC) includes any facility to which waste is transferred by a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database includes registered receivers or regulated wastes, identified by registration number, company name and address. Data on the type of facility is also included, such as landfill, incinerators, transfer stations, PCB storage sites, sludge farms and water pollution control plants. The information is a summary of all years subsequent to 1986 to the most current available data. AllRock reviewed the REC database, and no records were found for the Project Area and Study Area.

3.2.1.7 Retail Fuel Storage Tank Information

Select federal, provincial and private databases including, the Private and Retail Fuel Storage Tanks (PRT), Retail Fuel Storage Tanks (RST), Anderson's Storage Tanks (TANK), Transport Canada Fuel Storage Tanks (TCFT), Variances for Abandonment of Underground Storage Tanks (VAR), Aboveground Storage Tanks (AST), Commercial Fuel Oil Tanks (CFOT), Delisted Fuel Tanks (DTNK), Fuel Storage Tank – Historic (FSTH), Fuel Storage Tank (FST) were searched by ERIS. These databases contain information pertaining to historical and/or current chemical storage tanks, as well as private and retail storage tanks. These databases typically contain the location, operation type. AllRock reviewed the above-referenced databases and no records were found for the Project Area; however, the following records were found for the adjacent properties:

- Petro Canada Ltd, Good Enterprises Inc, and Siva's Gas Bar were located at 1121 Kingston Road, and was registered in the RST, PRT, FST, RST, FSTH and DTNK databases. Three (3) approximate 50,000 L gasoline USTs were installed at this property circa 2003 and one (1) 22,700 L liquid fuel tank was installed in 1976. This property is located 60 m south of the Project Area and is situated hydraulically downgradient of the Project Area relative to the inferred groundwater flow direction. It is AllRock's opinion that the presence of petroleum storage in fixed tanks would be considered a PCA (**28. Gasoline and Associated Products in Fixed Tanks)**, however based on the distance between the property to the Project Area, and the inferred groundwater flow direction, this property is not considered an APEC with respect to the Project Area; and
- Pioneer Petroleums Inc, Sunoco Inc. and 1132410 Ontario Ltd. were located at 1161 Kingston Road, and was registered in the RST, PRT, FST, RST, FSTH and DTNK databases. Four (4) gasoline USTs with a capacity ranging from 22,700 L to 36,300 L, were installed at this property circa 1985, and one (1) 27,000 L liquid fuel tank was installed in 1996. This property is located 60 m south of the Project Area and is situated hydraulically downgradient of the Project Area relative

to the inferred groundwater flow direction. It is AllRock's opinion that the presence of petroleum storage in fixed tanks would be considered a PCA (**28. Gasoline and Associated Products in Fixed Tanks)**, however based on the distance between the property to the Project Area, and the inferred groundwater flow direction, this property is not considered an APEC with respect to the Project Area; and

3.2.1.8 Notices and Instruments Including RSCs

The Environmental Registry (EBR) database was searched by ERIS. This database lists proposals, decisions and exemptions regarding policies, Acts, instruments or regulations that could significantly affect the environment. ERIS also searched the Record of Site Condition (RSC) database for filings in the Project Area. AllRock reviewed the above-referenced databases, and no records were found for the Project Area or Study Area.

However, as provided by the Client, a record of site condition was completed for the property located at present-day 170 Fallingbrook Road (RSC#223608). This property is located immediately south adjacent to the Project Area and was redeveloped from industrial to parkland land use. A Phase One ESA, Phase Two ESA, and remediation work was conducted to support the RSC filing. Further details regarding the investigation is provided in section 3.1.5 of this report.

3.2.1.9 Areas of Natural and Scientific Significance

ERIS reviewed available provincial databases and records for areas that represent lands and waters containing important natural landscapes or features that are important for natural heritage, protection, appreciation scientific study or education relating to Areas of Natural and Scientific Interests' (ANSI) for the Project Area and Study Area. The ANSI map is included in the ERIS report located in ***Appendix F***. In addition, AllRock also reviewed the ANSI data set published by Land Information Ontario (LIO), as well as various records provided on the Ministry of Natural Resources and Forestry Natural Heritage Information Centre (NHIC). Based on the information provided by ERIS, no ANSIs were identified within the Study Area.

3.2.1.10 Landfill and Waste Disposal Information

The provincial databases Landfill Inventory Management Ontario (LIMO), Waste Disposal Sites – MOE CA Inventory (WDS), Anderson's Waste Disposal Sites (ANDR), and the Waste Disposal Sites – MOE 1991 Historical Approval (WDSH) were reviewed by ERIS. These databases maintain an inventory of active, inactive and closed disposal sites in Ontario. AllRock reviewed the above-referenced databases, and the following records were identified for the Project Area:

- Clonmore and Blantyre Dump was registered in the ANDR database for an open-faced dump circa 1970. Based on the historical summary, the landfill was approximately 3.75 hectares and operated until 1994.

- Clonmore and Blantyre Avenue was registered in the WDSH database for the Project Area with a classification of A3 - Potential Human Impact- Urban Municipal/Domestic Waste <10 years with a closed status.

AllRock notes as per the 2017 OHE Phase Two ESA, “no physical evidence as the use of the property as a landfill was identified during Phase Two ESA, or remedial work at the property”.

It is AllRock’s opinion that the presence of a landfill within the Project Area would be considered a PCA (**58. Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners)**, resulting in an APEC at the Project Area.

3.2.2 Ministry of the Environment, Conservation and Parks FOI

A Freedom of Information Request was submitted to the MECP for information on file with respect to the Site. The MECP maintains a database containing environmental concerns, orders, chemical spills and/or leaks at the Project Area, C-of-A, ECAs, and other environmental issues that may have impacts the Project Area’s condition. At the time of writing this report, no response has been received by MECP. When a response is received, the information will be reviewed by AllRock and, if any evidence of actual or potential issues of environmental concern are noted, a copy of the response will be forwarded to Client under a separate cover. Our conclusions and recommendations may be amended based on this information. A copy of AllRock’s request to MECP is provided in ***Appendix E*** of this report.

3.2.3 Technical Standards and Safety Authority Search

A request for information pertaining to the Project Area was submitted to the Technical Standards & Safety Authority (TSSA). The TSSA maintains a database containing incidents and occurrence reports, the presence, specifications and permitting of petroleum storage tanks and environmental reports. At the time of writing this report, no response has been received by TSSA. When a response is received, the information will be reviewed by AllRock and, if any evidence of actual or potential issues of environmental concern are noted, a copy of the response will be forwarded to Client under a separate cover. Our conclusions and recommendations may be amended based on this information. A copy of AllRock’s request to MECP is provided in ***Appendix E*** of this report.

3.2.4 Property Underwriters’ Reports and Plans

AllRock contacted Opta Information Intelligence (Opta) to obtain copies of Property Underwriters’ Reports (PURs) and Property Underwriters’ Plans (PUPs) associated with the Project Area. However, no PURs or PUPs were available for the Project Area.

3.2.5 City Directories

AllRock contacted ERIS to obtain city directories (CDs) from the Library and Archives of Canada (LAC) in Ottawa, Ontario for the Project Area and Study Area. AllRock notes that no city directories were available

prior to 1919 or subsequent to 2021. Based on AllRock's review of the provided information, the following summarizes the occupant listings at the Project Area:

Table 3.2.5 – Project Area Occupants Summary

Year	Description
2017	Scarborough Blantyre Pool

Based on AllRock's review of the above-noted city directories, the following PCAs were identified within the Study Area:

Address	Occupant Summary
1121-23 Kingston Road	- Various RFOs and commercial auto body shops (Blantyre Service Station, Blantyre Automotive Co Ltd., Richie Supertest Service Station, BP Service Station, Petro Canada Service Station, Swais Auto Service Centre, KGF Auto SVC CTR LTD., Siva's Gas Bar, Spiros and Sons Automotive, 1038196 Ontario Corp.) occupied the property from circa 1935 to 2021 (**10. Commercial Auto Body Shops, 28. Gasoline and Associated Products in Fixed Tanks).** This property is located approximately 60 m southwest of the Project Area and situated hydraulically transgradient relative to the inferred groundwater flow direction.
1161 Kingston Road	- Various RFOs (Fallingbrook Service Station, Fallingbrook Sunco Station, Ireland's Sunoco Service Station, Guald's Service Station, Coveart Bob Sunoco Service Centre, Sunoco Service Station, Pioneer Gas Bar, Top Valu) occupied the property from circa 1955 to 2021 **(28. Gasoline and Associated Products in Fixed Tanks).** - Flynn's Auto, V Plus Service, Spiros & Sons Automotive Centre, occupied the property from circa 1995 to 2017 **(10. Commercial Auto Body Shops).** This property is located approximately 60 m south of the Project Area and situated hydraulically downgradient relative to the inferred groundwater flow direction.
1210 Kingston Road	- Keyser Motors Auto, occupied the property from circa 1955 to 1960, subsequently, Al's Esso Service Station Gas and Oil, occupied the property in circa 1975 (**28. Gasoline and Associated Products in Fixed Tanks).** - Auto- Care Service, Fallingbrook Auto Garage, Economy Car and Truck Rental, and Lakeside Brewery and Wine Inc. occupied this property from 1995 to 2000 **(10. Commercial Auto Body Shops).** This property is located 20 m southeast of the Project Area, resulting in an APEC in the Project Area.
1208 Kingston Road	Coin Laundry and Quick-Clean Coin Laundry occupied the property from circa 1965 to 1988 **(37. Operation of Dry-Cleaning Equipment (where chemicals are used))** This property is located 20 m southeast of the Project Area, resulting in an APEC in the Project Area.

3.3 Physical Setting Sources

3.3.1 Aerial Photographs

AllRock contacted ERIS to obtain aerial photographs for the Project Area, and Study Area. Copies of aerial photographs dated 1946, 1960, 1973, 1988 and 2022 were provided by ERIS and reviewed. In addition, AllRock reviewed copies of satellite imagery dated 2002, 2009, 2018, and 2024 as obtained from Google Earth™. A summary of inferred information with respect to the Project Area is provided in the following table:

Table 3-1 – Aerial Photographs Summary for the Project Area

Year	Observations at the Project Area
1946	The Project Area appears to be vacant and undeveloped.
1960	An apparent building was situated along the southeast portion of the Project Area. A fence line similar in size and orientation along the present-day baseball field is apparent, however poor resolution prevents clear discernment of the Project Area details.
1973, 1988, 2002, and 2009	Similar to 1960; however, a pool similar and size and configuration to the present-day is apparent.
2016	Similar to 2009; however, the Toronto Hydro Transformer Station adjacent to the Project Area has been removed.
2018, and 2021	Buildings similar in size and configuration to those of present-day are apparent within the Project Area.

Based on the municipal land use of the Project Area, as well as the adjacent roadways, it is anticipated that seasonal de-icing salts would be used for pedestrian and/or vehicular safety within the southern parking lot and asphalt pathway. The use of de-icing salts would be considered an PCA (**N/S – De-Icing Activities)**, resulting in an APEC for the Project Area; and

3.3.2 Topography, Hydrology, Geology

The elevation of the Project Area is approximately 130 meters above sea level (masl), based on information from the Ontario Base Mapping (OBM). The Project Area and Study Area generally slopes gradually downwards towards the southeast. Based on review of the Bedrock geology Report (#23121300911) by ERIS the subsurface consists of shale, limestone, dolostone and siltstone. A review of the physiographical and geological data indicated the Project Area and Study Area is located within the Iroquois Plains region and consisted of sand plains and beaches. AllRock notes the approximate depth to bedrock is unknown. The topographic maps provided in the OBM can be found in ***Appendix F***.

The nearest water body is Lake Ontario located approximately 750 m southeast of the Project Area. The inferred groundwater flow direction is southeast towards Lake Ontario.

3.3.3 Fill Materials

AllRock notes that based on the Geotechnical Investigation completed by AllRock and dated December 20, 2023, a layer of fill materials was encountered in all boreholes below the surficial topsoil. The fill material can generally be described as brown, fine to coarse grained sand with trace to some gravel and silt. The fill layer extends to depths ranging from approximately 0.5 to 3.05 meters below ground surface (mbgs). The presence of fill material of unknown quality within the Project Area would be considered an PCA (**30. Importation of Fill Material of Unknown Quality**), resulting in an APEC for the Project Area.

3.3.4 Water Bodies, Areas of Natural Significance & Groundwater Information

No waterbodies were identified at the Project Area; however, Lake Ontario is situated approximately 750 m southeast of the Project Area. ERIS reviewed available provincial databases and records for areas that represent lands and waters containing important natural landscapes or features that are important for natural heritage, protection, appreciation scientific study or education relating to ANSI for the Study Area. Based on the information provided by ERIS, no ANSIs were identified in the Project Area, or within the Study Area. The ANSI map is included in ***Appendix F***.

3.3.5 Well Records

A search of the Water Well Information System (WWIS) database was searched by ERIS. Based on the information provided by ERIS, three (3) wells were identified within the Project Area, and forty-one (41) wells were identified for the Study Area. Their approximate locations and associated records are found in ***Appendix D***. AllRock notes that no wells were observed at the time of the Project Area reconnaissance, and none were reported by the Site representative.

3.4 Site Operating Records

Site operating records were not reviewed as part of this APU as the Project Area is currently developed as a municipal park.

4.0 INTERVIEWS

A video-call interview was conducted for the Project Area on January 29th, 2024. The interview was conducted with Mr. Scott Chislett, a supervisor for the Toronto Parks Scarborough district. The following information was noted:

- To the best of interviewee knowledge, no spills, release, or environmental related impacts have occurred on the Project Area;
- Mr. Scott Chislett had no knowledge of the historic landfill use within the Project Area.
- Following the meeting, the AST within Site Building A was confirmed to be utilised as a sand filter for the pool system; and

- Based on the evaluation of information gleaned through Mr. Scott Chislett with data obtained by record review of historical documents, AllRock confirms that Mr. Scott is a reliable source for valid information about the Project Area.

5.0 SITE RECONNISSANCE

5.1 General

AllRock conducted a reconnaissance on January 5, 2024 (cloudy, -5° C) to visually inspect the Project Area for the presence of environmental concerns, surface soil staining, hazardous materials, chemicals and waste storage, operations and adjacent properties. At the time of the Site reconnaissance, the Project Area was developed with one (1) single storey building located on the northern portion of the Project Area associated with the pool facility (hereafter referred to as 'Site Building A'). In addition, one (1) single storey washroom facility was located at the southwest portion of the Project Area adjacent to the baseball field and horseshoe pit (hereafter referred to as 'Site Building B'). The central portion of the Project Area was undeveloped, with the exception of the central east boundary which was developed with a playground. The Site reconnaissance was completed by a member of AllRock (i.e., Erum Syed), under the direction of AllRock's QP overseeing this project. The Site reconnaissance was completed between the hours of 10:00 am and 1:00 pm. The reconnaissance was completed on foot and consisted of a walk-through of the Project Area and Study Area. The reconnaissance was documented with field notes and photographs, some photographs are attached in ***Appendix B*** of this report.

5.2 Specific Observations at the Project Area

5.2.1 Description of Buildings and Structures

Table 6.2.1 – Building Description for the Project Area

Building/Structures	Age of the Building/Structure	Description of the Building/Structure
Site Building A	Circa 1973 based on aerial photographs reviewed.	A single storey building associated with the pool facility, containing a washroom facility, changeroom facility and maintenance room.
Site Building B	Circa 1988 based on aerial photographs reviewed.	A single-storey public washroom facility.

5.2.2 Description of Below-Ground Structures

No below ground levels were observed within the Site Buildings at the time of the Site reconnaissance, and none were reported by the Site Representative.

5.2.3 Description of Tanks

One (1) above ground storage tank (AST) was observed at the Project Area located within Site Building A at the time of the Site reconnaissance. The AST was a single wall, steel tank with an unknown capacity. At the time of the Site reconnaissance no staining was observed in the vicinity of the AST and no spills were reported by the Site Representative. The concrete floor was observed to be in good condition (i.e., no

cracking and/or pitting). AllRock notes the Site representative reported the AST was associated with the pool filtration system.

5.2.4 Potable and Non-Potable Water Sources

No potable or non-potable water sources were observed within the Project Area at the time of the Site reconnaissance, and none were reported by the Site Representative.

5.2.5 Description and Location of Underground Utilities

It is anticipated that underground utilities and corridors are present at the Project Area to connect the Site Buildings and baseball field lights to municipal and private services. Some overhead utility services were observed at the time of the reconnaissance.

5.2.6 Details of Heating System

No heating system was observed during the reconnaissance.

5.2.7 Details of Cooling System

No cooling system was observed during the reconnaissance.

5.2.8 Details of Drains, Pits and Sumps

Storm sewers were observed in the southern parking lot at the Project Area.

5.2.9 Unidentified Substances in Buildings and Structures

Chlorine, cleaning solutions and various pool maintenance equipment were observed in their original containers located in various locations of Site Building A.

5.2.10 Details of Staining and Corrosion

During the Site reconnaissance, AllRock did not observe any staining or corrosion at the Site.

5.2.11 Details of On-Site Wells

No wells were observed within the Project Area at the time of the Site Reconnaissance, and none were reported by the Site Representative.

5.2.12 Details of Sewage Works

The Project Area is inferred to be serviced by municipal storm sewers.

5.2.13 Details of Ground Cover

The Project Area was primarily covered by vegetated groundcover, however the playground area contained sand, and the south parking area and pool entrance sidewalk contained asphalt.

5.2.14 Details of Current or Former Railway Lines

No current or former railway lines were observed within the Project Area.

5.2.15 Areas of Stained soil, Vegetation, and Pavement

No areas of staining or stressed vegetation were observed at the Project Area during the Site reconnaissance.

5.2.16 Areas of Fill and Debris Materials

No obvious areas of fill or debris materials were observed at the Project Area; and none were reported by the Site Representative.

5.2.17 Unidentified Substances Outside Buildings and Structures

There were no unidentified substances observed within the Project Area.

5.2.18 Potentially Contaminating Activities

A PCA is defined by O. Reg 153/04 as a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in the Study Area, including the Project Area. The PCAs observed at the Project Area during the Site reconnaissance. Details pertaining to these PCAs are provided in the previous sections of this report, and as further summarized in Section 7.0

5.2.19 Surrounding Land Uses

At the time of the Site reconnaissance, AllRock completed an assessment by observing properties within the Study Area from publicly accessible areas. The surrounding properties generally consisted of commercial land uses. The following summarizes the adjacent properties:

6-12– Surrounding Properties Summary

Direction	Description	Inferred Groundwater Gradient Relative to the Site	Observable Chemicals or Hazardous Wastes
North	Clonmore Drive, followed by the Church of God, and residential properties.	Up/transgradient	None observed.
East	Fallingbrook Road, followed by residential properties.	Down/transgradient.	None observed.
South	Multi-unit commercial (i.e. Fallingbrook Wellness Inc., Beaches-Fallingbrook Veterinary Clinic, etc.) and Multi-tenant residential apartments followed by Kingston road and additional commercial properties (i.e. Petro-Canada, RBC bank, etc.)	Downgradient	None observed.
West	Blantyre Avenue, followed by residential properties.	Up/transgradient	None observed.

5.3 Enhanced Investigation Property

Based on a historical review of the Project Area, the Project Area operated as a municipal landfill from circa 1970 to 1994. Given the historical industrial operations within the Project Area, the Project Area is considered an enhanced investigation property in accordance with subsection 32. (1) (b) of O. Reg. 153/04. As such the investigation was carried out following the stipulated requirements for enhanced investigation properties as outlined in subsection 13(3) of O. Reg. 153/04 summarized in the table below:

Subject	Description	Source
1. Operations at the property, including processing or manufacturing.	None observed and none reported by the Site representative.	Reconnaissance and historical records review.
2. Hazardous materials used or stored at the Project Area	None observed and none reported by the Site representative.	Reconnaissance and historical records review.
3. Products manufactured at the Project Area	None observed and none reported by the Site representative.	Reconnaissance and historical records review.
4. By-products and wastes at the Project Area	None observed and none reported by the Site representative.	Reconnaissance and historical records review.
5. raw materials handling and storage locations at the Project Area	None observed and none reported by the Site representative.	Reconnaissance and historical records review.
6. Location and contents of drums, totes, and bins at the Project Area	None observed and none reported by the Site representative.	Reconnaissance and historical records review.
7. Details of all oil/water separators, at the Project Area, including for each separator, the location, installation date, source of incoming liquid and effluent discharge location.	None observed and none reported by the Site representative.	Reconnaissance and historical records review.
8. All vehicle and equipment maintenance areas, including the locations of maintenance, fluid storage, and waste storage areas.	None observed and none reported by the Site representative.	Reconnaissance and historical records review.
9. Details of spills including the dates, locations, materials involved, and volumes of materials spilled.	None observed and none reported by the Site representative.	Reconnaissance and historical records review.
10. Details of liquid discharge points such as water and French drains, including their locations.	None observed and none reported by the Site representative.	Reconnaissance and historical records review.
11. Details of all hydraulic lift equipment at the property, including elevators, in-ground hoists, and loading docks.	None observed and none reported by the Site representative.	Reconnaissance and historical records review.

5.4 Written Description of Investigation

This APU completed by AllRock included the investigation of the Project Area and the Study Area pursuant to Sections 13 and 14 of Schedule D of O. Reg. 153/04. The main objective of this investigation was to identify PCAs at the Project Area or within the Study Area that could have resulted in APECs at

the Project Area. AllRock notes that as per O. Reg. 153/04, all identified PCAs at the Project Area are considered APECs.

The investigation consisted of the following:

Project Area

- Review of available historical records, including FIPs, ERIS Regulatory search, information obtained through the MECP and TSSA requests, city directories and aerial photographs.
- Review of available maps provided by ERIS and information published online by the MNRF for the presence of an ANSI.
- A Site reconnaissance was completed on January 5, 2024 by Erum Syed of AllRock that included the assessment of the Project Area.

Study Area (Outside of the Project Area)

- Review of available historical records, including FIPs, ERIS Regulatory search, city directories and aerial photographs.
- Review of available maps provided by ERIS and information published online by the MNRF for the presence of an ANSI.
- Visual observations and inspections from publicly accessible areas for evidence of PCAs and waterbodies.

AllRock's investigation of the Project Area identified three (3) PCAs and the investigation of the Study Area identified seven (7) PCAs that have the potential to impact soil quality at the Project Area. The location and details of which are provided on the figures and in Section 7.2 of this report. The APECs associated with these are further discussed in Section 7.3 of this report.

No ANSIs were identified at the Project Area or Study Area. The presence of wells at the Project Area and within the Study Area that currently supply water for human consumption or for agricultural purposes were not identified as part of this investigation.

6.0 REVIEW AND EVALUATION OF INFORMATION

6.1 Current and Past Uses

To be best of AllRock's knowledge, the date of first developed use of the Project Area is approximately 1835 for residential land use of the Project Area. This was determined through review of past reports, aerial photographs, and FIPs. A summary of the current and past uses of the Project Area are presented below:

Table 6.1 – Current and Past Uses

Year	Name of Owner	Property Use	Other Observations from Records Review
May 1835 to May 1865	King's College	Institutional	Based on 2017 OHE Phase One ESA title search

May 1865 to July 1938	Various landowners	Residential	Based on 2017 OHE Phase One ESA title search
1938 to 1970	Scarborough Township	Parkland	Based on 2017 OHE Phase One ESA title search, and aerial photographs and FIPs.
Circa 1970 to 1994	Scarborough Township	Industrial	Based on records review of ANDR and WDSH databases.
1994 to Present Day	Scarborough Township	Parkland	Based on Site Reconnaissance, and aerials photographs.

6.2 Potentially Contaminating Activity

The details and locations of all PCAs as defined by Ontario Regulation 153/04 that were identified by AllRock at the Project Area and within the Study Area are summarized in the below table:

Table 6.2 – Potentially Contaminating Activities

PCA Designation	PCA Description	Location	Contributing to an APEC? (Yes/No)
PCA #1	**Item #58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners** Based on the ANDR and WDSH databases, the Project Area functioned as a landfill circa 1970.	Project Area	Yes
PCA #2	**Item #N/S – De-icing Activities** Based on the municipal use of the Project Area, it is anticipated that seasonal de-icing salts would have been used.	Project Area	Yes
PCA #3	**Item #30 – Importation of Fill Material of Unknown Quality** Based on the 2023 Geotechnical Investigation, fill material of unknown quality was identified in all boreholes, to a depth of approximately 3.05 mbgs.	Project Area	Yes
PCA #4	**Item #55- Transformer Manufacturing, Processing and Use** Based on the aerial photographs and 2017 OHE Phase One ESA, a former transformer station was located immediately south of the Project Area from circa 1960 to 2017.	Study Area	No
PCA #5	**Item #28 – Gasoline and associated products in fixed tanks.** Based on the 1934 FIP, a single UST was located at 207 Blantyre Ave. This property is located immediately south of the Project Area.	Study Area	Yes

PCA #6	**Item #28 – Gasoline and associated products in fixed tanks** Based on the CDs, and FIPs, an RFO was apparent at 1210 Kingston Road with two (2) USTs. This property is located 20 m southeast of the Project Area.	Study Area	Yes
	Item #10 – Commercial Autobody Shops Based on the CDs, an autobody shop, occupied 1210 Kingston Road from circa 1995 to 2000. This property is located 20 m southeast of the Project Area.	Study Area	Yes
PCA #7	**Item #37 – Operation of Dry-Cleaning Equipment** Based on the CDs, a dry-cleaning operation was identified at 1208 Kingston Road. This property is located 20 m southeast of the Project Area.	Study Area	Yes
PCA #8	**Item #37 – Operation of Dry-Cleaning Equipment** Based on the 1939 FIP, a dry-cleaning operation was identified approximately at present-day 289 Blantyre Ave. This property is located approximately 211 m north-northwest of the property	Study Area	No
PCA #9	**Item #10 – Commercial Autobody Shops** Based on the 1934 FIP, an autobody shop was situated at present-day 1120 Kingston Road. This property is located 125 m southwest and is situated hydraulically transgradient.	Study Area	No
	Item #28 – Gasoline and associated products in fixed tanks Based on the 1934 FIP, two (2) USTs were apparent at present-day 1120 Kingston Road. This property is located 125 m southwest and is situated hydraulically transgradient.	Study Area	No
PCA #10	**Item #28 – Gasoline and associated products in fixed tanks** Based on the records review, CDs, and FIPs, a RFO was apparent at inferred present-day 1121-3 Kingston Road with two (2) USTs. This property located approximately 60 m southwest of the Project Area and situated hydraulically downgradient.	Study Area	No
	Item #10 – Commercial Autobody Shops Based on the CDs, an autobody shop, occupied 1121-23 Kingston Road circa 1935 to 2021. This property is located approximately 60 m south of the Project Area and situated hydraulically downgradient	Study Area	No
PCA #11	**Item #28 – Gasoline and associated products in fixed tanks** Based on the records review, CDs, and FIPs, an RFO was apparent at 1161 Kingston Road with two (2) USTs. This property is located approximately 60 m south of the Project Area and situated hydraulically downgradient.	Study Area	No
	Item #N/S – Petroleum Spill	Study Area	No

	Two (2) petroleum spills were recorded at 1161 Kingston Road in 1989 for an unknown quantity and 2001 for 20 L. This property is located approximately 60 m south of the Project Area and situated hydraulically downgradient		
	Item #10 – Commercial Autobody Shops Based on the CDs, an autobody shop, occupied the property from circa 1995 to 2017. This property is located approximately 60 m south of the Project Area and situated hydraulically downgradient	Study Area	No

6.3 Areas of Potential Environmental Concern

The APECs identified during the APU, as well as the respective PCAs, contaminants of potential concern (COPCs) and the media that could potentially be impacted is summarized in the below table:

Table 6.3 – Areas of Potential Environmental Concern

APEC	Location of APEC on Project Area	PCA	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted
APEC #1 *(Historical Landfill Operations)*	Entire Project Area	**Item #58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners**	On-Site	PHCs, BTEX, VOC, PAH, PCBs, Metals and Inorganics	Soil
APEC #2 *(De-icing activities)*	Southern and central portion of the Project Area	**Item #N/S – De-icing Activities**	On-Site	EC and SAR	Soil
APEC #3 *(Fill materials)*	Entire Project Area	**Item #30 – Importation of Fill Material of Unknown Quality**	On-Site	PHCs, VOCs, PAHs, Metals and Inorganics	Soil
APEC #4 *(UST at 207 Blantyre Ave)*	Southwest portion of the Project Area	**Item #28 – Gasoline and associated products in fixed tanks**	Off-Site	PHCs, BTEX, Metals (Lead)	Soil
APEC #5 *RFO and autobody operations at 1210 Kingston Road*	Southeast portion of the Project Area	**Item #28 – Gasoline and associated products in fixed tanks**	Off-Site	PHCs, BTEX, Metals (Lead)	Soil
		Item #10 – Commercial Autobody Shops	Off-Site	PHCs, VOCs, PAHs, Metals and Inorganics	Soil

APEC #6 *(Drycleaning operations at 1208 Kingston Road)*	Southeast portion of the Project Area	**Item #37 – Operation of Dry-Cleaning Equipment**	Off-Site	VOCs	Soil

Legend:
PHCs – Petroleum Hydrocarbons in the F1-F4 (F1-F4) fraction range
BTEX – Benzene, Toluene, Ethylbenzene and xylenes
PAHs – Polycyclic aromatic Hydrocarbons
VOCs – Volatile organic compounds
PCBs – Polychlorinated biphenyls

6.4 Conceptual Site Model

6.4.1 Drawings

Figures of the Study Area are provided in ***Appendix A*** which illustrate the following features within the Study Area:

- Any existing buildings and structures;
- Water bodies located in whole or in part on the Study Area;
- Areas of natural significance located in whole or in part on the Study Area;
- Drinking water wells at the Project Area;
- Roads within the Study Area;
- Land uses of adjacent properties;
- PCAs at the Study Area, including tanks in such areas; and
- APECs at the Project Area.

6.4.2 Description and Assessment

The following provides a narrative summary of the Conceptual Site Model:

- The Project Area is an approximate 2.57 hectares (6.34 acres) irregular shaped parcel surrounded by Blantyre Avenue, Clonmore Drive, and Fallingbrook Road, approximately 50 meter north of the intersection between Kingston Road and Fallingbrook Road, in Scarborough, Ontario.
- No water bodies are located within the Project Area; however, Lake Ontario is located approximately 750 m southeast.
- No areas of natural significance were located within the Project Area.
- Underground utilities have the potential to affect contaminant distribution and transport through their respective corridors. Private utilities are anticipated that underground utilities and corridors are present at the Project Area to connect the Site Buildings to municipal and private services. Some overhead utility services were observed at the time of the Site reconnaissance.

- The immediate area surrounding the Project Area generally consists of residential and commercial land uses.
- Four (4) PCAs were identified within the Project Area (On-Site), and seven (7) PCAs were identified within the Study Area (Off-Site) which resulted in six (6) APECs identified for the Project Area. It is AllRock's opinion that these APECs may have resulted in potential soil contamination;
- The Project Area and surrounding Study Area are located within shale, dolostone, limestone and siltstone; and
- The Project Area is approximately 130 meters above sea level (masl), and slopes gradually downwards towards southeast towards Lake Ontario.

7.0 CONCLUSIONS

AllRock identified a total of three (3) PCAs within the Project Area (On-Site), and eight (8) PCAs within the Study Area (Off-Site), of which a total of six (6) APECs were identified for the Project Area. It is AllRock's opinion that these APECs may have resulted in potential subsurface impacts.

Based on the findings of this APU, AllRock recommends completing a sampling and analysis plan (SAP) as well as a soil characterization report (SCR) to determine the soil quality beneath the Project Area.

7.1 Certification and Signatures

This APU was conducted under the supervision of Scott Allen, P.Eng, $QP_{ESA.}$ The conclusions and recommendations provided in this report have been prepared based on historical information, interviews, as well as observations during the site reconnaissance for the purpose of conducting an APU. The QP certifies that:

- The Project Leader has provided the QP with all necessary information and access to the Project Area and authorized the QP to make any inquiries of the Project Leader and/or Operator's employees and agents for the purpose of assisting the QP in the preparation of this report;
- That the QP has reviewed the contents of this report: and
- To the best of the QP's knowledge, the report is complete and accurate and meets the requirements of the Excess Soil Regulation and the associated Excess Soil Rules.

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7.2 Terms and Limitations

This APU was prepared for the exclusive use of Cherie NG Architect Inc.. This APU was preformed to outline evidence of actual or potential issues of environmental concern for the Site located at Blantyre Park, Scarborough, ON, at the time of the Site reconnaissance. This APU was performed in general to Part VII and Schedule D of O. Reg. 153/04 for the purpose of assessing potential presence of environmental impacts at the Phase One property. The scope of work for this APU did not include tasks for sample gathering, laboratory testing, or intrusive testing of any kind, including but not limited to designated substances, and therefore these materials may be present within concealed areas.

AllRock will not be held responsible for the use of this report by any third party, or reliance on or any decision to be made based on it without the prior written consent of AllRock. Any use a third party makes of this report, or any reliance on or decisions to be made based on it, is the sole responsibility of such third parties. AllRock accepts no liability or responsibility of loss, injury, claim or damages suffered by any third party as a result of decisions made or actions conducted.

The evaluation and conclusions contained within this report have been prepared based on readily available documents, records, and information furnished by individuals noted in the report, at the time of the Site reconnaissance. AllRock has relied in good faith on the information provided and has assumed that information provided is factual and accurate. AllRock accepts no responsibility of any deficiency or inaccuracy in this report as a result of omissions, misstatements, misrepresentation or fraudulent acts of persons interviewed or contacted.

Ontario Regulation 153/04 does not apply to environmental auditing or environmental management systems. Therefore, with respect to Site operations and conditions, compliance with applicable Federal, Provincial or Municipal acts, regulations, laws and/or statutes was not evaluated as part of the APU.

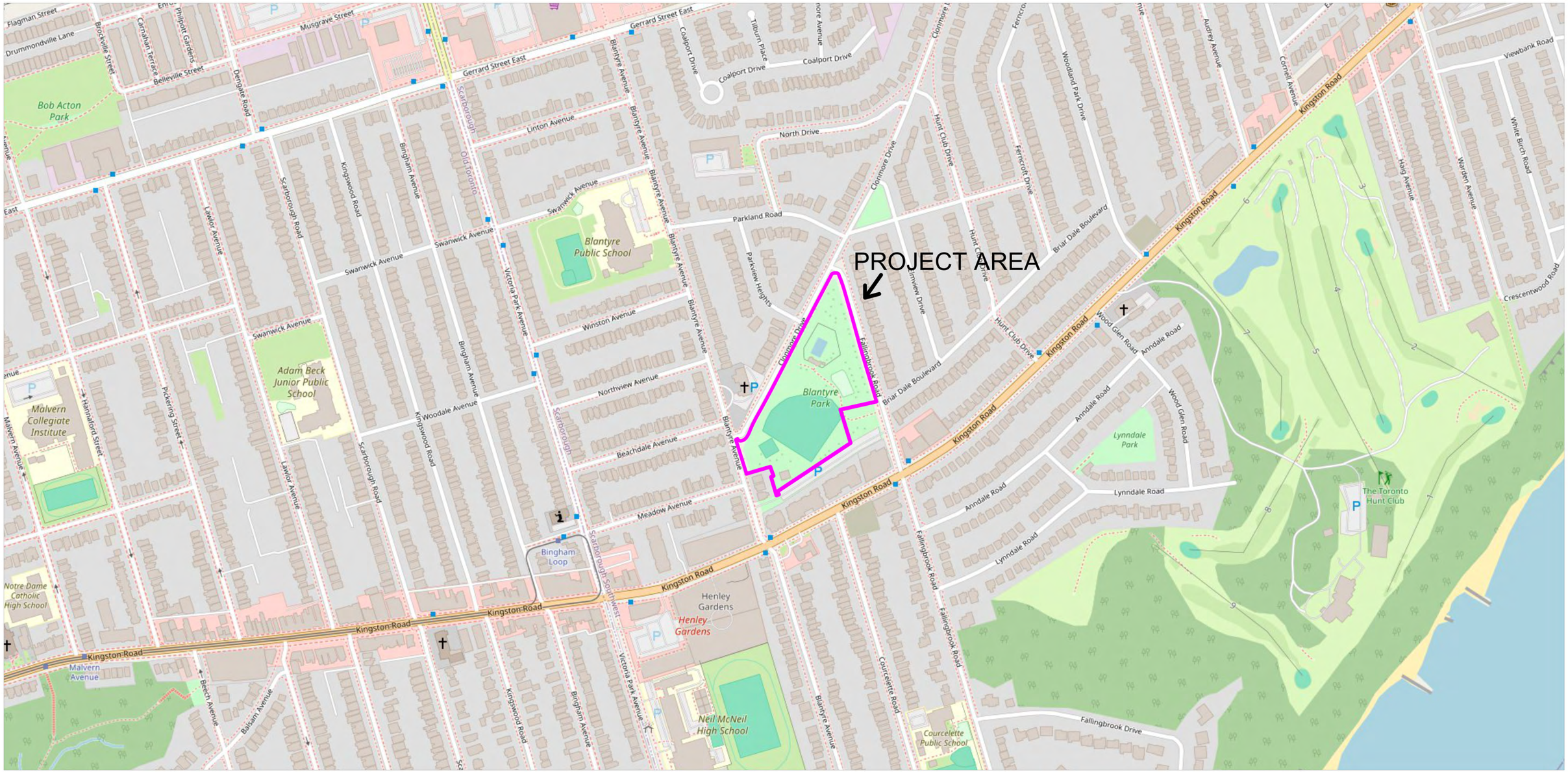
8.0 REFERENCES

Documents, persons and organizations providing information used in this report are listed below:

1. ERIS report entitled "*Blantyre Park, 180 Fallingbrook Road, Scarborough, ON M1N 1N3, 23376",* dated December 18, 2023 (ERIS Project #23121300911).
2. Opta Information Intelligence "*180 Fallingbrook Road, Scarborough, ON",* dated December 22, 2023 (ERIS Project #23121300911).
3. Google Earth™.
4. Ontario Ministry of Natural Resources and Forestry (MNRF). 2015. Natural Heritage Areas.
5. Canadian Standards Association (CSA) Standard. *CSA Z768-01, Phase I Environmental Site Assessment*, Canadian Standards Association International, November 2001, reaffirmed in 2016.
6. MECP Brownfields Environmental Site Registry.
7. Technical Standards & Safety Authority.
8. Ministry of Environment, Conservation, Parks.

APPENDIX A

Figures



LEGEND:

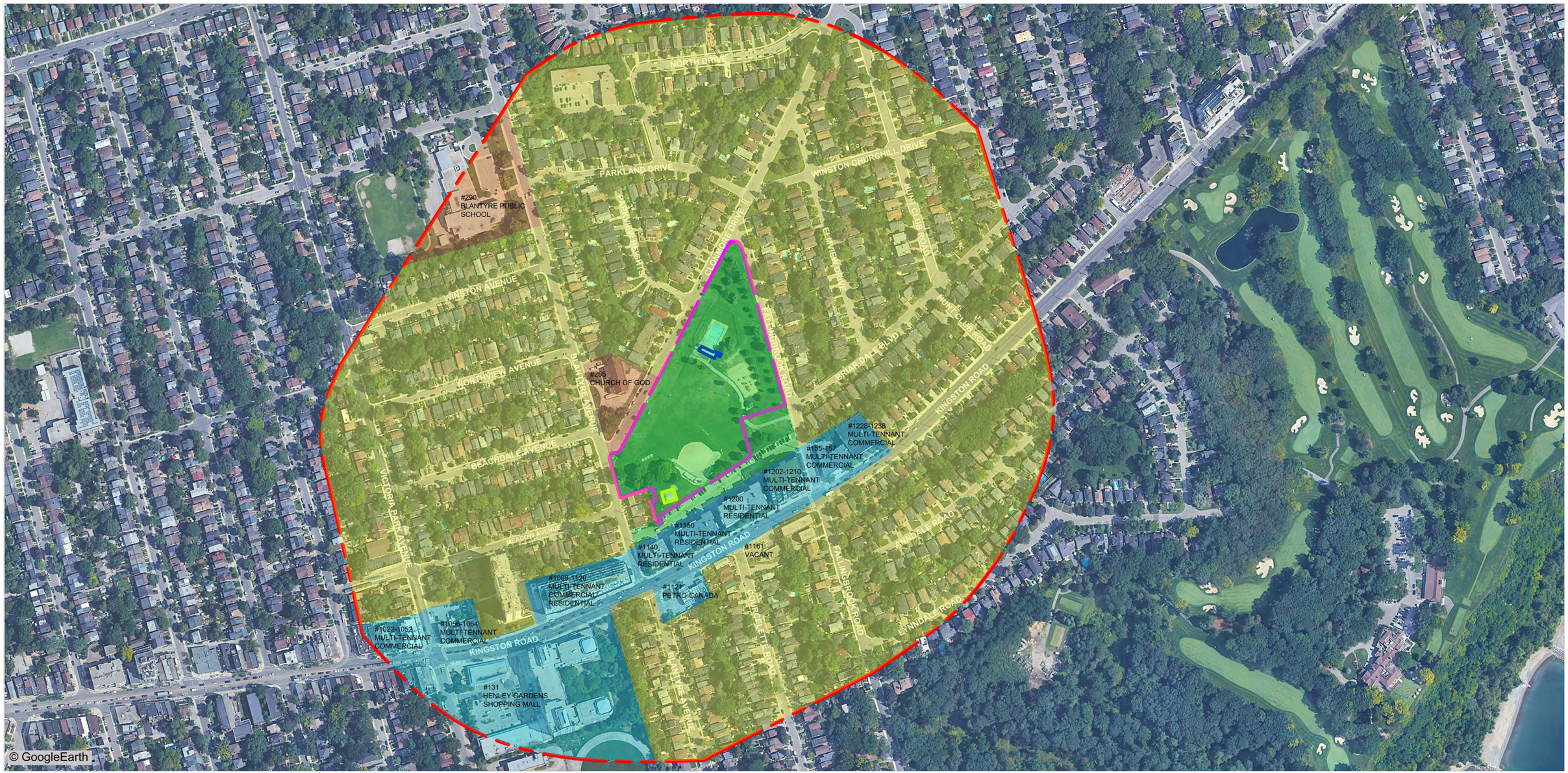
PROJECT AREA

N

FIGURE TITLE:	KEY MAP
PROJECT:	ASSESSMENT OF PAST USES
CLIENT:	CHERIE NG ARCHITECT INC.
ADDRESS:	180 FALLINGBROOK ROAD, SCARBOROUGH, ON
PROJECT NO: 23376	APPROXIMATE SCALE: NTS

AllRock Consulting Ltd

DATE: FEB. 2024	FIGURE NO.: 1
DRAWN BY: TM	CHECKED BY: NM



LEGEND:

- PROJECT AREA
- APU STUDY AREA
- SITE BUILDING A
- SITE BUILDING B
- COMMERCIAL LAND USE
- RESIDENTIAL LAND USE
- PARKLAND LAND USE
- INSTITUTIONAL LAND USE

N

FIGURE TITLE:	APU STUDY AREA
PROJECT:	ASSESSMENT OF PAST USES
CLIENT:	CHERIE NG ARCHITECT INC.
ADDRESS:	180 FALLINGBROOK ROAD, SCARBOROUGH, ON
PROJECT NO:	23376
APPROXIMATE SCALE:	NTS

AllRock Consulting Ltd

DATE: FEB. 2024	FIGURE NO.: 2
DRAWN BY: TM	CHECKED BY: NM

POTENTIALLY CONTAMINATING ACTIVITIES

1. PCA-1 (ITEM #58 WASTE DISPOSAL AND WASTE MANAGEMENT, INCLUDING THERMAL TREATMENT, LANDFILLING AND TRANSFER OF WASTE, OTHER THAN USE OF BIOSOILS AS SOIL CONDITIONERS.)
2. PCA-2 (ITEM #N/S - DE-ICING ACTIVITIES)
3. PCA-3 (ITEM #30 - FILL MATERIAL OF UNKNOWN QUALITY)
4. PCA-4 (ITEM#55 - TRANSFORMER MANUFACTORING, PROCESSING, AND USE)
5. PCA-5 (ITEM#28 - GASOLINE AND ASSOCIATED PRODUCTS IN FIXED TANKS)
6. PCA-6 (ITEM#28 - GASOLINE AND ASSOCIATED PRODUCTS IN FIXED TANKS, ITEM#10 - COMMERICAL AUTOBODY SHOP)
7. PCA-7 (ITEM #37 - OPERATION OF DRY CLEANING EQUIPMENT)
8. PCA-8 (ITEM #37 - OPERATION OF DRY CLEANING EQUIPMENT)
9. PCA-9 (ITEM#10 - COMMERICAL AUTOBODY SHOP, ITEM#28 - GASOLINE AND ASSOCIATED PRODUCTS IN FIXED TANKS)
10. PCA-10 (ITEM#28 - GASOLINE AND ASSOCIATED PRODUCTS IN FIXED TANKS, ITEM#10 - COMMERICAL AUTOBODY SHOP)
11. PCA-11 (ITEM#28 - GASOLINE AND ASSOCIATED PRODUCTS IN FIXED TANKS, ITEM#10 - COMMERICAL AUTOBODY SHOP, ITEM#N/S - PETROLEUM SPILL)

LEGEND:

- PROJECT AREA
- APU STUDY AREA
- SITE BUILDING A
- SITE BUILDING B
- APPROXIMATE LOCATION OF UST
- APPROXIMATE LOCATION OF AST

N

FIGURE TITLE:	POTENTIAL CONTAMINATING ACTIVITIES
PROJECT:	ASSESSMENT OF PAST USES
CLIENT:	CHERIE NG ARCHITECT INC.
ADDRESS:	180 FALLINGBROOK ROAD, SCARBOROUGH, ON
PROJECT NO:	23376
APPROXIMATE SCALE:	NTS

AllRock Consulting Ltd

DATE: FEB. 2024	FIGURE NO.: 3
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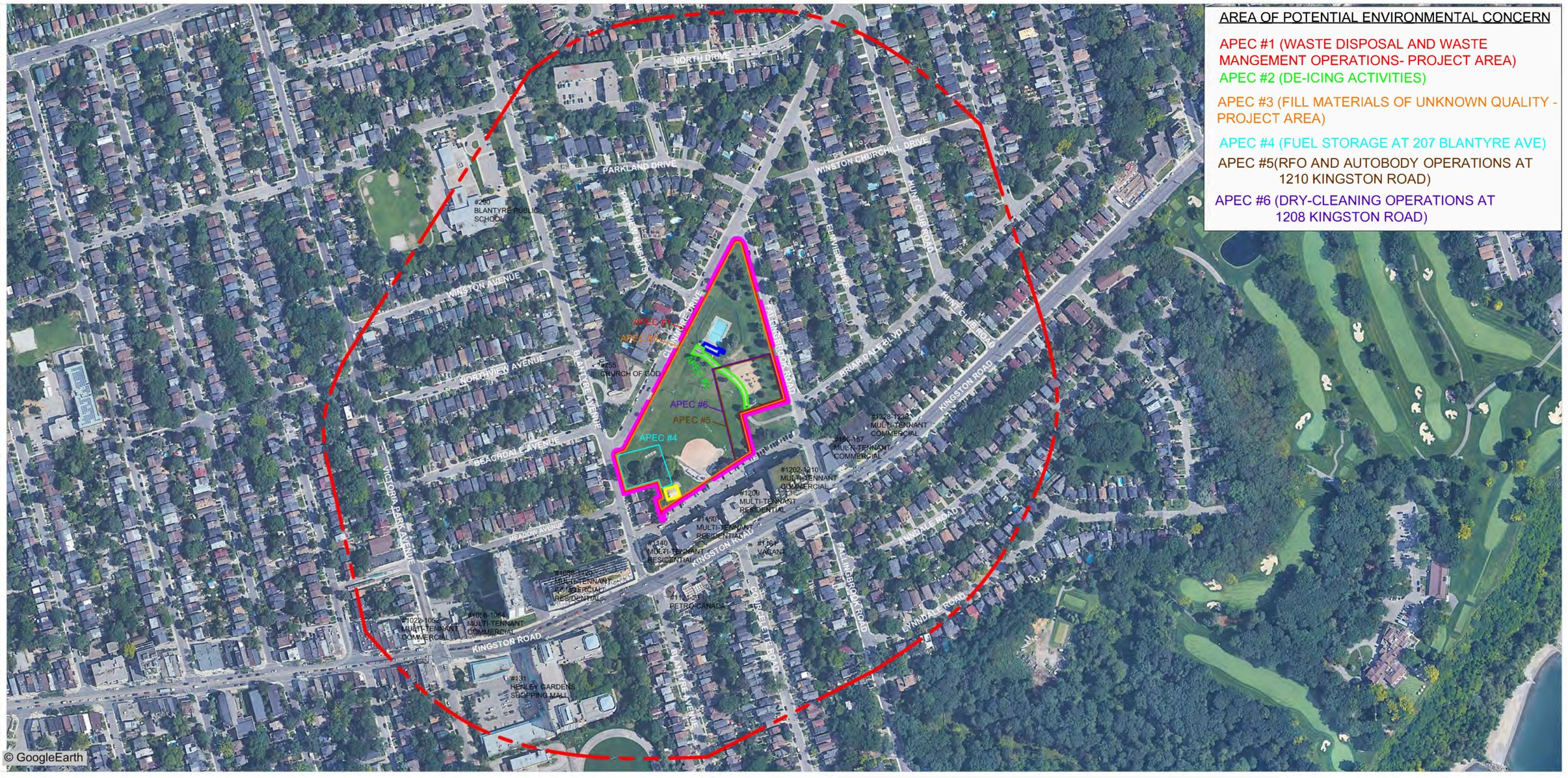

LEGEND:

- PROJECT AREA
- APU STUDY AREA
- SITE BUILDING A
- SITE BUILDING B

N

FIGURE TITLE:	AREA OF POTENTIAL ENVIRONMENTAL CONCERN
PROJECT:	ASSESSMENT OF PAST USES
CLIENT:	CHERIE NG ARCHITECT INC.
ADDRESS:	180 FALLINGBROOK ROAD, SCARBOROUGH, ON
PROJECT NO:	23376
APPROXIMATE SCALE:	NTS

AllRock Consulting Ltd

DATE: FEB. 2024	FIGURE NO.: 4
DRAWN BY: TM	CHECKED BY: NM

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APPENDIX B

Photos

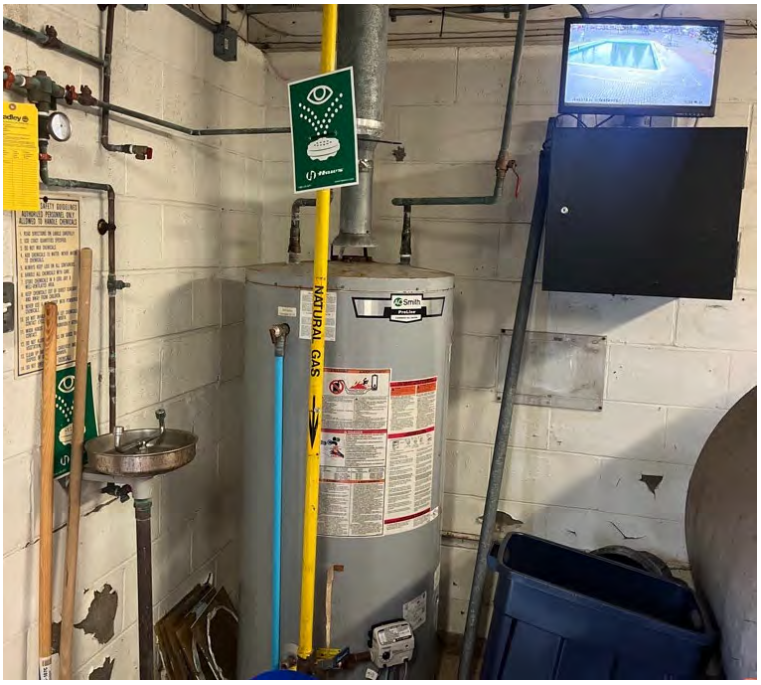

Photo 1 – Typical View of Pool Maintenance Room

Photo 2 – AST for Pool Filtration

Photo 3 – South view of pool maintenance room within Site Building A

Photo 4 – Pipe system with Site Building A

AllRock Consulting Ltd

APPENDIX C

OPTA

opta
INFORMATION INTELLIGENCE

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175 Commerce Valley Drive W
Markham, Ontario L3T 7Z3

T: 1 877 244 9437
W: optaintel.ca

Stephanie

Site Address:

180 Fallingbrook Road Scarborough ON

Project No:

23121300911

Opta Order ID:

138222

Requested by:

Eleanor Goolab
Ecolog Eris

Date Completed:

12/22/2023 2:08:13 PM

Project Name: Blantyre Park

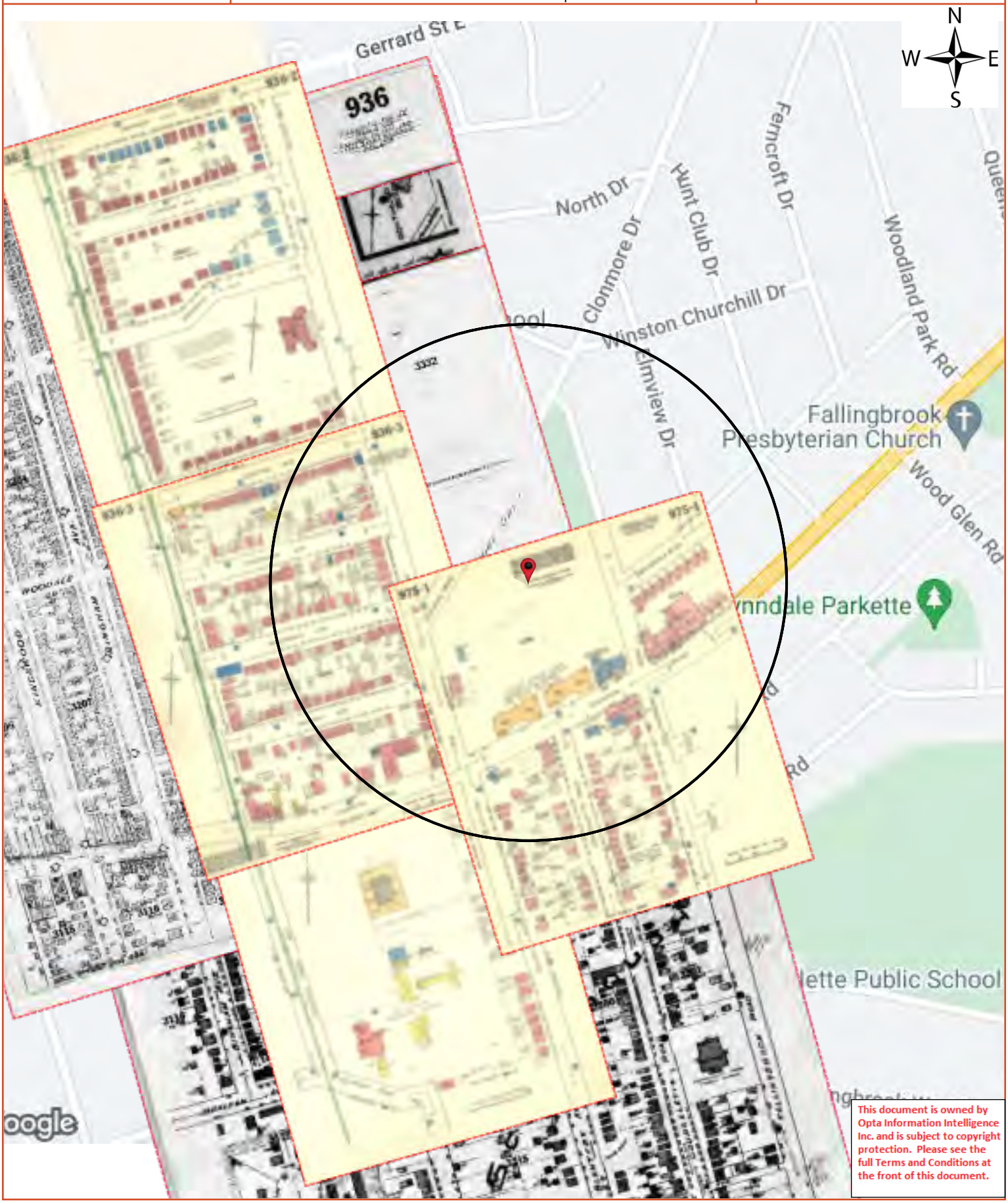
Project #: 23121300911
P.O. #: 23376

ENVIROSCAN Report

Search Area: 180 Fallingbrook Road Scarborough ON

Requested by:
Eleanor Goolab
Date Completed: 12/22/2023 14:08:13

enviroscan
OPTA INFORMATION INTELLIGENCE



Opta Historical Environmental Services Enviroscan™ Terms and Conditions

Report

The documents (hereinafter referred to as the "Documents") to be released as part of the report (hereinafter referred to as the "Report") to be delivered to the purchaser as set out above are documents in Opta's records relating to the described property (hereinafter referred to as the "Property"). Opta makes no representations or warranties respecting the Documents whatsoever, including, without limitation, with respect to the completeness, accuracy or usefulness of the Documents, and does not represent or warrant that these are the only plans and reports prepared in association with the Property or in Opta's possession at the time of Report delivery to the purchaser. The Documents are current as of the date(s) indicated on them. Interpretation of the Documents, if any, is by inference based upon the information which is apparent and obvious on the face of the Documents only. Opta does not represent, warrant or guarantee that interpretations other than those referred to do not exist from other sources. The Report will be prepared for use by the purchaser of the services as shown above hereof only.

Disclaimer

Opta disclaims responsibility for any losses or damages of any kind whatsoever, whether consequential or other, however caused, incurred or suffered, arising directly or indirectly as a result of the services (which services include, but are not limited to, the preparation of the Report provided hereunder), including but not limited to, any losses or damages arising directly or indirectly from any breach of contract, fundamental or otherwise, from reliance on Opta Reports or from any tortious acts or omissions of Opta's agents, employees or representatives.

Entire Agreement

The parties hereto acknowledge and agree to be bound by the terms and conditions hereof. The request form constitutes the entire agreement between the parties pertaining to the subject matter hereof and supersedes all prior and contemporaneous agreements, negotiations and discussions, whether oral or written, and there are no representations or warranties, or other agreements between the parties in connection with the subject matter hereof except as specifically set forth herein. No supplement, modification, waiver, or termination of the request shall be binding, unless confirmed in writing by the parties hereto.

Governing Document

In the event of any conflicts or inconsistencies between the provisions hereof and the Reports, the rights and obligations of the parties shall be deemed to be governed by the request form, which shall be the paramount document.

Law

This agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein.

ENVIROSCAN Report

Report Index

Requested by:
Eleanor Goolab
Date Completed: 12/22/2023 14:08:13

OPTA INFORMATION INTELLIGENCE

Page	Report Title
6	(1934) Volume: Toronto Volume 9 Firemap: 928
8	(1934) Volume: Toronto Volume 9 Firemap: 936
10	(1939) Volume: Toronto Volume 9 Firemap: 936
12	(1939) Volume: Toronto Volume 9 Firemap: 936
14	(1956) Volume: Toronto Volume 9 Part 1 Firemap: 928-2
16	(1956) Volume: Toronto Volume 9 Part 1 Firemap: 936-2
18	(1956) Volume: Toronto Volume 9 Part 1 Firemap: 936-3
20	(1956) Volume: Toronto Volume 9 Part 2 Firemap: 975-1

Project Name: Blantyre Park

Project #: 23121300911
P.O. #: 23376

ENVIROSCAN Report

1934 Volume: Toronto 9 Firemap: 928
Toronto Volume 9 Plan: 2107 (1924)
Sheet: 928 (1934)

Requested by:
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Date Completed: 12/22/2023 14:08:13

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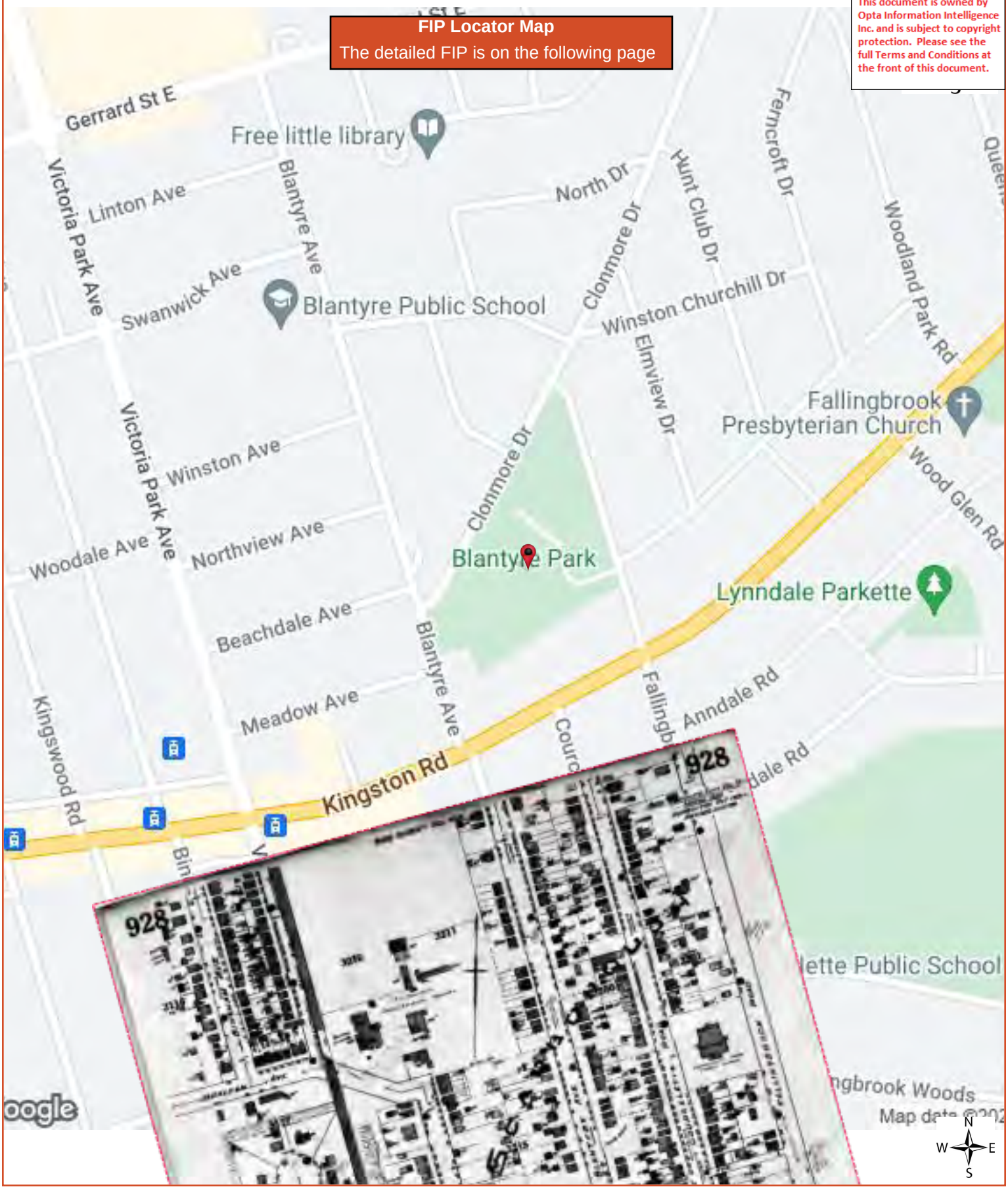

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Toronto Volume 9 Plan: 2107 (1924)
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Date Completed: 12/22/2023 14:08:13

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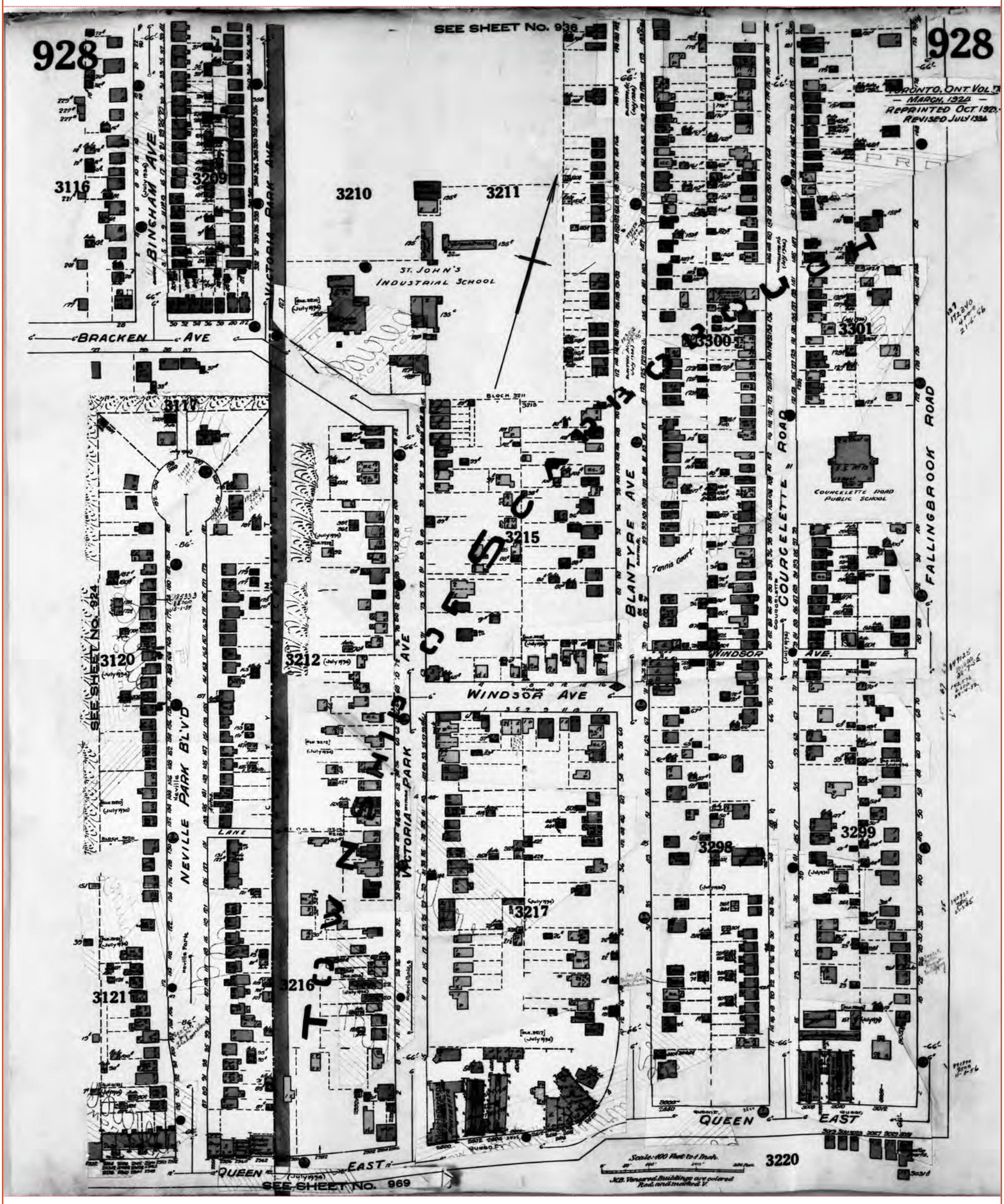

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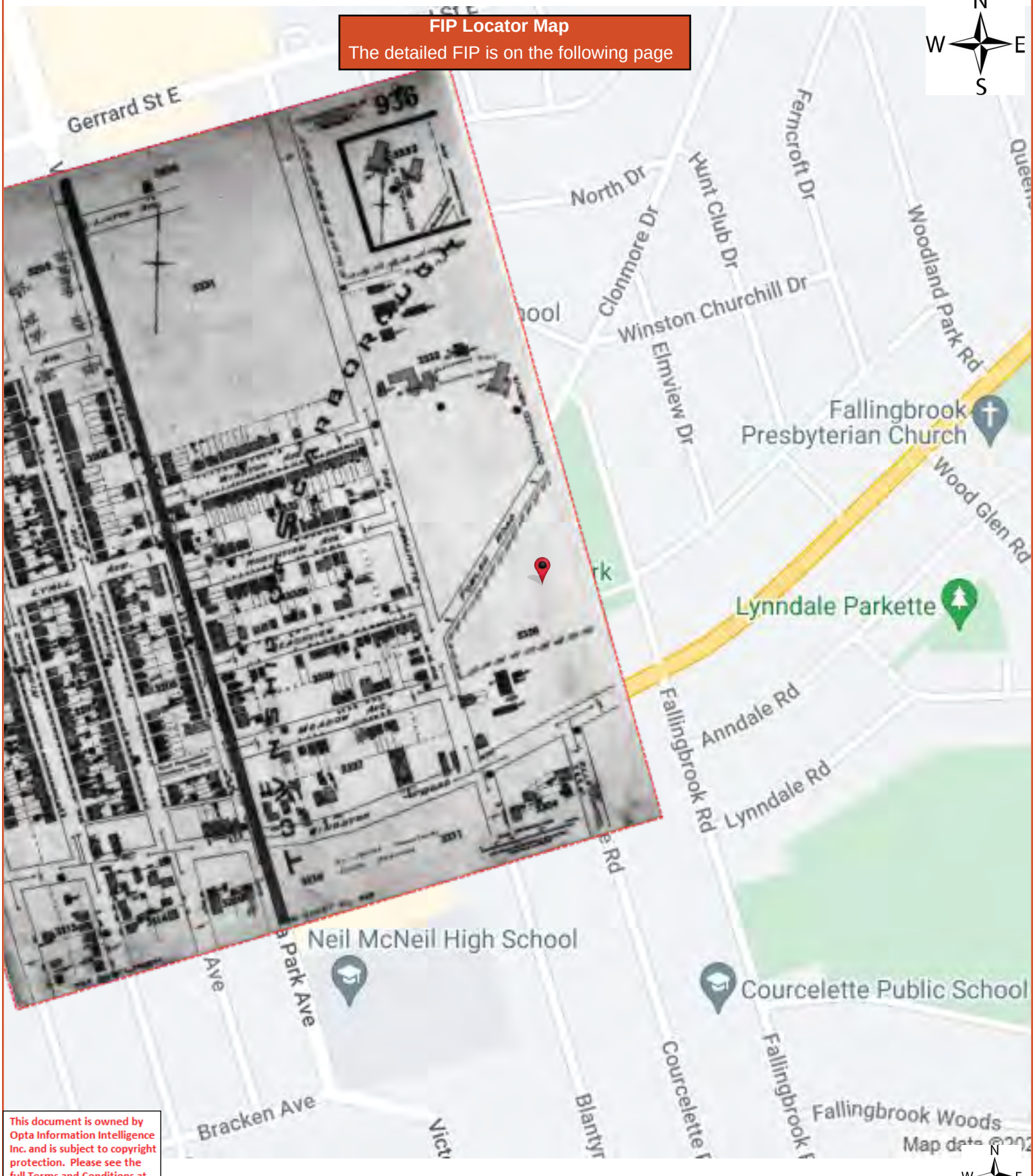

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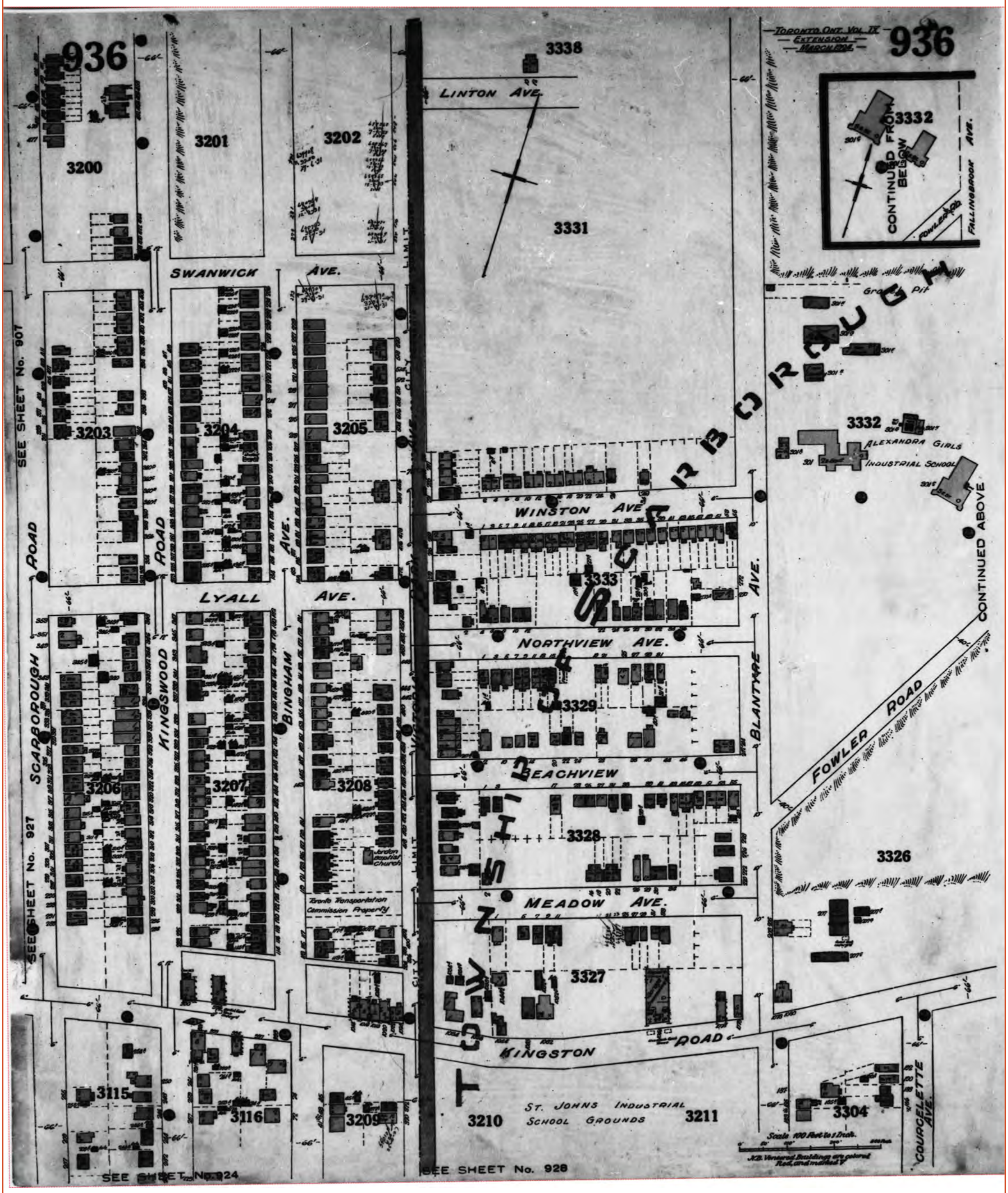

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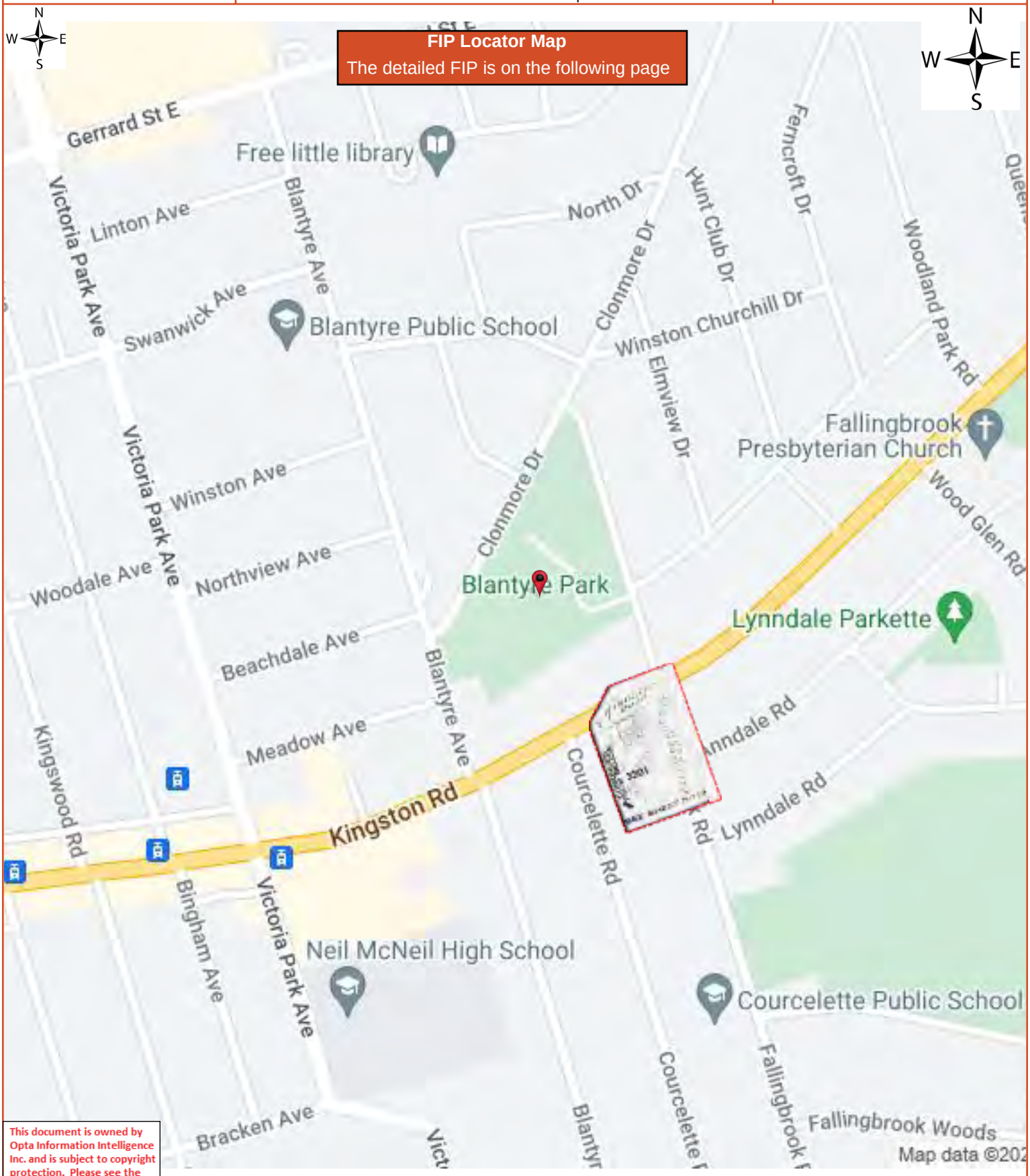

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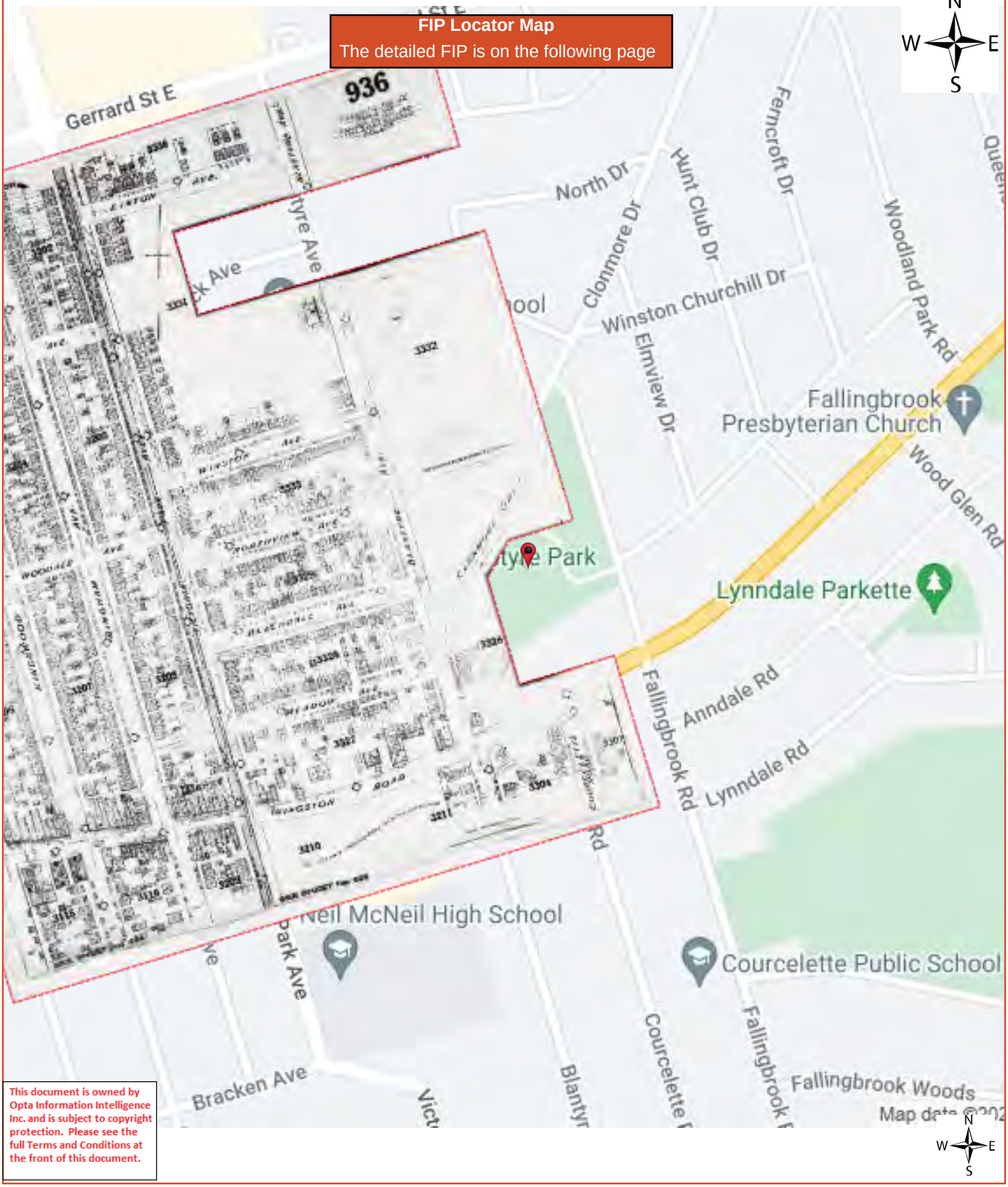

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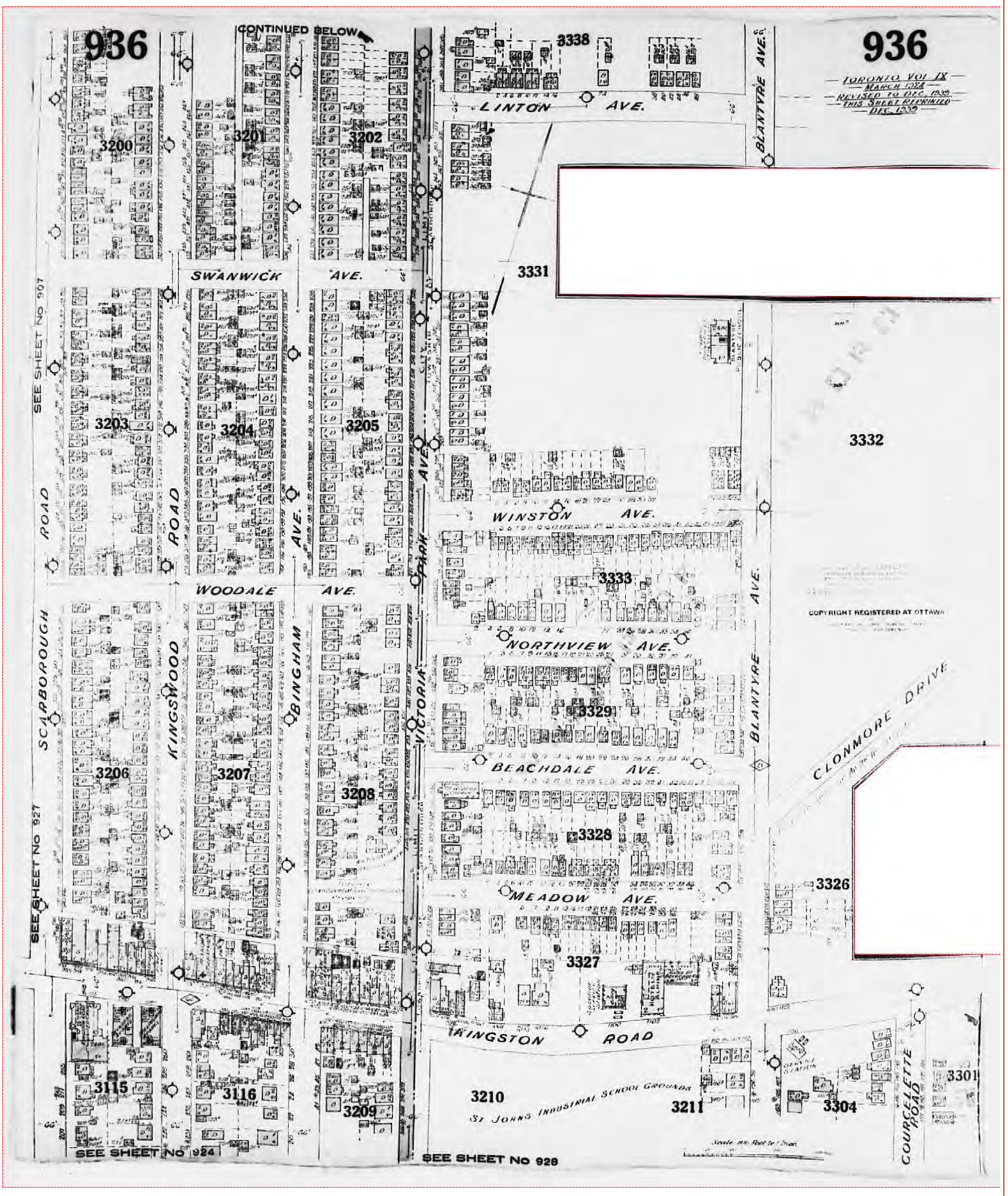

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Sheet: 928-2 (1956)

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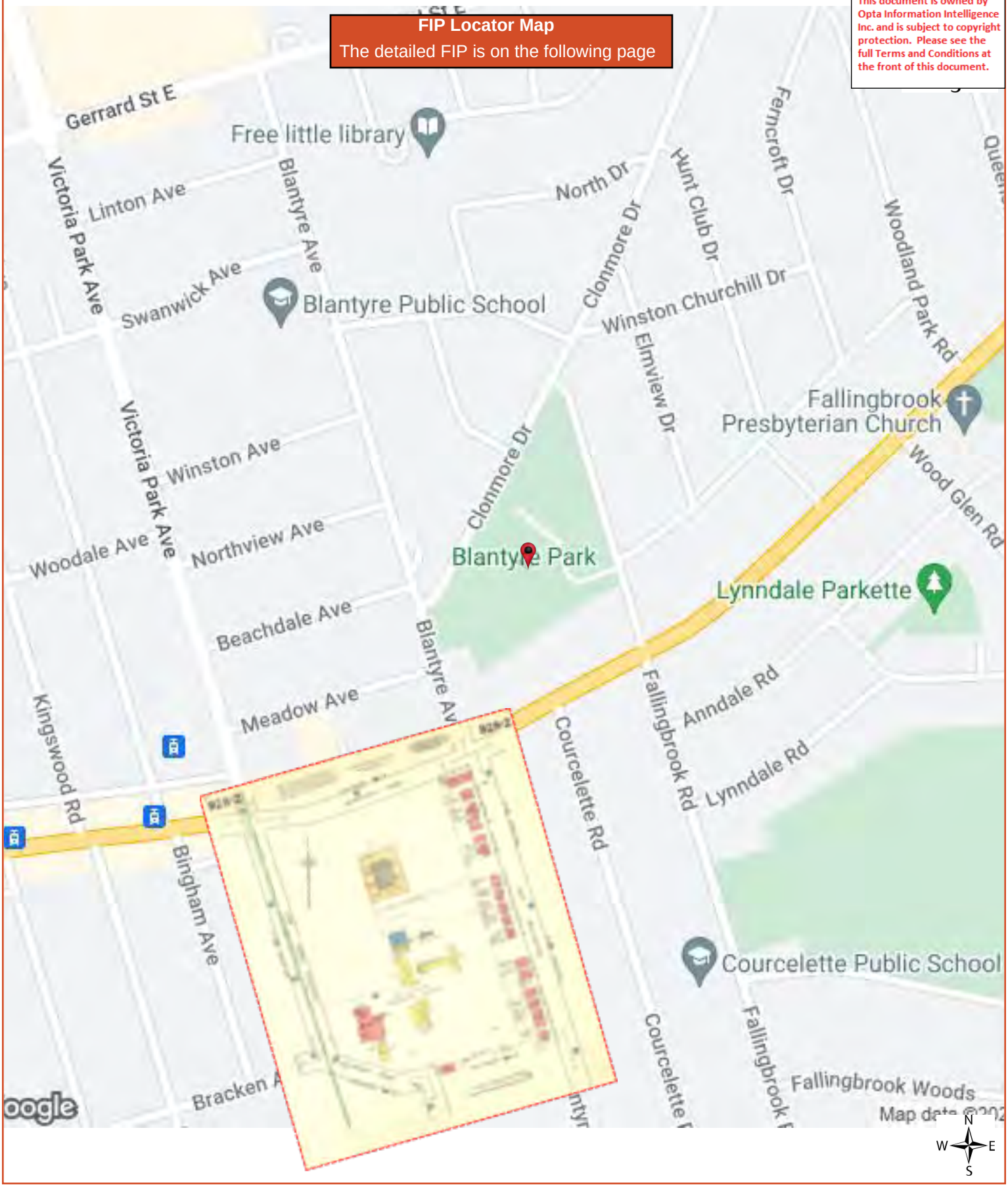

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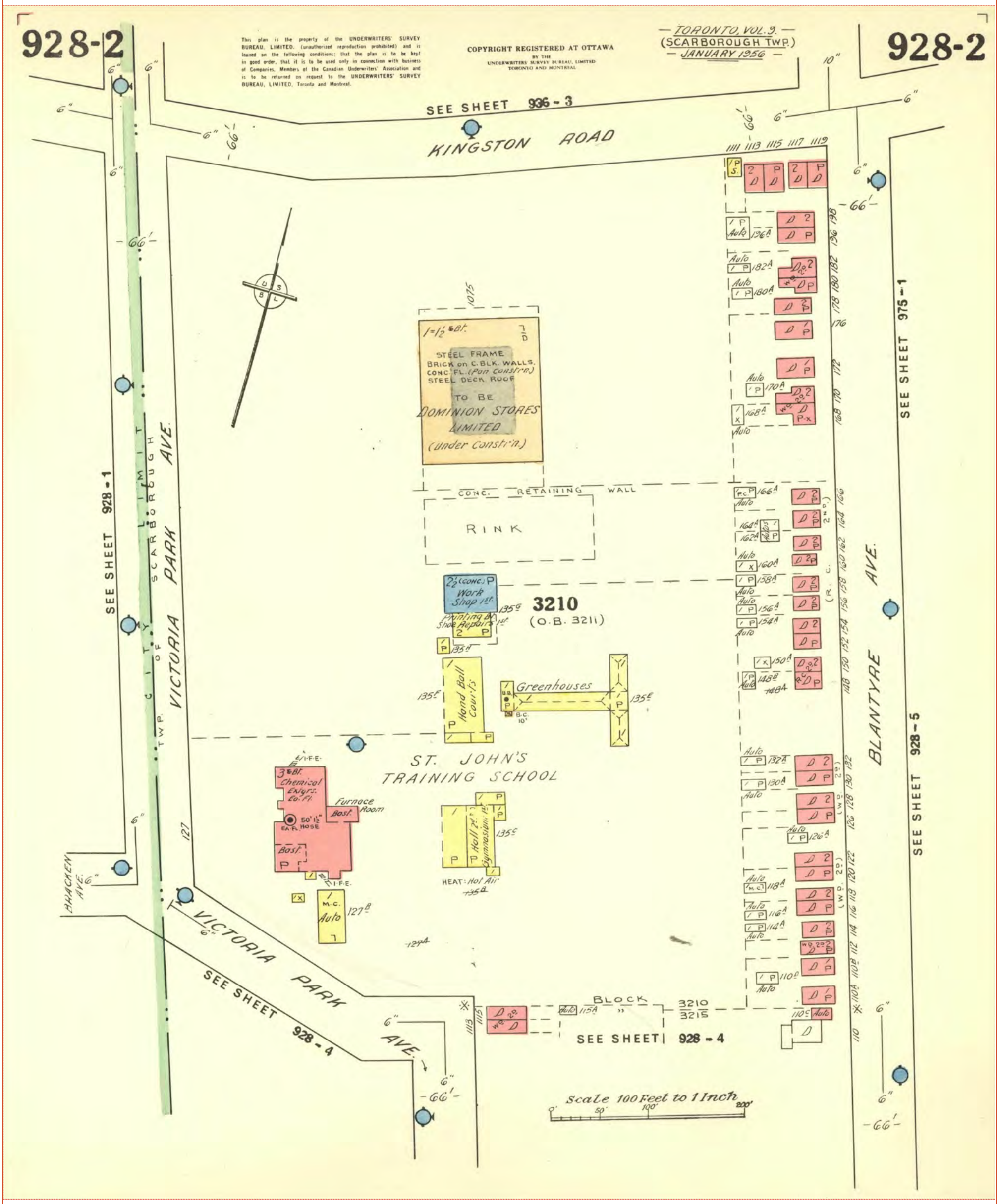

Project Name: Blantyre Park

Project #: 23121300911
P.O. #: 23376

ENVIROSCAN Report

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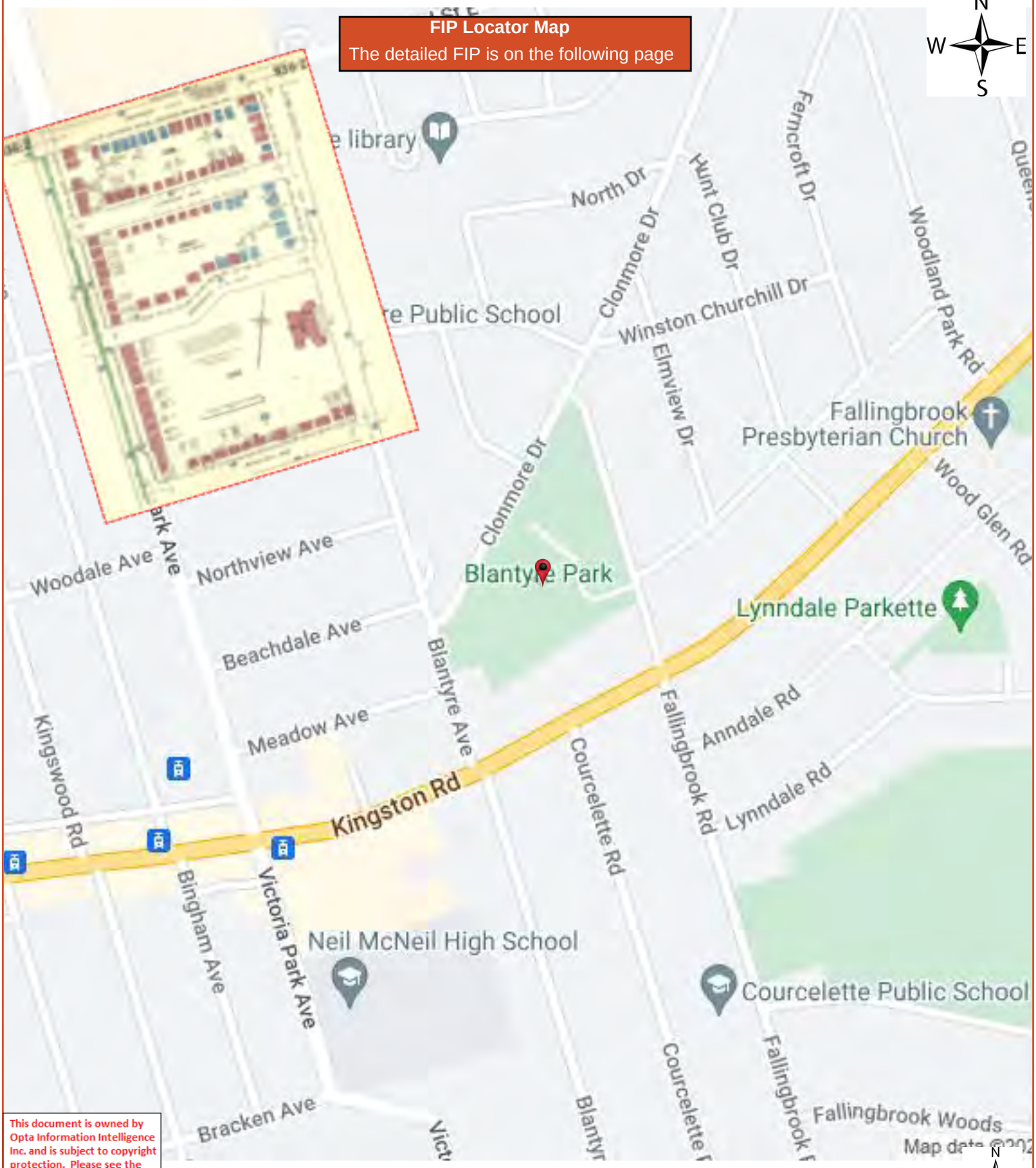

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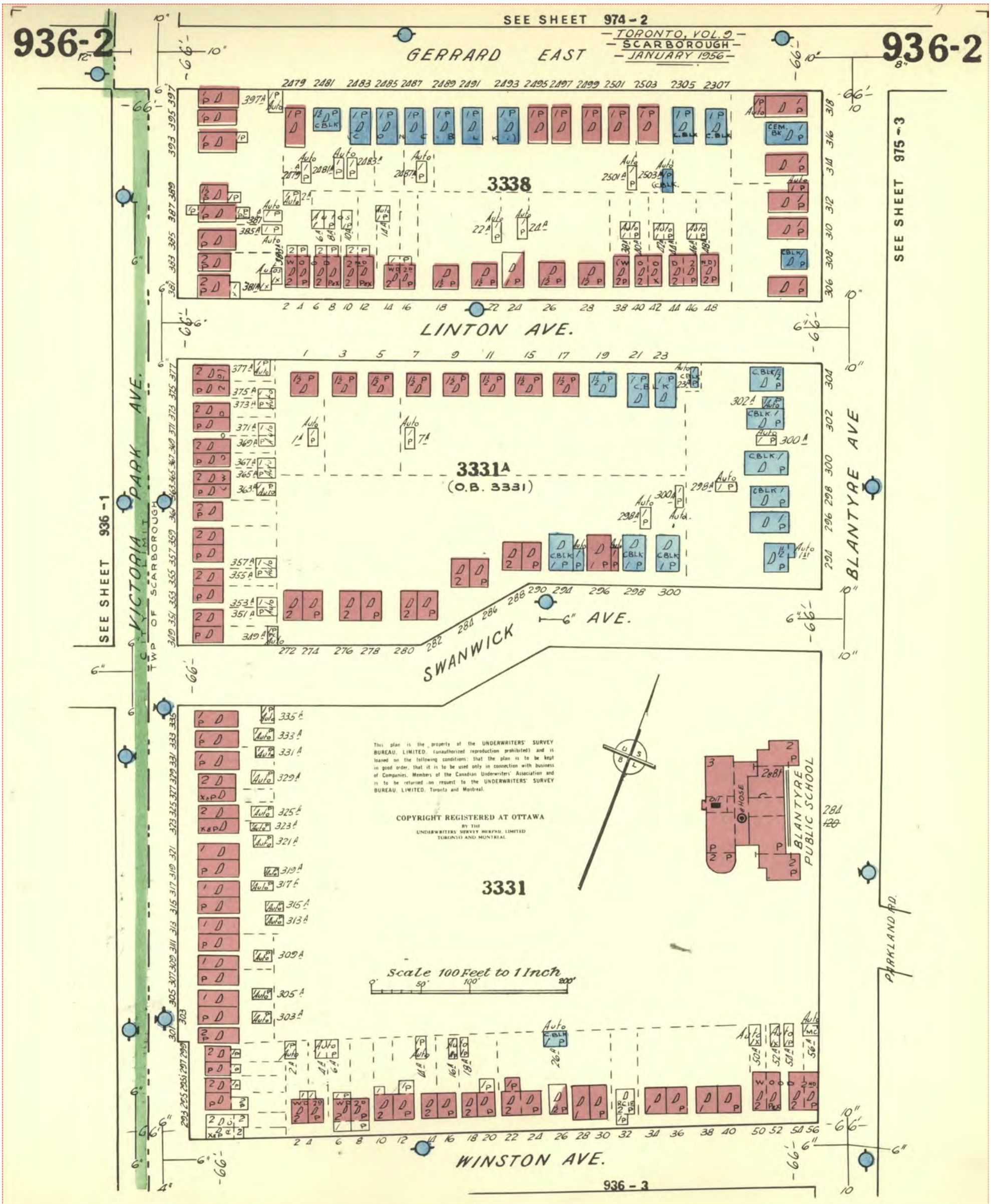

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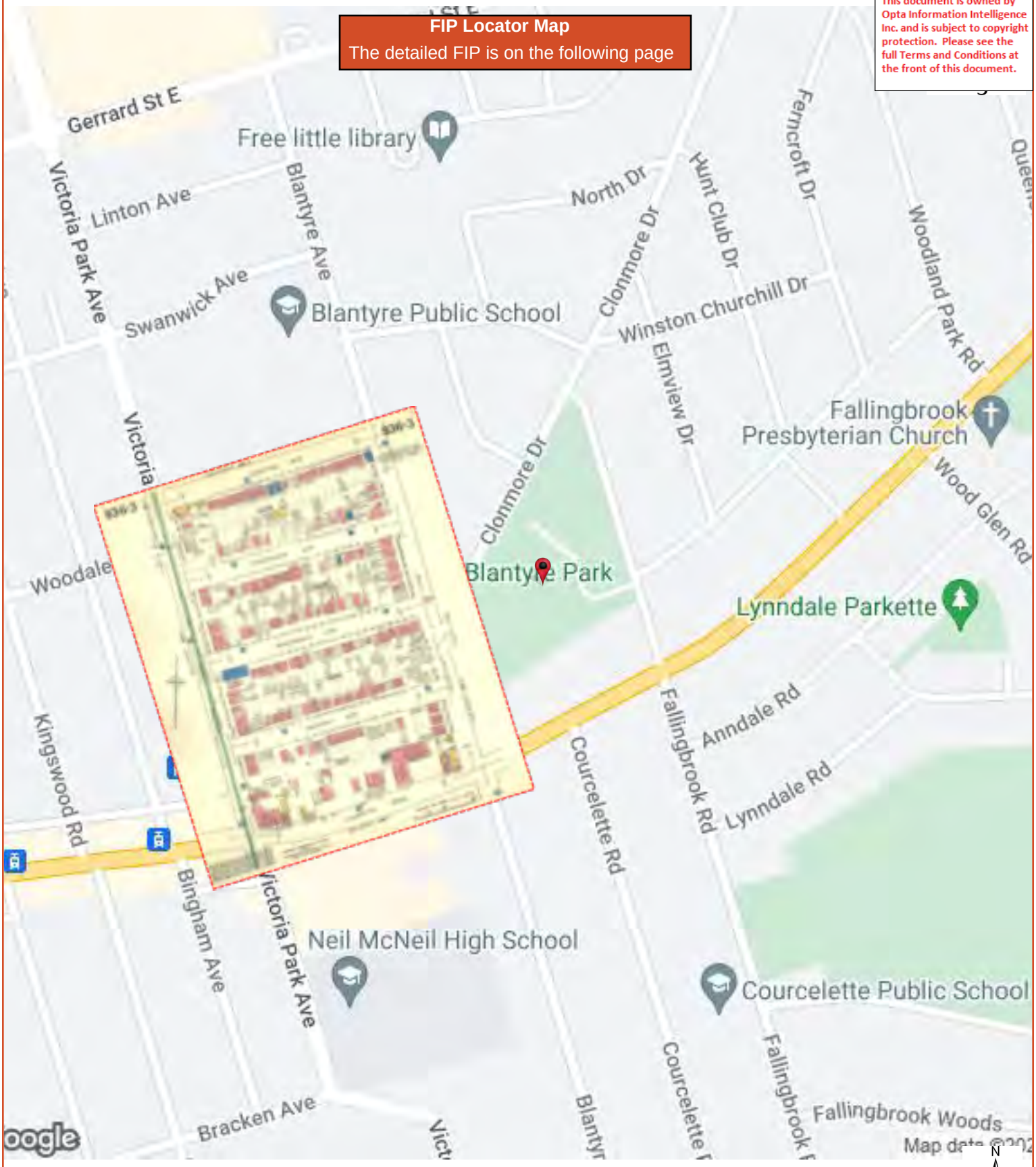

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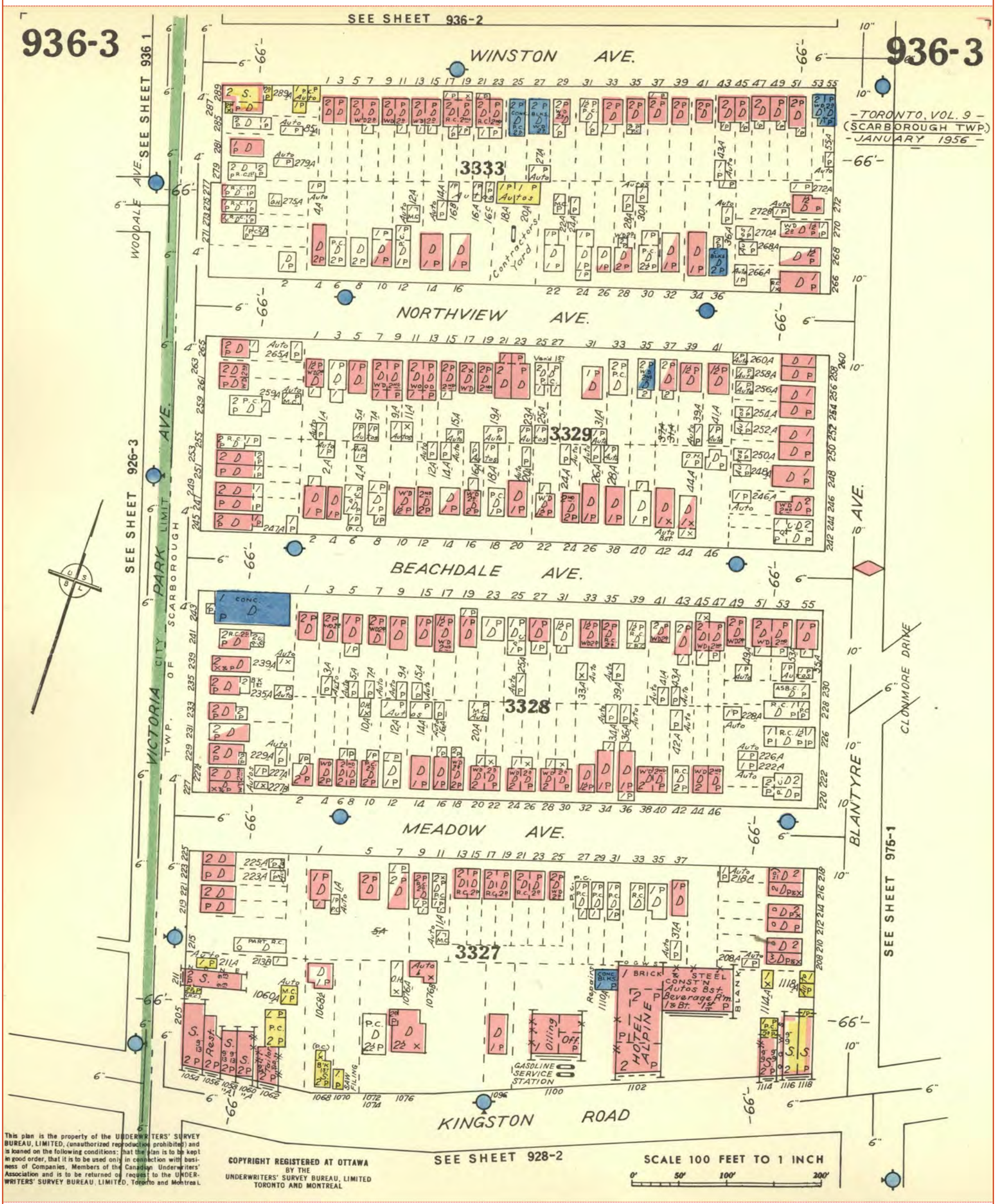

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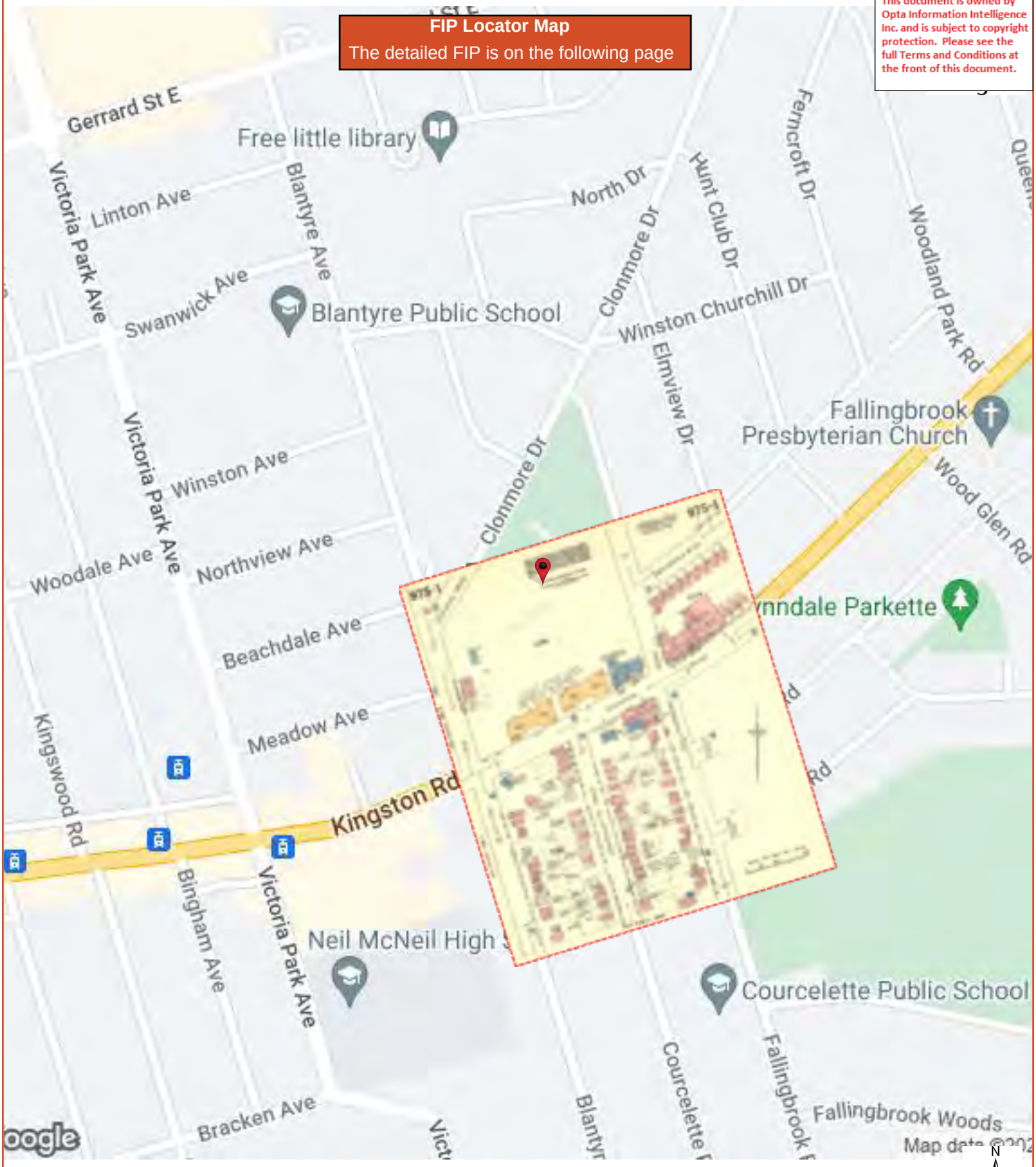

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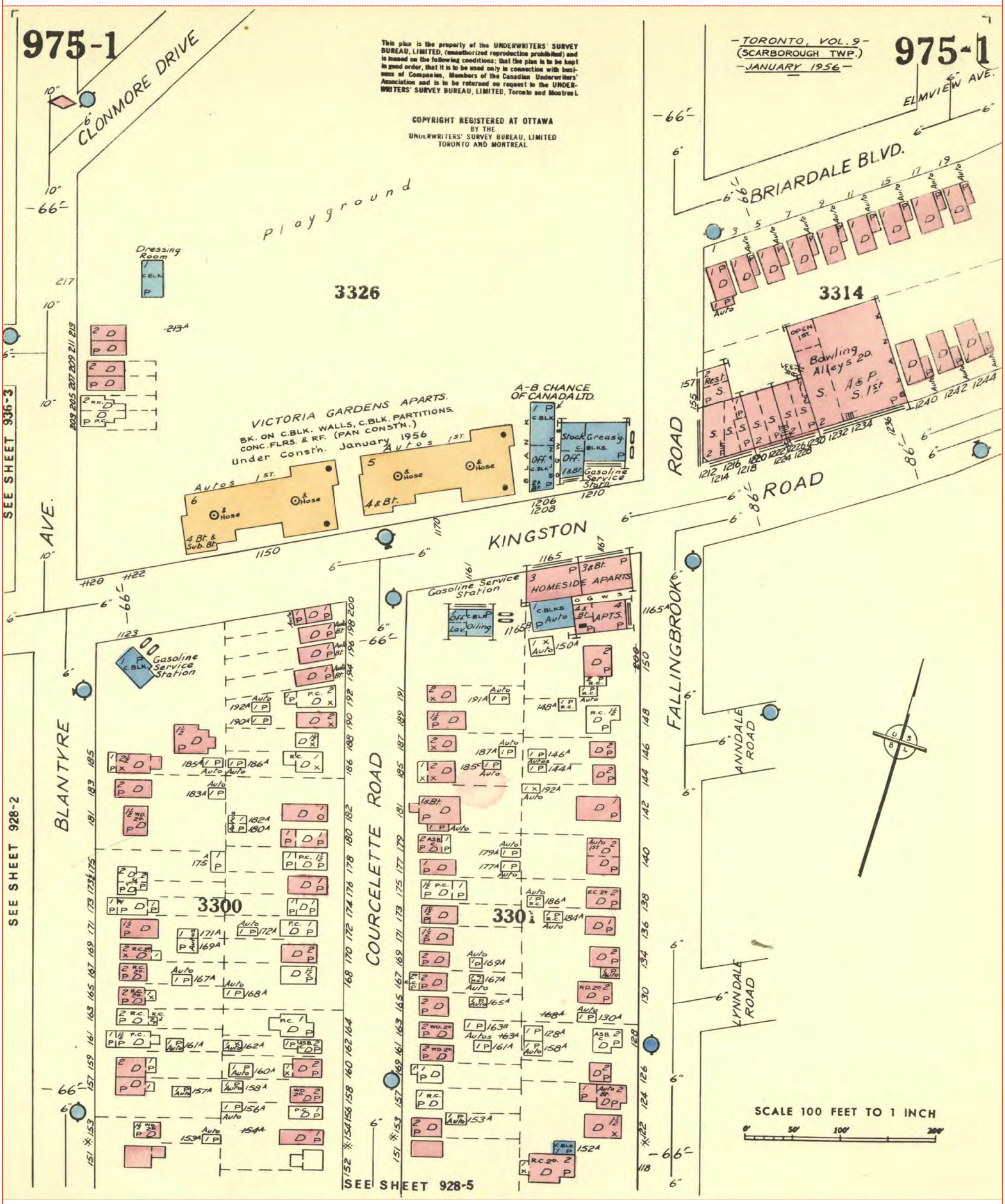


APPENDIX D

ERIS

DATABASE REPORT

Project Property:	*Blantyre Park,* *180 Fallingbrook Road,* *Scarborough ON M1N 1N3*
Project No:	*23376*
Report Type:	*RSC Report (Urban)*
Order No:	*23121300911*
Requested by:	*AllRock Consulting Ltd.*
Date Completed:	*December 18, 2023*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

Table of Contents

Executive Summary

Property Information:

Project Property:	*Blantyre Park,* *180 Fallingbrook Road, Scarborough ON M1N 1N3*
Project No:	*23376*

Order Information:

Order No:	*23121300911*
Date Requested:	*December 13, 2023*
Requested by:	*AllRock Consulting Ltd.*
Report Type:	*RSC Report (Urban)*

Historical/Products:

Aerial Photographs	*Aerials - National Collection*
City Directory Search	*Smart CD Search*
ERIS Xplorer	*ERIS Xplorer*
Insurance Products	*Fire Insurance Maps/Inspection Reports/Site Plans*
Physical Setting Report (PSR)	*Physical Setting Report (PSR)*
Topographic Map	*RSC Maps*

Executive Summary: Report Summary

Database	Name	Searched	Project Property	Boundary to 0.30km	Total
AAGR	Abandoned Aggregate Inventory	Y	0	0	0
AGR	Aggregate Inventory	Y	0	0	0
AMIS	Abandoned Mine Information System	Y	0	0	0
ANDR	Anderson's Waste Disposal Sites	Y	1	0	1
AST	Aboveground Storage Tanks	Y	0	0	0
AUWR	Automobile Wrecking & Supplies	Y	0	0	0
BORE	Borehole	Y	0	8	8
CA	Certificates of Approval	Y	0	5	5
CDRY	Dry Cleaning Facilities	Y	0	0	0
CFOT	Commercial Fuel Oil Tanks	Y	0	3	3
CHEM	Chemical Manufacturers and Distributors	Y	0	0	0
CHM	Chemical Register	Y	0	0	0
CNG	Compressed Natural Gas Stations	Y	0	0	0
COAL	Inventory of Coal Gasification Plants and Coal Tar Sites	Y	0	0	0
CONV	Compliance and Convictions	Y	0	0	0
CPU	Certificates of Property Use	Y	0	0	0
DRL	Drill Hole Database	Y	0	0	0
DTNK	Delisted Fuel Tanks	Y	0	15	15
EASR	Environmental Activity and Sector Registry	Y	0	0	0
EBR	Environmental Registry	Y	0	0	0
ECA	Environmental Compliance Approval	Y	0	0	0
EEM	Environmental Effects Monitoring	Y	0	0	0
EHS	ERIS Historical Searches	Y	1	38	39
EIIS	Environmental Issues Inventory System	Y	0	0	0
EMHE	Emergency Management Historical Event	Y	0	0	0
EPAR	Environmental Penalty Annual Report	Y	0	0	0
EXP	List of Expired Fuels Safety Facilities	Y	0	0	0
FCON	Federal Convictions	Y	0	0	0
FCS	Contaminated Sites on Federal Land	Y	0	0	0
FOFT	Fisheries & Oceans Fuel Tanks	Y	0	0	0
FRST	Federal Identification Registry for Storage Tank Systems (FIRSTS)	Y	0	0	0
FST	Fuel Storage Tank	Y	0	11	11
FSTH	Fuel Storage Tank - Historic	Y	0	3	3
GEN	Ontario Regulation 347 Waste Generators Summary	Y	0	71	71
GHG	Greenhouse Gas Emissions from Large Facilities	Y	0	0	0
HINC	TSSA Historic Incidents	Y	0	2	2

Database	Name	Searched	Project Property	Boundary to 0.30km	Total
IAFT	Indian & Northern Affairs Fuel Tanks	Y	0	0	0
INC	Fuel Oil Spills and Leaks	Y	0	4	4
LIMO	Landfill Inventory Management Ontario	Y	0	0	0
MINE	Canadian Mine Locations	Y	0	0	0
MNR	Mineral Occurrences	Y	0	0	0
NATE	National Analysis of Trends in Emergencies System (NATES)	Y	0	0	0
NCPL	Non-Compliance Reports	Y	0	0	0
NDFT	National Defense & Canadian Forces Fuel Tanks	Y	0	0	0
NDSP	National Defense & Canadian Forces Spills	Y	0	0	0
NDWD	National Defence & Canadian Forces Waste Disposal Sites	Y	0	0	0
NEBI	National Energy Board Pipeline Incidents	Y	0	0	0
NEBP	National Energy Board Wells	Y	0	0	0
NEES	National Environmental Emergencies System (NEES)	Y	0	0	0
NPCB	National PCB Inventory	Y	0	1	1
NPR2	National Pollutant Release Inventory 1993-2020	Y	0	0	0
NPRI	National Pollutant Release Inventory - Historic	Y	0	0	0
OGWE	Oil and Gas Wells	Y	0	0	0
OOGW	Ontario Oil and Gas Wells	Y	0	0	0
OPCB	Inventory of PCB Storage Sites	Y	0	2	2
ORD	Orders	Y	0	0	0
PAP	Canadian Pulp and Paper	Y	0	0	0
PCFT	Parks Canada Fuel Storage Tanks	Y	0	0	0
PES	Pesticide Register	Y	0	2	2
PFCH	NPRI Reporters - PFAS Substances	Y	0	0	0
PFHA	Potential PFAS Handers from NPRI	Y	0	0	0
PINC	Pipeline Incidents	Y	0	9	9
PRT	Private and Retail Fuel Storage Tanks	Y	0	2	2
PTTW	Permit to Take Water	Y	0	0	0
REC	Ontario Regulation 347 Waste Receivers Summary	Y	0	0	0
RSC	Record of Site Condition	Y	0	3	3
RST	Retail Fuel Storage Tanks	Y	0	7	7
SCT	Scott's Manufacturing Directory	Y	0	5	5
SPL	Ontario Spills	Y	0	17	17
SRDS	Wastewater Discharger Registration Database	Y	0	0	0
TANK	Anderson's Storage Tanks	Y	0	0	0
TCFT	Transport Canada Fuel Storage Tanks	Y	0	0	0
VAR	Variances for Abandonment of Underground Storage Tanks	Y	0	0	0
WDS	Waste Disposal Sites - MOE CA Inventory	Y	0	0	0
WDSH	Waste Disposal Sites - MOE 1991 Historical Approval Inventory	Y	1	0	1
WWIS	Water Well Information System	Y	3	41	44

Database	Name	Searched	Project Property	Boundary to 0.30km	Total
Total:			6	249	255

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev diff (m)	Page Number
1	WWIS		1150 KINGSTON ROAD 1200 SCARBOROUGH ON ***Well ID:*** 7151943	E/0.0	0.00	57
2	ANDR	Clonmore & Blantyre Dump	Toronto ON M1N	SW/0.0	0.00	59
3	WDSH		Clonmore Dr. & Blantyre Ave. SCARBOROUGH ON	SW/0.0	0.00	60
4	EHS		160 fallingbrook Scarborough ON M1N 2V2	ESE/0.0	0.00	60
5	WWIS		ON ***Well ID:*** 7304804	E/0.0	0.00	60
6	WWIS		ON ***Well ID:*** 7259673	ESE/0.0	0.00	62

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
7	WWIS		ON **Well ID:** 7239684	E/4.0	0.00	63
8	EHS		1200 Kingston Rd Scarborough ON M1N 1P1	S/9.8	0.00	64
9	GEN	Greenwin Property Management	1140 Kingston Road Toronto ON M1N 1N8	SSW/16.3	0.00	64
9	EHS		1140 Kingston Road Scarborough ON M1N 1N8	SSW/16.3	0.00	64
10	EHS		1080, 1150 & 1200 Kingston Road Toronto ON	S/20.7	0.00	64
10	EHS		1200 Kingston Rd Toronto ON M1N1P1	S/20.7	0.00	65
10	EHS		1150 Kingston Road Toronto Ontario Scarborough ON M1N 1N9	S/20.7	0.00	65
10	EHS		1200 Kingston Rd Scarborough ON M1N 1P1	S/20.7	0.00	65
10	EHS		1200 Kingston Rd Scarborough ON M1N 1P1	S/20.7	0.00	65
11	SCT	Descore Inc.	157 Fallingbrook Rd Scarborough ON M1N 2V2	ESE/21.0	0.00	65
12	EHS		160 Fallingbrook Rd Toronto ON M1N0A1	ESE/26.6	0.00	66
12	RSC	TORONTO HYDRO-ELECTRIC SYSTEM LIMITED	160 FALLINGBROOK ROAD, TORONTO, ON M1N 2V2 Toronto ON	ESE/26.6	0.00	66

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
13	RSC	1092KR URBAN PROPERTIES INC.	1116-1118 KINGSTON ROAD, TORONTO, ON M1N 1N4, 1102 KINGSTON ROAD, TORONTO, ON M1N 1N4, 1112-1114 KINGSTON ROAD, TORONTO, ON M1N 1N4, 1100 KINGSTON ROAD, TORONTO, ON M1N 1N4 Toronto ON	SW/34.8	-0.18	67
14	GEN	RENT-A-WRECK	A 479220 ONTARIO LTD. 1210 KINGSTON ROAD SCARBOROUGH ON M1N 1N8	ESE/35.9	0.00	68
14	GEN	RENT-A-WRECK	A 700828 ONTARIO INC. 1210 KINGSTON ROAD SCARBOROUGH ON M1N 1N8	ESE/35.9	0.00	69
14	GEN	RENT-A-WRECK 33-058	A 700828 ONTARIO INC. 1210 KINGSTON ROAD SCARBOROUGH ON M1N 1N8	ESE/35.9	0.00	69
14	GEN	RENT-A-WRECK	1210 KINGSTON ROAD SCARBOROUGH ON M1N 1N8	ESE/35.9	0.00	70
14	RSC	Wes-Jen Holdings Limited	1210 KINGSTON RD, TORONTO, ON, M1N 1N8 ON M1N 1N8	ESE/35.9	0.00	70
15	WWIS		1161 KINGSTON ROAD SCARBOROUGH ON ***Well ID:*** 7373065	SSE/46.3	0.00	71
16	EHS		1212-1238 Kingston Road Scarborough ON M1N 2V2	E/50.3	0.00	74
17	EHS		1212-1238 Kingston Road Scarborough ON M1N 2V2	E/50.9	0.00	74
18	EHS		39 Meadow Ave Scarborough ON M1N 1V5	SW/53.0	-2.98	74
19	SCT	MORFIDIS FURS	1 WINSTON CHURCHILL DR SCARBOROUGH ON M1N 1Z8	NNE/53.7	0.00	74
20	DTNK	CHRISTOS MORFIDIS	1 WINSTON CHURCHILL DRIVE SCARBOROUGH M1N 1Z8 ON CA ON	NNE/53.7	0.00	75

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
20	CFOT	CHRISTOS MORFIDIS	1 WINSTON CHURCHILL DRIVE SCARBOROUGH M1N 1Z8 ON CA ON	NNE/53.7	0.00	75
21	EHS		39 Meadow Avenue Scarborough ON M1N 1V5	SW/54.4	-2.30	76
21	EHS		39 Meadow Ave Scarborough ON M1N 1V5	SW/54.4	-2.30	76
22	SPL	Enbridge Gas Distribution Inc.	244 Blantyre Avenue Toronto ON M1N 2S1	W/59.8	-1.37	76
23	GEN	Upper Beaches Dental	1120 Kingston Road, Unit 4 Scarborough ON M1N 1N4	SW/60.2	-3.22	77
24	EHS		39 Meadow Avenue Scarborough ON M1N 1V5	SW/60.9	-1.39	77
24	EHS		39 Meadow Avenue Scarborough ON M1N 1V5	SW/60.9	-1.39	78
25	WWIS		1161 KINGSTON ROAD SCARBOROUGH ON ***Well ID:*** 7336195	SSE/62.5	0.00	78
26	PINC		246 Blantyre Avenue, Toronto ON	W/64.2	-1.37	81
27	WWIS		1165 KINGSTON ROAD Toronto ON ***Well ID:*** 7111417	SE/64.4	0.00	81
28	SPL	City of Toronto	In front of 14 Elmview Drive Toronto ON M1N 2W4	NE/65.0	0.53	85
29	BORE		ON	ESE/66.0	0.00	85
30	BORE		ON	SSE/66.8	0.00	86

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
31	WWIS		1161 KINGSTON ROAD SCARBOROUGH ON ***Well ID:*** 7373047	SE/68.8	0.00	87
32	EHS		1100 Kingston Rd Scarborough ON M1N 1N4	SW/70.4	-4.78	91
32	EHS		1100 Kingston Rd Scarborough ON M1N 1N4	SW/70.4	-4.78	91
32	EHS		1100 Kingston Rd Scarborough ON M1N 1N4	SW/70.4	-4.78	91
33	SCT	We Compute Inc.	1232 Kingston Rd Scarborough ON M1N 1P3	E/72.0	0.00	91
33	EHS		1212-1238 Kingston Road Scarborough ON M1N 2V2	E/72.0	0.00	91
33	EHS		1212-1238 Kingston Road Scarborough ON M1N 2V2	E/72.0	0.00	92
33	EHS		1212-1238 Kingston Road Scarborough ON M1N 2V2	E/72.0	0.00	92
34	PRT	SIVA GAS BAR	1121 KINGSTON RD SCARBOROUGH ON M1N1N7	S/72.5	0.00	92
34	RST	SIVA'S GAS BAR	1121 KINGSTON RD SCARBOROUGH ON M1N1N7	S/72.5	0.00	92
34	RST	PETRO CANADA LTD	1121 KINGSTON RD SCARBOROUGH ON M1N 1N7	S/72.5	0.00	92
34	RST	GODO ENTERPRISES INC	1121 KINGSTON RD SCARBOROUGH ON M1N 1N7	S/72.5	0.00	93
34	FSTH	1461148 ONTARIO CORP O/A PETRO CANADA #00676	1121 KINGSTON RD SCARBOROUGH ON M1N 1N7	S/72.5	0.00	93

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
34	RST	1461148 ONT CORP PETRO CANADA 00676	1121 KINGSTON RD SCARBOROUGH ON M1N 1N7	S/72.5	0.00	93
34	DTNK	DJ SERVICES ATTN DAVID NOUDELMAN	1121 KINGSTON RD SCARBOROUGH ON M1N 1N7	S/72.5	0.00	93
34	DTNK	1461148 ONTARIO CORP O/A PETRO CANADA #00676	1121 KINGSTON RD SCARBOROUGH ON	S/72.5	0.00	94
34	DTNK	1461148 ONTARIO CORP O/A PETRO CANADA #00676	1121 KINGSTON RD SCARBOROUGH ON	S/72.5	0.00	95
34	DTNK	1461148 ONTARIO CORP O/A PETRO CANADA #00676	1121 KINGSTON RD SCARBOROUGH ON	S/72.5	0.00	95
34	DTNK	1461148 ONTARIO CORP O/A PETRO CANADA #00676	1121 KINGSTON RD SCARBOROUGH ON	S/72.5	0.00	96
34	FST	SUNCOR ENERGY PRODUCTS PARTNERSHIP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	S/72.5	0.00	97
34	FST	SUNCOR ENERGY PRODUCTS PARTNERSHIP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	S/72.5	0.00	97
34	FST	SUNCOR ENERGY PRODUCTS PARTNERSHIP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	S/72.5	0.00	98
34	RST	PETRO CANADA	1121 KINGSTON RD SCARBOROUGH ON M1N1N7	S/72.5	0.00	98
34	RST	PETRO CANADA CORP	1121 KINGSTON RD SCARBOROUGH ON M1N1N7	S/72.5	0.00	98
34	DTNK	1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	S/72.5	0.00	98

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
34	DTNK	1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	S/72.5	0.00	99
34	DTNK	1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	S/72.5	0.00	100
34	DTNK	1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	S/72.5	0.00	100
34	RST	PETRO CANADA	1121 KINGSTON RD SCARBOROUGH ON M1N1N7	S/72.5	0.00	101
34	FST	1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	S/72.5	0.00	101
34	DTNK		1121 KINGSTON RD SCARBOROUGH ON M1N 1N7	S/72.5	0.00	102
34	FST	1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	S/72.5	0.00	102
34	FST	1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	S/72.5	0.00	103
34	FST	1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	S/72.5	0.00	103
35	EHS		1111, 1115, 1117, 1119 Kingston Road & 196, 198 Blantyre Avenue Scarborough ON M1N 1N6	SSW/72.7	0.00	104
35	EHS		1111, 1115, 1117, 1119 Kingston Road & 196, 198 Blantyre Avenue Scarborough ON M1N 1N6	SSW/72.7	0.00	104
35	EHS		1111, 1115, 1117, 1119 Kingston Road & 196, 198 Blantyre Avenue Scarborough ON M1N 1N6	SSW/72.7	0.00	104

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
36	EHS		1088-1118 Kingston Road Toronto ON	SW/73.7	-4.78	104
37	SPL	B PLUS SERVICE STATION	1161 KINGSTON ROAD SERVICE STATION TORONTO CITY ON M1N 1P2	SSE/75.4	0.00	105
37	PRT	SUNOCO INC - THROUGH AGENT PIONEER PETROLEUMS MANA	1161 KINGSTON RD SCARBOROUGH ON M1N1P2	SSE/75.4	0.00	105
37	SPL	PIONEER PETROLEUMS LTD.	1161 KINGSTON RD.SCARBOROUGH, ON SERVICE STATION TORONTO CITY ON M1N 1P2	SSE/75.4	0.00	106
37	FSTH	PIONEER PETROLEUMS MANAGEMENT INC**	1161 KINGSTON RD SCARBOROUGH ON M1N 1P2	SSE/75.4	0.00	106
37	FSTH	PIONEER PETROLEUMS MANAGEMENT INC**	1161 KINGSTON RD SCARBOROUGH ON M1N 1P2	SSE/75.4	0.00	107
37	FST	1132410 ONTARIO LTD	1161 KINGSTON RD SCARBOROUGH M1N 1P2 ON CA ON	SSE/75.4	0.00	108
37	FST	1132410 ONTARIO LTD	1161 KINGSTON RD SCARBOROUGH M1N 1P2 ON CA ON	SSE/75.4	0.00	108
37	FST	1132410 ONTARIO LTD	1161 KINGSTON RD SCARBOROUGH M1N 1P2 ON CA ON	SSE/75.4	0.00	109
37	FST	1132410 ONTARIO LTD	1161 KINGSTON RD SCARBOROUGH M1N 1P2 ON CA ON	SSE/75.4	0.00	109
37	EHS		1161 Kingston Road Scarborough ON M1N 1S4	SSE/75.4	0.00	110
37	EHS		1161 Kingston Road Scarborough ON M1N 1P2	SSE/75.4	0.00	110
37	DTNK		1161 KINGSTON RD SCARBOROUGH ON M1N 1P2	SSE/75.4	0.00	110

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
38	GEN	1547988 Ontario Inc.	1224699 Ontario.Inc 1095 SECOND AVENUE EAST OWEN SOUND ON N4K 2H8	SSW/77.1	-0.39	111
38	GEN	1547988 Ontario Inc.	1224699 Ontario.Inc 1095 SECOND AVENUE EAST OWEN SOUND ON N4K 2H8	SSW/77.1	-0.39	111
38	GEN	1547988 Ontario Inc.	1224699 Ontario.Inc 1095 SECOND AVENUE EAST OWEN SOUND ON N4K 2H8	SSW/77.1	-0.39	112
39	WWIS		ON ***Well ID:*** 7352593	SSE/81.3	0.00	112
40	HINC		36 MEADOW AVENUE TORONTO ON M1N 1V6	WSW/82.0	0.00	113
41	WWIS		1165 KINGSTON ROAD Toronto ON ***Well ID:*** 7111418	SE/84.9	0.00	113
42	WWIS		1161 KINGSTON RD SCARBOROUGH ON ***Well ID:*** 7336194	SSE/85.8	0.00	117
43	WWIS		1161 KINGSTON ROAD SCARBOROUGH ON ***Well ID:*** 7373050	SE/91.0	0.00	120
44	GEN	SCARBOROUGH PUBLIC UTILITIES COMM	150 FALLINGBROOK ROAD, C/O 1530 MARKHAM ROAD, SCARBOROUGH, ON M1N 2T6	SE/96.0	0.00	123
44	GEN	SCARBOROUGH PUBLIC UTILITIES COMM 34-353	150 FALLINGBROOK ROAD, C/O 1530 MARKHAM ROAD, SCARBOROUGH, ON M1N 2T6	SE/96.0	0.00	123
45	GEN	Whitten Health group	1092 Kingston Rd Toronto ON M1N 1N4	SW/96.4	-1.65	124
45	EHS		1092 Kingston Road Toronto ON M1N 1N4	SW/96.4	-1.65	124

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
45	GEN	Whitten Health group	1092 Kingston Rd Toronto ON M1N 1N4	SW/96.4	-1.65	124
45	GEN	Whitten Health group	1092 Kingston Rd Toronto ON M1N 1N4	SW/96.4	-1.65	125
45	GEN	Whitten Health group	1092 Kingston Rd Toronto ON M1N 1N4	SW/96.4	-1.65	125
45	GEN	Whitten Health group	1092 Kingston Rd Toronto ON	SW/96.4	-1.65	125
45	GEN	Whitten Health group	1092 Kingston Rd Toronto ON M1N 1N4	SW/96.4	-1.65	126
45	GEN	Whitten Health group	1092 Kingston Rd Toronto ON M1N 1N4	SW/96.4	-1.65	126
46	GEN	MTCC 1010	1091 Kingston Rd Scarborough ON M1N 4E5	SW/113.1	-4.54	127
47	SPL	TRANSPORT TRUCK	1239 KINGSTON RD MOTOR VEHICLE (OPERATING FLUID) TORONTO CITY ON M1N 1P4	E/115.4	0.00	127
48	WWIS		1089 KINGSTON RD Toronto ON ***Well ID:*** 7245021	SW/118.3	-2.66	128
49	BORE		ON	WSW/122.3	0.00	131
50	WWIS		1080 KINGSTON ROAD SCARBOROUGH ON ***Well ID:*** 7112201	SW/123.6	-0.90	133
51	CA	SCARBOROUGH CITY - LOT 34, CONC. A	ANNDALE RD./FALLINGBROOK RD. SCARBOROUGH CITY ON	SE/128.4	0.00	136
52	BORE		ON	SW/128.6	-0.03	136

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
53	SPL	SCARBOROUGH HYDRO	17 MEADOW ACRES TRANSFORMER TORONTO CITY ON M1N 1V5	WSW/129.8	0.00	137
54	EHS		1080 Kingston Road Scarborough ON M1N 1N5	WSW/139.3	-0.04	138
55	EHS		1080 Kingston Rd Toronto ON M1N1N5	WSW/139.4	-0.04	138
55	INC		1080 KINGSTON RD, TORONTO ON	WSW/139.4	-0.04	139
55	INC		1080 KINGSTON RD, TORONTO ON	WSW/139.4	-0.04	139
56	PINC		1 ANNDALE ROAD, TORONTO ON	ESE/151.7	-0.78	140
57	CFOT	EDNA SULLIVAN	7 PARKLAND RD SCARBOROUGH M1N 1V6 ON CA ON	NW/155.2	-0.97	140
57	DTNK	EDNA SULLIVAN	7 PARKLAND RD SCARBOROUGH M1N 1V6 ON CA ON	NW/155.2	-0.97	141
58	WWIS		1085 KINGSTON RD SCARBOROUGH ON ***Well ID:*** 7241836	SW/160.5	1.00	141
59	SPL		171 Courcelette Rd Toronto ON	SSE/165.5	0.00	145
59	PINC	PIPELINE HIT 1/2"	171 COURCELETTE RD,,TORONTO,ON, M1N 2T1,CA ON	SSE/165.5	0.00	146
60	INC		169 Courcelette Road, Toronto ON	SSE/172.8	0.00	146
61	EHS		1085-1089 Kingston Road Scarborough ON M4E 3S2	SW/177.9	0.33	147

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
62	HINC		291 BLANTYRE AVENUE TORONTO ON M1N 2S2	NW/182.8	0.12	147
63	SPL	Enbridge Gas Distribution Inc.	56 Winston Ave (Vic Park and Kingston) Toronto ON M1N 1W3	WNW/182.8	-0.01	147
63	PINC		56 Winston Avenue, Toronto ON	WNW/182.8	-0.01	148
64	INC		1255 Kingston Road, Toronto ON	E/183.7	0.00	149
65	GEN	BIKENERGY LTD.	1066 KINGSTON RD. SCARBOROUGH ON M1N 1N4	SW/185.4	1.02	149
65	GEN	BIKENERGY LTD. 05-190	1066 KINGSTON RD. SCARBOROUGH ON M1N 1N4	SW/185.4	1.02	150
66	PINC	PIPELINE HIT - 1/2"	19 ANNDALE RD,,TORONTO,ON,M1N 1C4,CA ON	ESE/188.7	-1.04	150
67	SPL		40 Winston Ave Toronto ON M1N 1W3	WNW/200.8	0.00	151
68	PES	659960 ONTARIO INC./HENLEY GARDENS VALU-MART	1089 KINGSTON ROAD SCARBOROUGH ON M1N1N6	SW/203.6	0.83	151
68	GEN	Sunrise Kids Dental	1089 Kingston Road, Unit 5 Toronto ON M1N4E4	SW/203.6	0.83	152
68	GEN	Sunrise Kids Dental	1089 Kingston Road, Unit 5 Toronto ON M1N4E4	SW/203.6	0.83	152
68	GEN	Sunrise Kids Dental	1089 Kingston Road, Unit 5 Toronto ON M1N4E4	SW/203.6	0.83	152
68	PES	659960 ONTARIO INC./HENLEY GARDENS VALU-MART	1089 KINGSTON ROAD SCARBOROUGH ON M1N1N6	SW/203.6	0.83	153

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
68	GEN	Sunrise Kids Dental	1089 Kingston Road, Unit 5 Toronto ON M1N4E4	SW/203.6	0.83	153
68	GEN	Sunrise Kids Dental	1089 Kingston Road, Unit 5 Toronto ON M1N4E4	SW/203.6	0.83	154
68	GEN	Sunrise Kids Dental	1089 Kingston Road, Unit 5 Toronto ON M1N4E4	SW/203.6	0.83	154
69	PINC	MURGA CONSTRUCTION LTD	27 ANNDALE RD,,TORONTO,ON,M1N 1C4,CA ON	E/214.0	-0.93	154
70	WWIS		NORTHVIEW AVE. & DANFORTH SCARBOROUGH ON ***Well ID:*** 7116163	W/220.9	0.00	155
71	WWIS		1085-1089 KINGSTON RD SCARBOROUGH ON ***Well ID:*** 7241837	SW/222.1	-0.11	157
72	DTNK	Mrs. Galina Ozols	3 Lynndale Rd, Scarborough, ON ON M1N 1B9	SE/225.8	-4.00	160
72	CFOT	GALINA OZOLS	3 LYNNDALE RD SCARBOROUGH M1N 1B9 ON CA ON	SE/225.8	-4.00	161
72	DTNK	GALINA OZOLS	3 LYNNDALE RD SCARBOROUGH M1N 1B9 ON CA ON	SE/225.8	-4.00	161
73	SPL	CONSUMERS' GAS CO. LTD., THE	MEADOW AVE, KINGSTON RD/VICTORIA PARK NATURAL GAS PIPELINE TORONTO CITY ON	WSW/228.8	0.00	162
74	SPL	Toronto Transit Commission	Meadow Ave and Victoria Park Ave Toronto ON	WSW/229.2	0.00	163
75	SPL		5 Lynndale Road<UNOFFICIAL> Toronto ON M1N 1B9	SE/231.4	-4.89	164

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
76	CA	P.U.C. SCARBOROUGH - LOT 35, CONC. A	VICTORIA PARK AVE./KINGSTON RD SCARBOROUGH CITY ON	WSW/234.1	0.00	164
77	WWIS		4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101723	W/236.7	0.00	165
78	WWIS		4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101798	W/237.3	0.00	168
79	WWIS		4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101721	W/237.7	0.00	171
80	WWIS		4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101722	W/238.5	0.00	174
81	WWIS		4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101799	W/239.2	0.00	177
82	SPL		149 Courcelette Rd, Toronto TORONTO ON	SSE/239.4	0.00	180
83	WWIS		4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101802	W/239.4	0.00	181
84	WWIS		4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101801	W/239.9	0.00	184
85	WWIS		4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101800	W/240.9	0.00	187
86	WWIS		ON ***Well ID:*** 7160102	W/241.5	0.00	190
87	WWIS		4 NORTHVIEW DRIVE SCARBOROUGH ON ***Well ID:*** 7110505	W/242.7	0.00	191
87	SPL	Enbridge Gas Distribution Inc.	2 Northview Avenue, Scarborough Toronto ON	W/242.7	0.00	196

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
87	PINC		2 Northview Avenue, Toronto ON	W/242.7	0.00	197
88	WWIS		4 NORTHVIEW AVE SCARBOROUGH ON ***Well ID:*** 7048097	W/243.1	0.00	197
89	BORE		ON	WSW/244.2	0.00	199
90	BORE		ON	WSW/245.5	0.15	201
91	SPL		31 Annedale Rd Toronto ON	E/245.7	-1.20	203
92	GEN	METRO SEPARATE SCHOOL BOARD	NEIL MCNEIL HIGH SCHOOL 127 VICTORIA PARK AVENUE SCARBOROUGH ON M4E 3S2	SSW/245.7	-4.85	204
92	GEN	METROPOLITAN SEPARATE SCHOOL BOARD	NEIL MCNEIL HIGH SCHOOL 127 VICTORIA PARK AVENUE SCARBOROUGH ON M4E 3S2	SSW/245.7	-4.85	204
92	GEN	METROPOLITAN SEPARATE SCHOOL BRD. 25-261	NEIL MCNEIL HIGH SCHOOL 127 VICTORIA PARK AVENUE SCARBOROUGH ON M4E 3S2	SSW/245.7	-4.85	205
92	GEN	TORONTO CATHOLIC DISTRICT SCHOOL BOARD	NEIL MCNEIL HIGH SCHOOL 127 VICTORIA PARK AVENUE SCARBOROUGH ON M4E 3S2	SSW/245.7	-4.85	206
92	GEN	Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	SSW/245.7	-4.85	206
92	GEN	Toronto Catholic District School Board	127 Victoria Park Toronto ON	SSW/245.7	-4.85	207
92	GEN	Toronto Catholic District School Board	127 Victoria Park Toronto ON	SSW/245.7	-4.85	207
92	GEN	Toronto Catholic District School Board	127 Victoria Park Toronto ON	SSW/245.7	-4.85	208

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
92	GEN	Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	SSW/245.7	-4.85	208
92	GEN	Toronto Catholic District School Board	127 Victoria Park Toronto ON	SSW/245.7	-4.85	209
92	GEN	Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	SSW/245.7	-4.85	210
92	GEN	Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	SSW/245.7	-4.85	210
92	GEN	Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	SSW/245.7	-4.85	211
92	GEN	Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	SSW/245.7	-4.85	211
92	GEN	Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	SSW/245.7	-4.85	212
92	GEN	Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	SSW/245.7	-4.85	213
92	GEN	Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	SSW/245.7	-4.85	214
93	PINC	ALBION UNDERGROUND TIC INC	1052 KINGSTON RD,,TORONTO,ON,M4E 1T4,CA ON	WSW/247.0	0.00	215
94	WWIS		4 NORTHVIEW AVENUE TORONTO ON ***Well ID:*** 6929596	W/247.3	0.15	215
95	OPCB	MOTOROLA CANADA LTD	400 VICTORIA PARK AVENUE NORTH YORK ON M4E 3T2	WSW/247.7	0.35	218
95	OPCB	MOTOROLA CANADA LTD	400 VICTORIA PARK AVENUE NORTH YORK ON M4E 3T2	WSW/247.7	0.35	218

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
95	NPCB	MOTOROLA CANADA LTD	400 VICTORIA PARK AVENUE NORTH YORK ON	WSW/247.7	0.35	219
96	SCT	Brian's Drum Shop	1051 Kingston Rd Toronto ON M4E 1T5	SW/253.8	-0.13	219
97	SPL	Enbridge Gas Distribution Inc.	27 Lynndale Cres Toronto ON	ESE/254.0	-5.02	219
98	EHS		1048 kingston Road Toronto ON M4E 1T4	WSW/254.8	0.00	220
99	WWIS		1048 Kingston Road Toronto ON ***Well ID:*** 7333347	WSW/254.9	0.35	220
100	WWIS		ON ***Well ID:*** 7397852	NNE/255.7	0.00	223
101	EHS		34-01 Toronto ON	NNE/256.4	0.05	224
101	EHS		34-01 Toronto ON	NNE/256.4	0.05	224
101	EHS		34-01 Toronto ON	NNE/256.4	0.05	225
102	WWIS		4 NOTHVIEW AVENUE TORONTO ON ***Well ID:*** 6929595	W/260.8	0.12	225
103	WWIS		ON ***Well ID:*** 7171485	SSW/265.8	-9.89	228
104	EHS		1035 KINGSTON RD TORONTO ON M4E 1T5	WSW/266.3	0.00	229
105	WWIS		ON	NW/269.2	-4.01	229

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
			Well ID: 7397850			
106	BORE		ON	ENE/269.9	1.00	230
107	CA	SCARBOROUGH CITY - LOT 34, CONC. A	LYNNDALE RD./LYNNDALE CRES. SCARBOROUGH CITY ON	ESE/271.3	-4.16	231
108	WWIS		ON ***Well ID:*** 7397851	NW/273.4	-4.01	231
109	SPL	Enbridge Gas Distribution Inc.	366 Victoria Park Ave. Toronto ON	SW/275.9	-1.36	232
109	PINC	PIPELINE HIT - 1/2"	366 VICTORIA PARK AVE,,TORONTO, ON,M4E 3S8,CA ON	SW/275.9	-1.36	233
110	CA	SCARBOROUGH BOARD OF EDUCATION	290 BLANTYRE AVENUE SCARBOROUGH CITY ON M1N 2S4	WNW/278.1	-4.11	233
110	GEN	SCARBOROUGH BOARD OF EDUCATION	BLANTYRE 290 BLANTYRE AVENUE SCARBOROUGH ON M1N 2S4	WNW/278.1	-4.11	234
110	GEN	TORONTO DISTRICT SCHOOL BOARD	BLANTYRE 290 BLANTYRE AVENUE TORONTO ON M1N 2S4	WNW/278.1	-4.11	234
110	GEN	TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVENUE TORONTO ON M1N 2S4	WNW/278.1	-4.11	234
110	GEN	TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON	WNW/278.1	-4.11	235
110	GEN	TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON	WNW/278.1	-4.11	235
110	GEN	TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4	WNW/278.1	-4.11	235
110	GEN	TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4	WNW/278.1	-4.11	236

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
110	GEN	TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4	WNW/278.1	-4.11	237
110	GEN	TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4	WNW/278.1	-4.11	237
110	GEN	TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4	WNW/278.1	-4.11	238
111	BORE		ON	SSE/279.9	-1.01	238
112	GEN	Toronto Transit Commission	410 Victoria Park Avenue Toronto ON M4E 3T2	WSW/280.3	0.00	239
112	GEN	Toronto Transit Commission	410 Victoria Park Avenue Toronto ON M4E 3T2	WSW/280.3	0.00	240
112	GEN	Toronto Transit Commission	410 Victoria Park Avenue Toronto ON M4E 3T2	WSW/280.3	0.00	240
112	GEN	Toronto Transit Commission	410 Victoria Park Avenue Toronto ON M4E 3T2	WSW/280.3	0.00	241
113	WWIS		ON ***Well ID:*** 7397854	NNW/281.4	-5.78	241
114	CA	1198152 ONTARIO LIMITED	COALPORT DR/RATHMORE AVE. SCARBOROUGH CITY ON	N/289.4	-5.50	242
115	WWIS		ON ***Well ID:*** 7397874	NNW/290.0	-5.96	242
116	GEN	KINGSTON ROAD ANIMAL HOSPITAL	1025 KINGSTON ROAD TORONTO ON M4E 1T4	WSW/290.0	-0.21	243
116	GEN	Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T5	WSW/290.0	-0.21	244

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
116	GEN	Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T5	WSW/290.0	-0.21	244
116	GEN	Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T5	WSW/290.0	-0.21	244
116	GEN	Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T5	WSW/290.0	-0.21	245
116	GEN	Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON	WSW/290.0	-0.21	245
117	GEN	Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	WSW/290.0	-0.21	245
117	GEN	Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	WSW/290.0	-0.21	246
117	GEN	Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	WSW/290.0	-0.21	246
117	GEN	Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	WSW/290.0	-0.21	246
117	GEN	Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	WSW/290.0	-0.21	247
117	GEN	Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	WSW/290.0	-0.21	247
117	GEN	Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	WSW/290.0	-0.21	248
118	SCT	Celestial Stained Glass	1024 Kingston Rd Toronto ON M4E 1T4	WSW/290.1	0.00	248
119	EHS		1020 - 1024 Kingston Road Toronto ON	WSW/290.6	0.00	248

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
120	WWIS		ON **Well ID:** 7397894	NW/291.0	-4.81	248
121	WWIS		ON **Well ID:** 7397891	NNW/292.8	-6.09	249
122	WWIS		127 VICTORIA PARK AVENUE Toronto ON **Well ID:** 7052481	SSW/292.8	-7.19	250
123	WWIS		ON **Well ID:** 7397877	NW/294.0	-4.99	254
124	EHS		Unknown Toronto ON	NNW/295.6	-6.12	255
125	WWIS		ON **Well ID:** 7397853	NW/296.7	-5.87	255
125	WWIS		ON **Well ID:** 7397892	NW/296.7	-5.87	256
126	WWIS		ON **Well ID:** 7397856	NNW/297.2	-6.26	257

Executive Summary: Summary By Data Source

ANDR - Anderson's Waste Disposal Sites

A search of the ANDR database, dated 1860s-Present has found that there are 1 ANDR site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
Clonmore & Blantyre Dump	Toronto ON M1N	0.0	2

BORE - Borehole

A search of the BORE database, dated 1875-Jul 2018 has found that there are 8 BORE site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	ON	66.0	29
	ON	66.8	30
	ON	122.3	49
	ON	128.6	52
	ON	244.2	89
	ON	245.5	90
	ON	269.9	106

Site	Address	Distance (m)	Map Key
	ON	279.9	111

CA - Certificates of Approval

A search of the CA database, dated 1985-Oct 30, 2011* has found that there are 5 CA site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
SCARBOROUGH CITY - LOT 34, CONC. A	ANNDALE RD./FALLINGBROOK RD. SCARBOROUGH CITY ON	128.4	51
P.U.C. SCARBOROUGH - LOT 35, CONC. A	VICTORIA PARK AVE./KINGSTON RD SCARBOROUGH CITY ON	234.1	76
SCARBOROUGH CITY - LOT 34, CONC. A	LYNNDALE RD./LYNNDALE CRES. SCARBOROUGH CITY ON	271.3	107
SCARBOROUGH BOARD OF EDUCATION	290 BLANTYRE AVENUE SCARBOROUGH CITY ON M1N 2S4	278.1	110
1198152 ONTARIO LIMITED	COALPORT DR/RATHMORE AVE. SCARBOROUGH CITY ON	289.4	114

CFOT - Commercial Fuel Oil Tanks

A search of the CFOT database, dated Feb 28, 2022 has found that there are 3 CFOT site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
CHRISTOS MORFIDIS	1 WINSTON CHURCHILL DRIVE SCARBOROUGH M1N 1Z8 ON CA ON	53.7	20
EDNA SULLIVAN	7 PARKLAND RD SCARBOROUGH M1N 1V6 ON CA ON	155.2	57

Site	Address	Distance (m)	Map Key
GALINA OZOLS	3 LYNNDALE RD SCARBOROUGH M1N 1B9 ON CA ON	225.8	72

DTNK - Delisted Fuel Tanks

A search of the DTNK database, dated Feb 28, 2022 has found that there are 15 DTNK site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
CHRISTOS MORFIDIS	1 WINSTON CHURCHILL DRIVE SCARBOROUGH M1N 1Z8 ON CA ON	53.7	20
1461148 ONTARIO CORP O/A PETRO CANADA #00676	1121 KINGSTON RD SCARBOROUGH ON	72.5	34
1461148 ONTARIO CORP O/A PETRO CANADA #00676	1121 KINGSTON RD SCARBOROUGH ON	72.5	34
1461148 ONTARIO CORP O/A PETRO CANADA #00676	1121 KINGSTON RD SCARBOROUGH ON	72.5	34
1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	72.5	34
1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	72.5	34
1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	72.5	34
1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	72.5	34

Site	Address	Distance (m)	Map Key
	1121 KINGSTON RD SCARBOROUGH ON M1N 1N7	72.5	34
DJ SERVICES ATTN DAVID NOUDELMAN	1121 KINGSTON RD SCARBOROUGH ON M1N 1N7	72.5	34
1461148 ONTARIO CORP O/A PETRO CANADA #00676	1121 KINGSTON RD SCARBOROUGH ON	72.5	34
	1161 KINGSTON RD SCARBOROUGH ON M1N 1P2	75.4	37
EDNA SULLIVAN	7 PARKLAND RD SCARBOROUGH M1N 1V6 ON CA ON	155.2	57
Mrs. Galina Ozols	3 Lynndale Rd, Scarborough, ON ON M1N 1B9	225.8	72
GALINA OZOLS	3 LYNNDALE RD SCARBOROUGH M1N 1B9 ON CA ON	225.8	72

EHS - ERIS Historical Searches

A search of the EHS database, dated 1999-Sep 30, 2023 has found that there are 39 EHS site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	160 fallingbrook Scarborough ON M1N 2V2	0.0	4
	1200 Kingston Rd Scarborough ON M1N 1P1	9.8	8
	1140 Kingston Road Scarborough ON M1N 1N8	16.3	9

Site	Address	Distance (m)	Map Key
	1080, 1150 & 1200 Kingston Road Toronto ON	20.7	10
	1200 Kingston Rd Toronto ON M1N1P1	20.7	10
	1150 Kingston Road Toronto Ontario Scarborough ON M1N 1N9	20.7	10
	1200 Kingston Rd Scarborough ON M1N 1P1	20.7	10
	1200 Kingston Rd Scarborough ON M1N 1P1	20.7	10
	160 Fallingbrook Rd Toronto ON M1N0A1	26.6	12
	1212-1238 Kingston Road Scarborough ON M1N 2V2	50.3	16
	1212-1238 Kingston Road Scarborough ON M1N 2V2	50.9	17
	39 Meadow Ave Scarborough ON M1N 1V5	53.0	18
	39 Meadow Avenue Scarborough ON M1N 1V5	54.4	21
	39 Meadow Ave Scarborough ON M1N 1V5	54.4	21

Site	Address	Distance (m)	Map Key
	39 Meadow Avenue Scarborough ON M1N 1V5	60.9	24
	39 Meadow Avenue Scarborough ON M1N 1V5	60.9	24
	1100 Kingston Rd Scarborough ON M1N 1N4	70.4	32
	1100 Kingston Rd Scarborough ON M1N 1N4	70.4	32
	1100 Kingston Rd Scarborough ON M1N 1N4	70.4	32
	1212-1238 Kingston Road Scarborough ON M1N 2V2	72.0	33
	1212-1238 Kingston Road Scarborough ON M1N 2V2	72.0	33
	1212-1238 Kingston Road Scarborough ON M1N 2V2	72.0	33
	1111, 1115, 1117, 1119 Kingston Road & 196, 198 Blantyre Avenue Scarborough ON M1N 1N6	72.7	35
	1111, 1115, 1117, 1119 Kingston Road & 196, 198 Blantyre Avenue Scarborough ON M1N 1N6	72.7	35
	1111, 1115, 1117, 1119 Kingston Road & 196, 198 Blantyre Avenue Scarborough ON M1N 1N6	72.7	35
	1088-1118 Kingston Road Toronto ON	73.7	36

Site	Address	Distance (m)	Map Key
	1161 Kingston Road Scarborough ON M1N 1S4	75.4	37
	1161 Kingston Road Scarborough ON M1N 1P2	75.4	37
	1092 Kingston Road Toronto ON M1N 1N4	96.4	45
	1080 Kingston Road Scarborough ON M1N 1N5	139.3	54
	1080 Kingston Rd Toronto ON M1N1N5	139.4	55
	1085-1089 Kingston Road Scarborough ON M4E 3S2	177.9	61
	1048 kingston Road Toronto ON M4E 1T4	254.8	98
	34-01 Toronto ON	256.4	101
	34-01 Toronto ON	256.4	101
	34-01 Toronto ON	256.4	101
	1035 KINGSTON RD TORONTO ON M4E 1T5	266.3	104

Site	Address	Distance (m)	Map Key
	1020 - 1024 Kingston Road Toronto ON	290.6	119
	Unknown Toronto ON	295.6	124

FST - Fuel Storage Tank

A search of the FST database, dated Feb 28, 2022 has found that there are 11 FST site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	72.5	34
1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	72.5	34
1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	72.5	34
SUNCOR ENERGY PRODUCTS PARTNERSHIP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	72.5	34
SUNCOR ENERGY PRODUCTS PARTNERSHIP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	72.5	34
SUNCOR ENERGY PRODUCTS PARTNERSHIP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	72.5	34
1461148 ONTARIO CORP	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	72.5	34
1132410 ONTARIO LTD	1161 KINGSTON RD SCARBOROUGH M1N 1P2 ON CA ON	75.4	37

Site	Address	Distance (m)	Map Key
1132410 ONTARIO LTD	1161 KINGSTON RD SCARBOROUGH M1N 1P2 ON CA ON	75.4	37
1132410 ONTARIO LTD	1161 KINGSTON RD SCARBOROUGH M1N 1P2 ON CA ON	75.4	37
1132410 ONTARIO LTD	1161 KINGSTON RD SCARBOROUGH M1N 1P2 ON CA ON	75.4	37

FSTH - Fuel Storage Tank - Historic

A search of the FSTH database, dated Pre-Jan 2010* has found that there are 3 FSTH site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
1461148 ONTARIO CORP O/A PETRO CANADA #00676	1121 KINGSTON RD SCARBOROUGH ON M1N 1N7	72.5	34
PIONEER PETROLEUMS MANAGEMENT INC**	1161 KINGSTON RD SCARBOROUGH ON M1N 1P2	75.4	37
PIONEER PETROLEUMS MANAGEMENT INC**	1161 KINGSTON RD SCARBOROUGH ON M1N 1P2	75.4	37

GEN - Ontario Regulation 347 Waste Generators Summary

A search of the GEN database, dated 1986-Oct 31, 2022 has found that there are 71 GEN site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
Greenwin Property Management	1140 Kingston Road Toronto ON M1N 1N8	16.3	9
RENT-A-WRECK	A 479220 ONTARIO LTD. 1210 KINGSTON ROAD SCARBOROUGH ON M1N 1N8	35.9	14

Site	Address	Distance (m)	Map Key
RENT-A-WRECK	A 700828 ONTARIO INC. 1210 KINGSTON ROAD SCARBOROUGH ON M1N 1N8	35.9	14
RENT-A-WRECK 33-058	A 700828 ONTARIO INC. 1210 KINGSTON ROAD SCARBOROUGH ON M1N 1N8	35.9	14
RENT-A-WRECK	1210 KINGSTON ROAD SCARBOROUGH ON M1N 1N8	35.9	14
Upper Beaches Dental	1120 Kingston Road, Unit 4 Scarborough ON M1N 1N4	60.2	23
1547988 Ontario Inc.	1224699 Ontario.Inc 1095 SECOND AVENUE EAST OWEN SOUND ON N4K 2H8	77.1	38
1547988 Ontario Inc.	1224699 Ontario.Inc 1095 SECOND AVENUE EAST OWEN SOUND ON N4K 2H8	77.1	38
1547988 Ontario Inc.	1224699 Ontario.Inc 1095 SECOND AVENUE EAST OWEN SOUND ON N4K 2H8	77.1	38
SCARBOROUGH PUBLIC UTILITIES COMM	150 FALLINGBROOK ROAD, C/O 1530 MARKHAM ROAD, SCARBOROUGH, ON M1N 2T6	96.0	44
SCARBOROUGH PUBLIC UTILITIES COMM 34-353	150 FALLINGBROOK ROAD, C/O 1530 MARKHAM ROAD, SCARBOROUGH, ON M1N 2T6	96.0	44
Whitten Health group	1092 Kingston Rd Toronto ON M1N 1N4	96.4	45
Whitten Health group	1092 Kingston Rd Toronto ON M1N 1N4	96.4	45

Site	Address	Distance (m)	Map Key
Whitten Health group	1092 Kingston Rd Toronto ON M1N 1N4	96.4	45
Whitten Health group	1092 Kingston Rd Toronto ON M1N 1N4	96.4	45
Whitten Health group	1092 Kingston Rd Toronto ON	96.4	45
Whitten Health group	1092 Kingston Rd Toronto ON M1N 1N4	96.4	45
Whitten Health group	1092 Kingston Rd Toronto ON M1N 1N4	96.4	45
MTCC 1010	1091 Kingston Rd Scarborough ON M1N 4E5	113.1	46
BIKENERGY LTD.	1066 KINGSTON RD. SCARBOROUGH ON M1N 1N4	185.4	65
BIKENERGY LTD. 05-190	1066 KINGSTON RD. SCARBOROUGH ON M1N 1N4	185.4	65
Sunrise Kids Dental	1089 Kingston Road, Unit 5 Toronto ON M1N4E4	203.6	68
Sunrise Kids Dental	1089 Kingston Road, Unit 5 Toronto ON M1N4E4	203.6	68
Sunrise Kids Dental	1089 Kingston Road, Unit 5 Toronto ON M1N4E4	203.6	68
Sunrise Kids Dental	1089 Kingston Road, Unit 5 Toronto ON M1N4E4	203.6	68

Site	Address	Distance (m)	Map Key
Sunrise Kids Dental	1089 Kingston Road, Unit 5 Toronto ON M1N4E4	203.6	68
Sunrise Kids Dental	1089 Kingston Road, Unit 5 Toronto ON M1N4E4	203.6	68
METRO SEPARATE SCHOOL BOARD	NEIL MCNEIL HIGH SCHOOL 127 VICTORIA PARK AVENUE SCARBOROUGH ON M4E 3S2	245.7	92
METROPOLITAN SEPARATE SCHOOL BOARD	NEIL MCNEIL HIGH SCHOOL 127 VICTORIA PARK AVENUE SCARBOROUGH ON M4E 3S2	245.7	92
METROPOLITAN SEPARATE SCHOOL BRD. 25-261	NEIL MCNEIL HIGH SCHOOL 127 VICTORIA PARK AVENUE SCARBOROUGH ON M4E 3S2	245.7	92
TORONTO CATHOLIC DISTRICT SCHOOL BOARD	NEIL MCNEIL HIGH SCHOOL 127 VICTORIA PARK AVENUE SCARBOROUGH ON M4E 3S2	245.7	92
Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	245.7	92
Toronto Catholic District School Board	127 Victoria Park Toronto ON	245.7	92
Toronto Catholic District School Board	127 Victoria Park Toronto ON	245.7	92
Toronto Catholic District School Board	127 Victoria Park Toronto ON	245.7	92
Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	245.7	92

Site	Address	Distance (m)	Map Key
Toronto Catholic District School Board	127 Victoria Park Toronto ON	245.7	92
Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	245.7	92
Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	245.7	92
Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	245.7	92
Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	245.7	92
Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	245.7	92
Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	245.7	92
Toronto Catholic District School Board	127 Victoria Park Toronto ON M4E 3S2	245.7	92
SCARBOROUGH BOARD OF EDUCATION	BLANTYRE 290 BLANTYRE AVENUE SCARBOROUGH ON M1N 2S4	278.1	110
TORONTO DISTRICT SCHOOL BOARD	BLANTYRE 290 BLANTYRE AVENUE TORONTO ON M1N 2S4	278.1	110
TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVENUE TORONTO ON M1N 2S4	278.1	110
TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON	278.1	110

Site	Address	Distance (m)	Map Key
TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON	278.1	110
TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4	278.1	110
TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4	278.1	110
TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4	278.1	110
TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4	278.1	110
TORONTO DISTRICT SCHOOL BOARD	BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4	278.1	110
Toronto Transit Commission	410 Victoria Park Avenue Toronto ON M4E 3T2	280.3	112
Toronto Transit Commission	410 Victoria Park Avenue Toronto ON M4E 3T2	280.3	112
Toronto Transit Commission	410 Victoria Park Avenue Toronto ON M4E 3T2	280.3	112
Toronto Transit Commission	410 Victoria Park Avenue Toronto ON M4E 3T2	280.3	112
KINGSTON ROAD ANIMAL HOSPITAL	1025 KINGSTON ROAD TORONTO ON M4E 1T4	290.0	116

Site	Address	Distance (m)	Map Key
Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T5	290.0	116
Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T5	290.0	116
Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T5	290.0	116
Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T5	290.0	116
Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON	290.0	116
Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	290.0	117
Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	290.0	117
Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	290.0	117
Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	290.0	117
Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	290.0	117
Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	290.0	117
Kingston Rd. Animal Hospital	1025 Kingston Rd Toronto ON M4E 1T4	290.0	117

Site	Address	Distance (m)	Map Key

HINC - TSSA Historic Incidents

A search of the HINC database, dated 2006-June 2009* has found that there are 2 HINC site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	36 MEADOW AVENUE TORONTO ON M1N 1V6	82.0	40
	291 BLANTYRE AVENUE TORONTO ON M1N 2S2	182.8	62

INC - Fuel Oil Spills and Leaks

A search of the INC database, dated Feb 28, 2022 has found that there are 4 INC site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	1080 KINGSTON RD, TORONTO ON	139.4	55
	1080 KINGSTON RD, TORONTO ON	139.4	55
	169 Courcelette Road, Toronto ON	172.8	60
	1255 Kingston Road, Toronto ON	183.7	64

NPCB - National PCB Inventory

A search of the NPCB database, dated 1988-2008* has found that there are 1 NPCB site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
MOTOROLA CANADA LTD	400 VICTORIA PARK AVENUE NORTH YORK ON	247.7	95

OPCB - Inventory of PCB Storage Sites

A search of the OPCB database, dated 1987-Oct 2004; 2012-Dec 2013 has found that there are 2 OPCB site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
MOTOROLA CANADA LTD	400 VICTORIA PARK AVENUE NORTH YORK ON M4E 3T2	247.7	95
MOTOROLA CANADA LTD	400 VICTORIA PARK AVENUE NORTH YORK ON M4E 3T2	247.7	95

PES - Pesticide Register

A search of the PES database, dated Oct 2011- Oct 31, 2023 has found that there are 2 PES site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
659960 ONTARIO INC./HENLEY GARDENS VALU-MART	1089 KINGSTON ROAD SCARBOROUGH ON M1N1N6	203.6	68
659960 ONTARIO INC./HENLEY GARDENS VALU-MART	1089 KINGSTON ROAD SCARBOROUGH ON M1N1N6	203.6	68

PINC - Pipeline Incidents

A search of the PINC database, dated Feb 28, 2021 has found that there are 9 PINC site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	246 Blantyre Avenue, Toronto ON	64.2	26

Site	Address	Distance (m)	Map Key
	1 ANNDALE ROAD, TORONTO ON	151.7	56
PIPELINE HIT 1/2"	171 COURCELETTE RD,,TORONTO,ON, M1N 2T1,CA ON	165.5	59
	56 Winston Avenue, Toronto ON	182.8	63
PIPELINE HIT - 1/2"	19 ANNDALE RD,,TORONTO,ON,M1N 1C4, CA ON	188.7	66
MURGA CONSTRUCTION LTD	27 ANNDALE RD,,TORONTO,ON,M1N 1C4, CA ON	214.0	69
	2 Northview Avenue, Toronto ON	242.7	87
ALBION UNDERGROUND TIC INC	1052 KINGSTON RD,,TORONTO,ON,M4E 1T4,CA ON	247.0	93
PIPELINE HIT - 1/2"	366 VICTORIA PARK AVE,,TORONTO,ON, M4E 3S8,CA ON	275.9	109

PRT - Private and Retail Fuel Storage Tanks

A search of the PRT database, dated 1989-1996* has found that there are 2 PRT site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
SIVA GAS BAR	1121 KINGSTON RD SCARBOROUGH ON M1N1N7	72.5	34
SUNOCO INC - THROUGH AGENT PIONEER PETROLEUMS MANA	1161 KINGSTON RD SCARBOROUGH ON M1N1P2	75.4	37

Site	Address	Distance (m)	Map Key

RSC - Record of Site Condition

A search of the RSC database, dated 1997-Sept 2001, Oct 2004-Oct 2023 has found that there are 3 RSC site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
TORONTO HYDRO-ELECTRIC SYSTEM LIMITED	160 FALLINGBROOK ROAD, TORONTO, ON M1N 2V2 Toronto ON	26.6	12
1092KR URBAN PROPERTIES INC.	1116-1118 KINGSTON ROAD, TORONTO, ON M1N 1N4, 1102 KINGSTON ROAD, TORONTO, ON M1N 1N4, 1112-1114 KINGSTON ROAD, TORONTO, ON M1N 1N4, 1100 KINGSTON ROAD, TORONTO, ON M1N 1N4 Toronto ON	34.8	13
Wes-Jen Holdings Limited	1210 KINGSTON RD, TORONTO, ON, M1N 1N8 ON M1N 1N8	35.9	14

RST - Retail Fuel Storage Tanks

A search of the RST database, dated 1999-Oct 31, 2023 has found that there are 7 RST site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
PETRO CANADA LTD	1121 KINGSTON RD SCARBOROUGH ON M1N 1N7	72.5	34
1461148 ONT CORP PETRO CANADA 00676	1121 KINGSTON RD SCARBOROUGH ON M1N 1N7	72.5	34
GODO ENTERPRISES INC	1121 KINGSTON RD SCARBOROUGH ON M1N 1N7	72.5	34
SIVA'S GAS BAR	1121 KINGSTON RD SCARBOROUGH ON M1N1N7	72.5	34

Site	Address	Distance (m)	Map Key
PETRO CANADA	1121 KINGSTON RD SCARBOROUGH ON M1N1N7	72.5	34
PETRO CANADA CORP	1121 KINGSTON RD SCARBOROUGH ON M1N1N7	72.5	34
PETRO CANADA	1121 KINGSTON RD SCARBOROUGH ON M1N1N7	72.5	34

SCT - Scott's Manufacturing Directory

A search of the SCT database, dated 1992-Mar 2011* has found that there are 5 SCT site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
Descore Inc.	157 Fallingbrook Rd Scarborough ON M1N 2V2	21.0	11
MORFIDIS FURS	1 WINSTON CHURCHILL DR SCARBOROUGH ON M1N 1Z8	53.7	19
We Compute Inc.	1232 Kingston Rd Scarborough ON M1N 1P3	72.0	33
Brian's Drum Shop	1051 Kingston Rd Toronto ON M4E 1T5	253.8	96
Celestial Stained Glass	1024 Kingston Rd Toronto ON M4E 1T4	290.1	118

SPL - Ontario Spills

A search of the SPL database, dated 1988-Dec 2021; see description has found that there are 17 SPL site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
Enbridge Gas Distribution Inc.	244 Blantyre Avenue Toronto ON M1N 2S1	59.8	22
City of Toronto	In front of 14 Elmview Drive Toronto ON M1N 2W4	65.0	28
B PLUS SERVICE STATION	1161 KINGSTON ROAD SERVICE STATION TORONTO CITY ON M1N 1P2	75.4	37
PIONEER PETROLEUMS LTD.	1161 KINGSTON RD.SCARBOROUGH, ON SERVICE STATION TORONTO CITY ON M1N 1P2	75.4	37
TRANSPORT TRUCK	1239 KINGSTON RD MOTOR VEHICLE (OPERATING FLUID) TORONTO CITY ON M1N 1P4	115.4	47
SCARBOROUGH HYDRO	17 MEADOW ACRES TRANSFORMER TORONTO CITY ON M1N 1V5	129.8	53
	171 Courcelette Rd Toronto ON	165.5	59
Enbridge Gas Distribution Inc.	56 Winston Ave (Vic Park and Kingston) Toronto ON M1N 1W3	182.8	63
	40 Winston Ave Toronto ON M1N 1W3	200.8	67
CONSUMERS' GAS CO. LTD., THE	MEADOW AVE, KINGSTON RD/VICTORIA PARK NATURAL GAS PIPELINE TORONTO CITY ON	228.8	73
Toronto Transit Commission	Meadow Ave and Victoria Park Ave Toronto ON	229.2	74
	5 Lynndale Road<UNOFFICIAL> Toronto ON M1N 1B9	231.4	75

Site	Address	Distance (m)	Map Key
	149 Courcelette Rd, Toronto TORONTO ON	239.4	82
Enbridge Gas Distribution Inc.	2 Northview Avenue, Scarborough Toronto ON	242.7	87
	31 Annedale Rd Toronto ON	245.7	91
Enbridge Gas Distribution Inc.	27 Lynndale Cres Toronto ON	254.0	97
Enbridge Gas Distribution Inc.	366 Victoria Park Ave. Toronto ON	275.9	109

WDSH - Waste Disposal Sites - MOE 1991 Historical Approval Inventory

A search of the WDSH database, dated Up to Oct 1990* has found that there are 1 WDSH site(s) within approximately 0.30 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	Clonmore Dr. & Blantyre Ave. SCARBOROUGH ON	0.0	3

WWIS - Water Well Information System

A search of the WWIS database, dated Mar 31 2023 has found that there are 44 WWIS site(s) within approximately 0.30 kilometers of the project property.

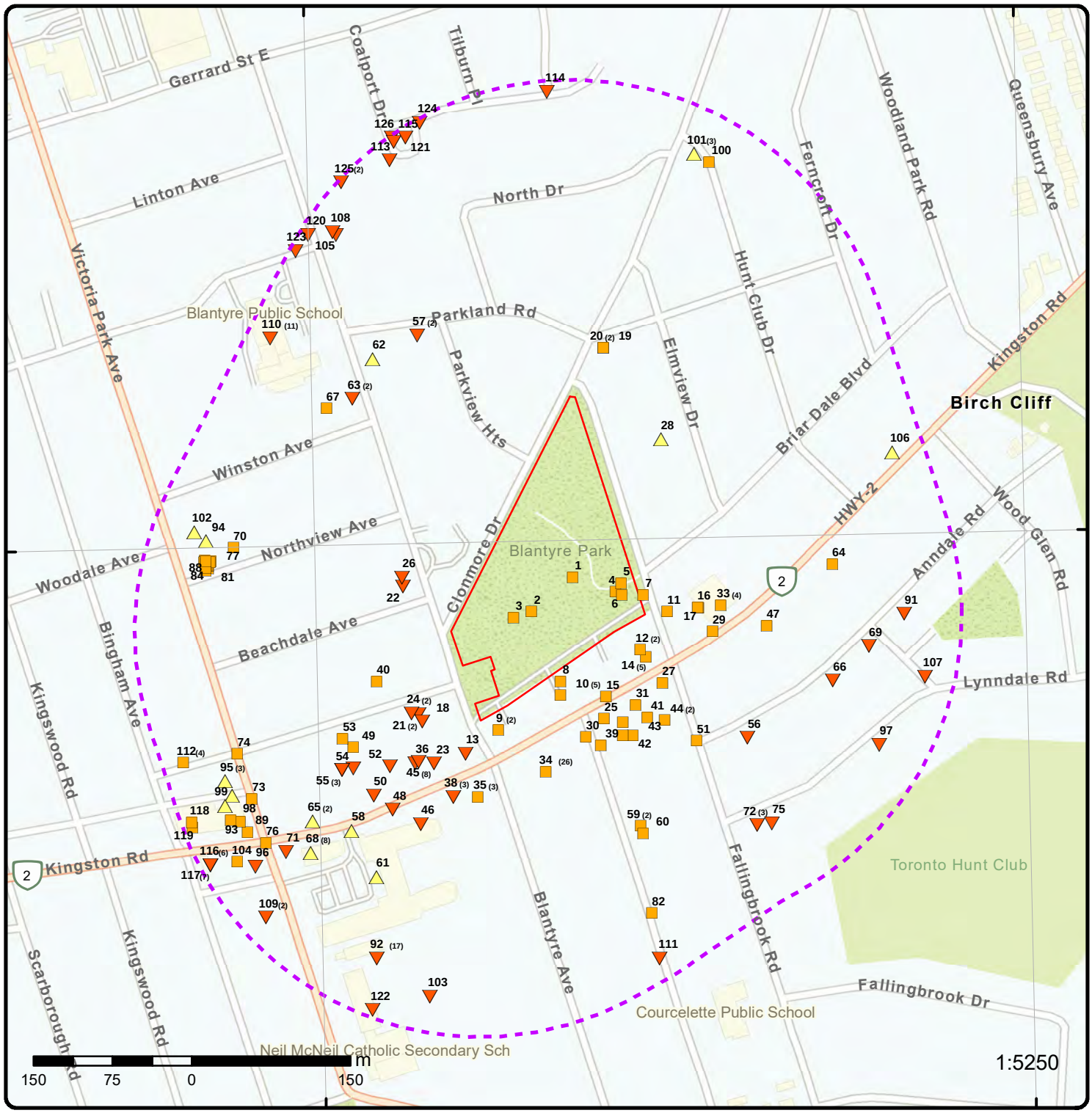
Site	Address	Distance (m)	Map Key
	1150 KINGSTON ROAD 1200 SCARBOROUGH ON ***Well ID:*** 7151943	0.0	1
	ON	0.0	5

Site	Address	Distance (m)	Map Key
	Well ID: 7304804		
	ON ***Well ID:*** 7259673	0.0	6
	ON ***Well ID:*** 7239684	4.0	7
	1161 KINGSTON ROAD SCARBOROUGH ON ***Well ID:*** 7373065	46.3	15
	1161 KINGSTON ROAD SCARBOROUGH ON ***Well ID:*** 7336195	62.5	25
	1165 KINGSTON ROAD Toronto ON ***Well ID:*** 7111417	64.4	27
	1161 KINGSTON ROAD SCARBOROUGH ON ***Well ID:*** 7373047	68.8	31
	ON ***Well ID:*** 7352593	81.3	39
	1165 KINGSTON ROAD Toronto ON ***Well ID:*** 7111418	84.9	41
	1161 KINGSTON RD SCARBOROUGH ON ***Well ID:*** 7336194	85.8	42
	1161 KINGSTON ROAD SCARBOROUGH ON ***Well ID:*** 7373050	91.0	43
	1089 KINGSTON RD Toronto ON ***Well ID:*** 7245021	118.3	48

Site	Address	Distance (m)	Map Key
	1080 KINGSTON ROAD SCARBOROUGH ON ***Well ID:*** 7112201	123.6	50
	1085 KINGSTON RD SCARBOROUGH ON ***Well ID:*** 7241836	160.5	58
	NORTHVIEW AVE. & DANFORTH SCARBOROUGH ON ***Well ID:*** 7116163	220.9	70
	1085-1089 KINGSTON RD SCARBOROUGH ON ***Well ID:*** 7241837	222.1	71
	4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101723	236.7	77
	4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101798	237.3	78
	4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101721	237.7	79
	4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101722	238.5	80
	4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101799	239.2	81
	4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101802	239.4	83
	4 NORTHVIEW AVE. SCARBOROUGH ON ***Well ID:*** 7101801	239.9	84
	4 NORTHVIEW AVE. SCARBOROUGH ON	240.9	85

Site	Address	Distance (m)	Map Key
	Well ID: 7101800		
	ON ***Well ID:*** 7160102	241.5	86
	4 NORTHVIEW DRIVE SCARBOROUGH ON ***Well ID:*** 7110505	242.7	87
	4 NORTHVIEW AVE SCARBOROUGH ON ***Well ID:*** 7048097	243.1	88
	4 NORTHVIEW AVENUE TORONTO ON ***Well ID:*** 6929596	247.3	94
	1048 Kingston Road Toronto ON ***Well ID:*** 7333347	254.9	99
	ON ***Well ID:*** 7397852	255.7	100
	4 NOTHVIEW AVENUE TORONTO ON ***Well ID:*** 6929595	260.8	102
	ON ***Well ID:*** 7171485	265.8	103
	ON ***Well ID:*** 7397850	269.2	105
	ON ***Well ID:*** 7397851	273.4	108
	ON ***Well ID:*** 7397854	281.4	113

Site	Address	Distance (m)	Map Key
	ON ***Well ID:*** 7397874	290.0	115
	ON ***Well ID:*** 7397894	291.0	120
	ON ***Well ID:*** 7397891	292.8	121
	127 VICTORIA PARK AVENUE Toronto ON ***Well ID:*** 7052481	292.8	122
	ON ***Well ID:*** 7397877	294.0	123
	ON ***Well ID:*** 7397853	296.7	125
	ON ***Well ID:*** 7397892	296.7	125
	ON ***Well ID:*** 7397856	297.2	126



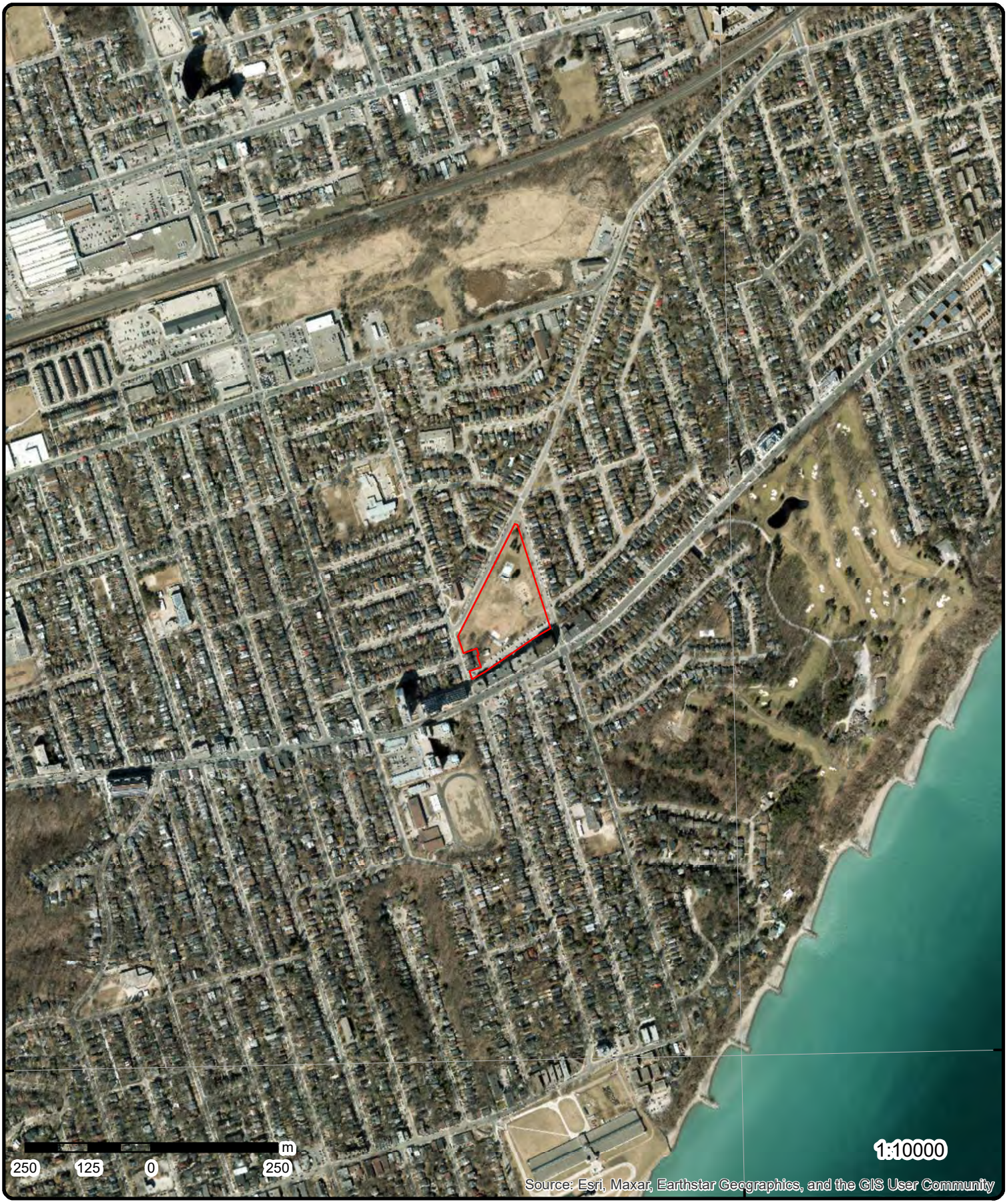
Map: 0.3 Kilometer Radius

Order Number: 23121300911

Address: 180 Fallingbrook Road, Scarborough, ON

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Freeways; Highways
- Traffic Circle; Ramp
- Major Arterial; Minor Arterial
- Local Road
- Service Road; Traffic Circle; Ramp
- Rail
- Beach
- Airport
- Industrial Area
- Military Base
- Aircraft Roads
- Native Reservation
- Hospital
- Shopping & Sports Area
- University/College
- Cemetery; Golf Course
- Parkt (National)
- Park (City/County)

79°16'30"W



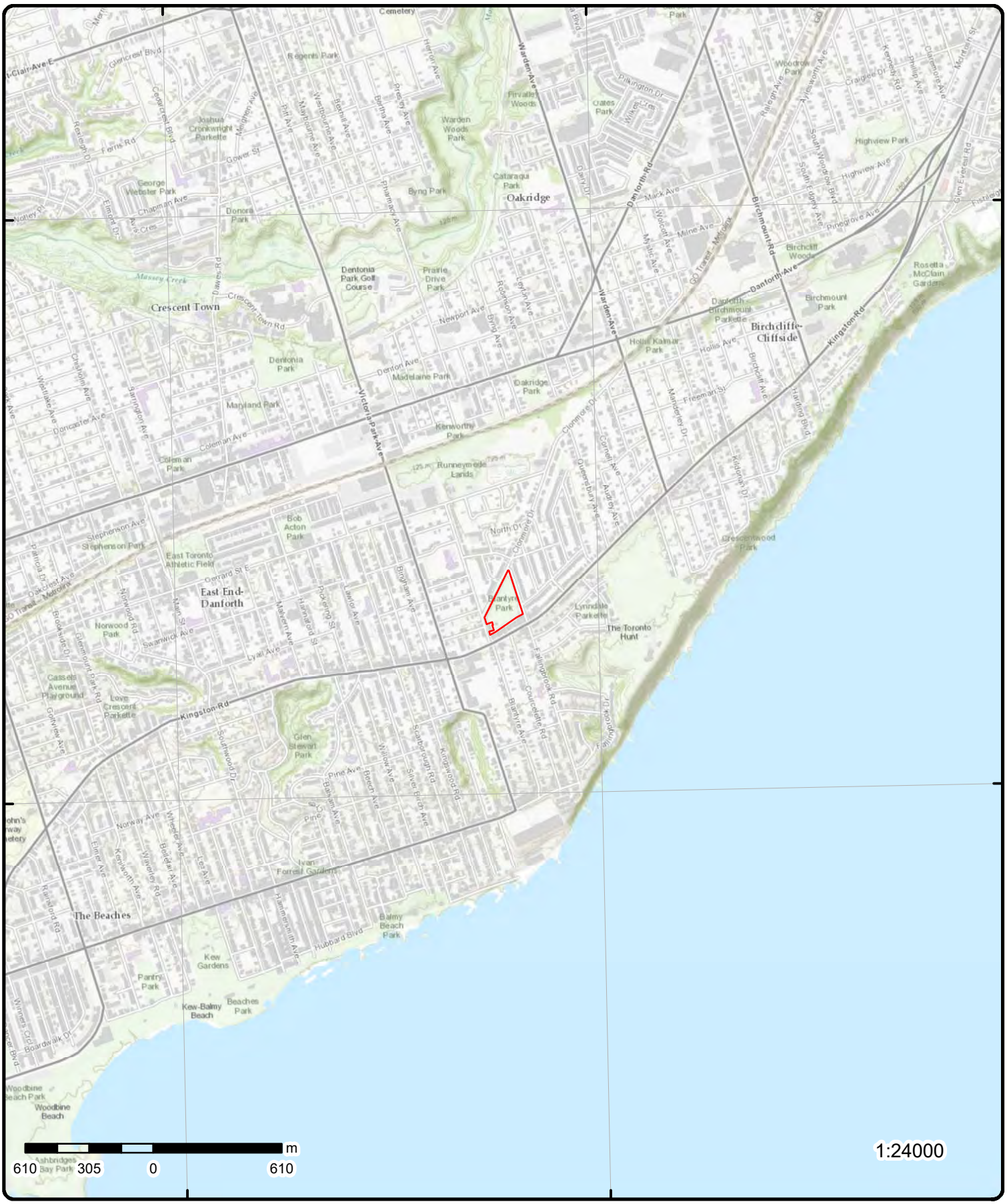
43°40'30"N

Aerial **Year: 2022**

Order Number: 23121300911

Address: 180 Fallingbrook Road, Scarborough, ON

Source: ESRI World Imagery



Topographic Map

Address: 180 Fallingbrook Road, ON

Source: ESRI World Topographic Map

Order Number: 23121300911

Detail Report

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
1	1 of 1	E/0.0	129.8 / 0.00	1150 KINGSTON ROAD 1200 SCARBOROUGH ON	WWIS

Well ID:	7151943	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Monitoring and Test Hole	**Data Entry Status:**	
Use 2nd:	0	**Data Src:**	
Final Well Status:	Monitoring and Test Hole	**Date Received:**	09/24/2010
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z122004	**Contractor:**	7241
Tag:	A107697	**Form Version:**	7
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	

Municipality: SCARBOROUGH BOROUGH
Site Info: WKQ-002990/A0-A00

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/715\7151943.pdf

Additional Detail(s) (Map)

Well Completed Date: 09/03/2010
Year Completed: 2010
Depth (m): 5.7912
Latitude: 43.6830171424099
Longitude: -79.2803785670628
Path: 715\7151943.pdf

Bore Hole Information

Bore Hole ID:	1003339720	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638602.00
Code OB Desc:		**North83:**	4838104.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	09/03/2010	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr

Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID:	1003510739
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Mat2 Desc:	GRAVEL
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	19.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1003510741
Layer:	1
Plug From:	0.0
Plug To:	0.5
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1003510742
Layer:	2
Plug From:	0.5
Plug To:	8.0
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1003510743
Layer:	3
Plug From:	8.0
Plug To:	19.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	1003510749
Method Construction Code:	B
Method Construction:	Other Method
Other Method Construction:	DIRECT PUSH

Pipe Information

Pipe ID:	1003510738
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1003510745
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0.0
Depth To:	9.0
Casing Diameter:	1.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Screen

Screen ID:	1003510746
Layer:	1
Slot:	10
Screen Top Depth:	9.0
Screen End Depth:	19.0
Screen Material:	5
Screen Depth UOM:	ft
Screen Diameter UOM:	inch
Screen Diameter:	1.0

Water Details

Water ID:	1003510744
Layer:	
Kind Code:	
Kind:	
Water Found Depth:	
Water Found Depth UOM:	ft

Hole Diameter

Hole ID:	1003510740
Diameter:	25.0
Depth From:	0.0
Depth To:	19.0
Hole Depth UOM:	ft
Hole Diameter UOM:	inch

Links

Bore Hole ID:	1003339720	**Tag No:**	A107697
Depth M:	5.7912	**Contractor:**	7241
Year Completed:	2010	**Latitude:**	43.6830171424099
Well Completed Dt:	09/03/2010	**Longitude:**	-79.2803785670628
Audit No:	Z122004	**Y:**	43.68301713922432
Path:	715\7151943.pdf	**X:**	-79.28037841595348

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2 ***1 of 1*** ***SW/0.0*** ***129.8 / 0.00*** ***Clonmore & Blantyre Dump*** ***ANDR***

Toronto ON M1N

Legal Description:	Scarborough Range A Lot 35 pt
Location Description:	Clonmore Dr & Blantyre Avenue; under Blantyre Park
Municipality:	Scarborough Township
Current Municipality:	Toronto City
RM:	Toronto City
Facility:	Dump
Date Active:	pre 1970

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Date Begun:
Date Complete:
Area (Ha): 3.75
Landfill Type: open faced dump
Group Name:
Operated By:
Serial: MOEE 3020
NTS: 30M11
Diameter (m):

Historical Summary:

Clonmore & Blantyre Dump MOEE Files extant for this site in 1979 (Site Identification Study 1979). MTSER 1994 This site depicted as a landfill, closed by 1994. Located apparently in Blantyre Park in the block bounded by Clonmore, Fallingbrook, Blantyre and Kingston Rd. Bourne¿s Gravel Pit Ratepayers of Meadow Ave, Scarborough are angry over surface drainage and standing water in their district, blocking roads and sidewalks. Engineer Fraser has prepared a scheme of drainage involving a 12 inch sewer running from 250 yards west of the Blantyre Ave street line easterly to drain into Bourne's Gravel Pit. Gravel pit is on the east side of Blantyre Ave, and is privately owned, entailing a three-year agreement for drainage into it at $175 pa. System would also drain Blantyre Ave from Kingston Rd and the whole of Meadow Ave (Toronto Telegram Oct 1 1926 p28). 1954 Air Photos Ground disturbance marked 1985 OBM This site is a pit 2m deep roughly 150 by 250 metres.

Waste Type:
UTM X Nad 27: 638550
UTM Y Nad 27: 4837850
UTM Zone: 17

3	1 of 1	SW/0.0	129.8 / 0.00	Clonmore Dr. & Blantyre Ave. SCARBOROUGH ON	WDSH

Site No.: X3020
Region: CENTRAL
County: TORONTO
Concession:
Lot: Clonmore Dr. & Blantyre Ave.
Easting: 638550
Northing: 4837850
Zone: 17
Date Closed:
Status: CLOSED
Classification: A3 - POTENTIAL HUMAN IMPACT-URBAN MUNICIPAL/DOMESTIC WASTE - CLOSED <10 YRS
%CommericialWste: n/a
%DomesticWste Rec: n/a
%LiquidWste Rec: n/a
%HazardousWste Rec: n/a
%Non-haz.Wste Rec: n/a
%Sewage/Sludge Rec: n/a
%Other Wste Rec: n/a

4	1 of 1	ESE/0.0	129.8 / 0.00	160 fallingbrook Scarborough ON M1N 2V2	EHS

Order No: 23091100068
Status: C
Report Type: Standard Report
Report Date: 12-SEP-23
Date Received: 11-SEP-23
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -79.2798788
Y: 43.6828847

5	1 of 1	E/0.0	129.8 / 0.00		WWIS

Well ID:	7304804	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:		**Data Entry Status:**	Yes
Use 2nd:		**Data Src:**	
Final Well Status:		**Date Received:**	02/02/2018
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	C38214	**Contractor:**	7437
Tag:	A209685	**Form Version:**	8
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	

Municipality: SCARBOROUGH BOROUGH
Site Info:

PDF URL (Map):

Additional Detail(s) (Map)

Well Completed Date: 11/03/2017
Year Completed: 2017
Depth (m):
Latitude: 43.6829545569369
Longitude: -79.2798096465049
Path:

Bore Hole Information

Bore Hole ID:	1006979940	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638648.00
Code OB Desc:		**North83:**	4838098.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	11/03/2017	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr

Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Links

Bore Hole ID:	1006979940	**Tag No:**	A209685
Depth M:		**Contractor:**	7437
Year Completed:	2017	**Latitude:**	43.6829545569369
Well Completed Dt:	11/03/2017	**Longitude:**	-79.2798096465049
Audit No:	C38214	**Y:**	43.68295455451693
Path:		**X:**	-79.2798094960032

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
6	1 of 1	ESE/0.0	129.8 / 0.00	ON	WWIS

Well ID:	7259673	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:		**Data Entry Status:**	Yes
Use 2nd:		**Data Src:**	
Final Well Status:		**Date Received:**	03/22/2016
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	C30832	**Contractor:**	7437
Tag:	A175724	**Form Version:**	8
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map):

Additional Detail(s) (Map)

Well Completed Date:	02/12/2016
Year Completed:	2016
Depth (m):	
Latitude:	43.6828553708505
Longitude:	-79.2798000746866
Path:	

Bore Hole Information

Bore Hole ID:	1005910579	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638649.00
Code OB Desc:		**North83:**	4838087.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	02/12/2016	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Links

Bore Hole ID:	1005910579	**Tag No:**	A175724
Depth M:		**Contractor:**	7437
Year Completed:	2016	**Latitude:**	43.6828553708505
Well Completed Dt:	02/12/2016	**Longitude:**	-79.2798000746866
Audit No:	C30832	**Y:**	43.68285536788206
Path:		**X:**	-79.2797999244656

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
7	1 of 1	E/4.0	129.8 / 0.00	ON	WWIS

Well ID:	7239684	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:		**Data Entry Status:**	Yes
Use 2nd:		**Data Src:**	
Final Well Status:		**Date Received:**	04/09/2015
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	C28351	**Contractor:**	7437
Tag:	A175724	**Form Version:**	8
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map):

Additional Detail(s) (Map)

Well Completed Date:	03/13/2015
Year Completed:	2015
Depth (m):	
Latitude:	43.6828516370008
Longitude:	-79.2795520475939
Path:	

Bore Hole Information

Bore Hole ID:	1005322459	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638669.00
Code OB Desc:		**North83:**	4838087.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	03/13/2015	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Links

Bore Hole ID:	1005322459	**Tag No:**	A175724
Depth M:		**Contractor:**	7437
Year Completed:	2015	**Latitude:**	43.6828516370008
Well Completed Dt:	03/13/2015	**Longitude:**	-79.2795520475939
Audit No:	C28351	**Y:**	43.68285163440142
Path:		**X:**	-79.27955189700022

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
8	1 of 1	S/9.8	129.8 / 0.00	1200 Kingston Rd Scarborough ON M1N 1P1	EHS

Order No: 22061300434
Status: C
Report Type: Standard Report
Report Date: 16-JUN-22
Date Received: 13-JUN-22
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -79.2805454
Y: 43.6821313

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
9	1 of 2	SSW/16.3	129.8 / 0.00	Greenwin Property Management 1140 Kingston Road Toronto ON M1N 1N8	GEN

Generator No: ON1662416
SIC Code: 561799
SIC Description: All Other Services to Buildings and Dwellings
Approval Years: 05
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 222
Waste Class Name: HEAVY FUELS

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
9	2 of 2	SSW/16.3	129.8 / 0.00	1140 Kingston Road Scarborough ON M1N 1N8	EHS

Order No: 23071001472
Status: C
Report Type: Standard Report
Report Date: 13-JUL-23
Date Received: 10-JUL-23
Previous Site Name:
Lot/Building Size:
Additional Info Ordered: Fire Insur. Maps and/or Site Plans; City Directory
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -79.2812843
Y: 43.681728

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
10	1 of 5	S/20.7	129.8 / 0.00	1080, 1150 & 1200 Kingston Road Toronto ON	EHS

Order No: 20070923003
Status: C
Report Type: CAN - Custom Report
Report Date: 10/2/2007
Date Received: 9/23/2007
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:
Nearest Intersection: Victoria Park Ave & Fallingbrook Rd
Municipality:
Client Prov/State:
Search Radius (km): 0.25
X: -79.281465
Y: 43.681438

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
10	2 of 5	S/20.7	129.8 / 0.00	1200 Kingston Rd Toronto ON M1N1P1	EHS

Order No:	20131111023	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Standard Select Report	**Client Prov/State:**	ON
Report Date:	18-NOV-13	**Search Radius (km):**	.25
Date Received:	11-NOV-13	**X:**	-79.280547
Previous Site Name:		**Y:**	43.682013
Lot/Building Size:			
Additional Info Ordered:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
10	3 of 5	S/20.7	129.8 / 0.00	1150 Kingston Road Toronto Ontario Scarborough ON M1N 1N9	EHS

Order No:	20181011040	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Standard Report	**Client Prov/State:**	ON
Report Date:	16-OCT-18	**Search Radius (km):**	.25
Date Received:	11-OCT-18	**X:**	-79.28052
Previous Site Name:		**Y:**	43.682173
Lot/Building Size:			
Additional Info Ordered:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
10	4 of 5	S/20.7	129.8 / 0.00	1200 Kingston Rd Scarborough ON M1N 1P1	EHS

Order No:	22061300434	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Standard Report	**Client Prov/State:**	ON
Report Date:	16-JUN-22	**Search Radius (km):**	.25
Date Received:	13-JUN-22	**X:**	-79.2805454
Previous Site Name:		**Y:**	43.6821313
Lot/Building Size:			
Additional Info Ordered:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
10	5 of 5	S/20.7	129.8 / 0.00	1200 Kingston Rd Scarborough ON M1N 1P1	EHS

Order No:	22061300434	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Standard Report	**Client Prov/State:**	ON
Report Date:	16-JUN-22	**Search Radius (km):**	.25
Date Received:	13-JUN-22	**X:**	-79.2805454
Previous Site Name:		**Y:**	43.6821313
Lot/Building Size:			
Additional Info Ordered:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
11	1 of 1	ESE/21.0	129.8 / 0.00	Descore Inc. 157 Fallingbrook Rd Scarborough ON M1N 2V2	SCT

Established:	01-SEP-99
Plant Size (ft²):	1500
Employment:	

--Details--

Description: Computer Systems Design and Related Services
SIC/NAICS Code: 541510

Description: Computer, Computer Peripheral and Pre-Packaged Software Wholesaler-Distributors
SIC/NAICS Code: 417310

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12 | **1 of 2** | **ESE/26.6** | **129.8 / 0.00** | **160 Fallingbrook Rd**
Toronto ON M1N0A1 | **EHS**

Order No: 20141209006
Status: C
Report Type: Standard Report
Report Date: 15-DEC-14
Date Received: 09-DEC-14
Previous Site Name:
Lot/Building Size:
Additional Info Ordered: Fire Insur. Maps and/or Site Plans; Topographic Maps

Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -79.2798
Y: 43.68289

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12 | **2 of 2** | **ESE/26.6** | **129.8 / 0.00** | **TORONTO HYDRO-ELECTRIC SYSTEM LIMITED**
160 FALLINGBROOK ROAD, TORONTO, ON M1N 2V2
Toronto ON | **RSC**

RSC ID: 223608
RA No:
RSC Type: Phase 1 and 2 RSC
Curr Property Use: Industrial
Ministry District: Toronto District Office
Filing Date: 2017/08/18
Date Ack:
Date Returned:
Restoration Type:
Soil Type:
Criteria:
CPU Issued Sect 1686:

Cert Date:
Cert Prop Use No:
Intended Prop Use: Parkland
Qual Person Name: MIKE GRAYHURST
Stratified (Y/N):
Audit (Y/N):
Entire Leg Prop. (Y/N):
Accuracy Estimate:
Telephone:
Fax:
Email:

Asmt Roll No: 19-01-012-030-00900
Prop ID No (PIN): 06470-0128 (LT)
Property Municipal Address: 160 FALLINGBROOK ROAD, TORONTO, ON M1N 2V2
Mailing Address:
Latitude & Latitude:
UTM Coordinates:
Consultant:
Legal Desc:
Measurement Method:
Applicable Standards:
RSC PDF: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=83700&fileName=BROWNFIELDS-E.pdf

Document(s) Detail

Document Heading: Supporting Documents
Document Name: Fallingbrook legal ltr.pdf
Document Type: Lawyer's letter consisting of a legal description of the property
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=83704&fileName=Fallingbrook+legal+ltr.pdf

Document Heading: Supporting Documents
Document Name: OHE T Hydro_CSM_Fallingbrook Feb 16-17 rcd.pdf
Document Type: Phase 2 Conceptual Site Model
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=83702&fileName=OHE+T+Hydro_CSM_Fallingbrook+Feb+16-17+rcd.pdf

Document Heading: Supporting Documents
Document Name: THESL_Cert of Status.pdf
Document Type: Certificate of Status
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=83707&fileName=THESL_Cert+of+Status.pdf

Document Heading: Supporting Documents
Document Name: Fallingbrook TS deed.pdf
Document Type: Copy of any deed(s), transfer(s) or other document(s)
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=83708&fileName=Fallingbrook+TS+deed.pdf

Document Heading: Supporting Documents
Document Name: marked up survey.pdf
Document Type: A Current plan of Survey
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=83711&fileName=marked+up+survey.pdf

Document Heading: Supporting Documents
Document Name: 160 Fallingbrook Rd_non potable.pdf
Document Type: A copy of No Objection Statement from municipality
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=83701&fileName=160+Fallingbrook+Rd_non+potable.pdf

Document Heading: Supporting Documents
Document Name: Tble Areas of PECs.pdf
Document Type: Area(s) of Potential Environmental Concern
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=83706&fileName=Tble+Areas+of+PECs.pdf

Document Heading: Supporting Documents
Document Name: Fallingbrook Rd_Agent Auth_sgnd.pdf
Document Type: Proof of the owner's authorization
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=83699&fileName=Fallingbrook+Rd_Agent+Auth_sgnd.pdf

Document Heading: Supporting Documents
Document Name: Tble_Current Past Uses-May 2017.pdf
Document Type: Table of Current and Past Property Use
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=83703&fileName=Tble_Current+Past+Uses-May+2017.pdf

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13	1 of 1	SW/34.8	129.7 / -0.18	***1092KR URBAN PROPERTIES INC.*** ***1116-1118 KINGSTON ROAD, TORONTO, ON M1N 1N4, 1102 KINGSTON ROAD, TORONTO, ON M1N 1N4, 1112-1114 KINGSTON ROAD, TORONTO, ON M1N 1N4, 1100 KINGSTON ROAD,*** ***TORONTO, ON M1N 1N4 Toronto ON***	RSC

RSC ID: 222362
RA No:
RSC Type: Phase 1 and 2 RSC
Curr Property Use: Commercial
Ministry District: Toronto District Office
Filing Date: 2016/09/07
Date Ack:
Date Returned:
Restoration Type:
Soil Type:
Criteria:
CPU Issued Sect 1686:
Asmt Roll No: 19-01-01-2-010-02600-0000,

Cert Date:
Cert Prop Use No:
Intended Prop Use: Residential
Qual Person Name: RAKESH KONERU
Stratified (Y/N):
Audit (Y/N):
Entire Leg Prop. (Y/N):
Accuracy Estimate:
Telephone:
Fax:
Email:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

	19-01-01-2-010-02800-0000, 19-01-01-2-010-03000-0000, 19-01-01-2-010-02900-0000
Prop ID No (PIN):	06470-0052 (LT), 06470-0051 (LT), 06470-0269 (LT), 06470-0053 (LT)
Property Municipal Address:	1116-1118 KINGSTON ROAD, TORONTO, ON M1N 1N4, 1102 KINGSTON ROAD, TORONTO, ON M1N 1N4, 1112-1114 KINGSTON ROAD, TORONTO, ON M1N 1N4, 1100 KINGSTON ROAD, TORONTO, ON M1N 1N4
Mailing Address:	
Latitude & Latitude:	
UTM Coordinates:	
Consultant:	
Legal Desc:	
Measurement Method:	
Applicable Standards:	
RSC PDF:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=68447&fileName=BROWNFIELDS-E.pdf

Document(s) Detail

Document Heading:	Supporting Documents
Document Name:	currentpastuses.pdf
Document Type:	Table of Current and Past Property Use
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=68444&fileName=currentpastuses.pdf
Document Heading:	Supporting Documents
Document Name:	surveyplan.pdf
Document Type:	A Current plan of Survey
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=68445&fileName=surveyplan.pdf
Document Heading:	Supporting Documents
Document Name:	transferdeeds.PDF
Document Type:	Copy of any deed(s), transfer(s) or other document(s)
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=68442&fileName=transferdeeds.PDF
Document Heading:	Supporting Documents
Document Name:	certificateofstatus.PDF
Document Type:	Certificate of Status
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=68440&fileName=certificateofstatus.PDF
Document Heading:	Supporting Documents
Document Name:	PhaseTwo.pdf
Document Type:	Phase 2 Conceptual Site Model
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=70096&fileName=PhaseTwo.pdf
Document Heading:	Supporting Documents
Document Name:	APEC.pdf
Document Type:	Area(s) of Potential Environmental Concern
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=70094&fileName=APEC.pdf
Document Heading:	Supporting Documents
Document Name:	LawyersLetter.pdf
Document Type:	Lawyer's letter consisting of a legal description of the property
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=70095&fileName=LawyersLetter.pdf

14	*1 of 5*	*ESE/35.9*	*129.8 / 0.00*	***RENT-A-WRECK*** ***A 479220 ONTARIO LTD. 1210 KINGSTON ROAD***	***GEN***

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
				SCARBOROUGH ON M1N 1N8	

Generator No: ON0299800
SIC Code: 9921
SIC Description: AUTO./TRUCK RENTAL
Approval Years: 86,87
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 251
Waste Class Name: OIL SKIMMINGS & SLUDGES

Waste Class: 252
Waste Class Name: WASTE OILS & LUBRICANTS

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14 | **2 of 5** | **ESE/35.9** | **129.8 / 0.00** | **RENT-A-WRECK**
A 700828 ONTARIO INC. 1210 KINGSTON ROAD
SCARBOROUGH ON M1N 1N8 | **GEN**

Generator No: ON0299800
SIC Code: 9921
SIC Description: AUTO./TRUCK RENTAL
Approval Years: 88,89,90,92,93,97
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 251
Waste Class Name: OIL SKIMMINGS & SLUDGES

Waste Class: 252
Waste Class Name: WASTE OILS & LUBRICANTS

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14 | **3 of 5** | **ESE/35.9** | **129.8 / 0.00** | **RENT-A-WRECK 33-058**
A 700828 ONTARIO INC. 1210 KINGSTON ROAD
SCARBOROUGH ON M1N 1N8 | **GEN**

Generator No: ON0299800
SIC Code: 9921
SIC Description: AUTO./TRUCK RENTAL
Approval Years: 94,95,96
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 251
Waste Class Name: OIL SKIMMINGS & SLUDGES

Waste Class: 252
Waste Class Name: WASTE OILS & LUBRICANTS

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14 ***4 of 5*** ***ESE/35.9*** ***129.8 / 0.00*** ***RENT-A-WRECK***
1210 KINGSTON ROAD
SCARBOROUGH ON M1N 1N8 ***GEN***

Generator No: ON0299800
SIC Code: 9921
SIC Description: AUTO./TRUCK RENTAL
Approval Years: 98,99,00,01
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 251
Waste Class Name: OIL SKIMMINGS & SLUDGES

Waste Class: 252
Waste Class Name: WASTE OILS & LUBRICANTS

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14 ***5 of 5*** ***ESE/35.9*** ***129.8 / 0.00*** ***Wes-Jen Holdings Limited***
1210 KINGSTON RD, TORONTO, ON, M1N 1N8
ON M1N 1N8 ***RSC***

RSC ID: 2934
RA No:
RSC Type:
Curr Property Use: Commercial
Ministry District: TORONTO
Filing Date: 11-Apr-06
Date Ack:
Date Returned:
Restoration Type:
Soil Type:
Criteria:
CPU Issued Sect 1686: No
Asmt Roll No:
Cert Date: 10-Mar-06
Cert Prop Use No: No CPU
Intended Prop Use: Residential
Qual Person Name: Mike Kavanagh
Stratified (Y/N):
Audit (Y/N):
Entire Leg Prop. (Y/N): Yes
Accuracy Estimate: 11 to 20 meters
Telephone: 905-6495164
Fax:
Email: mkavanagh785@aol.com

Prop ID No (PIN): 06470-0129(LT)
Property Municipal Address: 1210 KINGSTON RD, TORONTO, ON, M1N 1N8
Mailing Address: 785 BRAND RD, UXBRIDGE, ON, L9P 1R4
Latitude & Latitude: 43.68044850N 79.27960830W (converted from UTM)
UTM Coordinates: NAD83 17-638670-4837820
Consultant:
Legal Desc: Part Lot 35, Concession A, City of Toronto (formerly City of Scarborough) as in Instrument SC626120
Measurement Method: Interpolation from a map
Applicable Standards: Full Depth Site Conditions Standard, with Nonpotable Ground Water, Coarse Textured Soil, for

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
RSC PDF:		Residential/Parkland/Institutional property use			

15	1 of 1	SSE/46.3	129.8 / 0.00	1161 KINGSTON ROAD SCARBOROUGH ON	WWIS

Well ID: 7373065
Construction Date:
Use 1st: Monitoring
Use 2nd:
Final Well Status: Observation Wells
Water Type:
Casing Material:
Audit No: LFIKCEJK
Tag: A300623
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: SCARBOROUGH BOROUGH
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src:
Date Received: 11/15/2020
Selected Flag: TRUE
Abandonment Rec:
Contractor: 6607
Form Version: 9
Owner:
County: YORK
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 1008504728
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 10/07/2020
Remarks:
Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 17
East83: 638634.00
North83: 4837991.00
Org CS: UTM83
UTMRC: 4
UTMRC Desc: margin of error : 30 m - 100 m
Location Method: wwr

Overburden and Bedrock Materials Interval

Formation ID: 1008504859
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 11
Mat2 Desc: GRAVEL
Mat3: 01
Mat3 Desc: FILL
Formation Top Depth: 0.0
Formation End Depth: 2.299999952316284
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID:	1008504860
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Mat2 Desc:	GRAVEL
Mat3:	77
Mat3 Desc:	LOOSE
Formation Top Depth:	2.299999952316284
Formation End Depth:	6.099999904632568
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1008504861
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	66
Mat3 Desc:	DENSE
Formation Top Depth:	6.099999904632568
Formation End Depth:	25.899999618530273
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1008504987
Layer:	1
Plug From:	0.0
Plug To:	0.30000001192092896
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1008504959
Layer:	1
Plug From:	
Plug To:	
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1008504988
Layer:	2
Plug From:	0.30000001192092896
Plug To:	20.700000762939453
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	1008504805
Method Construction Code:	6
Method Construction:	Boring
Other Method Construction:	

Pipe Information

Pipe ID:	1008504776
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1008504895
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0.0
Depth To:	21.399999618530273
Casing Diameter:	5.099999904632568
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1008504914
Layer:	1
Slot:	10
Screen Top Depth:	21.399999618530273
Screen End Depth:	25.899999618530273
Screen Material:	5
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	6.400000095367432

Results of Well Yield Testing

Pumping Test Method Desc:	
Pump Test ID:	1008504777
Pump Set At:	
Static Level:	
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	m
Rate UOM:	LPM
Water State After Test Code:	
Water State After Test:	
Pumping Test Method:	
Pumping Duration HR:	
Pumping Duration MIN:	
Flowing:	

Hole Diameter

Hole ID:	1008504937

Diameter:	21.0
Depth From:	0.0
Depth To:	25.899999618530273
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Links

Bore Hole ID:	1008504728	**Tag No:**	A300623
Depth M:	25.9	**Contractor:**	6607
Year Completed:	2020	**Latitude:**	43.6819941758933
Well Completed Dt:	10/07/2020	**Longitude:**	-79.2800107860824
Audit No:	LFIKCEJK	**Y:**	43.681994173110205
Path:	737\7373065.pdf	**X:**	-79.28001063510358

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16 | ***1 of 1*** | ***E/50.3*** | ***129.8 / 0.00*** | ***1212-1238 Kingston Road Scarborough ON M1N 2V2*** | ***EHS***

Order No:	22092905065	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Custom Report	**Client Prov/State:**	ON
Report Date:	04-OCT-22	**Search Radius (km):**	.1
Date Received:	29-SEP-22	**X:**	-79.27891681
Previous Site Name:		**Y:**	43.68274048
Lot/Building Size:			
Additional Info Ordered:	City Directory		

---

17 | ***1 of 1*** | ***E/50.9*** | ***129.8 / 0.00*** | ***1212-1238 Kingston Road Scarborough ON M1N 2V2*** | ***EHS***

Order No:	23061900731	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	RSC Report (Urban)	**Client Prov/State:**	ON
Report Date:	22-JUN-23	**Search Radius (km):**	.3
Date Received:	19-JUN-23	**X:**	-79.27890818
Previous Site Name:		**Y:**	43.68273411
Lot/Building Size:			
Additional Info Ordered:	City Directory		

---

18 | ***1 of 1*** | ***SW/53.0*** | ***126.9 / -2.98*** | ***39 Meadow Ave Scarborough ON M1N 1V5*** | ***EHS***

Order No:	23062000727	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Custom Report	**Client Prov/State:**	ON
Report Date:	23-JUN-23	**Search Radius (km):**	.25
Date Received:	20-JUN-23	**X:**	-79.28217828
Previous Site Name:		**Y:**	43.68181215
Lot/Building Size:			
Additional Info Ordered:			

---

19 | ***1 of 1*** | ***NNE/53.7*** | ***129.8 / 0.00*** | ***MORFIDIS FURS 1 WINSTON CHURCHILL DR SCARBOROUGH ON M1N 1Z8*** | ***SCT***

Established:	1972
Plant Size (ft²):	900
Employment:	2

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

--Details--
Description: FUR GOODS
SIC/NAICS Code: 2371

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20 ***1 of 2*** ***NNE/53.7*** ***129.8 / 0.00*** ***CHRISTOS MORFIDIS*** ***DTNK***
1 WINSTON CHURCHILL DRIVE
SCARBOROUGH M1N 1Z8 ON CA
ON

Delisted Expired Fuel Safety Facilities

Instance No:	61234935	***Expired Date:***	
Status:	EXPIRED	***Max Hazard Rank:***	NULL
Instance ID:		***Facility Location:***	1 WINSTON CHURCHILL DRIVE SCARBOROUGH M1N 1Z8 ON CA
Instance Type:		***Facility Type:***	FS FUEL OIL TANK
Instance Creation Dt:	2/5/2009	***Fuel Type 2:***	
Instance Install Dt:	2/5/2009	***Fuel Type 3:***	
Item Description:	Fuel Oil Tank	***Panam Related:***	NULL
Manufacturer:	NULL	***Panam Venue Nm:***	NULL
Model:	NULL	***External Identifier:***	NULL
Serial No:	NULL	***Item:***	
ULC Standard:	NULL	***Piping Steel:***	
Quantity:	1	***Piping Galvanized:***	
Unit of Measure:	EA	***Tank Single Wall St:***	
Overfill Prot Type:		***Piping Underground:***	
Creation Date:	7/5/2009 3:14:45 AM	***Tank Underground:***	
Next Periodic Str DT:	NULL	***Source:***	FS Fuel Oil Tank
TSSA Base Sched Cycle 2:	NULL		
TSSAMax Hazard Rank 1:	NULL		
TSSA Risk Based Periodic Yn:	NULL		
TSSA Volume of Directives:	NULL		
TSSA Periodic Exempt:	NULL		
TSSA Statutory Interval:	NULL		
TSSA Recd Insp Interva:	NULL		
TSSA Recd Tolerance:	NULL		
TSSA Program Area:	NULL		
TSSA Program Area 2:	NULL		
Description:	NULL		
Original Source:	EXP		
Record Date:	31-MAY-2021		

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20 ***2 of 2*** ***NNE/53.7*** ***129.8 / 0.00*** ***CHRISTOS MORFIDIS*** ***CFOT***
1 WINSTON CHURCHILL DRIVE
SCARBOROUGH M1N 1Z8 ON CA
ON

Licence No:		***Item Description:***	Fuel Oil Tank
Registration No:		***Instance Type:***	
Posse File No:		***Facility Type:***	
Posse Reg No:		***Fuel Type:***	
Status Name:		***Distributor:***	
Tank Type:	Liquid Fuel Single Wall UST	***Letter Sent:***	
Tank Size:	4500	***Comments:***	
Tank Material:	Steel	***Corrosion Protect:***	
Instance No:	61234935	***Province:***	
Inst Creation Date:	2/5/2009	***Nbr:***	
Inst Install Date:	2/5/2009	***Context:***	FS Fuel Oil Tank
Item:	FS FUEL OIL TANK		
Tank Age (as of 05/1992):			

Device Installed Location: 1 WINSTON CHURCHILL DRIVE SCARBOROUGH M1N 1Z8 ON CA
Description: NULL
Contact Name:
Contact Address:
Contact Address2:
Contact Suite:
Contact City:
Contact Prov:
Contact Postal:

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21 | **1 of 2** | **SW/54.4** | **127.5 / -2.30** | **39 Meadow Avenue Scarborough ON M1N 1V5** | **EHS**

Order No: 20200810026
Status: C
Report Type: Standard Report
Report Date: 13-AUG-20
Date Received: 10-AUG-20
Previous Site Name:
Lot/Building Size:
Additional Info Ordered: Fire Insur. Maps and/or Site Plans

Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -79.2823
Y: 43.6818836

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21 | **2 of 2** | **SW/54.4** | **127.5 / -2.30** | **39 Meadow Ave Scarborough ON M1N 1V5** | **EHS**

Order No: 23062000727
Status: C
Report Type: Custom Report
Report Date: 23-JUN-23
Date Received: 20-JUN-23
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:

Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -79.28217828
Y: 43.68181215

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22 | **1 of 1** | **W/59.8** | **128.5 / -1.37** | **Enbridge Gas Distribution Inc. 244 Blantyre Avenue Toronto ON M1N 2S1** | **SPL**

Ref No: 7150-8XCPX2
Year:
Incident Dt: 20-AUG-12
Dt MOE Arvl on Scn:
MOE Reported Dt: 20-AUG-12
Dt Document Closed: 08-JAN-13
Site No:
Facility Name:
MOE Response: Not MOE mandate
Site County/District:
Site Geo Ref Meth:
Site District Office:
Nearest Watercourse:
Site Name: line strike<UNOFFICIAL>
Site Address: 244 Blantyre Avenue
Site Region:
Site Municipality: Toronto
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:

Municipality No:
Nature of Damage:
Discharger Report:
Material Group:
Health/Env Conseq:
Agency Involved:

Easting:	
Incident Cause:	Discharge or Emission to Air
Incident Event:	
Environment Impact:	Confirmed
Nature of Impact:	Air Pollution
Contaminant Qty:	0 other - see incident description
System Facility Address:	
Client Name:	Enbridge Gas Distribution Inc.
Client Type:	
Call Report Locatn Geodata:	
Contaminant Code:	35
Contaminant Name:	NATURAL GAS (METHANE)
Contaminant Limit 1:	
Contam Limit Freq 1:	
Contaminant UN No 1:	
Receiving Medium:	
Receiving Environment:	
Incident Reason:	Error- Operator error
Incident Summary:	TSSA-FSB: 1/2" plastic line strike, repaired
Activity Preceding Spill:	
Property 2nd Watershed:	
Property Tertiary Watershed:	
Sector Type:	Pipeline
SAC Action Class:	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Source Type:	

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23 | **1 of 1** | **SW/60.2** | **126.6 / -3.22** | **Upper Beaches Dental**
1120 Kingston Road, Unit 4
Scarborough ON M1N 1N4 | **GEN**

Generator No:	ON8629110
SIC Code:	
SIC Description:	
Approval Years:	As of Oct 2022
PO Box No:	
Country:	Canada
Status:	Registered
Co Admin:	
Choice of Contact:	
Phone No Admin:	
Contaminated Facility:	
MHSW Facility:	

Detail(s)

Waste Class:	312 P
Waste Class Name:	PATHOLOGICAL WASTES

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24 | **1 of 2** | **SW/60.9** | **128.5 / -1.39** | **39 Meadow Avenue**
Scarborough ON M1N 1V5 | **EHS**

Order No:	20200810026	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Standard Report	**Client Prov/State:**	ON
Report Date:	13-AUG-20	**Search Radius (km):**	.25
Date Received:	10-AUG-20	**X:**	-79.2823
Previous Site Name:		**Y:**	43.6818836
Lot/Building Size:			
Additional Info Ordered:	Fire Insur. Maps and/or Site Plans		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
24	2 of 2	SW/60.9	128.5 / -1.39	39 Meadow Avenue Scarborough ON M1N 1V5	EHS

Order No:	20200810026	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Standard Report	**Client Prov/State:**	ON
Report Date:	13-AUG-20	**Search Radius (km):**	.25
Date Received:	10-AUG-20	**X:**	-79.2823
Previous Site Name:		**Y:**	43.6818836
Lot/Building Size:			
Additional Info Ordered:	Fire Insur. Maps and/or Site Plans		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
25	1 of 1	SSE/62.5	129.8 / 0.00	1161 KINGSTON ROAD SCARBOROUGH ON	WWIS

Well ID:	7336195	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Monitoring	**Data Entry Status:**	
Use 2nd:		**Data Src:**	
Final Well Status:		**Date Received:**	07/03/2019
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z312827	**Contractor:**	6946
Tag:	A262869	**Form Version:**	7
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/733\7336195.pdf

Additional Detail(s) (Map)

Well Completed Date:	05/03/2019
Year Completed:	2019
Depth (m):	7.62
Latitude:	43.6818055502713
Longitude:	-79.2800409893841
Path:	733\7336195.pdf

Bore Hole Information

Bore Hole ID:	1007513795	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638632.00
Code OB Desc:		**North83:**	4837970.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	05/03/2019	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			

Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID:	1007991206
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	68
Mat3 Desc:	DRY
Formation Top Depth:	20.0
Formation End Depth:	25.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	1007991205
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	12
Mat2 Desc:	STONES
Mat3:	66
Mat3 Desc:	DENSE
Formation Top Depth:	0.0
Formation End Depth:	20.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1007992193
Layer:	2
Plug From:	15.0
Plug To:	25.0
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1007992192
Layer:	1
Plug From:	1.0
Plug To:	18.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	1007993077
Method Construction Code:	2
Method Construction:	Rotary (Convent.)

Other Method Construction:

Pipe Information

Pipe ID: 1007990610
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1007993488
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 20.0
Depth To: 25.0
Casing Diameter: 2.0
Casing Diameter UOM: Inch
Casing Depth UOM: ft

Construction Record - Screen

Screen ID: 1007993876
Layer: 1
Slot: 10
Screen Top Depth: 20.0
Screen End Depth: 25.0
Screen Material: 5
Screen Depth UOM: ft
Screen Diameter UOM: inch
Screen Diameter: 2.25

Results of Well Yield Testing

Pumping Test Method Desc:
Pump Test ID: 1007994405
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code:
Water State After Test:
Pumping Test Method: 0
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1007992691
Diameter: 8.0
Depth From: 0.0
Depth To: 25.0
Hole Depth UOM: ft
Hole Diameter UOM: Inch

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Links

Bore Hole ID:	1007513795	***Tag No:***	A262869
Depth M:	7.62	***Contractor:***	6946
Year Completed:	2019	***Latitude:***	43.6818055502713
Well Completed Dt:	05/03/2019	***Longitude:***	-79.2800409893841
Audit No:	Z312827	***Y:***	43.681805547089915
Path:	733\7336195.pdf	***X:***	-79.28004083826697

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26 | ***1 of 1*** | ***W/64.2*** | ***128.5 / -1.37*** | ***246 Blantyre Avenue, Toronto ON*** | ***PINC***

Incident Id:		***Pipe Material:***	
Incident No:	860978	***Fuel Category:***	Natural Gas
Incident Reported Dt:		***Health Impact:***	
Type:	FS-Pipeline Incident	***Environment Impact:***	
Status Code:	Pipeline Damage Reason Est	***Property Damage:***	Yes
Tank Status:	RC Established	***Service Interrupt:***	
Task No:	3992530	***Enforce Policy:***	Yes
Spills Action Centre:		***Public Relation:***	
Fuel Type:		***Pipeline System:***	
Fuel Occurrence Tp:		***PSIG:***	
Date of Occurrence:		***Attribute Category:***	FS-Perform P-line Inc Invest
Occurrence Start Dt:	2012/08/20	***Regulator Location:***	
Depth:		***Method Details:***	E-mail
Customer Acct Name:			
Incident Address:			
Operation Type:			
Pipeline Type:			
Regulator Type:			
Summary:	246 Blantyre Avenue, Toronto - 1/2" Pipeline Hit		
Reported By:	Terry McDonnell - Enbridge		
Affiliation:			
Occurrence Desc:			
Damage Reason:	Excavation practices not sufficient		
Notes:			

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27 | ***1 of 1*** | ***SE/64.4*** | ***129.8 / 0.00*** | ***1165 KINGSTON ROAD Toronto ON*** | ***WWIS***

Well ID:	7111417	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Test Hole	***Data Entry Status:***	
Use 2nd:		***Data Src:***	
Final Well Status:	Observation Wells	***Date Received:***	09/17/2008
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	Z88595	***Contractor:***	7147
Tag:	A074047	***Form Version:***	7
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	YORK
Elevatn Reliabilty:		***Lot:***	
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	TORONTO CITY		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/711\7111417.pdf

Additional Detail(s) (Map)

Well Completed Date: 09/08/2008
Year Completed: 2008
Depth (m): 4.6
Latitude: 43.6821012806713
Longitude: -79.2793501789292
Path: 711\7111417.pdf

Bore Hole Information

Bore Hole ID: 1001799205
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 09/08/2008
Remarks:
Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 17
East83: 638687.00
North83: 4838004.00
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Overburden and Bedrock Materials Interval

Formation ID: 1001912918
Layer: 1
Color: 6
General Color: BROWN
Mat1: 01
Most Common Material: FILL
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 1.7999999523162842
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1001912919
Layer: 2
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 1.7999999523162842
Formation End Depth: 3.299999952316284
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID:	1001912920
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Mat2 Desc:	GRAVEL
Mat3:	
Mat3 Desc:	
Formation Top Depth:	3.299999952316284
Formation End Depth:	4.599999904632568
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001912925
Layer:	4
Plug From:	
Plug To:	4.599999904632568
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001912922
Layer:	1
Plug From:	0.0
Plug To:	0.20000000298023224
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001912924
Layer:	3
Plug From:	3.0
Plug To:	4.599999904632568
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001912923
Layer:	2
Plug From:	0.20000000298023224
Plug To:	3.0
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	1001912930
Method Construction Code:	6
Method Construction:	Boring
Other Method Construction:	

Pipe Information

Pipe ID:	1001912917
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1001912927
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0.0
Depth To:	3.0999999046325684
Casing Diameter:	5.0
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1001912928
Layer:	1
Slot:	10
Screen Top Depth:	3.0999999046325684
Screen End Depth:	4.599999904632568
Screen Material:	5
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	6.300000190734863

Water Details

Water ID:	1001912926
Layer:	
Kind Code:	
Kind:	
Water Found Depth:	
Water Found Depth UOM:	m

Hole Diameter

Hole ID:	1001912921
Diameter:	11.399999618530273
Depth From:	0.0
Depth To:	4.599999904632568
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Links

Bore Hole ID:	1001799205	***Tag No:***	A074047
Depth M:	4.6	***Contractor:***	7147
Year Completed:	2008	***Latitude:***	43.6821012806713
Well Completed Dt:	09/08/2008	***Longitude:***	-79.2793501789292
Audit No:	Z88595	***Y:***	43.682101278375185
Path:	711\7111417.pdf	***X:***	-79.2793500286182

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
28	1 of 1	NE/65.0	130.4 / 0.53	City of Toronto In front of 14 Elmview Drive Toronto ON M1N 2W4	SPL

Ref No:	1533-7BVQEH	**Municipality No:**	
Year:		**Nature of Damage:**	
Incident Dt:		**Discharger Report:**	
Dt MOE Arvl on Scn:		**Material Group:**	
MOE Reported Dt:	2/16/2008	**Health/Env Conseq:**	
Dt Document Closed:		**Agency Involved:**	
Site No:			
Facility Name:			
MOE Response:	No Field Response		
Site County/District:			
Site Geo Ref Meth:			
Site District Office:	Toronto - District		
Nearest Watercourse:			
Site Name:	Elmview Drive<UNOFFICIAL>		
Site Address:			
Site Region:			
Site Municipality:	Toronto		
Site Lot:			
Site Conc:			
Site Geo Ref Accu:			
Site Map Datum:			
Northing:			
Easting:			
Incident Cause:	Unknown		
Incident Event:			
Environment Impact:	Not Anticipated		
Nature of Impact:			
Contaminant Qty:	12 other - see incident description		
System Facility Address:			
Client Name:	City of Toronto		
Client Type:			
Call Report Locatn Geodata:			
Contaminant Code:	15		
Contaminant Name:	HYDRAULIC OIL		
Contaminant Limit 1:			
Contam Limit Freq 1:			
Contaminant UN No 1:			
Receiving Medium:			
Receiving Environment:			
Incident Reason:	Spill		
Incident Summary:	City Of Toronto Truck Hydraulic Spill		
Activity Preceding Spill:			
Property 2nd Watershed:			
Property Tertiary Watershed:			
Sector Type:	Transport Truck		
SAC Action Class:	Land Spills		
Source Type:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
29	1 of 1	ESE/66.0	129.8 / 0.00	ON	BORE

Borehole ID:	626619	**Inclin FLG:**	No
OGF ID:	215527059	**SP Status:**	Initial Entry
Status:		**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:	Geotechnical/Geological Investigation	**Primary Name:**	
Completion Date:	MAR-1968	**Municipality:**	
Static Water Level:		**Lot:**	
Primary Water Use:	Not Used	**Township:**	
Sec. Water Use:		**Latitude DD:**	43.682531

Total Depth m:	6.2	**Longitude DD:**	-79.278746
Depth Ref:	Ground Surface	**UTM Zone:**	17
Depth Elev:		**Easting:**	638735
Drill Method:	Power auger	**Northing:**	4838053
Orig Ground Elev m:	134	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Not Applicable
DEM Ground Elev m:	134		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218440899	**Mat Consistency:**	
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	.6	**Material Texture:**	Medium
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Asphalt	**Geologic Group:**	
Material 3:	Concrete	**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	SAND-MEDIUM,ASPHALT,CONCRETE. BROWN.		

Geology Stratum ID:	218440900	**Mat Consistency:**	Dense
Top Depth:	.6	**Material Moisture:**	
Bottom Depth:	6.2	**Material Texture:**	Fine to Medium
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Silt	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	SAND-FINE TO MEDIUM,SILT. BROWN,DENSE,GRANULAR. 000200236 **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Source

Source Type:	Data Survey	**Source Appl:**	Spatial/Tabular
Source Orig:	Geological Survey of Canada	**Source Iden:**	1
Source Date:	1956-1972	**Scale or Res:**	Varies
Confidence:	H	**Horizontal:**	NAD27
Observatio:		**Verticalda:**	Mean Average Sea Level
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Details:	File: OSHAWA.txt RecordID: 003840 NTS_Sheet: 30M11C		
Confiden 1:	Logged by professional. Exact and complete description of material and properties.		

Source List

Source Identifier:	1	**Horizontal Datum:**	NAD27
Source Type:	Data Survey	**Vertical Datum:**	Mean Average Sea Level
Source Date:	1956-1972	**Projection Name:**	Universal Transverse Mercator
Scale or Resolution:	Varies		
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Originators:	Geological Survey of Canada		

30 ***1 of 1*** ***SSE/66.8*** ***129.8 / 0.00*** ***ON*** ***BORE***

Borehole ID:	626616	**Inclin FLG:**	No
OGF ID:	215527056	**SP Status:**	Initial Entry

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Status:		**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:	Geotechnical/Geological Investigation	**Primary Name:**	
Completion Date:	MAR-1968	**Municipality:**	
Static Water Level:		**Lot:**	
Primary Water Use:	Not Used	**Township:**	
Sec. Water Use:		**Latitude DD:**	43.681654
Total Depth m:	6.3	**Longitude DD:**	-79.28026
Depth Ref:	Ground Surface	**UTM Zone:**	17
Depth Elev:		**Easting:**	638615
Drill Method:	Power auger	**Northing:**	4837953
Orig Ground Elev m:	132	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Not Applicable
DEM Ground Elev m:	132		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218440895	**Mat Consistency:**	Dense
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	6.3	**Material Texture:**	Fine
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Gravel	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			

Stratum Description: SAND-FINE,GRAVEL. BROWN,VERY DENSE,GRANULAR. 00000037O ME **Note: Many records provided by the department have a truncated [Stratum Description] field.

Source

Source Type:	Data Survey	**Source Appl:**	Spatial/Tabular
Source Orig:	Geological Survey of Canada	**Source Iden:**	1
Source Date:	1956-1972	**Scale or Res:**	Varies
Confidence:	H	**Horizontal:**	NAD27
Observatio:		**Verticalda:**	Mean Average Sea Level

Source Name: Urban Geology Automated Information System (UGAIS)
Source Details: File: OSHAWA.txt RecordID: 003810 NTS_Sheet: 30M11C
Confiden 1: Logged by professional. Exact and complete description of material and properties.

Source List

Source Identifier:	1	**Horizontal Datum:**	NAD27
Source Type:	Data Survey	**Vertical Datum:**	Mean Average Sea Level
Source Date:	1956-1972	**Projection Name:**	Universal Transverse Mercator
Scale or Resolution:	Varies		

Source Name: Urban Geology Automated Information System (UGAIS)
Source Originators: Geological Survey of Canada

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31 | ***1 of 1*** | ***SE/68.8*** | ***129.8 / 0.00*** | ***1161 KINGSTON ROAD SCARBOROUGH ON*** | ***WWIS***

Well ID:	7373047	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Monitoring	**Data Entry Status:**	
Use 2nd:		**Data Src:**	
Final Well Status:	Observation Wells	**Date Received:**	11/15/2020
Water Type:		**Selected Flag:**	TRUE

Casing Material:		***Abandonment Rec:***	
Audit No:	EDU5ARE2	***Contractor:***	6607
Tag:	A293305	***Form Version:***	9
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	YORK
Elevatn Reliabilty:		***Lot:***	
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

Bore Hole Information

Bore Hole ID:	1008504363	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:		***East83:***	638662.00
Code OB Desc:		***North83:***	4837983.00
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	10/09/2020	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1008504505
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	66
Mat3 Desc:	DENSE
Formation Top Depth:	6.099999904632568
Formation End Depth:	25.899999618530273
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1008504504
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Mat2 Desc:	GRAVEL
Mat3:	77

Mat3 Desc: LOOSE
Formation Top Depth: 2.299999952316284
Formation End Depth: 6.099999904632568
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1008504503
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 11
Mat2 Desc: GRAVEL
Mat3: 01
Mat3 Desc: FILL
Formation Top Depth: 0.0
Formation End Depth: 2.299999952316284
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1008504625
Layer: 1
Plug From: 0.0
Plug To: 0.30000001192092896
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1008504626
Layer: 2
Plug From: 0.30000001192092896
Plug To: 20.700000762939453
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1008504596
Layer: 1
Plug From:
Plug To:
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID: 1008504438
Method Construction Code: 6
Method Construction: Boring
Other Method Construction:

Pipe Information

Pipe ID: 1008504410
Casing No: 0

Comment:
Alt Name:

Construction Record - Casing

Casing ID:	1008504537
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0.0
Depth To:	21.399999618530273
Casing Diameter:	5.099999904632568
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1008504556
Layer:	1
Slot:	10
Screen Top Depth:	21.399999618530273
Screen End Depth:	25.899999618530273
Screen Material:	5
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	6.400000095367432

Results of Well Yield Testing

Pumping Test Method Desc:	
Pump Test ID:	1008504411
Pump Set At:	
Static Level:	
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	m
Rate UOM:	LPM
Water State After Test Code:	
Water State After Test:	
Pumping Test Method:	
Pumping Duration HR:	
Pumping Duration MIN:	
Flowing:	

Hole Diameter

Hole ID:	1008504576
Diameter:	21.0
Depth From:	0.0
Depth To:	25.899999618530273
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Links

Bore Hole ID:	1008504363	***Tag No:***	A293305
Depth M:	25.9	***Contractor:***	6607
Year Completed:	2020	***Latitude:***	43.6819169494986
Well Completed Dt:	10/09/2020	***Longitude:***	-79.2796656110469

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Audit No:	EDU5ARE2	**Y:**	43.68191694622913
Path:	737\7373047.pdf	**X:**	-79.2796654602676

32 | **1 of 3** | **SW/70.4** | **125.1 / -4.78** | **1100 Kingston Rd, Scarborough ON M1N 1N4** | **EHS**

Order No:	22062900622	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	RSC Report (Urban)	**Client Prov/State:**	ON
Report Date:	05-JUL-22	**Search Radius (km):**	.3
Date Received:	29-JUN-22	**X:**	-79.28222772
Previous Site Name:		**Y:**	43.68146997
Lot/Building Size:			
Additional Info Ordered:			

32 | **2 of 3** | **SW/70.4** | **125.1 / -4.78** | **1100 Kingston Rd, Scarborough ON M1N 1N4** | **EHS**

Order No:	22062900622	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	RSC Report (Urban)	**Client Prov/State:**	ON
Report Date:	05-JUL-22	**Search Radius (km):**	.3
Date Received:	29-JUN-22	**X:**	-79.28222772
Previous Site Name:		**Y:**	43.68146997
Lot/Building Size:			
Additional Info Ordered:			

32 | **3 of 3** | **SW/70.4** | **125.1 / -4.78** | **1100 Kingston Rd, Scarborough ON M1N 1N4** | **EHS**

Order No:	22062900622	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	RSC Report (Urban)	**Client Prov/State:**	ON
Report Date:	05-JUL-22	**Search Radius (km):**	.3
Date Received:	29-JUN-22	**X:**	-79.28222772
Previous Site Name:		**Y:**	43.68146997
Lot/Building Size:			
Additional Info Ordered:			

33 | **1 of 4** | **E/72.0** | **129.8 / 0.00** | **We Compute Inc., 1232 Kingston Rd, Scarborough ON M1N 1P3** | **SCT**

Established:	1988
Plant Size (ft²):	
Employment:	3

--Details--

Description:	Periodical Publishers
SIC/NAICS Code:	511120

33 | **2 of 4** | **E/72.0** | **129.8 / 0.00** | **1212-1238 Kingston Road, Scarborough ON M1N 2V2** | **EHS**

Order No:	22092905065	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Custom Report	**Client Prov/State:**	ON

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Report Date: 04-OCT-22
Date Received: 29-SEP-22
Previous Site Name:
Lot/Building Size:
Additional Info Ordered: City Directory
Search Radius (km): .1
X: -79.27891681
Y: 43.68274048

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33 | **3 of 4** | **E/72.0** | **129.8 / 0.00** | **1212-1238 Kingston Road Scarborough ON M1N 2V2** | **EHS**

Order No: 23061900731
Status: C
Report Type: RSC Report (Urban)
Report Date: 22-JUN-23
Date Received: 19-JUN-23
Previous Site Name:
Lot/Building Size:
Additional Info Ordered: City Directory
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .3
X: -79.27890818
Y: 43.68273411

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33 | **4 of 4** | **E/72.0** | **129.8 / 0.00** | **1212-1238 Kingston Road Scarborough ON M1N 2V2** | **EHS**

Order No: 22092905065
Status: C
Report Type: Custom Report
Report Date: 04-OCT-22
Date Received: 29-SEP-22
Previous Site Name:
Lot/Building Size:
Additional Info Ordered: City Directory
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .1
X: -79.27891681
Y: 43.68274048

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34 | **1 of 26** | **S/72.5** | **129.8 / 0.00** | **SIVA GAS BAR 1121 KINGSTON RD SCARBOROUGH ON M1N1N7** | **PRT**

Location ID: 13035
Type: retail
Expiry Date: 1995-08-31
Capacity (L): 90800
Licence #: 0076395284

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34 | **2 of 26** | **S/72.5** | **129.8 / 0.00** | **SIVA'S GAS BAR 1121 KINGSTON RD SCARBOROUGH ON M1N1N7** | **RST**

Headcode: 1186800
Headcode Desc: Service Stations-Gasoline, Oil & Natural Gas
Phone: 4166994955
List Name:
Description:

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34 | **3 of 26** | **S/72.5** | **129.8 / 0.00** | **PETRO CANADA LTD 1121 KINGSTON RD SCARBOROUGH ON M1N 1N7** | **RST**

Headcode: 1186800
Headcode Desc: Service Stations-Gasoline, Oil & Natural Gas
Phone: 4166994955

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
List Name:					
Description:					

34	4 of 26	S/72.5	129.8 / 0.00	**GODO ENTERPRISES INC** **1121 KINGSTON RD** **SCARBOROUGH ON M1N 1N7**	RST

Headcode: 1186800
Headcode Desc: Service Stations-Gasoline, Oil & Natural Gas
Phone: 4166865394
List Name:
Description:

34	5 of 26	S/72.5	129.8 / 0.00	**1461148 ONTARIO CORP O/A PETRO CANADA #00676** **1121 KINGSTON RD** **SCARBOROUGH ON M1N 1N7**	FSTH

License Issue Date: 12/19/2007 11:39:00 AM
Tank Status: Licensed
Tank Status As Of: December 2008
Operation Type: Retail Fuel Outlet
Facility Type: Gasoline Station - Self Serve

--Details--
Status: Active
Year of Installation: 2003
Corrosion Protection:
Capacity: 50000
Tank Fuel Type: Liquid Fuel Double Wall UST - Gasoline

Status: Active
Year of Installation: 2003
Corrosion Protection:
Capacity: 50000
Tank Fuel Type: Liquid Fuel Double Wall UST - Gasoline

Status: Active
Year of Installation: 2003
Corrosion Protection:
Capacity: 50000
Tank Fuel Type: Liquid Fuel Double Wall UST - Gasoline

34	6 of 26	S/72.5	129.8 / 0.00	**1461148 ONT CORP PETRO CANADA 00676** **1121 KINGSTON RD** **SCARBOROUGH ON M1N 1N7**	RST

Headcode: 01186800
Headcode Desc: SERVICE STATIONS-GASOLINE, OIL & NATURAL GAS
Phone:
List Name:
Description:

34	7 of 26	S/72.5	129.8 / 0.00	**DJ SERVICES ATTN DAVID NOUDELMAN** **1121 KINGSTON RD** **SCARBOROUGH ON M1N 1N7**	DTNK

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Delisted Expired Fuel Safety Facilities

Instance No:	9505198	***Expired Date:***	5/9/2000
Status:	EXPIRED	***Max Hazard Rank:***	
Instance ID:		***Facility Location:***	
Instance Type:	FS Facility	***Facility Type:***	
Instance Creation Dt:		***Fuel Type 2:***	
Instance Install Dt:		***Fuel Type 3:***	
Item Description:		***Panam Related:***	
Manufacturer:		***Panam Venue Nm:***	
Model:		***External Identifier:***	
Serial No:		***Item:***	
ULC Standard:		***Piping Steel:***	
Quantity:		***Piping Galvanized:***	
Unit of Measure:		***Tank Single Wall St:***	
Overfill Prot Type:		***Piping Underground:***	
Creation Date:		***Tank Underground:***	
Next Periodic Str DT:		***Source:***	
TSSA Base Sched Cycle 2:			
TSSAMax Hazard Rank 1:			
TSSA Risk Based Periodic Yn:			
TSSA Volume of Directives:			
TSSA Periodic Exempt:			
TSSA Statutory Interval:			
TSSA Recd Insp Interva:			
TSSA Recd Tolerance:			
TSSA Program Area:			
TSSA Program Area 2:			
Description:			
Original Source:	EXP		
Record Date:	Up to May 2013		

34	***8 of 26***	***S/72.5***	***129.8 / 0.00***	***1461148 ONTARIO CORP O/A PETRO CANADA #00676*** ***1121 KINGSTON RD*** ***SCARBOROUGH ON***	***DTNK***

Delisted Expired Fuel Safety Facilities

Instance No:	10954635	***Expired Date:***	
Status:	EXPIRED	***Max Hazard Rank:***	
Instance ID:	55864	***Facility Location:***	
Instance Type:	FS Piping	***Facility Type:***	
Instance Creation Dt:		***Fuel Type 2:***	
Instance Install Dt:		***Fuel Type 3:***	
Item Description:		***Panam Related:***	
Manufacturer:		***Panam Venue Nm:***	
Model:		***External Identifier:***	
Serial No:		***Item:***	
ULC Standard:		***Piping Steel:***	
Quantity:		***Piping Galvanized:***	
Unit of Measure:		***Tank Single Wall St:***	
Overfill Prot Type:		***Piping Underground:***	
Creation Date:		***Tank Underground:***	
Next Periodic Str DT:		***Source:***	
TSSA Base Sched Cycle 2:			
TSSAMax Hazard Rank 1:			
TSSA Risk Based Periodic Yn:			
TSSA Volume of Directives:			
TSSA Periodic Exempt:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

TSSA Statutory Interval:
TSSA Recd Insp Interva:
TSSA Recd Tolerance:
TSSA Program Area:
TSSA Program Area 2:
Description: FS Piping
Original Source: EXP
Record Date: Up to Mar 2012

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
34	9 of 26	S/72.5	129.8 / 0.00	1461148 ONTARIO CORP O/A PETRO CANADA #00676 1121 KINGSTON RD SCARBOROUGH ON	DTNK

Delisted Expired Fuel Safety Facilities

Instance No: 10954618
Status: EXPIRED
Instance ID: 55904
Instance Type: FS Piping
Instance Creation Dt:
Instance Install Dt:
Item Description:
Manufacturer:
Model:
Serial No:
ULC Standard:
Quantity:
Unit of Measure:
Overfill Prot Type:
Creation Date:
Next Periodic Str DT:
TSSA Base Sched Cycle 2:
TSSAMax Hazard Rank 1:
TSSA Risk Based Periodic Yn:
TSSA Volume of Directives:
TSSA Periodic Exempt:
TSSA Statutory Interval:
TSSA Recd Insp Interva:
TSSA Recd Tolerance:
TSSA Program Area:
TSSA Program Area 2:
Description: FS Piping
Original Source: EXP
Record Date: Up to Mar 2012

Expired Date:
Max Hazard Rank:
Facility Location:
Facility Type:
Fuel Type 2:
Fuel Type 3:
Panam Related:
Panam Venue Nm:
External Identifier:
Item:
Piping Steel:
Piping Galvanized:
Tank Single Wall St:
Piping Underground:
Tank Underground:
Source:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
34	10 of 26	S/72.5	129.8 / 0.00	1461148 ONTARIO CORP O/A PETRO CANADA #00676 1121 KINGSTON RD SCARBOROUGH ON	DTNK

Delisted Expired Fuel Safety Facilities

Instance No: 10954603
Status: EXPIRED
Instance ID: 55969
Instance Type: FS Piping
Instance Creation Dt:
Instance Install Dt:

Expired Date:
Max Hazard Rank:
Facility Location:
Facility Type:
Fuel Type 2:
Fuel Type 3:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Item Description:
Manufacturer:
Model:
Serial No:
ULC Standard:
Quantity:
Unit of Measure:
Overfill Prot Type:
Creation Date:
Next Periodic Str DT:
TSSA Base Sched Cycle 2:
TSSAMax Hazard Rank 1:
TSSA Risk Based Periodic Yn:
TSSA Volume of Directives:
TSSA Periodic Exempt:
TSSA Statutory Interval:
TSSA Recd Insp Interva:
TSSA Recd Tolerance:
TSSA Program Area:
TSSA Program Area 2:
Description: FS Piping
Original Source: EXP
Record Date: Up to Mar 2012

Panam Related:
Panam Venue Nm:
External Identifier:
Item:
Piping Steel:
Piping Galvanized:
Tank Single Wall St:
Piping Underground:
Tank Underground:
Source:

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34 | ***11 of 26*** | ***S/72.5*** | ***129.8 / 0.00*** | ***1461148 ONTARIO CORP O/A PETRO CANADA #00676***
1121 KINGSTON RD
SCARBOROUGH ON | ***DTNK***

Delisted Expired Fuel Safety Facilities

Instance No: 10954588
Status: EXPIRED
Instance ID: 56604
Instance Type: FS Piping
Instance Creation Dt:
Instance Install Dt:
Item Description:
Manufacturer:
Model:
Serial No:
ULC Standard:
Quantity:
Unit of Measure:
Overfill Prot Type:
Creation Date:
Next Periodic Str DT:
TSSA Base Sched Cycle 2:
TSSAMax Hazard Rank 1:
TSSA Risk Based Periodic Yn:
TSSA Volume of Directives:
TSSA Periodic Exempt:
TSSA Statutory Interval:
TSSA Recd Insp Interva:
TSSA Recd Tolerance:
TSSA Program Area:
TSSA Program Area 2:
Description: FS Piping
Original Source: EXP
Record Date: Up to Mar 2012

Expired Date:
Max Hazard Rank:
Facility Location:
Facility Type:
Fuel Type 2:
Fuel Type 3:
Panam Related:
Panam Venue Nm:
External Identifier:
Item:
Piping Steel:
Piping Galvanized:
Tank Single Wall St:
Piping Underground:
Tank Underground:
Source:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
34	12 of 26	S/72.5	129.8 / 0.00	SUNCOR ENERGY PRODUCTS PARTNERSHIP 1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	FST

Instance No: 25451684
Status:
Cont Name:
Instance Type: FS Liquid Fuel Tank
Item:
Item Description: FS Liquid Fuel Tank
Tank Type: Double Wall UST
Install Date: 5/11/2009
Install Year: 2003
Years in Service:
Model: NULL
Description:
Capacity: 50000
Tank Material: Fiberglass (FRP)
Corrosion Protect: Fiberglass
Overfill Protect:
Facility Type: FS Liquid Fuel Tank
Parent Facility Type: FS Gasoline Station - Self Serve
Facility Location:
Device Installed Location: 1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA

Manufacturer:
Serial No:
Ulc Standard:
Quantity:
Unit of Measure:
Fuel Type: Gasoline
Fuel Type2: NULL
Fuel Type3: NULL
Piping Steel:
Piping Galvanized:
Tanks Single Wall St:
Piping Underground:
No Underground:
Panam Related:
Panam Venue:

Liquid Fuel Tank Details

Overfill Protection:
Owner Account Name: SUNCOR ENERGY PRODUCTS PARTNERSHIP
Item: FS LIQUID FUEL TANK

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
34	13 of 26	S/72.5	129.8 / 0.00	SUNCOR ENERGY PRODUCTS PARTNERSHIP 1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	FST

Instance No: 25451686
Status:
Cont Name:
Instance Type: FS Liquid Fuel Tank
Item:
Item Description: FS Liquid Fuel Tank
Tank Type: Double Wall UST
Install Date: 5/11/2009
Install Year: 2003
Years in Service:
Model: NULL
Description:
Capacity: 50000
Tank Material: Fiberglass (FRP)
Corrosion Protect: Fiberglass
Overfill Protect:
Facility Type: FS Liquid Fuel Tank
Parent Facility Type: FS Gasoline Station - Self Serve
Facility Location:
Device Installed Location: 1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA

Manufacturer:
Serial No:
Ulc Standard:
Quantity:
Unit of Measure:
Fuel Type: Gasoline
Fuel Type2: NULL
Fuel Type3: NULL
Piping Steel:
Piping Galvanized:
Tanks Single Wall St:
Piping Underground:
No Underground:
Panam Related:
Panam Venue:

Liquid Fuel Tank Details

Overfill Protection:
Owner Account Name: SUNCOR ENERGY PRODUCTS PARTNERSHIP
Item: FS LIQUID FUEL TANK

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
34	14 of 26	S/72.5	129.8 / 0.00	SUNCOR ENERGY PRODUCTS PARTNERSHIP 1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	FST

Instance No: 25451685
Status:
Cont Name:
Instance Type: FS Liquid Fuel Tank
Item:
Item Description: FS Liquid Fuel Tank
Tank Type: Double Wall UST
Install Date: 5/11/2009
Install Year: 2003
Years in Service:
Model: NULL
Description:
Capacity: 50000
Tank Material: Fiberglass (FRP)
Corrosion Protect: Fiberglass
Overfill Protect:
Facility Type: FS Liquid Fuel Tank
Parent Facility Type: FS Gasoline Station - Self Serve
Facility Location:
Device Installed Location: 1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA

Manufacturer:
Serial No:
Ulc Standard:
Quantity:
Unit of Measure:
Fuel Type: Gasoline
Fuel Type2: NULL
Fuel Type3: NULL
Piping Steel:
Piping Galvanized:
Tanks Single Wall St:
Piping Underground:
No Underground:
Panam Related:
Panam Venue:

Liquid Fuel Tank Details

Overfill Protection:
Owner Account Name: SUNCOR ENERGY PRODUCTS PARTNERSHIP
Item: FS LIQUID FUEL TANK

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
34	15 of 26	S/72.5	129.8 / 0.00	PETRO CANADA 1121 KINGSTON RD SCARBOROUGH ON M1N1N7	RST

Headcode: 01186800
Headcode Desc: SERVICE STATIONS GASOLINE OIL & NATURAL
Phone: 4166865394
List Name:
Description:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
34	16 of 26	S/72.5	129.8 / 0.00	PETRO CANADA CORP 1121 KINGSTON RD SCARBOROUGH ON M1N1N7	RST

Headcode: 01186800
Headcode Desc: SERVICE STATIONS GASOLINE OIL & NATURAL
Phone: 4166865394
List Name:
Description:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
34	17 of 26	S/72.5	129.8 / 0.00	1461148 ONTARIO CORP 1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON	DTNK

Delisted Expired Fuel Safety

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Facilities

Instance No:	10954627	***Expired Date:***	
Status:	EXPIRED	***Max Hazard Rank:***	NULL
Instance ID:		***Facility Location:***	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA
Instance Type:		***Facility Type:***	FS LIQUID FUEL TANK
Instance Creation Dt:	7/19/2000 8:15:15 PM	***Fuel Type 2:***	NULL
Instance Install Dt:	5/11/2009	***Fuel Type 3:***	NULL
Item Description:	FS Liquid Fuel Tank	***Panam Related:***	NULL
Manufacturer:	NULL	***Panam Venue Nm:***	NULL
Model:	NULL	***External Identifier:***	NULL
Serial No:	NULL	***Item:***	
ULC Standard:	NULL	***Piping Steel:***	
Quantity:	1	***Piping Galvanized:***	
Unit of Measure:	EA	***Tank Single Wall St:***	
Overfill Prot Type:	NULL	***Piping Underground:***	
Creation Date:	7/5/2009 1:22:32 AM	***Tank Underground:***	
Next Periodic Str DT:	NULL	***Source:***	FS Liquid Fuel Tank
TSSA Base Sched Cycle 2:	NULL		
TSSAMax Hazard Rank 1:	NULL		
TSSA Risk Based Periodic Yn:	NULL		
TSSA Volume of Directives:	NULL		
TSSA Periodic Exempt:	NULL		
TSSA Statutory Interval:	NULL		
TSSA Recd Insp Interva:	NULL		
TSSA Recd Tolerance:	NULL		
TSSA Program Area:	NULL		
TSSA Program Area 2:	NULL		
Description:	2009VBS		
Original Source:	EXP		
Record Date:	31-JUL-2020		

34	***18 of 26***	***S/72.5***	***129.8 / 0.00***	***1461148 ONTARIO CORP*** ***1121 KINGSTON RD SCARBOROUGH M1N 1N7*** ***ON CA*** ***ON***	***DTNK***

Delisted Expired Fuel Safety Facilities

Instance No:	10954594	***Expired Date:***	
Status:	EXPIRED	***Max Hazard Rank:***	NULL
Instance ID:		***Facility Location:***	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA
Instance Type:		***Facility Type:***	FS LIQUID FUEL TANK
Instance Creation Dt:	7/19/2000 8:15:15 PM	***Fuel Type 2:***	NULL
Instance Install Dt:	5/11/2009	***Fuel Type 3:***	NULL
Item Description:	FS Liquid Fuel Tank	***Panam Related:***	NULL
Manufacturer:	NULL	***Panam Venue Nm:***	NULL
Model:	NULL	***External Identifier:***	NULL
Serial No:	NULL	***Item:***	
ULC Standard:	NULL	***Piping Steel:***	
Quantity:	1	***Piping Galvanized:***	
Unit of Measure:	EA	***Tank Single Wall St:***	
Overfill Prot Type:	NULL	***Piping Underground:***	
Creation Date:	7/5/2009 1:22:32 AM	***Tank Underground:***	
Next Periodic Str DT:	NULL	***Source:***	FS Liquid Fuel Tank
TSSA Base Sched Cycle 2:	NULL		
TSSAMax Hazard Rank 1:	NULL		
TSSA Risk Based Periodic Yn:	NULL		
TSSA Volume of Directives:	NULL		
TSSA Periodic Exempt:	NULL		

TSSA Statutory Interval:	NULL
TSSA Recd Insp Interva:	NULL
TSSA Recd Tolerance:	NULL
TSSA Program Area:	NULL
TSSA Program Area 2:	NULL
Description:	2009VBS
Original Source:	EXP
Record Date:	31-JUL-2020

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34 | ***19 of 26*** | ***S/72.5*** | ***129.8 / 0.00*** | ***1461148 ONTARIO CORP***
1121 KINGSTON RD SCARBOROUGH M1N 1N7
ON CA
ON | ***DTNK***

Delisted Expired Fuel Safety Facilities

Instance No:	10954579	***Expired Date:***	
Status:	EXPIRED	***Max Hazard Rank:***	NULL
Instance ID:		***Facility Location:***	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA
Instance Type:		***Facility Type:***	FS LIQUID FUEL TANK
Instance Creation Dt:	7/19/2000 8:15:15 PM	***Fuel Type 2:***	NULL
Instance Install Dt:	5/11/2009	***Fuel Type 3:***	NULL
Item Description:	FS Liquid Fuel Tank	***Panam Related:***	NULL
Manufacturer:	NULL	***Panam Venue Nm:***	NULL
Model:	NULL	***External Identifier:***	NULL
Serial No:	NULL	***Item:***	
ULC Standard:	NULL	***Piping Steel:***	
Quantity:	1	***Piping Galvanized:***	
Unit of Measure:	EA	***Tank Single Wall St:***	
Overfill Prot Type:	NULL	***Piping Underground:***	
Creation Date:	7/5/2009 1:22:35 AM	***Tank Underground:***	
Next Periodic Str DT:	NULL	***Source:***	FS Liquid Fuel Tank
TSSA Base Sched Cycle 2:	NULL		
TSSAMax Hazard Rank 1:	NULL		
TSSA Risk Based Periodic Yn:	NULL		
TSSA Volume of Directives:	NULL		
TSSA Periodic Exempt:	NULL		
TSSA Statutory Interval:	NULL		
TSSA Recd Insp Interva:	NULL		
TSSA Recd Tolerance:	NULL		
TSSA Program Area:	NULL		
TSSA Program Area 2:	NULL		
Description:	2009VBS		
Original Source:	EXP		
Record Date:	31-JUL-2020		

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34 | ***20 of 26*** | ***S/72.5*** | ***129.8 / 0.00*** | ***1461148 ONTARIO CORP***
1121 KINGSTON RD SCARBOROUGH M1N 1N7
ON CA
ON | ***DTNK***

Delisted Expired Fuel Safety Facilities

Instance No:	10954612	***Expired Date:***	
Status:	EXPIRED	***Max Hazard Rank:***	NULL
Instance ID:		***Facility Location:***	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA
Instance Type:		***Facility Type:***	FS LIQUID FUEL TANK

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Instance Creation Dt:	7/19/2000 8:15:15 PM	**Fuel Type 2:**	NULL
Instance Install Dt:	5/11/2009	**Fuel Type 3:**	NULL
Item Description:	FS Liquid Fuel Tank	**Panam Related:**	NULL
Manufacturer:	NULL	**Panam Venue Nm:**	NULL
Model:	NULL	**External Identifier:**	NULL
Serial No:	NULL	**Item:**	
ULC Standard:	NULL	**Piping Steel:**	
Quantity:	1	**Piping Galvanized:**	
Unit of Measure:	EA	**Tank Single Wall St:**	
Overfill Prot Type:	NULL	**Piping Underground:**	
Creation Date:	7/5/2009 1:22:39 AM	**Tank Underground:**	
Next Periodic Str DT:	NULL	**Source:**	FS Liquid Fuel Tank

TSSA Base Sched Cycle 2:	NULL
TSSAMax Hazard Rank 1:	NULL
TSSA Risk Based Periodic Yn:	NULL
TSSA Volume of Directives:	NULL
TSSA Periodic Exempt:	NULL
TSSA Statutory Interval:	NULL
TSSA Recd Insp Interva:	NULL
TSSA Recd Tolerance:	NULL
TSSA Program Area:	NULL
TSSA Program Area 2:	NULL
Description:	2009VBS
Original Source:	EXP
Record Date:	31-JUL-2020

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34 | ***21 of 26*** | ***S/72.5*** | ***129.8 / 0.00*** | ***PETRO CANADA***
1121 KINGSTON RD
SCARBOROUGH ON M1N1N7 | ***RST***

Headcode:	01186800
Headcode Desc:	SERVICE STATIONS GASOLINE OIL & NATURAL GAS
Phone:	4166865394
List Name:	INFO-DIRECT(TM) BUSINESS FILE
Description:	

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34 | ***22 of 26*** | ***S/72.5*** | ***129.8 / 0.00*** | ***1461148 ONTARIO CORP***
1121 KINGSTON RD SCARBOROUGH M1N 1N7
ON CA
ON | ***FST***

Instance No:	10954579	**Manufacturer:**	
Status:		**Serial No:**	
Cont Name:		**Ulc Standard:**	
Instance Type:		**Quantity:**	
Item:		**Unit of Measure:**	
Item Description:	FS Liquid Fuel Tank	**Fuel Type:**	Gasoline
Tank Type:	Liquid Fuel Single Wall UST	**Fuel Type2:**	NULL
Install Date:	5/11/2009	**Fuel Type3:**	NULL
Install Year:	1976	**Piping Steel:**	
Years in Service:		**Piping Galvanized:**	
Model:	NULL	**Tanks Single Wall St:**	
Description:		**Piping Underground:**	
Capacity:	22700	**No Underground:**	
Tank Material:	Fiberglass (FRP)	**Panam Related:**	
Corrosion Protect:	Fiberglass	**Panam Venue:**	
Overfill Protect:			

Facility Type:	FS Liquid Fuel Tank
Parent Facility Type:	
Facility Location:	
Device Installed Location:	1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Liquid Fuel Tank Details

Overfill Protection:
Owner Account Name: 1461148 ONTARIO CORP
Item: FS LIQUID FUEL TANK

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34 | ***23 of 26*** | ***S/72.5*** | ***129.8 / 0.00*** | ***1121 KINGSTON RD SCARBOROUGH ON M1N 1N7*** | ***DTNK***

Delisted Fuel Storage Tank

Instance No:	25384418	***Creation Date:***	
Status:	Active	***Overfill Prot Type:***	
Instance Type:		***Facility Location:***	
Fuel Type:		***Piping SW Steel:***	0
Cont Name:		***Piping SW Galvan:***	0
Capacity:		***Tanks SW Steel:***	0
Tank Material:		***Piping Underground:***	2
Corrosion Prot:		***No Underground:***	3
Tank Type:		***Max Hazard Rank:***	
Install Year:		***Max Hazard Rank 1:***	
Facility Type:		***Nxt Period Start Dt:***	
Device Installed Loc:		***Program Area 1:***	
Fuel Type 2:		***Program Area 2:***	
Fuel Type 3:		***Nxt Period Strt Dt 2:***	
Item:	FS GASOLINE STATION - SELF SERVE	***Risk Based Periodic:***	
Item Description:		***Vol of Directives:***	
Model:		***Years in Service:***	
Description:		***Created Date:***	
Instance Creation Dt:		***Federal Device:***	
Instance Install Dt:		***Periodic Exempt:***	
Manufacturer:		***Statutory Interval:***	
Serial No:		***Rcomnd Insp Interval:***	
ULC Standard:		***Recommended Toler:***	
Quantity:		***Panam Venue Name:***	
Unit of Measure:		***External Identifier:***	
Parent Fac Type:			
TSSA Base Sched Cycle 1:			
TSSA Base Sched Cycle 2:			
Original Source:	FST		
Record Date:	31-MAY-2021		

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34 | ***24 of 26*** | ***S/72.5*** | ***129.8 / 0.00*** | ***1461148 ONTARIO CORP 1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA ON*** | ***FST***

Instance No:	10954612	***Manufacturer:***	
Status:		***Serial No:***	
Cont Name:		***Ulc Standard:***	
Instance Type:		***Quantity:***	
Item:		***Unit of Measure:***	
Item Description:	FS Liquid Fuel Tank	***Fuel Type:***	Gasoline
Tank Type:	Liquid Fuel Single Wall UST	***Fuel Type2:***	NULL
Install Date:	5/11/2009	***Fuel Type3:***	NULL
Install Year:	1976	***Piping Steel:***	
Years in Service:		***Piping Galvanized:***	
Model:	NULL	***Tanks Single Wall St:***	
Description:		***Piping Underground:***	
Capacity:	22700	***No Underground:***	
Tank Material:	Fiberglass (FRP)	***Panam Related:***	
Corrosion Protect:	Fiberglass	***Panam Venue:***	

Overfill Protect:
Facility Type: FS Liquid Fuel Tank
Parent Facility Type:
Facility Location:
Device Installed Location: 1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA

Liquid Fuel Tank Details

Overfill Protection:
Owner Account Name: 1461148 ONTARIO CORP
Item: FS LIQUID FUEL TANK

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34 | ***25 of 26*** | ***S/72.5*** | ***129.8 / 0.00*** | ***1461148 ONTARIO CORP***
1121 KINGSTON RD SCARBOROUGH M1N 1N7
ON CA
ON | ***FST***

Instance No:	10954627	***Manufacturer:***	
Status:		***Serial No:***	
Cont Name:		***Ulc Standard:***	
Instance Type:		***Quantity:***	
Item:		***Unit of Measure:***	
Item Description:	FS Liquid Fuel Tank	***Fuel Type:***	Gasoline
Tank Type:	Liquid Fuel Single Wall UST	***Fuel Type2:***	NULL
Install Date:	5/11/2009	***Fuel Type3:***	NULL
Install Year:	1976	***Piping Steel:***	
Years in Service:		***Piping Galvanized:***	
Model:	NULL	***Tanks Single Wall St:***	
Description:		***Piping Underground:***	
Capacity:	22700	***No Underground:***	
Tank Material:	Fiberglass (FRP)	***Panam Related:***	
Corrosion Protect:	Fiberglass	***Panam Venue:***	

Overfill Protect:
Facility Type: FS Liquid Fuel Tank
Parent Facility Type:
Facility Location:
Device Installed Location: 1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA

Liquid Fuel Tank Details

Overfill Protection:
Owner Account Name: 1461148 ONTARIO CORP
Item: FS LIQUID FUEL TANK

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34 | ***26 of 26*** | ***S/72.5*** | ***129.8 / 0.00*** | ***1461148 ONTARIO CORP***
1121 KINGSTON RD SCARBOROUGH M1N 1N7
ON CA
ON | ***FST***

Instance No:	10954594	***Manufacturer:***	
Status:		***Serial No:***	
Cont Name:		***Ulc Standard:***	
Instance Type:		***Quantity:***	
Item:		***Unit of Measure:***	
Item Description:	FS Liquid Fuel Tank	***Fuel Type:***	Gasoline
Tank Type:	Liquid Fuel Single Wall UST	***Fuel Type2:***	NULL
Install Date:	5/11/2009	***Fuel Type3:***	NULL
Install Year:	1976	***Piping Steel:***	
Years in Service:		***Piping Galvanized:***	
Model:	NULL	***Tanks Single Wall St:***	
Description:		***Piping Underground:***	
Capacity:	22700	***No Underground:***	
Tank Material:	Fiberglass (FRP)	***Panam Related:***	

Corrosion Protect: Fiberglass
Panam Venue:
Overfill Protect:
Facility Type: FS Liquid Fuel Tank
Parent Facility Type:
Facility Location:
Device Installed Location: 1121 KINGSTON RD SCARBOROUGH M1N 1N7 ON CA

Liquid Fuel Tank Details

Overfill Protection:
Owner Account Name: 1461148 ONTARIO CORP
Item: FS LIQUID FUEL TANK

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35 | ***1 of 3*** | ***SSW/72.7*** | ***129.8 / 0.00*** | ***1111, 1115, 1117, 1119 Kingston Road & 196, 198 Blantyre Avenue Scarborough ON M1N 1N6*** | ***EHS***

Order No: 22051600314
Status: C
Report Type: Custom Report
Report Date: 19-MAY-22
Date Received: 16-MAY-22
Previous Site Name:
Lot/Building Size:
Additional Info Ordered: Topographic Maps
Nearest Intersection:
Municipality: Scarborough
Client Prov/State: ON
Search Radius (km): .25
X: -79.28154085
Y: 43.6811598

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35 | ***2 of 3*** | ***SSW/72.7*** | ***129.8 / 0.00*** | ***1111, 1115, 1117, 1119 Kingston Road & 196, 198 Blantyre Avenue Scarborough ON M1N 1N6*** | ***EHS***

Order No: 22051600314
Status: C
Report Type: Custom Report
Report Date: 19-MAY-22
Date Received: 16-MAY-22
Previous Site Name:
Lot/Building Size:
Additional Info Ordered: Topographic Maps
Nearest Intersection:
Municipality: Scarborough
Client Prov/State: ON
Search Radius (km): .25
X: -79.28154085
Y: 43.6811598

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35 | ***3 of 3*** | ***SSW/72.7*** | ***129.8 / 0.00*** | ***1111, 1115, 1117, 1119 Kingston Road & 196, 198 Blantyre Avenue Scarborough ON M1N 1N6*** | ***EHS***

Order No: 22051600314
Status: C
Report Type: Custom Report
Report Date: 19-MAY-22
Date Received: 16-MAY-22
Previous Site Name:
Lot/Building Size:
Additional Info Ordered: Topographic Maps
Nearest Intersection:
Municipality: Scarborough
Client Prov/State: ON
Search Radius (km): .25
X: -79.28154085
Y: 43.6811598

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36 | ***1 of 1*** | ***SW/73.7*** | ***125.1 / -4.78*** | ***1088-1118 Kingston Road Toronto ON*** | ***EHS***

Order No: 20150217084
Status: C
Report Type: Custom Report
Report Date: 24-FEB-15
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Date Received:	17-FEB-15	**X:**	-79.282268
Previous Site Name:		**Y:**	43.681461
Lot/Building Size:			
Additional Info Ordered:			

37 **1 of 12** **SSE/75.4** **129.8 / 0.00** **B PLUS SERVICE STATION** **SPL**
1161 KINGSTON ROAD SERVICE STATION
TORONTO CITY ON M1N 1P2

Ref No:	28751	**Municipality No:**	01106
Year:		**Nature of Damage:**	
Incident Dt:	12/11/1989	**Discharger Report:**	
Dt MOE Arvl on Scn:		**Material Group:**	
MOE Reported Dt:	12/11/1989	**Health/Env Conseq:**	
Dt Document Closed:		**Agency Involved:**	MCCR, SCARBOROUGH FD
Site No:			
Facility Name:			
MOE Response:			
Site County/District:			
Site Geo Ref Meth:			
Site District Office:			
Nearest Watercourse:			
Site Name:			
Site Address:			
Site Region:			
Site Municipality:	TORONTO CITY		
Site Lot:			
Site Conc:			
Site Geo Ref Accu:			
Site Map Datum:			
Northing:			
Easting:			
Incident Cause:	UNKNOWN		
Incident Event:			
Environment Impact:			
Nature of Impact:			
Contaminant Qty:			
System Facility Address:			
Client Name:			
Client Type:			
Call Report Locatn Geodata:			
Contaminant Code:			
Contaminant Name:			
Contaminant Limit 1:			
Contam Limit Freq 1:			
Contaminant UN No 1:			
Receiving Medium:	LAND		
Receiving Environment:			
Incident Reason:	UNKNOWN		
Incident Summary:	POWER TANK LINES- UNKNOWNQTY OF GASOLINE SPILLED TO GROUND DURING FILLING		
Activity Preceding Spill:			
Property 2nd Watershed:			
Property Tertiary Watershed:			
Sector Type:			
SAC Action Class:			
Source Type:			

37 **2 of 12** **SSE/75.4** **129.8 / 0.00** **SUNOCO INC - THROUGH AGENT PIONEER** **PRT**
PETROLEUMS MANA
1161 KINGSTON RD
SCARBOROUGH ON M1N1P2

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Location ID: 13036
Type: retail
Expiry Date: 1996-01-31
Capacity (L): 27000
Licence #: 0076412287

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37 **3 of 12** **SSE/75.4** **129.8 / 0.00** **SPL**

PIONEER PETROLEUMS LTD.
1161 KINGSTON RD.SCARBOROUGH, ON
SERVICE STATION
TORONTO CITY ON M1N 1P2

Ref No: 215157
Year:
Incident Dt: 10/31/2001
Dt MOE Arvl on Scn:
MOE Reported Dt: 10/31/2001
Dt Document Closed:
Site No:
Facility Name:
MOE Response:
Site County/District:
Site Geo Ref Meth:
Site District Office:
Nearest Watercourse:
Site Name:
Site Address:
Site Region:
Site Municipality: TORONTO CITY
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:
Easting:
Incident Cause: PIPE/HOSE LEAK
Incident Event:
Environment Impact: Possible
Nature of Impact: Soil contamination
Contaminant Qty:
System Facility Address:
Client Name:
Client Type:
Call Report Locatn Geodata:
Contaminant Code:
Contaminant Name:
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Receiving Medium: Land
Receiving Environment:
Incident Reason: NEGLIGENCE (APPARENT)
Incident Summary: TSSA: 1161 KINGSTON RD. 20 L GAS TO GROUND CONTAINED AND CLEANED-UP
Activity Preceding Spill:
Property 2nd Watershed:
Property Tertiary Watershed:
Sector Type:
SAC Action Class:
Source Type:

Municipality No: 01106
Nature of Damage:
Discharger Report:
Material Group:
Health/Env Conseq:
Agency Involved: SCARBOROUGH FIRE DEPT.

---

37 **4 of 12** **SSE/75.4** **129.8 / 0.00** **FSTH**

PIONEER PETROLEUMS MANAGEMENT INC**
1161 KINGSTON RD
SCARBOROUGH ON M1N 1P2

License Issue Date: 12/28/2001
Tank Status: Licensed
Tank Status As Of: August 2007
Operation Type: Retail Fuel Outlet
Facility Type: Gasoline Station - Full Serve

--Details--
Status: Active
Year of Installation: 1985
Corrosion Protection:
Capacity: 22700
Tank Fuel Type: Liquid Fuel Single Wall UST - Gasoline

Status: Active
Year of Installation: 1985
Corrosion Protection:
Capacity: 27200
Tank Fuel Type: Liquid Fuel Single Wall UST - Gasoline

Status: Active
Year of Installation: 1985
Corrosion Protection:
Capacity: 36300
Tank Fuel Type: Liquid Fuel Single Wall UST - Gasoline

Status: Active
Year of Installation: 1985
Corrosion Protection:
Capacity: 36300
Tank Fuel Type: Liquid Fuel Single Wall UST - Gasoline

37	5 of 12	SSE/75.4	129.8 / 0.00	***PIONEER PETROLEUMS MANAGEMENT INC***** ***1161 KINGSTON RD*** ***SCARBOROUGH ON M1N 1P2***	FSTH

License Issue Date: 12/28/2001
Tank Status: Pending Renewal
Tank Status As Of: December 2008
Operation Type: Retail Fuel Outlet
Facility Type: Gasoline Station - Full Serve

--Details--
Status: Active
Year of Installation: 1985
Corrosion Protection:
Capacity: 22700
Tank Fuel Type: Liquid Fuel Single Wall UST - Gasoline

Status: Active
Year of Installation: 1985
Corrosion Protection:
Capacity: 27200
Tank Fuel Type: Liquid Fuel Single Wall UST - Gasoline

Status: Active
Year of Installation: 1985
Corrosion Protection:
Capacity: 36300
Tank Fuel Type: Liquid Fuel Single Wall UST - Gasoline

Status: Active

Year of Installation: 1985
Corrosion Protection:
Capacity: 36300
Tank Fuel Type: Liquid Fuel Single Wall UST - Gasoline

---

37 | ***6 of 12*** | ***SSE/75.4*** | ***129.8 / 0.00*** | ***1132410 ONTARIO LTD***
1161 KINGSTON RD SCARBOROUGH M1N 1P2
ON CA
ON | ***FST***

Instance No: 10954642
Status:
Cont Name:
Instance Type: FS Liquid Fuel Tank
Item:
Item Description: FS Liquid Fuel Tank
Tank Type: Single Wall UST
Install Date: 5/11/2009
Install Year: 1985
Years in Service:
Model: NULL
Description:
Capacity: 22700
Tank Material: Fiberglass (FRP)
Corrosion Protect: Fiberglass
Overfill Protect:
Facility Type: FS Liquid Fuel Tank
Parent Facility Type: FS Gasoline Station - Full Serve
Facility Location:
Device Installed Location: 1161 KINGSTON RD SCARBOROUGH M1N 1P2 ON CA

Manufacturer:
Serial No:
Ulc Standard:
Quantity:
Unit of Measure:
Fuel Type: Gasoline
Fuel Type2: NULL
Fuel Type3: NULL
Piping Steel:
Piping Galvanized:
Tanks Single Wall St:
Piping Underground:
No Underground:
Panam Related:
Panam Venue:

Liquid Fuel Tank Details

Overfill Protection:
Owner Account Name: 1132410 ONTARIO LTD
Item: FS LIQUID FUEL TANK

---

37 | ***7 of 12*** | ***SSE/75.4*** | ***129.8 / 0.00*** | ***1132410 ONTARIO LTD***
1161 KINGSTON RD SCARBOROUGH M1N 1P2
ON CA
ON | ***FST***

Instance No: 11373253
Status:
Cont Name:
Instance Type: FS Liquid Fuel Tank
Item:
Item Description: FS Liquid Fuel Tank
Tank Type: Single Wall UST
Install Date: 5/11/2009
Install Year: 1985
Years in Service:
Model: NULL
Description:
Capacity: 36300
Tank Material: Fiberglass (FRP)
Corrosion Protect: Fiberglass
Overfill Protect:
Facility Type: FS Liquid Fuel Tank
Parent Facility Type: FS Gasoline Station - Full Serve
Facility Location:
Device Installed Location: 1161 KINGSTON RD SCARBOROUGH M1N 1P2 ON CA

Manufacturer:
Serial No:
Ulc Standard:
Quantity:
Unit of Measure:
Fuel Type: Gasoline
Fuel Type2: NULL
Fuel Type3: NULL
Piping Steel:
Piping Galvanized:
Tanks Single Wall St:
Piping Underground:
No Underground:
Panam Related:
Panam Venue:

Liquid Fuel Tank Details

Overfill Protection:
Owner Account Name: 1132410 ONTARIO LTD
Item: FS LIQUID FUEL TANK

---

37 | ***8 of 12*** | ***SSE/75.4*** | ***129.8 / 0.00*** | ***1132410 ONTARIO LTD***
1161 KINGSTON RD SCARBOROUGH M1N 1P2
ON CA
ON | ***FST***

Instance No: 11373264
Status:
Cont Name:
Instance Type: FS Liquid Fuel Tank
Item:
Item Description: FS Liquid Fuel Tank
Tank Type: Single Wall UST
Install Date: 5/11/2009
Install Year: 1985
Years in Service:
Model: NULL
Description:
Capacity: 36300
Tank Material: Fiberglass (FRP)
Corrosion Protect: Fiberglass
Overfill Protect:
Facility Type: FS Liquid Fuel Tank
Parent Facility Type: FS Gasoline Station - Full Serve
Facility Location:
Device Installed Location: 1161 KINGSTON RD SCARBOROUGH M1N 1P2 ON CA

Manufacturer:
Serial No:
Ulc Standard:
Quantity:
Unit of Measure:
Fuel Type: Gasoline
Fuel Type2: NULL
Fuel Type3: NULL
Piping Steel:
Piping Galvanized:
Tanks Single Wall St:
Piping Underground:
No Underground:
Panam Related:
Panam Venue:

Liquid Fuel Tank Details

Overfill Protection:
Owner Account Name: 1132410 ONTARIO LTD
Item: FS LIQUID FUEL TANK

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37 | ***9 of 12*** | ***SSE/75.4*** | ***129.8 / 0.00*** | ***1132410 ONTARIO LTD***
1161 KINGSTON RD SCARBOROUGH M1N 1P2
ON CA
ON | ***FST***

Instance No: 11373236
Status:
Cont Name:
Instance Type: FS Liquid Fuel Tank
Item:
Item Description: FS Liquid Fuel Tank
Tank Type: Single Wall UST
Install Date: 5/11/2009
Install Year: 1985
Years in Service:
Model: NULL
Description:
Capacity: 27200
Tank Material: Fiberglass (FRP)
Corrosion Protect: Fiberglass
Overfill Protect:
Facility Type: FS Liquid Fuel Tank
Parent Facility Type: FS Gasoline Station - Full Serve
Facility Location:

Manufacturer:
Serial No:
Ulc Standard:
Quantity:
Unit of Measure:
Fuel Type: Gasoline
Fuel Type2: NULL
Fuel Type3: NULL
Piping Steel:
Piping Galvanized:
Tanks Single Wall St:
Piping Underground:
No Underground:
Panam Related:
Panam Venue:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Device Installed Location: 1161 KINGSTON RD SCARBOROUGH M1N 1P2 ON CA

Liquid Fuel Tank Details

Overfill Protection:
Owner Account Name: 1132410 ONTARIO LTD
Item: FS LIQUID FUEL TANK

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
37	10 of 12	SSE/75.4	129.8 / 0.00	1161 Kingston Road Scarborough ON M1N 1S4	EHS

Order No: 20180920065
Status: C
Report Type: Site Report
Report Date: 20-SEP-18
Date Received: 20-SEP-18
Previous Site Name:
Lot/Building Size: 15,000 sq. ft.
Additional Info Ordered:

Nearest Intersection:
Municipality: Scarborough
Client Prov/State: ON
Search Radius (km): .001
X: -79.27982
Y: 43.681772

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
37	11 of 12	SSE/75.4	129.8 / 0.00	1161 Kingston Road Scarborough ON M1N 1P2	EHS

Order No: 20190319068
Status: C
Report Type: Custom Report
Report Date: 26-MAR-19
Date Received: 19-MAR-19
Previous Site Name:
Lot/Building Size:
Additional Info Ordered: City Directory

Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -79.279889
Y: 43.681739

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
37	12 of 12	SSE/75.4	129.8 / 0.00	1161 KINGSTON RD SCARBOROUGH ON M1N 1P2	DTNK

Delisted Fuel Storage Tank

Instance No: 9773103
Status: Active
Instance Type:
Fuel Type:
Cont Name:
Capacity:
Tank Material:
Corrosion Prot:
Tank Type:
Install Year:
Facility Type:
Device Installed Loc:
Fuel Type 2:
Fuel Type 3:
Item: FS GASOLINE STATION - FULL SERVE
Item Description:
Model:
Description:
Instance Creation Dt:
Instance Install Dt:
Manufacturer:
Serial No:

Creation Date:
Overfill Prot Type:
Facility Location:
Piping SW Steel: 0
Piping SW Galvan: 0
Tanks SW Steel: 0
Piping Underground: 2
No Underground: 4
Max Hazard Rank:
Max Hazard Rank 1:
Nxt Period Start Dt:
Program Area 1:
Program Area 2:
Nxt Period Strt Dt 2:
Risk Based Periodic:
Vol of Directives:
Years in Service:
Created Date:
Federal Device:
Periodic Exempt:
Statutory Interval:
Rcomnd Insp Interval:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

ULC Standard: ***Recommended Toler:***
Quantity: ***Panam Venue Name:***
Unit of Measure: ***External Identifier:***
Parent Fac Type:
TSSA Base Sched Cycle 1:
TSSA Base Sched Cycle 2:
Original Source: FST
Record Date: 31-MAY-2021

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38 *1 of 3* ***SSW/77.1*** ***129.5 / -0.39*** ***1547988 Ontario Inc.***
1224699 Ontario.Inc 1095 SECOND AVENUE EAST
OWEN SOUND ON N4K 2H8 ***GEN***

Generator No: ON0290000
SIC Code: 812320
SIC Description: DRY CLEANING AND LAUNDRY SERVICES (EXCEPT COIN-OPERATED)
Approval Years: 2016
PO Box No:
Country: Canada
Status:
Co Admin:
Choice of Contact: CO_OFFICIAL
Phone No Admin:
Contaminated Facility: No
MHSW Facility: No

Detail(s)

Waste Class: 213
Waste Class Name: PETROLEUM DISTILLATES

Waste Class: 241
Waste Class Name: HALOGENATED SOLVENTS

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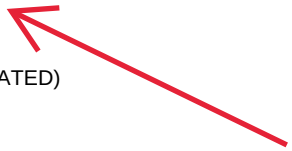
38 *2 of 3* ***SSW/77.1*** ***129.5 / -0.39*** ***1547988 Ontario Inc.***
1224699 Ontario.Inc 1095 SECOND AVENUE EAST
OWEN SOUND ON N4K 2H8 ***GEN***



Generator No: ON0290000
SIC Code: 812320
SIC Description: DRY CLEANING AND LAUNDRY SERVICES (EXCEPT COIN-OPERATED)
Approval Years: 2015
PO Box No:
Country: Canada
Status:
Co Admin:
Choice of Contact: CO_OFFICIAL
Phone No Admin:
Contaminated Facility: No
MHSW Facility: No

Detail(s)

Waste Class: 213
Waste Class Name: PETROLEUM DISTILLATES

Waste Class: 241
Waste Class Name: HALOGENATED SOLVENTS

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
38	3 of 3	SSW/77.1	129.5 / -0.39	1547988 Ontario Inc. 1224699 Ontario.Inc 1095 SECOND AVENUE EAST OWEN SOUND ON N4K 2H8	GEN

Generator No: ON0290000
SIC Code: 812320
SIC Description: DRY CLEANING AND LAUNDRY SERVICES (EXCEPT COIN-OPERATED)
Approval Years: 2014
PO Box No:
Country: Canada
Status:
Co Admin:
Choice of Contact: CO_OFFICIAL
Phone No Admin:
Contaminated Facility: No
MHSW Facility: No

Detail(s)

Waste Class: 241
Waste Class Name: HALOGENATED SOLVENTS

Waste Class: 213
Waste Class Name: PETROLEUM DISTILLATES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
39	1 of 1	SSE/81.3	129.8 / 0.00	ON	WWIS

Well ID: 7352593
Construction Date:
Use 1st:
Use 2nd:
Final Well Status:
Water Type:
Casing Material:
Audit No: C45716
Tag: A277492
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: SCARBOROUGH BOROUGH
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status: Yes
Data Src:
Date Received: 01/31/2020
Selected Flag: TRUE
Abandonment Rec:
Contractor: 7230
Form Version: 8
Owner:
County: YORK
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

PDF URL (Map):

Additional Detail(s) (Map)

Well Completed Date: 12/16/2019
Year Completed: 2019
Depth (m):
Latitude: 43.6815811114788
Longitude: -79.2800846222933
Path:

Bore Hole Information

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Bore Hole ID:	1008045739	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638629.00
Code OB Desc:		**North83:**	4837945.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	12/16/2019	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Links

Bore Hole ID:	1008045739	**Tag No:**	A277492
Depth M:		**Contractor:**	7230
Year Completed:	2019	**Latitude:**	43.6815811114788
Well Completed Dt:	12/16/2019	**Longitude:**	-79.2800846222933
Audit No:	C45716	**Y:**	43.681581108437435
Path:		**X:**	-79.28008447124272

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40 | ***1 of 1*** | ***WSW/82.0*** | ***129.8 / 0.00*** | ***36 MEADOW AVENUE TORONTO ON M1N 1V6*** | ***HINC***

External File Num:	FS INC 0702-00788
Fuel Occurrence Type:	CO Release
Date of Occurrence:	2/16/2007
Fuel Type Involved:	Natural Gas
Status Desc:	Completed - Causal Analysis(End)
Job Type Desc:	Incident/Near-Miss Occurrence (FS)
Oper. Type Involved:	Private Dwelling
Service Interruptions:	No
Property Damage:	No
Fuel Life Cycle Stage:	Utilization
Root Cause:	
Reported Details:	
Fuel Category:	Unknown
Occurrence Type:	Near-miss
Affiliation:	Industry Stakeholder (Licensee/Registration/Certificate Holder, Facility Owner, etc.)
County Name:	Toronto
Approx. Quant. Rel:	
Nearby body of water:	
Enter Drainage Syst.:	
Approx. Quant. Unit:	
Environmental Impact:	

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41 | ***1 of 1*** | ***SE/84.9*** | ***129.8 / 0.00*** | ***1165 KINGSTON ROAD Toronto ON*** | ***WWIS***

Well ID:	7111418	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Test Hole	**Data Entry Status:**	
Use 2nd:		**Data Src:**	
Final Well Status:	Observation Wells	**Date Received:**	09/17/2008
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z88596	**Contractor:**	7147

Tag:	A074047	**Form Version:**	7
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	TORONTO CITY		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/711\7111418.pdf

Additional Detail(s) (Map)

Well Completed Date:	09/08/2008
Year Completed:	2008
Depth (m):	2.7
Latitude:	43.6818068964641
Longitude:	-79.2795322854346
Path:	711\7111418.pdf

Bore Hole Information

Bore Hole ID:	1001799208	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638673.00
Code OB Desc:		**North83:**	4837971.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	3
Date Completed:	09/08/2008	**UTMRC Desc:**	margin of error : 10 - 30 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1001913043
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	01
Most Common Material:	FILL
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	1.7999999523162842
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID: 1001913045
Layer: 3
Color: 6
General Color: BROWN
Mat1:
Most Common Material:
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 2.700000047683716
Formation End Depth:
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1001913044
Layer: 2
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 1.7999999523162842
Formation End Depth: 2.700000047683716
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1001913047
Layer: 1
Plug From: 0.0
Plug To: 0.20000000298023224
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1001913049
Layer: 3
Plug From: 1.2999999523162842
Plug To: 2.700000047683716
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1001913048
Layer: 2
Plug From: 0.20000000298023224
Plug To: 1.2999999523162842
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1001913050
Layer: 4
Plug From:
Plug To: 2.700000047683716
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID: 1001913055
Method Construction Code: 6
Method Construction: Boring
Other Method Construction:

Pipe Information

Pipe ID: 1001913042
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1001913052
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0.0
Depth To: 1.2999999523162842
Casing Diameter: 5.0
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1001913053
Layer: 1
Slot:
Screen Top Depth: 1.2999999523162842
Screen End Depth: 2.700000047683716
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6.300000190734863

Water Details

Water ID: 1001913051
Layer:
Kind Code:
Kind:
Water Found Depth:
Water Found Depth UOM: m

Hole Diameter

Hole ID: 1001913046
Diameter: 11.399999618530273
Depth From: 0.0
Depth To: 2.700000047683716
Hole Depth UOM: m

Hole Diameter UOM: cm

Links

Bore Hole ID:	1001799208	**Tag No:**	A074047
Depth M:	2.7	**Contractor:**	7147
Year Completed:	2008	**Latitude:**	43.6818068964641
Well Completed Dt:	09/08/2008	**Longitude:**	-79.2795322854346
Audit No:	Z88596	**Y:**	43.68180689313972
Path:	711\7111418.pdf	**X:**	-79.279532134162

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42 | **1 of 1** | **SSE/85.8** | **129.8 / 0.00** | **1161 KINGSTON RD SCARBOROUGH ON** | **WWIS**

Well ID:	7336194	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Monitoring	**Data Entry Status:**	
Use 2nd:		**Data Src:**	
Final Well Status:	Observation Wells	**Date Received:**	07/03/2019
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z312840	**Contractor:**	6946
Tag:	A262870	**Form Version:**	7
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/733\7336194.pdf

Additional Detail(s) (Map)

Well Completed Date:	05/23/2019
Year Completed:	2019
Depth (m):	18.288
Latitude:	43.6816581911957
Longitude:	-79.2798218843641
Path:	733\7336194.pdf

Bore Hole Information

Bore Hole ID:	1007513720	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638650.00
Code OB Desc:		**North83:**	4837954.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	05/23/2019	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			

Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID:	1007991203
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	12
Mat2 Desc:	STONES
Mat3:	66
Mat3 Desc:	DENSE
Formation Top Depth:	0.0
Formation End Depth:	18.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	1007991204
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	68
Mat2 Desc:	DRY
Mat3:	85
Mat3 Desc:	SOFT
Formation Top Depth:	18.0
Formation End Depth:	60.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1007992191
Layer:	2
Plug From:	48.0
Plug To:	60.0
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1007992190
Layer:	1
Plug From:	1.0
Plug To:	48.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	1007993075
Method Construction Code:	2
Method Construction:	Rotary (Convent.)
Other Method Construction:	

Pipe Information

Pipe ID:	1007990609
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1007993487
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0.0
Depth To:	50.0
Casing Diameter:	2.0
Casing Diameter UOM:	Inch
Casing Depth UOM:	ft

Construction Record - Screen

Screen ID:	1007993875
Layer:	1
Slot:	10
Screen Top Depth:	50.0
Screen End Depth:	60.0
Screen Material:	5
Screen Depth UOM:	ft
Screen Diameter UOM:	inch
Screen Diameter:	2.25

Results of Well Yield Testing

Pumping Test Method Desc:	
Pump Test ID:	1007994404
Pump Set At:	
Static Level:	
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	
Water State After Test:	
Pumping Test Method:	0
Pumping Duration HR:	
Pumping Duration MIN:	
Flowing:	

Hole Diameter

Hole ID:	1007992690
Diameter:	
Depth From:	
Depth To:	
Hole Depth UOM:	ft
Hole Diameter UOM:	

Hole Diameter

Hole ID:	1007992689
Diameter:	8.0
Depth From:	0.0
Depth To:	60.0
Hole Depth UOM:	ft
Hole Diameter UOM:	Inch

Links

Bore Hole ID:	1007513720	***Tag No:***	A262870
Depth M:	18.288	***Contractor:***	6946
Year Completed:	2019	***Latitude:***	43.6816581911957
Well Completed Dt:	05/23/2019	***Longitude:***	-79.2798218843641
Audit No:	Z312840	***Y:***	43.6816581882519
Path:	733\7336194.pdf	***X:***	-79.27982173296385

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43 | ***1 of 1*** | ***SE/91.0*** | ***129.8 / 0.00*** | ***1161 KINGSTON ROAD SCARBOROUGH ON*** | ***WWIS***

Well ID:	7373050	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Monitoring	***Data Entry Status:***	
Use 2nd:		***Data Src:***	
Final Well Status:	Observation Wells	***Date Received:***	11/15/2020
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	JCO6XNCH	***Contractor:***	6607
Tag:	A300835	***Form Version:***	9
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	YORK
Elevatn Reliabilty:		***Lot:***	
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

Bore Hole Information

Bore Hole ID:	1008504372	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:		***East83:***	638659.00
Code OB Desc:		***North83:***	4837954.00
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	10/13/2020	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock

Materials Interval

Formation ID:	1008504511
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Mat2 Desc:	GRAVEL
Mat3:	01
Mat3 Desc:	FILL
Formation Top Depth:	0.0
Formation End Depth:	1.100000023841858
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1008504513
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	66
Mat3 Desc:	DENSE
Formation Top Depth:	6.0
Formation End Depth:	22.899999618530273
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1008504512
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Mat2 Desc:	GRAVEL
Mat3:	77
Mat3 Desc:	LOOSE
Formation Top Depth:	1.100000023841858
Formation End Depth:	6.0
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1008504632
Layer:	1
Plug From:	0.0
Plug To:	0.30000001192092896
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID: 1008504633
Layer: 2
Plug From: 0.30000001192092896
Plug To: 17.799999237060547
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1008504599
Layer: 1
Plug From:
Plug To:
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID: 1008504441
Method Construction Code: 6
Method Construction: Boring
Other Method Construction:

Pipe Information

Pipe ID: 1008504416
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1008504540
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0.0
Depth To: 18.399999618530273
Casing Diameter: 5.099999904632568
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1008504559
Layer: 1
Slot: 10
Screen Top Depth: 18.399999618530273
Screen End Depth: 22.899999618530273
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6.400000095367432

Results of Well Yield Testing

Pumping Test Method Desc:
Pump Test ID: 1008504417
Pump Set At:
Static Level:
Final Level After Pumping:

Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM: m
Rate UOM: LPM
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID: 1008504580
Diameter: 21.0
Depth From: 0.0
Depth To: 22.899999618530273
Hole Depth UOM: m
Hole Diameter UOM: cm

Links

Bore Hole ID:	1008504372	***Tag No:***	A300835
Depth M:	22.9	***Contractor:***	6607
Year Completed:	2020	***Latitude:***	43.6816565110876
Well Completed Dt:	10/13/2020	***Longitude:***	-79.2797102743846
Audit No:	JCO6XNCH	***Y:***	43.681656508249525
Path:	737\7373050.pdf	***X:***	-79.2797101236138

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44 ***1 of 2*** ***SE/96.0*** ***129.8 / 0.00*** ***SCARBOROUGH PUBLIC UTILITIES COMM***
150 FALLINGBROOK ROAD, C/O 1530
MARKHAM ROAD,
SCARBOROUGH, ON M1N 2T6 ***GEN***

Generator No: ON0422009
SIC Code: 0000
SIC Description: *** NOT DEFINED ***
Approval Years: 86,87,88,89,90
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

not adjacent

Detail(s)

Waste Class: 122
Waste Class Name: ALKALINE WASTES - OTHER METALS

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44 ***2 of 2*** ***SE/96.0*** ***129.8 / 0.00*** ***SCARBOROUGH PUBLIC UTILITIES COMM 34-353***
150 FALLINGBROOK ROAD, C/O 1530
MARKHAM ROAD,
SCARBOROUGH, ON M1N 2T6 ***GEN***

Generator No: ON0422009
SIC Code: 4911

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

SIC Description: ELECT. POWER SYS.
Approval Years: 92,93,94,95,96,97,98
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 122
Waste Class Name: ALKALINE WASTES - OTHER METALS

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45 **1 of 8** **SW/96.4** **128.2 / -1.65** **Whitten Health group**
1092 Kingston Rd
Toronto ON M1N 1N4 **GEN**

Generator No: ON7956772
SIC Code: 621310
SIC Description: Offices of Chiropractors
Approval Years: 07,08
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

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45 **2 of 8** **SW/96.4** **128.2 / -1.65** **1092 Kingston Road**
Toronto ON M1N 1N4 **EHS**

Order No: 20101221007
Status: C
Report Type: Standard Report
Report Date: 1/3/2011
Date Received: 12/21/2010 9:51:43 AM
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): 0.25
X: -79.282557
Y: 43.681353

---

45 **3 of 8** **SW/96.4** **128.2 / -1.65** **Whitten Health group**
1092 Kingston Rd
Toronto ON M1N 1N4 **GEN**

Generator No: ON7956772
SIC Code: 621310
SIC Description: Offices of Chiropractors
Approval Years: 2009
PO Box No:
Country:
Status:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

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45 | ***4 of 8*** | ***SW/96.4*** | ***128.2 / -1.65*** | ***Whitten Health group*** ***1092 Kingston Rd*** ***Toronto ON M1N 1N4*** | ***GEN***

Generator No: ON7956772
SIC Code: 621310
SIC Description: Offices of Chiropractors
Approval Years: 2010
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

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45 | ***5 of 8*** | ***SW/96.4*** | ***128.2 / -1.65*** | ***Whitten Health group*** ***1092 Kingston Rd*** ***Toronto ON M1N 1N4*** | ***GEN***

Generator No: ON7956772
SIC Code: 621310
SIC Description: Offices of Chiropractors
Approval Years: 2012
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

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45 | ***6 of 8*** | ***SW/96.4*** | ***128.2 / -1.65*** | ***Whitten Health group*** ***1092 Kingston Rd*** ***Toronto ON*** | ***GEN***

Generator No: ON7956772
SIC Code: 621310

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

SIC Description:
Approval Years: 2013
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

45	7 of 8	SW/96.4	128.2 / -1.65	Whitten Health group 1092 Kingston Rd Toronto ON M1N 1N4	GEN

Generator No: ON7956772
SIC Code: 621310
SIC Description: 621310
Approval Years: 2015
PO Box No:
Country: Canada
Status:
Co Admin:
Choice of Contact: CO_OFFICIAL
Phone No Admin:
Contaminated Facility: No
MHSW Facility: No

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

45	8 of 8	SW/96.4	128.2 / -1.65	Whitten Health group 1092 Kingston Rd Toronto ON M1N 1N4	GEN

Generator No: ON7956772
SIC Code: 621310
SIC Description: 621310
Approval Years: 2014
PO Box No:
Country: Canada
Status:
Co Admin:
Choice of Contact: CO_OFFICIAL
Phone No Admin:
Contaminated Facility: No
MHSW Facility: No

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
46	1 of 1	SW/113.1	125.3 / -4.54	MTCC 1010 1091 Kingston Rd Scarborough ON M1N 4E5	GEN

Generator No: ON6207917
SIC Code:
SIC Description:
Approval Years: As of Oct 2022
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 331 I
Waste Class Name: WASTE COMPRESSED GASES

Waste Class: 145 L
Waste Class Name: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 145 I
Waste Class Name: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 252 L
Waste Class Name: WASTE OILS & LUBRICANTS

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
47	1 of 1	E/115.4	129.8 / 0.00	TRANSPORT TRUCK 1239 KINGSTON RD MOTOR VEHICLE (OPERATING FLUID) TORONTO CITY ON M1N 1P4	SPL

Ref No: 218437
Year:
Incident Dt: 12/17/2001
Dt MOE Arvl on Scn:
MOE Reported Dt: 12/17/2001
Dt Document Closed:
Site No:
Facility Name:
MOE Response:
Site County/District:
Site Geo Ref Meth:
Site District Office:
Nearest Watercourse:
Site Name:
Site Address:
Site Region:
Site Municipality: TORONTO CITY
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:
Easting:
Incident Cause: OTHER TRANSPORTATION ACCIDENT
Incident Event:
Environment Impact: Possible
Nature of Impact: Soil contamination
Contaminant Qty:
Municipality No: 01106
Nature of Damage:
Discharger Report:
Material Group:
Health/Env Conseq:
Agency Involved: FD,WORKS

System Facility Address:	
Client Name:	
Client Type:	
Call Report Locatn Geodata:	
Contaminant Code:	
Contaminant Name:	
Contaminant Limit 1:	
Contam Limit Freq 1:	
Contaminant UN No 1:	
Receiving Medium:	Land, Water
Receiving Environment:	
Incident Reason:	OTHER
Incident Summary:	TRANSPORT TRUCK- 90 L OF DIESEL TO LAWN, SMALL AMTTO CB.FD,WORKS.
Activity Preceding Spill:	
Property 2nd Watershed:	
Property Tertiary Watershed:	
Sector Type:	
SAC Action Class:	
Source Type:	

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48 ***1 of 1*** ***SW/118.3*** ***127.2 / -2.66*** ***1089 KINGSTON RD Toronto ON*** ***WWIS***

Well ID:	7245021	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Monitoring and Test Hole	***Data Entry Status:***	
Use 2nd:	0	***Data Src:***	
Final Well Status:	Test Hole	***Date Received:***	07/21/2015
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	Z208850	***Contractor:***	7241
Tag:	A180410	***Form Version:***	7
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	YORK
Elevatn Reliabilty:		***Lot:***	
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/724\7245021.pdf

Additional Detail(s) (Map)

Well Completed Date:	05/13/2015
Year Completed:	2015
Depth (m):	21.0312
Latitude:	43.6810688565733
Longitude:	-79.2825433057355
Path:	724\7245021.pdf

Bore Hole Information

Bore Hole ID:	1005496617	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:		***East83:***	638432.00
Code OB Desc:		***North83:***	4837884.00

Open Hole: ***Org CS:*** UTM83
Cluster Kind: ***UTMRC:*** 4
Date Completed: 05/13/2015 ***UTMRC Desc:*** margin of error : 30 m - 100 m
Remarks: ***Location Method:*** wwr
Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 1005649498
Layer: 2
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 06
Mat2 Desc: SILT
Mat3:
Mat3 Desc:
Formation Top Depth: 6.0
Formation End Depth: 30.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 1005649497
Layer: 1
Color: 6
General Color: BROWN
Mat1: 01
Most Common Material: FILL
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 6.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 1005649499
Layer: 3
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 30.0
Formation End Depth: 69.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID:	1005649507
Layer:	1
Plug From:	0.0
Plug To:	0.5
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1005649509
Layer:	3
Plug From:	58.0
Plug To:	69.0
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1005649508
Layer:	2
Plug From:	0.5
Plug To:	58.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	1005649506
Method Construction Code:	D
Method Construction:	Direct Push
Other Method Construction:	

Pipe Information

Pipe ID:	1005649496
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1005649502
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0.0
Depth To:	59.0
Casing Diameter:	2.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Screen

Screen ID:	1005649503
Layer:	1
Slot:	10
Screen Top Depth:	59.0

Screen End Depth:	69.0
Screen Material:	5
Screen Depth UOM:	ft
Screen Diameter UOM:	inch
Screen Diameter:	2.25

Water Details

Water ID:	1005649501
Layer:	
Kind Code:	
Kind:	
Water Found Depth:	
Water Found Depth UOM:	ft

Hole Diameter

Hole ID:	1005649500
Diameter:	6.0
Depth From:	0.0
Depth To:	69.0
Hole Depth UOM:	ft
Hole Diameter UOM:	inch

Links

Bore Hole ID:	1005496617	**Tag No:**	A180410
Depth M:	21.0312	**Contractor:**	7241
Year Completed:	2015	**Latitude:**	43.6810688565733
Well Completed Dt:	05/13/2015	**Longitude:**	-79.2825433057355
Audit No:	Z208850	**Y:**	43.68106885404142
Path:	724\7245021.pdf	**X:**	-79.28254315494375

49 | ***1 of 1*** | ***WSW/122.3*** | ***129.8 / 0.00*** | ***ON*** | ***BORE***

Borehole ID:	627817	**Inclin FLG:**	No
OGF ID:	215528237	**SP Status:**	Initial Entry
Status:		**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:	Geotechnical/Geological Investigation	**Primary Name:**	
Completion Date:	FEB-1965	**Municipality:**	
Static Water Level:		**Lot:**	
Primary Water Use:	Not Used	**Township:**	
Sec. Water Use:		**Latitude DD:**	43.681605
Total Depth m:	9.4	**Longitude DD:**	-79.28299
Depth Ref:	Ground Surface	**UTM Zone:**	17
Depth Elev:		**Easting:**	638395
Drill Method:	Power auger	**Northing:**	4837943
Orig Ground Elev m:	125	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Not Applicable
DEM Ground Elev m:	130		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218445958	**Mat Consistency:**	
Top Depth:	3	**Material Moisture:**	
Bottom Depth:	4.6	**Material Texture:**	

Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Gravel	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	SAND,GRAVEL. BROWN.		

Geology Stratum ID:	218445956	**Mat Consistency:**	
Top Depth:	.6	**Material Moisture:**	
Bottom Depth:	2.7	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Gravel	**Geologic Formation:**	
Material 2:	Sand	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	GRAVEL,SAND. BROWN.		

Geology Stratum ID:	218445957	**Mat Consistency:**	
Top Depth:	2.7	**Material Moisture:**	
Bottom Depth:	3	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Gravel	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	SAND,GRAVEL. BROWN.		

Geology Stratum ID:	218445960	**Mat Consistency:**	
Top Depth:	6.1	**Material Moisture:**	
Bottom Depth:	7.6	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Gravel	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	SAND,GRAVEL. BROWN.		

Geology Stratum ID:	218445955	**Mat Consistency:**	
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	.6	**Material Texture:**	
Material Color:		**Non Geo Mat Type:**	
Material 1:	Fill	**Geologic Formation:**	
Material 2:	Soil	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	fill
Gsc Material Description:			
Stratum Description:	FILL,SOIL.		

Geology Stratum ID:	218445959	**Mat Consistency:**	
Top Depth:	4.6	**Material Moisture:**	
Bottom Depth:	6.1	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Gravel	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	SAND,GRAVEL. BROWN.		

Geology Stratum ID:	218445961	**Mat Consistency:**	
Top Depth:	7.6	**Material Moisture:**	
Bottom Depth:	9.4	**Material Texture:**	

Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Gravel	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	

Gsc Material Description:

Stratum Description: SAND,GRAVEL. BROWN. 000900300010003000150030002000300025003O **Note: Many records provided by the department have a truncated [Stratum Description] field.

Source

Source Type:	Data Survey	**Source Appl:**	Spatial/Tabular
Source Orig:	Geological Survey of Canada	**Source Iden:**	1
Source Date:	1956-1972	**Scale or Res:**	Varies
Confidence:	H	**Horizontal:**	NAD27
Observatio:		**Verticalda:**	Mean Average Sea Level

Source Name: Urban Geology Automated Information System (UGAIS)
Source Details: File: OSHAWA.txt RecordID: 015820 NTS_Sheet: 30M11C
Confiden 1: Logged by professional. Exact and complete description of material and properties.

Source List

Source Identifier:	1	**Horizontal Datum:**	NAD27
Source Type:	Data Survey	**Vertical Datum:**	Mean Average Sea Level
Source Date:	1956-1972	**Projection Name:**	Universal Transverse Mercator
Scale or Resolution:	Varies		

Source Name: Urban Geology Automated Information System (UGAIS)
Source Originators: Geological Survey of Canada

50	***1 of 1***	***SW/123.6***	***128.9 / -0.90***	***1080 KINGSTON ROAD SCARBOROUGH ON***	***WWIS***

Well ID:	7112201	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Monitoring and Test Hole	**Data Entry Status:**	
Use 2nd:	0	**Data Src:**	
Final Well Status:	Monitoring and Test Hole	**Date Received:**	09/26/2008
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z88793	**Contractor:**	7241
Tag:	A077960	**Form Version:**	7
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	

Municipality: SCARBOROUGH BOROUGH
Site Info: WKQ-000660

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/711\7112201.pdf

Additional Detail(s) (Map)

Well Completed Date: 09/17/2008
Year Completed: 2008
Depth (m): 17.3736
Latitude: 43.6811892106308
Longitude: -79.2827631858053

Path: 711\7112201.pdf

Bore Hole Information

Bore Hole ID:	1001818587	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:		***East83:***	638414.00
Code OB Desc:		***North83:***	4837897.00
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	3
Date Completed:	09/17/2008	***UTMRC Desc:***	margin of error : 10 - 30 m
Remarks:		***Location Method:***	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1001955875
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	57.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1001955878
Layer:	2
Plug From:	1.0
Plug To:	47.0
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1001955877
Layer:	1
Plug From:	0.0
Plug To:	1.0
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1001955879
Layer:	3
Plug From:	47.0

Plug To: 57.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 1001955885
Method Construction Code: 2
Method Construction: Rotary (Convent.)
Other Method Construction: DIRECT PUSH

Pipe Information

Pipe ID: 1001955874
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1001955881
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0.0
Depth To: 47.0
Casing Diameter: 1.5
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Screen

Screen ID: 1001955882
Layer: 1
Slot: 10
Screen Top Depth: 47.0
Screen End Depth: 57.0
Screen Material: 5
Screen Depth UOM: ft
Screen Diameter UOM: inch
Screen Diameter: 1.5

Water Details

Water ID: 1001955880
Layer:
Kind Code:
Kind:
Water Found Depth:
Water Found Depth UOM: ft

Hole Diameter

Hole ID: 1001955876
Diameter: 6.0
Depth From: 0.0
Depth To: 57.0
Hole Depth UOM: ft
Hole Diameter UOM: inch

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Links

Bore Hole ID:	1001818587	***Tag No:***	A077960
Depth M:	17.3736	***Contractor:***	7241
Year Completed:	2008	***Latitude:***	43.6811892106308
Well Completed Dt:	09/17/2008	***Longitude:***	-79.2827631858053
Audit No:	Z88793	***Y:***	43.681189208135116
Path:	711\7112201.pdf	***X:***	-79.28276303549508

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51 ***1 of 1*** ***SE/128.4*** ***129.8 / 0.00*** ***SCARBOROUGH CITY - LOT 34, CONC. A ANNDALE RD./FALLINGBROOK RD. SCARBOROUGH CITY ON*** ***CA***

Certificate #:	3-0964-92-
Application Year:	92
Issue Date:	8/11/1992
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

---

52 ***1 of 1*** ***SW/128.6*** ***129.8 / -0.03*** ***ON*** ***BORE***

Borehole ID:	627816	***Inclin FLG:***	No
OGF ID:	215528236	***SP Status:***	Initial Entry
Status:		***Surv Elev:***	No
Type:	Borehole	***Piezometer:***	No
Use:	Geotechnical/Geological Investigation	***Primary Name:***	
Completion Date:	FEB-1965	***Municipality:***	
Static Water Level:		***Lot:***	
Primary Water Use:	Not Used	***Township:***	
Sec. Water Use:		***Latitude DD:***	43.681425
Total Depth m:	9.1	***Longitude DD:***	-79.282996
Depth Ref:	Ground Surface	***UTM Zone:***	17
Depth Elev:		***Easting:***	638395
Drill Method:	Power auger	***Northing:***	4837923
Orig Ground Elev m:	125	***Location Accuracy:***	
Elev Reliabil Note:		***Accuracy:***	Not Applicable
DEM Ground Elev m:	130		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218445952	***Mat Consistency:***	
Top Depth:	.6	***Material Moisture:***	
Bottom Depth:	2.5	***Material Texture:***	
Material Color:	Brown	***Non Geo Mat Type:***	
Material 1:	Gravel	***Geologic Formation:***	
Material 2:	Sand	***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			

Stratum Description: GRAVEL,SAND. BROWN.

Geology Stratum ID:	218445953	**Mat Consistency:**	Hard
Top Depth:	2.5	**Material Moisture:**	
Bottom Depth:	5.8	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:		**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	

Gsc Material Description:
Stratum Description: SAND. BROWN,HARD.

Geology Stratum ID:	218445954	**Mat Consistency:**	Hard
Top Depth:	5.8	**Material Moisture:**	
Bottom Depth:	9.1	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:		**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	

Gsc Material Description:
Stratum Description: SAND. BROWN,HARD. 00081030001900301LL **Note: Many records provided by the department have a truncated [Stratum Description] field.

Geology Stratum ID:	218445951	**Mat Consistency:**	
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	.6	**Material Texture:**	
Material Color:		**Non Geo Mat Type:**	
Material 1:	Soil	**Geologic Formation:**	
Material 2:		**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	

Gsc Material Description:
Stratum Description: SOIL.

Source

Source Type:	Data Survey	**Source Appl:**	Spatial/Tabular
Source Orig:	Geological Survey of Canada	**Source Iden:**	1
Source Date:	1956-1972	**Scale or Res:**	Varies
Confidence:	H	**Horizontal:**	NAD27
Observatio:		**Verticalda:**	Mean Average Sea Level

Source Name: Urban Geology Automated Information System (UGAIS)
Source Details: File: OSHAWA.txt RecordID: 015810 NTS_Sheet: 30M11C
Confiden 1: Logged by professional. Exact and complete description of material and properties.

Source List

Source Identifier:	1	**Horizontal Datum:**	NAD27
Source Type:	Data Survey	**Vertical Datum:**	Mean Average Sea Level
Source Date:	1956-1972	**Projection Name:**	Universal Transverse Mercator
Scale or Resolution:	Varies		

Source Name: Urban Geology Automated Information System (UGAIS)
Source Originators: Geological Survey of Canada

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53 | ***1 of 1*** | ***WSW/129.8*** | ***129.8 / 0.00*** | ***SCARBOROUGH HYDRO 17 MEADOW ACRES TRANSFORMER TORONTO CITY ON M1N 1V5*** | ***SPL***

Ref No:	8120	**Municipality No:**	1106
Year:		**Nature of Damage:**	
Incident Dt:	8/16/1988	**Discharger Report:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Dt MOE Arvl on Scn:
MOE Reported Dt: 8/16/1988
Dt Document Closed:
Site No:
Facility Name:
MOE Response:
Site County/District:
Site Geo Ref Meth:
Site District Office:
Nearest Watercourse:
Site Name:
Site Address:
Site Region:
Site Municipality: TORONTO CITY
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:
Easting:
Incident Cause: OTHER CONTAINER LEAK
Incident Event:
Environment Impact:
Nature of Impact:
Contaminant Qty:
System Facility Address:
Client Name:
Client Type:
Call Report Locatn Geodata:
Contaminant Code:
Contaminant Name:
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Receiving Medium: LAND
Receiving Environment:
Incident Reason: EQUIPMENT FAILURE
Incident Summary: SCARBOROUGH UTILITIES - 1 L MINERAL OIL TO LAND
Activity Preceding Spill:
Property 2nd Watershed:
Property Tertiary Watershed:
Sector Type:
SAC Action Class:
Source Type:
Material Group:
Health/Env Conseq:
Agency Involved:

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54 | ***1 of 1*** | ***WSW/139.3*** | ***129.8 / -0.04*** | ***1080 Kingston Road Scarborough ON M1N 1N5*** | ***EHS***

Order No: 20190822024
Status: C
Report Type: Standard Report
Report Date: 27-AUG-19
Date Received: 22-AUG-19
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -79.283132
Y: 43.681414

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55 | ***1 of 3*** | ***WSW/139.4*** | ***129.8 / -0.04*** | ***1080 Kingston Rd Toronto ON M1N1N5*** | ***EHS***

Order No: 20141006053
Status: C
Nearest Intersection:
Municipality:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Report Type:	Custom Report	**Client Prov/State:**	ON
Report Date:	07-OCT-14	**Search Radius (km):**	.25
Date Received:	06-OCT-14	**X:**	-79.283132
Previous Site Name:		**Y:**	43.681414
Lot/Building Size:			
Additional Info Ordered:			

55 **2 of 3** **WSW/139.4** **129.8 / -0.04** **1080 KINGSTON RD, TORONTO ON** **INC**

Incident No:	1322900	**Any Health Impact:**	No
Incident ID:		**Any Enviro Impact:**	No
Instance No:		**Service Interrupted:**	Yes
Status Code:		**Was Prop Damaged:**	No
Attribute Category:	FS-Perform L1 Incident Insp	**Reside App. Type:**	
Context:		**Commer App. Type:**	
Date of Occurrence:	2014/01/21 00:00:00	**Indus App. Type:**	
Time of Occurrence:	22:30:00	**Institut App. Type:**	
Incident Created On:		**Venting Type:**	
Instance Creation Dt:		**Vent Conn Mater:**	
Instance Install Dt:		**Vent Chimney Mater:**	
Occur Insp Start Date:	2014/01/22 00:00:00	**Pipeline Type:**	
Approx Quant Rel:		**Pipeline Involved:**	
Tank Capacity:		**Pipe Material:**	
Fuels Occur Type:	CO Release	**Depth Ground Cover:**	
Fuel Type Involved:	Natural Gas	**Regulator Location:**	
Enforcement Policy:	NULL	**Regulator Type:**	
Prc Escalation Req:	NULL	**Operation Pressure:**	
Tank Material Type:		**Liquid Prop Make:**	
Tank Storage Type:		**Liquid Prop Model:**	
Tank Location Type:		**Liquid Prop Serial No:**	
Pump Flow Rate Cap:		**Liquid Prop Notes:**	
Task No:	4882927	**Equipment Type:**	
Notes:		**Equipment Model:**	
Drainage System:		**Serial No:**	
Sub Surface Contam.:		**Cylinder Capacity:**	
Aff Prop Use Water:		**Cylinder Cap Units:**	
Contam. Migrated:		**Cylinder Mat Type:**	
Contact Natural Env:		**Near Body of Water:**	
Incident Location:	1080 KINGSTON RD, TORONTO - CO RELEASE		
Occurence Narrative:	Boiler not installed properly		
Operation Type Involved:	Multi-unit Residential		
Item:			
Item Description:			
Device Installed Location:			

55 **3 of 3** **WSW/139.4** **129.8 / -0.04** **1080 KINGSTON RD, TORONTO ON** **INC**

Incident No:	1322900	**Any Health Impact:**	Yes
Incident ID:		**Any Enviro Impact:**	No
Instance No:		**Service Interrupted:**	Yes
Status Code:		**Was Prop Damaged:**	No
Attribute Category:	FS-Perform L1 Incident Insp	**Reside App. Type:**	
Context:		**Commer App. Type:**	
Date of Occurrence:	2014/01/21 00:00:00	**Indus App. Type:**	
Time of Occurrence:	22:30:00	**Institut App. Type:**	
Incident Created On:		**Venting Type:**	
Instance Creation Dt:		**Vent Conn Mater:**	
Instance Install Dt:		**Vent Chimney Mater:**	
Occur Insp Start Date:	2014/01/22 00:00:00	**Pipeline Type:**	
Approx Quant Rel:		**Pipeline Involved:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Tank Capacity:		**Pipe Material:**	
Fuels Occur Type:	CO Release	**Depth Ground Cover:**	
Fuel Type Involved:	Natural Gas	**Regulator Location:**	
Enforcement Policy:	NULL	**Regulator Type:**	
Prc Escalation Req:	NULL	**Operation Pressure:**	
Tank Material Type:		**Liquid Prop Make:**	
Tank Storage Type:		**Liquid Prop Model:**	
Tank Location Type:		**Liquid Prop Serial No:**	
Pump Flow Rate Cap:		**Liquid Prop Notes:**	
Task No:	4782360	**Equipment Type:**	
Notes:		**Equipment Model:**	
Drainage System:		**Serial No:**	
Sub Surface Contam.:		**Cylinder Capacity:**	
Aff Prop Use Water:		**Cylinder Cap Units:**	
Contam. Migrated:		**Cylinder Mat Type:**	
Contact Natural Env:		**Near Body of Water:**	
Incident Location:	1080 KINGSTON RD, TORONTO - CO RELEASE		
Occurence Narrative:	CO RELEASE FROM BOILER		
Operation Type Involved:	Multi-unit Residential		
Item:			
Item Description:			
Device Installed Location:			

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56 | ***1 of 1*** | ***ESE/151.7*** | ***129.1 / -0.78*** | ***1 ANNDALE ROAD, TORONTO ON*** | ***PINC***

Incident Id:		**Pipe Material:**	
Incident No:	1705340	**Fuel Category:**	Natural Gas
Incident Reported Dt:		**Health Impact:**	
Type:	FS-Pipeline Incident	**Environment Impact:**	
Status Code:	Pipeline Damage Reason Est	**Property Damage:**	Yes
Tank Status:	RC Established	**Service Interrupt:**	
Task No:	5835733	**Enforce Policy:**	Yes
Spills Action Centre:		**Public Relation:**	
Fuel Type:		**Pipeline System:**	
Fuel Occurrence Tp:		**PSIG:**	
Date of Occurrence:		**Attribute Category:**	FS-Perform P-line Inc Invest
Occurrence Start Dt:	2015/08/21	**Regulator Location:**	
Depth:		**Method Details:**	E-mail
Customer Acct Name:			
Incident Address:			
Operation Type:			
Pipeline Type:			
Regulator Type:			
Summary:	1 ANNDALE ROAD, TORONTO - PIPELINE HIT - 1/2"		
Reported By:	Vince Lobianco - ENBRIDGE		
Affiliation:			
Occurrence Desc:			
Damage Reason:	Notification to one call center made but not sufficient		
Notes:			

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57 | ***1 of 2*** | ***NW/155.2*** | ***128.9 / -0.97*** | ***EDNA SULLIVAN 7 PARKLAND RD SCARBOROUGH M1N 1V6 ON CA ON*** | ***CFOT***

Licence No:		**Item Description:**	Fuel Oil Tank
Registration No:		**Instance Type:**	
Posse File No:		**Facility Type:**	
Posse Reg No:		**Fuel Type:**	
Status Name:		**Distributor:**	
Tank Type:	Single Wall UST	**Letter Sent:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Tank Size:	450	**Comments:**	
Tank Material:	Steel	**Corrosion Protect:**	
Instance No:	40538485	**Province:**	
Inst Creation Date:	1/17/2006	**Nbr:**	
Inst Install Date:	1/17/2006	**Context:**	FS Fuel Oil Tank
Item:	FS FUEL OIL TANK		
Tank Age (as of 05/1992):			
Device Installed Location:	7 PARKLAND RD SCARBOROUGH M1N 1V6 ON CA		
Description:	NULL		
Contact Name:			
Contact Address:			
Contact Address2:			
Contact Suite:			
Contact City:			
Contact Prov:			
Contact Postal:			

57	2 of 2	NW/155.2	128.9 / -0.97	**EDNA SULLIVAN** **7 PARKLAND RD SCARBOROUGH M1N 1V6 ON CA** **ON**	DTNK

Delisted Fuel Storage Tank

Instance No:	40538485	**Creation Date:**	7/5/2009 2:57:14 AM
Status:	Active	**Overfill Prot Type:**	
Instance Type:		**Facility Location:**	7 PARKLAND RD SCARBOROUGH M1N 1V6 ON CA
Fuel Type:		**Piping SW Steel:**	
Cont Name:		**Piping SW Galvan:**	
Capacity:	450	**Tanks SW Steel:**	
Tank Material:	Steel	**Piping Underground:**	
Corrosion Prot:	NULL	**No Underground:**	
Tank Type:	Single Wall UST	**Max Hazard Rank:**	NULL
Install Year:	1985	**Max Hazard Rank 1:**	NULL
Facility Type:	FS FUEL OIL TANK	**Nxt Period Start Dt:**	NULL
Device Installed Loc:		**Program Area 1:**	NULL
Fuel Type 2:		**Program Area 2:**	NULL
Fuel Type 3:		**Nxt Period Strt Dt 2:**	NULL
Item:		**Risk Based Periodic:**	NULL
Item Description:	Fuel Oil Tank	**Vol of Directives:**	NULL
Model:	NULL	**Years in Service:**	5.2
Description:	NULL	**Created Date:**	17-JAN-06
Instance Creation Dt:	1/17/2006	**Federal Device:**	NULL
Instance Install Dt:	1/17/2006	**Periodic Exempt:**	NULL
Manufacturer:	NULL	**Statutory Interval:**	NULL
Serial No:	NULL	**Rcomnd Insp Interval:**	NULL
ULC Standard:	NULL	**Recommended Toler:**	NULL
Quantity:	1	**Panam Venue Name:**	NULL
Unit of Measure:	EA	**External Identifier:**	NULL
Parent Fac Type:			
TSSA Base Sched Cycle 1:	NULL		
TSSA Base Sched Cycle 2:	NULL		
Original Source:	FST		
Record Date:	31-MAY-2021		

58	1 of 1	SW/160.5	130.8 / 1.00	**1085 KINGSTON RD** **SCARBOROUGH ON**	WWIS

Well ID:	7241836	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	

Use 1st:	Monitoring	***Data Entry Status:***	
Use 2nd:		***Data Src:***	
Final Well Status:	Observation Wells	***Date Received:***	05/28/2015
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	Z207896	***Contractor:***	7241
Tag:	A181143	***Form Version:***	7
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	YORK
Elevatn Reliabilty:		***Lot:***	
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map):

Additional Detail(s) (Map)

Well Completed Date:	05/12/2015
Year Completed:	2015
Depth (m):	19.812
Latitude:	43.6808961249029
Longitude:	-79.2830320796955
Path:	

Bore Hole Information

Bore Hole ID:	1005381500	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:		***East83:***	638393.00
Code OB Desc:		***North83:***	4837864.00
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	05/12/2015	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1005624242
Layer:	4
Color:	6
General Color:	BROWN
Mat1:	06
Most Common Material:	SILT
Mat2:	28
Mat2 Desc:	SAND
Mat3:	77
Mat3 Desc:	LOOSE
Formation Top Depth:	20.0

Formation End Depth:	65.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	1005624241
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	06
Most Common Material:	SILT
Mat2:	28
Mat2 Desc:	SAND
Mat3:	77
Mat3 Desc:	LOOSE
Formation Top Depth:	1.5
Formation End Depth:	20.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	1005624239
Layer:	1
Color:	8
General Color:	BLACK
Mat1:	
Most Common Material:	
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	0.5
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	1005624240
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Mat2 Desc:	GRAVEL
Mat3:	77
Mat3 Desc:	LOOSE
Formation Top Depth:	0.5
Formation End Depth:	1.5
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1005624250
Layer:	2
Plug From:	0.5
Plug To:	54.0
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1005624251
Layer:	3
Plug From:	54.0
Plug To:	65.0
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1005624249
Layer:	1
Plug From:	0.0
Plug To:	0.5
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	1005624248
Method Construction Code:	D
Method Construction:	Direct Push
Other Method Construction:	

Pipe Information

Pipe ID:	1005624238
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1005624245
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0.0
Depth To:	55.0
Casing Diameter:	2.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Screen

Screen ID:	1005624246
Layer:	1
Slot:	10
Screen Top Depth:	55.0
Screen End Depth:	65.0
Screen Material:	5
Screen Depth UOM:	ft
Screen Diameter UOM:	inch
Screen Diameter:	2.25

Water Details

Water ID: 1005624244
Layer:
Kind Code:
Kind:
Water Found Depth:
Water Found Depth UOM: ft

Hole Diameter

Hole ID: 1005624243
Diameter:
Depth From: 0.0
Depth To: 65.0
Hole Depth UOM: ft
Hole Diameter UOM: inch

Links

Bore Hole ID: 1005381500
Depth M: 19.812
Year Completed: 2015
Well Completed Dt: 05/12/2015
Audit No: Z207896
Path: 724\7241836.pdf
Tag No: A181143
Contractor: 7241
Latitude: 43.6808961249029
Longitude: -79.2830320796955
Y: 43.680896122294165
X: -79.28303192904727

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59 | ***1 of 2*** | ***SSE/165.5*** | ***129.8 / 0.00*** | ***171 Courcelette Rd Toronto ON*** | ***SPL***

Ref No: 1482-AK4RPD
Year:
Incident Dt: 3/3/2017
Dt MOE Arvl on Scn:
MOE Reported Dt: 3/3/2017
Dt Document Closed:
Site No:
Facility Name:
MOE Response:
Site County/District:
Site Geo Ref Meth:
Site District Office: Toronto - District
Nearest Watercourse:
Site Name: Line Strike<UNOFFICIAL>
Site Address: 171 Courcelette Rd
Site Region: Central
Site Municipality: Toronto
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:
Easting:
Incident Cause:
Incident Event: Leak/Break
Environment Impact:
Nature of Impact:
Contaminant Qty: 0 other - see incident description
System Facility Address:
Client Name:
Client Type:
Call Report Locatn Geodata:
Contaminant Code: 35
Contaminant Name: NATURAL GAS (METHANE)
Contaminant Limit 1:
Municipality No:
Nature of Damage:
Discharger Report:
Material Group:
Health/Env Conseq: 2 - Minor Environment
Agency Involved:

Contam Limit Freq 1:	
Contaminant UN No 1:	1075
Receiving Medium:	
Receiving Environment:	Air
Incident Reason:	Operator/Human Error
Incident Summary:	TSSA FSB; 1/2" Plastic IP Line Strike; Made Safe
Activity Preceding Spill:	
Property 2nd Watershed:	
Property Tertiary Watershed:	
Sector Type:	Unknown / N/A
SAC Action Class:	
Source Type:	Pipeline/Components

---

59 | ***2 of 2*** | ***SSE/165.5*** | ***129.8 / 0.00*** | ***PIPELINE HIT 1/2"***
171 COURCELETTE RD,,TORONTO,ON,M1N 2T1, CA
ON | ***PINC***

Incident Id:		**Pipe Material:**	
Incident No:	2039056	**Fuel Category:**	
Incident Reported Dt:	3/9/2017	**Health Impact:**	
Type:	FS-Pipeline Incident	**Environment Impact:**	
Status Code:		**Property Damage:**	
Tank Status:	Pipeline Damage Reason Est	**Service Interrupt:**	
Task No:		**Enforce Policy:**	
Spills Action Centre:		**Public Relation:**	
Fuel Type:		**Pipeline System:**	
Fuel Occurrence Tp:		**PSIG:**	
Date of Occurrence:		**Attribute Category:**	
Occurrence Start Dt:		**Regulator Location:**	
Depth:		**Method Details:**	
Customer Acct Name:	PIPELINE HIT 1/2"		
Incident Address:	171 COURCELETTE RD,,TORONTO,ON,M1N 2T1,CA		
Operation Type:			
Pipeline Type:			
Regulator Type:			
Summary:			
Reported By:			
Affiliation:			
Occurrence Desc:			
Damage Reason:			
Notes:			

---

60 | ***1 of 1*** | ***SSE/172.8*** | ***129.8 / 0.00*** | ***169 Courcelette Road, Toronto***
ON | ***INC***

Incident No:	666756	**Any Health Impact:**	No
Incident ID:	2823576	**Any Enviro Impact:**	No
Instance No:		**Service Interrupted:**	Yes
Status Code:	Causal Analysis Complete	**Was Prop Damaged:**	No
Attribute Category:	FS-Perform L1 Incident Insp	**Reside App. Type:**	
Context:		**Commer App. Type:**	
Date of Occurrence:	2011/10/03 00:00:00	**Indus App. Type:**	
Time of Occurrence:	15:27:00	**Institut App. Type:**	
Incident Created On:		**Venting Type:**	
Instance Creation Dt:		**Vent Conn Mater:**	
Instance Install Dt:		**Vent Chimney Mater:**	
Occur Insp Start Date:	2011/10/03 00:00:00	**Pipeline Type:**	
Approx Quant Rel:		**Pipeline Involved:**	
Tank Capacity:		**Pipe Material:**	
Fuels Occur Type:	Vapour Release	**Depth Ground Cover:**	
Fuel Type Involved:	Natural Gas	**Regulator Location:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Enforcement Policy:	NULL	**Regulator Type:**	
Prc Escalation Req:	NULL	**Operation Pressure:**	
Tank Material Type:		**Liquid Prop Make:**	
Tank Storage Type:		**Liquid Prop Model:**	
Tank Location Type:		**Liquid Prop Serial No:**	
Pump Flow Rate Cap:		**Liquid Prop Notes:**	
Task No:	3497780	**Equipment Type:**	
Notes:		**Equipment Model:**	
Drainage System:		**Serial No:**	
Sub Surface Contam.:		**Cylinder Capacity:**	
Aff Prop Use Water:		**Cylinder Cap Units:**	
Contam. Migrated:		**Cylinder Mat Type:**	
Contact Natural Env:		**Near Body of Water:**	
Incident Location:	169 Courcelette Road, Toronto - Vapour Release		
Occurence Narrative:	LEAK LEFT ON MANUAL SHUT OFF TO WATER HEATER		
Operation Type Involved:	Private Dwelling		
Item:			
Item Description:			
Device Installed Location:			

61	1 of 1	SW/177.9	130.2 / 0.33	1085-1089 Kingston Road Scarborough ON M4E 3S2	EHS

Order No:	20150414022	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Standard Report	**Client Prov/State:**	ON
Report Date:	20-APR-15	**Search Radius (km):**	.25
Date Received:	14-APR-15	**X:**	-79.282754
Previous Site Name:		**Y:**	43.680499
Lot/Building Size:			
Additional Info Ordered:			

62	1 of 1	NW/182.8	130.0 / 0.12	291 BLANTYRE AVENUE TORONTO ON M1N 2S2	HINC

External File Num:	FS INC 0711-07124
Fuel Occurrence Type:	CO Release
Date of Occurrence:	11/23/2007
Fuel Type Involved:	Natural Gas
Status Desc:	Completed - No Action Required
Job Type Desc:	Incident/Near-Miss Occurrence (FS)
Oper. Type Involved:	Private Dwelling
Service Interruptions:	No
Property Damage:	No
Fuel Life Cycle Stage:	Utilization
Root Cause:	Root Cause: Equipment/Material/Component:No Procedures:No Maintenance:Yes Design:No Training:No Management:No Human Factors:No
Reported Details:	
Fuel Category:	Gaseous Fuel
Occurrence Type:	Near-miss
Affiliation:	Emergency Services (Fire, Police,etc)
County Name:	Toronto
Approx. Quant. Rel:	
Nearby body of water:	
Enter Drainage Syst.:	
Approx. Quant. Unit:	
Environmental Impact:	

63	1 of 2	WNW/182.8	129.8 / -0.01	Enbridge Gas Distribution Inc. 56 Winston Ave (Vic Park and Kingston)	SPL

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Toronto ON M1N 1W3

Ref No: 0838-8XFQZM
Year:
Incident Dt: 23-AUG-12
Dt MOE Arvl on Scn:
MOE Reported Dt: 23-AUG-12
Dt Document Closed:
Site No:
Facility Name:
MOE Response: Referral to others
Site County/District:
Site Geo Ref Meth:
Site District Office:
Nearest Watercourse:
Site Name: tssa<UNOFFICIAL>
Site Address: 56 Winston Ave (Vic Park and Kingston)
Site Region:
Site Municipality: Toronto
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:
Easting:
Incident Cause: Other Discharges
Incident Event:
Environment Impact: Not Anticipated
Nature of Impact: Human Health/Safety
Contaminant Qty: other - see incident description
System Facility Address:
Client Name: Enbridge Gas Distribution Inc.
Client Type:
Call Report Locatn Geodata:
Contaminant Code: 35
Contaminant Name: METHANE GAS, COMPRESSED (NATURAL GAS)
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Receiving Medium:
Receiving Environment:
Incident Reason: Spill
Incident Summary: TSSA: line strike 1/2" 56 Winston
Activity Preceding Spill:
Property 2nd Watershed:
Property Tertiary Watershed:
Sector Type: Other
SAC Action Class: Air Spills - Gases and Vapours
Source Type:

63	2 of 2	WNW/182.8	129.8 / -0.01	56 Winston Avenue, Toronto ON	PINC

Incident Id:
Incident No: 862950
Incident Reported Dt:
Type: FS-Pipeline Incident
Status Code: Pipeline Damage Reason Est
Tank Status: RC Established
Task No: 3999466
Spills Action Centre:
Fuel Type:
Fuel Occurrence Tp:
Pipe Material:
Fuel Category: Natural Gas
Health Impact:
Environment Impact:
Property Damage: Yes
Service Interrupt:
Enforce Policy: Yes
Public Relation:
Pipeline System:
PSIG:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Date of Occurrence:		**Attribute Category:**	FS-Perform P-line Inc Invest
Occurrence Start Dt:	2012/08/22	**Regulator Location:**	
Depth:		**Method Details:**	E-mail
Customer Acct Name:			
Incident Address:			
Operation Type:			
Pipeline Type:			
Regulator Type:			
Summary:	56 Winston Avenue, Toronto - 1/2" Pipeline Hit		
Reported By:	Terry Mcdonnell - Enbridge		
Affiliation:			
Occurrence Desc:			
Damage Reason:	Excavation practices not sufficient		
Notes:			

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64 | **1 of 1** | **E/183.7** | **129.8 / 0.00** | **1255 Kingston Road, Toronto ON** | **INC**

Incident No:	766374	**Any Health Impact:**	No
Incident ID:	2923442	**Any Enviro Impact:**	No
Instance No:		**Service Interrupted:**	Yes
Status Code:	Causal Analysis Complete	**Was Prop Damaged:**	No
Attribute Category:	FS-Perform L1 Incident Insp	**Reside App. Type:**	Boiler
Context:		**Commer App. Type:**	
Date of Occurrence:	2012/02/27 00:00:00	**Indus App. Type:**	
Time of Occurrence:	NULL	**Institut App. Type:**	
Incident Created On:		**Venting Type:**	Natural Draft
Instance Creation Dt:		**Vent Conn Mater:**	C Vent (e.g., Single Wall Vent)
Instance Install Dt:		**Vent Chimney Mater:**	Liner - Aluminum
Occur Insp Start Date:	2012/02/28 00:00:00	**Pipeline Type:**	
Approx Quant Rel:		**Pipeline Involved:**	
Tank Capacity:		**Pipe Material:**	
Fuels Occur Type:	CO Release	**Depth Ground Cover:**	
Fuel Type Involved:	Natural Gas	**Regulator Location:**	
Enforcement Policy:	NULL	**Regulator Type:**	
Prc Escalation Req:	NULL	**Operation Pressure:**	
Tank Material Type:		**Liquid Prop Make:**	
Tank Storage Type:		**Liquid Prop Model:**	
Tank Location Type:		**Liquid Prop Serial No:**	
Pump Flow Rate Cap:		**Liquid Prop Notes:**	
Task No:	3741075	**Equipment Type:**	
Notes:		**Equipment Model:**	CB100C
Drainage System:		**Serial No:**	485M1006
Sub Surface Contam.:		**Cylinder Capacity:**	
Aff Prop Use Water:		**Cylinder Cap Units:**	
Contam. Migrated:		**Cylinder Mat Type:**	
Contact Natural Env:		**Near Body of Water:**	
Incident Location:	1255 Kingston Road, Toronto - CO Release		
Occurence Narrative:	CO release from natural draft boiler recently serviced		
Operation Type Involved:	Private Dwelling		
Item:			
Item Description:			
Device Installed Location:			

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65 | **1 of 2** | **SW/185.4** | **130.9 / 1.02** | **BIKENERGY LTD.**
1066 KINGSTON RD.
SCARBOROUGH ON M1N 1N4 | **GEN**

Generator No:	ON0826700
SIC Code:	3931
SIC Description:	SPORTING GOODS IND.
Approval Years:	86,87,88,89,90

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 213
Waste Class Name: PETROLEUM DISTILLATES

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65 **2 of 2** **SW/185.4** **130.9 / 1.02** **BIKENERGY LTD. 05-190**
1066 KINGSTON RD.
SCARBOROUGH ON M1N 1N4 **GEN**

Generator No: ON0826700
SIC Code: 3931
SIC Description: SPORTING GOODS IND.
Approval Years: 92,93,94,95,96,97,98
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 213
Waste Class Name: PETROLEUM DISTILLATES

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66 **1 of 1** **ESE/188.7** **128.8 / -1.04** **PIPELINE HIT - 1/2"**
19 ANNDALE RD,,TORONTO,ON,M1N 1C4,CA
ON **PINC**

Incident Id:
Incident No: 1953086
Incident Reported Dt: 10/3/2016
Type: FS-Pipeline Incident
Status Code:
Tank Status: Pipeline Damage Reason Est
Task No:
Spills Action Centre:
Fuel Type:
Fuel Occurrence Tp:
Date of Occurrence:
Occurrence Start Dt:
Depth:
Customer Acct Name: PIPELINE HIT - 1/2"
Incident Address: 19 ANNDALE RD,,TORONTO,ON,M1N 1C4,CA
Operation Type:
Pipeline Type:
Regulator Type:
Summary:
Reported By:
Affiliation:
Occurrence Desc:
Damage Reason:
Pipe Material:
Fuel Category:
Health Impact:
Environment Impact:
Property Damage:
Service Interrupt:
Enforce Policy:
Public Relation:
Pipeline System:
PSIG:
Attribute Category:
Regulator Location:
Method Details:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Notes:					

67	1 of 1	WNW/200.8	129.8 / 0.00	40 Winston Ave Toronto ON M1N 1W3	SPL

Ref No:	4403-885SKN	Municipality No:	
Year:		Nature of Damage:	
Incident Dt:		Discharger Report:	
Dt MOE Arvl on Scn:		Material Group:	
MOE Reported Dt:	8/8/2010	Health/Env Conseq:	
Dt Document Closed:		Agency Involved:	
Site No:			
Facility Name:			
MOE Response:	No Field Response		
Site County/District:			
Site Geo Ref Meth:			
Site District Office:			
Nearest Watercourse:			
Site Name:	1/2 plastic damage<UNOFFICIAL>		
Site Address:			
Site Region:			
Site Municipality:			
Site Lot:			
Site Conc:			
Site Geo Ref Accu:			
Site Map Datum:			
Northing:			
Easting:			
Incident Cause:	Discharge or Emission to Air		
Incident Event:			
Environment Impact:	Not Anticipated		
Nature of Impact:	Air Pollution		
Contaminant Qty:	0 other - see incident description		
System Facility Address:			
Client Name:			
Client Type:			
Call Report Locatn Geodata:			
Contaminant Code:	35		
Contaminant Name:	NATURAL GAS (METHANE)		
Contaminant Limit 1:			
Contam Limit Freq 1:			
Contaminant UN No 1:			
Receiving Medium:			
Receiving Environment:			
Incident Reason:	Negligence (Apparent) - Caused by lack of diligence		
Incident Summary:	Enbridge Gas: Damaged plastic service.		
Activity Preceding Spill:			
Property 2nd Watershed:			
Property Tertiary Watershed:			
Sector Type:	Other		
SAC Action Class:	TSSA - Fuel Safety Branch		
Source Type:			

68	1 of 8	SW/203.6	130.7 / 0.83	659960 ONTARIO INC./HENLEY GARDENS VALU-MART 1089 KINGSTON ROAD SCARBOROUGH ON M1N1N6	PES

Detail Licence No:	23-01-10692-0	Operator Box:	
Licence No:	10692	Operator Class:	
Status:		Operator No:	
Approval Date:		Operator Type:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Report Source:	Legacy Licenses (Excluding TS)	**Oper Area Code:**	416
Licence Type:	Limited Vendor	**Oper Phone No:**	6903091
Licence Type Code:	23	**Operator Ext:**	
Licence Class:	01	**Operator Lot:**	
Licence Control:	0	**Oper Concession:**	
Latitude:		**Operator Region:**	3
Longitude:		**Operator District:**	1
Lot:		**Operator County:**	62
Concession:		**Op Municipality:**	
Region:	3	**Post Office Box:**	
District:	1	**MOE District:**	
County:	62	**SWP Area Name:**	
Trade Name:			
PDF URL:			

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68 | ***2 of 8*** | ***SW/203.6*** | ***130.7 / 0.83*** | ***Sunrise Kids Dental*** ***1089 Kingston Road, Unit 5*** ***Toronto ON M1N4E4*** | ***GEN***

Generator No:	ON5182870
SIC Code:	621210
SIC Description:	OFFICES OF DENTISTS
Approval Years:	2016
PO Box No:	
Country:	Canada
Status:	
Co Admin:	Victoria Oosterveld
Choice of Contact:	CO_OFFICIAL
Phone No Admin:	6473507562 Ext.
Contaminated Facility:	No
MHSW Facility:	No

Detail(s)

Waste Class:	312
Waste Class Name:	PATHOLOGICAL WASTES

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68 | ***3 of 8*** | ***SW/203.6*** | ***130.7 / 0.83*** | ***Sunrise Kids Dental*** ***1089 Kingston Road, Unit 5*** ***Toronto ON M1N4E4*** | ***GEN***

Generator No:	ON5182870
SIC Code:	621210
SIC Description:	OFFICES OF DENTISTS
Approval Years:	2015
PO Box No:	
Country:	Canada
Status:	
Co Admin:	Carolyn Positano
Choice of Contact:	CO_OFFICIAL
Phone No Admin:	6473507562 Ext.
Contaminated Facility:	No
MHSW Facility:	No

Detail(s)

Waste Class:	312
Waste Class Name:	PATHOLOGICAL WASTES

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68 | ***4 of 8*** | ***SW/203.6*** | ***130.7 / 0.83*** | ***Sunrise Kids Dental*** ***1089 Kingston Road, Unit 5*** | ***GEN***

Toronto ON M1N4E4

Generator No: ON5182870
SIC Code:
SIC Description:
Approval Years: As of Dec 2018
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312 P
Waste Class Name: Pathological wastes

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68 **5 of 8** **SW/203.6** **130.7 / 0.83** **659960 ONTARIO INC./HENLEY GARDENS VALU-MART**
1089 KINGSTON ROAD
SCARBOROUGH ON M1N1N6 **PES**

Detail Licence No:
Licence No: 10692
Status:
Approval Date:
Report Source: Legacy Licenses (Excluding TS)
Licence Type: Retail Vendor Class 03
Licence Type Code: 21
Licence Class: 03
Licence Control:
Latitude:
Longitude:
Lot:
Concession:
Region:
District:
County:
Trade Name:
PDF URL:

Operator Box:
Operator Class:
Operator No:
Operator Type:
Oper Area Code: 416
Oper Phone No: 6903091
Operator Ext:
Operator Lot:
Oper Concession:
Operator Region:
Operator District:
Operator County:
Op Municipality:
Post Office Box:
MOE District:
SWP Area Name:

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68 **6 of 8** **SW/203.6** **130.7 / 0.83** **Sunrise Kids Dental**
1089 Kingston Road, Unit 5
Toronto ON M1N4E4 **GEN**

Generator No: ON5182870
SIC Code:
SIC Description:
Approval Years: As of Jul 2020
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Detail(s)

Waste Class: 312 P
Waste Class Name: Pathological wastes

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
68	7 of 8	SW/203.6	130.7 / 0.83	Sunrise Kids Dental 1089 Kingston Road, Unit 5 Toronto ON M1N4E4	GEN

Generator No: ON5182870
SIC Code:
SIC Description:
Approval Years: As of Nov 2021
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312 P
Waste Class Name: Pathological wastes

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
68	8 of 8	SW/203.6	130.7 / 0.83	Sunrise Kids Dental 1089 Kingston Road, Unit 5 Toronto ON M1N4E4	GEN

Generator No: ON5182870
SIC Code:
SIC Description:
Approval Years: As of Oct 2022
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312 P
Waste Class Name: PATHOLOGICAL WASTES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
69	1 of 1	E/214.0	128.9 / -0.93	MURGA CONSTRUCTION LTD 27 ANNDALE RD,,TORONTO,ON,M1N 1C4,CA ON	PINC

Incident Id:
Incident No: 1387566
Incident Reported Dt: 5/5/2014
Type: FS-Pipeline Incident
Status Code:
Tank Status: Pipeline Damage Reason Est
Task No:
Spills Action Centre:
Fuel Type:
Pipe Material:
Fuel Category:
Health Impact:
Environment Impact:
Property Damage:
Service Interrupt:
Enforce Policy:
Public Relation:
Pipeline System:

Fuel Occurrence Tp:		**PSIG:**	
Date of Occurrence:		**Attribute Category:**	
Occurrence Start Dt:		**Regulator Location:**	
Depth:		**Method Details:**	
Customer Acct Name:	MURGA CONSTRUCTION LTD		
Incident Address:	27 ANNDALE RD,,TORONTO,ON,M1N 1C4,CA		
Operation Type:			
Pipeline Type:			
Regulator Type:			
Summary:			
Reported By:			
Affiliation:			
Occurrence Desc:			
Damage Reason:			
Notes:			

70 | **1 of 1** | **W/220.9** | **129.8 / 0.00** | **NORTHVIEW AVE. & DANFORTH SCARBOROUGH ON** | **WWIS**

Well ID:	7116163	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Monitoring	**Data Entry Status:**	
Use 2nd:		**Data Src:**	
Final Well Status:	0	**Date Received:**	12/02/2008
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	M01537	**Contractor:**	7241
Tag:	A072933	**Form Version:**	5
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map):

Additional Detail(s) (Map)

Well Completed Date:	05/22/2008
Year Completed:	2008
Depth (m):	5.79
Latitude:	43.6833289762064
Longitude:	-79.2843522368144
Path:	

Bore Hole Information

Bore Hole ID:	1001908253	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638281.00
Code OB Desc:		**North83:**	4838132.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	3
Date Completed:	05/22/2008	**UTMRC Desc:**	margin of error : 10 - 30 m
Remarks:		**Location Method:**	wwr

Loc Method Desc:	on Water Well Record
Elevrc Desc:	
Location Source Date:	
Improvement Location Source:	
Improvement Location Method:	
Source Revision Comment:	
Supplier Comment:	

Overburden and Bedrock Materials Interval

Formation ID:	1002786822
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Mat2 Desc:	GRAVEL
Mat3:	73
Mat3 Desc:	HARD
Formation Top Depth:	0.0
Formation End Depth:	2.440000057220459
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1002786823
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	73
Mat3 Desc:	HARD
Formation Top Depth:	2.440000057220459
Formation End Depth:	3.6600000858306885
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1002786824
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	66
Mat3 Desc:	DENSE
Formation Top Depth:	3.6600000858306885
Formation End Depth:	5.789999961853027
Formation End Depth UOM:	m

Method of Construction & Well Use

Method Construction ID: 1002786828
Method Construction Code: 9
Method Construction: Driving
Other Method Construction:

Pipe Information

Pipe ID: 1002786821
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002786825
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0.0
Depth To: 2.740000009536743
Casing Diameter: 4.03000020980835
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002786826
Layer: 1
Slot: 10
Screen Top Depth: 2.740000009536743
Screen End Depth: 5.789999961853027
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 4.820000171661377

Links

Bore Hole ID: 1001908253
Depth M: 5.79
Year Completed: 2008
Well Completed Dt: 05/22/2008
Audit No: M01537
Path:
Tag No: A072933
Contractor: 7241
Latitude: 43.6833289762064
Longitude: -79.2843522368144
Y: 43.683328973049484
X: -79.28435208626557

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71 | **1 of 1** | **SW/222.1** | **129.7 / -0.11** | **1085-1089 KINGSTON RD SCARBOROUGH ON** | **WWIS**

Well ID: 7241837
Construction Date:
Use 1st: Monitoring and Test Hole
Use 2nd: 0
Final Well Status: Observation Wells
Water Type:
Casing Material:
Audit No: Z208753
Tag: A181135
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src:
Date Received: 05/28/2015
Selected Flag: TRUE
Abandonment Rec:
Contractor: 7241
Form Version: 7
Owner:
County: YORK
Lot:
Concession:
Concession Name:

Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: SCARBOROUGH BOROUGH
Site Info:

PDF URL (Map):

Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Additional Detail(s) (Map)

Well Completed Date: 05/13/2015
Year Completed: 2015
Depth (m): 20.4216
Latitude: 43.6807276749029
Longitude: -79.2838060725717
Path:

Bore Hole Information

Bore Hole ID: 1005381503
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 05/13/2015
Remarks:
Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 17
East83: 638331.00
North83: 4837844.00
Org CS: UTM83
UTMRC: 4
UTMRC Desc: margin of error : 30 m - 100 m
Location Method: wwr

Overburden and Bedrock Materials Interval

Formation ID: 1005624278
Layer: 2
Color: 6
General Color: BROWN
Mat1: 08
Most Common Material: FINE SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 15.0
Formation End Depth: 60.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 1005624279
Layer: 3
Color: 6
General Color: BROWN
Mat1: 10

Most Common Material:	COARSE SAND
Mat2:	
Mat2 Desc:	
Mat3:	91
Mat3 Desc:	WATER-BEARING
Formation Top Depth:	60.0
Formation End Depth:	67.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	1005624277
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	29
Most Common Material:	FINE GRAVEL
Mat2:	08
Mat2 Desc:	FINE SAND
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	15.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1005624287
Layer:	1
Plug From:	0.0
Plug To:	1.0
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1005624288
Layer:	2
Plug From:	1.0
Plug To:	55.0
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1005624289
Layer:	3
Plug From:	55.0
Plug To:	67.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	1005624286
Method Construction Code:	2
Method Construction:	Rotary (Convent.)
Other Method Construction:	DIRECT PUSH

Pipe Information

Pipe ID:	1005624276
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1005624282
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0.0
Depth To:	57.0
Casing Diameter:	2.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Screen

Screen ID:	1005624283
Layer:	1
Slot:	10
Screen Top Depth:	57.0
Screen End Depth:	67.0
Screen Material:	5
Screen Depth UOM:	ft
Screen Diameter UOM:	inch
Screen Diameter:	2.25

Water Details

Water ID:	1005624281
Layer:	
Kind Code:	
Kind:	
Water Found Depth:	
Water Found Depth UOM:	ft

Hole Diameter

Hole ID:	1005624280
Diameter:	8.0
Depth From:	0.0
Depth To:	67.0
Hole Depth UOM:	ft
Hole Diameter UOM:	inch

Links

Bore Hole ID:	1005381503	***Tag No:***	A181135
Depth M:	20.4216	***Contractor:***	7241
Year Completed:	2015	***Latitude:***	43.6807276749029
Well Completed Dt:	05/13/2015	***Longitude:***	-79.2838060725717
Audit No:	Z208753	***Y:***	43.68072767197818
Path:	724\7241837.pdf	***X:***	-79.28380592265363

72	***1 of 3***	***SE/225.8***	***125.8 / -4.00***	***Mrs. Galina Ozols*** ***3 Lynndale Rd, Scarborough, ON*** ***ON M1N 1B9***	***DTNK***

Delisted Commercial Fuel Oil Tanks

Licence No:	689612	***Facility Type:***	
Registration No:	200204-0316	***Fuel Type:***	
Posse File No:	FS OIL 2005-00347	***Corrosion Protection:***	
Posse Reg No:	4460	***NBR:***	
Instance No:		***Contact Name:***	
Status Name:		***Contact Address:***	3 Lynndale Rd, Scarborough, ON
Tank Type:		***Contact Address2:***	
Tank Size:	2200 L	***Contact Suite:***	
Tank Material:		***Contact City:***	Scarborough
Tk Age(as of 05/1992):		***Contact Prov:***	ON
Tank Address:	3 Lynndale Rd, Scarborough, ON	***Contact Postal:***	M1N 1B9
Instance Type:		***Province:***	
Instance Creation Dt:		***Letter Sent:***	
Instance Install Dt:		***Context:***	
Item:		***Distributor:***	Esso Home Comfort - Imperial Oil
Item Desc:		***Comments:***	Tank Removed
Device Instld Loc:			
Description:			
Original Source:	CFOT		
Record Date:	Up to Apr 2013		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
72	2 of 3	SE/225.8	125.8 / -4.00	***GALINA OZOLS*** ***3 LYNNDALE RD SCARBOROUGH M1N 1B9 ON CA*** ***ON***	***CFOT***

Licence No:		***Item Description:***	Fuel Oil Tank
Registration No:		***Instance Type:***	
Posse File No:		***Facility Type:***	
Posse Reg No:		***Fuel Type:***	
Status Name:		***Distributor:***	
Tank Type:	Single Wall UST	***Letter Sent:***	
Tank Size:	2200	***Comments:***	
Tank Material:	NULL	***Corrosion Protect:***	
Instance No:	39321649	***Province:***	
Inst Creation Date:	3/31/2002	***Nbr:***	
Inst Install Date:	3/31/2002	***Context:***	FS Fuel Oil Tank
Item:	FS FUEL OIL TANK		
Tank Age (as of 05/1992):			
Device Installed Location:	3 LYNNDALE RD SCARBOROUGH M1N 1B9 ON CA		
Description:	NULL		
Contact Name:			
Contact Address:			
Contact Address2:			
Contact Suite:			
Contact City:			
Contact Prov:			
Contact Postal:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
72	3 of 3	SE/225.8	125.8 / -4.00	***GALINA OZOLS*** ***3 LYNNDALE RD SCARBOROUGH M1N 1B9 ON CA*** ***ON***	***DTNK***

Delisted Fuel Storage Tank

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Instance No:	39321649	**Creation Date:**	7/5/2009 2:57:00 AM
Status:	Active	**Overfill Prot Type:**	
Instance Type:		**Facility Location:**	3 LYNNDALE RD SCARBOROUGH M1N 1B9 ON CA
Fuel Type:		**Piping SW Steel:**	
Cont Name:		**Piping SW Galvan:**	
Capacity:	2200	**Tanks SW Steel:**	
Tank Material:	NULL	**Piping Underground:**	
Corrosion Prot:	NULL	**No Underground:**	
Tank Type:	Single Wall UST	**Max Hazard Rank:**	NULL
Install Year:	NULL	**Max Hazard Rank 1:**	NULL
Facility Type:	FS FUEL OIL TANK	**Nxt Period Start Dt:**	NULL
Device Installed Loc:		**Program Area 1:**	NULL
Fuel Type 2:		**Program Area 2:**	NULL
Fuel Type 3:		**Nxt Period Strt Dt 2:**	NULL
Item:		**Risk Based Periodic:**	NULL
Item Description:	Fuel Oil Tank	**Vol of Directives:**	NULL
Model:	NULL	**Years in Service:**	9
Description:	NULL	**Created Date:**	31-MAR-02
Instance Creation Dt:	3/31/2002	**Federal Device:**	NULL
Instance Install Dt:	3/31/2002	**Periodic Exempt:**	NULL
Manufacturer:	NULL	**Statutory Interval:**	NULL
Serial No:	NULL	**Rcomnd Insp Interval:**	NULL
ULC Standard:	NULL	**Recommended Toler:**	NULL
Quantity:	1	**Panam Venue Name:**	NULL
Unit of Measure:	EA	**External Identifier:**	NULL
Parent Fac Type:			
TSSA Base Sched Cycle 1:	NULL		
TSSA Base Sched Cycle 2:	NULL		
Original Source:	FST		
Record Date:	31-MAY-2021		

73	1 of 1	WSW/228.8	129.8 / 0.00	**CONSUMERS' GAS CO. LTD., THE** **MEADOW AVE, KINGSTON RD/VICTORIA PARK** **NATURAL GAS PIPELINE** **TORONTO CITY ON**	SPL

Ref No:	111452	**Municipality No:**	1106
Year:		**Nature of Damage:**	
Incident Dt:	3/29/1995	**Discharger Report:**	
Dt MOE Arvl on Scn:		**Material Group:**	
MOE Reported Dt:	3/29/1995	**Health/Env Conseq:**	
Dt Document Closed:		**Agency Involved:**	F.D., POLICE, WORKS
Site No:			
Facility Name:			
MOE Response:			
Site County/District:			
Site Geo Ref Meth:			
Site District Office:			
Nearest Watercourse:			
Site Name:			
Site Address:			
Site Region:			
Site Municipality:	TORONTO CITY		
Site Lot:			
Site Conc:			
Site Geo Ref Accu:			
Site Map Datum:			
Northing:			
Easting:			
Incident Cause:	PIPE/HOSE LEAK		
Incident Event:			
Environment Impact:	POSSIBLE		
Nature of Impact:	Air Pollution		
Contaminant Qty:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

System Facility Address:
Client Name:
Client Type:
Call Report Locatn Geodata:
Contaminant Code:
Contaminant Name:
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Receiving Medium: AIR
Receiving Environment:
Incident Reason: ERROR
Incident Summary: CONSUMERS GAS: NATURAL GAS TO ATM FROM DAMAGED PIPELINE, SOME EVACUATION
Activity Preceding Spill:
Property 2nd Watershed:
Property Tertiary Watershed:
Sector Type:
SAC Action Class:
Source Type:

74	1 of 1	WSW/229.2	129.8 / 0.00	***Toronto Transit Commission*** ***Meadow Ave and Victoria Park Ave*** ***Toronto ON***	SPL

Ref No: 3687-9H6ME7
Year:
Incident Dt: 2014/03/13
Dt MOE Arvl on Scn: 2014/03/13
MOE Reported Dt: 2014/03/13
Dt Document Closed: 2015/01/06
Site No: NA
Facility Name:
MOE Response: No Field Response
Site County/District:
Site Geo Ref Meth:
Site District Office:
Nearest Watercourse: Great Lakes - St. Lawrence; Lake Ontario; Toronto Region Lake Ontario Tributaries; Don River - East Toronto Beach
Site Name: TTC Bingham Loop<UNOFFICIAL>
Site Address: Meadow Ave and Victoria Park Ave
Site Region:
Site Municipality: Toronto
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:
Easting:
Incident Cause: Leak/Break
Incident Event:
Environment Impact: Not Anticipated
Nature of Impact: Soil Contamination; Surface Water Pollution
Contaminant Qty: 5 L
System Facility Address:
Client Name: Toronto Transit Commission
Client Type:
Call Report Locatn Geodata:
Contaminant Code: 15
Contaminant Name: ENGINE OIL
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Receiving Medium:
Receiving Environment:

Municipality No:
Nature of Damage:
Discharger Report:
Material Group:
Health/Env Conseq:
Agency Involved:

Incident Reason:	Unknown / N/A
Incident Summary:	TTC bus leaking oil to ground and c/b
Activity Preceding Spill:	
Property 2nd Watershed:	
Property Tertiary Watershed:	
Sector Type:	Motor Vehicle
SAC Action Class:	Land Spills
Source Type:	

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75 | **1 of 1** | **SE/231.4** | **124.9 / -4.89** | **5 Lynndale Road<UNOFFICIAL>**
Toronto ON M1N 1B9 | **SPL**

Ref No:	2421-77AHB2	**Municipality No:**	
Year:		**Nature of Damage:**	
Incident Dt:		**Discharger Report:**	
Dt MOE Arvl on Scn:		**Material Group:**	Oil
MOE Reported Dt:	9/22/2007	**Health/Env Conseq:**	
Dt Document Closed:		**Agency Involved:**	
Site No:			
Facility Name:			
MOE Response:	No Field Response		
Site County/District:			
Site Geo Ref Meth:			
Site District Office:			
Nearest Watercourse:			
Site Name:	5 Lynndale Road<UNOFFICIAL>		
Site Address:			
Site Region:			
Site Municipality:	Toronto		
Site Lot:			
Site Conc:			
Site Geo Ref Accu:			
Site Map Datum:			
Northing:			
Easting:			
Incident Cause:	Other Discharges		
Incident Event:			
Environment Impact:	Confirmed		
Nature of Impact:	Soil Contamination; Surface Water Pollution		
Contaminant Qty:	Unknown Unknown		
System Facility Address:			
Client Name:			
Client Type:			
Call Report Locatn Geodata:			
Contaminant Code:	15		
Contaminant Name:	PETROLEUM OIL (N.O.S.)		
Contaminant Limit 1:			
Contam Limit Freq 1:			
Contaminant UN No 1:			
Receiving Medium:	Land & Water		
Receiving Environment:			
Incident Reason:	Unknown - Reason not determined		
Incident Summary:	Lynndale Road: Oil spill to ground and sewer		
Activity Preceding Spill:			
Property 2nd Watershed:			
Property Tertiary Watershed:			
Sector Type:	Other		
SAC Action Class:			
Source Type:			

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76 | **1 of 1** | **WSW/234.1** | **129.8 / 0.00** | **P.U.C. SCARBOROUGH - LOT 35, CONC. A**
VICTORIA PARK AVE./KINGSTON RD | **CA**

SCARBOROUGH CITY ON

Certificate #: 7-0664-92-
Application Year: 92
Issue Date: 7/9/1992
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

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77 ***1 of 1*** ***W/236.7*** ***129.8 / 0.00*** ***4 NORTHVIEW AVE. SCARBOROUGH ON*** ***WWIS***

Well ID: 7101723
Construction Date:
Use 1st: Test Hole
Use 2nd:
Final Well Status: Test Hole
Water Type:
Casing Material:
Audit No: Z75132
Tag: A055958
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: SCARBOROUGH BOROUGH
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src:
Date Received: 02/06/2008
Selected Flag: TRUE
Abandonment Rec:
Contractor: 7241
Form Version: 4
Owner:
County: YORK
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/710\7101723.pdf

Additional Detail(s) (Map)

Well Completed Date: 01/22/2008
Year Completed: 2008
Depth (m): 6.1
Latitude: 43.6832158862446
Longitude: -79.2846160026908
Path: 710\7101723.pdf

Bore Hole Information

Bore Hole ID: 1001492367
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 01/22/2008
Remarks:

Elevation:
Elevrc:
Zone: 17
East83: 638260.00
North83: 4838119.00
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 1001545124
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 0.0
Formation End Depth: 2.440000057220459
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1001545125
Layer: 2
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 2.440000057220459
Formation End Depth: 6.099999904632568
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1001545128
Layer: 2
Plug From: 1.2200000286102295
Plug To: 6.099999904632568
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1001545127
Layer: 1
Plug From: 0.0
Plug To: 1.2200000286102295
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID: 1001545133
Method Construction Code: B
Method Construction: Other Method
Other Method Construction: DIRECT PUSH

Pipe Information

Pipe ID: 1001545122
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1001545130
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 1.5
Casing Diameter: 3.809999942779541
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1001545131
Layer:
Slot:
Screen Top Depth:
Screen End Depth:
Screen Material: 5
Screen Depth UOM:
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pumping Test Method Desc:
Pump Test ID: 1001545123
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM: m
Rate UOM: LPM
Water State After Test Code: 0
Water State After Test:
Pumping Test Method: 0
Pumping Duration HR:
Pumping Duration MIN:
Flowing: No

Water Details

Water ID: 1001545129
Layer: 1
Kind Code:

Kind:
Water Found Depth:
Water Found Depth UOM: m

Hole Diameter

Hole ID: 1001545126
Diameter: 8.8100004196167
Depth From:
Depth To: 6.099999904632568
Hole Depth UOM: m
Hole Diameter UOM: cm

Links

Bore Hole ID: 1001492367
Depth M: 6.1
Year Completed: 2008
Well Completed Dt: 01/22/2008
Audit No: Z75132
Path: 710\7101723.pdf
Tag No: A055958
Contractor: 7241
Latitude: 43.6832158862446
Longitude: -79.2846160026908
Y: 43.683215882931215
X: -79.28461585221996

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78 | **1 of 1** | **W/237.3** | **129.8 / 0.00** | **4 NORTHVIEW AVE. SCARBOROUGH ON** | **WWIS**

Well ID: 7101798
Construction Date:
Use 1st: Monitoring and Test Hole
Use 2nd: 0
Final Well Status: Monitoring and Test Hole
Water Type:
Casing Material:
Audit No: Z75131
Tag: A055960
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: SCARBOROUGH BOROUGH
Site Info:
Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src:
Date Received: 02/06/2008
Selected Flag: TRUE
Abandonment Rec:
Contractor: 7241
Form Version: 4
Owner:
County: YORK
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

PDF URL (Map):

Additional Detail(s) (Map)

Well Completed Date: 01/22/2008
Year Completed: 2008
Depth (m): 6.1
Latitude: 43.6832070724332
Longitude: -79.2846286606656
Path:

Bore Hole Information

Bore Hole ID: 1001494294
DP2BR:
Spatial Status:
Elevation:
Elevrc:
Zone: 17

Code OB:		***East83:***	638259.00
Code OB Desc:		***North83:***	4838118.00
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	3
Date Completed:	01/22/2008	***UTMRC Desc:***	margin of error : 10 - 30 m
Remarks:		***Location Method:***	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1001532784
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	85
Mat3 Desc:	SOFT
Formation Top Depth:	0.0
Formation End Depth:	2.440000057220459
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1001532785
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	85
Mat3 Desc:	SOFT
Formation Top Depth:	2.440000057220459
Formation End Depth:	6.099999904632568
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001532787
Layer:	1
Plug From:	0.0
Plug To:	1.2200000286102295
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001532788
Layer:	2

Plug From: 1.2200000286102295
Plug To: 6.099999904632568
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID: 1001532794
Method Construction Code: B
Method Construction: Other Method
Other Method Construction: DIRECT PUSH

Pipe Information

Pipe ID: 1001532782
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1001532790
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 1.5
Casing Diameter: 3.809999942779541
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1001532791
Layer:
Slot:
Screen Top Depth:
Screen End Depth:
Screen Material: 5
Screen Depth UOM:
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pumping Test Method Desc:
Pump Test ID: 1001532783
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM: m
Rate UOM: LPM
Water State After Test Code: 0
Water State After Test:
Pumping Test Method: 0
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Water Details

Water ID:	1001532789
Layer:	1
Kind Code:	
Kind:	
Water Found Depth:	
Water Found Depth UOM:	m

Hole Diameter

Hole ID:	1001532786
Diameter:	8.84000015258789
Depth From:	
Depth To:	6.099999904632568
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Links

Bore Hole ID:	1001494294	***Tag No:***	A055960
Depth M:	6.1	***Contractor:***	7241
Year Completed:	2008	***Latitude:***	43.6832070724332
Well Completed Dt:	01/22/2008	***Longitude:***	-79.2846286606656
Audit No:	Z75131	***Y:***	43.683207069346544
Path:		***X:***	-79.28462851037735

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79 | ***1 of 1*** | ***W/237.7*** | ***129.8 / 0.00*** | ***4 NORTHVIEW AVE. SCARBOROUGH ON*** | ***WWIS***

Well ID:	7101721	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Test Hole	***Data Entry Status:***	
Use 2nd:		***Data Src:***	
Final Well Status:	Test Hole	***Date Received:***	02/06/2008
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	Z75130	***Contractor:***	7241
Tag:	A055954	***Form Version:***	4
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	YORK
Elevatn Reliabilty:		***Lot:***	
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/710\7101721.pdf

Additional Detail(s) (Map)

Well Completed Date:	01/22/2008
Year Completed:	2008
Depth (m):	6.1
Latitude:	43.6831534449316
Longitude:	-79.28465500264
Path:	710\7101721.pdf

Bore Hole Information

Bore Hole ID:	1001492361	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:		***East83:***	638257.00
Code OB Desc:		***North83:***	4838112.00
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	3
Date Completed:	01/22/2008	***UTMRC Desc:***	margin of error : 10 - 30 m
Remarks:		***Location Method:***	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1001545098
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	85
Mat3 Desc:	SOFT
Formation Top Depth:	2.440000057220459
Formation End Depth:	6.099999904632568
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1001545097
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	85
Mat3 Desc:	SOFT
Formation Top Depth:	0.0
Formation End Depth:	2.440000057220459
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001545100
Layer:	1
Plug From:	0.0
Plug To:	1.2200000286102295
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001545101
Layer:	2
Plug From:	1.2200000286102295
Plug To:	6.099999904632568
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	1001545106
Method Construction Code:	B
Method Construction:	Other Method
Other Method Construction:	DIRECT PUSH

Pipe Information

Pipe ID:	1001545095
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1001545103
Layer:	
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	
Depth To:	1.5
Casing Diameter:	3.809999942779541
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1001545104
Layer:	
Slot:	
Screen Top Depth:	
Screen End Depth:	
Screen Material:	5
Screen Depth UOM:	
Screen Diameter UOM:	
Screen Diameter:	

Results of Well Yield Testing

Pumping Test Method Desc:	
Pump Test ID:	1001545096
Pump Set At:	
Static Level:	
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	m

Rate UOM:	LPM
Water State After Test Code:	0
Water State After Test:	
Pumping Test Method:	0
Pumping Duration HR:	
Pumping Duration MIN:	
Flowing:	No

Water Details

Water ID:	1001545102
Layer:	1
Kind Code:	
Kind:	
Water Found Depth:	
Water Found Depth UOM:	m

Hole Diameter

Hole ID:	1001545099
Diameter:	8.890000343322754
Depth From:	
Depth To:	6.099999904632568
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Links

Bore Hole ID:	1001492361	**Tag No:**	A055954
Depth M:	6.1	**Contractor:**	7241
Year Completed:	2008	**Latitude:**	43.6831534449316
Well Completed Dt:	01/22/2008	**Longitude:**	-79.28465500264
Audit No:	Z75130	**Y:**	43.683153442028555
Path:	710\7101721.pdf	**X:**	-79.28465485257105

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Well ID:	7101722	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:		**Data Entry Status:**	
Use 2nd:		**Data Src:**	
Final Well Status:	Test Hole	**Date Received:**	02/06/2008
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z75118	**Contractor:**	7241
Tag:	A055955	**Form Version:**	4
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/710\7101722.pdf

Additional Detail(s) (Map)

Well Completed Date: 01/22/2008
Year Completed: 2008
Depth (m): 6.1
Latitude: 43.6831804448376
Longitude: -79.2846542331131
Path: 710\7101722.pdf

Bore Hole Information

Bore Hole ID: 1001492364
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 01/22/2008
Remarks:
Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 17
East83: 638257.00
North83: 4838115.00
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Overburden and Bedrock Materials Interval

Formation ID: 1001545111
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 0.0
Formation End Depth: 2.440000057220459
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1001545112
Layer: 2
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 2.440000057220459
Formation End Depth: 6.099999904632568
Formation End Depth UOM: m

Annular Space/Abandonment

Sealing Record

Plug ID:	1001545114
Layer:	1
Plug From:	0.0
Plug To:	1.2200000286102295
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001545115
Layer:	2
Plug From:	1.2200000286102295
Plug To:	6.099999904632568
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	1001545119
Method Construction Code:	B
Method Construction:	Other Method
Other Method Construction:	DIRECT PUSH

Pipe Information

Pipe ID:	1001545109
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1001545117
Layer:	
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	
Depth To:	1.5
Casing Diameter:	3.809999942779541
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1001545118
Layer:	
Slot:	
Screen Top Depth:	
Screen End Depth:	
Screen Material:	5
Screen Depth UOM:	
Screen Diameter UOM:	
Screen Diameter:	

Results of Well Yield Testing

Pumping Test Method Desc:	
Pump Test ID:	1001545110
Pump Set At:	

Static Level:	
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	m
Rate UOM:	LPM
Water State After Test Code:	0
Water State After Test:	
Pumping Test Method:	0
Pumping Duration HR:	
Pumping Duration MIN:	
Flowing:	No

Water Details

Water ID:	1001545116
Layer:	1
Kind Code:	
Kind:	
Water Found Depth:	
Water Found Depth UOM:	m

Hole Diameter

Hole ID:	1001545113
Diameter:	8.890000343322754
Depth From:	
Depth To:	6.099999904632568
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Links

Bore Hole ID:	1001492364	**Tag No:**	A055955
Depth M:	6.1	**Contractor:**	7241
Year Completed:	2008	**Latitude:**	43.6831804448376
Well Completed Dt:	01/22/2008	**Longitude:**	-79.2846542331131
Audit No:	Z75118	**Y:**	43.683180442139204
Path:	710\7101722.pdf	**X:**	-79.28465408181442

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Well ID:	7101799	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Monitoring and Test Hole	**Data Entry Status:**	
Use 2nd:	0	**Data Src:**	
Final Well Status:	Test Hole	**Date Received:**	02/06/2008
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z75122	**Contractor:**	7241
Tag:	A055965	**Form Version:**	4
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	

Clear/Cloudy:
Municipality: SCARBOROUGH BOROUGH
Site Info:

PDF URL (Map):

Additional Detail(s) (Map)

Well Completed Date: 01/22/2008
Year Completed: 2008
Depth (m): 6.1
Latitude: 43.683135817298
Longitude: -79.2846803185478
Path:

Bore Hole Information

Bore Hole ID: 1001494297
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 01/22/2008
Remarks:
Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

UTM Reliability:
Elevation:
Elevrc:
Zone: 17
East83: 638255.00
North83: 4838110.00
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Overburden and Bedrock Materials Interval

Formation ID: 1001532845
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 85
Mat2 Desc: SOFT
Mat3: 68
Mat3 Desc: DRY
Formation Top Depth: 0.0
Formation End Depth: 2.440000057220459
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1001532846
Layer: 2
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:

Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 2.440000057220459
Formation End Depth: 6.099999904632568
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1001532848
Layer: 1
Plug From: 0.0
Plug To: 1.2200000286102295
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1001532849
Layer: 2
Plug From: 1.2200000286102295
Plug To: 6.099999904632568
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID: 1001532855
Method Construction Code: D
Method Construction: Direct Push
Other Method Construction:

Pipe Information

Pipe ID: 1001532843
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1001532851
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 1.5
Casing Diameter: 3.809999942779541
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1001532852
Layer:
Slot:
Screen Top Depth:
Screen End Depth:
Screen Material: 5
Screen Depth UOM:
Screen Diameter UOM:

Screen Diameter:

Results of Well Yield Testing

Pumping Test Method Desc:
Pump Test ID: 1001532844
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM: m
Rate UOM: LPM
Water State After Test Code: 0
Water State After Test:
Pumping Test Method: 0
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Water Details

Water ID: 1001532850
Layer: 1
Kind Code:
Kind:
Water Found Depth:
Water Found Depth UOM: m

Hole Diameter

Hole ID: 1001532847
Diameter: 8.890000343322754
Depth From:
Depth To: 6.099999904632568
Hole Depth UOM: m
Hole Diameter UOM: cm

Links

Bore Hole ID: 1001494297
Depth M: 6.1
Year Completed: 2008
Well Completed Dt: 01/22/2008
Audit No: Z75122
Path:
Tag No: A055965
Contractor: 7241
Latitude: 43.683135817298
Longitude: -79.2846803185478
Y: 43.683135814189974
X: -79.28468016798755

82	1 of 1	SSE/239.4	129.8 / 0.00	149 Courcelette Rd, Toronto TORONTO ON	SPL

Ref No: 1-2G7SSF
Year:
Incident Dt: 1/11/2023 4:35:00 PM
Dt MOE Arvl on Scn:
MOE Reported Dt: 1/11/2023 7:09:09 PM
Dt Document Closed:
Site No:
Facility Name:
MOE Response: Desktop Response
Site County/District:
Municipality No:
Nature of Damage:
Discharger Report:
Material Group:
Health/Env Conseq: 0 No Impact
Agency Involved:

Site Geo Ref Meth:	
Site District Office:	Toronto District Office
Nearest Watercourse:	
Site Name:	
Site Address:	149 Courcelette Rd, Toronto
Site Region:	
Site Municipality:	TORONTO
Site Lot:	
Site Conc:	
Site Geo Ref Accu:	
Site Map Datum:	
Northing:	
Easting:	
Incident Cause:	
Incident Event:	Line Strike
Environment Impact:	1 Minor Impact
Nature of Impact:	
Contaminant Qty:	0 other - see notes
System Facility Address:	
Client Name:	
Client Type:	
Call Report Locatn Geodata:	{"integration_ids":["PR00002488027"],"wkts":["POINT (-79.2792792000 43.6801896000)"],"creation_date":"2023-01-11"}
Contaminant Code:	
Contaminant Name:	NATURAL GAS
Contaminant Limit 1:	
Contam Limit Freq 1:	
Contaminant UN No 1:	
Receiving Medium:	Air
Receiving Environment:	
Incident Reason:	Human error (Specify)
Incident Summary:	TSSA FSB - Spill - half inch plastic IP service hit by contractor
Activity Preceding Spill:	
Property 2nd Watershed:	029 | Lake Ontario
Property Tertiary Watershed:	029A | West Lake Ontario Shoreline
Sector Type:	NATURAL GAS DISTRIBUTION
SAC Action Class:	
Source Type:	Pipeline/Components

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Well ID:	7101802	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Monitoring and Test Hole	**Data Entry Status:**	
Use 2nd:	0	**Data Src:**	
Final Well Status:	Test Hole	**Date Received:**	02/06/2008
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z75119	**Contractor:**	7241
Tag:	A055964	**Form Version:**	4
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map):

Additional Detail(s) (Map)

Well Completed Date: 01/22/2008
Year Completed: 2008
Depth (m): 6.1
Latitude: 43.6831806309904
Longitude: -79.2846666345675
Path:

Bore Hole Information

Bore Hole ID: 1001494337
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 01/22/2008
Remarks:
Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 17
East83: 638256.00
North83: 4838115.00
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Overburden and Bedrock Materials Interval

Formation ID: 1001532935
Layer: 2
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 2.440000057220459
Formation End Depth: 6.099999904632568
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1001532934
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 85
Mat2 Desc: SOFT
Mat3: 68
Mat3 Desc: DRY
Formation Top Depth: 0.0
Formation End Depth: 2.440000057220459
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID:	1001532937
Layer:	1
Plug From:	0.0
Plug To:	1.2200000286102295
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001532938
Layer:	2
Plug From:	1.5499999523162842
Plug To:	6.099999904632568
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	1001532944
Method Construction Code:	D
Method Construction:	Direct Push
Other Method Construction:	

Pipe Information

Pipe ID:	1001532932
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1001532940
Layer:	
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	
Depth To:	1.5
Casing Diameter:	3.809999942779541
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1001532941
Layer:	
Slot:	
Screen Top Depth:	
Screen End Depth:	
Screen Material:	5
Screen Depth UOM:	
Screen Diameter UOM:	
Screen Diameter:	

Results of Well Yield Testing

Pumping Test Method Desc:
Pump Test ID: 1001532933
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM: m
Rate UOM: LPM
Water State After Test Code: 0
Water State After Test:
Pumping Test Method: 0
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Water Details

Water ID: 1001532939
Layer: 1
Kind Code:
Kind:
Water Found Depth:
Water Found Depth UOM: m

Hole Diameter

Hole ID: 1001532936
Diameter: 8.890000343322754
Depth From:
Depth To: 6.099999904632568
Hole Depth UOM: m
Hole Diameter UOM: cm

Links

Bore Hole ID: 1001494337
Depth M: 6.1
Year Completed: 2008
Well Completed Dt: 01/22/2008
Audit No: Z75119
Path:
Tag No: A055964
Contractor: 7241
Latitude: 43.6831806309904
Longitude: -79.2846666345675
Y: 43.68318062793521
X: -79.28466648395126

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84 ***1 of 1*** ***W/239.9*** ***129.8 / 0.00*** ***4 NORTHVIEW AVE. SCARBOROUGH ON*** ***WWIS***

Well ID: 7101801
Construction Date:
Use 1st: Monitoring and Test Hole
Use 2nd: 0
Final Well Status: Test Hole
Water Type:
Casing Material:
Audit No: Z75120
Tag: A055963
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src:
Date Received: 02/06/2008
Selected Flag: TRUE
Abandonment Rec:
Contractor: 7241
Form Version: 4
Owner:
County: YORK
Lot:
Concession:
Concession Name:

Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/710\7101801.pdf

Additional Detail(s) (Map)

Well Completed Date:	01/22/2008
Year Completed:	2008
Depth (m):	6.1
Latitude:	43.6831628172044
Longitude:	-79.2846795490327
Path:	710\7101801.pdf

Bore Hole Information

Bore Hole ID:	1001494319	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638255.00
Code OB Desc:		**North83:**	4838113.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	3
Date Completed:	01/22/2008	**UTMRC Desc:**	margin of error : 10 - 30 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1001532875
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	85
Mat2 Desc:	SOFT
Mat3:	68
Mat3 Desc:	DRY
Formation Top Depth:	0.0
Formation End Depth:	2.440000057220459
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1001532876
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28

Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 2.440000057220459
Formation End Depth: 6.099999904632568
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1001532879
Layer: 2
Plug From: 1.2200000286102295
Plug To: 6.099999904632568
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 1001532878
Layer: 1
Plug From: 0.0
Plug To: 1.2200000286102295
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID: 1001532885
Method Construction Code: D
Method Construction: Direct Push
Other Method Construction:

Pipe Information

Pipe ID: 1001532873
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1001532881
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 1.5
Casing Diameter: 3.809999942779541
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1001532882
Layer:
Slot:
Screen Top Depth:
Screen End Depth:

Screen Material: 5
Screen Depth UOM:
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pumping Test Method Desc:
Pump Test ID: 1001532874
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM: m
Rate UOM: LPM
Water State After Test Code: 0
Water State After Test:
Pumping Test Method: 0
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Water Details

Water ID: 1001532880
Layer: 1
Kind Code:
Kind:
Water Found Depth:
Water Found Depth UOM: m

Hole Diameter

Hole ID: 1001532877
Diameter: 8.8100004196167
Depth From:
Depth To: 6.099999904632568
Hole Depth UOM: m
Hole Diameter UOM: cm

Links

Bore Hole ID: 1001494319
Depth M: 6.1
Year Completed: 2008
Well Completed Dt: 01/22/2008
Audit No: Z75120
Path: 710\7101801.pdf
Tag No: A055963
Contractor: 7241
Latitude: 43.6831628172044
Longitude: -79.2846795490327
Y: 43.68316281430856
X: -79.28467939812921

85	1 of 1	W/240.9	129.8 / 0.00	4 NORTHVIEW AVE. SCARBOROUGH ON	WWIS

Well ID: 7101800
Construction Date:
Use 1st: Monitoring and Test Hole
Use 2nd: 0
Final Well Status: Test Hole
Water Type:
Casing Material:
Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src:
Date Received: 02/06/2008
Selected Flag: TRUE
Abandonment Rec:

Audit No:	Z75121	**Contractor:**	7241
Tag:	A055957	**Form Version:**	4
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/710\7101800.pdf

Additional Detail(s) (Map)

Well Completed Date:	01/22/2008
Year Completed:	2008
Depth (m):	6.1
Latitude:	43.6831988170793
Longitude:	-79.284678523011
Path:	710\7101800.pdf

Bore Hole Information

Bore Hole ID:	1001494300	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638255.00
Code OB Desc:		**North83:**	4838117.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	3
Date Completed:	01/22/2008	**UTMRC Desc:**	margin of error : 10 - 30 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1001532861
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	85
Mat3 Desc:	SOFT
Formation Top Depth:	2.440000057220459
Formation End Depth:	6.099999904632568
Formation End Depth UOM:	m

Overburden and Bedrock

Materials Interval

Formation ID:	1001532860
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	68
Mat2 Desc:	DRY
Mat3:	85
Mat3 Desc:	SOFT
Formation Top Depth:	0.0
Formation End Depth:	2.440000057220459
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001532864
Layer:	2
Plug From:	1.2200000286102295
Plug To:	6.099999904632568
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001532863
Layer:	1
Plug From:	0.0
Plug To:	1.2200000286102295
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	1001532870
Method Construction Code:	D
Method Construction:	Direct Push
Other Method Construction:	

Pipe Information

Pipe ID:	1001532858
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1001532866
Layer:	
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	
Depth To:	1.5
Casing Diameter:	3.809999942779541
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1001532867
Layer:	
Slot:	
Screen Top Depth:	
Screen End Depth:	
Screen Material:	5
Screen Depth UOM:	
Screen Diameter UOM:	
Screen Diameter:	

Results of Well Yield Testing

Pumping Test Method Desc:	
Pump Test ID:	1001532859
Pump Set At:	
Static Level:	
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	m
Rate UOM:	LPM
Water State After Test Code:	0
Water State After Test:	
Pumping Test Method:	0
Pumping Duration HR:	
Pumping Duration MIN:	
Flowing:	

Water Details

Water ID:	1001532865
Layer:	1
Kind Code:	
Kind:	
Water Found Depth:	
Water Found Depth UOM:	m

Hole Diameter

Hole ID:	1001532862
Diameter:	8.890000343322754
Depth From:	
Depth To:	6.099999904632568
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Links

Bore Hole ID:	1001494300	***Tag No:***	A055957
Depth M:	6.1	***Contractor:***	7241
Year Completed:	2008	***Latitude:***	43.6831988170793
Well Completed Dt:	01/22/2008	***Longitude:***	-79.284678523011
Audit No:	Z75121	***Y:***	43.683198814447735
Path:	710\7101800.pdf	***X:***	-79.28467837225034

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Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Well ID:	7160102	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:		**Data Entry Status:**	Yes
Use 2nd:		**Data Src:**	
Final Well Status:		**Date Received:**	03/08/2011
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	M08990	**Contractor:**	7464
Tag:	A033879	**Form Version:**	5
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/716\7160102.pdf

Additional Detail(s) (Map)

Well Completed Date:	12/23/2010
Year Completed:	2010
Depth (m):	
Latitude:	43.6832168170166
Longitude:	-79.2846780099994
Path:	716\7160102.pdf

Bore Hole Information

Bore Hole ID:	1003483049	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638255.00
Code OB Desc:		**North83:**	4838119.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	3
Date Completed:	12/23/2010	**UTMRC Desc:**	margin of error : 10 - 30 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Links

Bore Hole ID:	1003483049	**Tag No:**	A033879
Depth M:		**Contractor:**	7464
Year Completed:	2010	**Latitude:**	43.6832168170166
Well Completed Dt:	12/23/2010	**Longitude:**	-79.2846780099994
Audit No:	M08990	**Y:**	43.68321681450925
Path:	716\7160102.pdf	**X:**	-79.28467785931089

87	*1 of 3*	*W/242.7*	*129.8 / 0.00*	***4 NORTHVIEW DRIVE SCARBOROUGH ON***	***WWIS***

Well ID:	7110505	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Monitoring	**Data Entry Status:**	
Use 2nd:		**Data Src:**	
Final Well Status:	Test Hole	**Date Received:**	08/28/2008
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	M03753	**Contractor:**	7241
Tag:	A067613	**Form Version:**	5
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	

Municipality: SCARBOROUGH BOROUGH
Site Info:

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/711\7110505.pdf

Additional Detail(s) (Map)

Well Completed Date: 08/12/2008
Year Completed: 2008
Depth (m):
Latitude: 43.6832260031357
Longitude: -79.2846901549573
Path: 711\7110505.pdf

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/711\7110505.pdf

Additional Detail(s) (Map)

Well Completed Date: 08/13/2008
Year Completed: 2008
Depth (m): 4.88
Latitude: 43.6832260031357
Longitude: -79.2846901549573
Path: 711\7110505.pdf

Bore Hole Information

Bore Hole ID:	1001766184	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638254.00
Code OB Desc:		**North83:**	4838120.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	3
Date Completed:	08/13/2008	**UTMRC Desc:**	margin of error : 10 - 30 m
Remarks:		**Location Method:**	wwr

Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID:	1002691220
Layer:	2
Color:	2
General Color:	GREY
Mat1:	28
Most Common Material:	SAND
Mat2:	06
Mat2 Desc:	SILT
Mat3:	
Mat3 Desc:	
Formation Top Depth:	3.0999999046325684
Formation End Depth:	4.880000114440918
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1002691219
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	26
Mat2 Desc:	ROCK
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	3.0999999046325684
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1002691223
Layer:	2
Plug From:	1.5
Plug To:	4.880000114440918
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1002691222
Layer:	1
Plug From:	0.0
Plug To:	1.5
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	1002691227
Method Construction Code:	D
Method Construction:	Direct Push
Other Method Construction:	

Pipe Information

Pipe ID: 1002691218
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002691224
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0.0
Depth To: 4.880000114440918
Casing Diameter: 4.03000020980835
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002691225
Layer: 1
Slot: 10
Screen Top Depth:
Screen End Depth:
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 4.820000171661377

Hole Diameter

Hole ID: 1002691221
Diameter: 5.710000038146973
Depth From: 0.0
Depth To: 4.880000114440918
Hole Depth UOM: m
Hole Diameter UOM: cm

Bore Hole Information

Bore Hole ID: 1002691209
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind: This is a record from cluster log sheet
Date Completed: 08/12/2008
Remarks:
Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 17
East83: 638254.00
North83: 4838120.00
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Annular Space/Abandonment Sealing Record

Plug ID: 1002691213
Layer:

Plug From:
Plug To:
Plug Depth UOM:

Method of Construction & Well Use

Method Construction ID: 1002691212
Method Construction Code:
Method Construction:
Other Method Construction: DIRECT PUSH

Pipe Information

Pipe ID: 1002691214
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1002691216
Layer:
Material: 5
Open Hole or Material: PLASTIC
Depth From:
Depth To: 1.5
Casing Diameter:
Casing Diameter UOM:
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1002691215
Layer:
Slot:
Screen Top Depth: 1.5
Screen End Depth: 4.880000114440918
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM:
Screen Diameter:

Results of Well Yield Testing

Pumping Test Method Desc:
Pump Test ID: 1002691217
Pump Set At:
Static Level:
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM:
Rate UOM:
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing:

Hole Diameter

Hole ID:	1002691211
Diameter:	5.710000038146973
Depth From:	
Depth To:	4.880000114440918
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Links

Bore Hole ID:	1001766184	***Tag No:***	A067613
Depth M:	4.88	***Contractor:***	7241
Year Completed:	2008	***Latitude:***	43.6832260031357
Well Completed Dt:	08/13/2008	***Longitude:***	-79.2846901549573
Audit No:	M03753	***Y:***	43.68322600033386
Path:	711\7110505.pdf	***X:***	-79.28469000452884

Links

Bore Hole ID:	1002691209	***Tag No:***	A067613
Depth M:		***Contractor:***	7241
Year Completed:	2008	***Latitude:***	43.6832260031357
Well Completed Dt:	08/12/2008	***Longitude:***	-79.2846901549573
Audit No:	M03753	***Y:***	43.68322600033386
Path:	711\7110505.pdf	***X:***	-79.28469000452884

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2 Northview Avenue, Scarborough
Toronto ON | ***SPL***

Ref No:	0676-8Y2PBA	***Municipality No:***	
Year:		***Nature of Damage:***	
Incident Dt:	11-SEP-12	***Discharger Report:***	
Dt MOE Arvl on Scn:		***Material Group:***	
MOE Reported Dt:	11-SEP-12	***Health/Env Conseq:***	
Dt Document Closed:	06-OCT-12	***Agency Involved:***	
Site No:			
Facility Name:			
MOE Response:	Referral to others		
Site County/District:			
Site Geo Ref Meth:			
Site District Office:			
Nearest Watercourse:			
Site Name:	vacant lot<UNOFFICIAL>		
Site Address:	2 Northview Avenue, Scarborough		
Site Region:			
Site Municipality:	Toronto		
Site Lot:			
Site Conc:			
Site Geo Ref Accu:			
Site Map Datum:			
Northing:			
Easting:			
Incident Cause:	Operator/Human error		
Incident Event:			
Environment Impact:	Not Anticipated		
Nature of Impact:	Air Pollution		
Contaminant Qty:	0 other - see incident description		
System Facility Address:			
Client Name:	Enbridge Gas Distribution Inc.		

Client Type:	
Call Report Locatn Geodata:	
Contaminant Code:	35
Contaminant Name:	NATURAL GAS (METHANE)
Contaminant Limit 1:	
Contam Limit Freq 1:	
Contaminant UN No 1:	
Receiving Medium:	
Receiving Environment:	
Incident Reason:	Operator/Human Error
Incident Summary:	TSSA FSB: 1 ¼ pl IP main line damage; made safe
Activity Preceding Spill:	
Property 2nd Watershed:	
Property Tertiary Watershed:	
Sector Type:	Pipeline/Components
SAC Action Class:	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Source Type:	

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Incident Id:		**Pipe Material:**	
Incident No:	871910	**Fuel Category:**	Natural Gas
Incident Reported Dt:		**Health Impact:**	
Type:	FS-Pipeline Incident	**Environment Impact:**	
Status Code:	Pipeline Damage Reason Est	**Property Damage:**	Yes
Tank Status:	RC Established	**Service Interrupt:**	
Task No:	4018501	**Enforce Policy:**	Yes
Spills Action Centre:		**Public Relation:**	
Fuel Type:		**Pipeline System:**	
Fuel Occurrence Tp:		**PSIG:**	
Date of Occurrence:		**Attribute Category:**	FS-Perform P-line Inc Invest
Occurrence Start Dt:	2012/09/12	**Regulator Location:**	
Depth:		**Method Details:**	E-mail
Customer Acct Name:			
Incident Address:			
Operation Type:			
Pipeline Type:			
Regulator Type:			
Summary:	2 Northview Avenue, Toronto - 1 ¼" Pipeline Hit		
Reported By:	Miles Routley - Enbridge Gas		
Affiliation:			
Occurrence Desc:			
Damage Reason:	Notification to one call center made but not sufficient		
Notes:			

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88 | ***1 of 1*** | ***W/243.1*** | ***129.8 / 0.00*** | ***4 NORTHVIEW AVE SCARBOROUGH ON*** | ***WWIS***

Well ID:	7048097	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Not Used	**Data Entry Status:**	
Use 2nd:		**Data Src:**	
Final Well Status:	Observation Wells	**Date Received:**	08/10/2007
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z74082	**Contractor:**	7241
Tag:	A056715	**Form Version:**	3
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	

Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/704\7048097.pdf

Additional Detail(s) (Map)

Well Completed Date:	07/25/2007
Year Completed:	2007
Depth (m):	
Latitude:	43.6832081893472
Longitude:	-79.2847030694258
Path:	704\7048097.pdf

Bore Hole Information

Bore Hole ID:	23048097	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:		***East83:***	638253.00
Code OB Desc:		***North83:***	4838118.00
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	3
Date Completed:	07/25/2007	***UTMRC Desc:***	margin of error : 10 - 30 m
Remarks:		***Location Method:***	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	44003473
Layer:	2
Plug From:	2.5
Plug To:	4.300000190734863
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	44003472
Layer:	1
Plug From:	0.0
Plug To:	2.5
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	25948097
Method Construction Code:	B
Method Construction:	Other Method

Other Method Construction:

Pipe Information

Pipe ID:	29048097
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	42148097
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0.0
Depth To:	2.799999952316284
Casing Diameter:	3.799999952316284
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	43148097
Layer:	1
Slot:	
Screen Top Depth:	2.799999952316284
Screen End Depth:	4.300000190734863
Screen Material:	5
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	3.799999952316284

Hole Diameter

Hole ID:	46002397
Diameter:	10.800000190734863
Depth From:	0.0
Depth To:	5.599999904632568
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Links

Bore Hole ID:	23048097	***Tag No:***	A056715
Depth M:		***Contractor:***	7241
Year Completed:	2007	***Latitude:***	43.6832081893472
Well Completed Dt:	07/25/2007	***Longitude:***	-79.2847030694258
Audit No:	Z74082	***Y:***	43.68320818607103
Path:	704\7048097.pdf	***X:***	-79.28470291870681

89 ***1 of 1*** ***WSW/244.2*** ***129.8 / 0.00*** ***ON*** ***BORE***

Borehole ID:	644161	***Inclin FLG:***	No
OGF ID:	215544544	***SP Status:***	Initial Entry
Status:		***Surv Elev:***	No
Type:	Borehole	***Piezometer:***	No
Use:	Geotechnical/Geological Investigation	***Primary Name:***	
Completion Date:	AUG-1961	***Municipality:***	
Static Water Level:		***Lot:***	

Primary Water Use:	Not Used	***Township:***	
Sec. Water Use:		***Latitude DD:***	43.680903
Total Depth m:	5	***Longitude DD:***	-79.284251
Depth Ref:	Ground Surface	***UTM Zone:***	17
Depth Elev:		***Easting:***	638295
Drill Method:	Diamond Drill	***Northing:***	4837863
Orig Ground Elev m:	130	***Location Accuracy:***	
Elev Reliabil Note:		***Accuracy:***	Not Applicable
DEM Ground Elev m:	131		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218506464	***Mat Consistency:***	
Top Depth:	0	***Material Moisture:***	
Bottom Depth:	.2	***Material Texture:***	
Material Color:		***Non Geo Mat Type:***	
Material 1:	Concrete	***Geologic Formation:***	
Material 2:		***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	CONCRETE. AGE POST-GLACIAL.		

Geology Stratum ID:	218506468	***Mat Consistency:***	Compact
Top Depth:	2.6	***Material Moisture:***	
Bottom Depth:	4	***Material Texture:***	Fine to Medium
Material Color:	Brown	***Non Geo Mat Type:***	
Material 1:	Sand	***Geologic Formation:***	
Material 2:		***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	glacial
Gsc Material Description:			
Stratum Description:	SAND-FINE TO MEDIUM.BROWN,COMPACT,AGE GLACIAL.		

Geology Stratum ID:	218506469	***Mat Consistency:***	Dense
Top Depth:	4	***Material Moisture:***	
Bottom Depth:	5	***Material Texture:***	
Material Color:	Brown	***Non Geo Mat Type:***	
Material 1:	Sand	***Geologic Formation:***	
Material 2:	Silt	***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	glacial
Gsc Material Description:			
Stratum Description:	SAND,SILT. GREY,BROWN,VERY DENSE, AGE GLACIAL. 004 010 004 0 **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	218506467	***Mat Consistency:***	Compact
Top Depth:	1.2	***Material Moisture:***	
Bottom Depth:	2.6	***Material Texture:***	Medium
Material Color:	Brown	***Non Geo Mat Type:***	
Material 1:	Sand	***Geologic Formation:***	
Material 2:	Silt	***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	glacial
Gsc Material Description:			
Stratum Description:	SAND-MEDIUM,SILT. BROWN,COMPACT,AGE GLACIAL.		

Geology Stratum ID:	218506465	***Mat Consistency:***	
Top Depth:	.2	***Material Moisture:***	
Bottom Depth:	.6	***Material Texture:***	
Material Color:	Brown	***Non Geo Mat Type:***	

Material 1:	Gravel	**Geologic Formation:**	
Material 2:	Sand	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	glacial
Gsc Material Description:			
Stratum Description:	GRAVEL,SAND. BROWN,AGE GLACIAL.		

Geology Stratum ID:	218506466	**Mat Consistency:**	Loose
Top Depth:	.6	**Material Moisture:**	
Bottom Depth:	1.2	**Material Texture:**	
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Gravel	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	glacial
Gsc Material Description:			
Stratum Description:	SAND,GRAVEL. BROWN,VERY LOOSE,AGE GLACIAL.		

Source

Source Type:	Data Survey	**Source Appl:**	Spatial/Tabular
Source Orig:	Geological Survey of Canada	**Source Iden:**	1
Source Date:	1956-1972	**Scale or Res:**	Varies
Confidence:	M	**Horizontal:**	NAD27
Observatio:		**Verticalda:**	Mean Average Sea Level
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Details:	File: TOR2.txt RecordID: 121820 NTS_Sheet: 30M11F		
Confiden 1:	Reliable information but incomplete.		

Source List

Source Identifier:	1	**Horizontal Datum:**	NAD27
Source Type:	Data Survey	**Vertical Datum:**	Mean Average Sea Level
Source Date:	1956-1972	**Projection Name:**	Universal Transverse Mercator
Scale or Resolution:	Varies		
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Originators:	Geological Survey of Canada		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
90	1 of 1	WSW/245.5	130.0 / 0.15	ON	BORE

Borehole ID:	644163	**Inclin FLG:**	No
OGF ID:	215544546	**SP Status:**	Initial Entry
Status:		**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:	Geotechnical/Geological Investigation	**Primary Name:**	
Completion Date:	AUG-1961	**Municipality:**	
Static Water Level:		**Lot:**	
Primary Water Use:	Not Used	**Township:**	
Sec. Water Use:		**Latitude DD:**	43.681221
Total Depth m:	6.4	**Longitude DD:**	-79.284428
Depth Ref:	Ground Surface	**UTM Zone:**	17
Depth Elev:		**Easting:**	638280
Drill Method:	Diamond Drill	**Northing:**	4837898
Orig Ground Elev m:	131	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Not Applicable
DEM Ground Elev m:	131		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218506479	***Mat Consistency:***	Dense
Top Depth:	3	***Material Moisture:***	
Bottom Depth:	4.6	***Material Texture:***	
Material Color:	Brown	***Non Geo Mat Type:***	
Material 1:	Sand	***Geologic Formation:***	
Material 2:	Gravel	***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	glacial
Gsc Material Description:			
Stratum Description:	SAND,GRAVEL. BROWN,VERY DENSE,AGE GLACIAL.		

Geology Stratum ID:	218506476	***Mat Consistency:***	
Top Depth:	0	***Material Moisture:***	
Bottom Depth:	.5	***Material Texture:***	
Material Color:	Black	***Non Geo Mat Type:***	
Material 1:	Soil	***Geologic Formation:***	
Material 2:	Sand	***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	SOIL,SAND. BLACK,AGE POST-GLACIAL.		

Geology Stratum ID:	218506477	***Mat Consistency:***	Compact
Top Depth:	.5	***Material Moisture:***	
Bottom Depth:	1.7	***Material Texture:***	Fine to Medium
Material Color:	Brown	***Non Geo Mat Type:***	
Material 1:	Sand	***Geologic Formation:***	
Material 2:	Gravel	***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	glacial
Gsc Material Description:			
Stratum Description:	SAND-FINE TO MEDIUM,GRAVEL. BROWN,COMPACT,AGE GLACIAL.		

Geology Stratum ID:	218506478	***Mat Consistency:***	Dense
Top Depth:	1.7	***Material Moisture:***	
Bottom Depth:	3	***Material Texture:***	Medium
Material Color:	Brown	***Non Geo Mat Type:***	
Material 1:	Sand	***Geologic Formation:***	
Material 2:	Silt	***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	glacial
Gsc Material Description:			
Stratum Description:	SAND-MEDIUM,SILT. BROWN,VERY DENSE,AGE GLACIAL.		

Geology Stratum ID:	218506481	***Mat Consistency:***	Dense
Top Depth:	6.1	***Material Moisture:***	
Bottom Depth:	6.4	***Material Texture:***	Medium
Material Color:	Brown	***Non Geo Mat Type:***	
Material 1:	Sand	***Geologic Formation:***	
Material 2:	Silt	***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	glacial
Gsc Material Description:			
Stratum Description:	SAND-MEDIUM,SILT. BROWN,VERY DENSE,AGE GLACIAL. 004 005 007 **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	218506480	***Mat Consistency:***	Dense
Top Depth:	4.6	***Material Moisture:***	
Bottom Depth:	6.1	***Material Texture:***	Medium
Material Color:	Brown	***Non Geo Mat Type:***	
Material 1:	Sand	***Geologic Formation:***	
Material 2:	Silt	***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	glacial

Gsc Material Description:
Stratum Description: SAND-MEDIUM,SILT. GREY,BROWN,VERY DENSE, AGE GLACIAL.

Source

Source Type:	Data Survey	**Source Appl:**	Spatial/Tabular
Source Orig:	Geological Survey of Canada	**Source Iden:**	1
Source Date:	1956-1972	**Scale or Res:**	Varies
Confidence:	M	**Horizontal:**	NAD27
Observatio:		**Verticalda:**	Mean Average Sea Level

Source Name: Urban Geology Automated Information System (UGAIS)
Source Details: File: TOR2.txt RecordID: 121840 NTS_Sheet: 30M11F
Confiden 1: Reliable information but incomplete.

Source List

Source Identifier:	1	**Horizontal Datum:**	NAD27
Source Type:	Data Survey	**Vertical Datum:**	Mean Average Sea Level
Source Date:	1956-1972	**Projection Name:**	Universal Transverse Mercator
Scale or Resolution:	Varies		

Source Name: Urban Geology Automated Information System (UGAIS)
Source Originators: Geological Survey of Canada

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91 | **1 of 1** | **E/245.7** | **128.6 / -1.20** | **31 Annedale Rd Toronto ON** | **SPL**

Ref No:	8664-BD4KEM	**Municipality No:**	
Year:		**Nature of Damage:**	
Incident Dt:	6/13/2019	**Discharger Report:**	
Dt MOE Arvl on Scn:		**Material Group:**	
MOE Reported Dt:	6/13/2019	**Health/Env Conseq:**	2 - Minor Environment
Dt Document Closed:		**Agency Involved:**	

Site No: NA
Facility Name:
MOE Response: No
Site County/District:
Site Geo Ref Meth:
Site District Office: Toronto - District
Nearest Watercourse:
Site Name: Catchbasin<UNOFFICIAL>
Site Address: 31 Annedale Rd
Site Region: Central
Site Municipality: Toronto
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing: 4838070.62
Easting: 638899.42
Incident Cause:
Incident Event: Leak/Break
Environment Impact:
Nature of Impact:
Contaminant Qty: 80 L
System Facility Address:
Client Name:
Client Type:
Call Report Locatn Geodata:
Contaminant Code: 15
Contaminant Name: HYDRAULIC OIL
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1: n/a

Receiving Medium:	
Receiving Environment:	Surface Water
Incident Reason:	Equipment Failure
Incident Summary:	City of Toronto: 50-80L of hydraulic oil to road, cb
Activity Preceding Spill:	
Property 2nd Watershed:	
Property Tertiary Watershed:	
Sector Type:	Miscellaneous Communal
SAC Action Class:	Watercourse Spills
Source Type:	Motor Vehicle

92	***1 of 17***	***SSW/245.7***	***125.0 / -4.85***	***METRO SEPARATE SCHOOL BOARD NEIL MCNEIL HIGH SCHOOL 127 VICTORIA PARK AVENUE SCARBOROUGH ON M4E 3S2***	***GEN***

Generator No:	ON0121801
SIC Code:	8511
SIC Description:	ELEMT./SECON. EDUC.
Approval Years:	86,87,88,89,90
PO Box No:	
Country:	
Status:	
Co Admin:	
Choice of Contact:	
Phone No Admin:	
Contaminated Facility:	
MHSW Facility:	

Detail(s)

Waste Class:	148
Waste Class Name:	INORGANIC LABORATORY CHEMICALS
Waste Class:	211
Waste Class Name:	AROMATIC SOLVENTS
Waste Class:	212
Waste Class Name:	ALIPHATIC SOLVENTS
Waste Class:	241
Waste Class Name:	HALOGENATED SOLVENTS
Waste Class:	252
Waste Class Name:	WASTE OILS & LUBRICANTS
Waste Class:	263
Waste Class Name:	ORGANIC LABORATORY CHEMICALS

92	***2 of 17***	***SSW/245.7***	***125.0 / -4.85***	***METROPOLITAN SEPARATE SCHOOL BOARD NEIL MCNEIL HIGH SCHOOL 127 VICTORIA PARK AVENUE SCARBOROUGH ON M4E 3S2***	***GEN***

Generator No:	ON0121801
SIC Code:	8511
SIC Description:	ELEMT./SECON. EDUC.
Approval Years:	92,93,97,98,99,00,01
PO Box No:	
Country:	
Status:	
Co Admin:	

Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 148
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 211
Waste Class Name: AROMATIC SOLVENTS

Waste Class: 212
Waste Class Name: ALIPHATIC SOLVENTS

Waste Class: 221
Waste Class Name: LIGHT FUELS

Waste Class: 241
Waste Class Name: HALOGENATED SOLVENTS

Waste Class: 251
Waste Class Name: OIL SKIMMINGS & SLUDGES

Waste Class: 252
Waste Class Name: WASTE OILS & LUBRICANTS

Waste Class: 263
Waste Class Name: ORGANIC LABORATORY CHEMICALS

Waste Class: 331
Waste Class Name: WASTE COMPRESSED GASES

92	*3 of 17*	*SSW/245.7*	*125.0 / -4.85*	***METROPOLITAN SEPARATE SCHOOL BRD. 25-261 NEIL MCNEIL HIGH SCHOOL 127 VICTORIA PARK AVENUE SCARBOROUGH ON M4E 3S2***	***GEN***

Generator No: ON0121801
SIC Code: 8511
SIC Description: ELEMT./SECON. EDUC.
Approval Years: 94,95,96
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 241
Waste Class Name: HALOGENATED SOLVENTS

Waste Class: 212
Waste Class Name: ALIPHATIC SOLVENTS

Waste Class: 221
Waste Class Name: LIGHT FUELS

Waste Class: 263
Waste Class Name: ORGANIC LABORATORY CHEMICALS

Waste Class: 251
Waste Class Name: OIL SKIMMINGS & SLUDGES

Waste Class: 252
Waste Class Name: WASTE OILS & LUBRICANTS

Waste Class: 331
Waste Class Name: WASTE COMPRESSED GASES

Waste Class: 148
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 211
Waste Class Name: AROMATIC SOLVENTS

92	4 of 17	SSW/245.7	125.0 / -4.85	**TORONTO CATHOLIC DISTRICT SCHOOL BOARD** **NEIL MCNEIL HIGH SCHOOL 127 VICTORIA PARK AVENUE** **SCARBOROUGH ON M4E 3S2**	GEN

Generator No: ON0121801
SIC Code: 611110
SIC Description: Elementary & Secondary Schools
Approval Years: 02,03,04
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 148
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 221
Waste Class Name: LIGHT FUELS

Waste Class: 243
Waste Class Name: PCB'S

Waste Class: 263
Waste Class Name: ORGANIC LABORATORY CHEMICALS

Waste Class: 264
Waste Class Name: PHOTOPROCESSING WASTES

92	5 of 17	SSW/245.7	125.0 / -4.85	**Toronto Catholic District School Board** **127 Victoria Park** **Toronto ON M4E 3S2**	GEN

Generator No: ON6780527
SIC Code: 611110
SIC Description: Elementary and Secondary Schools
Approval Years: 04,06,07,08

PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 264
Waste Class Name: PHOTOPROCESSING WASTES

Waste Class: 264
Waste Class Name: PHOTOPROCESSING WASTES

Waste Class: 122
Waste Class Name: ALKALINE WASTES - OTHER METALS

Waste Class: 148
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 263
Waste Class Name: ORGANIC LABORATORY CHEMICALS

Waste Class: 331
Waste Class Name: WASTE COMPRESSED GASES

92	*6 of 17*	*SSW/245.7*	*125.0 / -4.85*	***Toronto Catholic District School Board*** ***127 Victoria Park*** ***Toronto ON***	*GEN*

Generator No: ON6780527
SIC Code: 611110
SIC Description: Elementary and Secondary Schools
Approval Years: 2009
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 122
Waste Class Name: ALKALINE WASTES - OTHER METALS

Waste Class: 148
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 263
Waste Class Name: ORGANIC LABORATORY CHEMICALS

Waste Class: 264
Waste Class Name: PHOTOPROCESSING WASTES

92	*7 of 17*	*SSW/245.7*	*125.0 / -4.85*	***Toronto Catholic District School Board*** ***127 Victoria Park***	*GEN*

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
				Toronto ON	

Generator No: ON6780527
SIC Code: 611110
SIC Description: Elementary and Secondary Schools
Approval Years: 2010
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 122
Waste Class Name: ALKALINE WASTES - OTHER METALS

Waste Class: 263
Waste Class Name: ORGANIC LABORATORY CHEMICALS

Waste Class: 264
Waste Class Name: PHOTOPROCESSING WASTES

Waste Class: 148
Waste Class Name: INORGANIC LABORATORY CHEMICALS

92	8 of 17	SSW/245.7	125.0 / -4.85	**Toronto Catholic District School Board** **127 Victoria Park** **Toronto ON**	GEN

Generator No: ON6780527
SIC Code: 611110
SIC Description: Elementary and Secondary Schools
Approval Years: 2011
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 122
Waste Class Name: ALKALINE WASTES - OTHER METALS

Waste Class: 264
Waste Class Name: PHOTOPROCESSING WASTES

Waste Class: 148
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 263
Waste Class Name: ORGANIC LABORATORY CHEMICALS

92	9 of 17	SSW/245.7	125.0 / -4.85	**Toronto Catholic District School Board** **127 Victoria Park**	GEN

Toronto ON M4E 3S2

Generator No: ON6780527
SIC Code: 611110
SIC Description: Elementary and Secondary Schools
Approval Years: 2012
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 148
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 263
Waste Class Name: ORGANIC LABORATORY CHEMICALS

Waste Class: 122
Waste Class Name: ALKALINE WASTES - OTHER METALS

Waste Class: 264
Waste Class Name: PHOTOPROCESSING WASTES

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92 | ***10 of 17*** | ***SSW/245.7*** | ***125.0 / -4.85*** | ***Toronto Catholic District School Board***
127 Victoria Park
Toronto ON | ***GEN***

Generator No: ON6780527
SIC Code: 611110
SIC Description: ELEMENTARY AND SECONDARY SCHOOLS
Approval Years: 2013
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 145
Waste Class Name: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 264
Waste Class Name: PHOTOPROCESSING WASTES

Waste Class: 122
Waste Class Name: ALKALINE WASTES - OTHER METALS

Waste Class: 212
Waste Class Name: ALIPHATIC SOLVENTS

Waste Class: 148
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 263
Waste Class Name: ORGANIC LABORATORY CHEMICALS

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92 **11 of 17** **SSW/245.7** **125.0 / -4.85** **Toronto Catholic District School Board**
127 Victoria Park
Toronto ON M4E 3S2 **GEN**

Generator No: ON6780527
SIC Code: 611110
SIC Description: ELEMENTARY AND SECONDARY SCHOOLS
Approval Years: 2016
PO Box No:
Country: Canada
Status:
Co Admin: Kelly Kwon
Choice of Contact: CO_OFFICIAL
Phone No Admin: 416 222-8282 Ext.2111
Contaminated Facility: No
MHSW Facility: No

Detail(s)

Waste Class: 122
Waste Class Name: ALKALINE WASTES - OTHER METALS

Waste Class: 212
Waste Class Name: ALIPHATIC SOLVENTS

Waste Class: 148
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 263
Waste Class Name: ORGANIC LABORATORY CHEMICALS

Waste Class: 264
Waste Class Name: PHOTOPROCESSING WASTES

Waste Class: 145
Waste Class Name: PAINT/PIGMENT/COATING RESIDUES

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92 **12 of 17** **SSW/245.7** **125.0 / -4.85** **Toronto Catholic District School Board**
127 Victoria Park
Toronto ON M4E 3S2 **GEN**

Generator No: ON6780527
SIC Code: 611110
SIC Description: ELEMENTARY AND SECONDARY SCHOOLS
Approval Years: 2015
PO Box No:
Country: Canada
Status:
Co Admin: Kelly Kwon
Choice of Contact: CO_OFFICIAL
Phone No Admin: 416 222-8282 Ext.2111
Contaminated Facility: No
MHSW Facility: No

Detail(s)

Waste Class: 212
Waste Class Name: ALIPHATIC SOLVENTS

Waste Class: 148

Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 145
Waste Class Name: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 122
Waste Class Name: ALKALINE WASTES - OTHER METALS

Waste Class: 263
Waste Class Name: ORGANIC LABORATORY CHEMICALS

Waste Class: 264
Waste Class Name: PHOTOPROCESSING WASTES

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92 | ***13 of 17*** | ***SSW/245.7*** | ***125.0 / -4.85*** | ***Toronto Catholic District School Board***
127 Victoria Park
Toronto ON M4E 3S2 | ***GEN***

Generator No: ON6780527
SIC Code: 611110
SIC Description: ELEMENTARY AND SECONDARY SCHOOLS
Approval Years: 2014
PO Box No:
Country: Canada
Status:
Co Admin: Kelly Kwon
Choice of Contact: CO_OFFICIAL
Phone No Admin: 416 222-8282 Ext.2111
Contaminated Facility: No
MHSW Facility: No

Detail(s)

Waste Class: 148
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 264
Waste Class Name: PHOTOPROCESSING WASTES

Waste Class: 145
Waste Class Name: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 212
Waste Class Name: ALIPHATIC SOLVENTS

Waste Class: 263
Waste Class Name: ORGANIC LABORATORY CHEMICALS

Waste Class: 122
Waste Class Name: ALKALINE WASTES - OTHER METALS

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92 | ***14 of 17*** | ***SSW/245.7*** | ***125.0 / -4.85*** | ***Toronto Catholic District School Board***
127 Victoria Park
Toronto ON M4E 3S2 | ***GEN***

Generator No: ON6780527
SIC Code:
SIC Description:
Approval Years: As of Dec 2018
PO Box No:
Country: Canada
Status: Registered
Co Admin:

Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 145 I
Waste Class Name: Wastes from the use of pigments, coatings and paints

Waste Class: 148 B
Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 148 C
Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 148 R
Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 148 T
Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 212 B
Waste Class Name: Aliphatic solvents and residues

Waste Class: 263 B
Waste Class Name: Misc. waste organic chemicals

Waste Class: 263 C
Waste Class Name: Misc. waste organic chemicals

Waste Class: 263 I
Waste Class Name: Misc. waste organic chemicals

Waste Class: 264 C
Waste Class Name: Photoprocessing wastes

Waste Class: 264 L
Waste Class Name: Photoprocessing wastes

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92 | ***15 of 17*** | ***SSW/245.7*** | ***125.0 / -4.85*** | ***Toronto Catholic District School Board***
127 Victoria Park
Toronto ON M4E 3S2 | ***GEN***

Generator No: ON6780527
SIC Code:
SIC Description:
Approval Years: As of Jul 2020
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 263 B
Waste Class Name: Misc. waste organic chemicals

Waste Class: 148 B

Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 212 B
Waste Class Name: Aliphatic solvents and residues

Waste Class: 264 L
Waste Class Name: Photoprocessing wastes

Waste Class: 145 I
Waste Class Name: Wastes from the use of pigments, coatings and paints

Waste Class: 263 C
Waste Class Name: Misc. waste organic chemicals

Waste Class: 148 C
Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 263 I
Waste Class Name: Misc. waste organic chemicals

Waste Class: 148 R
Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 264 C
Waste Class Name: Photoprocessing wastes

Waste Class: 148 T
Waste Class Name: Misc. wastes and inorganic chemicals

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92 | ***16 of 17*** | ***SSW/245.7*** | ***125.0 / -4.85*** | ***Toronto Catholic District School Board***
127 Victoria Park
Toronto ON M4E 3S2 | ***GEN***

Generator No: ON6780527
SIC Code:
SIC Description:
Approval Years: As of Nov 2021
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 263 C
Waste Class Name: Misc. waste organic chemicals

Waste Class: 212 B
Waste Class Name: Aliphatic solvents and residues

Waste Class: 148 R
Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 264 C
Waste Class Name: Photoprocessing wastes

Waste Class: 263 I
Waste Class Name: Misc. waste organic chemicals

Waste Class: 145 I

Waste Class Name: Wastes from the use of pigments, coatings and paints

Waste Class: 148 C
Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 263 B
Waste Class Name: Misc. waste organic chemicals

Waste Class: 148 B
Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 264 L
Waste Class Name: Photoprocessing wastes

Waste Class: 148 T
Waste Class Name: Misc. wastes and inorganic chemicals

92	17 of 17	SSW/245.7	125.0 / -4.85	Toronto Catholic District School Board 127 Victoria Park Toronto ON M4E 3S2	GEN

Generator No: ON6780527
SIC Code:
SIC Description:
Approval Years: As of Oct 2022
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 148 R
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 148 T
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 263 C
Waste Class Name: ORGANIC LABORATORY CHEMICALS

Waste Class: 145 I
Waste Class Name: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 263 I
Waste Class Name: ORGANIC LABORATORY CHEMICALS

Waste Class: 148 B
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 212 B
Waste Class Name: ALIPHATIC SOLVENTS

Waste Class: 148 C
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 264 C
Waste Class Name: PHOTOPROCESSING WASTES

Waste Class: 263 B

Waste Class Name: ORGANIC LABORATORY CHEMICALS

Waste Class: 264 L
Waste Class Name: PHOTOPROCESSING WASTES

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93 | **1 of 1** | **WSW/247.0** | **129.8 / 0.00** | **ALBION UNDERGROUND TIC INC**
1052 KINGSTON RD,,TORONTO,ON,M4E 1T4,CA
ON | **PINC**

Incident Id:
Incident No: 1527608
Incident Reported Dt: 11/24/2014
Type: FS-Pipeline Incident
Status Code:
Tank Status: Pipeline Damage Reason Est
Task No:
Spills Action Centre:
Fuel Type:
Fuel Occurrence Tp:
Date of Occurrence:
Occurrence Start Dt:
Depth:
Customer Acct Name: ALBION UNDERGROUND TIC INC
Incident Address: 1052 KINGSTON RD,,TORONTO,ON,M4E 1T4,CA
Operation Type:
Pipeline Type:
Regulator Type:
Summary:
Reported By:
Affiliation:
Occurrence Desc:
Damage Reason:
Notes:

Pipe Material:
Fuel Category:
Health Impact:
Environment Impact:
Property Damage:
Service Interrupt:
Enforce Policy:
Public Relation:
Pipeline System:
PSIG:
Attribute Category:
Regulator Location:
Method Details:

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94 | **1 of 1** | **W/247.3** | **130.0 / 0.15** | **4 NORTHVIEW AVENUE**
TORONTO ON | **WWIS**

Well ID: 6929596
Construction Date:
Use 1st: Not Used
Use 2nd:
Final Well Status: Observation Wells
Water Type:
Casing Material:
Audit No: Z37150
Tag: A033884
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: SCARBOROUGH BOROUGH
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src:
Date Received: 11/24/2005
Selected Flag: TRUE
Abandonment Rec:
Contractor: 7147
Form Version: 3
Owner:
County: YORK
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/692\6929596.pdf

Additional Detail(s) (Map)

Well Completed Date:	11/04/2005
Year Completed:	2005
Depth (m):	16.2
Latitude:	43.6833878164185
Longitude:	-79.2846731363656
Path:	692\6929596.pdf

Bore Hole Information

Bore Hole ID:	11328565	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638255.00
Code OB Desc:		**North83:**	4838138.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	11/04/2005	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	933039678
Layer:	1
Color:	8
General Color:	BLACK
Mat1:	02
Most Common Material:	TOPSOIL
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	0.20000000298023224
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	933039679
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	84
Mat2 Desc:	SILTY
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.20000000298023224
Formation End Depth:	16.200000762939453
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID: 933039680
Layer: 3
Color:
General Color:
Mat1:
Most Common Material:
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 16.200000762939453
Formation End Depth:
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 933281661
Layer: 3
Plug From: 11.0
Plug To: 16.200000762939453
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 933281662
Layer: 4
Plug From:
Plug To: 16.200000762939453
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 933281659
Layer: 2
Plug From: 0.20000000298023224
Plug To: 11.0
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 933281660
Layer: 1
Plug From: 0.0
Plug To: 0.20000000298023224
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID: 966929596
Method Construction Code: B
Method Construction: Other Method
Other Method Construction:

Pipe Information

Pipe ID: 11343420
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930873571
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0.0
Depth To: 11.699999809265137
Casing Diameter: 5.0
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 933415616
Layer: 1
Slot: 10
Screen Top Depth: 11.699999809265137
Screen End Depth: 16.200000762939453
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6.300000190734863

Hole Diameter

Hole ID: 11549683
Diameter: 10.0
Depth From: 0.0
Depth To: 16.200000762939453
Hole Depth UOM: m
Hole Diameter UOM: cm

Links

Bore Hole ID: 11328565
Depth M: 16.2
Year Completed: 2005
Well Completed Dt: 11/04/2005
Audit No: Z37150
Path: 692\6929596.pdf
Tag No: A033884
Contractor: 7147
Latitude: 43.6833878164185
Longitude: -79.2846731363656
Y: 43.68338781352488
X: -79.28467298503871

95	1 of 3	WSW/247.7	130.2 / 0.35	MOTOROLA CANADA LTD 400 VICTORIA PARK AVENUE NORTH YORK ON M4E 3T2	OPCB

Year: 1999
Site Number: 30195A034
Name Owner:
Additional Site Information:

95	2 of 3	WSW/247.7	130.2 / 0.35	MOTOROLA CANADA LTD 400 VICTORIA PARK AVENUE NORTH YORK ON M4E 3T2	OPCB

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Year: 2000
Site Number: 30195A034
Name Owner:
Additional Site Information:

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95 | **3 of 3** | **WSW/247.7** | **130.2 / 0.35** | **MOTOROLA CANADA LTD**
400 VICTORIA PARK AVENUE
NORTH YORK ON | **NPCB**

Company Code: F0947
Industry: UNDEFINED
Site Status:
Transaction Date:
Inspection Date:

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96 | **1 of 1** | **SW/253.8** | **129.7 / -0.13** | **Brian's Drum Shop**
1051 Kingston Rd
Toronto ON M4E 1T5 | **SCT**

Established: 01-NOV-83
Plant Size (ft²): 3000
Employment:

--Details--
Description: Musical Instrument and Supplies Stores
SIC/NAICS Code: 451140

Description: Other Personal and Household Goods Repair and Maintenance
SIC/NAICS Code: 811490

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97 | **1 of 1** | **ESE/254.0** | **124.8 / -5.02** | **Enbridge Gas Distribution Inc.**
27 Lynndale Cres
Toronto ON | **SPL**

Ref No: 5138-9JTPG9
Year:
Incident Dt: 2014/05/05
Dt MOE Arvl on Scn:
MOE Reported Dt: 2014/05/05
Dt Document Closed: 2014/07/15
Site No: NA
Facility Name:
MOE Response: Referral to others
Site County/District:
Site Geo Ref Meth:
Site District Office:
Nearest Watercourse:
Site Name: Private Residence<UNOFFICIAL>
Site Address: 27 Lynndale Cres
Site Region:
Site Municipality: Toronto
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:
Easting:
Incident Cause: Unknown / N/A
Incident Event:
Environment Impact: Confirmed
Municipality No:
Nature of Damage:
Discharger Report:
Material Group:
Health/Env Conseq:
Agency Involved:

Nature of Impact:	Air Pollution
Contaminant Qty:	0 other - see incident description
System Facility Address:	
Client Name:	Enbridge Gas Distribution Inc.
Client Type:	
Call Report Locatn Geodata:	
Contaminant Code:	35
Contaminant Name:	NATURAL GAS (METHANE)
Contaminant Limit 1:	
Contam Limit Freq 1:	
Contaminant UN No 1:	
Receiving Medium:	
Receiving Environment:	
Incident Reason:	Unknown / N/A
Incident Summary:	TSSA FSB: 1/2" plastic damage, safe
Activity Preceding Spill:	
Property 2nd Watershed:	
Property Tertiary Watershed:	
Sector Type:	Unknown / N/A
SAC Action Class:	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Source Type:	

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98 | ***1 of 1*** | ***WSW/254.8*** | ***129.8 / 0.00*** | ***1048 kingston Road Toronto ON M4E 1T4*** | ***EHS***

Order No:	20190306152	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Standard Report	**Client Prov/State:**	ON
Report Date:	13-MAR-19	**Search Radius (km):**	.25
Date Received:	06-MAR-19	**X:**	-79.284451
Previous Site Name:		**Y:**	43.681005
Lot/Building Size:			
Additional Info Ordered:	Fire Insur. Maps and/or Site Plans; Title Searches; City Directory		

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99 | ***1 of 1*** | ***WSW/254.9*** | ***130.2 / 0.35*** | ***1048 Kingston Road Toronto ON*** | ***WWIS***

Well ID:	7333347	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Test Hole	**Data Entry Status:**	
Use 2nd:		**Data Src:**	
Final Well Status:	Test Hole	**Date Received:**	05/22/2019
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z309206	**Contractor:**	7215
Tag:	A266448	**Form Version:**	7
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	TORONTO CITY		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/733\7333347.pdf

Additional Detail(s) (Map)

Well Completed Date: 03/29/2019
Year Completed: 2019
Depth (m): 21.336
Latitude: 43.6811344731489
Longitude: -79.2845140410983
Path: 733\7333347.pdf

Bore Hole Information

Bore Hole ID: 1007456393
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 03/29/2019
Remarks:
Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 17
East83: 638273.00
North83: 4837888.00
Org CS: UTM83
UTMRC: 4
UTMRC Desc: margin of error : 30 m - 100 m
Location Method: wwr

Overburden and Bedrock Materials Interval

Formation ID: 1007845991
Layer: 2
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 3.0
Formation End Depth: 70.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 1007845990
Layer: 1
Color: 8
General Color: BLACK
Mat1: 01
Most Common Material: FILL
Mat2:
Mat2 Desc:
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 0.0
Formation End Depth: 3.0
Formation End Depth UOM: ft

Annular Space/Abandonment

Sealing Record

Plug ID:	1007847516
Layer:	3
Plug From:	58.0
Plug To:	70.0
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1007847514
Layer:	1
Plug From:	0.0
Plug To:	2.0
Plug Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1007847515
Layer:	2
Plug From:	2.0
Plug To:	58.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	1007849617
Method Construction Code:	2
Method Construction:	Rotary (Convent.)
Other Method Construction:	

Pipe Information

Pipe ID:	1007844811
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1007850093
Layer:	1
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	0.0
Depth To:	60.0
Casing Diameter:	2.0
Casing Diameter UOM:	Inch
Casing Depth UOM:	ft

Construction Record - Screen

Screen ID:	1007850693
Layer:	1
Slot:	10
Screen Top Depth:	60.0
Screen End Depth:	70.0
Screen Material:	5

Screen Depth UOM:	ft
Screen Diameter UOM:	inch
Screen Diameter:	2.0

Results of Well Yield Testing

Pumping Test Method Desc:	
Pump Test ID:	1007851511
Pump Set At:	
Static Level:	
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	
Water State After Test:	
Pumping Test Method:	0
Pumping Duration HR:	
Pumping Duration MIN:	
Flowing:	

Water Details

Water ID:	1007851195
Layer:	1
Kind Code:	8
Kind:	Untested
Water Found Depth:	60.0
Water Found Depth UOM:	ft

Hole Diameter

Hole ID:	1007848786
Diameter:	9.0
Depth From:	0.0
Depth To:	70.0
Hole Depth UOM:	ft
Hole Diameter UOM:	Inch

Links

Bore Hole ID:	1007456393	**Tag No:**	A266448
Depth M:	21.336	**Contractor:**	7215
Year Completed:	2019	**Latitude:**	43.6811344731489
Well Completed Dt:	03/29/2019	**Longitude:**	-79.2845140410983
Audit No:	Z309206	**Y:**	43.68113447012932
Path:	733\7333347.pdf	**X:**	-79.28451389005721

100 ***1 of 1*** ***NNE/255.7*** ***129.8 / 0.00*** ***ON*** ***WWIS***

Well ID:	7397852	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:		**Data Entry Status:**	Yes
Use 2nd:		**Data Src:**	
Final Well Status:		**Date Received:**	09/21/2021
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	Yes
Audit No:	Z366461	**Contractor:**	7215

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Tag:		**Form Version:**	7
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

Bore Hole Information

Bore Hole ID:	1008783966	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638731.00
Code OB Desc:		**North83:**	4838497.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	08/25/2021	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Links

Bore Hole ID:	1008783966	**Tag No:**	
Depth M:		**Contractor:**	7215
Year Completed:	2021	**Latitude:**	43.6865300333368
Well Completed Dt:	08/25/2021	**Longitude:**	-79.2786776265366
Audit No:	Z366461	**Y:**	43.686530030228596
Path:		**X:**	-79.27867747596068

101	1 of 3	NNE/256.4	129.9 / 0.05	34-01 Toronto ON	EHS

Order No:	22092300110	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Custom Report	**Client Prov/State:**	ON
Report Date:	30-SEP-22	**Search Radius (km):**	.25
Date Received:	23-SEP-22	**X:**	-79.27884954
Previous Site Name:		**Y:**	43.68660577
Lot/Building Size:			
Additional Info Ordered:			

101	2 of 3	NNE/256.4	129.9 / 0.05	34-01 Toronto ON	EHS

Order No:	22092300110	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Custom Report	**Client Prov/State:**	ON
Report Date:	30-SEP-22	**Search Radius (km):**	.25
Date Received:	23-SEP-22	**X:**	-79.27884954
Previous Site Name:		**Y:**	43.68660577

Lot/Building Size:
Additional Info Ordered:

---

101 | **3 of 3** | **NNE/256.4** | **129.9 / 0.05** | **34-01 Toronto ON** | **EHS**

Order No:	22092300110	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Custom Report	**Client Prov/State:**	ON
Report Date:	30-SEP-22	**Search Radius (km):**	.25
Date Received:	23-SEP-22	**X:**	-79.27884954
Previous Site Name:		**Y:**	43.68660577

Lot/Building Size:
Additional Info Ordered:

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102 | **1 of 1** | **W/260.8** | **130.0 / 0.12** | **4 NOTHVIEW AVENUE TORONTO ON** | **WWIS**

Well ID:	6929595	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Not Used	**Data Entry Status:**	
Use 2nd:		**Data Src:**	
Final Well Status:	Observation Wells	**Date Received:**	11/24/2005
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z37151	**Contractor:**	7147
Tag:	A033879	**Form Version:**	3
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/692\6929595.pdf

Additional Detail(s) (Map)

Well Completed Date:	11/04/2005
Year Completed:	2005
Depth (m):	16.2
Latitude:	43.6834708637313
Longitude:	-79.2848072444469
Path:	692\6929595.pdf

Bore Hole Information

Bore Hole ID:	11328564	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638244.00
Code OB Desc:		**North83:**	4838147.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	11/04/2005	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr

Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 933039676
Layer: 1
Color: 8
General Color: BLACK
Mat1: 02
Most Common Material: TOPSOIL
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 0.20000000298023224
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 933039677
Layer: 2
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 84
Mat2 Desc: SILTY
Mat3:
Mat3 Desc:
Formation Top Depth: 0.20000000298023224
Formation End Depth: 16.200000762939453
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 933281655
Layer: 3
Plug From: 11.0
Plug To: 16.200000762939453
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 933281658
Layer: 4
Plug From:
Plug To: 16.200000762939453
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 933281657
Layer: 2
Plug From: 0.20000000298023224
Plug To: 11.0
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 933281656
Layer: 1
Plug From: 0.0
Plug To: 0.20000000298023224
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID: 966929595
Method Construction Code: B
Method Construction: Other Method
Other Method Construction:

Pipe Information

Pipe ID: 11343419
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930873570
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0.0
Depth To: 11.699999809265137
Casing Diameter: 5.0
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 933415615
Layer: 1
Slot: 10
Screen Top Depth: 11.699999809265137
Screen End Depth: 16.200000762939453
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 6.300000190734863

Hole Diameter

Hole ID: 11549682
Diameter: 10.0
Depth From: 0.0
Depth To: 16.200000762939453

Hole Depth UOM: m
Hole Diameter UOM: cm

Links

Bore Hole ID:	11328564	**Tag No:**	A033879
Depth M:	16.2	**Contractor:**	7147
Year Completed:	2005	**Latitude:**	43.6834708637313
Well Completed Dt:	11/04/2005	**Longitude:**	-79.2848072444469
Audit No:	Z37151	**Y:**	43.68347086114794
Path:	692\6929595.pdf	**X:**	-79.28480709357903

---

103 | **1 of 1** | **SSW/265.8** | **119.9 / -9.89** | **ON** | **WWIS**

Well ID:	7171485	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:		**Data Entry Status:**	Yes
Use 2nd:		**Data Src:**	
Final Well Status:		**Date Received:**	11/14/2011
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	M10384	**Contractor:**	6607
Tag:	A115312	**Form Version:**	5
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/717\7171485.pdf

Additional Detail(s) (Map)

Well Completed Date:	08/26/2011
Year Completed:	2011
Depth (m):	
Latitude:	43.6794693394573
Longitude:	-79.2821547348436
Path:	717\7171485.pdf

Bore Hole Information

Bore Hole ID:	1003605836	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638467.00
Code OB Desc:		**North83:**	4837707.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	5
Date Completed:	08/26/2011	**UTMRC Desc:**	margin of error : 100 m - 300 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			

Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Links

Bore Hole ID:	1003605836	***Tag No:***	A115312
Depth M:		***Contractor:***	6607
Year Completed:	2011	***Latitude:***	43.6794693394573
Well Completed Dt:	08/26/2011	***Longitude:***	-79.2821547348436
Audit No:	M10384	***Y:***	43.67946933625575
Path:	717\7171485.pdf	***X:***	-79.28215458444046

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104 ***1 of 1*** ***WSW/266.3*** ***129.8 / 0.00*** ***1035 KINGSTON RD TORONTO ON M4E 1T5*** ***EHS***

Order No:	20110722014	***Nearest Intersection:***	KINGSTON RD 7 BINGHAM AVE
Status:	C	***Municipality:***	
Report Type:	Standard Select Report	***Client Prov/State:***	ON
Report Date:	8/2/2011	***Search Radius (km):***	0.25
Date Received:	7/22/2011 11:10:25 AM	***X:***	-79.284382
Previous Site Name:		***Y:***	43.680651
Lot/Building Size:			
Additional Info Ordered:	Aerial Photos		

---

105 ***1 of 1*** ***NW/269.2*** ***125.8 / -4.01*** ***ON*** ***WWIS***

Well ID:	7397850	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:		***Data Entry Status:***	Yes
Use 2nd:		***Data Src:***	
Final Well Status:		***Date Received:***	09/21/2021
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	Yes
Audit No:	Z366466	***Contractor:***	7215
Tag:		***Form Version:***	7
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	YORK
Elevatn Reliabilty:		***Lot:***	
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

Bore Hole Information

Bore Hole ID:	1008783960	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:		***East83:***	638378.00
Code OB Desc:		***North83:***	4838428.00
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	08/25/2021	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			

Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Links

Bore Hole ID:	1008783960	***Tag No:***	
Depth M:		***Contractor:***	7215
Year Completed:	2021	***Latitude:***	43.6859748976335
Well Completed Dt:	08/25/2021	***Longitude:***	-79.283073294665
Audit No:	Z366466	***Y:***	43.68597489495192
Path:		***X:***	-79.28307314419185

106 ***1 of 1*** ***ENE/269.9*** ***130.8 / 1.00*** ***ON*** ***BORE***

Borehole ID:	626618	***Inclin FLG:***	No
OGF ID:	215527058	***SP Status:***	Initial Entry
Status:		***Surv Elev:***	No
Type:	Borehole	***Piezometer:***	No
Use:	Geotechnical/Geological Investigation	***Primary Name:***	
Completion Date:	MAR-1968	***Municipality:***	
Static Water Level:		***Lot:***	
Primary Water Use:	Not Used	***Township:***	
Sec. Water Use:		***Latitude DD:***	43.68403
Total Depth m:	6.2	***Longitude DD:***	-79.276594
Depth Ref:	Ground Surface	***UTM Zone:***	17
Depth Elev:		***Easting:***	638905
Drill Method:	Power auger	***Northing:***	4838223
Orig Ground Elev m:	135	***Location Accuracy:***	
Elev Reliabil Note:		***Accuracy:***	Not Applicable
DEM Ground Elev m:	134		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218440897	***Mat Consistency:***	
Top Depth:	0	***Material Moisture:***	
Bottom Depth:	.7	***Material Texture:***	
Material Color:	Brown	***Non Geo Mat Type:***	
Material 1:	Sand	***Geologic Formation:***	
Material 2:	Silt	***Geologic Group:***	
Material 3:	Asphalt	***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	SAND,SILT,ASPHALT. BROWN,GRANULAR.		

Geology Stratum ID:	218440898	***Mat Consistency:***	Dense
Top Depth:	.7	***Material Moisture:***	
Bottom Depth:	6.2	***Material Texture:***	Fine to Medium
Material Color:	Brown	***Non Geo Mat Type:***	
Material 1:	Sand	***Geologic Formation:***	
Material 2:	Silt	***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	SAND-FINE TO MEDIUM,SILT. BROWN,VERY DENSE,GRANULAR. 00023026 **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Source

Source Type:	Data Survey	***Source Appl:***	Spatial/Tabular
Source Orig:	Geological Survey of Canada	***Source Iden:***	1
Source Date:	1956-1972	***Scale or Res:***	Varies
Confidence:	H	***Horizontal:***	NAD27
Observatio:		***Verticalda:***	Mean Average Sea Level
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Details:	File: OSHAWA.txt RecordID: 003830 NTS_Sheet: 30M11C		
Confiden 1:	Logged by professional. Exact and complete description of material and properties.		

Source List

Source Identifier:	1	***Horizontal Datum:***	NAD27
Source Type:	Data Survey	***Vertical Datum:***	Mean Average Sea Level
Source Date:	1956-1972	***Projection Name:***	Universal Transverse Mercator
Scale or Resolution:	Varies		
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Originators:	Geological Survey of Canada		

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107 ***1 of 1*** ***ESE/271.3*** ***125.7 / -4.16*** ***SCARBOROUGH CITY - LOT 34, CONC. A LYNNDALE RD./LYNNDALE CRES. SCARBOROUGH CITY ON*** ***CA***

Certificate #:	3-1188-92-
Application Year:	92
Issue Date:	9/17/1992
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

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108 ***1 of 1*** ***NW/273.4*** ***125.8 / -4.01*** ***ON*** ***WWIS***

Well ID:	7397851	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:		***Data Entry Status:***	Yes
Use 2nd:		***Data Src:***	
Final Well Status:		***Date Received:***	09/21/2021
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	Yes
Audit No:	Z366465	***Contractor:***	7215
Tag:		***Form Version:***	7
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	YORK
Elevatn Reliabilty:		***Lot:***	
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

Bore Hole Information

Bore Hole ID:	1008783963	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:		***East83:***	638375.00
Code OB Desc:		***North83:***	4838431.00
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	08/25/2021	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Links

Bore Hole ID:	1008783963	***Tag No:***	
Depth M:		***Contractor:***	7215
Year Completed:	2021	***Latitude:***	43.6860024565014
Well Completed Dt:	08/25/2021	***Longitude:***	-79.2831097304295
Audit No:	Z366465	***Y:***	43.68600245440255
Path:		***X:***	-79.28310957894739

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109 ***1 of 2*** ***SW/275.9*** ***128.5 / -1.36*** ***Enbridge Gas Distribution Inc.*** ***SPL***
366 Victoria Park Ave.
Toronto ON

Ref No:	8461-AG5U34	***Municipality No:***	
Year:		***Nature of Damage:***	
Incident Dt:	2016/11/28	***Discharger Report:***	
Dt MOE Arvl on Scn:		***Material Group:***	
MOE Reported Dt:	2016/11/28	***Health/Env Conseq:***	
Dt Document Closed:		***Agency Involved:***	
Site No:	NA		
Facility Name:			
MOE Response:	No		
Site County/District:			
Site Geo Ref Meth:			
Site District Office:			
Nearest Watercourse:			
Site Name:	Residence<UNOFFICIAL>		
Site Address:	366 Victoria Park Ave.		
Site Region:			
Site Municipality:	Toronto		
Site Lot:			
Site Conc:			
Site Geo Ref Accu:			
Site Map Datum:			
Northing:			
Easting:			
Incident Cause:			
Incident Event:	Operator/Human error		
Environment Impact:			
Nature of Impact:			
Contaminant Qty:	0 other - see incident description		
System Facility Address:			
Client Name:	Enbridge Gas Distribution Inc.		

Client Type:	
Call Report Locatn Geodata:	
Contaminant Code:	35
Contaminant Name:	NATURAL GAS (METHANE)
Contaminant Limit 1:	
Contam Limit Freq 1:	
Contaminant UN No 1:	
Receiving Medium:	
Receiving Environment:	Air
Incident Reason:	Operator/Human Error
Incident Summary:	TSSA FSB - Enbridge, 1/2" Plastic Service Line Damaged, Made Safe
Activity Preceding Spill:	
Property 2nd Watershed:	
Property Tertiary Watershed:	
Sector Type:	Miscellaneous Communal
SAC Action Class:	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Source Type:	

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109 *2 of 2* *SW/275.9* *128.5 / -1.36* ***PIPELINE HIT - 1/2"***
366 VICTORIA PARK AVE,,TORONTO,ON,M4E 3S8,CA
ON **PINC**

Incident Id:		**Pipe Material:**	
Incident No:	1984288	**Fuel Category:**	
Incident Reported Dt:	11/29/2016	**Health Impact:**	
Type:	FS-Pipeline Incident	**Environment Impact:**	
Status Code:		**Property Damage:**	
Tank Status:	Pipeline Damage Reason Est	**Service Interrupt:**	
Task No:		**Enforce Policy:**	
Spills Action Centre:		**Public Relation:**	
Fuel Type:		**Pipeline System:**	
Fuel Occurrence Tp:		**PSIG:**	
Date of Occurrence:		**Attribute Category:**	
Occurrence Start Dt:		**Regulator Location:**	
Depth:		**Method Details:**	
Customer Acct Name:	PIPELINE HIT - 1/2"		
Incident Address:	366 VICTORIA PARK AVE,,TORONTO,ON,M4E 3S8,CA		
Operation Type:			
Pipeline Type:			
Regulator Type:			
Summary:			
Reported By:			
Affiliation:			
Occurrence Desc:			
Damage Reason:			
Notes:			

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110 *1 of 11* *WNW/278.1* *125.7 / -4.11* ***SCARBOROUGH BOARD OF EDUCATION***
290 BLANTYRE AVENUE
SCARBOROUGH CITY ON M1N 2S4 **CA**

Certificate #:	8-3248-94-
Application Year:	94
Issue Date:	6/22/1994
Approval Type:	Industrial air
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Project Description: #2 OIL-FIRED STANDBY GENERATOR
Contaminants: Nitrogen Oxides
Emission Control: No Controls

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110 | ***2 of 11*** | ***WNW/278.1*** | ***125.7 / -4.11*** | ***SCARBOROUGH BOARD OF EDUCATION BLANTYRE 290 BLANTYRE AVENUE SCARBOROUGH ON M1N 2S4*** | ***GEN***

Generator No: ON0155659
SIC Code: 8511
SIC Description: ELEMT./SECON. EDUC.
Approval Years: 93,94,95,96,97,98,99,00,01
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 221
Waste Class Name: LIGHT FUELS

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110 | ***3 of 11*** | ***WNW/278.1*** | ***125.7 / -4.11*** | ***TORONTO DISTRICT SCHOOL BOARD BLANTYRE 290 BLANTYRE AVENUE TORONTO ON M1N 2S4*** | ***GEN***

Generator No: ON0155659
SIC Code: 611110
SIC Description: Elementary and Secondary Schools
Approval Years: 04
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

---

110 | ***4 of 11*** | ***WNW/278.1*** | ***125.7 / -4.11*** | ***TORONTO DISTRICT SCHOOL BOARD BLANTYRE P S 290 BLANTYRE AVENUE TORONTO ON M1N 2S4*** | ***GEN***

Generator No: ON0155659
SIC Code: 611110
SIC Description: Elementary and Secondary Schools
Approval Years: 05
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 145
Waste Class Name: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 148
Waste Class Name: INORGANIC LABORATORY CHEMICALS

Waste Class: 221
Waste Class Name: LIGHT FUELS

Waste Class: 263
Waste Class Name: ORGANIC LABORATORY CHEMICALS

---

110 *5 of 11* *WNW/278.1* *125.7 / -4.11* ***TORONTO DISTRICT SCHOOL BOARD BLANTYRE P S 290 BLANTYRE AVE TORONTO ON*** ***GEN***

Generator No: ON5265502
SIC Code: 611110
SIC Description: Elementary and Secondary Schools
Approval Years: 2012
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

---

110 *6 of 11* *WNW/278.1* *125.7 / -4.11* ***TORONTO DISTRICT SCHOOL BOARD BLANTYRE P S 290 BLANTYRE AVE TORONTO ON*** ***GEN***

Generator No: ON5265502
SIC Code: 611110
SIC Description: ELEMENTARY AND SECONDARY SCHOOLS
Approval Years: 2013
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 252
Waste Class Name: WASTE OILS & LUBRICANTS

Waste Class: 122
Waste Class Name: ALKALINE WASTES - OTHER METALS

Waste Class: 146
Waste Class Name: OTHER SPECIFIED INORGANICS

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110 *7 of 11* *WNW/278.1* *125.7 / -4.11* ***TORONTO DISTRICT SCHOOL BOARD BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4*** ***GEN***

Generator No: ON5265502

SIC Code:	611110
SIC Description:	ELEMENTARY AND SECONDARY SCHOOLS
Approval Years:	2016
PO Box No:	
Country:	Canada
Status:	
Co Admin:	
Choice of Contact:	CO_OFFICIAL
Phone No Admin:	
Contaminated Facility:	No
MHSW Facility:	No

Detail(s)

Waste Class:	145
Waste Class Name:	PAINT/PIGMENT/COATING RESIDUES
Waste Class:	146
Waste Class Name:	OTHER SPECIFIED INORGANICS
Waste Class:	122
Waste Class Name:	ALKALINE WASTES - OTHER METALS
Waste Class:	112
Waste Class Name:	ACID WASTE - HEAVY METALS
Waste Class:	252
Waste Class Name:	WASTE OILS & LUBRICANTS

---

110 | **8 of 11** | **WNW/278.1** | **125.7 / -4.11** | **TORONTO DISTRICT SCHOOL BOARD**
BLANTYRE P S 290 BLANTYRE AVE
TORONTO ON M1N 2S4 | **GEN**

Generator No:	ON5265502
SIC Code:	611110
SIC Description:	ELEMENTARY AND SECONDARY SCHOOLS
Approval Years:	2015
PO Box No:	
Country:	Canada
Status:	
Co Admin:	
Choice of Contact:	CO_OFFICIAL
Phone No Admin:	
Contaminated Facility:	No
MHSW Facility:	No

Detail(s)

Waste Class:	252
Waste Class Name:	WASTE OILS & LUBRICANTS
Waste Class:	112
Waste Class Name:	ACID WASTE - HEAVY METALS
Waste Class:	145
Waste Class Name:	PAINT/PIGMENT/COATING RESIDUES
Waste Class:	122
Waste Class Name:	ALKALINE WASTES - OTHER METALS
Waste Class:	146
Waste Class Name:	OTHER SPECIFIED INORGANICS

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
110	9 of 11	WNW/278.1	125.7 / -4.11	TORONTO DISTRICT SCHOOL BOARD BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4	GEN

Generator No: ON5265502
SIC Code: 611110
SIC Description: ELEMENTARY AND SECONDARY SCHOOLS
Approval Years: 2014
PO Box No:
Country: Canada
Status:
Co Admin:
Choice of Contact: CO_OFFICIAL
Phone No Admin:
Contaminated Facility: No
MHSW Facility: No

Detail(s)

Waste Class: 146
Waste Class Name: OTHER SPECIFIED INORGANICS

Waste Class: 122
Waste Class Name: ALKALINE WASTES - OTHER METALS

Waste Class: 252
Waste Class Name: WASTE OILS & LUBRICANTS

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
110	10 of 11	WNW/278.1	125.7 / -4.11	TORONTO DISTRICT SCHOOL BOARD BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4	GEN

Generator No: ON5265502
SIC Code:
SIC Description:
Approval Years: As of Dec 2017
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 145 I
Waste Class Name: Wastes from the use of pigments, coatings and paints

Waste Class: 146 C
Waste Class Name: Other specified inorganic sludges, slurries or solids

Waste Class: 252 L
Waste Class Name: Waste crankcase oils and lubricants

Waste Class: 232 L
Waste Class Name: Polymeric resins

Waste Class: 146 R
Waste Class Name: Other specified inorganic sludges, slurries or solids

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Waste Class: 148 C
Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 112 C
Waste Class Name: Acid solutions - containing heavy metals

Waste Class: 122 C
Waste Class Name: Alkaline slutions - containing other metals and non-metals (not cyanide)

---

110 | **11 of 11** | **WNW/278.1** | **125.7 / -4.11** | **TORONTO DISTRICT SCHOOL BOARD BLANTYRE P S 290 BLANTYRE AVE TORONTO ON M1N 2S4** | **GEN**

Generator No: ON5265502
SIC Code:
SIC Description:
Approval Years: As of Oct 2019
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 146 R
Waste Class Name: Other specified inorganic sludges, slurries or solids

Waste Class: 112 C
Waste Class Name: Acid solutions - containing heavy metals

Waste Class: 146 C
Waste Class Name: Other specified inorganic sludges, slurries or solids

Waste Class: 252 L
Waste Class Name: Waste crankcase oils and lubricants

Waste Class: 232 L
Waste Class Name: Polymeric resins

Waste Class: 148 C
Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 122 C
Waste Class Name: Alkaline slutions - containing other metals and non-metals (not cyanide)

Waste Class: 145 I
Waste Class Name: Wastes from the use of pigments, coatings and paints

---

111 | **1 of 1** | **SSE/279.9** | **128.8 / -1.01** | **ON** | **BORE**

Borehole ID: 626620
OGF ID: 215527060
Status:
Type: Borehole
Use: Geotechnical/Geological Investigation
Completion Date: MAR-1968
Static Water Level:
Primary Water Use: Not Used
Inclin FLG: No
SP Status: Initial Entry
Surv Elev: No
Piezometer: No
Primary Name:
Municipality:
Lot:
Township:

Sec. Water Use:		**Latitude DD:**	43.679751
Total Depth m:	6.2	**Longitude DD:**	-79.279446
Depth Ref:	Ground Surface	**UTM Zone:**	17
Depth Elev:		**Easting:**	638685
Drill Method:	Power auger	**Northing:**	4837743
Orig Ground Elev m:	126	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Not Applicable
DEM Ground Elev m:	127		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218440902	**Mat Consistency:**	Dense
Top Depth:	4.9	**Material Moisture:**	
Bottom Depth:	6.2	**Material Texture:**	Medium
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Silt	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	SAND-MEDIUM,SILT. BROWN,VERY DENSE,GRANULAR. 0000000400160030 **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	218440901	**Mat Consistency:**	Loose
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	4.9	**Material Texture:**	Fine to Medium
Material Color:	Brown	**Non Geo Mat Type:**	
Material 1:	Sand	**Geologic Formation:**	
Material 2:	Silt	**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	SAND-FINE TO MEDIUM,SILT. BROWN,LOOSE,GRANULAR.		

Source

Source Type:	Data Survey	**Source Appl:**	Spatial/Tabular
Source Orig:	Geological Survey of Canada	**Source Iden:**	1
Source Date:	1956-1972	**Scale or Res:**	Varies
Confidence:	H	**Horizontal:**	NAD27
Observatio:		**Verticalda:**	Mean Average Sea Level
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Details:	File: OSHAWA.txt RecordID: 003850 NTS_Sheet: 30M11C		
Confiden 1:	Logged by professional. Exact and complete description of material and properties.		

Source List

Source Identifier:	1	**Horizontal Datum:**	NAD27
Source Type:	Data Survey	**Vertical Datum:**	Mean Average Sea Level
Source Date:	1956-1972	**Projection Name:**	Universal Transverse Mercator
Scale or Resolution:	Varies		
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Originators:	Geological Survey of Canada		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
112	1 of 4	WSW/280.3	129.8 / 0.00	Toronto Transit Commission 410 Victoria Park Avenue Toronto ON M4E 3T2	GEN

Generator No:	ON7927063
SIC Code:	485110
SIC Description:	485110
Approval Years:	2016
PO Box No:	
Country:	Canada
Status:	
Co Admin:	James Power
Choice of Contact:	CO_ADMIN
Phone No Admin:	4163978502 Ext.
Contaminated Facility:	No
MHSW Facility:	No

Detail(s)

Waste Class:	251
Waste Class Name:	OIL SKIMMINGS & SLUDGES
Waste Class:	212
Waste Class Name:	ALIPHATIC SOLVENTS
Waste Class:	150
Waste Class Name:	INERT INORGANIC WASTES

---

112 **2 of 4** **WSW/280.3** **129.8 / 0.00** **Toronto Transit Commission**
410 Victoria Park Avenue
Toronto ON M4E 3T2 **GEN**

Generator No:	ON7927063
SIC Code:	
SIC Description:	
Approval Years:	As of Dec 2018
PO Box No:	
Country:	Canada
Status:	Registered
Co Admin:	
Choice of Contact:	
Phone No Admin:	
Contaminated Facility:	
MHSW Facility:	

Detail(s)

Waste Class:	150 L
Waste Class Name:	Inert organic wastes
Waste Class:	212 L
Waste Class Name:	Aliphatic solvents and residues
Waste Class:	251 L
Waste Class Name:	Waste oils/sludges (petroleum based)

---

112 **3 of 4** **WSW/280.3** **129.8 / 0.00** **Toronto Transit Commission**
410 Victoria Park Avenue
Toronto ON M4E 3T2 **GEN**

Generator No:	ON7927063
SIC Code:	
SIC Description:	
Approval Years:	As of Jul 2020
PO Box No:	
Country:	Canada
Status:	Registered

Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 251 L
Waste Class Name: Waste oils/sludges (petroleum based)

Waste Class: 212 L
Waste Class Name: Aliphatic solvents and residues

Waste Class: 150 L
Waste Class Name: Inert organic wastes

---

112 | ***4 of 4*** | ***WSW/280.3*** | ***129.8 / 0.00*** | ***Toronto Transit Commission***
410 Victoria Park Avenue
Toronto ON M4E 3T2 | ***GEN***

Generator No: ON7927063
SIC Code:
SIC Description:
Approval Years: As of Nov 2021
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 251 L
Waste Class Name: Waste oils/sludges (petroleum based)

Waste Class: 150 L
Waste Class Name: Inert organic wastes

Waste Class: 212 L
Waste Class Name: Aliphatic solvents and residues

---

113 | ***1 of 1*** | ***NNW/281.4*** | ***124.1 / -5.78*** | ***ON*** | ***WWIS***

Well ID:	7397854	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:		***Data Entry Status:***	Yes
Use 2nd:		***Data Src:***	
Final Well Status:		***Date Received:***	09/21/2021
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	Yes
Audit No:	Z366467	***Contractor:***	7215
Tag:		***Form Version:***	7
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	YORK
Elevatn Reliabilty:		***Lot:***	
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	

Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: SCARBOROUGH BOROUGH
Site Info:

Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 1008783972
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 08/25/2021
Remarks:
Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 17
East83: 638429.00
North83: 4838499.00
Org CS: UTM83
UTMRC: 4
UTMRC Desc: margin of error : 30 m - 100 m
Location Method: wwr

Links

Bore Hole ID: 1008783972
Depth M:
Year Completed: 2021
Well Completed Dt: 08/25/2021
Audit No: Z366467
Path:

Tag No:
Contractor: 7215
Latitude: 43.6866043895063
Longitude: -79.2824225540972
Y: 43.686604387253965
X: -79.28242240295592

---

114 | ***1 of 1*** | ***N/289.4*** | ***124.3 / -5.50*** | ***1198152 ONTARIO LIMITED COALPORT DR/RATHMORE AVE. SCARBOROUGH CITY ON*** | ***CA***

Certificate #: 7-0951-97-
Application Year: 97
Issue Date: 9/15/1997
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

---

115 | ***1 of 1*** | ***NNW/290.0*** | ***123.9 / -5.96*** | ***ON*** | ***WWIS***

Well ID: 7397874
Construction Date:
Use 1st:
Use 2nd:
Final Well Status:
Water Type:
Casing Material:

Flowing (Y/N):
Flow Rate:
Data Entry Status: Yes
Data Src:
Date Received: 09/21/2021
Selected Flag: TRUE
Abandonment Rec: Yes

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Audit No:	Z366456	**Contractor:**	7215
Tag:		**Form Version:**	7
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

Bore Hole Information

Bore Hole ID:	1008784032	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638444.00
Code OB Desc:		**North83:**	4838520.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	08/25/2021	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Links

Bore Hole ID:	1008784032	**Tag No:**	
Depth M:		**Contractor:**	7215
Year Completed:	2021	**Latitude:**	43.6867905922318
Well Completed Dt:	08/25/2021	**Longitude:**	-79.28223112698
Audit No:	Z366456	**Y:**	43.68679058947897
Path:		**X:**	-79.2822309765052

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
116	1 of 6	WSW/290.0	129.6 / -0.21	KINGSTON ROAD ANIMAL HOSPITAL 1025 KINGSTON ROAD TORONTO ON M4E 1T4	GEN

Generator No:	ON2287000
SIC Code:	0211
SIC Description:	VETERINARY SERVICE
Approval Years:	97,98,99,00,01
PO Box No:	
Country:	
Status:	
Co Admin:	
Choice of Contact:	
Phone No Admin:	
Contaminated Facility:	
MHSW Facility:	

Detail(s)

Waste Class:	312

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Waste Class Name: PATHOLOGICAL WASTES

---

116 | **2 of 6** | **WSW/290.0** | **129.6 / -0.21** | **Kingston Rd. Animal Hospital**
1025 Kingston Rd
Toronto ON M4E 1T5 | **GEN**

Generator No: ON8920651
SIC Code: 541940
SIC Description: Veterinary Services
Approval Years: 07,08
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

---

116 | **3 of 6** | **WSW/290.0** | **129.6 / -0.21** | **Kingston Rd. Animal Hospital**
1025 Kingston Rd
Toronto ON M4E 1T5 | **GEN**

Generator No: ON8920651
SIC Code: 541940
SIC Description: Veterinary Services
Approval Years: 2009
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

---

116 | **4 of 6** | **WSW/290.0** | **129.6 / -0.21** | **Kingston Rd. Animal Hospital**
1025 Kingston Rd
Toronto ON M4E 1T5 | **GEN**

Generator No: ON8920651
SIC Code: 541940
SIC Description:
Approval Years: 2011
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

---

116 | ***5 of 6*** | ***WSW/290.0*** | ***129.6 / -0.21*** | ***Kingston Rd. Animal Hospital*** ***1025 Kingston Rd*** ***Toronto ON M4E 1T5*** | ***GEN***

Generator No: ON8920651
SIC Code: 541940
SIC Description: Veterinary Services
Approval Years: 2012
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

---

116 | ***6 of 6*** | ***WSW/290.0*** | ***129.6 / -0.21*** | ***Kingston Rd. Animal Hospital*** ***1025 Kingston Rd*** ***Toronto ON*** | ***GEN***

Generator No: ON8920651
SIC Code: 541940
SIC Description: VETERINARY SERVICES
Approval Years: 2013
PO Box No:
Country:
Status:
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

---

117 | ***1 of 7*** | ***WSW/290.0*** | ***129.6 / -0.21*** | ***Kingston Rd. Animal Hospital*** ***1025 Kingston Rd*** ***Toronto ON M4E 1T4*** | ***GEN***

Generator No: ON8920651
SIC Code: 541940
SIC Description: VETERINARY SERVICES
Approval Years: 2016
PO Box No:
Country: Canada
Status:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Co Admin: Jonathan Mitelman
Choice of Contact: CO_OFFICIAL
Phone No Admin: 416-690-0625 Ext.
Contaminated Facility: No
MHSW Facility: No

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

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117 *2 of 7* *WSW/290.0* *129.6 / -0.21* ***Kingston Rd. Animal Hospital***
1025 Kingston Rd
Toronto ON M4E 1T4 ***GEN***

Generator No: ON8920651
SIC Code: 541940
SIC Description: VETERINARY SERVICES
Approval Years: 2015
PO Box No:
Country: Canada
Status:
Co Admin: Jonathan Mitelman
Choice of Contact: CO_OFFICIAL
Phone No Admin: 416-690-0625 Ext.
Contaminated Facility: No
MHSW Facility: No

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

---

117 *3 of 7* *WSW/290.0* *129.6 / -0.21* ***Kingston Rd. Animal Hospital***
1025 Kingston Rd
Toronto ON M4E 1T4 ***GEN***

Generator No: ON8920651
SIC Code: 541940
SIC Description: VETERINARY SERVICES
Approval Years: 2014
PO Box No:
Country: Canada
Status:
Co Admin: Jonathan Mitelman
Choice of Contact: CO_OFFICIAL
Phone No Admin: 416-690-0625 Ext.
Contaminated Facility: No
MHSW Facility: No

Detail(s)

Waste Class: 312
Waste Class Name: PATHOLOGICAL WASTES

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117 *4 of 7* *WSW/290.0* *129.6 / -0.21* ***Kingston Rd. Animal Hospital***
1025 Kingston Rd
Toronto ON M4E 1T4 ***GEN***

Generator No: ON8920651
SIC Code:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

SIC Description:
Approval Years: As of Dec 2018
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312 P
Waste Class Name: Pathological wastes

117	5 of 7	WSW/290.0	129.6 / -0.21	Kingston Rd. Animal Hospital 1025 Kingston Rd Toronto ON M4E 1T4	GEN

Generator No: ON8920651
SIC Code:
SIC Description:
Approval Years: As of Jul 2020
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312 P
Waste Class Name: Pathological wastes

117	6 of 7	WSW/290.0	129.6 / -0.21	Kingston Rd. Animal Hospital 1025 Kingston Rd Toronto ON M4E 1T4	GEN

Generator No: ON8920651
SIC Code:
SIC Description:
Approval Years: As of Nov 2021
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312 P
Waste Class Name: Pathological wastes

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
117	7 of 7	WSW/290.0	129.6 / -0.21	Kingston Rd. Animal Hospital 1025 Kingston Rd Toronto ON M4E 1T4	GEN

Generator No: ON8920651
SIC Code:
SIC Description:
Approval Years: As of Oct 2022
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 312 P
Waste Class Name: PATHOLOGICAL WASTES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
118	1 of 1	WSW/290.1	129.8 / 0.00	Celestial Stained Glass 1024 Kingston Rd Toronto ON M4E 1T4	SCT

Established:
Plant Size (ft²):
Employment: 4

--Details--
Description: Glass Manufacturing
SIC/NAICS Code: 327214

Description: Glass Product Manufacturing from Purchased Glass
SIC/NAICS Code: 327215

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
119	1 of 1	WSW/290.6	129.8 / 0.00	1020 - 1024 Kingston Road Toronto ON	EHS

Order No: 20061204018
Status: C
Report Type: Basic Report
Report Date: 12/12/2006
Date Received: 12/4/2006
Previous Site Name:
Lot/Building Size:
Additional Info Ordered: Fire Insur. Maps And /or Site Plans

Nearest Intersection: Bingham Avenue
Municipality: Toronto
Client Prov/State: ON
Search Radius (km): 0.25
X: -79.284898
Y: 43.680953

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
120	1 of 1	NW/291.0	125.0 / -4.81	ON	WWIS

Well ID: 7397894
Construction Date:
Use 1st:
Use 2nd:
Final Well Status:
Water Type:
Casing Material:
Audit No: Z366464

Flowing (Y/N):
Flow Rate:
Data Entry Status: Yes
Data Src:
Date Received: 09/21/2021
Selected Flag: TRUE
Abandonment Rec:
Contractor: 7215

Tag:	A183474	**Form Version:**	7
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

Bore Hole Information

Bore Hole ID:	1008791988	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638352.00
Code OB Desc:		**North83:**	4838428.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	08/25/2021	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Links

Bore Hole ID:	1008791988	**Tag No:**	A183474
Depth M:		**Contractor:**	7215
Year Completed:	2021	**Latitude:**	43.6859797418745
Well Completed Dt:	08/25/2021	**Longitude:**	-79.2833957472192
Audit No:	Z366464	**Y:**	43.6859797390646
Path:		**X:**	-79.28339559615634

---

121 ***1 of 1*** ***NNW/292.8*** ***123.8 / -6.09*** ***ON*** ***WWIS***

Well ID:	7397891	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:		**Data Entry Status:**	Yes
Use 2nd:		**Data Src:**	
Final Well Status:		**Date Received:**	09/21/2021
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z366458	**Contractor:**	7215
Tag:	A093139	**Form Version:**	7
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		

Site Info:

Bore Hole Information

Bore Hole ID:	1008791892	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:		***East83:***	638433.00
Code OB Desc:		***North83:***	4838516.00
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	08/25/2021	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Links

Bore Hole ID:	1008791892	***Tag No:***	A093139
Depth M:		***Contractor:***	7215
Year Completed:	2021	***Latitude:***	43.6867566430561
Well Completed Dt:	08/25/2021	***Longitude:***	-79.2823685785255
Audit No:	Z366458	***Y:***	43.68675664032628
Path:		***X:***	-79.28236842858423

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122 ***1 of 1*** ***SSW/292.8*** ***122.7 / -7.19*** ***127 VICTORIA PARK AVENUE Toronto ON*** ***WWIS***

Well ID:	7052481	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Test Hole	***Data Entry Status:***	
Use 2nd:		***Data Src:***	
Final Well Status:	Observation Wells	***Date Received:***	11/16/2007
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	Z61702	***Contractor:***	7241
Tag:	A063242	***Form Version:***	4
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	YORK
Elevatn Reliabilty:		***Lot:***	
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	TORONTO CITY		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/705\7052481.pdf

Additional Detail(s) (Map)

Well Completed Date:	10/27/2007
Year Completed:	2007
Depth (m):	8.53
Latitude:	43.6793624041962

Longitude: -79.2828277091323
Path: 705\7052481.pdf

Bore Hole Information

Bore Hole ID: 23052481
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 10/27/2007
Remarks:
Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 17
East83: 638413.00
North83: 4837694.00
Org CS: UTM83
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Overburden and Bedrock Materials Interval

Formation ID: 1001494845
Layer: 2
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 06
Mat2 Desc: SILT
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 0.30000001192092896
Formation End Depth: 2.440000057220459
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1001494846
Layer: 3
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 06
Mat2 Desc: SILT
Mat3: 66
Mat3 Desc: DENSE
Formation Top Depth: 2.440000057220459
Formation End Depth: 6.099999904632568
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 1001494844
Layer: 1
Color: 6

General Color:	BROWN
Mat1:	01
Most Common Material:	FILL
Mat2:	28
Mat2 Desc:	SAND
Mat3:	77
Mat3 Desc:	LOOSE
Formation Top Depth:	0.0
Formation End Depth:	0.30000001192092896
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1001494847
Layer:	4
Color:	2
General Color:	GREY
Mat1:	28
Most Common Material:	SAND
Mat2:	06
Mat2 Desc:	SILT
Mat3:	91
Mat3 Desc:	WATER-BEARING
Formation Top Depth:	6.099999904632568
Formation End Depth:	8.529999732971191
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001494849
Layer:	1
Plug From:	0.0
Plug To:	0.30000001192092896
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001494850
Layer:	2
Plug From:	0.30000001192092896
Plug To:	5.179999828338623
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1001494851
Layer:	3
Plug From:	5.179999828338623
Plug To:	8.529999732971191
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	1001494856
Method Construction Code:	B
Method Construction:	Other Method
Other Method Construction:	GEOPROBE

Pipe Information

Pipe ID:	1001494842
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1001494853
Layer:	
Material:	5
Open Hole or Material:	PLASTIC
Depth From:	
Depth To:	5.489999771118164
Casing Diameter:	3.809999942779541
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1001494854
Layer:	
Slot:	
Screen Top Depth:	
Screen End Depth:	
Screen Material:	5
Screen Depth UOM:	
Screen Diameter UOM:	
Screen Diameter:	

Results of Well Yield Testing

Pumping Test Method Desc:	
Pump Test ID:	1001494843
Pump Set At:	
Static Level:	
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	m
Rate UOM:	LPM
Water State After Test Code:	0
Water State After Test:	
Pumping Test Method:	0
Pumping Duration HR:	
Pumping Duration MIN:	
Flowing:	

Water Details

Water ID:	1001494852
Layer:	1
Kind Code:	
Kind:	
Water Found Depth:	
Water Found Depth UOM:	m

Hole Diameter

Hole ID:	1001494848
Diameter:	8.890000343322754
Depth From:	
Depth To:	8.529999732971191
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Links

Bore Hole ID:	23052481	***Tag No:***	A063242
Depth M:	8.53	***Contractor:***	7241
Year Completed:	2007	***Latitude:***	43.6793624041962
Well Completed Dt:	10/27/2007	***Longitude:***	-79.2828277091323
Audit No:	Z61702	***Y:***	43.67936240105553
Path:	705\7052481.pdf	***X:***	-79.2828275580284

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123 ***1 of 1*** ***NW/294.0*** ***124.9 / -4.99*** ***ON*** ***WWIS***

Well ID:	7397877	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:		***Data Entry Status:***	Yes
Use 2nd:		***Data Src:***	
Final Well Status:		***Date Received:***	09/21/2021
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	Yes
Audit No:	Z366463	***Contractor:***	7215
Tag:		***Form Version:***	7
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	YORK
Elevatn Reliabilty:		***Lot:***	
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

Bore Hole Information

Bore Hole ID:	1008784041	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:		***East83:***	638340.00
Code OB Desc:		***North83:***	4838413.00
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	08/25/2021	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Links

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Bore Hole ID: 1008784041
Depth M:
Year Completed: 2021
Well Completed Dt: 08/25/2021
Audit No: Z366463
Path:

Tag No:
Contractor: 7215
Latitude: 43.6858469779855
Longitude: -79.2835484219905
Y: 43.685846975441606
X: -79.28354827109

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124 **1 of 1** **NNW/295.6** **123.7 / -6.12** **Unknown Toronto ON** **EHS**

Order No: 20090624009
Status: C
Report Type: Custom Report
Report Date: 7/3/2009
Date Received: 6/24/2009
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:

Nearest Intersection: Victoria Park Ave and Gerrard Street East
Municipality: Toronto
Client Prov/State: ON
Search Radius (km): 0.25
X: -79.282064
Y: 43.686917

---

125 **1 of 2** **NW/296.7** **124.0 / -5.87** **ON** **WWIS**

Well ID: 7397853
Construction Date:
Use 1st:
Use 2nd:
Final Well Status:
Water Type:
Casing Material:
Audit No: Z366460
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: SCARBOROUGH BOROUGH
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status: Yes
Data Src:
Date Received: 09/21/2021
Selected Flag: TRUE
Abandonment Rec: Yes
Contractor: 7215
Form Version: 7
Owner:
County: YORK
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 1008783969
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 08/25/2021
Remarks:
Loc Method Desc: on Water Well Record
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 17
East83: 638383.00
North83: 4838478.00
Org CS: UTM83
UTMRC: 4
UTMRC Desc: margin of error : 30 m - 100 m
Location Method: wwr

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Links

Bore Hole ID:	1008783969	***Tag No:***	
Depth M:		***Contractor:***	7215
Year Completed:	2021	***Latitude:***	43.6864239637475
Well Completed Dt:	08/25/2021	***Longitude:***	-79.2829984454302
Audit No:	Z366460	***Y:***	43.68642396135527
Path:		***X:***	-79.28299829385189

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125 ***2 of 2*** ***NW/296.7*** ***124.0 / -5.87*** ***ON*** ***WWIS***

Well ID:	7397892	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:		***Data Entry Status:***	Yes
Use 2nd:		***Data Src:***	
Final Well Status:		***Date Received:***	09/21/2021
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	Z366459	***Contractor:***	7215
Tag:	A183475	***Form Version:***	7
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	YORK
Elevatn Reliabilty:		***Lot:***	
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

Bore Hole Information

Bore Hole ID:	1008791982	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:		***East83:***	638383.00
Code OB Desc:		***North83:***	4838478.00
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	08/25/2021	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Links

Bore Hole ID:	1008791982	***Tag No:***	A183475
Depth M:		***Contractor:***	7215
Year Completed:	2021	***Latitude:***	43.6864239637475
Well Completed Dt:	08/25/2021	***Longitude:***	-79.2829984454302
Audit No:	Z366459	***Y:***	43.68642396135527
Path:		***X:***	-79.28299829385189

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
126	1 of 1	NNW/297.2	123.6 / -6.26	ON	WWIS

Well ID:	7397856	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:		**Data Entry Status:**	Yes
Use 2nd:		**Data Src:**	
Final Well Status:		**Date Received:**	09/21/2021
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	Yes
Audit No:	Z366457	**Contractor:**	7215
Tag:		**Form Version:**	7
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	YORK
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	SCARBOROUGH BOROUGH		
Site Info:			

Bore Hole Information

Bore Hole ID:	1008783978	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	638431.00
Code OB Desc:		**North83:**	4838520.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	08/25/2021	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Links

Bore Hole ID:	1008783978	**Tag No:**	
Depth M:		**Contractor:**	7215
Year Completed:	2021	**Latitude:**	43.6867930156895
Well Completed Dt:	08/25/2021	**Longitude:**	-79.2823923553606
Audit No:	Z366457	**Y:**	43.686793013126476
Path:		**X:**	-79.28239220428408

Unplottable Summary

Total: 30 Unplottable sites

DB	Company Name/Site Name	Address	City	Postal
CA	WHIPPET DEVELOPMENTS LTD.	KINGSTON RD.	SCARBOROUGH CITY ON	
CA	SCARBOROUGH CITY PROJ. 830	EASEMENT OF N.SIDE OF KINGSTON	SCARBOROUGH CITY ON	
CA	WHIPPET DEVELOPMENTS LTD.	KINGSTON RD.	SCARBOROUGH CITY ON	
CA	SCARBOROUGH CITY PARKLAND RD. PROJ.#728	PARKLAND RD.	SCARBOROUGH CITY ON	
CA	TORONTO CITY DR. NO. LA-1183	LANE 31.0 M N. OF SWANWICK AVE	TORONTO CITY ON	
CA	INTRAURBAN PROPERTIES INC.	KINGSTON RD.	SCARBOROUGH CITY ON	
CA	SCARBOROUGH CITY - PROJ# 8365	FALLINGBROOK STORM OUTLET	SCARBOROUGH CITY ON	
CA	P.U.C. SCARBOROUGH	KINGSTON ROAD	SCARBOROUGH CITY ON	
CA	P.U.C.	KINGSTON RD.	SCARBOROUGH ON	
CA	1562930 Ontario Inc.	North Drive	Toronto ON	
CA	1562930 Ontario Inc.	North Drive	Toronto ON	
CA		Victoria Park Avenue	Toronto ON	
CA		Victoria Park Avenue	Toronto ON	
CA	CITY	S.OF KINGSTON RD.	TORONTO CITY ON	
CA	HIGHLAND VILLAGE PROPERTIES LTD.	KINGSTON ROAD	SCARBOROUGH CITY ON	
CA	DEAUVILLE DEV. LTD.	KINGSTON RD.	SCARBOROUGH ON	
ECA	City of Toronto	Victoria Park Avenue	Toronto ON	M5H 2N2

ECA	City of Toronto	Victoria Park Avenue	Toronto ON	M5V 3C6
ECA	1562930 Ontario Inc.	North Dr	Toronto ON	M5V 3E7
ECA	1562930 Ontario Inc.	North Dr	Toronto ON	M5V 3E7
EHS		Kingston Rd to Frenchman's Bay	Toronto and Pickering ON	
LIMO	City of Toronto Blantyre Park Landfill	North of Kingston Road, between Blantyre Ave and Fallingbrook Road Toronto	ON	
NCPL	Vertex Environmental Inc.	Kingston Rd intersection	Toronto ON	
PINC	PIPELINE HIT - 1/2"	TORONTO,,TORONTO,ON,,CA	ON	
PINC	PIPELINE HIT - 1/2"	TORONTO,,TORONTO,ON,,CA	ON	
PINC	PIPELINE HIT - 1/2"	TORONTO,,TORONTO,ON,,CA	ON	
SPL	C.C. TANK LINES LTD.	KINGSTON ROAD, WESTHILL TOP VALUE GAS STATION TANK TRUCK (CARGO)	TORONTO CITY ON	
SPL	PROVOST BULK CARRIERS INC.	PETRO CANADA TERMINAL TANK TRUCK (CARGO)	TORONTO CITY ON	
SPL	Enbridge Gas Distribution Inc.	Victoria Park	Toronto ON	
SPL		Across from Victoria Park Subway Stn (Southbound Lanes)	Toronto ON	

Unplottable Report

Site: ***WHIPPET DEVELOPMENTS LTD.***
KINGSTON RD. SCARBOROUGH CITY ON

Database: ***CA***

Certificate #:	7-1689-87-
Application Year:	87
Issue Date:	11/16/1987
Approval Type:	Municipal water
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Site: ***SCARBOROUGH CITY PROJ. 830***
EASEMENT OF N.SIDE OF KINGSTON SCARBOROUGH CITY ON

Database: ***CA***

Certificate #:	3-1071-87-
Application Year:	87
Issue Date:	8/5/1987
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Site: ***WHIPPET DEVELOPMENTS LTD.***
KINGSTON RD. SCARBOROUGH CITY ON

Database: ***CA***

Certificate #:	3-2011-87-
Application Year:	87
Issue Date:	11/16/1987
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Site: ***SCARBOROUGH CITY PARKLAND RD. PROJ.#728***
PARKLAND RD. SCARBOROUGH CITY ON

Database: ***CA***

Certificate #:	3-0574-88-

Application Year: 88
Issue Date: 6/1/1988
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***TORONTO CITY DR. NO. LA-1183***
LANE 31.0 M N. OF SWANWICK AVE TORONTO CITY ON

Database: ***CA***

Certificate #: 3-0263-89-
Application Year: 89
Issue Date: 3/22/1989
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***INTRAURBAN PROPERTIES INC.***
KINGSTON RD. SCARBOROUGH CITY ON

Database: ***CA***

Certificate #: 3-1510-89-
Application Year: 89
Issue Date: 10/11/1989
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***SCARBOROUGH CITY - PROJ# 8365***
FALLINGBROOK STORM OUTLET SCARBOROUGH CITY ON

Database: ***CA***

Certificate #: 3-0961-91-
Application Year: 91
Issue Date: 7/10/1991
Approval Type: Municipal sewage
Status: Preliminary approval
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***P.U.C. SCARBOROUGH***
KINGSTON ROAD SCARBOROUGH CITY ON

Database: ***CA***

Certificate #: 7-0777-86-
Application Year: 86
Issue Date: 7/28/1986
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***P.U.C.***
KINGSTON RD. SCARBOROUGH ON

Database: ***CA***

Certificate #: 7-0316-85-006
Application Year: 85
Issue Date: 7/3/85
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***1562930 Ontario Inc.***
North Drive Toronto ON

Database: ***CA***

Certificate #: 8268-6QZRP9
Application Year: 2006
Issue Date: 6/30/2006
Approval Type: Municipal and Private Sewage Works
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***1562930 Ontario Inc.***
North Drive Toronto ON

Database: ***CA***

Certificate #: 4308-5RBJSB
Application Year: 2003
Issue Date: 9/16/2003
Approval Type: Municipal and Private Sewage Works
Status: Revoked and/or Replaced
Application Type:
Client Name:
Client Address:

Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site:
Victoria Park Avenue Toronto ON

Database:
CA

Certificate #: 0280-4P5KHC
Application Year: 00
Issue Date: 9/15/00
Approval Type: Municipal & Private water
Status: Approved
Application Type: New Certificate of Approval
Client Name: Corporation of the City of Toronto
Client Address: 55 John St.
Client City: Toronto
Client Postal Code: M5V 3C6
Project Description: Re-connection of Existing Watermain on Victoria Park Ave.
Contaminants:
Emission Control:

Site:
Victoria Park Avenue Toronto ON

Database:
CA

Certificate #: 1822-4YBJCG
Application Year: 01
Issue Date: 7/11/01
Approval Type: Municipal & Private water
Status: Approved
Application Type: New Certificate of Approval
Client Name: Corporation of the City of Toronto
Client Address: 100 Queen Street West
Client City: Toronto
Client Postal Code: M5H 2N2
Project Description: Construction of watermains on Victoria Park Avenue
Contaminants:
Emission Control:

Site: ***CITY***
S.OF KINGSTON RD. TORONTO CITY ON

Database:
CA

Certificate #: 3-1238-85-006
Application Year: 85
Issue Date: 11/14/85
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***HIGHLAND VILLAGE PROPERTIES LTD.***
KINGSTON ROAD SCARBOROUGH CITY ON

Database:
CA

Certificate #: 7-0134-90-
Application Year: 90

Issue Date: 3/1/1990
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***DEAUVILLE DEV. LTD.***
KINGSTON RD. SCARBOROUGH ON

Database: ***CA***

Certificate #: 7-0107-85-006
Application Year: 85
Issue Date: 4/2/85
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***City of Toronto***
Victoria Park Avenue Toronto ON M5H 2N2

Database: ***ECA***

Approval No: 1822-4YBJCG
Approval Date: 2001-07-11
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name:
Approval Type: ECA-Municipal and Private Water Works
Project Type: Municipal and Private Water Works
Business Name: City of Toronto
Address: Victoria Park Avenue
Full Address:
Full PDF Link:
PDF Site Location:

MOE District:
City:
Longitude:
Latitude:
Geometry X:
Geometry Y:

Site: ***City of Toronto***
Victoria Park Avenue Toronto ON M5V 3C6

Database: ***ECA***

Approval No: 0280-4P5KHC
Approval Date: 2000-09-15
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name:
Approval Type: ECA-Municipal and Private Water Works
Project Type: Municipal and Private Water Works
Business Name: City of Toronto
Address: Victoria Park Avenue
Full Address:
Full PDF Link:
PDF Site Location:

MOE District:
City:
Longitude:
Latitude:
Geometry X:
Geometry Y:

Site: ***1562930 Ontario Inc.***
North Dr Toronto ON M5V 3E7

Database: ***ECA***

Approval No:	8268-6QZRP9	***MOE District:***	
Approval Date:	2006-06-30	***City:***	
Status:	Approved	***Longitude:***	
Record Type:	ECA	***Latitude:***	
Link Source:	IDS	***Geometry X:***	
SWP Area Name:		***Geometry Y:***	
Approval Type:	ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS		
Project Type:	MUNICIPAL AND PRIVATE SEWAGE WORKS		
Business Name:	1562930 Ontario Inc.		
Address:	North Dr		
Full Address:			
Full PDF Link:	https://www.accessenvironment.ene.gov.on.ca/instruments/2903-6QYPQT-14.pdf		
PDF Site Location:			

Site: ***1562930 Ontario Inc.***
North Dr Toronto ON M5V 3E7

Database: ***ECA***

Approval No:	4308-5RBJSB	***MOE District:***	
Approval Date:	2003-09-16	***City:***	
Status:	Revoked and/or Replaced	***Longitude:***	
Record Type:	ECA	***Latitude:***	
Link Source:	IDS	***Geometry X:***	
SWP Area Name:		***Geometry Y:***	
Approval Type:	ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS		
Project Type:	MUNICIPAL AND PRIVATE SEWAGE WORKS		
Business Name:	1562930 Ontario Inc.		
Address:	North Dr		
Full Address:			
Full PDF Link:	https://www.accessenvironment.ene.gov.on.ca/instruments/4756-5R9RZ4-14.pdf		
PDF Site Location:			

Site:
Kingston Rd to Frenchman's Bay Toronto and Pickering ON

Database: ***EHS***

Order No:	20110103027	***Nearest Intersection:***	
Status:	C	***Municipality:***	
Report Type:	No Charge	***Client Prov/State:***	ON
Report Date:	1/4/2011	***Search Radius (km):***	0.25
Date Received:	1/3/2011	***X:***	-79.122352
Previous Site Name:		***Y:***	1
Lot/Building Size:			
Additional Info Ordered:			

Site: ***City of Toronto Blantyre Park Landfill***
North of Kingston Road, between Blantyre Ave and Fallingbrook Road Toronto ON

Database: ***LIMO***

ECA/Instrument No:	X3020	***Natural Attenuation:***	
Operation Status:	Historic	***Liners:***	
C of A Issue Date:		***Cover Material:***	
C of A Issued to:		***Leachate Off-Site:***	
Lndfl Gas Mgmt (P):		***Leachate On Site:***	
Lndfl Gas Mgmt (F):		***Req Coll Lndfll Gas:***	
Lndfl Gas Mgmt (E):		***Lndfll Gas Coll:***	
Lndfl Gas Mgmt Sys:		***Total Waste Rec:***	
Landfill Gas Mntr:		***TWR Methodology:***	
Leachate Coll Sys:		***TWR Unit:***	
ERC Est Vol (m3):		***Tot Aprv Cap Unit:***	
ERC Volume Unit:		***Financial Assurance:***	
ERC Dt Last Det:		***Last Report Year:***	
Landfill Type:		***Region:***	

Source File Type:	Historic and Closed Landfills	***District Office:***	
Fill Rate:		***Site County:***	
Fill Rate Unit:		***Lot:***	
Tot Fill Area (ha):		***Concession:***	
Tot Site Area (ha):		***Latitude:***	
Footprint:		***Longitude:***	
Tot Apprv Cap (m3):		***Easting:***	
Contam Atten Zone:		***Northing:***	
Grndwtr Mntr:		***UTM Zone:***	
Surf Wtr Mntr:		***Data Source:***	
Air Emis Monitor:			
Approved Waste Type:			
Client Site Name:	City of Toronto Blantyre Park Landfill		
ERC Methodology:			
Site Name:			
Site Location Details:	North of Kingston Road, between Blantyre Ave and Fallingbrook Road Toronto		
Service Area:			
Page URL:			

Site: ***Vertex Environmental Inc.***
Kingston Rd intersection Toronto ON

Database: ***NCPL***

Year:	0020
Site Name:	Intersection of Kingston Rd and Glen everest Rd
Facility Owner:	Vertex Environmental Inc.
Discharge Type:	Industrial Sewage
Sector:	Miscellaneous Industrial
District Area:	Toronto
Type of Concern:	Approval / Permit Non-Compliance
Contaminant:	SUSPENDED SOLIDS, TOTAL
Status Report:	

Details

Incident Date:	
Exceedance Start Date:	2020-10-28
Exceedance End Date:	2020-12-04
Limit/Unit/Freq:	25mg/L / any
Quantity Min/Max:	27.4/2040
Facility Action:	Equipment Modified - Repaired - Replaced or Re-calibrated
Ministry Action:	Voluntary Abatement Program Underway

Site: ***PIPELINE HIT - 1/2"***
TORONTO,,TORONTO,ON,,CA ON

Database: ***PINC***

Incident Id:		***Pipe Material:***	
Incident No:	1113372	***Fuel Category:***	
Incident Reported Dt:	6/6/2013	***Health Impact:***	
Type:	FS-Pipeline Incident	***Environment Impact:***	
Status Code:		***Property Damage:***	
Tank Status:	Pipeline Damage Reason Est	***Service Interrupt:***	
Task No:		***Enforce Policy:***	
Spills Action Centre:		***Public Relation:***	
Fuel Type:		***Pipeline System:***	
Fuel Occurrence Tp:		***PSIG:***	
Date of Occurrence:		***Attribute Category:***	
Occurrence Start Dt:		***Regulator Location:***	
Depth:		***Method Details:***	
Customer Acct Name:	PIPELINE HIT - 1/2"		
Incident Address:	TORONTO,,TORONTO,ON,,CA		
Operation Type:			
Pipeline Type:			
Regulator Type:			

Summary:
Reported By:
Affiliation:
Occurrence Desc:
Damage Reason:
Notes:

Site: ***PIPELINE HIT - 1/2"***
TORONTO,,TORONTO,ON,,CA ON

Database: ***PINC***

Incident Id:
Incident No: 1113372
Incident Reported Dt: 6/6/2013
Type: FS-Pipeline Incident
Status Code:
Tank Status: Pipeline Damage Reason Est
Task No:
Spills Action Centre:
Fuel Type:
Fuel Occurrence Tp:
Date of Occurrence:
Occurrence Start Dt:
Depth:
Customer Acct Name: PIPELINE HIT - 1/2"
Incident Address: TORONTO,,TORONTO,ON,,CA
Operation Type:
Pipeline Type:
Regulator Type:
Summary:
Reported By:
Affiliation:
Occurrence Desc:
Damage Reason:
Notes:

Pipe Material:
Fuel Category:
Health Impact:
Environment Impact:
Property Damage:
Service Interrupt:
Enforce Policy:
Public Relation:
Pipeline System:
PSIG:
Attribute Category:
Regulator Location:
Method Details:

Site: ***PIPELINE HIT - 1/2"***
TORONTO,,TORONTO,ON,,CA ON

Database: ***PINC***

Incident Id:
Incident No: 1113372
Incident Reported Dt: 6/6/2013
Type: FS-Pipeline Incident
Status Code:
Tank Status: Pipeline Damage Reason Est
Task No:
Spills Action Centre:
Fuel Type:
Fuel Occurrence Tp:
Date of Occurrence:
Occurrence Start Dt:
Depth:
Customer Acct Name: PIPELINE HIT - 1/2"
Incident Address: TORONTO,,TORONTO,ON,,CA
Operation Type:
Pipeline Type:
Regulator Type:
Summary:
Reported By:
Affiliation:
Occurrence Desc:
Damage Reason:
Notes:

Pipe Material:
Fuel Category:
Health Impact:
Environment Impact:
Property Damage:
Service Interrupt:
Enforce Policy:
Public Relation:
Pipeline System:
PSIG:
Attribute Category:
Regulator Location:
Method Details:

Site: ***C.C. TANK LINES LTD.***

Database:

KINGSTON ROAD, WESTHILL TOP VALUE GAS STATION TANK TRUCK (CARGO) TORONTO CITY ON ***SPL***

Ref No:	55229	***Municipality No:***	01106
Year:		***Nature of Damage:***	
Incident Dt:	8/6/1991	***Discharger Report:***	
Dt MOE Arvl on Scn:		***Material Group:***	
MOE Reported Dt:	8/6/1991	***Health/Env Conseq:***	
Dt Document Closed:		***Agency Involved:***	
Site No:			
Facility Name:			
MOE Response:			
Site County/District:			
Site Geo Ref Meth:			
Site District Office:			
Nearest Watercourse:			
Site Name:			
Site Address:			
Site Region:			
Site Municipality:	TORONTO CITY		
Site Lot:			
Site Conc:			
Site Geo Ref Accu:			
Site Map Datum:			
Northing:			
Easting:			
Incident Cause:	PIPE/HOSE LEAK		
Incident Event:			
Environment Impact:	NOT ANTICIPATED		
Nature of Impact:			
Contaminant Qty:			
System Facility Address:			
Client Name:			
Client Type:			
Call Report Locatn Geodata:			
Contaminant Code:			
Contaminant Name:			
Contaminant Limit 1:			
Contam Limit Freq 1:			
Contaminant UN No 1:			
Receiving Medium:	LAND		
Receiving Environment:			
Incident Reason:	ERROR		
Incident Summary:	CC TRANSPORT TANKER TRUCK2 L GASOLINE TO PAVEMENT.		
Activity Preceding Spill:			
Property 2nd Watershed:			
Property Tertiary Watershed:			
Sector Type:			
SAC Action Class:			
Source Type:			

Site: ***PROVOST BULK CARRIERS INC.***
PETRO CANADA TERMINAL TANK TRUCK (CARGO) TORONTO CITY ON

Database: ***SPL***

Ref No:	23012	***Municipality No:***	01106
Year:		***Nature of Damage:***	
Incident Dt:	8/1/1989	***Discharger Report:***	
Dt MOE Arvl on Scn:		***Material Group:***	
MOE Reported Dt:	8/1/1989	***Health/Env Conseq:***	
Dt Document Closed:		***Agency Involved:***	
Site No:			
Facility Name:			
MOE Response:			
Site County/District:			
Site Geo Ref Meth:			
Site District Office:			
Nearest Watercourse:			
Site Name:			

Site Address:
Site Region:
Site Municipality: TORONTO CITY
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:
Easting:
Incident Cause: OTHER CONTAINER LEAK
Incident Event:
Environment Impact:
Nature of Impact:
Contaminant Qty:
System Facility Address:
Client Name:
Client Type:
Call Report Locatn Geodata:
Contaminant Code:
Contaminant Name:
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Receiving Medium: LAND
Receiving Environment:
Incident Reason: ERROR
Incident Summary: PROVOST CARTAGE-25 L GASOLINE TO ASPHALT.
Activity Preceding Spill:
Property 2nd Watershed:
Property Tertiary Watershed:
Sector Type:
SAC Action Class:
Source Type:

Site: ***Enbridge Gas Distribution Inc.***
Victoria Park Toronto ON

Database: ***SPL***

Ref No: 1121-9ZHMM4
Year:
Incident Dt: 8/18/2015
Dt MOE Arvl on Scn:
MOE Reported Dt: 8/18/2015
Dt Document Closed: 10/3/2015
Site No: NA
Facility Name:
MOE Response: No
Site County/District:
Site Geo Ref Meth:
Site District Office:
Nearest Watercourse:
Site Name: 1658 Victoria Park Ave<UNOFFICIAL>
Site Address: Victoria Park
Site Region:
Site Municipality: Toronto
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:
Easting:
Incident Cause:
Incident Event:
Environment Impact:
Nature of Impact:
Contaminant Qty: 1 other - see incident description
System Facility Address:
Client Name: Enbridge Gas Distribution Inc.

Municipality No:
Nature of Damage:
Discharger Report:
Material Group:
Health/Env Conseq:
Agency Involved:

Client Type:
Call Report Locatn Geodata:
Contaminant Code: 35
Contaminant Name: NATURAL GAS (METHANE)
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Receiving Medium:
Receiving Environment:
Incident Reason: Unknown / N/A
Incident Summary: TSSA FSB: 1/2 in gas pipe broken off the water heater, made safe
Activity Preceding Spill:
Property 2nd Watershed:
Property Tertiary Watershed:
Sector Type: Miscellaneous Industrial
SAC Action Class: TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Source Type:

Site:
Across from Victoria Park Subway Stn (Southbound Lanes) Toronto ON

Database: ***SPL***

Ref No: 3023-9M457D
Year:
Incident Dt: 2014/07/16
Dt MOE Arvl on Scn:
MOE Reported Dt: 2014/07/16
Dt Document Closed: 2015/01/29
Site No: NA
Facility Name:
MOE Response: No Field Response
Site County/District:
Site Geo Ref Meth:
Site District Office:
Nearest Watercourse:
Site Name: Roadway<UNOFFICIAL>
Site Address: Across from Victoria Park Subway Stn (Southbound Lanes)
Site Region:
Site Municipality: Toronto
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:
Easting:
Incident Cause: Unknown / N/A
Incident Event:
Environment Impact: Not Anticipated
Nature of Impact: Other Impact(s)
Contaminant Qty: 5 L
System Facility Address:
Client Name:
Client Type:
Call Report Locatn Geodata:
Contaminant Code: 13
Contaminant Name: DIESEL FUEL
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Receiving Medium:
Receiving Environment:
Incident Reason: Unknown / N/A
Incident Summary: Unknown: 5 L diesel fuel to roadway, cntd
Activity Preceding Spill:
Property 2nd Watershed:
Property Tertiary Watershed:
Sector Type: Unknown / N/A
SAC Action Class: Land Spills

Municipality No:
Nature of Damage:
Discharger Report:
Material Group:
Health/Env Conseq:
Agency Involved:

Source Type:

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ***Note:*** *Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

Abandoned Aggregate Inventory: Provincial AAGR

The MAAP Program maintains a database of abandoned pits and quarries. Please note that the database is only referenced by lot and concession and city/town location. The database provides information regarding the location, type, size, land use, status and general comments.*

Government Publication Date: Sept 2002*

Aggregate Inventory: Provincial AGR

The Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry (ONDMNRF) maintains this database of pits and quarries. The database provides information regarding the registered owner/operator, location name, operation type, approval type, and maximum annual tonnage.

Government Publication Date: Up to Oct 2022

Abandoned Mine Information System: Provincial AMIS

The Abandoned Mines Information System contains data on known abandoned and inactive mines located on both Crown and privately held lands. The information was provided by the Ministry of Northern Development and Mines (MNDM), with the following disclaimer: "the database provided has been compiled from various sources, and the Ministry of Northern Development and Mines makes no representation and takes no responsibility that such information is accurate, current or complete". Reported information includes official mine name, status, background information, mine start/end date, primary commodity, mine features, hazards and remediation.

Government Publication Date: 1800-Mar 2022

Anderson's Waste Disposal Sites: Private ANDR

The information provided in this database was collected by examining various historical documents which aimed to characterize the likely position of former waste disposal sites from 1860 to present. The research initiative behind the creation of this database was to identify those sites that are missing from the Ontario MOE Waste Disposal Site Inventory, as well as to provide revisions and corrections to the positions and descriptions of sites currently listed in the MOE inventory. In addition to historic waste disposal facilities, the database also identifies certain auto wreckers and scrap yards that have been extrapolated from documentary sources. Please note that the data is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1860s-Present

Aboveground Storage Tanks: Provincial AST

Historical listing of aboveground storage tanks made available by the Department of Natural Resources and Forestry. Includes tanks used to hold water or petroleum. This dataset has been retired as of September 25, 2014 and will no longer be updated.

Government Publication Date: May 31, 2014

Automobile Wrecking & Supplies: Private AUWR

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999-Oct 31, 2023

Borehole: Provincial BORE

A borehole is the generalized term for any narrow shaft drilled in the ground, either vertically or horizontally. The information here includes geotechnical investigations or environmental site assessments, mineral exploration, or as a pilot hole for installing piers or underground utilities. Information is from many sources such as the Ministry of Transportation (MTO) boreholes from engineering reports and projects from the 1950 to 1990's in Southern Ontario. Boreholes from the Ontario Geological Survey (OGS) including The Urban Geology Analysis Information System (UGAIS) and the York Peel Durham Toronto (YPDT) database of the Conservation Authority Moraine Coalition. This database will include fields such as location, stratigraphy, depth, elevation, year drilled, etc. For all water well data or oil and gas well data for Ontario please refer to WWIS and OOGW.

Government Publication Date: 1875-Jul 2018

Certificates of Approval: Provincial CA

This database contains the following types of approvals: Air & Noise, Industrial Sewage, Municipal & Private Sewage, Waste Management Systems and Renewable Energy Approvals. The MOE in Ontario states that any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste, must have a Certificate of Approval before it can operate lawfully. Fields include approval number, business name, address, approval date, approval type and status. This database will no longer be updated, as CofA's have been replaced by either Environmental Activity and Sector Registry (EASR) or Environmental Compliance Approval (ECA). Please refer to those individual databases for any information after Oct.31, 2011.

Government Publication Date: 1985-Oct 30, 2011*

Dry Cleaning Facilities: Federal CDRY

List of dry cleaning facilities made available by Environment and Climate Change Canada. Environment and Climate Change Canada's Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations (SOR/2003-79) are intended to reduce releases of tetrachloroethylene to the environment from dry cleaning facilities.

Government Publication Date: Jan 2004-Dec 2022

Commercial Fuel Oil Tanks: Provincial CFOT

Locations of commercial underground fuel oil tanks. This is not a comprehensive or complete inventory of commercial fuel tanks in the province; this listing is a copy of records of registered commercial underground fuel oil tanks obtained under Access to Public Information.
Note that the following types of tanks do not require registration: waste oil tanks in apartments, office buildings, residences, etc.; aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Chemical Manufacturers and Distributors: Private CHEM

This database includes information from both a one time study conducted in 1992 and private source and is a listing of facilities that manufacture or distribute chemicals. The production of these chemical substances may involve one or more chemical reactions and/or chemical separation processes (i.e. fractionation, solvent extraction, crystallization, etc.).

Government Publication Date: 1999-Jan 31, 2020

Chemical Register: Private CHM

This database includes a listing of locations of facilities within the Province or Territory that either manufacture and/or distributes chemicals.

Government Publication Date: 1999-Oct 31, 2023

Compressed Natural Gas Stations: Private CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 2012 -Aug 2023

Inventory of Coal Gasification Plants and Coal Tar Sites: Provincial COAL

This inventory includes both the "Inventory of Coal Gasification Plant Waste Sites in Ontario-April 1987" and the Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario-November 1988) collected by the MOE. It identifies industrial sites that produced and continue to produce or use coal tar and other related tars. Detailed information is available and includes: facility type, size, land use, information on adjoining properties, soil condition, site operators/occupants, site description, potential environmental impacts and historic maps available. This was a one-time inventory.*

Government Publication Date: Apr 1987 and Nov 1988*

Compliance and Convictions: Provincial CONV

This database summarizes the fines and convictions handed down by the Ontario courts beginning in 1989. Companies and individuals named here have been found guilty of environmental offenses in Ontario courts of law.

Government Publication Date: 1989-Sep 2023

Certificates of Property Use: Provincial CPU

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include CPU's on the registry such as (EPA s. 168.6) - Certificate of Property Use.

Government Publication Date: 1994 - Oct 31, 2023

Drill Hole Database: Provincial DRL

The Ontario Drill Hole Database contains information on more than 113,000 percussion, overburden, sonic and diamond drill holes from assessment files on record with the department of Mines and Minerals. Please note that limited data is available for southern Ontario, as it was the last area to be completed. The database was created when surveys submitted to the Ministry were converted in the Assessment File Research Image Database (AFRI) project. However, the degree of accuracy (coordinates) as to the exact location of drill holes is dependent upon the source document submitted to the MNDM. Levels of accuracy used to locate holes are: centering on the mining claim; a sketch of the mining claim; a 1:50,000 map; a detailed company map; or from submitted a "Report of Work".

Government Publication Date: 1886 - Aug 2023

Delisted Fuel Tanks: Provincial DTNK

List of fuel storage tank sites that were once found in - and have since been removed from - the list of fuel storage tanks made available by the regulatory agency under Access to Public Information.

Government Publication Date: Feb 28, 2022

Environmental Activity and Sector Registry: Provincial EASR

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. The EASR allows businesses to register certain activities with the ministry, rather than apply for an approval. The registry is available for common systems and processes, to which preset rules of operation can be applied. The EASR is currently available for: heating systems, standby power systems and automotive refinishing. Businesses whose activities aren't subject to the EASR may apply for an ECA (Environmental Compliance Approval), Please see our ECA database.

Government Publication Date: Oct 2011- Oct 31, 2023

Environmental Registry: Provincial EBR

The Environmental Registry lists proposals, decisions and exceptions regarding policies, Acts, instruments, or regulations that could significantly affect the environment. Through the Registry, thirteen provincial ministries notify the public of upcoming proposals and invite their comments. For example, if a local business is requesting a permit, license, or certificate of approval to release substances into the air or water; these are notified on the registry. Data includes: Approval for discharge into the natural environment other than water (i.e. Air) - EPA s. 9, Approval for sewage works - OWRA s. 53(1), and EPA s. 27 - Approval for a waste disposal site. For information regarding Permit to Take Water (PTTW), Certificate of Property Use (CPU) and (ORD) Orders please refer to those individual databases.

Government Publication Date: 1994 - Oct 31, 2023

Environmental Compliance Approval: Provincial ECA

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. In the past, a business had to apply for multiple approvals (known as certificates of approval) for individual processes and pieces of equipment. Today, a business either registers itself, or applies for a single approval, depending on the types of activities it conducts. Businesses whose activities aren't subject to the EASR may apply for an ECA. A single ECA addresses all of a business's emissions, discharges and wastes. Separate approvals for air, noise and waste are no longer required. This database will also include Renewable Energy Approvals. For certificates of approval prior to Nov 1st, 2011, please refer to the CA database. For all Waste Disposal Sites please refer to the WDS database.

Government Publication Date: Oct 2011- Oct 31, 2023

Environmental Effects Monitoring: Federal EEM

The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.

Government Publication Date: 1992-2007*

ERIS Historical Searches: Private EHS

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Government Publication Date: 1999-Sep 30, 2023

Environmental Issues Inventory System: Federal EIIS

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

Government Publication Date: 1992-2001*

Emergency Management Historical Event: Provincial EMHE

List of locations of historical occurrences of emergency events, including those assigned to the Ministry of Natural Resources by Order-In-Council (OIC) under the Emergency Management and Civil Protection Act, as well as events where MNR provided requested emergency response assistance. Many of these events will have involved community evacuations, significant structural loss, and/or involvement of MNR emergency response staff. These events fall into one of ten (10) type categories: Dam Failure; Drought / Low Water; Erosion; Flood; Forest Fire; Soil and Bedrock Instability; Petroleum Resource Center Event, EMO Requested Assistance, Continuity of Operations Event, Other Requested Assistance. EMHE record details are reproduced by ERIS under License with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2017.

Government Publication Date: Apr 30, 2022

Environmental Penalty Annual Report: Provincial EPAR

This database contains data from Ontario's annual environmental penalty report published by the Ministry of the Environment and Climate Change. These reports provide information on environmental penalties for land or water violations issued to companies in one of the nine industrial sectors covered by the Municipal Industrial Strategy for Abatement (MISA) regulations.

Government Publication Date: Jan 1, 2011 - Dec 31, 2022

List of Expired Fuels Safety Facilities: Provincial EXP

List of facilities and tanks for which there was once a fuel registration. This is not a comprehensive or complete inventory of expired tanks/tank facilities in the province; this listing is a copy of previously registered tanks and facilities obtained under Access to Public Information. Includes private fuel outlets, bulk plants, fuel oil tanks, gasoline stations, marinas, propane filling stations, liquid fuel tanks, piping systems, etc; includes tanks which have been removed from the ground.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Federal Convictions: Federal FCON

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

Government Publication Date: 1988-Jun 2007*

Contaminated Sites on Federal Land: Federal FCS

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government. Includes fire training sites and sites at which Per- and Polyfluoroalkyl Substances (PFAS) are a concern.

Government Publication Date: Jun 2000-Sep 2023

Fisheries & Oceans Fuel Tanks: Federal FOFT

Fisheries & Oceans Canada maintains an inventory of aboveground & underground fuel storage tanks located on Fisheries & Oceans property or controlled by DFO. Our inventory provides information on the site name, location, tank owner, tank operator, facility type, storage tank location, tank contents & capacity, and date of tank installation.

Government Publication Date: 1964-Sep 2019

Federal Identification Registry for Storage Tank Systems (FIRSTS): Federal FRST

A list of federally regulated Storage tanks from the Federal Identification Registry for Storage Tank Systems (FIRSTS). FIRSTS is Environment and Climate Change Canada's database of storage tank systems subject to the Storage Tank for Petroleum Products and Allied Petroleum Products Regulations. The main objective of the Regulations is to prevent soil and groundwater contamination from storage tank systems located on federal and aboriginal lands. Storage tank systems that do not have a valid identification number displayed in a readily visible location on or near the storage tank system may be refused product delivery.

Government Publication Date: Oct 31, 2021

Fuel Storage Tank: Provincial FST

List of registered private and retail fuel storage tanks. This is not a comprehensive or complete inventory of private and retail fuel storage tanks in the province; this listing is a copy of registered private and retail fuel storage tanks, obtained under Access to Public Information.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Fuel Storage Tank - Historic: Provincial FSTH

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks. Public records of private fuel storage tanks are only available since the registration became effective in September 1989. This information is now collected by the Technical Standards and Safety Authority.

Government Publication Date: Pre-Jan 2010*

Ontario Regulation 347 Waste Generators Summary: Provincial GEN

Regulation 347 of the Ontario EPA defines a waste generation site as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled, or stored at the site. This database contains the registration number, company name and address of registered generators including the types of hazardous wastes generated. It includes data on waste generating facilities such as: drycleaners, waste treatment and disposal facilities, machine shops, electric power distribution etc. This information is a summary of all years from 1986 including the most currently available data. Some records may contain, within the company name, the phrase "See & Use..." followed by a series of letters and numbers. This occurs when one company is amalgamated with or taken over by another registered company. The number listed as "See & Use", refers to the new ownership and the other identification number refers to the original ownership. This phrase serves as a link between the 2 companies until operations have been fully transferred.

Government Publication Date: 1986-Oct 31, 2022

Greenhouse Gas Emissions from Large Facilities: Federal GHG

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO2 eq).

Government Publication Date: 2013-Dec 2020

TSSA Historic Incidents: Provincial HINC

List of historic incidences of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen recorded by the TSSA in their previous incident tracking system. The TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, the TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of historical fuel spills and leaks in the province. This listing is a copy of the data captured at one moment in time and is hence limited by the record date provided here.

Government Publication Date: 2006-June 2009*

Indian & Northern Affairs Fuel Tanks: Federal IAFT

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

Government Publication Date: 1950-Aug 2003*

Fuel Oil Spills and Leaks: Provincial INC

Listing of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen reported to the Spills Action Centre (SAC). This is not a comprehensive or complete inventory of fuel-related leaks, spills, and incidents in the province; this listing in a copy of incidents reported to the SAC, obtained under Access to Public Information. Includes incidents from fuel-related hazards such as spills, fires, and explosions. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Landfill Inventory Management Ontario: Provincial LIMO

The Landfill Inventory Management Ontario (LIMO) database is updated every year, as the Ministry of the Environment, Conservation and Parks compiles new and updated information. Includes small and large landfills currently operating as well as those which are closed and historic. Operators of larger landfills provide landfill information for the previous operating year to the ministry for LIMO including: estimated amount of total waste received, landfill capacity, estimated total remaining landfill capacity, fill rates, engineering designs, reporting and monitoring details, size of location, service area, approved waste types, leachate of site treatment, contaminant attenuation zone and more. The small landfills include information such as site owner, site location and certificate of approval # and status.

Government Publication Date: Mar 21, 2022

Canadian Mine Locations: Private MINE

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Government Publication Date: 1998-2009*

Mineral Occurrences: Provincial MNR

In the early 70's, the Ministry of Northern Development and Mines created an inventory of approximately 19,000 mineral occurrences in Ontario, in regard to metallic and industrial minerals, as well as some information on building stones and aggregate deposits. Please note that the "Horizontal Positional Accuracy" is approximately +/- 200 m. Many reference elements for each record were derived from field sketches using pace or chain/tape measurements against claim posts or topographic features in the area. The primary limiting factor for the level of positional accuracy is the scale of the source material. The testing of horizontal accuracy of the source materials was accomplished by comparing the plan metric (X and Y) coordinates of that point with the coordinates of the same point as defined from a source of higher accuracy.

Government Publication Date: 1846-Feb 2023

National Analysis of Trends in Emergencies System (NATES): Federal NATE

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Government Publication Date: 1974-1994*

Non-Compliance Reports: Provincial NCPL

The Ministry of the Environment provides information about non-compliant discharges of contaminants to air and water that exceed legal allowable limits, from regulated industrial and municipal facilities. A reported non-compliance failure may be in regard to a Control Order, Certificate of Approval, Sectoral Regulation or specific regulation/act.

Government Publication Date: Dec 31, 2021

National Defense & Canadian Forces Fuel Tanks: Federal NDFT

The Department of National Defense and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.

Government Publication Date: Up to May 2001*

National Defense & Canadian Forces Spills: Federal NDSP

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

Government Publication Date: Mar 1999-Oct 2022

National Defence & Canadian Forces Waste Disposal Sites: Federal NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents: Federal NEBI

Locations of pipeline incidents from 2008 to present, made available by the Canada Energy Regulator (CER) - previously the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008-Jun 30, 2021

National Energy Board Wells: Federal NEBP

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES): Federal NEES

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory: Federal NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory 1993-2020: Federal NPR2

The National Pollutant Release Inventory (NPRI) is Canada's public inventory of pollutant releases (to air, water and land), disposals, and transfers for recycling. The inventory, managed by Environment and Climate Change Canada, tracks over 300 substances. Under the authority of the Canadian Environmental Protection Act (CEPA), owners or operators of facilities that meet published reporting requirements are required to report to the NPRI.

Government Publication Date: Sep 2020

National Pollutant Release Inventory - Historic: Federal NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances. This data holds historic records; current records are found in NPR2.

Government Publication Date: 1993-May 2017

Oil and Gas Wells: Private OGWE

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-Aug 31, 2023

Ontario Oil and Gas Wells: Provincial OOGW

In 1998, the MNR handed over to the Ontario Oil, Gas and Salt Resources Corporation, the responsibility of maintaining a database of oil and gas wells drilled in Ontario. The OGSR Library has over 20,000+ wells in their database. Information available for all wells in the ERIS database include well owner/operator, location, permit issue date, and well cap date, license No., status, depth and the primary target (rock unit) of the well being drilled. All geology/stratigraphy table information, plus all water table information is also provide for each well record.

Government Publication Date: 1800-Aug 2023

Inventory of PCB Storage Sites: Provincial OPCB

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of PCB storage sites within the province. Ontario Regulation 11/82 (Waste Management - PCB) and Regulation 347 (Generator Waste Management) under the Ontario EPA requires the registration of inactive PCB storage equipment and/or disposal sites of PCB waste with the Ontario Ministry of Environment. This database contains information on: 1) waste quantities; 2) major and minor sites storing liquid or solid waste; and 3) a waste storage inventory.

Government Publication Date: 1987-Oct 2004; 2012-Dec 2013

Orders: Provincial ORD

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include Orders on the registry such as (EPA s. 17) - Order for remedial work, (EPA s. 18) - Order for preventative measures, (EPA s. 43) - Order for removal of waste and restoration of site, (EPA s. 44) - Order for conformity with Act for waste disposal sites, (EPA s. 136) - Order for performance of environmental measures.

Government Publication Date: 1994 - Oct 31, 2023

Canadian Pulp and Paper: Private PAP

This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

Government Publication Date: 1999, 2002, 2004, 2005, 2009-2014

Parks Canada Fuel Storage Tanks: Federal PCFT

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Government Publication Date: 1920-Jan 2005*

Pesticide Register: Provincial PES

The Ontario Ministry of the Environment and Climate Change maintains a database of licensed operators and vendors of registered pesticides.

Government Publication Date: Oct 2011- Oct 31, 2023

NPRI Reporters - PFAS Substances: Federal PFCH

The National Pollutant Release Inventory (NPRI) is Canada's public inventory of releases, disposals, and transfers, tracking over 320 pollutants. Per - and polyfluoroalkyl substances (PFAS) are a group of over 4,700 human-made substances for which adverse environmental and health effects have been observed. This listing of PFAS substance reporters includes those NPRI facilities that reported substances that are found in either: a) the Comprehensive Global Database of PFASs compiled by the Organisation for Economic Co-operation and Development (OECD), b) the US Environmental Protection Agency (US EPA) Master List of PFAS Substances, c) the US EPA list of PFAS chemicals without explicit structures, or d) the US EPA list of PFAS structures (encompassing the largest set of structures having sufficient levels of fluorination to potentially impart PFAS-type properties).

Government Publication Date: Sep 2020

Potential PFAS Handers from NPRI: Federal PFHA

The National Pollutant Release Inventory (NPRI) is Canada's public inventory of releases, disposals, and transfers, tracking over 320 pollutants. Per - and polyfluoroalkyl substances (PFAS) are a group of over 4,700 human-made substances for which adverse environmental and health effects have been observed. This list of potential PFAS handlers includes those NPRI facilities that reported business activity (NAICS code) included in the US Environmental Protection Agency (US EPA) list of Potential PFAS-Handling Industry Sectors, further described as operating in industry sectors where literature reviews indicate that PFAS may be handled and/or released. Inclusion of a facility in this listing does not indicate that PFAS are being manufactured, processed, used, or released by the facility - these are facilities that potentially handle PFAS based on their industrial profile.

Government Publication Date: Sep 2020

Pipeline Incidents: Provincial PINC

List of pipeline incidents (strikes, leaks, spills). This is not a comprehensive or complete inventory of pipeline incidents in the province; this listing in an historical copy of records previously obtained under Access to Public Information. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2021

Private and Retail Fuel Storage Tanks: Provincial PRT

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks and licensed retail fuel outlets. This database includes an inventory of locations that have gasoline, oil, waste oil, natural gas and/or propane storage tanks on their property. The MCCR no longer collects this information. This information is now collected by the Technical Standards and Safety Authority (TSSA).

Government Publication Date: 1989-1996*

Permit to Take Water: Provincial PTTW

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include PTTW's on the registry such as OWRA s. 34 - Permit to take water.

Government Publication Date: 1994 - Oct 31, 2023

Ontario Regulation 347 Waste Receivers Summary: Provincial REC

Part V of the Ontario Environmental Protection Act ("EPA") regulates the disposal of regulated waste through an operating waste management system or a waste disposal site operated or used pursuant to the terms and conditions of a Certificate of Approval or a Provisional Certificate of Approval. Regulation 347 of the Ontario EPA defines a waste receiving site as any site or facility to which waste is transferred by a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents registered receivers of regulated wastes, identified by registration number, company name and address, and includes receivers of waste such as: landfills, incinerators, transfer stations, PCB storage sites, sludge farms and water pollution control plants. This information is a summary of all years from 1986 including the most currently available data.

Government Publication Date: 1986-1990, 1992-2021

Record of Site Condition: Provincial RSC

The Record of Site Condition (RSC) is part of the Ministry of the Environment's Brownfields Environmental Site Registry. Protection from environmental cleanup orders for property owners is contingent upon documentation known as a record of site condition (RSC) being filed in the Environmental Site Registry. In order to file an RSC, the property must have been properly assessed and shown to meet the soil, sediment and groundwater standards appropriate for the use (such as residential) proposed to take place on the property. The Record of Site Condition Regulation (O. Reg. 153/04) details requirements related to site assessment and clean up.
RSCs filed after July 1, 2011 will also be included as part of the new (O.Reg. 511/09).

Government Publication Date: 1997-Sept 2001, Oct 2004-Oct 2023

Retail Fuel Storage Tanks: Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999-Oct 31, 2023

Scott's Manufacturing Directory: Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Ontario Spills: Provincial SPL

List of spills and incidents made available by the Ministry of the Environment, Conservation and Parks. This database identifies information such as location (approximate), type and quantity of contaminant, date of spill, environmental impact, cause, nature of impact, etc. Information from 1988-2002 was part of the ORIS (Occurrence Reporting Information System). The SAC (Spills Action Centre) handles all spills reported in Ontario. Regulations for spills in Ontario are part of the MOE's Environmental Protection Act, Part X. The Ministry of the Environment, Conservation and Parks cites the coronavirus pandemic as an explanation for delays in releasing data pursuant to requests. This database includes spill incidents that occurred in February, March, May, June-November 2022, and January 2023 in addition to those listed in the Government Publication Date.

Government Publication Date: 1988-Dec 2021; see description

Wastewater Discharger Registration Database: Provincial SRDS

Facilities that report either municipal treated wastewater effluent or industrial wastewater discharges under the Effluent Monitoring and Effluent Limits (EMEL) and Municipal/Industrial Strategy for Abatement Regulations. The Municipal/Industrial Strategy for Abatement (MISA) division of the Ontario Ministry of Environment keeps record of direct dischargers of toxic pollutants within nine sectors including: Electric Power Generation, Mining, Petroleum Refining, Organic Chemicals, Inorganic Chemicals, Pulp & Paper, Metal Casting, Iron & Steel, and Quarries.

Government Publication Date: 1990-Dec 31, 2020

Anderson's Storage Tanks: Private TANK

The information provided in this database was collected by examining various historical documents, which identified the location of former storage tanks, containing substances such as fuel, water, gas, oil, and other various types of miscellaneous products. Information is available in regard to business operating at tank site, tank location, permit year, permit & installation type, no. of tanks installed & configuration and tank capacity. Data contained within this database pertains only to the city of Toronto and is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1915-1953*

Transport Canada Fuel Storage Tanks: Federal TCFT

List of fuel storage tanks currently or previously owned or operated by Transport Canada. This inventory also includes tanks on The Pickering Lands, which refers to 7,530 hectares (18,600 acres) of land in Pickering, Markham, and Uxbridge owned by the Government of Canada since 1972; properties on this land has been leased by the government since 1975, and falls under the Site Management Policy of Transport Canada, but is administered by Public Works and Government Services Canada. This inventory provides information on the site name, location, tank age, capacity and fuel type.

Government Publication Date: 1970 - Apr 2023

Variances for Abandonment of Underground Storage Tanks: Provincial VAR

Listing of variances granted for storage tank abandonment. This is not a comprehensive or complete inventory of tank abandonment variances in the province; this listing is a copy of tank abandonment variance records previously obtained under Access to Public Information. In Ontario, registered underground storage tanks must be removed within two years of disuse; if removal of a tank is not feasible, an application may be sought for a variance from this code requirement.
Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Waste Disposal Sites - MOE CA Inventory: Provincial WDS

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of known open (active or inactive) and closed disposal sites in the Province of Ontario. Active sites maintain a Certificate of Approval, are approved to receive and are receiving waste. Inactive sites maintain Certificate(s) of Approval but are not receiving waste. Closed sites are not receiving waste. The data contained within this database was compiled from the MOE's Certificate of Approval database. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number. All new Environmental Compliance Approvals handed out after Oct 31, 2011 for Waste Disposal Sites will still be found in this database.

Government Publication Date: Oct 2011-Oct 31, 2023

Waste Disposal Sites - MOE 1991 Historical Approval Inventory: Provincial WDSH

In June 1991, the Ontario Ministry of Environment, Waste Management Branch, published the "June 1991 Waste Disposal Site Inventory", of all known active and closed waste disposal sites as of October 30st, 1990. For each "active" site as of October 31st 1990, information is provided on site location, site/CA number, waste type, site status and site classification. For each "closed" site as of October 31st 1990, information is provided on site location, site/CA number, closure date and site classification. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number.

Government Publication Date: Up to Oct 1990*

Water Well Information System: Provincial WWIS

This database describes locations and characteristics of water wells found within Ontario in accordance with Regulation 903. It includes such information as coordinates, construction date, well depth, primary and secondary use, pump rate, static water level, well status, etc. Also included are detailed stratigraphy information, approximate depth to bedrock and the approximate depth to the water table.

Government Publication Date: Mar 31 2023

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

AllRock Consulting Ltd

APPENDIX E

Regulatory Correspondences

Technical Standards and Safety Authority
345 Carlingview Drive
Toronto, Ontario M9W 6N9
Customer Service: 1.877.682.8772
Fax: 416.734.3568
Email:publicinformationservices@tssa.org
www.tssa.org

Application for Release of Public Information
Issued under the Access and Privacy Code

For Office Use Only
WO No.

Clear Form | Print Form

A. REQUESTOR INFORMATION

Your File/Reference No: 23376 ***Date:** January 17, 2024

*Organization Name: AllRock Consulting			Account Number:
*Suite/Unit No: Unit 5	*Street No: 24	*Street Name: Brydon Drive	
*City: Toronto		*Province: Ontario	*Postal Code: M9W 5R6
*Primary Phone: 613-371-3442		Secondary Phone:	
Email:			Fax No:

*Requestor Name: Nathan Martin	*Requestor Email: nathan.martin@allrockconsulting.com
*Requestor Phone: 613-371-3442	

B. REQUEST

***PROGRAM(S) TO SEARCH** (Please check all that apply)**:**

☐ BOILERS & PRESSURE VESSELS/OE PLANT ☐ ELEVATING/AMUSEMENT DEVICES ☑ FUELS

***SUBJECT ADDRESS TO BE SEARCHED (One Address Per Form):**

*Suite/Unit No:	*Street/Lot No: 180	*Street/Concession Name: Fallingbrook Road	
*City: Scarborough		*Province: Ontario	*Postal Code: M1N 1N3

REASON FOR REQUEST (Please explain the reason for your request)**:**

DETAILS OF REQUEST (Please list the information you require)**:**

Incidents/occurence reports, fuels tanks and environmental reports

C. TERMS AND CONDITIONS:

Please refer to the link for our Access and Privacy Code Access and Privacy Code.pdf.

If this request includes a release of personal information, TSSA will require consent from the effected party

***Requestor Signature:** Nathan Martin	***Date:** January 17, 2023

D. FEES & PAYMENT

Expedited (Rush) Service is not available for Public Information requests

If you need assistance in determining the quantity and service type, please contact us at: **publicinformationservices@tssa.org** before completing this form. TSSA will provide a fee quote for multiple record requests, which must be approved by the Applicant before a record search commences. For fees for single searches, please see below or refer to our Website Fee Schedule.pdf

Program		Request	FEE TYPE	FEE	HST	# OF TYPE	Total
BPV/OE Boilers Pressure Vessels	☐	Confirmation of BPV/OE *Includes all available inspections/incidents* *You will receive No-Record letter if applicable*	per Address	50.00	6.50	1	
	☐	Copy of CRN Design Submission *Authorization from Design Owner **Mandatory** CRN #'s:_____	per CRN #	50.00	6.50		
	☐	Piping Registration Documents *Authorization from Building Owner **Mandatory** P #'s:_____	per P #	50.00	6.50		
	☐	MDR/U1A Request *Ontario Identification Number **Mandatory** OIN: _____	per Device	50.00	6.50		
ED/AD Elevating Devices Amusement Devices	☐	Copy of latest Inspection Report	per Device	40.00	5.20		
	☐	ED/AD Design/Technical Dossier Submission Documents *Authorization from Building Owner **Mandatory** ED/AD Device #'s:_____	per Device	80.00	10.40		
	☐	ED/AD Incident Report ED/AD Device #: _____ Date of Incident: _____ Victim Name (If applicable):_____	per Device	80.00	10.40		
	☐	ED/AD Devices status report (6 devices per report) ED/AD Device #'s:_____ _____ _____	Per Report	70.00	9.10		
FS Fuels Safety	✓	Archive Search *This includes all available inspections/incidents* *You will receive No-Record letter if applicable* **Incident Request:** Date of Incident: _____ Victim Name (If applicable):_____	per Address	50.00	6.50	1	$ 56.50
OTHER	☐	Mutiple Records Request ***(Non-Refundable Fee to Review)**	each	120.00	15.60	1	
	☐	Written/Hard Copy Confirmation of Licensing, Certification, Registration	each	50.00	6.50	1	
(HST REGISTRATION NO: 891131369			**Total Fees Due:**	$ 50.00	$ 6.50		$ 56.50
				1			

If paying by credit card, amount in Box 1 to be entered in TSSA Service Prepayment Portal

Authorization Requirements (if required):

- Official letter on company letter head
- Signature, title & full name of individual authorizing release
- Telephone number & email address of individual authorizing release

***Multiple Records are charged by applicable hourly rate. One hour to be paid with the application, and the remaining hours will be invoiced.**

Technical Standards and Safety Authority
345 Carlingview Drive
Toronto, Ontario M9W 6N9
Customer Service: 1.877.682.8772
Email: customerservices@tssa.org
www.tssa.org

PAYMENT INSTRUCTIONS

TSSA use only WO # _____	L # CH #

Payment Options:

☑ **Credit Card - Click link below**

TSSA Service Prepayment Portal
https://forms.tssa.org/Payments/Service-Prepayment-Portal

Ontario

Ministry of the Environment, Conservation and Parks

Freedom of Information Request for Property Information

Instructions

Use this form to:

- submit and pay for a new FOI request for access to records/information about a property
- pay for a deposit or a final fee on an existing FOI request

Fields marked with an asterisk (*) are mandatory.

Are you: *

☑ Submitting a new FOI Request for Property Information

☐ Paying a deposit or final fee for an existing FOI Request for Property Information

Section 1 – Description of Records Requested

Time Period for Records Requested

From (yyyy/mm/dd) * 1934/01/01

To (yyyy/mm/dd) * 2024/01/17

Type of Record(s) *

☑ All environmental records relating to the identified property/site exclusive of Environmental Approvals and Registrations

☐ Environmental Approvals and Registrations (e.g. Environmental Compliance Approvals; Certificate of Approval; Renewable Energy Approvals; Environmental Activity and Sector Registry Registrations)

Select only if you are seeking access to an Approval or Registration that is not publicly available or if you are also seeking supporting documents relating to the Approval or Registration.

Operator and vendor Pesticide Licenses from September 4, 2018, final Approvals and Registrations are publicly available on the Access Environment website at:
https://www.accessenvironment.ene.gov.on.ca/AEWeb/ae/GoSearch.action?search=basic&lang=en.

Records of Site Condition (RSC) records are publicly available on the Brownfields Environmental Site Registry (BSER).

- RSC records between 2004 to June 30, 2011 are available at: https://www.lrcsde.lrc.gov.on.ca/besrWebPublic/generalSearch
- RSC records filed after July 2011 are available at: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/earchFiledRsc_search?request_locale=en

☐ Other Specific Document(s)

List any record(s) that should be excluded from the scope of your request (e.g. email correspondences; records originating from your organization/business; records already in your possession, prior year(s) annual reports for approvals)

Please provide any additional relevant information relating to your request. For example, does your request relate to any other ministry business? Please note that this information is being requested only in order to provide contextual information to the Access and Privacy Office and will not in any way affect or expedite the status of any related ministry business identified.

Section 2 – Requester Information

Last Name * Martin

First Name * Nathan

Middle Initial

Business/Organization Name (if applicable or indicate "N/A") * AllRock Consulting

Project/Reference Number (if applicable) 23376

Are you submitting this request on behalf of a client? *

☐ Yes ☑ No

Mailing Address

Unit Number

Street Number * 24

Street Name * Brydon Drive, Unit#5

PO Box

City/Town * Toronto

Province * ON

Postal Code * M9W 5R6

Telephone Number * 613-371-3442

ext.

Email Address * nathan.martin@allrockconsulting.com

Is there an alternate contact (e.g. office admin)? *

☐ Yes ☑ No

Section 3 – Current Property Address Information

Is the property a:

☑ Park ☐ Lake ☐ First Nation Band ☐ Wind Farm ☐ Federal Land ☐ Island ☐ Unsurveyed Land

Please upload a map of the property in Section 5 (Supporting Documentation)

Please upload a map of the property in Section 6 (Supporting Documentation)

Are you requesting information about multiple addresses? *

☐ Yes ☑ No

Property Address

Unit Number

Street Number 180

Street Name Fallingbrook Road

Full Lot Number

Concession

Geographic Township

City/Town/Village *

Scarborough

Closest Intersection

Fallingbrook Road and Kingston Road

Section 4 – Previous Property Address Information

Do you want the ministry to search all prior historical addresses for this property/site for the time period of the records requested? *

☐ Yes ☑ No

Section 5 – Supporting Documents

Please upload any documents (e.g. Maps) that are relevant to your FOI request.

The total size of all attachments must not be more than 8 MB.

1. File Name

   FIGURE 1 - KEY MAP.pdf

   Total File Size

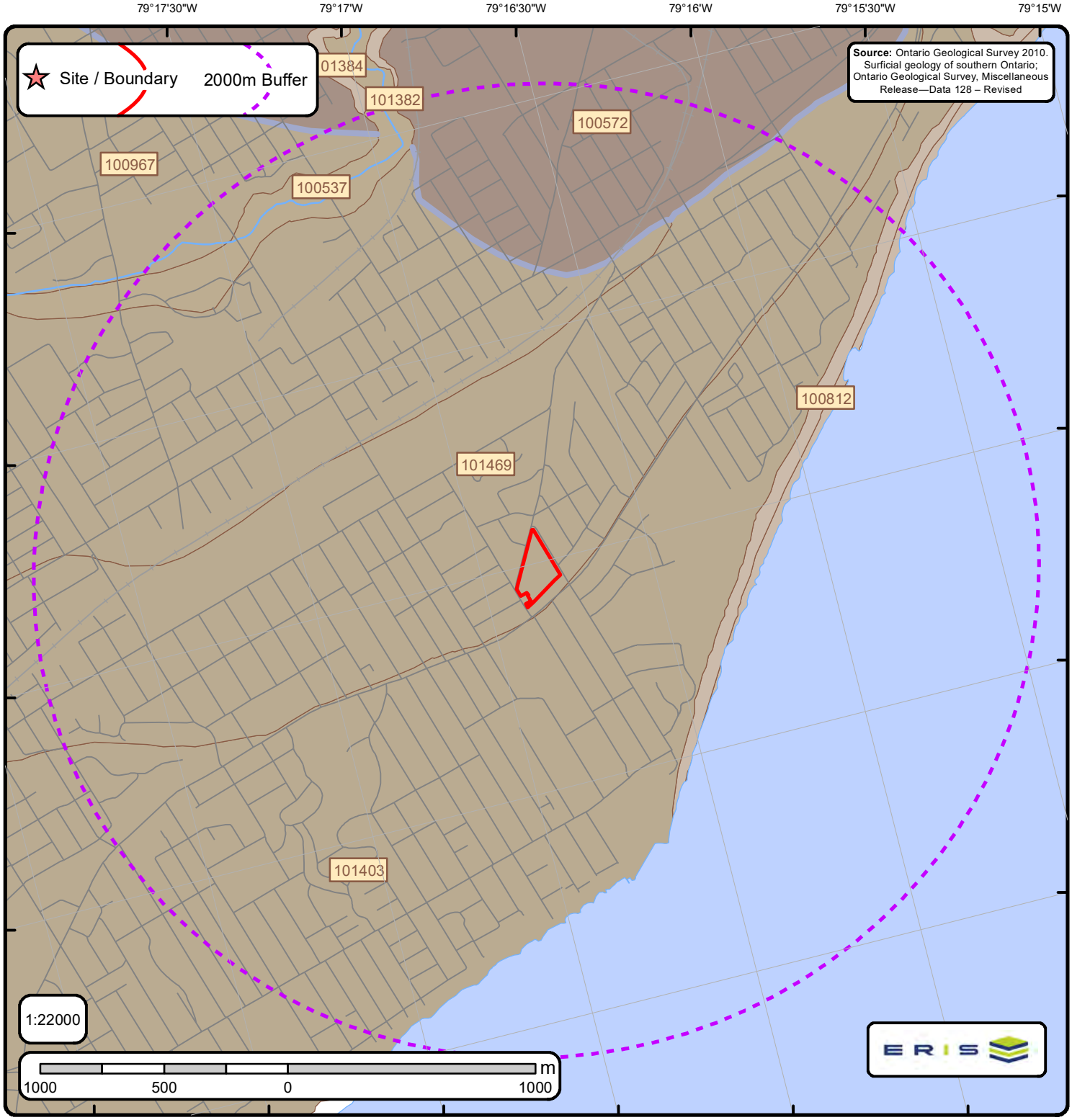
   1.62 MB

Payment confirmation number: 28189117

AllRock Consulting Ltd

APPENDIX F

Maps



The Surficial Geology of Southern Ontario

Order No. 23121300911

Spot Height	Streams	Dune	Beach	Esker	karst	pitsg		
Waterbody	Contour Lines	Lake	Bluff	Esker ND	linfeat	popup		
Wetlands	Roads	Rib	Crevasse	Fluvial DL	megarip	ribl		
Airports	Railroads	Scab	Crest	fluvndl	mfluvdl	slidel		
Pit or Quarry	Morains	Slide	End	iceberg	mfluvndl	slumpb		
Lots		NOF Dune	Escarpment	icslope	moraine	terrace		

Surface Geology Report

Surface Geology units found within 2000 m of
180 Fallingbrook Road,

Order No.
23121300911

ID: 100537 | **Unit Name:** River deposits |
Deposit Type Code: 10 | **Deposit Age:** Quaternary | **Map Number:** of3336 | **Map Name:** Toronto | **Source Map Scale:** 1:50 000 | **Primary Material:** sand, gravel | **Primary Material Modifier:** | **Secondary Material:** | **Primary General:** fluvial | **Primary General Modifier:** abandoned floodplain | **Veneer:** | **Episode:** Hudson | **Sub Episode:** | **Phase:** | **Stratus Modifier:** Surface | **Provenance:** | **Carbon Content:** | **Formation:** | **Permeability:** Variable | **Material Description:** Sand and gravel

ID: 100572 | **Unit Name:** Glacial deposits (Newmarket/Northern/Bowmanville Till) |
Deposit Type Code: 3f | **Deposit Age:** Quaternary | **Map Number:** of3336 | **Map Name:** Toronto | **Source Map Scale:** 1:50 000 | **Primary Material:** diamicton | **Primary Material Modifier:** sandy silt to sand | **Secondary Material:** | **Primary General:** glacial | **Primary General Modifier:** | **Veneer:** | **Episode:** Wisconsin | **Sub Episode:** Michigan | **Phase:** Mackinaw | **Stratus Modifier:** Surface | **Provenance:** Simcoe | **Carbon Content:** | **Formation:** Newmarket Till | **Permeability:** Low-Medium | **Material Description:** sandy silt to snd till; 3% stone content, stratified interbeds, 1-50m thick

ID: 100698 | **Unit Name:** Lower (drift) deposits |
Deposit Type Code: 2j | **Deposit Age:** Quaternary | **Map Number:** of3336 | **Map Name:** Toronto | **Source Map Scale:** 1:50 000 | **Primary Material:** diamicton | **Primary Material Modifier:** clay | **Secondary Material:** | **Primary General:** glacial | **Primary General Modifier:** | **Veneer:** | **Episode:** Wisconsin | **Sub Episode:** Ontario | **Phase:** Guildwood | **Stratus Modifier:** SubSurface | **Provenance:** Erie-Ontario | **Carbon Content:** | **Formation:** Sunnybrook Till/Port Hope till | **Permeability:** Low | **Material Description:** Till, fine-medium sand, and laminated silt and clay 1-50m thick (Sunnybrooke/Port Hope Till)

ID: 100812 | **Unit Name:** Lower (drift) deposits |
Deposit Type Code: 2 | **Deposit Age:** Quaternary | **Map Number:** of3336 | **Map Name:** Toronto | **Source Map Scale:** 1:50 000 | **Primary Material:** clay, silt, sand, diamicton | **Primary Material Modifier:** | **Secondary Material:** | **Primary General:** glacial, glaciofluvial, glaciolacustrine | **Primary General Modifier:** | **Veneer:** | **Episode:** | **Sub Episode:** | **Phase:** | **Stratus Modifier:** SubSurface | **Provenance:** | **Carbon Content:** | **Formation:** Undifferentiated older tills, may include stratified deposits | **Permeability:** Variable | **Material Description:** Till, fine-medium sand, and laminated silt and clay 1-50m thick, exposed in bluffs

ID: 100967 | **Unit Name:** Glacial lake deposits |
Deposit Type Code: 8a | **Deposit Age:** Quaternary | **Map Number:** of3336 | **Map Name:** Toronto | **Source Map Scale:** 1:50 000 | **Primary Material:** sand | **Primary Material Modifier:** silty | **Secondary Material:** | **Primary General:** glaciolacustrine | **Primary General Modifier:** foreshore/basinal | **Veneer:** | **Episode:** Wisconsin | **Sub Episode:** Michigan | **Phase:** | **Stratus Modifier:** Surface | **Provenance:** | **Carbon Content:** | **Formation:** | **Permeability:** High | **Material Description:** Sand and silty sand; 1->50m thick; occurs in basin lows and nearshore flats

ID: 101403 | **Unit Name:** Glacial lake deposits |
Deposit Type Code: 8a | **Deposit Age:** Quaternary | **Map Number:** of3336 | **Map Name:** Toronto | **Source Map Scale:** 1:50 000 | **Primary Material:** sand | **Primary Material Modifier:** silty | **Secondary Material:** | **Primary General:** glaciolacustrine | **Primary General Modifier:** foreshore/basinal | **Veneer:** | **Episode:** Wisconsin | **Sub Episode:** Michigan | **Phase:** | **Stratus Modifier:** Surface | **Provenance:** | **Carbon Content:** | **Formation:** | **Permeability:** High | **Material Description:** Sand and silty sand; 1->50m thick; occurs in basin lows and nearshore flats

ID: 101469 | **Unit Name:** Glacial lake deposits |
Deposit Type Code: 8b | **Deposit Age:** Quaternary | **Map Number:** of3336 | **Map Name:** Toronto | **Source Map Scale:** 1:50 000 | **Primary Material:** sand, gravel | **Primary Material Modifier:** | **Secondary Material:** | **Primary General:** glaciolacustrine | **Primary General Modifier:** littoral/foreshore | **Veneer:** | **Episode:** Wisconsin | **Sub Episode:** Michigan | **Phase:** | **Stratus Modifier:** Surface | **Provenance:** | **Carbon Content:** | **Formation:** | **Permeability:** High | **Material Description:** Gravelly sand and gravel; 1-5m thick; riased shorelines or bars

Surface Geology Report Metadata

Ontario Geological Survey 2010. Surficial geology of southern Ontario; Ontario Geological Survey, Miscellaneous Release - Data 128 - Revised.

ONTARIO MINISTRY OF NORTHERN DEVELOPMENT, MINES AND FORESTRY

ID - ID applied to the Unit

Unit Name - Name of deposit

Deposit Type Code - The geological unit number taken from the original map legend.

Deposit Age - to show the age when the sediments were deposited, e.g., Wisconsinan, postglacial or recent.

Map Number - Original map series number, eg., 'M2402' or 'P1973'. Each sgu_point feature is tagged to its original map.

Map Name - Usually NTS area where mapping was completed, e.g., 'Golden Lake'

Source Map Scale - The scale at which the original map was captured, e.g., '1:50 000'

Primary Material - This attribute provides the user with information regarding the most prevalent material present within a given area.

Primary Material Modifier- This attribute provides the user with a more refined description of the lithological classification of the primary material.

Secondary Material - This attribute provides the user with information regarding subordinate materials present within a given area.

Primary General - This attribute provides the user with an interpretation of the depositional environment within which the primary material was deposited.

Primary General Modifier - This attribute provides the user with a refined interpretation of the primary genetic modifier.

Veneer - This attribute provides the user with information regarding the type of material that forms a thin, discontinuous veneer over the primary material.

Sub Episode - A diachronic stratigraphic unit in a lower order than Episode and the proposed sequence-stratigraphic classification, consists in descending order of Michigan, Elgin and Ontario in the eastern and northern Great Lakes area in the Wisconsin Episode (Johnson et al. 1997; Karrow et al. 2000).

Sub Episode - A diachronic stratigraphic unit in a lower order than Episode and the proposed sequence-stratigraphic classification, consists in descending order of Michigan, Elgin and Ontario in the eastern and northern Great Lakes area in the Wisconsin Episode (Johnson et al. 1997; Karrow et al. 2000).

Phase - A diachronic stratigraphic unit in a lower order than Subepisode, and the proposed sequence-stratigraphic classification is listed in the following table in the eastern and northern Great Lakes area (Karrow et al. 2000)

Stratus Modifier - This attribute provides the user information regarding the stratigraphic position of the mapped unit (i.e., whether the unit occurs primarily on the surface or in the subsurface).

Provenance - This attribute provides the user with information regarding the provenance of a particular till unit (i.e. direction or lobe from which the till is derived).

Carbon Content - This attribute provides the user with information regarding the carbonate content of till.

Formation - This attribute provides the user with information regarding the formation to which a given primary material belongs (e.g., Tavistock Till, Port Stanley Till, Scarborough Formation). This attribute is seamless and allows the user to create a map based on formation.

Permeability - This attribute provides the user with basic information about permeability of the sediments in a ranking of high, medium and low.

Material Description - Material or sediment description, e.g., 'sand and silty fine sand', 'silty sand and gravel' and 'silty till with low stone content'.

AllRock Consulting Ltd

Sampling and Analysis Plan

Blantyre Park,
180 Fallingbrook Road,
Scarborough, Ontario

Prepared For:
Cherie NG Architect Inc.
2662 Bloor Street West,
Etobicoke, Ontario M8X 2Z7

March 21, 2024
AllRock File: 23376

AllRock Consulting Ltd.
24 Brydon Drive, Unit #5
Toronto, ON M9W 5R6

Version 1.0

Sampling and Analysis Plan

Blantyre Park, 180 Fallingbrook Road, Scarborough, Ontario

Project No.: 23376 / March 21, 2024

Prepared by:

Nathan Martin, B. Eng.
Environmental Project Manager
613.371.3442
nathan.martin@allrockconsulting.com

Reviewed by:

Scott Allen, P.Eng., QP$_{ESA}$
President
416.452.8998
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TABLE OF CONTENTS

LIST OF APPENDICES

1.0 INTRODUCTION

AllRock Consulting Limited (AllRock) was retained by Cherie NG Architect Inc. (Client) to conduct a Sampling and Analysis Plan (SAP) for the proposed Blantyre Park upgrades, located at 180 Fallingbrook Road, Scarborough, Ontario (hereafter referred to as the 'Site' or 'Project Area').

This Sampling and Analysis Plan was prepared in general accordance with *Ontario Regulation 406/19* made under the *Environmental Protect Act (EPA) – On-Site and Excess Soil Management* (Excess Soil Regulation), and the document entitled "*Rules for Soil Management and Excess Soil Quality Standards"* dated November 19, 2019 (Excess Soil Rules).

The client informed AllRock that the estimated volume of excess soil to be removed from the Project Area is approximately 2,000 cubic meters (m^3).

Based on the information obtained from the APU, AllRock identified a total of three (3) PCAs on the Project Area (On-Site), and eight (8) PCAs within the Study Area (Off-Site), of which a total of six (6) APECs were identified. Based on the APECs identified, the following Contaminants of Potential Concern (COPCs) include:

- Metals and Inorganics including pH, sodium adsorption ratio (SAR), electrical conductivity (EC);
- Petroleum hydrocarbons (PHCs);
- Polycyclic aromatic hydrocarbons (PAHs);
- Volatile organic compounds (VOCs); and
- Polychlorinated biphenyls (PCBs).

1.1 Person(s) Involved with the Project

The person(s) involved with the project are provided in *Table 2-1*, illustrated below:

Table 2.1 Person(s) Involved with the Project

Role	Information
Client	Cherie Ng, M.Arch Cherie NG, Architect Inc. Email: cng@cherieng.com Tel: (416) 898-1979
Qualified Person	Scott Allen, P.Eng., QP_{ESA} AllRock Consulting Ltd. 24 Brydon Drive, Unit #5, Toronto, Ontario, M9W 5R6 Email: scott.allen@allrockconsulting.com Tel: (416) 452-8998
Project Leader	To be determined.

2.0 OVERIVEW

2.1 Objective

As detailed in the Excess Soil Rules, the general objectives of the SAP are to:

- Identify each area where soil or crushed rock will be excavated from an APEC that will be subject to sampling and analysis; and
- Ensure that appropriate sampling and analysis is conducted to determine the concentrations of COPCs in the excavated soil or crushed rock to identify the potential receiving/reuse sites at which excess soil from the Project Area may be deposited for final placement.

2.2 Areas of Potential Environmental Concern

The APECs identified at the Project Area as part of the APU are detailed below and their respective locations are illustrated on Figure 2 (located in ***Appendix A***).

Table 2.1 Areas of Potential Environmental Concern

APEC	*PCA*	*Location of PCA (on-Site or off-Site)*	*Contaminants of Potential Concern*
APEC #1 *(Historical Landfill Operations)*	**Item #58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners**	On-Site	PHCs, BTEX, VOC, PAH, PCBs, Metals and Inorganics
APEC #2 *(De-icing activities)*	**Item #N/S – De-icing Activities**	On-Site	EC and SAR
APEC #3 *(Fill materials)*	**Item #30 – Importation of Fill Material of Unknown Quality**	On-Site	PHCs, VOCs, PAHs, Metals and Inorganics
APEC #4 *(UST at 207 Blantyre Ave)*	**Item #28 – Gasoline and associated products in fixed tanks**	Off-Site	PHCs, BTEX, Metals
APEC #5 *RFO and autobody operations at 1210 Kingston Road*	**Item #28 – Gasoline and associated products in fixed tanks**	Off-Site	PHCs, BTEX, Metals
	Item #10 – Commercial Autobody Shops	Off-Site	PHCs, VOCs, PAHs, Metals and Inorganics
APEC #6 *(Drycleaning operations at 1208 Kingston Road)*	**Item #37 – Operation of Dry-Cleaning Equipment**	Off-Site	VOCs

3.0 SAMPLING AND ANALYSIS PLAN

3.1 Sample Locations

The Soil Characterization will assess soil quality from the areas located partially or wholly within the APECs. The areas determined by the QP to require investigation through the sampling and analysis are illustrated on the figures provided in ***Appendix A***.

3.2 Sample Frequency

The quantity of boreholes within each APEC was based on the requirement to collect soil samples at the frequency specified in the Excess Soil Rules as well as the geotechnical investigation. Based on AllRock's understanding of the depth and extent of the planned excavation, as well as the extent of the APECs that will be partially or wholly excavated, it is anticipated that a volume of 2,000 cubic meters (m^3) of excess soil will be generated through excavation. Based on this volume the collection of ten (10) soil samples would be sufficient to comply with the Excess Soil Rules.

The Excess Soil Rules also require that leachate analysis using the Synthetic Precipitate Leachate Procedure (SPLP) be completed in addition to the analysis of soils detailed above. Subsequent to the analytical results, three (3) soil samples will be submitted for leachate analysis. The soil samples submitted for leachate analysis shall be collected from the sampling locations where 90% (or higher) of the highest contaminant concentrations were found. SPLP samples were proposed at a minimum frequency of requirements.

Ten (10) boreholes are to be advanced as part of the geotechnical investigation at proposed maximum excavation depths of 4.4 meters below ground surface (mbgs). The exact borehole locations and depths may vary depending on the field conditions to avoid any conflicts.

3.3 Sample Parameters

Ten (10) soil samples will be submitted for the analysis petroleum hydrocarbons (PHCs) in the F1 to F4 fraction ranges (F1-F4), benzene, toluene, ethylbenzene, xylenes (collectively hereafter referred to as 'BTEX'), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), as well as metals and inorganics.

4.0 METHODOLOGY

The Soil Characterization will be completed in general accordance with the MECP document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario" dated December 1996, and the Association of Professional Geoscientists of Ontario document entitled "Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended)", dated April 2011.

4.1 Soil: Borehole Drilling

It is AllRock's understanding that as part of the geotechnical investigation Ten (10) boreholes are to be advanced at proposed maximum excavation depths of 4.4 mbgs, pending the clearance of underground

services in the work area. Soil samples will be collected in 0.76 m intervals. The exact borehole locations and depths may vary depending on the field conditions to avoid any conflicts.

Soil stratigraphy will be observed and documented at the Project Area at the time of drilling. Soil samples will be examined in the field for visual and olfactory evidence of impacts. A portion of each sample was separated and analyzed for petroleum and VOC derived vapour concentrations using a combustible gas indicator calibrated to hexane and a photo-ionization detector calibrated to isobutylene or equivalent.

4.2 Soil: Sampling

Ten (10) “worst-case” soil samples, based on visual, olfactory conditions, and vapour headspace concentrations, recovered from each test pit were submitted for select laboratory analysis of PHCs (F1-F4), BTEX, PAHs, VOCs, as well as metals and inorganics including pH, SAR and EC.

Three (3) soil samples were collected and submitted for leachate analysis of metals using the Synthetic Precipitate Leachate Procedure (mSPLP).

In addition (1) soil sample was collected and submitted for leachate analysis of inorganics, VOCs, PCBs, and benzo(a)pyrene, using the Toxicity Characteristic Leachate Procedure (TCLP).

4.3 Analytical Laboratory

The QP shall ensure that the requirements of Section 47 of Ontario Regulation 153/04 are complied with. Soil samples collected will be delivered to Eurofins Laboratories (Eurofins) in Ottawa for analysis. Eurofins is an independent laboratory accredited by the Standards Council of Canada and the Canadian Association for Laboratory Accreditation. A chain of custody records of the sample submissions will be maintained between AllRock and the staff at Eurofins.

5.0 QA/QC PROTOCOLS

Various quality assurance/quality control (QA/QC) protocols were followed while conducting this Soil Characterization Report to ensure that representative soil samples will be obtained. The following field QA/QC protocols completed by AllRock included the following:

- Care will be taken to not obtain samples in direct contact with the drilling equipment.
- Soil samples are to be placed in laboratory-supplied glass jars;
- Soil samples are to be placed in coolers on ice immediately upon sample collection. Appropriate sample temperatures will be maintained during sampling, transportation and submission to the laboratory;
- Dedicated and disposable nitrile gloves were used for sample handling;
- Non-dedicated equipment used in sampling and monitoring (e.g., soil knife) are to be cleaned with Alcanox and a deionized rinse prior to initial use and between uses to minimum the potential for cross contamination.

6.0 CONCLUSIONS

AllRock identified a total of three (3) PCAs on the Project Area (On-Site), and eight (8) PCAs within the Study Area (Off-Site), of which a total of six (6) APECs were identified for the Project Area. It is AllRock's opinion that these APECs may have resulted in potential soil contamination.

Based on the findings of this APU, AllRock recommended completing a sampling and analysis plan (SAP) as well as a soil characterization report (SCR) to determine the soil quality beneath the Project Area. It is recommended that the following samples be collected and submitted for laboratory analysis of the COPCs:

Estimated Excess Soil Volume (m3)	Required Number of In-Situ Soil Samples for Analysis		
	PHCs, BTEX, as well as metals and inorganics	mSPLP (metals)	TCLP (VOCs, PCBs, and benzo(a)pyrene)
2,000	10 samples	3 samples	1 sample

6.1 Qualified Person Declaration

The Qualified Person confirms that the SAP was conducted and/or supervised by the Qualified Person. The QP certifies that to the best of the QP's knowledge, the report is complete and accurate and generally meets the requirements of the Excess Soil Regulation and the associated Excess Soil Rules.

6.2 Terms and Limitations

This SAP was prepared for the exclusive use of Cherie NG Architect Inc. This SAP was preformed to outline a proposed scope of work to provide information pertaining to the APECs identified in an Assessment of Past Uses previously completed by AllRock and associated with the Site located at Blantyre Park, 180 Fallingbrook Road, Scarborough, Ontario, at the time of the field investigation.

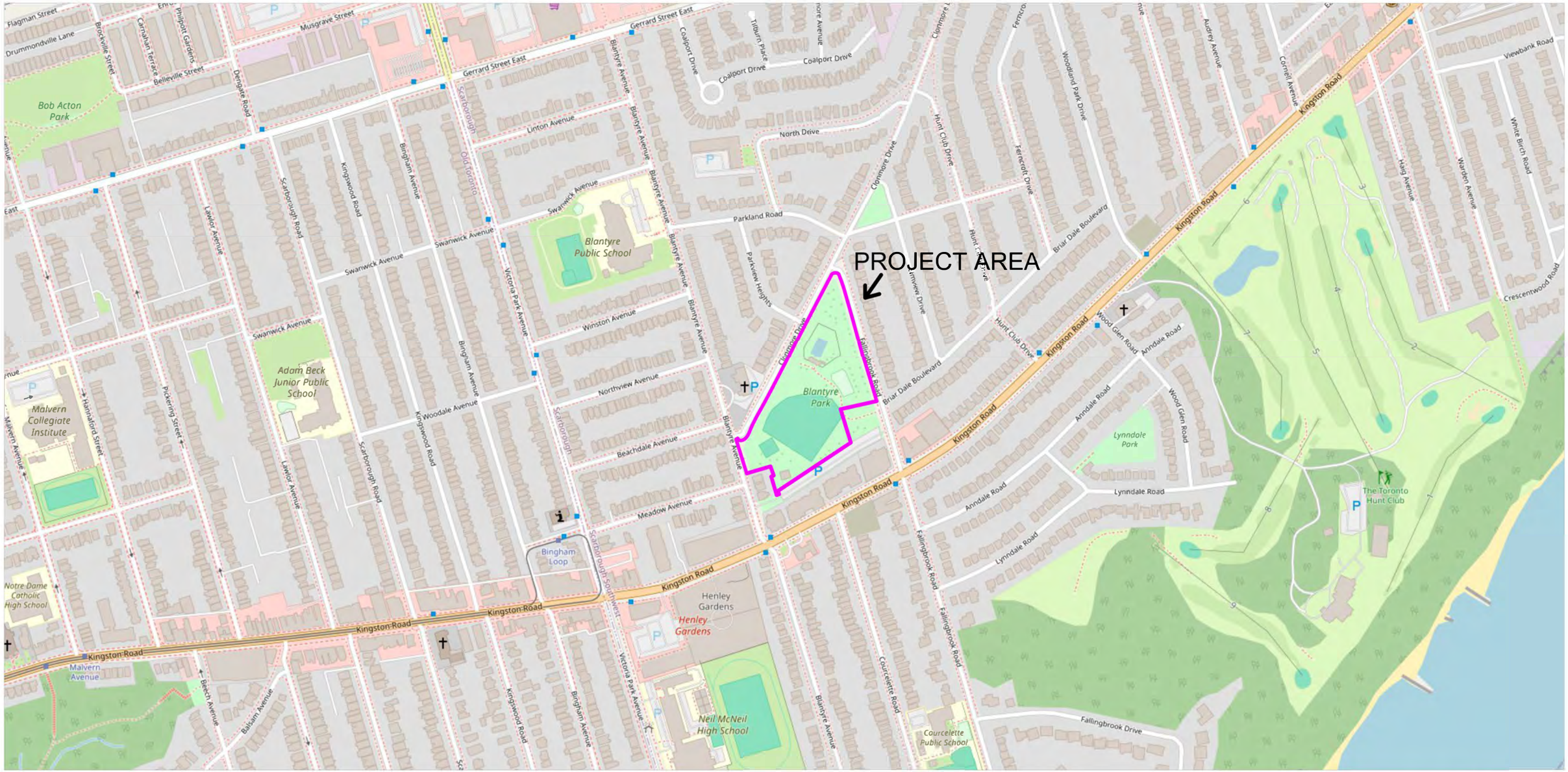
The evaluation and conclusions contained within this report have been prepared based on the observations and/or information available to AllRock at the time of preparation, using standard engineering and environmental methods and practices. AllRock accepts no responsibility of any deficiency or inaccuracy in this report as a result of omissions, misstatements, misrepresentation or fraudulent acts of persons interviewed or contacted.

AllRock Consulting Limited prepared this report for the Client. The material in it reflects AllRock Consulting Limited judgement in light of the information available to it at the time of preparation. Any use which a Party other than those listed above, makes of this report, or any reliance or decisions to be made based on it are the responsibilities for such Parties. AllRock Consulting Limited accepts no responsibility for damages, if any, suffered by any Party as a result of decisions made or actions based on this report.

AllRock will not be held responsible for the use of this report by any third party, or reliance on or any decision to be made based on it without the prior written consent of AllRock. Any use a third party makes of this report, or any reliance on or decisions to be made based on it, is the sole responsibility of such third parties. AllRock accepts no liability or responsibility of loss, injury, claim or damages suffered by any third party as a result of decisions made or actions conducted.

APPENDIX A

Figures



LEGEND:

PROJECT AREA

FIGURE TITLE:	KEY MAP
PROJECT:	SAMPLING AND ANALYSIS PLAN
CLIENT:	CHERIE NG ARCHITECT INC.
ADDRESS:	180 FALLINGBROOK ROAD, SCARBOROUGH, ON
PROJECT NO:	23376
APPROXIMATE SCALE:	NTS

AllRock Consulting Ltd

DATE: FEB. 2024	FIGURE NO.: 1
DRAWN BY: TM	CHECKED BY: NM

LEGEND:

- PROJECT AREA
- APU STUDY AREA
- SITE BUILDING A
- SITE BUILDING B

N

FIGURE TITLE:	AREA OF POTENTIAL ENVIRONMENTAL CONCERN
PROJECT:	SAMPLING AND ANALYSIS PLAN
CLIENT:	CHERIE NG ARCHITECT INC.
ADDRESS:	180 FALLINGBROOK ROAD, SCARBOROUGH, ON
PROJECT NO:	23376
APPROXIMATE SCALE:	NTS

AllRock Consulting Ltd

DATE: FEB. 2024	FIGURE NO.: 2
DRAWN BY: TM	CHECKED BY: NM

AllRock Consulting Ltd

Soil Characterization Report

Blantyre Park,
180 Fallingbrook Road,
Scarborough, Ontario

Prepared For:
Cherie NG Architect Inc.
2662 Bloor Street West,
Etobicoke, Ontario M8X 2Z7

March 21, 2024
AllRock File: 23376

AllRock Consulting Ltd.
24 Brydon Drive, Unit #5
Toronto, ON M9W 5R6

Version 1.0

Soil Characterization Report

Blantyre Park, 180 Fallingbrook Road, Scarborough, Ontario

Project No.: 23376 / March 21, 2024

Prepared by:

Nathan Martin, B. Eng.
Environmental Project Manager
613.371.3442
nathan.martin@allrockconsulting.com

Reviewed by:

Scott Allen, P.Eng., QP$_{ESA}$
President
416.452.8998
scott.allen@allrockconsulting.com

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LIST OF APPENDICES

1.0 INTRODUCTION

AllRock Consulting Limited (AllRock) was retained by Cherie NG Architect Inc. (Client) to conduct a Soil Characterization Report (SCR) for the proposed Blantyre Park upgrades, located at 180 Fallingbrook Road, Scarborough, Ontario (hereafter referred to as the 'Site' or 'Project Area'). The client informed AllRock that the estimated volume of excess soil to be removed from the Project Area is approximately 2,000 cubic meters (m3).

This Soil Characterization Report was completed in the support of the management of excess soil relating to proposed Blantyre Park upgrades and was completed in general accordance with Ontario Regulation 406/19 made under the Environmental Protection Act – On-Site and Excess Soil Management dated December 4, 2019 (Excess Soil Regulation) and the Rules for Soil Management and Excess Soil Quality Standards dated November 19, 2019 (Excess Soil Rules).

Based on the information obtained from the APU, AllRock identified a total of three (3) PCAs on the Project Area (On-Site), and eight (8) PCAs within the Study Area (Off-Site), of which a total of six (6) APECs were identified. Based on the APECs identified, the following Contaminants of Potential Concern (COPCs) include:

- Metals and Inorganics including pH, sodium adsorption ratio (SAR), electrical conductivity (EC);
- Petroleum hydrocarbons (PHCs);
- Polycyclic aromatic hydrocarbons (PAHs);
- Volatile organic compounds (VOCs); and
- Polychlorinated biphenyls (PCBs).

Figures of the Project Area and surrounding areas are included on Figure 1, located in ***Appendix A***.

1.1 Person(s) Involved with the Project

The person(s) involved with the project are provided in *Table 2-1*, illustrated below:

Table 1.1 Person(s) Involved with the Project

Role	Information
Client	Cherie Ng, M.Arch Cherie NG, Architect Inc. Email: cng@cherieng.com Tel: (416) 898-1979
Qualified Person	Scott Allen, P.Eng., QP_{ESA} AllRock Consulting Ltd. 24 Brydon Drive, Unit #5, Toronto, Ontario, M9W 5R6 Email: scott.allen@allrockconsulting.com Tel: (416) 452-8998
Project Leader	To be determined.

1.2 Site Condition Standards

The Project Area is a parkland land use property located in the Scarborough, Ontario. It is AllRock's understanding that potable water for the Project Area and study area is supplied by the municipality and therefore the Project Area is considered to be within a non-potable groundwater condition.

Boreholes were advanced to a maximum depth of approximately 4.4 mbgs and bedrock was not encountered at the Project Areas and as such the Site is not considered a shallow soil property. In addition, the Site does not contain a waterbody nor is located within 30 meters (m) of a waterbody and as such, the standards for properties situated within 30 m of a waterbody would not be applicable.

Ontario Regulation 153/04 (as amended) indicates that a site can be classified as an "environmentally sensitive area" if the pH for surface soils (less than 1.5 mbgs) is outside the acceptable pH range between 5 and 9, and/or the pH range for sub-surface soils (greater than 1.5 mbgs) is outside the acceptable pH range between 5 and 11, if the site is within an area of natural significance, includes or is adjacent to an area of natural significance, and/or includes land that is within 30 m of an area of natural significance. Several representative soil samples were collected from the Project Area and were submitted for laboratory analysis of pH. Soil samples submitted were in range of the surface and subsurface values, and as such the Site is not considered to be an environmentally sensitive area.

Based on the above, the appliable Site Condition Standards would be the Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition, Residential/Parkland/Institutional Property Use (RPI), coarse-grained soils of the MECP document entitled "*Soil, Ground Water, and Sediment Standards for Use Under Part XV.1 of the Environmental Protect Act*" and dated April 15, 2011 (*Table 3 RPI Standards*).

2.0 BACKGROUND

2.1 Physical Setting

The Project Area is located within the Iroquois Plain Physiographic Region which is comprised of sand plains and beaches. The surficial geology within the Project Area comprised of glacial deposits of sandy silt to sand till and river deposits of sand and gravel. The Bedrock Geology is described as shale, limestone, dolostone, and siltstone of the Georgian Bay Formation.

The closest surface water body is Lake Ontario, which was located approximately 750 m southeast of the Project Area. Based on the surface water flow direction and ground surface topography, the general groundwater flow direction is expected to be southeast towards Lake Ontario.

2.2 Areas of Potential Environmental Concern

The APECs identified at the Project Area as part of the APU are detailed below and their respective locations are illustrated on Figure 2 (located in ***Appendix A***).

Table 2.1 Areas of Potential Environmental Concern

APEC	PCA	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern
APEC #1 *(Historical Landfill Operations)*	**Item #58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners**	On-Site	PHCs, BTEX, VOC, PAH, PCBs, Metals and Inorganics
APEC #2 *(De-icing activities)*	**Item #N/S – De-icing Activities**	On-Site	EC and SAR
APEC #3 *(Fill materials)*	**Item #30 – Importation of Fill Material of Unknown Quality**	On-Site	PHCs, VOCs, PAHs, Metals and Inorganics
APEC #4 *(UST at 207 Blantyre Ave)*	**Item #28 – Gasoline and associated products in fixed tanks**	Off-Site	PHCs, BTEX, Metals
APEC #5 *RFO and autobody operations at 1210 Kingston Road*	**Item #28 – Gasoline and associated products in fixed tanks**	Off-Site	PHCs, BTEX, Metals
	Item #10 – Commercial Autobody Shops	Off-Site	PHCs, VOCs, PAHs, Metals and Inorganics
APEC #6 *(Drycleaning operations at 1208 Kingston Road)*	**Item #37 – Operation of Dry-Cleaning Equipment**	Off-Site	VOCs

3.0 INVESTIGATION METHODOLOGY

3.1 Overview of Investigation

The scope of work for this Soil Characterization Report was completed to address the APECs identified at the Project Area and to characterize soil quality. The scope of work consisted of the following:

- Advancement of and ten (10) boreholes, following the clearance of underground services;
- Field screen soil samples for visual and olfactory evidence of impacts and for the presence of petroleum and volatile organic compound (VOC) derived vapours using a combustible gas indicator (CGI) calibrated to hexane and a photo-ionization detector (PID) calibrated to isobutylene or equivalent;
- Submit ten (10) “worst-case” soil samples for select laboratory analysis of metals and inorganics, PAHs, VOCs, PCBs, PHCs, benzene, toluene, ethylbenzene, and xylenes (collectively hereafter referred to as ‘BTEX’),

- Submit three (3) soil samples based on analytical data, for leachate analysis of metals using the Synthetic Precipitate Leachate Procedure;
- Compare the soil analytical results to the applicable regulatory criteria; and
- Prepare a factual report outlining the findings and recommendations of the SCR.

3.2 Deviations from Sampling and Analysis Plan

No notable limitations or deviations with respect to the Sampling and Analysis Plan were documented during field activities. AllRock had full access of the Project Area to complete the Soil Characterization Report. The Soil Characterization Report was completed in a manner that is generally consistent with the Sampling and Analysis Plan.

Soil samples were collected as part of the geotechnical investigation in order to optimize the drilling program. The soil samples were collected from the sampling location where the APECs were anticipated to be present. However, at that time COPCs did not include PCBs and therefore, no samples were analyzed for PCBs. AllRock notes that no physical evidence of landfill was encountered during the drilling investigation.

3.3 Soil: Drilling

AllRock retained Terra Firma Environmental Services Ltd. for the advancement of ten (10) boreholes (BH1 to BH11) within the Project Area on November 21, and November 22, 2023. The clearance of underground services in the work area were completed by public utility locators and AllRock retained a private utility locator prior to field activities. The boreholes were advanced using a rubber track mounted drill rig to a maximum completion depth of approximately 4.4 mbgs. Soil samples were collected at regular 0.76 m intervals. Discrete soil samples were collected and placed in laboratory supplied glass sample jars.

Soil stratigraphy was observed and documented on-Site by AllRock at the time of drilling activities. Soil samples were examined in the field for visual and olfactory evidence of impacts. A portion of each sample was separated and analyzed for petroleum and VOC derived vapour concentrations using a combustible CGI calibrated to hexane and a PID calibrated to isobutylene or equivalent.

The locations of the boreholes are presented in Figure 5 (***Appendix A***) and the associated borehole logs are presented in ***Appendix B***.

3.4 Soil: Sampling

Ten (10) “worst-case” soil samples, based on visual, olfactory conditions, and vapour headspace concentrations, recovered from each test pit were submitted for select laboratory analysis of PHCs (F1-F4), BTEX, PAHs, VOCs, as well as metals and inorganics including pH, SAR and EC.

Three (3) soil samples were collected and submitted for leachate analysis of metals using the Synthetic Precipitate Leachate Procedure (mSPLP).

In addition (1) soil sample was collected and submitted for leachate analysis of inorganics, VOCs, PCBs, and benzo(a)pyrene, using the Toxicity Characteristic Leachate Procedure (TCLP).

3.5 Soil: Vapour Concentrations

A portion of each sample was assessed in the field for petroleum and VOC-derived vapour concentrations in soil headspace using a PID and CGI operated in methane elimination mode and calibrated to hexane and isobutylene. Vapour concentrations measured in the headspace of soil samples were collected during the drilling investigation. The soil samples collected for vapour screening purposes were placed in a resealable plastic bag.

Table 3.5 Field Screening Measurements

Subject	Details	
Make and Model Number	RKI Eagle II	
Chemicals the equipment can detect and associated limits and accuracy of the measurements	**Hydrocarbons (CH4, std)**	
	0 – 100% LEL,	± 5% of reading or ± 2% LEL
	0-5% Vol (CH4)	± 5% of reading or ± 2% LEL
	0 – 50,000 ppm	± 50 ppm or ± 5% of reading
	VOCs	
	0-50 ppm	-
	0 – 2000 ppm	-
Precision of the measurements	2 significant figures	
Calibration reference standards	CH4, std: Hexane VOCs: Isobutylene	
Procedures for checking calibration of the equipment	The RKI Eagle II is calibrated by the factory on an annual basis, and the calibration is checked in the field on a daily basis in general accordance with the manufacturer's procedures prior to use.	

3.6 Analytical Laboratory

Soil samples collected were delivered to Eurofins Labs (Eurofins) in Ottawa for analysis. Eurofins is an independent laboratory accredited by the Standards Council of Canada and the Canadian Association for Laboratory Accreditation. A chain of custody records of the sample submissions was maintained between AllRock and the staff at Eurofins.

4.0 QA/QC PROTOCOLS

Various QA/QC protocols were followed while conducting this SCR to ensure that representative soil samples were obtained. The following field QA/QC protocols completed by AllRock included the following:

- Care was taken to not obtain samples in direct contact with the drilling equipment;
- Soil samples were placed in laboratory-supplied glass jars;
- Soil samples were placed in coolers on ice immediately upon sample collection. Appropriate sample temperatures were maintained during sampling, transportation and submission to the laboratory;
- Dedicated and disposable nitrile gloves were used for sample handling;
- Non-dedicated equipment used in sampling (e.g., shovel) were cleaned with Alcanox and a deionized rinse prior to initial use and between uses to minimum the potential for cross contamination.

5.0 SUBSURFACE FINDINGS

5.1 Soil Stratigraphy

Based on observations during the drilling program, the soil stratigraphy at the borehole locations generally consisted of fill materials of brown fine to coarse grained sand, with trace to some gravel, as well as brown gravelly sand. Details of the soil stratigraphy observed during the field investigation is documented in the borehole logs, located in ***Appendix B***.

5.2 Depth to Water Table

Groundwater was not encountered during the drilling program.

5.3 Soil Vapour Concentrations

A portion of each sample was assessed in the field for petroleum and volatile organic compound derived. vapour concentrations in soil headspace using a PID and CGI operated in methane elimination mode. Vapour concentrations measured in the headspace of soil samples were collected during the drilling sampling events. Soil vapour concentrations measured with the CGI were below the reportable detection limit (i.e., less than 5.0 parts per million by volume (ppmv)) and soil vapour concentrations measured with the PID were all non-detect (i.e., 0 ppmv).

5.4 Field Observations

AllRock notes that no odours were detected in any soil sample collected during the field investigation.

6.0 CHEMICAL ANALYSIS

6.1 Soil

The soil samples submitted for analysis, as well as a summary interpretation of the analytical results are presented in Table 1 (located in ***Appendix C***). AllRock compared the analytical criteria to the *Table 1 (RPICC), Table 2.1 (ICC) and Table 3.1 (ICC) Excess Soil Quality Standards.* A total of ten (10) soil samples, and four (4) leachate samples were collected and submitted for select laboratory analysis. The analytical results are summarized in the below table:

Exceedances of MECP Excess Soil Quality Standards							
Sample ID	**PHCs (F1-F4) + BTEX**	**VOCs**	**PAHs**	**Metals & Inorganics**	**Table 1: Full Depth Background Site Condition Standards (RPIICC)[1]**	**Table 2.1 ESQS: Full Depth Excess Soil Quality Standards in a Potable Ground Water Condition (ICC)[1]**	**Table 3.1 ESQS: Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition (ICC)[1]**
BH1 SS2	●	●	●	●	*PHC F2*	*None*	*None*
BH3 SS3	●	●	●	●	*None*	*None*	*None*
BH4 SS3	●	●	●	●	*None*	*None*	*None*
BH5 SS2	●	●	●	●	*None*	*None*	*None*
BH5 SS3	●	●	●	●	*None*	*None*	*None*
BH6 SS2	●	●	●	●	*None*	*None*	*None*
BH6 SS3	●	●	●	●	*None*	*None*	*None*
BH9 SS1	●	●	●	●	*None*	*None*	*None*
BH9 SS2	●	●	●	●	*None*	*None*	*None*
BH10 SS3	●	●	●	●	*SAR*	*None*	*None*

mSPLP

One soil sample was submitted for laboratory analysis of metals using the mSPLP. The soil sample met the applicable *Table 1, Table 2.1,* and *Table 3.1 Leachate Screening Levels (LSL).*

TCLP

The leachate concentrations in the soil samples were below the applicable Schedule 4 Criteria of Ontario Regulation 347 (as amended), and as such the excess soil would be suitable for off-Site disposal as non-hazardous waste.

The laboratory Certificates of Analysis for the soil samples is provided in ***Appendix D***.

7.0 CONCLUSION

This Updated Soil Characterization Report will assist with the potential management, reuse and disposal requirements for excess soil generated as part of this project. Based on the information obtained through this investigation, AllRock notes the analytical results reported provide acceptable quality assurance and control with respect to the sample collection, processing, and analysis.

Based on the results of this Soil Characterization Report excess soil met the applicable *Table 1 RPIICC* standards with the exception of the following:

- Soil sample BH1 SS2 collected at a depth of 0.76 to 1.52 mbgs exceeded the *Table 1 RPIICC* standards for PHC (F2).

- Soil sample BH10 SS3 collected at a depth of 1.52 to 2.29 mbgs exceeded the *Table 1 RPIICC* standards for SAR.

The majority of excess soil could likely be transported to a Table 1 RPIICC ESQS Reuse Site with the exception of material in the vicinity of BH10 SS3 and BH1 SS1 requiring transportation to a *Table 2.1 ICC ESQS Resue* Site, pending approval. AllRock notes that additional samples may be required at the discretion of the receiving site.

With respect to elevated SAR concentrations and subject to the Reuse Site, these contaminants in soil resulting from the use of a substance for the safety of vehicular or pedestrian traffic and applied under conditions of snow or ice, or both, are deemed to be met if the following criteria are met:

1. The excess soil is finally placed at one of the following locations:
    a. Where it is reasonable to expect that the soil will be affected by the same chemicals as a result of continued application of a substance for the safety of vehicular or pedestrian traffic under conditions of snow or ice;
    b. At an industrial or commercial property use and to which non-potable standards would be applicable; or
    c. At least 1.5 metres below the surface of the soil.
2. The excess soil is not finally placed at any of the following locations:
    a. Within 30 metres of a waterbody;
    b. Within 100 metres of a potable water well or area with an intended property use that may require a potable water well; or
    c. a location that will be used for growing crops or pasturing livestock unless the excess soil is placed 1.5 metres or greater below the soil surface.
3. The project leader or operator of the project area has informed the reuse site owner or operator that the excess soil is from a location that may be expected to contain the chemical and, if sampling and analysis has been conducted in accordance with the regulation, the project leader or operator of the project area has provided relevant sampling results to the reuse site owner or operator, including the soil characterization report if prepared, and identified and communicated any potential risks to surface water and ground water to the reuse site owner or operator.

8.0 QUALIFIED PERSON DECLARATION

The Qualified Person confirms that this SCR was conducted and/or supervised by the Qualified Person. The QP certifies that to the best of the QP's knowledge, the report is complete and accurate and meets the requirements of the Excess Soil Regulation and the associated Excess Soil Rules.

9.0 TERMS AND LIMITATIONS

This report has been prepared for the exclusive use of Cherie NG Architect for specific application to the Site. This SCR was conducted in general compliance with currently acceptable practices for environmental site investigations, and specific Client requests, as applicable to this Site. No other warranty, expressed or implied, is made. The scope of work completed by AllRock as part of this investigation, is not sufficient (in and of itself) to meet the requirements for the submission of a Record of Site Condition (RSC) in accordance with Ontario Regulation 153/04 (as amended).

It is noted that this analysis was focused on identifying the presence and levels of contaminants within the materials analysed. The conclusions and recommendations in this report are based on information determined through analysis of select individual samples. Contamination levels may differ from those reported and conditions may become apparent during excavation, construction, or re-development, which would not be detected or anticipated at the time of the assessment.

The conclusions presented in this report are professional opinions based upon chemical analysis and limited information provided by persons knowledgeable about past and current activities on this property. As such, AllRock Consulting Limited cannot be held responsible for environmental conditions at the Project Area that were not apparent from the available information.

AllRock Consulting Limited prepared this report for the Client. The material in it reflects AllRock Consulting Limited judgement in light of the information available to it at the time of preparation. Any use which a Party other than those listed above, makes of this report, or any reliance or decisions to be made based on it are the responsibilities for such Parties. AllRock Consulting Limited accepts no responsibility for damages, if any, suffered by any Party as a result of decisions made or actions based on this report.

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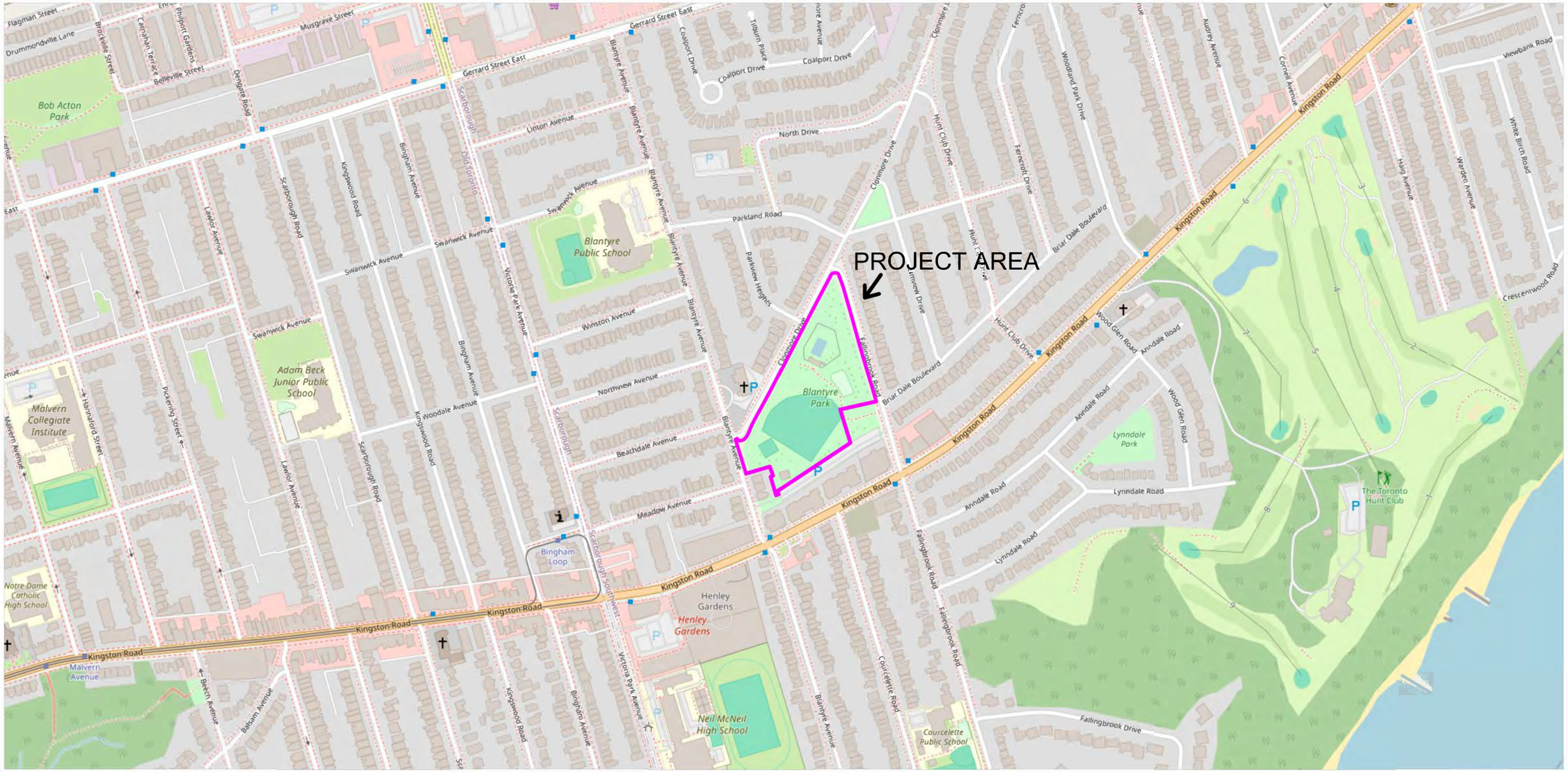
APPENDIX A

Figures



LEGEND:

PROJECT AREA

N

FIGURE TITLE:	KEY MAP
PROJECT:	SOIL CHARACTERIZATION REPORT
CLIENT:	CHERIE NG ARCHITECT INC.
ADDRESS:	180 FALLINGBROOK ROAD, SCARBOROUGH, ON
PROJECT NO.: 23376	APPROXIMATE SCALE: NTS

AllRock Consulting Ltd

DATE: FEB. 2024	FIGURE NO.: 1
DRAWN BY: TM	CHECKED BY: NM

LEGEND:

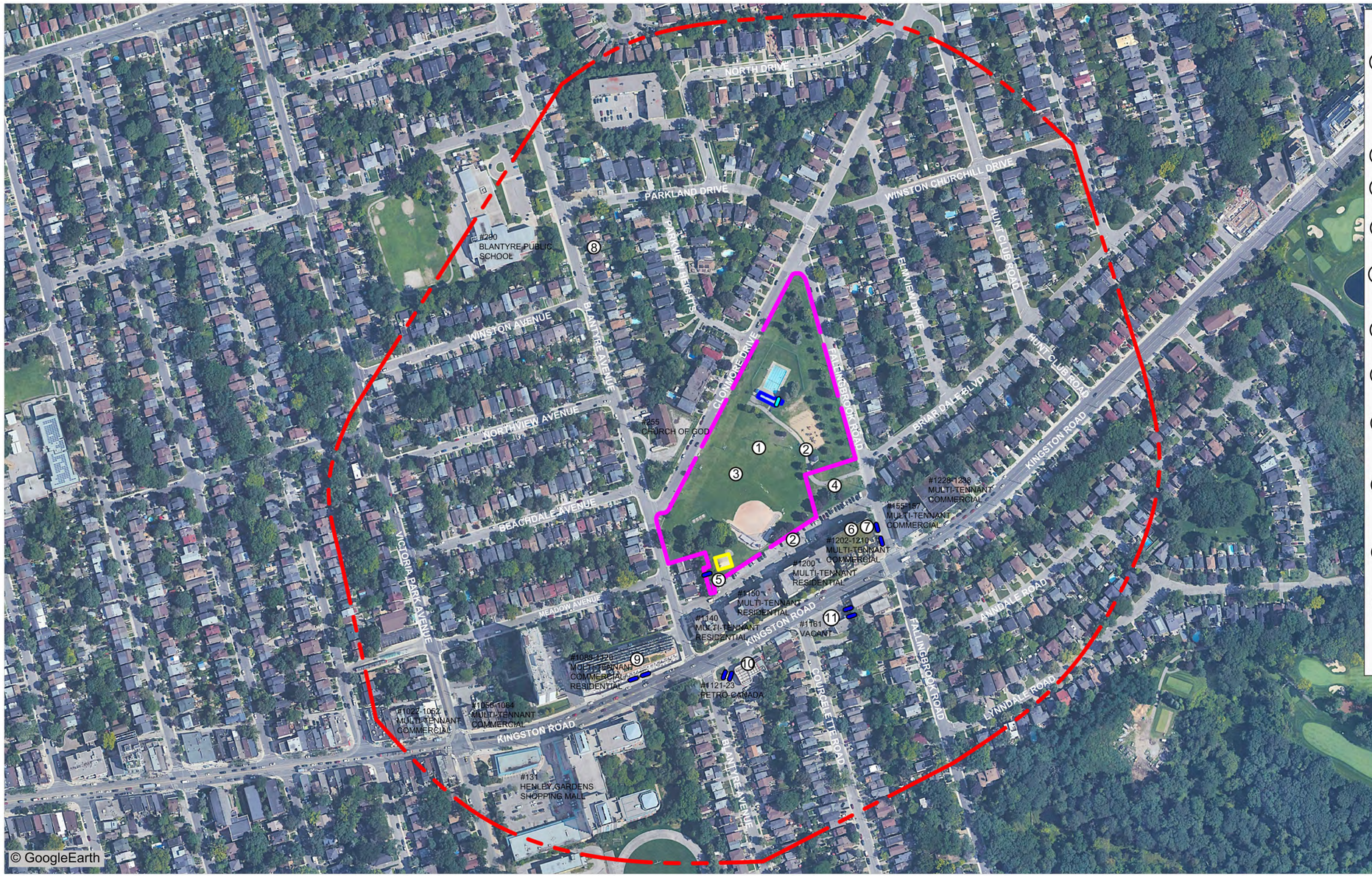
- PROJECT AREA
- APU STUDY AREA
- SITE BUILDING A
- SITE BUILDING B
- COMMERCIAL LAND USE
- RESIDENTIAL LAND USE
- PARKLAND LAND USE
- INSTITUTIONAL LAND USE

N

FIGURE TITLE:	APU STUDY AREA
PROJECT:	SOIL CHARACTERIZATION REPORT
CLIENT:	CHERIE NG ARCHITECT INC.
ADDRESS:	180 FALLINGBROOK ROAD, SCARBOROUGH, ON
PROJECT NO:	23376
APPROXIMATE SCALE:	NTS

AllRock Consulting Ltd

DATE: FEB. 2024	FIGURE NO.: 2
DRAWN BY: TM	CHECKED BY: NM



POTENTIALLY CONTAMINATING ACTIVITIES

1. PCA-1 (ITEM #58 WASTE DISPOSAL AND WASTE MANAGEMENT, INCLUDING THERMAL TREATMENT, LANDFILLING AND TRANSFER OF WASTE, OTHER THAN USE OF BIOSOILS AS SOIL CONDITIONERS.)
2. PCA-2 (ITEM #N/S - DE-ICING ACTIVITIES)
3. PCA-3 (ITEM #30 - FILL MATERIAL OF UNKNOWN QUALITY)
4. PCA-4 (ITEM#55 - TRANSFORMER MANUFACTORING, PROCESSING, AND USE)
5. PCA-5 (ITEM#28 - GASOLINE AND ASSOCIATED PRODUCTS IN FIXED TANKS)
6. PCA-6 (ITEM#28 - GASOLINE AND ASSOCIATED PRODUCTS IN FIXED TANKS, ITEM#10 - COMMERICAL AUTOBODY SHOP)
7. PCA-7 (ITEM #37 - OPERATION OF DRY CLEANING EQUIPMENT)
8. PCA-8 (ITEM #37 - OPERATION OF DRY CLEANING EQUIPMENT)
9. PCA-9 (ITEM#10 - COMMERICAL AUTOBODY SHOP, ITEM#28 - GASOLINE AND ASSOCIATED PRODUCTS IN FIXED TANKS)
10. PCA-10 (ITEM#28 - GASOLINE AND ASSOCIATED PRODUCTS IN FIXED TANKS, ITEM#10 - COMMERICAL AUTOBODY SHOP)
11. PCA-11 (ITEM#28 - GASOLINE AND ASSOCIATED PRODUCTS IN FIXED TANKS, ITEM#10 - COMMERICAL AUTOBODY SHOP, ITEM#N/S - PETROLEUM SPILL)

LEGEND:

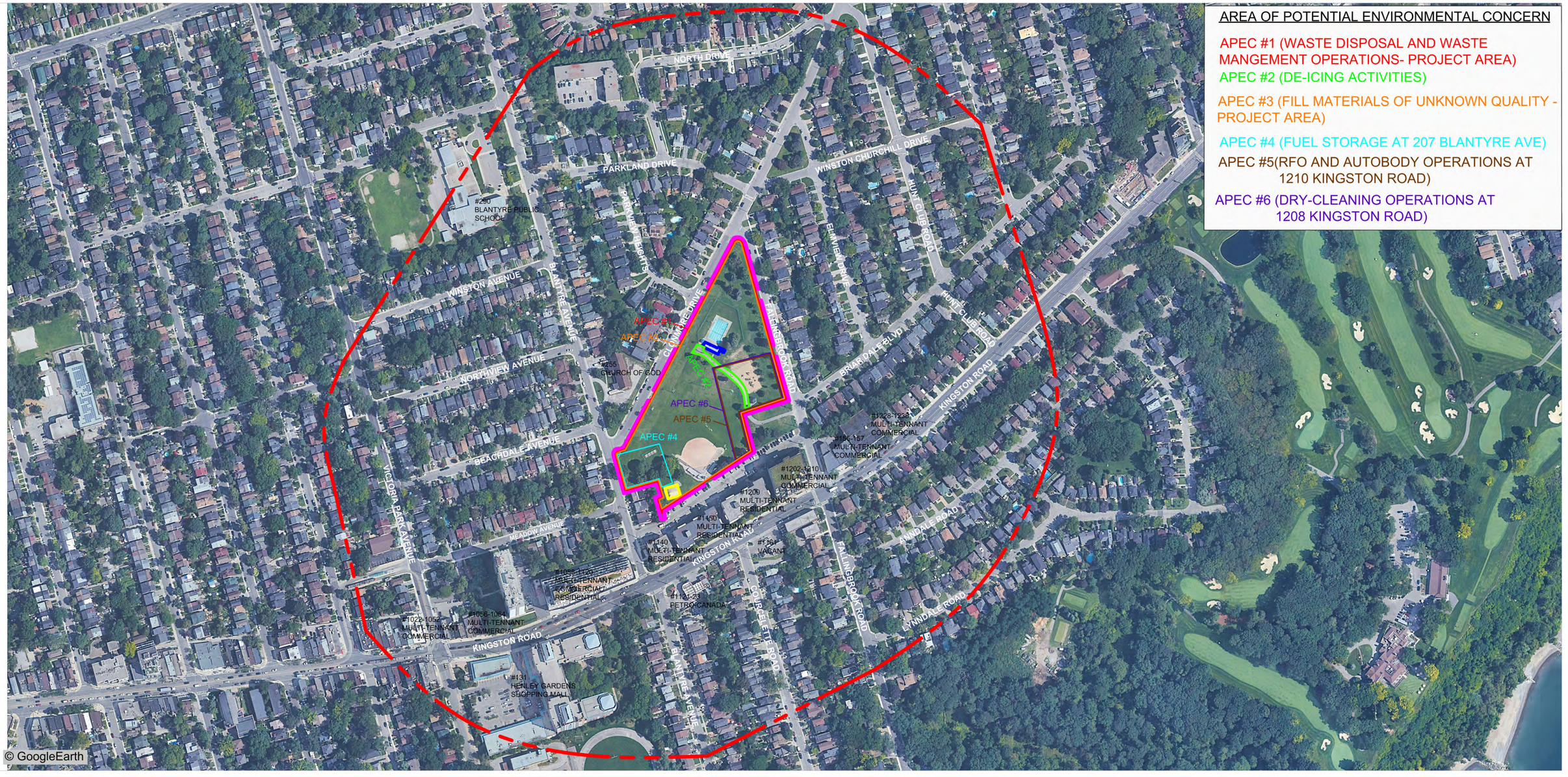
- PROJECT AREA
- APU STUDY AREA
- SITE BUILDING A
- SITE BUILDING B
- APPROXIMATE LOCATION OF UST
- APPROXIMATE LOCATION OF AST

N

FIGURE TITLE:	POTENTIAL CONTAMINATING ACTIVITIES
PROJECT:	SOIL CHARACTERIZATION REPORT
CLIENT:	CHERIE NG ARCHITECT INC.
ADDRESS:	180 FALLINGBROOK ROAD, SCARBOROUGH, ON
PROJECT NO:	23376
APPROXIMATE SCALE:	NTS

AllRock Consulting Ltd

DATE: FEB. 2024	FIGURE NO.: 3
DRAWN BY: TM	CHECKED BY: NM



LEGEND:

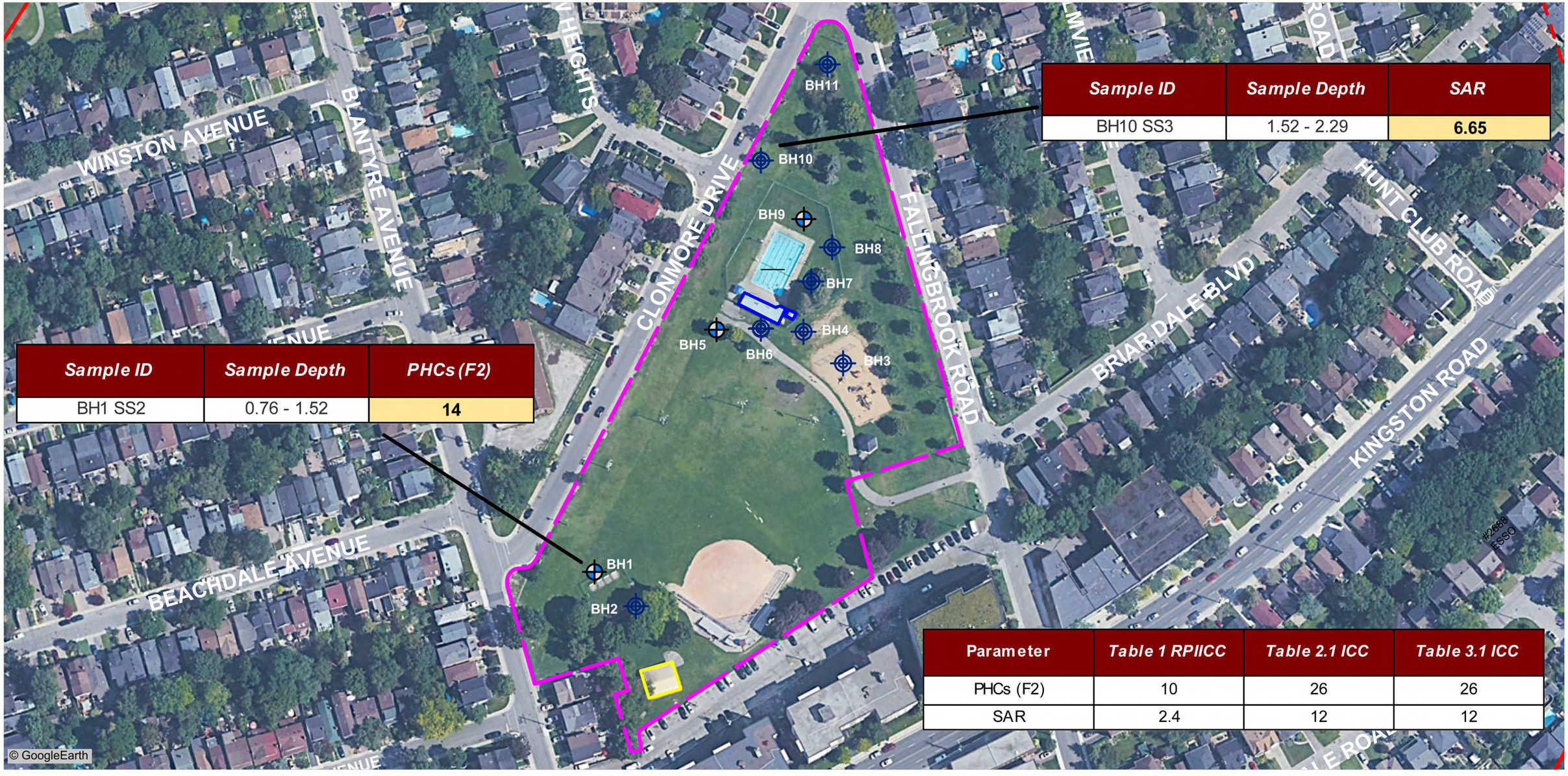
- PROJECT AREA
- APU STUDY AREA
- SITE BUILDING A
- SITE BUILDING B

N

FIGURE TITLE:	AREA OF POTENTIAL ENVIRONMENTAL CONCERN
PROJECT:	SOIL CHARACTERIZATION REPORT
CLIENT:	CHERIE NG ARCHITECT INC.
ADDRESS:	180 FALLINGBROOK ROAD, SCARBOROUGH, ON
PROJECT NO:	23376
APPROXIMATE SCALE:	NTS

AllRock Consulting Ltd

DATE: FEB. 2024	FIGURE NO.: 4
DRAWN BY: TM	CHECKED BY: NM



Sample ID	Sample Depth	PHCs (F2)
BH1 SS2	0.76 - 1.52	**14**

Sample ID	Sample Depth	SAR
BH10 SS3	1.52 - 2.29	**6.65**

Parameter	Table 1 RPIICC	Table 2.1 ICC	Table 3.1 ICC
PHCs (F2)	10	26	26
SAR	2.4	12	12

LEGEND:

- PHASE ONE PROPERTY
- APPROXIMATE BOREHOLE LOCATION
- APPROXIMATE MONITORING WELL LOCATION
- EXCEEDS THE TABLE 1 ESQS
- EXCEEDS THE TABLE 1, and TABLE 2.1 ICC ESQS
- EXCEEDS THE TABLE 1, TABLE 2.1 ICC and TABLE 3.1 ICC ESQS

N

FIGURE TITLE: LOCATION OF SOIL EXCEEDANCES

PROJECT: SOIL CHARACTERIZATION REPORT

CLIENT: CHERIE NG ARCHITECT INC.

ADDRESS: 180 FALLINGBROOK ROAD, SCARBOROUGH, ON

PROJECT NO: 23376

APPROXIMATE SCALE: NTS

AllRock Consulting Ltd

DATE: FEB. 2024

FIGURE NO.: 5

DRAWN BY: TM

CHECKED BY: NM

AllRock Consulting Ltd

APPENDIX B

BH Logs

WELL NUMBER BH1

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Soil Characterization Report
PROJECT NUMBER 23376
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 127.771 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 1	33	4-4-5-3 (9)		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL) 127.67 Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	Flushmount Protective Casing Backfilled with auger cuttings
	SS 2	50	2-2-1-2 (3)		1.52 126.25	50mm diameter PVC riser Bentonite Seal
2	SS 3	50	2-1-2-5 (3)		Brown fine to coarse grained SAND, trace silt and gravel -Dry	Filter Sand
	SS 4	83	4-8-9-10 (17)			
	SS 5	100	14-10-24-32 (34)			50mm diameter PVC screen
4	SS 6	100	13-24-50-50 (74)		4.42 123.35 End of Borehole Bottom of hole at 4.42 m.	

BORING NUMBER BH2

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Soil Characterization Report
PROJECT NUMBER 23376
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-22 **COMPLETED** 23-11-22
GROUND ELEVATION 128.34 m **HOLE SIZE** 35mm
DRILLING CONTRACTOR AllRock
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	
	GB 1		Brown silty sand/sandy silt, contains organic material (TOPSOIL)	128.24
			0.10 Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	
	GB 2		0.76 Brown fine to coarse grained SAND, trace silt and gravel -Dry	127.58
			1.52 End of Borehole	126.82

Bottom of hole at 1.52 m.

BORING NUMBER BH3

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Soil Characterization Report
PROJECT NUMBER 23376
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 126.74 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
	SS 1	50	6-8-20-12 (28)		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL) 126.64 Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)
	SS 2	58	2-1-2-4 (3)		1.52 125.22
2	SS 3	67	2-2-4-7 (6)		Brown fine to coarse grained SAND, trace silt and gravel -Dry
	SS 4	62	3-4-4-5 (8)		
	SS 5	83	9-18-18-22 (36)		
4	SS 6	100	8-10-12-18 (22)		4.42 122.32
					End of Borehole Bottom of hole at 4.42 m.

BORING NUMBER BH4

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Soil Characterization Report
PROJECT NUMBER 23376
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-22 **COMPLETED** 23-11-22
GROUND ELEVATION 127.822 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
	SS 1	33	5-6-5-6 (11)		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL)	127.72
					Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	
	SS 2	50	9-7-4-6 (11)			
					1.52	126.30
2	SS 3	67	10-7-6-5 (13)		Brown fine to coarse grained SAND, trace silt, clay and gravel -Dry	
	SS 4	67	3-8-7-11 (15)			
	SS 5	75	7-11-21-33 (32)			
4	SS 6	83	9-21-24-25 (45)		4.42	123.40
					End of Borehole	
					Bottom of hole at 4.42 m.	

WELL NUMBER BH5

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Soil Characterization Report
PROJECT NUMBER 23376
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 126.849 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 1	75	3-5-6-6 (11)		0.08 Brown silty sand/sandy silt, contains organic material (TOPSOIL) 126.77 Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	Flushmount Protective Casing Backfilled with auger cuttings
	SS 2	75	7-7-7-7 (14)		1.37 125.48	50mm diameter PVC riser
2	SS 3	83	5-7-9-16 (16)		Brown fine to coarse grained SAND, trace silt and gravel -Dry	Bentonite Seal Filter Sand
	SS 4	83	9-14-25-25 (39)			
	SS 5	100	11-20-32-47 (52)			50mm diameter PVC screen
4	SS 6	100	6-15-21-24 (36)		4.42 122.43 End of Borehole Bottom of hole at 4.42 m.	

BORING NUMBER BH6

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Soil Characterization Report
PROJECT NUMBER 23376
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 126.622 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
	SS 1	83	4-4-5-6 (9)		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL)	126.52
					0.50 Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	126.12
	SS 2	92	9-11-11-11 (22)		Brown fine to coarse grained SAND, trace silt and clay -Dry	
2	SS 3	100	6-12-15-23 (27)			
	SS 4	100	16-32-43-50 (75)			
	SS 5	100	20-26-22-40 (48)			
4	SS 6	100	6-19-18-22 (37)		4.42	122.20
					End of Borehole	
					Bottom of hole at 4.42 m.	

BORING NUMBER BH7

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Soil Characterization Report
PROJECT NUMBER 23376
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-22 **COMPLETED** 23-11-22
GROUND ELEVATION 128.575 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
	SS 1	50	5-4-5-7 (9)		0.08 Brown silty sand/sandy silt, contains organic material (TOPSOIL)	128.50
					Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	
					0.61	127.97
	SS 2	75	5-4-5-6 (9)		Brown fine to coarse grained SAND, trace silt and gravel -Dry	
2	SS 3	83	2-3-6-8 (9)			
	SS 4	100	10-15-16-20 (31)			
	SS 5	100	10-11-15-26 (26)			
4	SS 6	100	8-12-16-23 (28)		4.42	124.16
					End of Borehole	

Bottom of hole at 4.42 m.

BORING NUMBER BH8

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Soil Characterization Report
PROJECT NUMBER 23376
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-22 **COMPLETED** 23-11-22
GROUND ELEVATION 129.747 m **HOLE SIZE** 35mm
DRILLING CONTRACTOR AllRock
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	
	GB 1		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL)	129.65
			Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	
	GB 2		0.90	128.85
			Brown GRAVELLY SAND, some silt -Dry	
			1.52	128.23
			End of Borehole	
			Bottom of hole at 1.52 m.	

WELL NUMBER BH9

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Soil Characterization Report
PROJECT NUMBER 23376
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 129.679 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 1	92	4-6-8-10 (14)		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL) 129.58 Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	Flushmount Protective Casing Backfilled with auger cuttings
	SS 2	83	4-4-5-4 (9)		1.52 128.16	50mm diameter PVC riser Bentonite Seal
2	SS 3	100	4-3-2-3 (5)		Brown fine to coarse grained SAND, trace silt and gravel -Dry	Filter Sand
	SS 4	71	6-10-10-18 (20)			
	SS 5	50	4-6-16-32 (22)			50mm diameter PVC screen
4	SS 6	54	5-8-10-19 (18)		4.42 125.26	

End of Borehole

Bottom of hole at 4.42 m.

BORING NUMBER BH10

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Soil Characterization Report
PROJECT NUMBER 23376
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 131.576 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
	SS 1	33	3-7-6-7 (13)		0.08 Brown silty sand/sandy silt, contains organic material (TOPSOIL)	131.50
					Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	
	SS 2	67	8-11-11-16 (22)			
2	SS 3	50	11-16-20-16 (36)			
	SS 4	97	6-6-5-10 (11)		3.05	128.53
	SS 5	83	6-8-8-8 (16)		Brown fine to coarse grained SAND, some sand, trace silt and clay -Dry	
4	SS 6	100	5-10-10-12 (20)		4.42	127.16
					End of Borehole	
					Bottom of hole at 4.42 m.	

BORING NUMBER BH11

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Soil Characterization Report
PROJECT NUMBER 23376
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-22 **COMPLETED** 23-11-22
GROUND ELEVATION 131.613 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
	SS 1	50	2-4-6-7 (10)		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL) 131.51 Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)
	SS 2	75	3-4-7-8 (11)		1.22 130.39
	SS 3	70	10-8-7-9 (15)		Brown fine to coarse grained SAND, trace silt and gravel -Dry
2	SS 4	83	11-12-12-14 (24)		
	SS 5	75	8-10-12-13 (22)		
4	SS 6	83	9-6-7-11 (13)		4.42 127.19
					End of Borehole Bottom of hole at 4.42 m.

APPENDIX C

Tables

AllRock Consulting Ltd

TABLE 1 - Excess Soil Analytical Results

Cherie NG Architect Inc.

Blantyre Park, 180 Fallingbrook Road, Scarborough, Ontario

Parameter	Table 1: Full Depth Background Site Condition Standards (RPICC)	Table 2.1 ESQS: Full Depth Excess Soil Quality Standards in a Potable Ground Water Condition (ICC)	Table 3.1 ESQS: Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition (ICC)	Sample ID									
				Sample Collection Date (dd/mm/yyyy)									
				Sample Depth (mbgs)									
				BH5 SS3	BH6 SS3	BH3 SS3	BH10 SS3	BH1 SS2	BH6 SS2	BH5 SS2	BH9 SS1	BH9 SS2	BH4 SS3
				21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
				1.52 - 2.29	1.52 - 2.29	1.52 - 2.29	1.52 - 2.29	0.76 - 1.52	0.76 - 1.52	0.76 - 1.52	0.00 - 0.76	0.76 - 1.52	1.52 - 2.29
Petroleum Hydrocarbons (PHCs)													
Petroleum Hydrocarbons F1 (C_6-C_{10})	25	25	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons F2 (>C_{10}-C_{16})	10	26	26	<2	3	7	2	**14**	<2	<2	<2	<2	4
Petroleum Hydrocarbons F3 (>C_{16}-C_{34})	240	1700	1700	<20	<20	80	20	50	<20	<20	30	30	90
Petroleum Hydrocarbons F4 (>C_{34}-C_{50})	120	3300	3300	<20	<20	50	<20	<20	<20	<20	<20	<20	70
Volatile Organic Compounds													
Acetone	0.5	0.5	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	0.02	0.02	0.034	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068
Bromodichloromethane	0.05	0.05	5.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05	0.05	2.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05	0.083	0.28	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05	0.05	0.26	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	0.05	0.05	5.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,2-	0.05	0.05	6.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	0.05	6.8	6.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,4-	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05	1.5	1.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	0.05	0.05	0.57	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05	0.05	1.9	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018
Ethylene Dibromide	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexane	0.05	2.5	2.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	0.5	0.05	26	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	0.5	0.05	17	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05	0.05	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	0.05	0.05	6.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	0.2	0.2	7.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Trichloroethane, 1,1,1-	0.05	0.12	0.4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethane, 1,1,2-	0.05	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05	0.05	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Trichlorofluoromethane	0.25	0.25	0.46	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Xylenes (Total)	0.05	0.091	3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Polycyclic Aromatic Hydrocarbons (PAHs)													
Acenaphthene	0.072	2.5	15	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	0.093	0.093	0.093	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	0.16	0.16	0.16	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)anthracene	0.36	0.36	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	0.3	0.3	0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	0.47	3.2	7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(ghi)perylene	0.68	13	13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	0.48	3.1	7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	2.8	9.4	14	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenzo(a,h)anthracene	0.1	o.7	0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.56	2.8	70	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	0.12	6.8	6.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	0.23	0.76	0.76	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylnaphthalene 2-(1-)	0.59	0.59	8.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	0.09	0.2	1.8	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Phenanthrene	0.69	12	12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	1	28	70	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Metals and Inorganics													
Antimony	1.3	40	40	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic	18	18	18	<1	1	3	4	2	<1	1	3	5	2
Barium	220	670	670	9	9	32	36	23	10	14	36	44	30
Beryllium	2.5	8	8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron (total)	36	120	120	<5	<5	<5	6	<5	<5	<5	<5	5	<5
Boron (Hot Water Soluble)	NA	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	1.2	1.9	1.9	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium Total	70	160	160	3	3	13	21	8	4	7	14	21	13
Cobalt	21	80	80	1	1	4	6	3	2	2	4	6	4
Copper	92	230	230	3	3	12	18	9	4	6	14	18	10
Cyanide	0.051	0.051	0.051	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Electrical Conductivity (mS/cm)	0.57	1.4	1.4	0.06	0.07	0.11	0.34	0.11	0.08	0.10	0.12	0.13	0.14
Chromium VI	0.66	8	8	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.22	0.23
Lead	120	120	120	2	2	34	18	10	3	5	31	15	12
Mercury	0.27	0.27	0.27	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	2	40	40	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel	82	270	270	3	3	10	17	6	3	5	11	18	10
pH	5.0 to 9.0	5.0 to 9.0	5.0 to 9.0	7.80	7.89	7.83	7.84	7.80	7.90	7.95	7.80	7.84	7.82
Selenium	1.5	5.5	5.5	<0.5	<0.5	0.5	0.9	<0.5	<0.5	<0.5	<0.5	1.0	0.6
Silver	0.5	40	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Sodium Adsorption Ratio	2.4	12	12	0.16	0.22	0.12	**6.65**	0.17	0.16	0.21	0.30	0.60	0.21
Thallium	1	3.3	3.3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Uranium	2.5	33	33	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	0.6	<0.5
Vanadium	86	86	86	5	6	23	28	18	8	12	28	38	26
Zinc	290	340	340	7	7	45	65	24	8	12	53	55	38

Notes:

Tables	Table Standards noted above are from the Ministry of the Environment and Climate Change document entitled "Rules For Soil Management And Excess Soil Quality Standards".
Value	Exceeds applicable Table 1: Full Depth Background Site Condition Standards (RPICC)
Value	Exceeds applicable Table 1: Full Depth Background Site Condition Standards (RPICC), and Table 2.1 ESQS: Full Depth Excess Soil Quality Standards in a Potable Ground Water Condition (ICC)
Value	Exceeds applicable Table 1: Full Depth Background Site Condition Standards (RPICC), Table 2.1 ESQS: Full Depth Excess Soil Quality Standards in a Potable Ground Water Condition (ICC), Table 3.1 ESQS: Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition (ICC)
Units	All Units in micrograms per gram (µg/g)
mbgs	Meters Below Ground Surface

AllRock Consulting Ltd

APPENDIX D

Certificates of Analysis

Certificate of Analysis

Client: All Rock Consulting Limited
24 Brydon Drive, Unit #5
Toronto, ON
M9W 5R6
Attention: Mr. Nathan Martin
Invoice to: AllRock Consulting Limited
PO#:

Report Number:	3003384
Date Submitted:	2023-11-22
Date Reported:	2023-11-28
Project:	23301
COC #:	225144
Temperature (C):	6
Custody Seal:	

Dear Nathan Martin:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Sample Comment Summary

Sample ID: 1711516	BH6 SS3	Loss of methanol observed upon reception at the lab. Methanol was added to make up for the loss. Client has been notified.
Sample ID: 1711517	BH3 SS3	Loss of methanol observed upon reception at the lab. Methanol was added to make up for the loss. Client has been notified.
Sample ID: 1711519	BH1 SS2	Loss of methanol observed upon reception at the lab. Methanol was added to make up for the loss. Client has been notified.
Sample ID: 1711520	BH6 SS2	Loss of methanol observed upon reception at the lab. Methanol was added to make up for the loss. Client has been notified.

Report Comments:

Raheleh Zafari, Environmental Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at https://directory.cala.ca/

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

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M9W 5R6
Attention: Mr. Nathan Martin
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Invoice to: AllRock Consulting Limited

Report Number: 3003384
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Hydrocarbons				
BH1 SS2	Petroleum Hydrocarbons F2	14	ug/g	STD 10
Inorganics				
BH10 SS3	Sodium Adsorption Ratio	6.65		STD 2.4

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

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Invoice to: AllRock Consulting Limited

Report Number: 3003384
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	1711515	1711516	1711517	1711518	1711519
					Sample Matrix	Soil153	Soil153	Soil153	Soil153	Soil153
					Sample Type					
					Sample Date	2023-11-21	2023-11-21	2023-11-21	2023-11-21	2023-11-21
					Sampling Time					
					Sample I.D.	BH5 SS3	BH6 SS3	BH3 SS3	BH10 SS3	BH1 SS2
PHC's F1	452742	10	ug/g	STD 25		<10			<10	
	452840	10	ug/g	STD 25			<10	<10		<10
PHC's F1-BTEX	452745	10	ug/g			<10			<10	
	452844	10	ug/g				<10	<10		<10
PHC's F2	452879	2	ug/g	STD 10			3		2	
	452886	2	ug/g	STD 10		<2		7		14*
PHC's F2-Napth	452926	2	ug/g			<2	3	7	2	14
PHC's F3	452879	20	ug/g	STD 240			<20		20	
	452886	20	ug/g	STD 240		<20		80		50
PHC's F3-PAH	452927	20	ug/g			<20	<20	80	20	50
PHC's F4	452879	20	ug/g	STD 120			<20		<20	
	452886	20	ug/g	STD 120		<20		50		<20

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	1711520	1711521	1711522	1711523	1711524
					Sample Matrix	Soil153	Soil153	Soil153	Soil153	Soil153
					Sample Type					
					Sample Date	2023-11-21	2023-11-21	2023-11-21	2023-11-21	2023-11-21
					Sampling Time					
					Sample I.D.	BH6 SS2	BH5 SS2	BH9 SS1	BH9 SS2	BH4 SS3
PHC's F1	452742	10	ug/g	STD 25			<10	<10	<10	<10
	452840	10	ug/g	STD 25		<10				
PHC's F1-BTEX	452745	10	ug/g				<10	<10	<10	<10
	452844	10	ug/g			<10				
PHC's F2	452879	2	ug/g	STD 10			<2		<2	4
	452886	2	ug/g	STD 10		<2		<2		
PHC's F2-Napth	452926	2	ug/g			<2	<2	<2	<2	4

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Certificate of Analysis

Client: All Rock Consulting Limited
24 Brydon Drive, Unit #5
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M9W 5R6
Attention: Mr. Nathan Martin
PO#:
Invoice to: AllRock Consulting Limited

Report Number: 3003384
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	1711520 Soil153 2023-11-21 BH6 SS2	1711521 Soil153 2023-11-21 BH5 SS2	1711522 Soil153 2023-11-21 BH9 SS1	1711523 Soil153 2023-11-21 BH9 SS2	1711524 Soil153 2023-11-21 BH4 SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.									
PHC's F3	452879	20	ug/g	STD 240		<20		30	90
	452886	20	ug/g	STD 240	<20		30		
PHC's F3-PAH	452927	20	ug/g		<20	<20	30	30	90
PHC's F4	452879	20	ug/g	STD 120		<20		<20	70
	452886	20	ug/g	STD 120	<20		<20		

Metals

Analyte	Batch No	MRL	Units	Guideline	1711515 Soil153 2023-11-21 BH5 SS3	1711516 Soil153 2023-11-21 BH6 SS3	1711517 Soil153 2023-11-21 BH3 SS3	1711518 Soil153 2023-11-21 BH10 SS3	1711519 Soil153 2023-11-21 BH1 SS2
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.									
Antimony	452836	1	ug/g	STD 1.3	<1	<1	<1	<1	<1
Arsenic	452836	1	ug/g	STD 18	<1	1	3	4	2
Barium	452836	1	ug/g	STD 220	9	9	32	36	23
Beryllium	452836	1	ug/g	STD 2.5	<1	<1	<1	<1	<1
Boron (Hot Water Soluble)	452784	0.5	ug/g	STD N/A	<0.5	<0.5	<0.5	<0.5	<0.5
Boron (total)	452836	5	ug/g	STD 36	<5	<5	<5	6	<5
Cadmium	452836	0.4	ug/g	STD 1.2	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium Total	452836	1	ug/g	STD 70	3	3	13	21	8
Chromium VI	452738	0.20	ug/g	STD 0.66	<0.20	<0.20	<0.20	<0.20	<0.20
Cobalt	452836	1	ug/g	STD 21	1	1	4	6	3
Copper	452836	1	ug/g	STD 92	3	3	12	18	9
Lead	452836	1	ug/g	STD 120	2	2	34	18	10
Mercury	452836	0.1	ug/g	STD 0.27	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	452836	1	ug/g	STD 2	<1	<1	<1	<1	<1

Results relate only to the parameters tested on the samples submitted.
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Certificate of Analysis

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Report Number: 3003384
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Metals

Analyte	Batch No	MRL	Units	Guideline	1711515 Soil153 2023-11-21 BH5 SS3	1711516 Soil153 2023-11-21 BH6 SS3	1711517 Soil153 2023-11-21 BH3 SS3	1711518 Soil153 2023-11-21 BH10 SS3	1711519 Soil153 2023-11-21 BH1 SS2
				Lab I.D.	1711515	1711516	1711517	1711518	1711519
				Sample Matrix	Soil153	Soil153	Soil153	Soil153	Soil153
				Sample Type					
				Sample Date	2023-11-21	2023-11-21	2023-11-21	2023-11-21	2023-11-21
				Sampling Time					
				Sample I.D.	BH5 SS3	BH6 SS3	BH3 SS3	BH10 SS3	BH1 SS2
Nickel	452836	1	ug/g	STD 82	3	3	10	17	6
Selenium	452836	0.5	ug/g	STD 1.5	<0.5	<0.5	0.5	0.9	<0.5
Silver	452836	0.2	ug/g	STD 0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	452836	1	ug/g	STD 1	<1	<1	<1	<1	<1
Uranium	452836	0.5	ug/g	STD 2.5	<0.5	<0.5	<0.5	0.7	<0.5
Vanadium	452836	2	ug/g	STD 86	5	6	23	28	18
Zinc	452836	2	ug/g	STD 290	7	7	45	65	24

Metals

Analyte	Batch No	MRL	Units	Guideline	1711520 Soil153 2023-11-21 BH6 SS2	1711521 Soil153 2023-11-21 BH5 SS2	1711522 Soil153 2023-11-21 BH9 SS1	1711523 Soil153 2023-11-21 BH9 SS2	1711524 Soil153 2023-11-21 BH4 SS3
				Lab I.D.	1711520	1711521	1711522	1711523	1711524
				Sample Matrix	Soil153	Soil153	Soil153	Soil153	Soil153
				Sample Type					
				Sample Date	2023-11-21	2023-11-21	2023-11-21	2023-11-21	2023-11-21
				Sampling Time					
				Sample I.D.	BH6 SS2	BH5 SS2	BH9 SS1	BH9 SS2	BH4 SS3
Antimony	452836	1	ug/g	STD 1.3	<1	<1	<1	<1	<1
Arsenic	452836	1	ug/g	STD 18	<1	1	3	5	2
Barium	452836	1	ug/g	STD 220	10	14	36	44	30
Beryllium	452836	1	ug/g	STD 2.5	<1	<1	<1	<1	<1
Boron (Hot Water Soluble)	452784	0.5	ug/g	STD N/A	<0.5	<0.5	<0.5	<0.5	<0.5
Boron (total)	452836	5	ug/g	STD 36	<5	<5	<5	5	<5
Cadmium	452836	0.4	ug/g	STD 1.2	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium Total	452836	1	ug/g	STD 70	4	7	14	21	13
Chromium VI	452738	0.20	ug/g	STD 0.66	<0.20	<0.20	<0.20	0.22	0.23
Cobalt	452836	1	ug/g	STD 21	2	2	4	6	4
Copper	452836	1	ug/g	STD 92	4	6	14	18	10
Lead	452836	1	ug/g	STD 120	3	5	31	15	12

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Client: All Rock Consulting Limited
24 Brydon Drive, Unit #5
Toronto, ON
M9W 5R6
Attention: Mr. Nathan Martin
PO#:
Invoice to: AllRock Consulting Limited

Report Number: 3003384
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Metals

Analyte	Batch No	MRL	Units	Guideline	1711520 Soil153 2023-11-21 BH6 SS2	1711521 Soil153 2023-11-21 BH5 SS2	1711522 Soil153 2023-11-21 BH9 SS1	1711523 Soil153 2023-11-21 BH9 SS2	1711524 Soil153 2023-11-21 BH4 SS3
Lab I.D.					1711520	1711521	1711522	1711523	1711524
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2023-11-21	2023-11-21	2023-11-21	2023-11-21	2023-11-21
Sampling Time									
Sample I.D.					BH6 SS2	BH5 SS2	BH9 SS1	BH9 SS2	BH4 SS3
Mercury	452836	0.1	ug/g	STD 0.27	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	452836	1	ug/g	STD 2	<1	<1	<1	<1	<1
Nickel	452836	1	ug/g	STD 82	3	5	11	18	10
Selenium	452836	0.5	ug/g	STD 1.5	<0.5	<0.5	<0.5	1.0	0.6
Silver	452836	0.2	ug/g	STD 0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	452836	1	ug/g	STD 1	<1	<1	<1	<1	<1
Uranium	452836	0.5	ug/g	STD 2.5	<0.5	<0.5	<0.5	0.6	<0.5
Vanadium	452836	2	ug/g	STD 86	8	12	28	38	26
Zinc	452836	2	ug/g	STD 290	8	12	53	55	38

PAH

Analyte	Batch No	MRL	Units	Guideline	1711515 Soil153 2023-11-21 BH5 SS3	1711516 Soil153 2023-11-21 BH6 SS3	1711517 Soil153 2023-11-21 BH3 SS3	1711518 Soil153 2023-11-21 BH10 SS3	1711519 Soil153 2023-11-21 BH1 SS2
Lab I.D.					1711515	1711516	1711517	1711518	1711519
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2023-11-21	2023-11-21	2023-11-21	2023-11-21	2023-11-21
Sampling Time									
Sample I.D.					BH5 SS3	BH6 SS3	BH3 SS3	BH10 SS3	BH1 SS2
1+2-methylnaphthalene	452796	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	452678	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	452678	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	452678	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05	<0.05	<0.05
Benz[a]anthracene	452678	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[a]pyrene	452678	0.05	ug/g	STD 0.3	<0.05	<0.05	0.06	<0.05	<0.05
Benzo[b]fluoranthene	452678	0.05	ug/g	STD 0.47	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[ghi]perylene	452678	0.05	ug/g	STD 0.68	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	452678	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	452678	0.05	ug/g	STD 2.8	<0.05	<0.05	0.05	<0.05	<0.05

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Report Number: 3003384
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PAH

Analyte	Batch No	MRL	Units	Guideline	1711515 Soil153 2023-11-21 BH5 SS3	1711516 Soil153 2023-11-21 BH6 SS3	1711517 Soil153 2023-11-21 BH3 SS3	1711518 Soil153 2023-11-21 BH10 SS3	1711519 Soil153 2023-11-21 BH1 SS2
Lab I.D.					1711515	1711516	1711517	1711518	1711519
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2023-11-21	2023-11-21	2023-11-21	2023-11-21	2023-11-21
Sampling Time									
Sample I.D.					BH5 SS3	BH6 SS3	BH3 SS3	BH10 SS3	BH1 SS2
Dibenz[a h]anthracene	452678	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	452678	0.05	ug/g	STD 0.56	<0.05	<0.05	0.07	<0.05	<0.05
Fluorene	452678	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	452678	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	452678	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	452678	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	452678	0.013	ug/g	STD 0.09	<0.013	<0.013	<0.013	<0.013	<0.013
Phenanthrene	452678	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	452678	0.05	ug/g	STD 1	<0.05	<0.05	0.07	<0.05	<0.05

PAH

Analyte	Batch No	MRL	Units	Guideline	1711520 Soil153 2023-11-21 BH6 SS2	1711521 Soil153 2023-11-21 BH5 SS2	1711522 Soil153 2023-11-21 BH9 SS1	1711523 Soil153 2023-11-21 BH9 SS2	1711524 Soil153 2023-11-21 BH4 SS3
Lab I.D.					1711520	1711521	1711522	1711523	1711524
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2023-11-21	2023-11-21	2023-11-21	2023-11-21	2023-11-21
Sampling Time									
Sample I.D.					BH6 SS2	BH5 SS2	BH9 SS1	BH9 SS2	BH4 SS3
1+2-methylnaphthalene	452796	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	452678	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	452678	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	452678	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05	<0.05	<0.05
Benz[a]anthracene	452678	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[a]pyrene	452678	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	452678	0.05	ug/g	STD 0.47	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[ghi]perylene	452678	0.05	ug/g	STD 0.68	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	452678	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	452678	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05	<0.05	<0.05

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Invoice to: AllRock Consulting Limited

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Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PAH

Analyte	Batch No	MRL	Units	Guideline	1711520 Soil153 2023-11-21 BH6 SS2	1711521 Soil153 2023-11-21 BH5 SS2	1711522 Soil153 2023-11-21 BH9 SS1	1711523 Soil153 2023-11-21 BH9 SS2	1711524 Soil153 2023-11-21 BH4 SS3
				Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.					
Dibenz[a h]anthracene	452678	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	452678	0.05	ug/g	STD 0.56	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	452678	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	452678	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	452678	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	452678	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	452678	0.013	ug/g	STD 0.09	<0.013	<0.013	<0.013	<0.013	<0.013
Phenanthrene	452678	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	452678	0.05	ug/g	STD 1	<0.05	<0.05	<0.05	<0.05	<0.05

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1711515 Soil153 2023-11-21 BH5 SS3	1711516 Soil153 2023-11-21 BH6 SS3	1711517 Soil153 2023-11-21 BH3 SS3	1711518 Soil153 2023-11-21 BH10 SS3	1711519 Soil153 2023-11-21 BH1 SS2
				Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.					
Acetone	452740	0.50	ug/g	STD 0.5	<0.50			<0.50	
	452838	0.50	ug/g	STD 0.5		<0.50	<0.50		<0.50
Benzene	452740	0.0068	ug/g	STD 0.02	<0.0068			<0.0068	
	452838	0.0068	ug/g	STD 0.02		<0.0068	<0.0068		<0.0068
Bromodichloromethane	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Bromoform	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Bromomethane	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	1711515 Soil153 2023-11-21 BH5 SS3	1711516 Soil153 2023-11-21 BH6 SS3	1711517 Soil153 2023-11-21 BH3 SS3	1711518 Soil153 2023-11-21 BH10 SS3	1711519 Soil153 2023-11-21 BH1 SS2
Lab I.D.									
Sample Matrix									
Sample Type									
Sample Date									
Sampling Time									
Sample I.D.									
Carbon Tetrachloride	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Chlorobenzene	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Chloroform	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Dibromochloromethane	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Dichlorobenzene, 1,2-	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Dichlorobenzene, 1,3-	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Dichlorobenzene, 1,4-	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Dichlorodifluoromethane	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Dichloroethane, 1,1-	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Dichloroethane, 1,2-	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Dichloroethylene, 1,1-	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Dichloroethylene, 1,2-cis-	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	1711515 Soil153 2023-11-21 BH5 SS3	1711516 Soil153 2023-11-21 BH6 SS3	1711517 Soil153 2023-11-21 BH3 SS3	1711518 Soil153 2023-11-21 BH10 SS3	1711519 Soil153 2023-11-21 BH1 SS2
Lab I.D.					1711515	1711516	1711517	1711518	1711519
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2023-11-21	2023-11-21	2023-11-21	2023-11-21	2023-11-21
Sampling Time									
Sample I.D.					BH5 SS3	BH6 SS3	BH3 SS3	BH10 SS3	BH1 SS2
Dichloroethylene, 1,2-cis-	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Dichloroethylene, 1,2-trans-	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Dichloropropane, 1,2-	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Dichloropropene,1,3-	452744	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452843	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Dichloropropene,1,3-cis-	452740	0.05	ug/g		<0.05			<0.05	
	452838	0.05	ug/g			<0.05	<0.05		<0.05
Dichloropropene,1,3-trans-	452740	0.05	ug/g		<0.05			<0.05	
	452838	0.05	ug/g			<0.05	<0.05		<0.05
Ethylbenzene	452740	0.018	ug/g	STD 0.05	<0.018			<0.018	
	452838	0.018	ug/g	STD 0.05		<0.018	<0.018		<0.018
Ethylene dibromide	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Hexane (n)	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Methyl Ethyl Ketone	452740	0.50	ug/g	STD 0.5	<0.50			<0.50	
	452838	0.50	ug/g	STD 0.5		<0.50	<0.50		<0.50
Methyl Isobutyl Ketone	452740	0.50	ug/g	STD 0.5	<0.50			<0.50	
	452838	0.50	ug/g	STD 0.5		<0.50	<0.50		<0.50
Methyl tert-Butyl Ether (MTBE)	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05

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Project: 23301
COC #: 225144

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	1711515 Soil153 2023-11-21 BH5 SS3	1711516 Soil153 2023-11-21 BH6 SS3	1711517 Soil153 2023-11-21 BH3 SS3	1711518 Soil153 2023-11-21 BH10 SS3	1711519 Soil153 2023-11-21 BH1 SS2
Lab I.D.									
Sample Matrix									
Sample Type									
Sample Date									
Sampling Time									
Sample I.D.									
Methylene Chloride	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Styrene	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Tetrachloroethane, 1,1,1,2-	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Tetrachloroethane, 1,1,2,2-	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Tetrachloroethylene	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Toluene	452740	0.08	ug/g	STD 0.2	<0.08			<0.08	
	452838	0.08	ug/g	STD 0.2		<0.08	<0.08		<0.08
Trichloroethane, 1,1,1-	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Trichloroethane, 1,1,2-	452740	0.05	ug/g	STD 0.05	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Trichloroethylene	452740	0.01	ug/g	STD 0.05	<0.01			<0.01	
	452838	0.01	ug/g	STD 0.05		<0.01	<0.01		<0.01
Trichlorofluoromethane	452740	0.05	ug/g	STD 0.25	<0.05			<0.05	
	452838	0.05	ug/g	STD 0.25		<0.05	<0.05		<0.05
Vinyl Chloride	452740	0.02	ug/g	STD 0.02	<0.02			<0.02	
	452838	0.02	ug/g	STD 0.02		<0.02	<0.02		<0.02
Xylene Mixture	452743	0.05	ug/g	STD 0.05	<0.05			<0.05	

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	1711515 Soil153 2023-11-21 BH5 SS3	1711516 Soil153 2023-11-21 BH6 SS3	1711517 Soil153 2023-11-21 BH3 SS3	1711518 Soil153 2023-11-21 BH10 SS3	1711519 Soil153 2023-11-21 BH1 SS2
Lab I.D.									
Sample Matrix									
Sample Type									
Sample Date									
Sampling Time									
Sample I.D.									
Xylene Mixture	452842	0.05	ug/g	STD 0.05		<0.05	<0.05		<0.05
Xylene, m/p-	452740	0.05	ug/g		<0.05			<0.05	
	452838	0.05	ug/g			<0.05	<0.05		<0.05
Xylene, o-	452740	0.05	ug/g		<0.05			<0.05	
	452838	0.05	ug/g			<0.05	<0.05		<0.05

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1711520 Soil153 2023-11-21 BH6 SS2	1711521 Soil153 2023-11-21 BH5 SS2	1711522 Soil153 2023-11-21 BH9 SS1	1711523 Soil153 2023-11-21 BH9 SS2	1711524 Soil153 2023-11-21 BH4 SS3
Lab I.D.									
Sample Matrix									
Sample Type									
Sample Date									
Sampling Time									
Sample I.D.									
Acetone	452740	0.50	ug/g	STD 0.5		<0.50	<0.50	<0.50	<0.50
	452838	0.50	ug/g	STD 0.5	<0.50				
Benzene	452740	0.0068	ug/g	STD 0.02		<0.0068	<0.0068	<0.0068	<0.0068
	452838	0.0068	ug/g	STD 0.02	<0.0068				
Bromodichloromethane	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Bromoform	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Bromomethane	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Carbon Tetrachloride	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Chlorobenzene	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	1711520 Soil153 2023-11-21 BH6 SS2	1711521 Soil153 2023-11-21 BH5 SS2	1711522 Soil153 2023-11-21 BH9 SS1	1711523 Soil153 2023-11-21 BH9 SS2	1711524 Soil153 2023-11-21 BH4 SS3
Lab I.D.									
Sample Matrix									
Sample Type									
Sample Date									
Sampling Time									
Sample I.D.									
Chloroform	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Dibromochloromethane	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Dichlorobenzene, 1,2-	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Dichlorobenzene, 1,3-	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Dichlorobenzene, 1,4-	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Dichlorodifluoromethane	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Dichloroethane, 1,1-	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Dichloroethane, 1,2-	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Dichloroethylene, 1,1-	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Dichloroethylene, 1,2-cis-	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Dichloroethylene, 1,2-trans-	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Dichloropropane, 1,2-	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05

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M9W 5R6
Attention: Mr. Nathan Martin
PO#:
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Report Number: 3003384
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1711520 Soil153 2023-11-21 BH6 SS2	1711521 Soil153 2023-11-21 BH5 SS2	1711522 Soil153 2023-11-21 BH9 SS1	1711523 Soil153 2023-11-21 BH9 SS2	1711524 Soil153 2023-11-21 BH4 SS3
Lab I.D.									
Sample Matrix									
Sample Type									
Sample Date									
Sampling Time									
Sample I.D.									
Dichloropropane, 1,2-	452838	0.05	ug/g	STD 0.05	<0.05				
Dichloropropene,1,3-	452744	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452843	0.05	ug/g	STD 0.05	<0.05				
Dichloropropene,1,3-cis-	452740	0.05	ug/g			<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g		<0.05				
Dichloropropene,1,3-trans-	452740	0.05	ug/g			<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g		<0.05				
Ethylbenzene	452740	0.018	ug/g	STD 0.05		<0.018	<0.018	<0.018	<0.018
	452838	0.018	ug/g	STD 0.05	<0.018				
Ethylene dibromide	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Hexane (n)	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Methyl Ethyl Ketone	452740	0.50	ug/g	STD 0.5		<0.50	<0.50	<0.50	<0.50
	452838	0.50	ug/g	STD 0.5	<0.50				
Methyl Isobutyl Ketone	452740	0.50	ug/g	STD 0.5		<0.50	<0.50	<0.50	<0.50
	452838	0.50	ug/g	STD 0.5	<0.50				
Methyl tert-Butyl Ether (MTBE)	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Methylene Chloride	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Styrene	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	1711520 Soil153 2023-11-21 BH6 SS2	1711521 Soil153 2023-11-21 BH5 SS2	1711522 Soil153 2023-11-21 BH9 SS1	1711523 Soil153 2023-11-21 BH9 SS2	1711524 Soil153 2023-11-21 BH4 SS3
Lab I.D.									
Sample Matrix									
Sample Type									
Sample Date									
Sampling Time									
Sample I.D.									
Tetrachloroethane, 1,1,1,2-	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Tetrachloroethane, 1,1,2,2-	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Tetrachloroethylene	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Toluene	452740	0.08	ug/g	STD 0.2		<0.08	<0.08	<0.08	<0.08
	452838	0.08	ug/g	STD 0.2	<0.08				
Trichloroethane, 1,1,1-	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Trichloroethane, 1,1,2-	452740	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.05	<0.05				
Trichloroethylene	452740	0.01	ug/g	STD 0.05		<0.01	<0.01	<0.01	<0.01
	452838	0.01	ug/g	STD 0.05	<0.01				
Trichlorofluoromethane	452740	0.05	ug/g	STD 0.25		<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g	STD 0.25	<0.05				
Vinyl Chloride	452740	0.02	ug/g	STD 0.02		<0.02	<0.02	<0.02	<0.02
	452838	0.02	ug/g	STD 0.02	<0.02				
Xylene Mixture	452743	0.05	ug/g	STD 0.05		<0.05	<0.05	<0.05	<0.05
	452842	0.05	ug/g	STD 0.05	<0.05				
Xylene, m/p-	452740	0.05	ug/g			<0.05	<0.05	<0.05	<0.05
	452838	0.05	ug/g		<0.05				
Xylene, o-	452740	0.05	ug/g			<0.05	<0.05	<0.05	<0.05

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Certificate of Analysis

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1711520	1711521	1711522	1711523	1711524
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2023-11-21	2023-11-21	2023-11-21	2023-11-21	2023-11-21
Sampling Time									
Sample I.D.					BH6 SS2	BH5 SS2	BH9 SS1	BH9 SS2	BH4 SS3
Xylene, o-	452838	0.05	ug/g		<0.05				

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1711515	1711516	1711517	1711518	1711519
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2023-11-21	2023-11-21	2023-11-21	2023-11-21	2023-11-21
Sampling Time									
Sample I.D.					BH5 SS3	BH6 SS3	BH3 SS3	BH10 SS3	BH1 SS2
Cyanide (CN-)	452870	0.005	ug/g	STD 0.051	<0.005	<0.005	<0.005	<0.005	<0.005
Electrical Conductivity	452768	0.05	mS/cm	STD 0.57	0.06	0.07	0.11	0.34	0.11
pH - CaCl2	452751	2.00			7.80	7.89	7.83	7.84	7.80
Sodium Adsorption Ratio	452782	0.01		STD 2.4	0.16	0.22	0.12	6.65*	0.17

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1711520	1711521	1711522	1711523	1711524
Sample Matrix					Soil153	Soil153	Soil153	Soil153	Soil153
Sample Type									
Sample Date					2023-11-21	2023-11-21	2023-11-21	2023-11-21	2023-11-21
Sampling Time									
Sample I.D.					BH6 SS2	BH5 SS2	BH9 SS1	BH9 SS2	BH4 SS3
Cyanide (CN-)	452870	0.005	ug/g	STD 0.051	<0.005	<0.005	<0.005	<0.005	<0.005
Electrical Conductivity	452768	0.05	mS/cm	STD 0.57	0.08	0.10	0.12	0.13	0.14
pH - CaCl2	452751	2.00			7.90	7.95	7.80	7.84	7.82
Sodium Adsorption Ratio	452782	0.01		STD 2.4	0.16	0.21	0.30	0.60	0.21

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Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1711515 Soil153 2023-11-21 BH5 SS3	1711516 Soil153 2023-11-21 BH6 SS3	1711517 Soil153 2023-11-21 BH3 SS3	1711518 Soil153 2023-11-21 BH10 SS3	1711519 Soil153 2023-11-21 BH1 SS2
Moisture-Humidite	452879	0.1	%			1.6		3.1	
	452886	0.1	%		1.8		9.8		2.8

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1711520 Soil153 2023-11-21 BH6 SS2	1711521 Soil153 2023-11-21 BH5 SS2	1711522 Soil153 2023-11-21 BH9 SS1	1711523 Soil153 2023-11-21 BH9 SS2	1711524 Soil153 2023-11-21 BH4 SS3
Moisture-Humidite	452879	0.1	%			2.3		8.9	5.3
	452886	0.1	%		1.9		8.0		

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PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1711515 Soil153 2023-11-21 BH5 SS3	1711516 Soil153 2023-11-21 BH6 SS3	1711517 Soil153 2023-11-21 BH3 SS3	1711518 Soil153 2023-11-21 BH10 SS3	1711519 Soil153 2023-11-21 BH1 SS2
Alpha-androstrane	452879	0	%			93		97	
	452886	0	%		71		106		107

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1711520 Soil153 2023-11-21 BH6 SS2	1711521 Soil153 2023-11-21 BH5 SS2	1711522 Soil153 2023-11-21 BH9 SS1	1711523 Soil153 2023-11-21 BH9 SS2	1711524 Soil153 2023-11-21 BH4 SS3
Alpha-androstrane	452879	0	%			88		102	109
	452886	0	%		87		117		

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VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D. 1711515 Soil153 2023-11-21 BH5 SS3	1711516 Soil153 2023-11-21 BH6 SS3	1711517 Soil153 2023-11-21 BH3 SS3	1711518 Soil153 2023-11-21 BH10 SS3	1711519 Soil153 2023-11-21 BH1 SS2
1,2-dichloroethane-d4	452740	0	%		117			115	
	452838	0	%			107	104		99
4-bromofluorobenzene	452740	0	%		80			83	
	452838	0	%			74	73		75
Toluene-d8	452740	0	%		107			104	
	452838	0	%			91	98		103

VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D. 1711520 Soil153 2023-11-21 BH6 SS2	1711521 Soil153 2023-11-21 BH5 SS2	1711522 Soil153 2023-11-21 BH9 SS1	1711523 Soil153 2023-11-21 BH9 SS2	1711524 Soil153 2023-11-21 BH4 SS3
1,2-dichloroethane-d4	452740	0	%			121	114	114	114
	452838	0	%		105				
4-bromofluorobenzene	452740	0	%			80	80	74	81
	452838	0	%		75				
Toluene-d8	452740	0	%			104	106	105	105
	452838	0	%		103				

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Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
452678	Methlynaphthalene, 1-	<0.05 ug/g	62	50-140	63	50-140	0	0-40
452678	Methlynaphthalene, 2-	<0.05 ug/g	61	50-140	62	50-140	0	0-40
452678	Acenaphthene	<0.05 ug/g	53	50-140	53	50-140	0	0-40
452678	Acenaphthylene	<0.05 ug/g	50	50-140	51	50-140	0	0-40
452678	Anthracene	<0.05 ug/g	56	50-140	50	50-140	0	0-40
452678	Benz[a]anthracene	<0.05 ug/g	61	50-140	55	50-140	0	0-40
452678	Benzo[a]pyrene	<0.05 ug/g	56	50-140	54	50-140	0	0-40
452678	Benzo[b]fluoranthene	<0.05 ug/g	56	50-140	52	50-140	0	0-40
452678	Benzo[ghi]perylene	<0.05 ug/g	55	50-140	53	50-140	0	0-40
452678	Benzo[k]fluoranthene	<0.05 ug/g	59	50-140	54		0	0-40
452678	Chrysene	<0.05 ug/g	56	50-140	54	50-140	0	0-40
452678	Dibenz[a h]anthracene	<0.05 ug/g	56	50-140	54	50-140	0	0-40
452678	Fluoranthene	<0.05 ug/g	59	50-140	51	50-140	0	0-40
452678	Fluorene	<0.05 ug/g	53	50-140	53	50-140	0	0-40
452678	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	56	50-140	54	50-140	0	0-40
452678	Naphthalene	<0.013 ug/g	54	50-140	55	50-140	0	0-40
452678	Phenanthrene	<0.05 ug/g	55	50-140	50	50-140	0	0-40
452678	Pyrene	<0.05 ug/g	59	50-140	51	50-140	0	0-40
452738	Chromium VI	<0.20 ug/g	99	70-130	101	70-130	0	0-35
452740	Tetrachloroethane, 1,1,1,2-	<0.05 ug/g	122	60-130	107	50-140	0	0-50
452740	Trichloroethane, 1,1,1-	<0.05 ug/g	115	60-130	111	50-140	0	0-50
452740	Tetrachloroethane, 1,1,2,2-	<0.05 ug/g	119	60-130	91	50-140	0	0-30
452740	Trichloroethane, 1,1,2-	<0.05 ug/g	121	60-130	115	50-140	0	0-50
452740	Dichloroethane, 1,1-	<0.05 ug/g	117	60-130	112	50-140	0	0-50
452740	Dichloroethylene, 1,1-	<0.05 ug/g	108	60-130	87	50-140	0	0-50
452740	Dichlorobenzene, 1,2-	<0.05 ug/g	120	60-130	111	50-140	0	0-50
452740	Dichloroethane, 1,2-	<0.05 ug/g	121	60-130	114	50-140	0	0-50
452740	Dichloropropane, 1,2-	<0.05 ug/g	124	60-130	119	50-140	0	0-50
452740	Dichlorobenzene, 1,3-	<0.05 ug/g	120	60-130	112	50-140	0	0-50
452740	Dichlorobenzene, 1,4-	<0.05 ug/g	121	60-130	112	50-140	0	0-50
452740	Acetone	<0.50 ug/g	120	60-130	112	50-140	0	0-50
452740	Benzene	<0.0068	113	60-130	114	50-140	0	0-50

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Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
452740	Bromodichloromethane	<0.05 ug/g	120	60-130	110	50-140	0	0-50
452740	Bromoform	<0.05 ug/g	118	60-130	109	50-140	0	0-50
452740	Bromomethane	<0.05 ug/g	105	60-130	105	50-140	0	0-50
452740	Dichloroethylene, 1,2-cis-	<0.05 ug/g	121	60-130	115	50-140	0	0-50
452740	Dichloropropene,1,3-cis-	<0.05 ug/g	118	60-130	115	50-140	0	0-50
452740	Carbon Tetrachloride	<0.05 ug/g	115	60-130	107	50-140	0	0-50
452740	Chloroform	<0.05 ug/g	121	60-130	115	50-140	0	0-50
452740	Dibromochloromethane	<0.05 ug/g	120	60-130	101	50-140	0	0-50
452740	Dichlorodifluoromethane	<0.05 ug/g	114	60-130	106	50-140	0	0-50
452740	Methylene Chloride	<0.05 ug/g	102	60-130	95	50-140	0	0-50
452740	Ethylbenzene	<0.018 ug/g	116	60-130	121	50-140	0	0-50
452740	Ethylene dibromide	<0.05 ug/g	120	60-130	113	50-140	0	0-50
452740	Hexane (n)	<0.05 ug/g	113	60-130	112	50-140	0	0-50
452740	Xylene, m/p-	<0.05 ug/g	119	60-130	112	50-140	0	0-50
452740	Methyl Ethyl Ketone	<0.50 ug/g	118	60-130	116	50-140	0	0-50
452740	Methyl Isobutyl Ketone	<0.50 ug/g	121	60-130	114	50-140	0	0-50
452740	Methyl tert-Butyl Ether (MTBE)	<0.05 ug/g	120	60-130	114	50-140	0	0-50
452740	Chlorobenzene	<0.05 ug/g	115	60-130	115	50-140	0	0-50
452740	Xylene, o-	<0.05 ug/g	117	60-130	118	50-140	0	0-50
452740	Styrene	<0.05 ug/g	117	60-130	117	50-140	0	0-50
452740	Dichloroethylene, 1,2-trans-	<0.05 ug/g	120	60-130	110	50-140	0	0-50
452740	Dichloropropene,1,3-trans-	<0.05 ug/g	119	60-130	115	50-140	0	0-50
452740	Tetrachloroethylene	<0.05 ug/g	119	60-130	119	50-140	0	0-50
452740	Toluene	<0.08 ug/g	115	60-130	114	50-140	0	0-50
452740	Trichloroethylene	<0.01 ug/g	115	60-130	115	50-140	0	0-50
452740	Trichlorofluoromethane	<0.05 ug/g	116	60-130	98	50-140	0	0-50
452740	Vinyl Chloride	<0.02 ug/g	106	60-130	92	50-140	0	0-50
452742	PHC's F1	<10 ug/g	110	80-120	94	60-140		0-30
452743	Xylene Mixture							
452744	Dichloropropene,1,3-							
452745	PHC's F1-BTEX							
452751	pH - CaCl2	5.46	99	90-110			0	
452768	Electrical Conductivity	<0.05	100	90-110			0	0-10

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Client: All Rock Consulting Limited
24 Brydon Drive, Unit #5
Toronto, ON
M9W 5R6
Attention: Mr. Nathan Martin
PO#:
Invoice to: AllRock Consulting Limited

Report Number: 3003384
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
452782	Sodium Adsorption Ratio	<0.01					7	
452784	Boron (Hot Water Soluble)	<0.5 ug/g	106	70-130	118	60-140	0	0-30
452796	1+2-methylnaphthalene							
452836	Silver	<0.2 ug/g	111	70-130	107	70-130	0	0-20
452836	Arsenic	<1 ug/g	96	70-130	104	70-130	0	0-20
452836	Boron (total)	<5 ug/g	95	70-130	120	70-130	0	0-20
452836	Barium	<1 ug/g	97	70-130	112	70-130	4	0-20
452836	Beryllium	<1 ug/g	98	70-130	105	70-130	0	0-20
452836	Cadmium	<0.4 ug/g	97	70-130	108	70-130	0	0-20
452836	Cobalt	<1 ug/g	95	70-130	103	70-130	1	0-20
452836	Chromium Total	<1 ug/g	97	70-130	140	70-130	1	0-20
452836	Copper	<1 ug/g	105	70-130	113	70-130	4	0-20
452836	Mercury	<0.1 ug/g	90	70-130	100	70-130	0	0-20
452836	Molybdenum	<1 ug/g	90	70-130	98	70-130	0	0-20
452836	Nickel	<1 ug/g	103	70-130	115	70-130	2	0-20
452836	Lead	<1 ug/g	103	70-130	116	70-130	1	0-20
452836	Antimony	<1 ug/g	70	70-130	93	70-130	0	0-20
452836	Selenium	<0.5 ug/g	96	70-130	104	70-130	0	0-20
452836	Thallium	<1 ug/g	99	70-130	106	70-130	0	0-20
452836	Uranium	<0.5 ug/g	92	70-130	108	70-130	0	0-20
452836	Vanadium	<2 ug/g	94	70-130	141	70-130	1	0-20
452836	Zinc	<2 ug/g	106	70-130	108	70-130	3	0-20
452838	Tetrachloroethane, 1,1,1,2-	<0.05 ug/g	122	60-130	107	50-140	0	0-50
452838	Trichloroethane, 1,1,1-	<0.05 ug/g	115	60-130	111	50-140	0	0-50
452838	Tetrachloroethane, 1,1,2,2-	<0.05 ug/g	119	60-130	91	50-140	0	0-30
452838	Trichloroethane, 1,1,2-	<0.05 ug/g	121	60-130	115	50-140	0	0-50
452838	Dichloroethane, 1,1-	<0.05 ug/g	117	60-130	112	50-140	0	0-50
452838	Dichloroethylene, 1,1-	<0.05 ug/g	108	60-130	87	50-140	0	0-50
452838	Dichlorobenzene, 1,2-	<0.05 ug/g	120	60-130	111	50-140	0	0-50
452838	Dichloroethane, 1,2-	<0.05 ug/g	121	60-130	114	50-140	0	0-50
452838	Dichloropropane, 1,2-	<0.05 ug/g	124	60-130	119	50-140	0	0-50
452838	Dichlorobenzene, 1,3-	<0.05 ug/g	120	60-130	112	50-140	0	0-50
452838	Dichlorobenzene, 1,4-	<0.05 ug/g	121	60-130	112	50-140	0	0-50

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Report Number: 3003384
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
452838	Acetone	<0.50 ug/g	120	60-130	112	50-140	0	0-50
452838	Benzene	<0.0068	113	60-130	114	50-140	0	0-50
452838	Bromodichloromethane	<0.05 ug/g	120	60-130	110	50-140	0	0-50
452838	Bromoform	<0.05 ug/g	118	60-130	109	50-140	0	0-50
452838	Bromomethane	<0.05 ug/g	105	60-130	105	50-140	0	0-50
452838	Dichloroethylene, 1,2-cis-	<0.05 ug/g	121	60-130	115	50-140	0	0-50
452838	Dichloropropene,1,3-cis-	<0.05 ug/g	118	60-130	115	50-140	0	0-50
452838	Carbon Tetrachloride	<0.05 ug/g	115	60-130	107	50-140	0	0-50
452838	Chloroform	<0.05 ug/g	121	60-130	115	50-140	0	0-50
452838	Dibromochloromethane	<0.05 ug/g	120	60-130	101	50-140	0	0-50
452838	Dichlorodifluoromethane	<0.05 ug/g	114	60-130	106	50-140	0	0-50
452838	Methylene Chloride	<0.05 ug/g	102	60-130	95	50-140	0	0-50
452838	Ethylbenzene	<0.018 ug/g	116	60-130	121	50-140	0	0-50
452838	Ethylene dibromide	<0.05 ug/g	120	60-130	113	50-140	0	0-50
452838	Hexane (n)	<0.05 ug/g	113	60-130	112	50-140	0	0-50
452838	Xylene, m/p-	<0.05 ug/g	119	60-130	112	50-140	0	0-50
452838	Methyl Ethyl Ketone	<0.50 ug/g	118	60-130	116	50-140	0	0-50
452838	Methyl Isobutyl Ketone	<0.50 ug/g	121	60-130	114	50-140	0	0-50
452838	Methyl tert-Butyl Ether (MTBE)	<0.05 ug/g	120	60-130	114	50-140	0	0-50
452838	Chlorobenzene	<0.05 ug/g	115	60-130	115	50-140	0	0-50
452838	Xylene, o-	<0.05 ug/g	117	60-130	118	50-140	0	0-50
452838	Styrene	<0.05 ug/g	117	60-130	117	50-140	0	0-50
452838	Dichloroethylene, 1,2-trans-	<0.05 ug/g	120	60-130	110	50-140	0	0-50
452838	Dichloropropene,1,3-trans-	<0.05 ug/g	119	60-130	115	50-140	0	0-50
452838	Tetrachloroethylene	<0.05 ug/g	119	60-130	119	50-140	0	0-50
452838	Toluene	<0.08 ug/g	115	60-130	114	50-140	0	0-50
452838	Trichloroethylene	<0.01 ug/g	115	60-130	115	50-140	0	0-50
452838	Trichlorofluoromethane	<0.05 ug/g	116	60-130	98	50-140	0	0-50
452838	Vinyl Chloride	<0.02 ug/g	106	60-130	92	50-140	0	0-50
452840	PHC's F1	<10 ug/g	110	80-120	94	60-140		0-30
452842	Xylene Mixture							
452843	Dichloropropene,1,3-							
452844	PHC's F1-BTEX							

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Certificate of Analysis

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Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
452870	Cyanide (CN-)	<0.005 ug/g	92	75-125	100	70-130	0	0-20
452879	PHC's F2	<2 ug/g	101	80-120	87	60-140	0	0-30
452879	PHC's F3	<20 ug/g	100	80-120	87	60-140	0	0-30
452879	PHC's F4	<20 ug/g	100	80-120	87	60-140	0	0-30
452879	Moisture-Humidite	<0.1 %	100	80-120			27	
452886	PHC's F2	<2 ug/g	87	80-120	110	60-140	0	0-30
452886	PHC's F3	<20 ug/g	88	80-120	110	60-140	0	0-30
452886	PHC's F4	<20 ug/g	88	80-120	110	60-140	0	0-30
452886	Moisture-Humidite	<0.1 %	100	80-120			8	
452926	PHC's F2-Napth							
452927	PHC's F3-PAH							

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Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
452678	Methlynaphthalene, 1-	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Methlynaphthalene, 2-	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Acenaphthene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Acenaphthylene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Anthracene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Benz[a]anthracene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Benzo[a]pyrene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Benzo[b]fluoranthene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Benzo[ghi]perylene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Benzo[k]fluoranthene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Chrysene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Dibenz[a h]anthracene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Fluoranthene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Fluorene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Indeno[1 2 3-cd]pyrene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Naphthalene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Phenanthrene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452678	Pyrene	GC-MS	2023-11-24	2023-11-25	C_M	P 8270
452738	Chromium VI	FAA	2023-11-24	2023-11-24	MW	M US EPA 3060A
452740	Tetrachloroethane, 1,1,1,2-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Trichloroethane, 1,1,1-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Tetrachloroethane, 1,1,2,2-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Trichloroethane, 1,1,2-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Dichloroethane, 1,1-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Dichloroethylene, 1,1-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Dichlorobenzene, 1,2-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Dichloroethane, 1,2-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Dichloropropane, 1,2-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Dichlorobenzene, 1,3-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Dichlorobenzene, 1,4-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Acetone	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Benzene	GC-MS	2023-11-23	2023-11-24	SS	V 8260B

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Project: 23301
COC #: 225144

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
452740	Bromodichloromethane	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Bromoform	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Bromomethane	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Dichloroethylene, 1,2-cis-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Dichloropropene,1,3-cis-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Carbon Tetrachloride	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Chloroform	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Dibromochloromethane	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Dichlorodifluoromethane	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Methylene Chloride	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Ethylbenzene	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Ethylene dibromide	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Hexane (n)	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Xylene, m/p-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Methyl Ethyl Ketone	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Methyl Isobutyl Ketone	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Methyl tert-Butyl Ether (MTBE)	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Chlorobenzene	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Xylene, o-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Styrene	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Dichloroethylene, 1,2-trans-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Dichloropropene,1,3-trans-	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Tetrachloroethylene	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Toluene	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Trichloroethylene	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Trichlorofluoromethane	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452740	Vinyl Chloride	GC-MS	2023-11-23	2023-11-24	SS	V 8260B
452742	PHC's F1	GC/FID	2023-11-23	2023-11-24	SS	CCME
452743	Xylene Mixture	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452744	Dichloropropene,1,3-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452745	PHC's F1-BTEX	GC/FID	2023-11-24	2023-11-24	SS	CCME
452751	pH - CaCl2	pH Meter	2023-11-24	2023-11-24	IP	Ag Soil
452768	Electrical Conductivity	Electrical Conductivity Mete	2023-11-24	2023-11-24	IP	Cond-Soil

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Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
452782	Sodium Adsorption Ratio	iCAP OES	2023-11-24	2023-11-24	Z_S	Ag Soil
452784	Boron (Hot Water Soluble)	iCAP OES	2023-11-24	2023-11-24	Z_S	MOECC E3470
452796	1+2-methylnaphthalene	GC-MS	2023-11-27	2023-11-27	C_M	P 8270
452836	Silver	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Arsenic	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Boron (total)	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Barium	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Beryllium	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Cadmium	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Cobalt	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Chromium Total	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Copper	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Mercury	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Molybdenum	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Nickel	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Lead	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Antimony	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Selenium	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Thallium	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Uranium	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Vanadium	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452836	Zinc	ICAPQ-MS	2023-11-27	2023-11-27	AaN	EPA 200.8/6020
452838	Tetrachloroethane, 1,1,1,2-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Trichloroethane, 1,1,1-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Tetrachloroethane, 1,1,2,2-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Trichloroethane, 1,1,2-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Dichloroethane, 1,1-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Dichloroethylene, 1,1-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Dichlorobenzene, 1,2-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Dichloroethane, 1,2-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Dichloropropane, 1,2-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Dichlorobenzene, 1,3-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Dichlorobenzene, 1,4-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

Client: All Rock Consulting Limited
24 Brydon Drive, Unit #5
Toronto, ON
M9W 5R6
Attention: Mr. Nathan Martin
PO#:
Invoice to: AllRock Consulting Limited

Report Number: 3003384
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
452838	Acetone	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Benzene	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Bromodichloromethane	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Bromoform	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Bromomethane	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Dichloroethylene, 1,2-cis-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Dichloropropene,1,3-cis-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Carbon Tetrachloride	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Chloroform	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Dibromochloromethane	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Dichlorodifluoromethane	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Methylene Chloride	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Ethylbenzene	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Ethylene dibromide	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Hexane (n)	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Xylene, m/p-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Methyl Ethyl Ketone	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Methyl Isobutyl Ketone	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Methyl tert-Butyl Ether (MTBE)	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Chlorobenzene	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Xylene, o-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Styrene	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Dichloroethylene, 1,2-trans-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Dichloropropene,1,3-trans-	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Tetrachloroethylene	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Toluene	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Trichloroethylene	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Trichlorofluoromethane	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452838	Vinyl Chloride	GC-MS	2023-11-24	2023-11-24	SS	V 8260B
452840	PHC's F1	GC/FID	2023-11-24	2023-11-27	SS	CCME
452842	Xylene Mixture	GC-MS	2023-11-27	2023-11-27	SS	V 8260B
452843	Dichloropropene,1,3-	GC-MS	2023-11-27	2023-11-27	SS	V 8260B
452844	PHC's F1-BTEX	GC/FID	2023-11-27	2023-11-27	SS	CCME

Results relate only to the parameters tested on the samples submitted.
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Certificate of Analysis

Client: All Rock Consulting Limited
24 Brydon Drive, Unit #5
Toronto, ON
M9W 5R6
Attention: Mr. Nathan Martin
PO#:
Invoice to: AllRock Consulting Limited

Report Number: 3003384
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
452870	Cyanide (CN-)	Skalar CN Analyzer	2023-11-27	2023-11-27	Z_S	MOECC E3015
452879	PHC's F2	GC/FID	2023-11-28	2023-11-28	H_S	CCME
452879	PHC's F3	GC/FID	2023-11-28	2023-11-28	H_S	CCME
452879	PHC's F4	GC/FID	2023-11-28	2023-11-28	H_S	CCME
452879	Moisture-Humidite	Oven	2023-11-28	2023-11-28	H_S	ASTM 2216
452886	PHC's F2	GC/FID	2023-11-28	2023-11-28	H_S	CCME
452886	PHC's F3	GC/FID	2023-11-28	2023-11-28	H_S	CCME
452886	PHC's F4	GC/FID	2023-11-28	2023-11-28	H_S	CCME
452886	Moisture-Humidite	Oven	2023-11-28	2023-11-28	H_S	ASTM 2216
452926	PHC's F2-Napth	GC/FID	2023-11-28	2023-11-28	H_S	CCME
452927	PHC's F3-PAH	GC/FID	2023-11-28	2023-11-28	H_S	CCME

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

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Client: All Rock Consulting Limited
24 Brydon Drive, Unit #5
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Attention: Mr. Nathan Martin
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Report Number: 3003384
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225144

CWS for Petroleum Hydrocarbons in Soil - Tier 1

Notes:

1. The laboratory method complies with CCME Tier 1 reference method for PHC in soil. It is validated for laboratory use.
2. Where the F1 fraction (C6 to C10) and BTEX are both measured, F1-BTEX is reported.
3. Where the F2 fraction (C10 to C16) and naphthalene are both measured, F2-naphthalene is reported.
4. Where the F3 fraction (C16 to C34) and PAHs* are both measured, F3-PAH is reported.
5. F4G is analyzed if the chromatogram does not descend to baseline before C50. Where F4 (C34 to C50) and F4G are both reported, the higher result is compared to the standard.
6. Unless otherwise stated in the sample comments, the following criteria have been met where applicable:

   - nC6 and nC10 response factors within 30% of response factor for toluene;
   - nC10, nC16, and nC34 response factors within 10% of each other;
   - C50 response factors within 70% of nC10 + nC16 + nC34 average; and,
   - Linearity is within 15%.

7. Unless otherwise stated in the sample comments, sampling requirements and analytical holding times have been met.
8. Gravimetric heavy hydrocarbons (F4G) cannot be added to the C6 and C50 hydrocarbons.
9. *PAHs = phenanthrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene and pyrene.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

eurofins 225144

STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

Eurofins Workorder #: 3003384

CLIENT INFORMATION

Company: AllRock Consulting Limited
Contact: Nathan Martin / Erum Syed
Address: 24 Brydon drive etobicoke
Telephone: Cell: 416-432-6974
Email: #1: nathan.martin@allrockconsulting.com
Email: #2: erum.syed@allrockconsulting.com
Project: 23301 Quote #:

INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☐ NO ☐)

Company: Fax:
Contact: Email: #1: ap@allrockconsulting.com
Address: Email: #2:
Telephone: PO #:

TURN-AROUND TIME (Business Days)

☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☑ 5-7 Days (Standard)

Please contact Lab in advance to determine rush availability.
*For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.
**For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

REGULATION/GUIDELINE REQUIRED

☐ Sanitary Sewer, City:
☐ Storm Sewer, City:
☐ ODWSOG (Use DW CoC if analyzing drinking water)
☐ PWQO
☐ O.Reg 347
☐ Other:

☐ O. Reg 153
The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04. Analysis of full paramter list only Yes ☐ No ☐
Table # ___ Coarse / Fine, Surface / subsurface
Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment

☑ O. Reg 406 Excess Soils
Table # 1 Full depth/Strat/Ceiling/mSPLP Leachate
Type: Com-Ind /Res-Park /Agri/All Other
Category: Surface /Subsurface

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this COC is not to be used for drinking water samples. The COC must be complete upon submission of the samples, there will be a $25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details

Sample ID	Date/Time Collected	Sample Matrix	# of Containers	O.Reg.153 parameters: PHC F1 - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganics	Metals only	RN# (Lab Use Only)
BH5 SS3	Nov21 2023	Soil	4	✓		✓	✓		✓		1711515
BH6 SS3	Nov21, 2023			✓		✓	✓		✓		16
BH3 SS3				✓		✓	✓		✓		17
BH10 SS3				✓		✓	✓		✓		18
BH1 SS2				✓		✓	✓		✓		19
BH6 SS2				✓		✓	✓		✓		20
BH5 SS2				✓		✓	✓		✓		21
BH9 SS1				✓		✓	✓		✓		22
BH9 SS2				✓		✓	✓		✓		23
BH4 SS3				✓		✓	✓		✓		24

	PRINT	SIGN	DATE/TIME	TEMP (°C)
Sampled By:	Erum Syed		21 Nov, 2023	
Relinquished By:				
Received By:	Christine Sovaina		22/11/23 11am	5.7

COMMENTS:

CUSTODY SEAL: ☐ YES ☐ NO Ice packs submit ☑ Yes ☐ No

Certificate of Analysis

Client: All Rock Consulting Limited
24 Brydon Drive, Unit #5
Toronto, ON
M9W 5R6
Attention: Mr. Nathan Martin
PO#:
Invoice to: AllRock Consulting Limited

Report Number: 3003386
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225143

Dear Nathan Martin:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____
Raheleh Zafari, Environmental Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: https://directory.cala.ca/.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

eurofins | Environment Testing

Client: All Rock Consulting Limited
24 Brydon Drive, Unit #5
Toronto, ON
M9W 5R6
Attention: Mr. Nathan Martin
PO#:
Invoice to: AllRock Consulting Limited

Report Number: 3003386
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225143

				Lab I.D.	1711528
				Sample Matrix	R347
				Sample Type	
				Sampling Date	2023-11-21
				Sample I.D.	TCLP01
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
Anions	F	0.10	mg/L	LQC 150.0	<0.10
General Chemistry	Cyanide (free)	0.05	mg/L	LQC 20.0	<0.05
Leachate	REG 558 Leach				y
	Zero Headspace Extraction				y
Moisture	Moisture-Humidite	0.1	%		13.2
Others	NO2 + NO3 as N	1.0	mg/L	LQC 1000	<1.0
PAH	Benzo(a)pyrene	0.01	ug/L	LQC 1.0	<0.01
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	LQC 300	<0.1
VOCs Surrogates	1,2-dichloroethane-d4	0	%		121
	4-bromofluorobenzene	0	%		91
	Toluene-d8	0	%		96
Volatiles	1,1-dichloroethylene	0.5	ug/L	LQC 1400	<0.5
	1,2-dichlorobenzene	0.4	ug/L	LQC 20000	<0.4
	1,2-dichloroethane	0.5	ug/L	LQC 500	<0.5
	1,4-dichlorobenzene	0.4	ug/L	LQC 500	<0.4
	Benzene	0.5	ug/L	LQC 500	<0.5
	Carbon Tetrachloride	0.2	ug/L	LQC 500	<0.2
	Chloroform	0.5	ug/L	LQC 10000	<0.5
	Dichloromethane	4.0	ug/L	LQC 5000	<4.0
	Methyl Ethyl Ketone (MEK)	2	ug/L	LQC 200000	<2
	Monochlorobenzene	0.5	ug/L	LQC 8000	<0.5
	Tetrachloroethylene	0.3	ug/L	LQC 3000	<0.3
	Trichloroethylene	0.3	ug/L	LQC 5000	<0.3
	Vinyl Chloride	0.2	ug/L	LQC 200	<0.2

Guideline = REG 558 *** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
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Certificate of Analysis

Client: All Rock Consulting Limited
24 Brydon Drive, Unit #5
Toronto, ON
M9W 5R6
Attention: Mr. Nathan Martin
PO#:
Invoice to: AllRock Consulting Limited

Report Number: 3003386
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225143

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 452761 **Analysis/Extraction Date** 2023-11-24 **Analyst** IP **Method** EPA 1311/O. Reg 347			
REG 558 Leach			
Zero Headspace Extraction			
Run No 452762 **Analysis/Extraction Date** 2023-11-24 **Analyst** IP **Method** ASTM 2216			
Moisture-Humidite			80-120
Run No 452795 **Analysis/Extraction Date** 2023-11-24 **Analyst** AsA **Method** SM2320,2510,4500H/F			
F	<0.10 mg/L	103	90-110
Run No 452797 **Analysis/Extraction Date** 2023-11-25 **Analyst** C M **Method** P 8270			
Benzo[a]pyrene	<0.01 ug/L	78	50-140
Run No 452816 **Analysis/Extraction Date** 2023-11-26 **Analyst** SKH **Method** C SM4500-NO3-F			
NO2 + NO3 as N	<1.0 mg/L	93	80-120
Run No 452837 **Analysis/Extraction Date** 2023-11-24 **Analyst** SS **Method** EPA 8260			
Dichloroethylene, 1,1-	<0.5 ug/L	108	60-130

Guideline = REG 558 *** = Guideline Exceedence**

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Certificate of Analysis

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24 Brydon Drive, Unit #5
Toronto, ON
M9W 5R6
Attention: Mr. Nathan Martin
PO#:
Invoice to: AllRock Consulting Limited

Report Number: 3003386
Date Submitted: 2023-11-22
Date Reported: 2023-11-28
Project: 23301
COC #: 225143

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Dichlorobenzene, 1,2-	<0.4 ug/L	120	60-130
Dichloroethane, 1,2-	<0.5 ug/L	121	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	121	60-130
Benzene	<0.5 ug/L	113	60-130
Carbon Tetrachloride	<0.2 ug/L	115	60-130
Chloroform	<0.5 ug/L	121	60-130
Methylene Chloride	<4.0 ug/L	102	60-130
Methyl Ethyl Ketone	<2 ug/L	120	60-130
Chlorobenzene	<0.5 ug/L	115	60-130
Tetrachloroethylene	<0.3 ug/L	119	60-130
Trichloroethylene	<0.3 ug/L	115	60-130
Vinyl Chloride	<0.2 ug/L	106	60-130
Run No 452857 **Analysis/Extraction Date** 2023-11-27 **Analyst** PJ **Method** EPA 8081B			
Polychlorinated Biphenyls	<0.1 ug/L	91	60-140
Run No 452920 **Analysis/Extraction Date** 2023-11-28 **Analyst** Z_S **Method** SM4500-CNC/MOE E3015			
Cyanide (CN-)	<0.05 mg/L	93	75-125

Guideline = REG 558 *** = Guideline Exceedence**

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eurofins 225143

STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

Eurofins Workorder #: 3003385

CLIENT INFORMATION

Company: Allrock Consulting Limited
Contact: Nathan Newkirk / Erum Syed
Address: 24 Brydon drive, etobicoke
Telephone: Cell:
Email: #1: nathan.martin@allrockconsulting.com
Email: #2: erum.syed@allrockconsulting.com
Project: 23301 Quote #:

INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☐ NO ☐)

Company: Fax:
Contact: Email: #1: ap@allrockconsulting.com
Address: Email: #2:
Telephone: PO #:

TURN-AROUND TIME (Business Days)

☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☑ ~~5-7 Days~~ (Standard)

Please contact Lab in advance to determine rush availability.
*For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.
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REGULATION/GUIDELINE REQUIRED

☐ Sanitary Sewer, City:
☐ Storm Sewer, City:
☐ ODWSOG (Use DW CoC if analyzing drinking water)
☐ PWQO
☐ O.Reg 347
☐ Other:

☐ O. Reg 153
The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04. Analysis of full paramter list only Yes ☐ No ☐
Table # ___ Coarse / Fine, Surface / subsurface
Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment

☐ O. Reg 406 Excess Soils
Table # _____ Full depth/Strat/Ceiling/mSPLP Leachate
Type: Com-Ind /Res-Park /Agri/All Other
Category: Surface /Subsurface

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this COC is not to be used for drinking water samples. The COC must be complete upon submission of the samples, there will be a $25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details

Sample ID	Date/Time Collected	Sample Matrix	# of Containers	O.Reg.153 parameters: PHC F1 - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganic	Metals only	9PAPs	TCLP	RN# (Lab Use Only)
BH4 SS6	Nov 21, 2023	Soil	2	☒		☒	☒		☒		✓		1711525
BH5 SS6			2								✓		26
BH9 SS5			2								✓		27
TCLP01			2									✓	

PRINT	SIGN	DATE/TIME	TEMP (°C)	COMMENTS:
Sampled By: Erum Syed		Nov 21, 2023		
Relinquished By:			5.7	
Received By: Christine Soucina		22/11/23 11am		CUSTODY SEAL: ☐ YES ☐ NO Ice packs submit ☑ Yes ☐ No

BLANTYRE PARK
180 Fallingbrook Road

Functional Servicing Report

City of Toronto, ON

August 8th, 2024

UWGL Project: 23011

Civil Consultant:

Urban Watershed Group Ltd.

15955 Airport Road, Suite 304, Caledon East, Ontario, Canada, L7C 1H9

TEL: 905 584-1458 FAX: 905 584-1461 E-MAIL: urbanwater@grnland.com

WEBSITE: www.grnland.com

Offices: Greater Toronto and Collingwood

BLANTYRE PARK – 180 Fallingbrook Road

TECHNICAL APPENDICES

Functional Servicing Report

BLANTYRE PARK

180 Fallingbrook Road - TORONTO

1.0 INTRODUCTION

The following Functional Servicing Report has been prepared by Urban Watershed Group Ltd. (UWGL), in support of the redevelopment of Blantyre Park, which is located at 180 Fallingbrook Road, northeast of the intersection of Victoria Park Avenue and Kingston Road in the City of Toronto. Clonmore Drive can be found bordering the north side of the site, Fallingbrook Road to the east and a municipal parking lot can be found to the south. The west property line shares frontage on Blantyre Road with a few residential properties found in the southwest corner of the property. The site location is identified in **Figure No. 1**.

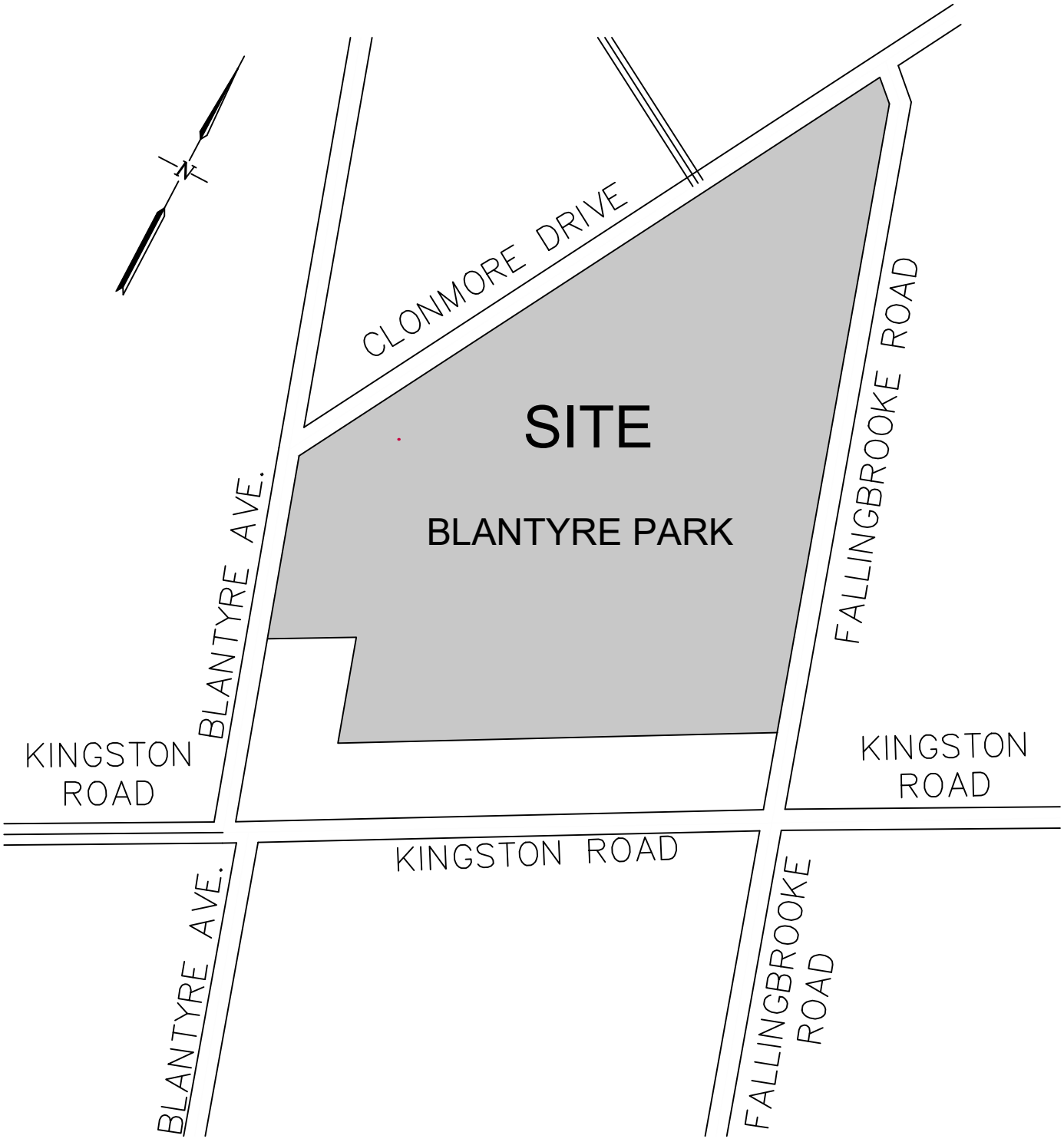
The existing park consists of an existing swimming pool and change facility with washrooms. Further to the south is an existing ball diamond and additional washrooms both of which are not the focus of the design. The redevelopment of the park involves the demolition and replacement of the pool and north change facility. In addition, a children's splashpad will be constructed along with the revitalization of the playground. Walkways have also been proposed throughout the park.

The portion of the existing property under redevelopment is serviced with an existing 50mm water line from Clonmore Drive. Sanitary flows from the pool and the changeroom, along with surface drainage from the park all discharge to a combined sewer immediately to the south of the change facility, and ultimately the combined sewer system within at Blantyre Avenue. A separate 1050mm diameter storm sewer runs south to north parallel to Clonmore Drive within the limits of the park property, however is not currently connected to any drainage infrastructure within the park. Plan & Profile drawings indicating the available municipal services have been provided by the City of Toronto and are included as **Appendix A**.

This report summarizes the proposed servicing for this development, including as follows:

- Identify the outlet and expected flow rates for the existing and proposed sanitary services; and,
- Determine the proposed fire and domestic water connection sizes and verify that water pressures and flow rates of the City's infrastructure are adequate to service this development.

A Stormwater Management Report (July 19, 2024) has been prepared by Urban Watershed Group Limited under a separate cover to address the site drainage needs of the proposed development.



Drawing Title

SITE LOCATION PLAN

BLANTYRE PARK OUT DOOR POOL RENOVATIONS
180 FALLINGBROOK RD.
CITY OF TORONTO, ONTARIO

15955 AIRPORT ROAD, SUITE 304
CALEDON EAST, ONTARIO, L7C 1H9
PHONE: (905) 584-1458 FAX: (905) 584-1461
rban Watershed Group Ltd.
A Member of the GREENLAND Group of Companies
urbanwater@grnland.com

Client

Drawn By	Checked By	Drawing No.
B. KLESS	P. ELLIS	FIG1
Scale: N.T.S.	Project No.: 23011	

2.0 SANITARY SERVICING

2.1 Existing Sanitary Sewers & Services

The existing change room building, and pool backwash, is serviced by a 250mm diameter concrete combined sewer which flows southerly through the park. Near the south limits of the park the combined sewer changes in direction and size to a 375mm diameter westerly flowing sewer. Ultimately the combined sewer flow from the park discharges to a 525mm diameter combined sewer on Blantyre Avenue flowing in the north westerly direction.

2.2 Proposed Sanitary Sewers & Services

A new 150mm diameter PVC service connections to the existing 250mm combined sewer within the park will be provided to the proposed building, pool, and splash pad.

The proposed storm sewer system will also help separate wet weather flows from the existing combined sewer system within the park by connection to the existing 1050mm diameter storm sewer parallel to Clonmore Drive. The splash pad shall also be constructed with a flow diverter, design to allow for separation of wet and dry weather flows received by the splash pad drain.

2.3 Existing Site Sanitary Flows

Calculations of the existing dry-weather flows generated from the change-room building have been carried out utilizing the fixture unit methodology provided as part of the Ontario Building Code to estimate maximum probable drainage rates. Detailed calculations are provided in **Appendix B**.

The peak discharge rate from the existing pool is also considered based on information provided on the current backwash cycle.

Existing Conditions	Peak Discharge to Combined Sewer
Existing Change Room	3.0 L/s
Existing Pool Backwash	30.3 L/s
Total Existing Dry-Weather Flow	**33.3 L/s**
100-yr Wet Weather Flow	266.1 L/s
Total Existing Wet-Weather Flow	**299.4 L/s**

2.4 Proposed Site Sanitary Flows

The proposed site conditions will include the installation of a larger change room facility which will generate an increased volume of dry-weather flows associated with additional plumbing fixtures, as well as a splash pad generating new dry-weather flow to the sanitary sewers. However, at the same time the existing pool shall also be replaced, and consequentially a more efficient backwash system will be installed. Letters from the pool and splash pad design consultants have been provided in **Appendix B** to confirm the proposed flow rates. Wet weather flow to the combined sewer will also be reduced through the sewer separation proposed for the new storm drainage and stormwater management proposed.

Ultimate Conditions	Peak Discharge to Combined Sewer
Proposed Change Room	4.2 L/s
Proposed Pool Backwash	8.6 L/s
Proposed Splash Pad	9.7 L/s
Total Proposed Dry-Weather Flow	**22.5 L/s**
100-yr Wet Weather Flow	166.2 L/s
Total Proposed Wet-Weather Flow	**188.7 L/s**

The proposed park upgrades will represent a 10.8 L/s decrease in dry weather flows in the ultimate conditions. The 100-year extreme wet weather flows are also expected to be decreased by 99.9 L/s from existing (refer to SWM Report for detailed analysis of sewer separation). Overall, the proposed development represents a 110.7 L/s (10.8 L/s dry weather + 99.9 L/s extreme wet weather) decrease in flows to the combined sewer system.

3.0 WATER DISTRIBUTION SERVICING

3.1 Existing City Watermains & Water Services

City of Toronto record drawings indicate there is an existing 150mm diameter cast iron watermain within the Clonmore Drive right-of-way on the south side of the roadway. An existing 50mm diameter service line is connected to the Clonmore Drive watermain and provides domestic water to the property. The existing water services are identified on the **Site Servicing Plan Dwg. No 23011-SS1.**

3.2 Proposed Water Services

The existing domestic water service in the municipal ROW is to be removed and replaced with a proposed 100 mm diameter service suitable for the proposed splash pad water demand. A water meter and backflow preventor is to be installed in a chamber per city standards. Any unused site servicing connections will be abandoned according to City of Toronto standards.

3.3 Fire Flow Demand & Water Distribution Assessment

The fire flow requirements for the building have been estimated using the NFPA Fire Underwriters Survey's Water Supply for Public Fire Protection (1999), and domestic water demands have been estimated to match the peak sanitary flow rate, less pool backwash, calculated under the Ontario Building Code (calculated above in **Section 4.4**). The gross above grade floor area of 232 sq.m has been used to determine the fire flow requirements for a non-sprinklered combustible building. Detailed calculations can be found in **Appendix E** and have been summarized below:

Water Demand	Proposed Building
Maximum Daily Demand (L/min)	948
Fire Flow Demand (L/min)	3000
Total Water Demand (L/min)	3948

The maximum anticipated water demand from the development will be 3,948 L/min, or 1,043 GPM.

City of Toronto Design Criteria require that a minimum fire flow water supply of 4,800 L/min be provided to all areas of the city. Therefore, it is anticipated that the required total water demand will be available to the subject development. Toronto Water has verified the Hydrant flow pressure and indicated that an additional hydrant flow test will not be necessary.

A model of the maximum daily water demand within the proposed service was also prepared to verify the proposed service diameter. The Hazen-Williams Equation was used to calculate the anticipated losses through the system assuming a starting residual pressure of 60 PSI at the connection to the municipal water supply. Based on the proposed servicing layout, the anticipated pressure drop at the proposed building will be 18.8 PSI, and the anticipated pressure drop at the splash pad manifold will be 13.4 PSI. Detailed calculations are included in **Appendix C**.

4.0 GROUNDWATER & PRIVATE WATER DISCHARGE

The proposed development plan includes measures to ensure private water (ground water) is not discharged into the municipal sewer system. **Appendix D** contains a Soil report that demonstrates that ground water is not expected to be present within the excavation depth of site services or foundation construction.

4.1 Conditions & Permanent Dewatering

The proposed building will be primarily constructed as a slab on grade, and a permanent dewatering system will not be installed at the site. The ground water will be locally managed and will not discharge into the sanitary sewer. Any drainage system installed around the proposed pool foundation should be discharged to a soak-away pit and managed on-site

4.2 Foundation Drainage Assessment

Foundation drainage will not be required for this scope of work.

5.0 SWM SUMMARY

A summary of the design criteria from the Stormwater Management Report (July 2024), has been provided.

Criteria	Value
Calculated Allowable Release Rate	40.1 L/s
Actual Release Rate	40.1 L/s
Required Storage	183.4 cu.m
Provided Storage	189.9 cu.m
Roof Release Rate	N/A
Roof Storage Provided	N/A
Orifice Tube Size	104mm
Water Balance Required	19.5 cu.m
Water Balance Provided	20.9 cu.m
OGS Unit Size	N/A

6.0 TORONTO GREEN STANDARD

The following describes how the site design complies with the Toronto Green Standard checklist.

WQ 1.1 Erosion & Sediment Control – The site shall have silt fence installed around the perimeter of the property where there is a risk of sediment runoff. The proposed and existing catch basins shall be protected with double wrapped filter cloth. A Mud-mat is to be installed at the construction entrance.

WQ 2.1 Stormwater Balance – Site will be controlled to the 2-year pre-development release rate via an orifice plate installed in the proposed storm sewer. Surface and super-pipe storage has been provided for runoff detention during all storms up to and including a 100-year rainfall event.

WQ 2.2 Stormwater Retention – An infiltration trench is provided to service the proposed changeroom building. Proposed impervious walkways will not be directly connected to the storm sewer system and treated by bioswales to promote additional infiltration.

WQ 3.1 Total Suspended Solids (TSS) – TSS removal shall occur from filtration as runoff is transported across vegetated buffer strips prior to being collected within the existing storm sewer system.

WQ 3.2 E. Coli Reduction - This criterion (Section 2.2.2.3, WWFM Guidelines) does not apply to this site since it does not discharge directly to the Lake Ontario waterfront.

7.0 EXECUTIVE SUMMARY

The proposed Stormwater Management Plan demonstrates that the development will meet the established criteria with respect to stormwater management set forth in governing documents. It is recommended the following site works be completed to accompany the required site servicing necessary as part of development for the site:

- Installation of new local storm sewer system to accommodate water quantity and peak flow control, connected to the existing municipal storm sewer crossing through the site, and diverting flow away from the combined sewer system.
- Installation of a flow diverter for the proposed splash pad to ensure the system is not contributing additional flows to the combined sewer system during wet-weather conditions; and,
- Upgrades for water and sanitary services per the associated Civil Drawing, 23011-SS1.

In conclusion, the municipal servicing has been provided to the proposed development in conformance with City of Toronto standards.

Please do not hesitate to contact us with any questions pertaining to the enclosed.

Yours truly,

Urban Watershed Group Ltd.

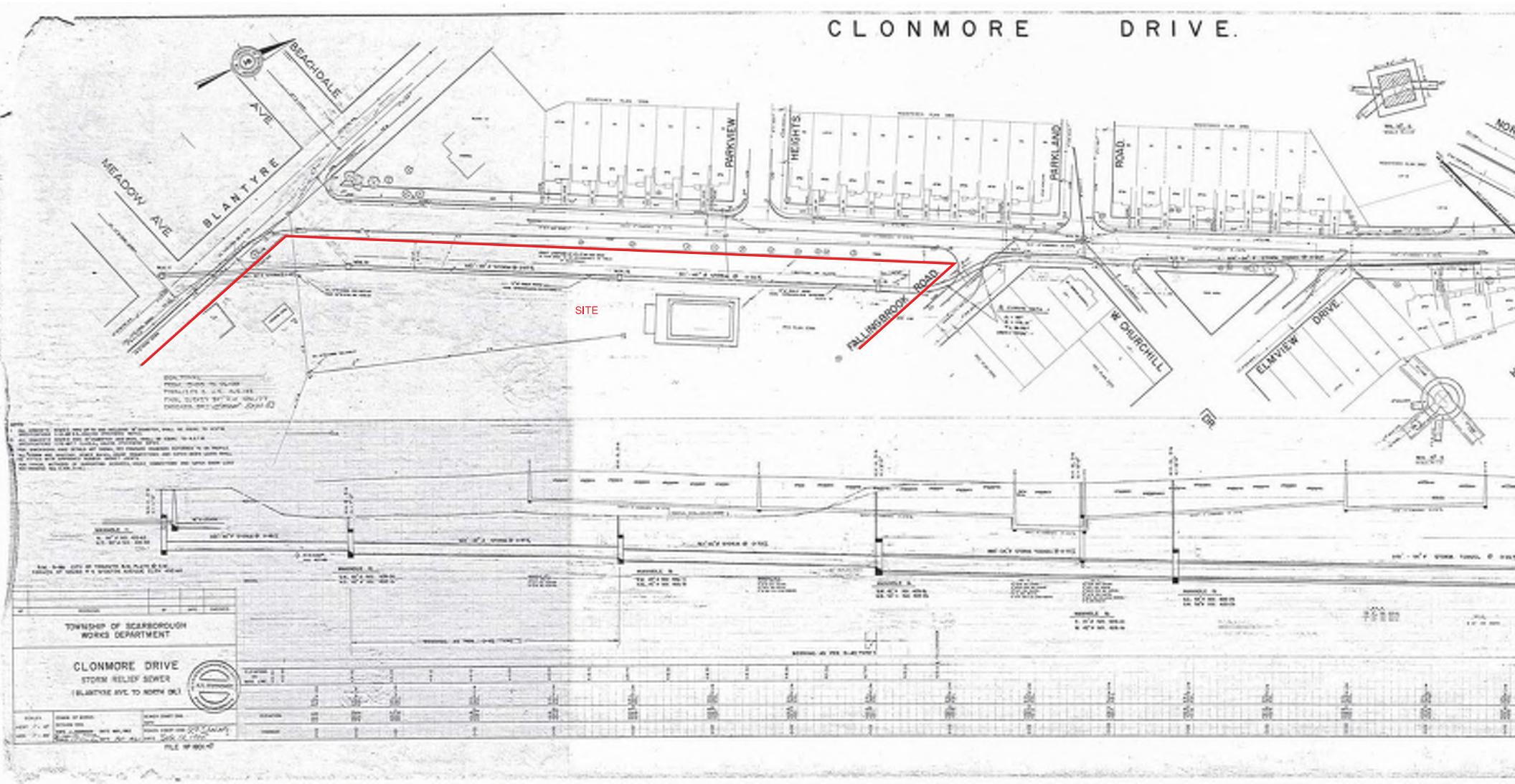
Prepare by:

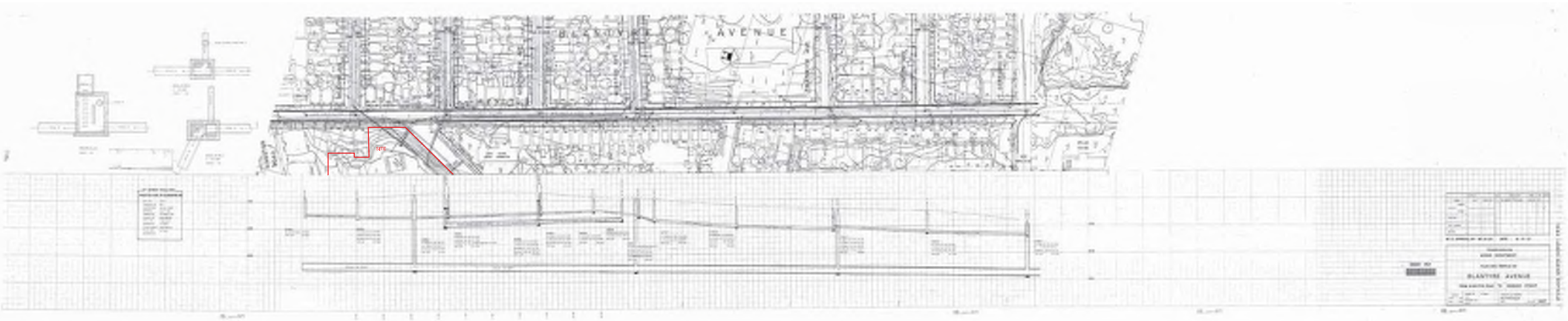
Adam McEwen, P.Eng.

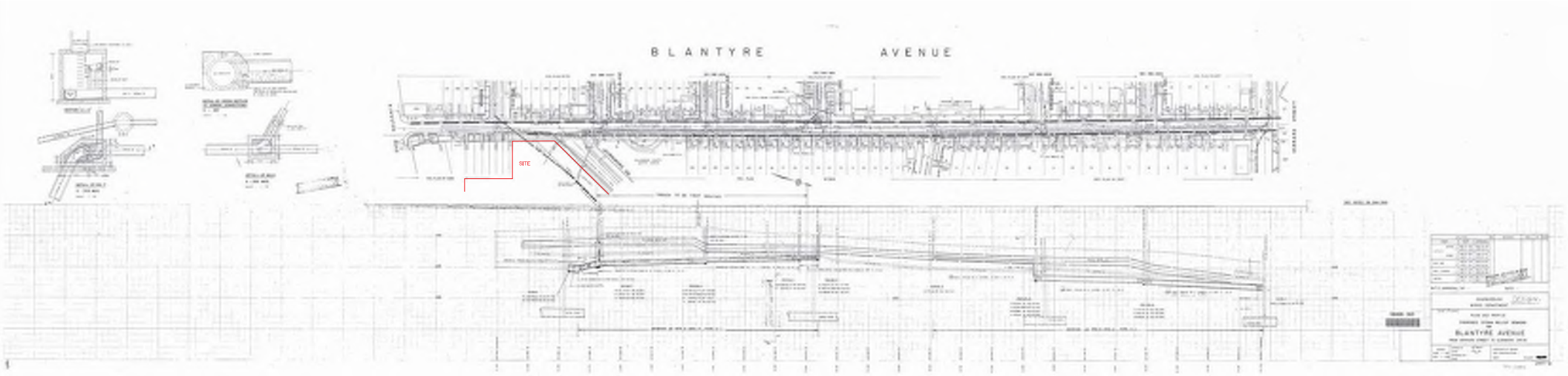
(905) 584-1458 ext. 233

Appendix A

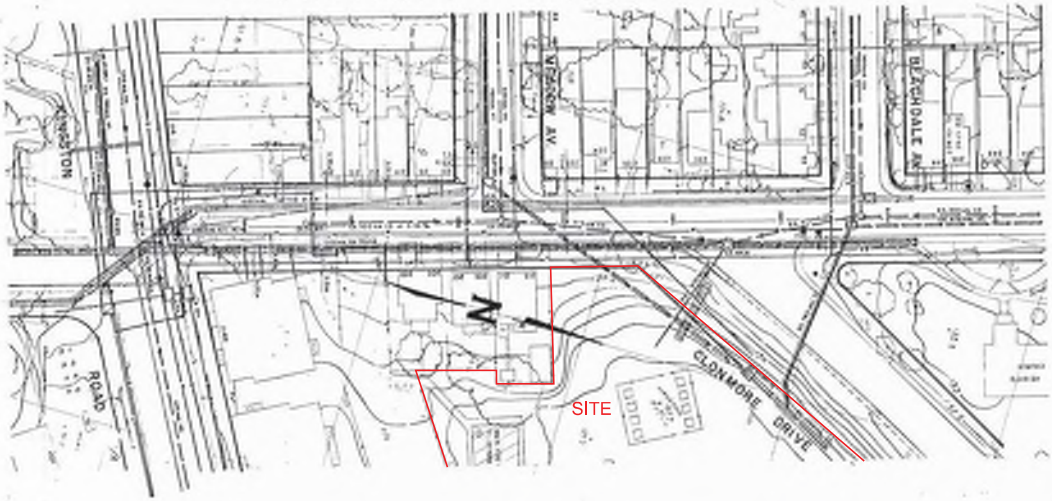
City of Toronto Record Drawings

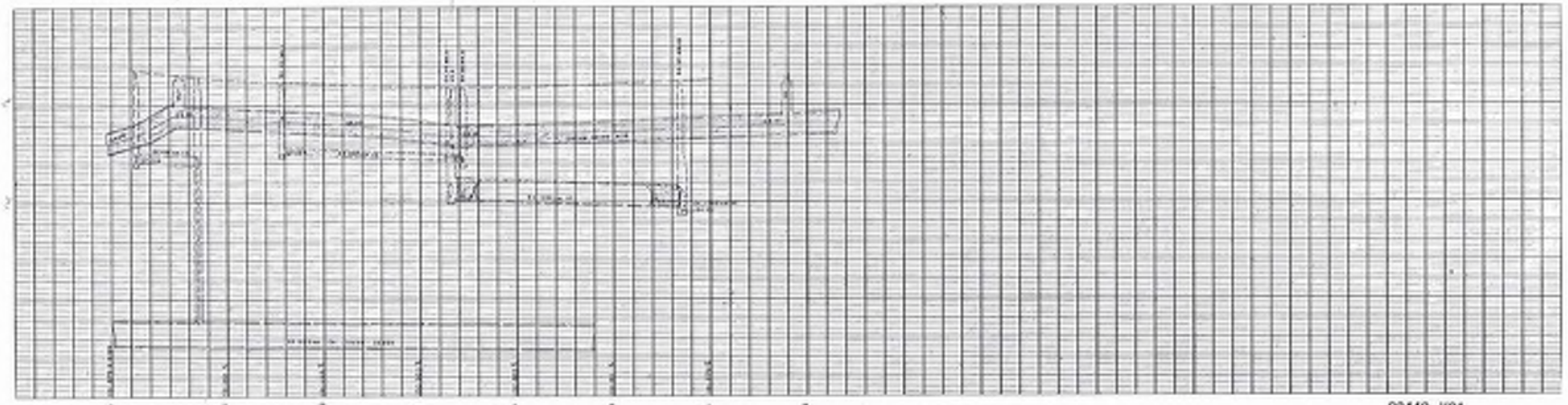

CLONMORE DRIVE.
BEACHDALE AVE
MEADOW AVE
BLANTYRE
PARKVIEW
HEIGHTS
PARKLAND
ROAD
SITE
FALLINGBROOK ROAD
CHURCHILL
ELMVIEW DRIVE
TOWNSHIP OF SCARBOROUGH
WORKS DEPARTMENT
CLONMORE DRIVE
STORM RELIEF SEWER
(BLANTYRE AVE. TO NORTH OF)


AVENUE


BLANTYRE AVENUE
SITE

BLANTYRE AVENUE





08440 V01

UTILITIES			AS CONSTRUCTED
NAME	DATE REQUIRED	DATE RECEIVED	
GAS			
HYDRO			
WATER			
COM. GAS			
BELL CANADA			
METRO			
CABLE TV			

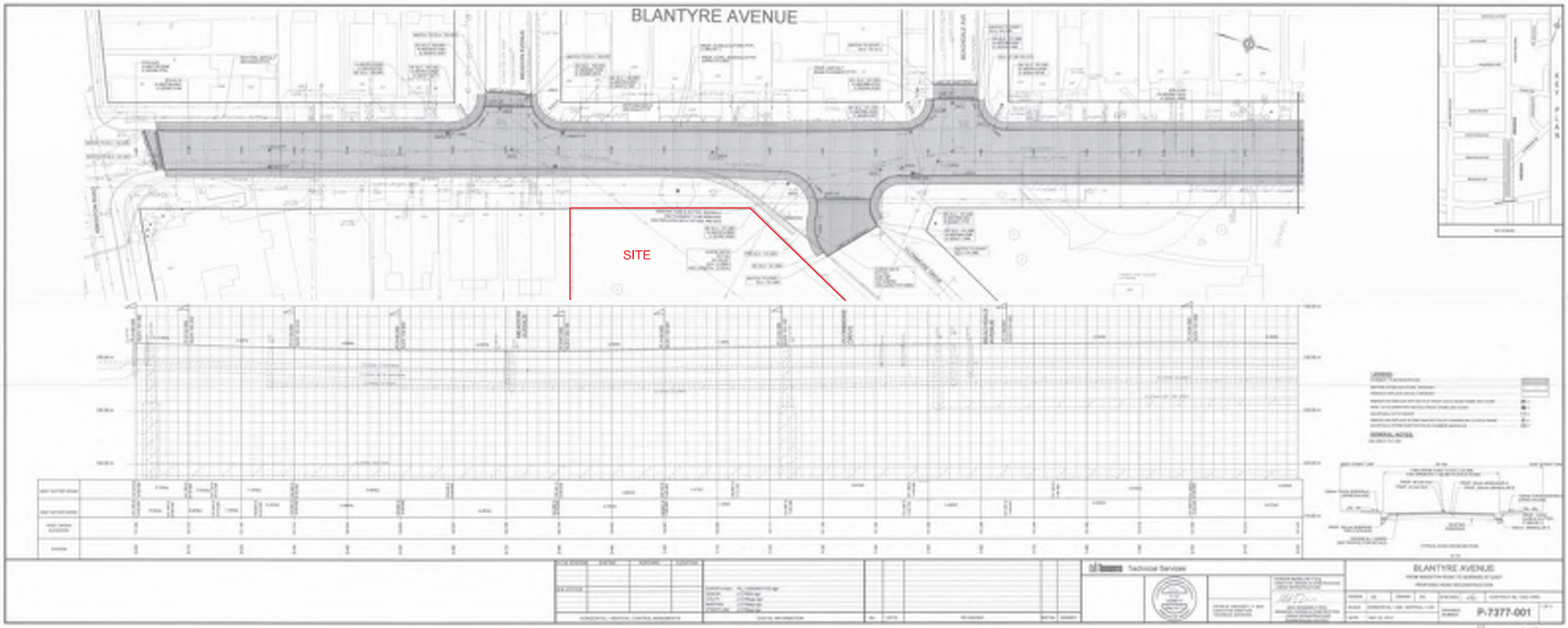
REF. DWG.	TITLE	No.	DATE	REVISIONS	BY

CITY OF SCARBOROUGH
WORKS DEPARTMENT

DIRECTOR OF DESIGN AND CONSTRUCTION

PLAN AND PROFILE
OF
BLANTYRE AVENUE
FROM KINGSTON ROAD TO CLONMORE DRIVE

DESIGN		DRAWN		CHECK	
SCALES	HOR. 1:500, VERT. 1:100			DRAWING NUMBER	3907-D
DATE					


BLANTYRE AVENUE
SITE
Technical Services
BLANTYRE AVENUE
P-7377-001

Appendix B

Sanitary Flow Calculations

Ontario Building Code Fixture Count for Blantyre Park **Job No.: 23011**

Domestic Water Demand Calculations Date: 23/02/2024

Proposed Pool Building

OBC Domestic Water Demands

Fixture Type	Hydraulic Load per Fixture	Number of Fixtures	Total Hydraulic Load
Flush Tank W.C.	8	7	56.0
Urinal	1.5	0	0.0
Hand Basin Sink	1.5	8	12.0
Eyewash Station	1	1	1.0
Shower	1.5	15	22.5
Floor Drains	2	9	18.0

Total Fixture Units : 109.5

Maximum Probable Drainage Rate : 54.8 GPM (UK) 4.15 L/s

Note: Number of Floor Drains = 13 - 4 for outdoor showers = 9 floor drains

Appendix C

Water Supply Calculations

WATER SUPPLY FOR PUBLIC FIRE PROTECTION - 1999
FIRE UNDERWRITERS SURVEY

Job No.: 21008
Date: 23/02/2024

KEELEWEST DEVELOPMENTS INC.

1. Required Fire Flow Calculation

F=220C(A)^0.5

F= the required fire flow in litres per minute
C= coefficient related to the type of construction
= 1.5 for wood frame construction (structure essentially all combustible)
= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)
= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)
= 0.6 for fire resistive construction (fully protected frame, floors, roof)
A= the total floor area in square metres in the buidling being considered

F= 3351 l/min

Type of Construction = Non- Combustible
C= 1.0

Total GFA = 232 m²

2. Determine if occupancy type has a low contents fire hazard or high contents fire hazard.

F= 3351 l/min

Per Appendix A - Occupancy is Considered Low Fire Hazard

Contents Classification			
1) Non-Combustible	-25%	0	0%
2) Limited Combustible	-15%	0	0%
3) Combustible	0%	1	0%
4) Free Burning	15%	0	0%
5) Rapid Burning	25%	0	0%
		Total	0%

3. Automatic Sprinkler Protection Reduction

F= 0 l/min

Sprinkler Reduction Ratings - Building is Sprinklered

Sprinkler Reduction Ratings			
1) Sprinkler System Conforms to NFPA 13 and other NFPA Sprinkler Standards	-30%	0	0%
2) Water supply standard for both the sprinkler system and fire department hose lines	-10%	0	0%
3) Fully supervised sprinkler system	-5%	0	0%
		Total	0%

4. Exposure to adjacent buildings

F= 0 l/min

Number of Walls within Exposure Limits

Separation	Charge		
1) 0 to 3.0m	25%	0	0%
2) 3.1 to 10.0m	20%	0	0%
3) 10.1 to 20.0m	15%	0	0%
4) 20.1 to 30.0m	10%	0	0%
5) 30.1 to 45.0m	5%	0	0%
		Total	0%

The total % shall be the sum of the % of all sides but shall not exceed 75%.

THEREFORE TOTAL FIRE FLOW REQUIRED = 3000 l/min
or 50.00 l/s

MINOR LOSSES IN PIPE Job No.: 23011

100mm dia. waterservice from 150mm watermain (0) to Tee (A) Date: 23/02/2024

L =	42	m	Hazen-William Equation
Q =	13.9	L/s	h_f = L [V/kC (4/d)^0.63]^1/0.54
C =	100		= -2.4 m
d =	0.1	m	= -3.4 PSI
A =	0.00785	sq. m	
V =	1.77	m/s	Elevation
k =	0.85		h_e = 132 - 127.75masl
			= 4.25 m
			= 6.1 PSI

Bends & Fittings

K_{BENDS} =	0.76	h_m = V^2/2g (ΣK)
K_{JOINTS} =	0.92	= -0.5 m
K_{VALVES} =	1.12	= -0.7 PSI
$K_{d/D}$ =	0.23	
ΣK =	3.03	

	90° Bend	45° Bend	Line Flow Tee	Branch Flow Tee	Gate Valve	d/D
Number of Fittings	-	4	2	1	7	100mm
Resistance Coefficent	0.30	0.19	0.14	0.64	0.16	150mm

Equipment

75mm Water Meter =	-7	PSI	-4.9 m
Backflow Preventor =	-5	PSI	-3.5 m

Total Losses = $h_f + h_{m\ +\ equipment}$

= -10.0 PSI

= -7.0 m

Residual Pressure =	60	PSI	Qmax =	206.2	L/s
	42.1	m		3,268	GPM

MINOR LOSSES IN PIPE Job No.: 23011

50mm dia. waterservice from waterservice Tee (A) to Building (B) Date: 23/02/2024

L =	9	m	Hazen-William Equation
Q =	4.2	L/s	h_f = L [V/kC (4/d)^0.63]^1/0.54
C =	100		= -1.6 m
d =	0.05	m	= -2.3 PSI
A =	0.00196	sq. m	
V =	2.14	m/s	Elevation
k =	0.85		h_e = 127.75 - 127.75masl
			= 0 m
			= 0.0 PSI

Bends & Fittings

K_{BENDS} =	0.00	h_m = V^2/2g (ΣK)
K_{JOINTS} =	0.64	= -0.3 m
K_{VALVES} =	0.35	= -0.4 PSI
$K_{d/D}$ =	0.32	
ΣK =	1.31	

	90° Bend	45° Bend	Line Flow Tee	Branch Flow Tee	Gate Valve	d/D
Number of Fittings	-	-	-	1	1	50mm
Resistance Coefficent	0.30	0.19	0.14	0.64	0.35	100mm

Equipment

Backflow Preventor =	-5	PSI	-3.5 m

Total Losses = $h_f + h_{m\ +\ equipment}$

= -7.8 PSI

= -5.4 m

Residual Pressure =	50	PSI	Qmax =	47.4	L/s
	35	m		751	GPM

MINOR LOSSES IN PIPE Job No.: 23011

50mm dia. waterservice from waterservice Tee (A) to Splash Pad (C) Date: 23/02/2024

L =	38	m	Hazen-William Equation
Q =	9.7	L/s	h_f = L [V/kC (4/d)^0.63]^1/0.54
C =	100		= -32.4 m
d =	0.05	m	= -46.1 PSI
A =	0.00196	sq. m	
V =	4.93	m/s	Elevation
k =	0.85		h_e = 127.75 - 127.75masl
			= 0 m
			= 0.0 PSI

Bends & Fittings

K_{BENDS} =	0.19	h_m = V^2/2g (ΣK)
K_{JOINTS} =	0.00	= -1.6 m
K_{VALVES} =	0.75	= -2.2 PSI
$K_{d/D}$ =	0.32	
ΣK =	1.26	

	90° Bend	45° Bend	Line Flow Tee	Branch Flow Tee	Gate Valve	d/D
Number of Fittings	-	1	-	-	3	50mm
Resistance Coefficent	0.30	0.19	0.14	0.64	0.25	100mm

Equipment

Splash Pad Manifold =		PSI	0.0 m

Total Losses = $h_f + h_{m\ +\ equipment}$

= -48.3 PSI

= -33.9 m

Residual Pressure =	50	PSI	Qmax =	9.4	L/s
	35.1	m		149	GPM

Appendix D

Soils Test Data (by AllRock)

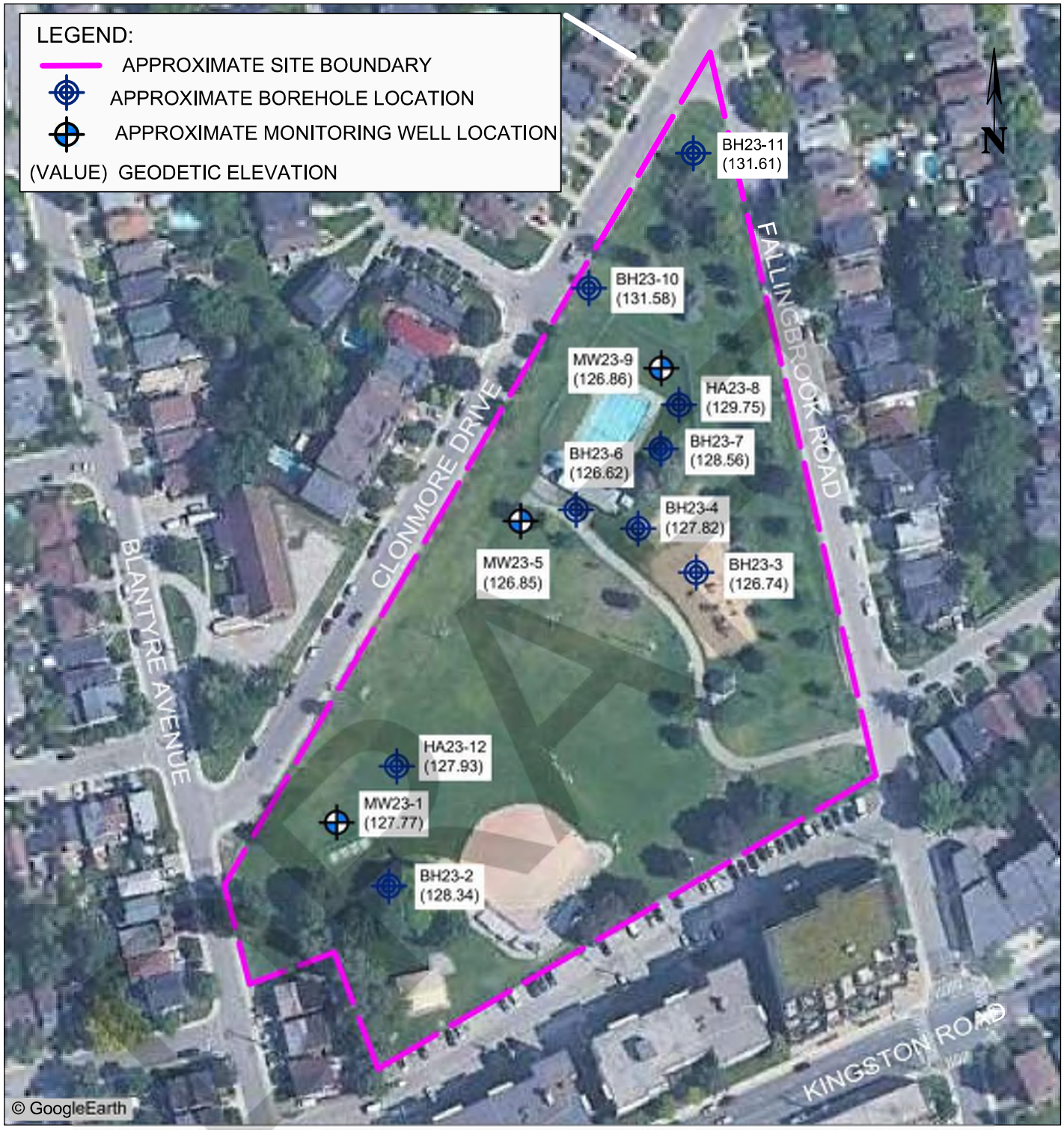


FIGURE TITLE: BOREHOLE LOCATION PLAN	
PROJECT: GEOTECHNICAL INVESTIGATION	
CLIENT: CHERIE NG ARCHITECT	
ADDRESS: BLANTYRE PARK, TORONTO, ON	
PROJECT NO: 23301	APPROXIMATE SCALE: NTS

AllRock Consulting Ltd

DATE: DEC. 2023	FIGURE NO.: 2
DRAWN BY: ES	CHECKED BY: GD

WELL NUMBER MW23-5

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 126.849 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 1	75	3-5-6-6 (11)		0.08 (126.77) Brown silty sand/sandy silt, contains organic material (TOPSOIL) Brown fine to coarse grained sand, trace to some gravel and silt (FILL MATERIAL)	Flushmount Protective Casing Backfilled with auger cuttings 50mm diameter PVC riser Bentonite Seal Filter Sand
	SS 2	75	7-7-7-7 (14)		1.37 (125.48) Brown fine to coarse grained SAND, trace silt and gravel -Dry	
2	SS 3	83	5-7-9-16 (16)			
	SS 4	83	9-14-25-25 (39)			
	SS 5	100	11-20-32-47 (52)			50mm diameter PVC screen
4	SS 6	100	6-15-21-24 (36)		4.42 (122.43) End of Borehole Bottom of hole at 4.42 m.	

4.2 Topsoil

A surficial layer of topsoil material was encountered in all boreholes. The topsoil can be described as brown silty sand/sandy silt and contains organic material. The thickness of this layer was about 80 to 100 millimteres.

4.3 Fill Material

A layer of fill material was encountered in all boreholes below the surficial topsoil. The fill material can generally be described as brown, fine to coarse grained sand with trace to some gravel and silt. The fill layer extends to depths ranging from about 0.5 to 3.05 metres below existing grade.

HA23-12 was terminated within the fill material at a depth of about 1.5 metres below existing grade.

4.4 Sand

Native deposits of brown, fine to coarse grained sand, with trace silt, clay and gravel were encountered below the fill material at all borehole locations excluding HA23-8. The sand extends to depths of about 4.4 metres below existing grade in all boreholes excluding HA23-2, HA23-8, and HA23-12.

HA23-2 was terminated within the sand material at a depth of about 1.52 metres below existing grade.

Standard penetration tests carried out in the sand material gave N values of 3 to greater than 50 blows per 0.3 metres of penetration, which reflects very loose to very dense relative density.

4.5 Gravelly Sand

Native deposits of brown gravelly sand, with some silt were encountered in augerhole HA23-8 at a depth of about 0.9 metres below existing grade. This hand augerholes was terminated within the gravelly sand at a depth of about 1.5 metres below existing grade.

4.6 Groundwater Level

On December 8th, 2023, the groundwater levels were observed in the well screens installed in boreholes MW23-1, MW23-5, and MW23-9. It is noted that all wells were determined to be dry.

It should be noted that the groundwater levels may be higher during wet periods of the year such as the early spring or following periods of precipitation.

BLANTYRE PARK
180 Fallingbrook Road

Stormwater Management Report

City of Toronto, ON

October 24, 2024

UWGL Project: 23011

Civil Consultant:

Urban Watershed Group Ltd.

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Offices: Greater Toronto and Collingwood

BLANTYRE PARK – 180 Fallingbrook Road

TECHNICAL APPENDICES

Stormwater Management Report

BLANTYRE PARK

180 Fallingbrook Road - TORONTO

1.0 INTRODUCTION

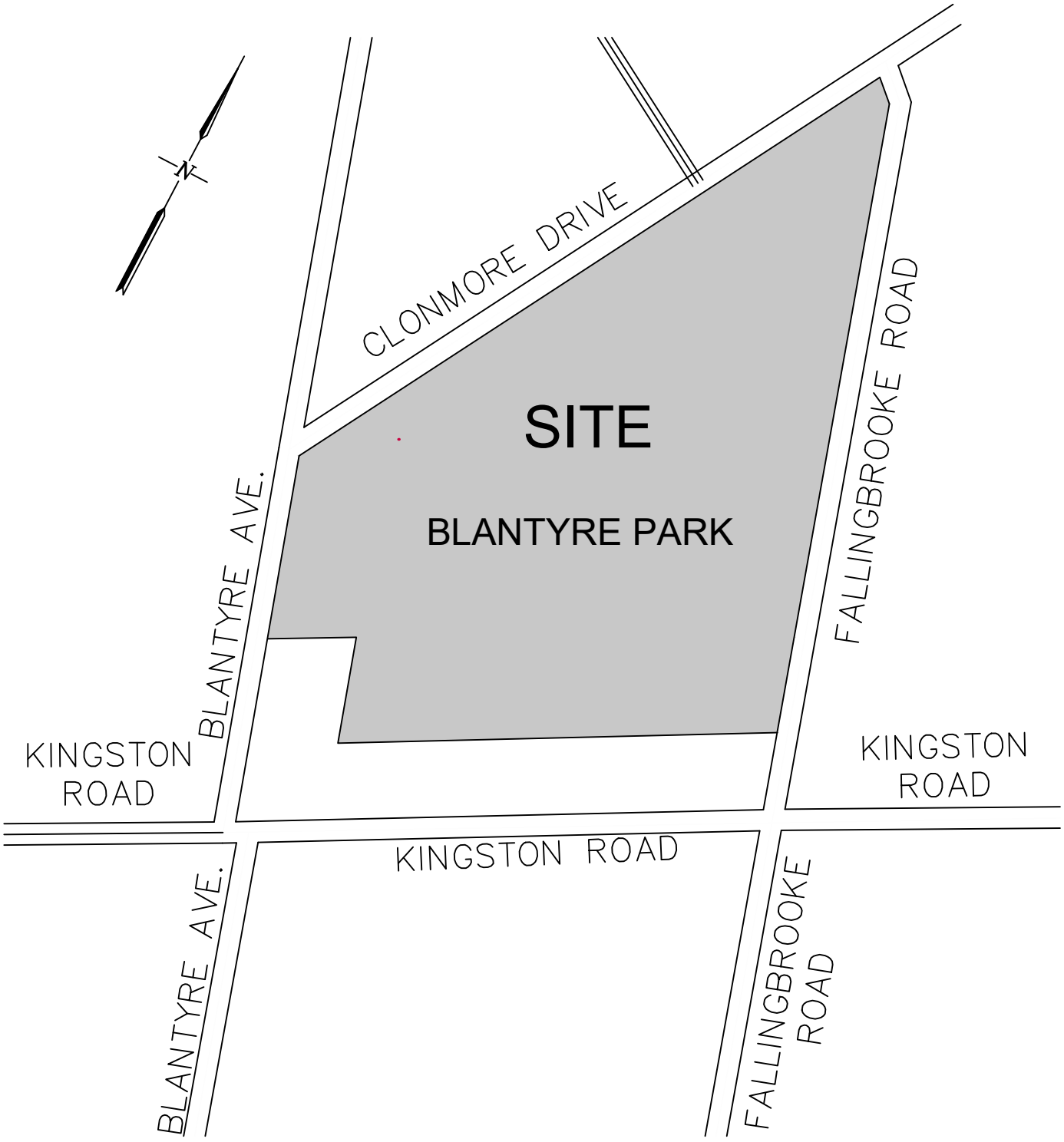
The following Stormwater Management & Functional Servicing Report has been prepared by Urban Watershed Group Ltd. (UWGL), in support of the redevelopment of Blantyre Park which is located at 180 Fallingbrook Road, north east of the intersection of Victoria Park Avenue and Kingston Road in the City of Toronto. Clonmore Drive can be found bordering the north side of the site, Fallingbrook Road to the east and a municipal parking lot can be found to the south. The west property line shares frontage on Blantyre Road with a few residential properties found in the south west corner of the property. The site location is identified in **Figure No. 1**.

The existing park consists of an existing swimming pool and change facility with washrooms. Further to the south is an existing ball diamond and additional washrooms both of which are not the focus of the design. The redevelopment of the park involves the demolition and replacement of the pool and north change facility. In addition, a children's splashpad will be constructed along with the revitalization of the playground. Walkways have also been proposed throughout the park.

Sanitary flows from the pool and the changeroom, along with surface drainage from the park all discharge to a combined sewer immediately to the south of the change facility, and ultimately the combined sewer system within at Blantyre Avenue. A separate 1050mm diameter storm sewer runs south to north parallel to Clonmore Drive within the limits of the park property, however is not currently connected to any drainage infrastructure within the park. Plan & Profile drawings indicating the available municipal services have been provided by the City of Toronto and are included as **Appendix A**.

This report intends to develop a stormwater management plan for the property to satisfy the criteria set out in the City of Toronto Wet Weather Flow Management Guidelines (WWFMG), for all storms up to an including a 100-year rainfall event.

A Functional Servicing Report (July 17, 2024) has been prepared by Urban Watershed Group Limited under a separate cover to address the water and wastewater needs of the proposed development.



Drawing Title

SITE LOCATION PLAN

BLANTYRE PARK OUT DOOR POOL RENOVATIONS
180 FALLINGBROOK RD.
CITY OF TORONTO, ONTARIO

15955 AIRPORT ROAD, SUITE 304
CALEDON EAST, ONTARIO, L7C 1H9
PHONE: (905) 584-1458 FAX: (905) 584-1461
rban Watershed Group Ltd.
A Member of the GREENLAND Group of Companies
urbanwater@grnland.com

Client

Drawn By	Checked By	Drawing No.
B. KLESS	P. ELLIS	FIG1
Scale: N.T.S.	Project No.: 23011	

2.0 STORMWATER SERVICING

The site is located within the City of Toronto and is subject to the Wet Weather Flow Management Guidelines (WWFMGs). Currently storm drainage is being collected by a few catchbasins immediately south of the change facility and the baseball diamond which are connected to a combined sewer system within the park and discharging to Clonmore Drive near the southwest corner of the site.

As part of part of the existing site conditions the southern portion of the park is a part of an existing overland flow route and major system storage system for the local watershed (>26 hectares). Given the park acts as a reservoir which relies solely on minor system drainage, implementation of traditional SWM controls such as surface storage or minor system capacity reduction within the park could impact operation of the local major system, and presents a unique constraint to ensure development of the site does not result in an increased risk of flooding upstream.

In accordance with MECP Regulation F-5-5 it is not permissible to increase the flows to a combined sewer which will result in any increase in the volume of combined sewer overflow downstream. Following City of Toronto's Design Criteria for Sewers and Watermain (January 2021), this means new storm drainage systems cannot be connected to existing combined sewers unless circumstances allow no other alternative.

As there is a 1050mm storm sewer passing through the park, the proposed storm sewer must connect to this system, eliminating the existing condition of storm drainage discharge to the combined sewer system. Stormwater management implemented in accordance with the City of Toronto WWFMGs must be implemented to meet the required level of protection for the new storm sewer connection.

The City of Toronto Wet Weather Flow Management Guidelines (WWFMGs) require 100-year protection for this development by supplying the on-site storage for all storm flows from 2-year up to 100-year return period based on City of Toronto Standards. To encourage sewer separation the WWFMGs shall be applied to the proposed development area on the north portion of the site, while the south portion will remain discharging as per the existing conditions. Discharge to the storm sewer system shall be limited to the 2-year pre-development flow, while discharge to the combined sewer system must demonstrate an improvement to the existing conditions.

Existing drainage patterns on adjacent properties shall not be altered and stormwater runoff from the subject development shall not be directed to drain onto adjacent properties.

2.1 Site Statistics

The site is generally located within a depression, up to 4 metres below the adjacent centerline of road to the north, east and west and over 1 metre below the municipal parking lot to the south. The existing condition of the park is primarily a pervious grass covered surface.

The overall site area is 23,748 sq.m, and generally slopes in a southerly direction, across a change in grade of approximately 1.0 meters with an average slope of 0.5%. The existing time of concentration using the uplands method is considered approximately 21.1 minutes.

The following pre and post-development site statistics shall be used when deriving the required stormwater detention volumes using the modified rational method. The site statistics and composite runoff coefficient for the existing and proposed site conditions have been provided below based on the pre- and post-development drainage area plan (**Figure No. 2 & 3** respectively).

Pre-Development Drainage Areas (Figure No. 2)

Land Use	AREA (m2)	C	Ac
Pervious (Open Space)	22,218.4	0.25	5,554.6
Existing Buildings	186.3	0.90	167.7
Existing Pool	291.0	1.00	291.6
Impervious (Walkways)	1,052.3	0.90	947.1
Total Area	**23,748.0**	**0.293**	**6,961.0**

Post-Development Drainage Areas (Figure No. 3)

Land Use	AREA (m2)	C	Ac
Pervious (Open Space)	19,414.7	0.25	4,853.7
Existing Building (To Remain)	105.9	0.90	95.3
Proposed Building	232.0	0.90	208.8
Proposed Pool	425.8	1.00	425.8
Impervious (Walkways)	3,569.6	0.90	3,212.6
Total Area	**23,748.0**	**0.370**	**8,796.2**

Therefore, the proposed development will result in a 2,803.7 sq.m increase in impervious area within the park. SWM controls shall be implemented considering the effect of this impervious area.

In order to prevent interference with the existing major system drainage network in the southern portion of the park SWM detention and peak flow control shall be exclusively implemented in the high elevation northern portion of the park. The creation of a north catchment will allow for the diversion of drainage from the combined sewer system into the storm sewer, and over compensate for minor alterations to occur in the south. Site statistics for this north and south catchment are summarized below, as identified on the post-development drainage plan.

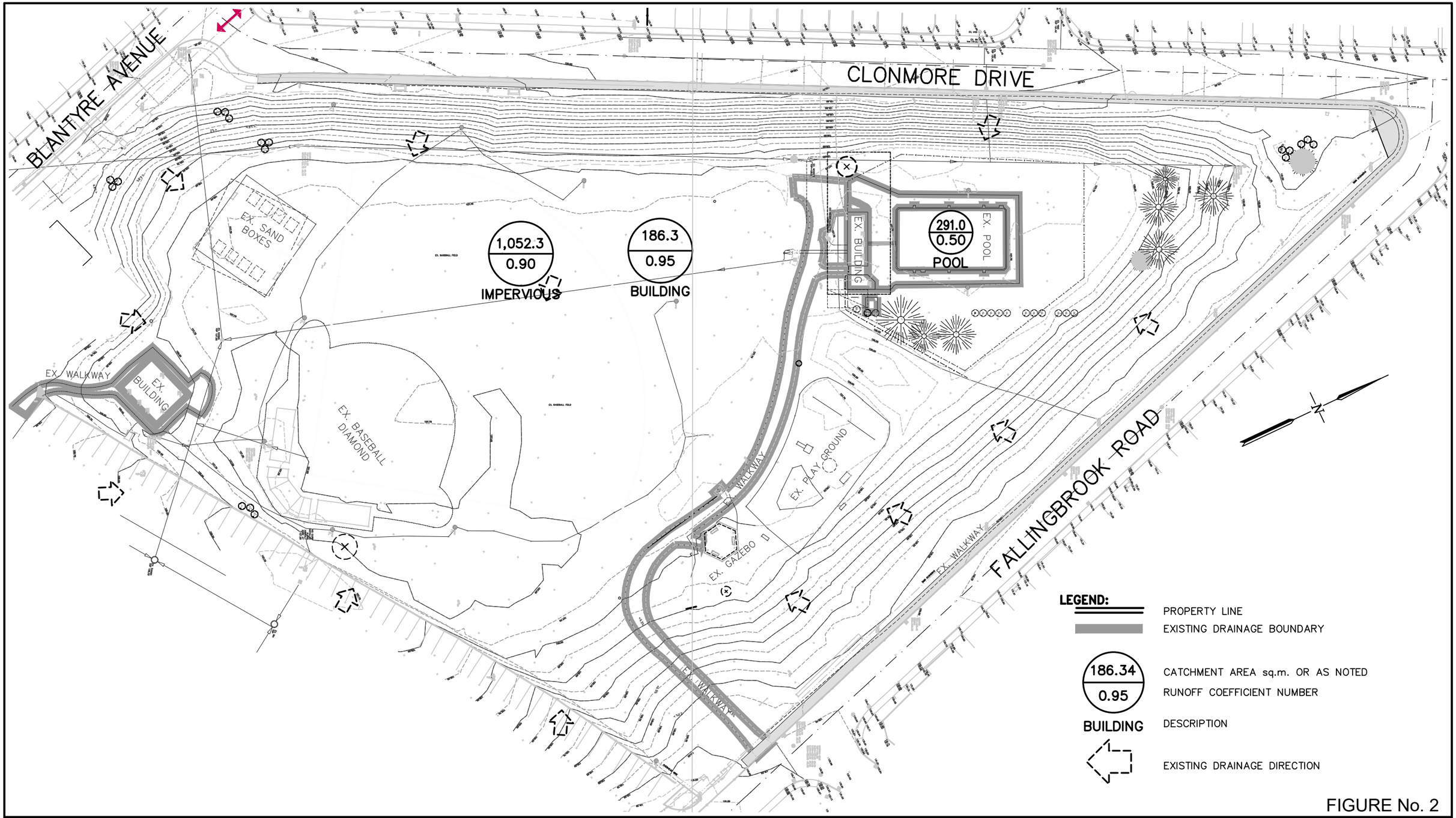


FIGURE No. 2

BLANTYRE PARK OUT DOOR POOL RENOVATIONS

180 FALLINGBROOK RD.
CITY OF TORONTO, ONTARIO

15955 AIRPORT ROAD, SUITE 304
CALEDON EAST, ONTARIO, L7C 1H9
PHONE: (905) 584-1458 FAX: (905) 584-1461
rban Watershed Group Ltd.
A Member of the GREENLAND Group of Companies
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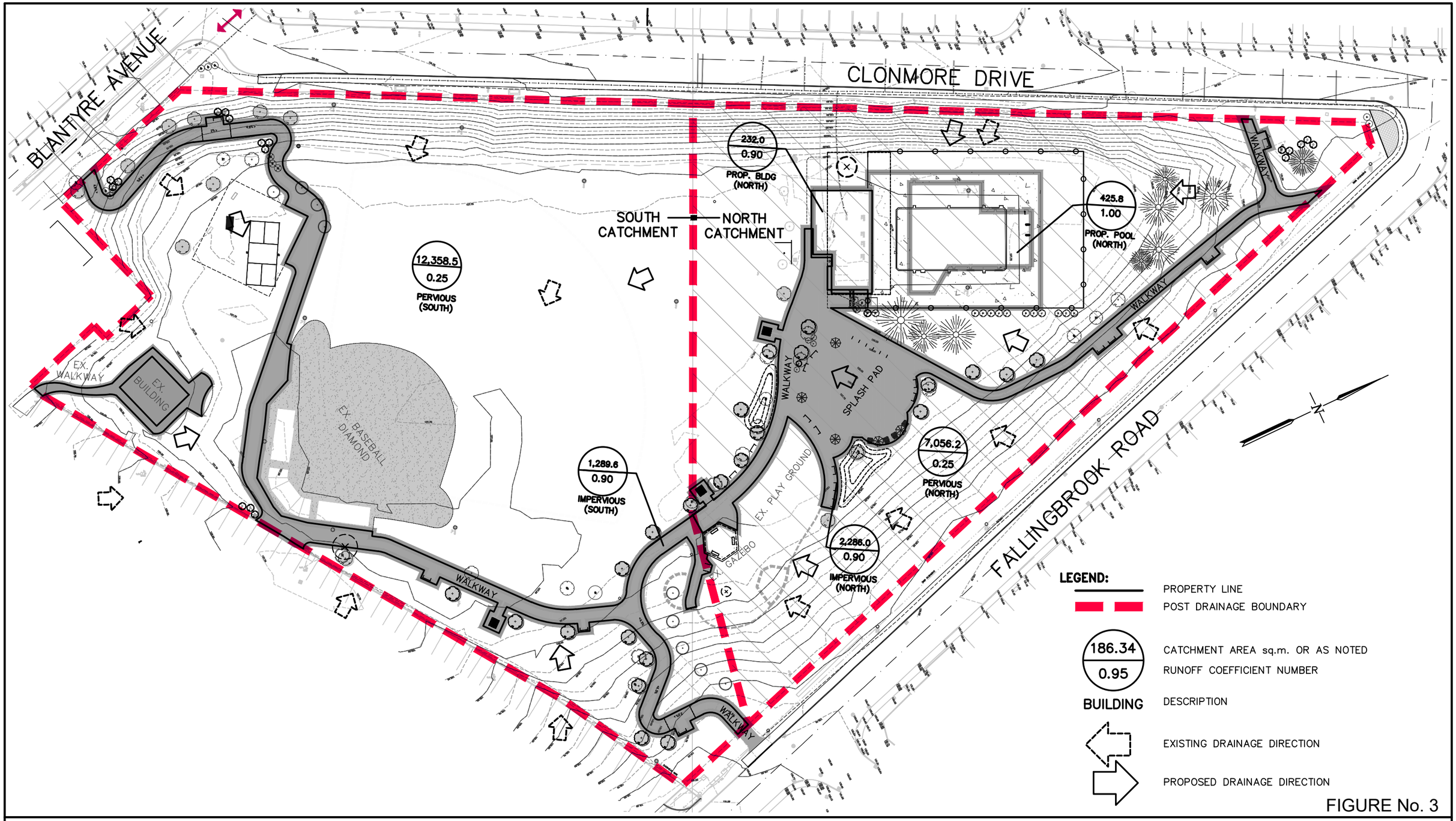
PRE DEVELOPMENT DRAINAGE AREA PLAN

SCALE 1:750



LEGEND:

- PROPERTY LINE
- POST DRAINAGE BOUNDARY
- 186.34 / 0.95 — CATCHMENT AREA sq.m. OR AS NOTED; RUNOFF COEFFICIENT NUMBER
- BUILDING — DESCRIPTION
- EXISTING DRAINAGE DIRECTION
- PROPOSED DRAINAGE DIRECTION

FIGURE No. 3

BLANTYRE PARK OUT DOOR POOL RENOVATIONS

180 FALLINGBROOK RD.
CITY OF TORONTO, ONTARIO

15955 AIRPORT ROAD, SUITE 304
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rban Watershed Group Ltd.
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POST DEVELOPMENT DRAINAGE AREA PLAN

SCALE 1:750

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North Catchment Drainage Areas (Figure No. 3)

Land Use	AREA (m2)	C	Ac
Pervious (Open Space)	7,056.2	0.25	1,764.1
Proposed Building	232.0	0.90	208.8
Proposed Pool	425.8	1.00	425.8
Impervious (Walkways)	2,286.0	0.90	2,057.4
Total Area	**10,000.0**	**0.446**	**4,456.1**

South Catchment Drainage Areas (Figure No. 3)

Land Use	AREA (m2)	C	Ac
Pervious (Open Space)	12,358.5	0.25	3,089.6
Existing Building (To Remain)	105.9	0.90	95.3
Impervious (Walkways)	1,283.6	0.90	1,155.2
Total Area	**13,748.0**	**0.316**	**4,340.2**

2.2 Allowable Release Rates

Storm Sewer Discharge

Discharge from the north catchment area to the existing municipal 1050 diameter storm sewer is subject to the City of Toronto Wet Weather Flow Management Guidelines (WWFMGs). As the proposed development consists of a major infill type development the rational method shall be used to determine the 2-year, C= 0.287, existing release rate for storm drainage in accordance with City of Toronto standards under the WWFMGs.

Allowable Release Rate

$I_{2\ YR,\ TORONTO} = A / (T_c / 60)^B$
$= 21.8 / (21.1 / 60)^{0.78}$
$= 49.3$ mm/hr

$Q_{ALLOWABLE,\ STORM} = CIA / 3600$
$= 0.293 \times 49.3$ mm/hr $\times 10{,}000$ m^2 / 3600
$= 40.1$ L/s

Combined Sewer Discharge

To verify the site will not result in an increase in flows to the combined sewer, and that the development will result in an improvement to the existing condition the sites existing 100-year existing peak flow rate to the combined sewer system has also been calculated.

Existing Release Rate

$I_{100\ YR,\ TORONTO} = A / (T_c / 60)^B$
$= 59.7 / (21.1 / 60)^{0.80}$
$= 137.7$ mm/hr

$Q_{EXISTING,\ COMBINED} = CIA / 3600$
$= 0.293 \times 137.7$ mm/hr $\times 23{,}748$ m^2 / 3600
$= 266.1$ L/s

2.3 Uncontrolled Drainage

Due to several constraints imposed by the existing site conditions control of drainage from the south catchment is not feasible, and the area shall remain discharging as per the existing conditions. Limiting factors include the requirement to not impede the existing overland flow route as well as installation and operation/maintenance costs associated with underground storage systems and excessive capital cost to separate the existing drainage system.

A total area of 1,283.6 sq.m of new walkways are proposed in the south catchment and will result in an increased volume of runoff being generated from the surface. However, the creation of the north catchment and diversion into the storm sewer system will more than compensate for the increase in runoff volume.

The proposed release rate from the south catchment in the post-development condition has been calculated to verify the total release rate from the overall site will be an improvement to the existing condition.

$$Q_{PROPOSED,\ COMBINED} = CIA / 3600$$
$$= 0.316 \times 137.7\ mm/hr \times 13{,}748\ m^2 / 3600$$
$$= 166.2\ L/s$$

The existing and proposed release rate from the overall site area has been summarized in the table below:

[1] 100-yr Ex. Release Rate (To Combined Sewer)	266.1 L/s
[A] WWFMG Allowable Release Rate (To Storm Sewer)	40.1 L/s
[B] Uncontrolled Release Rate (To Combined Sewer)	166.2 L/s
[2 = A + B] Total Release Rate from Site	206.3 L/s
[1 – 2] Total Reduction in Release Rate from Site	59.8 L/s

Therefore, proposed development represents a 59.8 L/s (206.3 L/s proposed – 266.1 L/s existing) decrease in release rate to the municipal sewer systems during the 100-year event.

2.4 SWM Detention Volumes

Stormwater detention is to be provided in the form of depression and super pipe storage for stormwater runoff rates more than the allowable release rate to the storm sewer system. The Modified Rational Method approach was used to establish the 100-year post-development flows and associated storage volumes. The maximum anticipated storage requirements were developed from the figures in **Appendix B** and are based upon the controlled release rate of 40.1 L/s for the north catchment area. A decreased time of concentration of 11.3 minutes has also been considered due to the higher flow velocity of runoff conveyed though the proposed storm sewer. **Figures No. 4 & 5** present the required storage considering the City of Toronto criteria.

100-year Post Detention Volume Required = 183.4 cu.m

Provisions on site shall be made to ensure the required 183.4 cu.m are available as surface and sub-surface storage. Detention storage shall be provided within a superpipe system sub-surface, and as depression storage in the north catchment.

2.5 Surface Storage Volumes

Two areas within the north catchment shall be regraded to accommodate proposed catchbasins. Orifice devices on the catchbasin outlets shall be used to create surface storage on the open space grassed area above the catchbasin tops. The available volume and ponding depth during a 100-year storm are as follows.

	CB1	CB2
Detention Volume	27 cu.m	63 cu.m
Maximum Ponding Depth	0.30m	0.30m
100-yr Elevation	128.00masl	127.63masl

CB1 is located at the north end of the site above the proposed pool, and will serve as the higher storage area. CB2 is located just south of the changeroom building and will serve as the lower storage area. Regrading around CB2 should be carried out to incorporate an overland spill from the lower storage area to ensure ponding water does not flood the building (which shall be at a minimum FFE of 127.78masl, or 150mm above the 100-year ponding elevation).

Underground storage shall also be provided within a super-pipe structure with a proposed 1067mm inside diameter. The 97 linear meter length of pipe has a calculated storage volume of 86.7 cu.m (πx1.063^2/4 x 97.6m). Additionally, MH3 and MH4 will provide a minimum depth of 2.61m of storage, equal to 6.6 cu.m (πx1.800^2/4 x 2.61m) each.

The total provided detention storage volume has been summarized below:

Surface Storage (CB1)	27 cu.m
Surface Storage (CB2)	63 cu.m
Super-Pipe Storage (1050 dia. STM)	86.7 cu.m
MH3 & MH4 Storage (1800 dia.)	13.2 cu.m
Total Detention Storage Provided	**189.9 cu.m**
Total Detention Storage Required	183.4 cu.m
	(6.5 cu.m Surplus)

2.6 Orifice Sizing

Orifice plates are to be installed on the catchbasin outlet for CB1, as well as downstream of the 1050mm diameter super-pipe to control flows from the site to the desired release rate.

For CB1 a minimum sized 75mm diameter orifice plate is proposed and will achieve the release rate calculated below:

Proposed Orifice Diameter = 75mm

Ponding elevation (m)	=	128.00
Downstream water level (m)	=	127.63
H (head)	=	0.37 m

Area Orifice $= \pi d^2/4 = 3.14 \times 0.075^2/4$ = 0.0044 sq.m

Q Orifice $= cA\sqrt{2g(\Delta h)}$ $= 0.64 \times 0.0044 \sqrt{(2 \times 9.81 \times 0.37)}$ = 7.6 L/s

The higher storage area created by the orifice in CB1 will discharge into the proposed super-pipe storm sewer system and will be further controlled by the lower tier orifice tube. Should the depression storage above CB1 exceed its capacity, flow will spill overland towards the south and be collected within the lower storage area.

For the super pipe a 104mm diameter orifice plate is proposed downstream and will achieve the overall release rate from the north catchment area as calculated below:

Proposed Orifice Diameter = 104 mm

Ponding elevation (m)	=	127.63
Orifice springline (m)	=	126.85
H (head)	=	2.79 m

Area Orifice $= \pi d^2/4 = 3.14 \times 0.104^2/4$ = 0.0084 sq.m

Q Orifice $= cA\sqrt{2g(\Delta h)}$ $= 0.64 \times 0.0084 \sqrt{(2 \times 9.81 \times 2.79)}$ = 40.1 L/s

Therefore, the proposed orifice plate on the super-pipe outlet shall control flows to a rate no greater than 40.1 L/s, to match the allowable of as calculated in **Section 2.2**. Orifice plates shall be installed per City of Toronto Standard T-706.010.

2.7 Water Quality Control

Runoff generated from impervious surfaces shall be indirectly discharged to the storm sewer system via overland flow across vegetated open space areas. The surfaces shall act as a buffer strip and serve to filter any sediment or debris from the stormwater runoff.

Regular care and maintenance of the vegetated buffer strips and receiving catchbasin should be carried out to remove accumulated sediment and debris. Semi-annual inspections and cleaning are recommended to maintain the performance of these systems.

2.8 Roof Drainage

The design of the proposed building does not include control-flo roof drains and the area will be considered as a free draining impervious surface. Roof drainage shall be conveyed to a soak-away pit via underground roof water leaders connected to the building downspouts.

2.9 Water Balance

Under the City of Toronto Wet Weather Flow Management Guidelines (WWFMG) stormwater must be retained on-site, to the extent practicable, to achieve the same level of annual volume of overland runoff under pre-development conditions.

The proposed development includes a total impervious area of 3,907.5 sq.m (3,569.6 sq.m impervious ground surface + 232 sq.m prop. building + 105.9 sq.m ex. building) compared to the existing impervious area of 1,238.8 sq.m (1,052.3 sq.m impervious ground surface + 186.3 sq.m ex. building). To mitigate the 2,668.7 sq.m (3,907.5 sq.m proposed – 1,238.8 sq.m existing) increase in imperviousness a retained runoff volume of 13.3 cu.m (2,668.7 sq.m x 0.005m) is required.

Low impact development (LID) features are proposed to achieve the sites runoff volume reduction requirement. Initial abstraction from the impervious surfaces has been considered as 1mm to account for evaporation. Runoff from the proposed change room building roof and splash pas will be directed towards separate infiltration trenches located south of the change room and south of the splash pad, respectively, to be retained via subsurface infiltration. Additionally, bio-swale type features will provide further retention storage along the perimeter of walkways in areas which will intercept drainage. Considering a 5mm rainfall event (equal to approximately 50% of annual rainfall), the proposed water balance retention volumes have been summarized in the table below.

	Impervious Surface Area	Runoff Abstraction	Retained Volume
Evaporation from Impervious Walkways and Buildings	3,907.5 sq.m	1.0mm	3.9 cu.m
Roof Infiltration Trench	232.0 sq.m	5.0 mm	1.2 cu.m
Splash Pad Infiltration Trench	593.5 sq.m	5.0mm	3.0 cu.m
Walkway Bio-swales	1,040 sq.m	5.0 mm	5.2 cu.m
Total Runoff Mitigated			**13.3 cu.m**

2.10 Infiltration Trench Design

Soil investigations completed by AllRock Consulting Ltd. in November 2023 (**Appendix C**), revealed a soils type of sand near the interface with the proposed infiltration feature (MW23-5 at depth of 1.37m to 4.42m).

The Supplementary standards of the Ontario Building code provide an approximate relationship of soils types to permeability and percolation time, which has been used to estimate an infiltration rate ranging between 300 to 50 mm/hr. A design infiltration rate of 14.3 mm/hr will be assumed considering the minimum percolation time and a safety factor of 3.5 in accordance with common practices for Low Impact Design (LID) measures.

Detailed infiltration trench design calculations, following Section 4.5.8 of the MOE Stormwater Planning and Design Manual (2003), have been completed below:

P = infiltration rate (mm/hr), t = draw down time (hrs), V = Retention volume (m^3) n = void ratio

Equation 4.2 depth = Pt
= 14.3 mm/hr x 48 hr
= 686.4 mm

Roof Infiltration Trench
Equation 4.3 Area = 1000V / (Pnt),
= 1000 x 1.2 / (14.3 x 0.40 x 48)
= 4.4 sq.m

Splash Pad Infiltration Trench
Equation 4.3 Area = 1000V / (Pnt),
= 1000 x 3.0 / (14.3 x 0.40 x 48)
= 10.9 sq.m

Therefore, for the roof area an infiltration trench with an area of 5 sq.m (5m x 1m) and 0.6m depth will provide the necessary storage volume and allow the retained rainwater to infiltrate within 48 hours. For the splash pad area an infiltration trench with an area of 12.4 sq.m (6.2m x 2m) and 0.6m depth will provide the necessary storage volume and allow the retained rainwater to infiltrate within 48 hours.

2.11 Bioswale Design

Four (4) separate bioswale cells are proposed to maximize the capture area of the clear stone reservoirs. Each bioswale cell shall be 400mm deep and 0.8m wide, with varying lengths based on available space.

Design calculations to verify the performance of the bioswale feature have been carried out following the same methodology as the infiltration trench and are summarized below.

	Dimensions (LxWxD)	Retention Volume (m^3)	Draw Down Time (hrs)	Footprint (m^2)
Bioswale #1	82mx0.8mx0.4m	10.5 cu.m	28.0 hrs	65.6 sq.m
Bioswale #2	28mx0.8mx0.4m	3.6 cu.m	28.0 hrs	22.4 sq.m
Bioswale #3	15mx0.8mx0.4m	2.9 cu.m	28.0 hrs	18.0 sq.m
Bioswale #4	41mx0.8mx0.4m	5.2 cu.m	28.0 hrs	32.8 sq.m
	Total	**22.2 cu.m**	**(5.2 cum required)**	

2.12 SWM Summary

Criteria	Value
Calculated Allowable Release Rate	40.1 L/s
Actual Release Rate	40.1 L/s
Required Storage	183.4 cu.m
Provided Storage	189.9 cu.m
Roof Release Rate	N/A
Roof Storage Provided	N/A
Orifice Tube Size	104mm
Water Balance Required	13.3 cu.m
Water Balance Provided	>13.3 cu.m
OGS Unit Size	N/A

3.0 TORONTO GREEN STANDARD

The following describes how the site design complies with the Toronto Green Standard checklist.

WQ 1.1 Erosion & Sediment Control – The site shall have silt fence installed around the perimeter of the property where there is a risk of sediment runoff. Proposed and existing catch basins shall be protected with double wrapped filter cloth. A Mud-mat is to be installed at the construction entrance.

WQ 2.1 Stormwater Balance – Site will be controlled to the 2-year pre-development release rate via an orifice plates installed in the proposed storm sewer. Surface and super-pipe storage has been provided for runoff detention during all storms up to and including a 100-year rainfall event.

WQ 2.2 Stormwater Retention – An infiltration trench is provided to service the proposed changeroom building. Proposed impervious walkways will not be directly connected to the storm sewer system and treated by bioswales to promote additional infiltration.

WQ 3.1 Total Suspended Solids (TSS) – TSS removal shall occur from filtration as runoff is transported across vegetated buffer strips prior to being collected within the existing storm sewer system.

WQ 3.2 E. Coli Reduction - This criterion (Section 2.2.2.3, WWFM Guidelines) does not apply to this site since it does not discharge directly to the Lake Ontario waterfront.

EXECUTIVE SUMMARY

The proposed Stormwater Management Plan demonstrates that the development will meet the established criteria with respect to stormwater management set forth in governing documents. It is recommended the following site works be completed to accompany the required site servicing necessary as part of development for the site:

- Installation of new local storm sewer system to accommodate water quantity and peak flow control, connected to the existing municipal storm sewer crossing through the site, and diverting flow away from the combined sewer system;
- Creation and maintenance of surface detention storage areas to facilitate ponding of 90 cu.m of stormwater runoff above proposed catchbasins during a 100-year storm event. A maximum ponding depth of 0.30m will be provided;
- Construction of a new 1050mm diameter super-pipe storage system to provide an additional detention storage volume of 86.7 cu.m +13.2 cu.m within the associate 1800mm diameter structures;
- A 75mm and 104mm orifice shall be installed on CB1 and downstream of the super-pipe storage system respectively. Orifice plates shall be installed per City of Toronto Standard T-706.010;
- Establish a Finished Floor Elevation of no less than 127.78 for the proposed changeroom building;
- Implement grading of proposed impervious ground surfaces to cross existing open space vegetated areas for stormwater quality treatment and to promote infiltration for water balance purposes;
- Installation of 1.2 cu.m and 3.0 cu.m infiltration facility to address water balance criteria from the proposed changeroom building and splash pads respectively;
- Installation of four (4) bioswale cells with minimum void retention volume of 22.2 cu.m to address water balance criteria from the proposed walkways; and,
- Installation of a flow diverter for the proposed splash pad to ensure the system is not contributing additional flows to the combined sewer system during wet-weather conditions.

In conclusion, the proposed stormwater management and servicing plan supports the concept of an environmentally sustainable development. The proposed plan will mitigate anticipated stormwater impacts associated with the construction of the proposed development and aims to mimic the pre-development hydrological characteristics of the site.

Please do not hesitate to contact us with any questions pertaining to the enclosed.

Yours truly,

Urban Watershed Group Ltd.

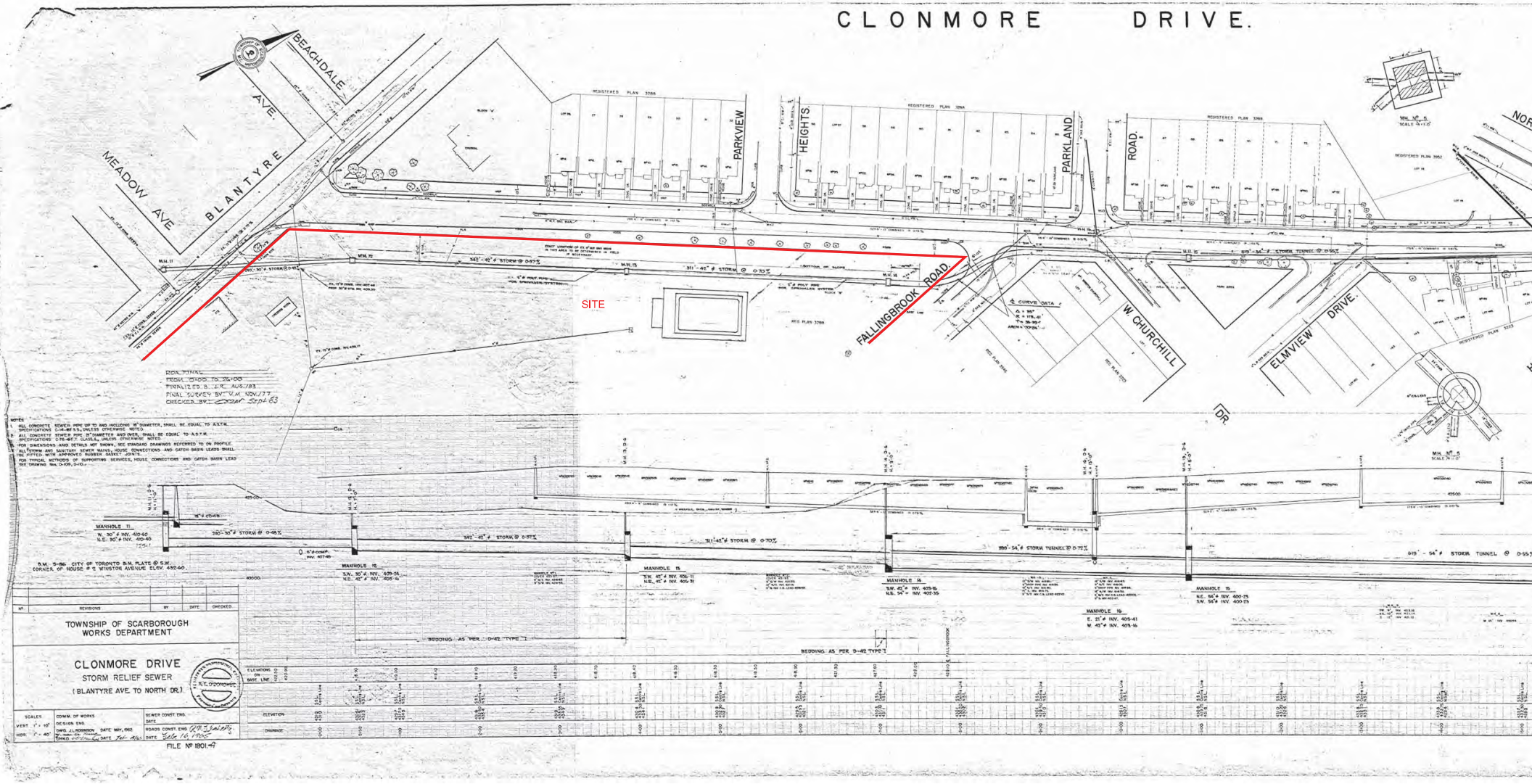
Prepare by:

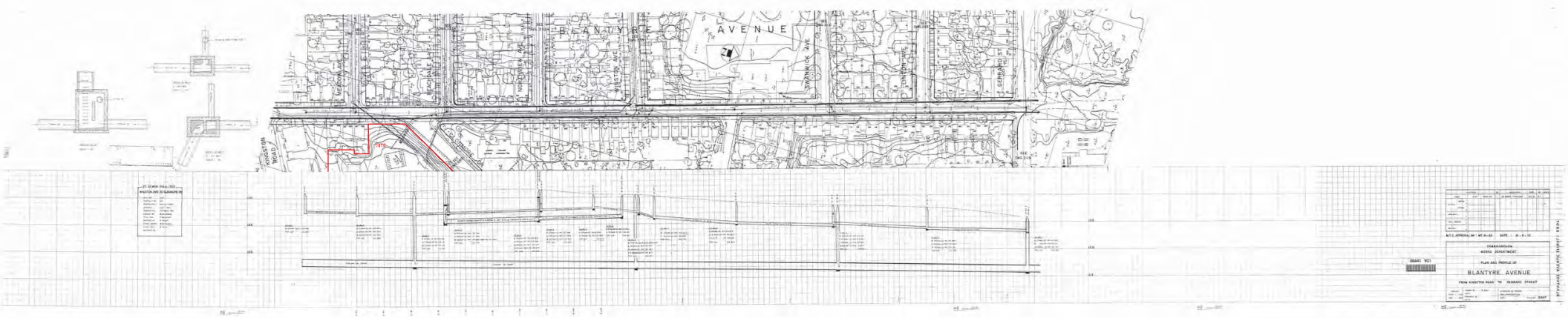
Adam McEwen, P.Eng.

(905) 584-1458 ext. 233

Appendix A

City of Toronto Record Drawings


CLONMORE DRIVE.
BEACHDALE AVE.
MEADOW AVE
BLANTYRE
PARKVIEW
HEIGHTS
PARKLAND
ROAD.
FALLINGBROOK ROAD.
W. CHURCHILL
ELMVIEW DRIVE.
SITE
MANHOLE 11
MANHOLE 12
MANHOLE 13
MANHOLE 14
MANHOLE 15
MANHOLE 16
TOWNSHIP OF SCARBOROUGH
WORKS DEPARTMENT
CLONMORE DRIVE
STORM RELIEF SEWER
(BLANTYRE AVE. TO NORTH DR.)
FILE Nº 1801-4



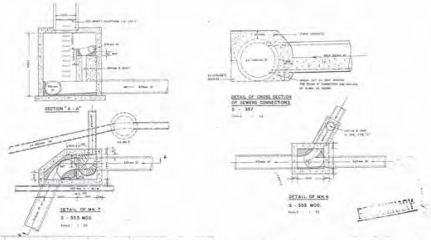
TORONTO
WORKS DEPARTMENT

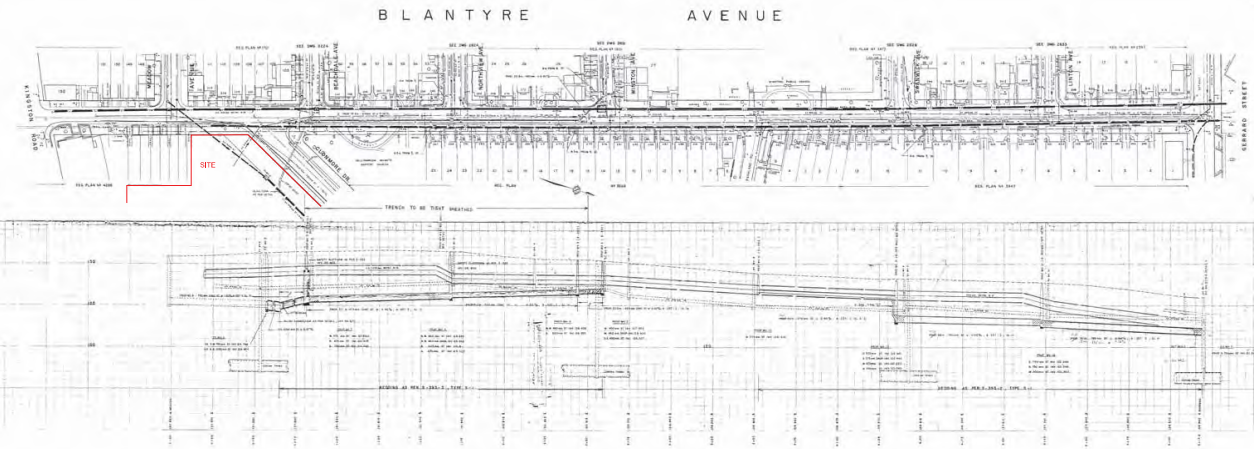
PLAN AND PROFILE OF

BLANTYRE AVENUE

FROM KINGSTON ROAD TO GERRARD STREET

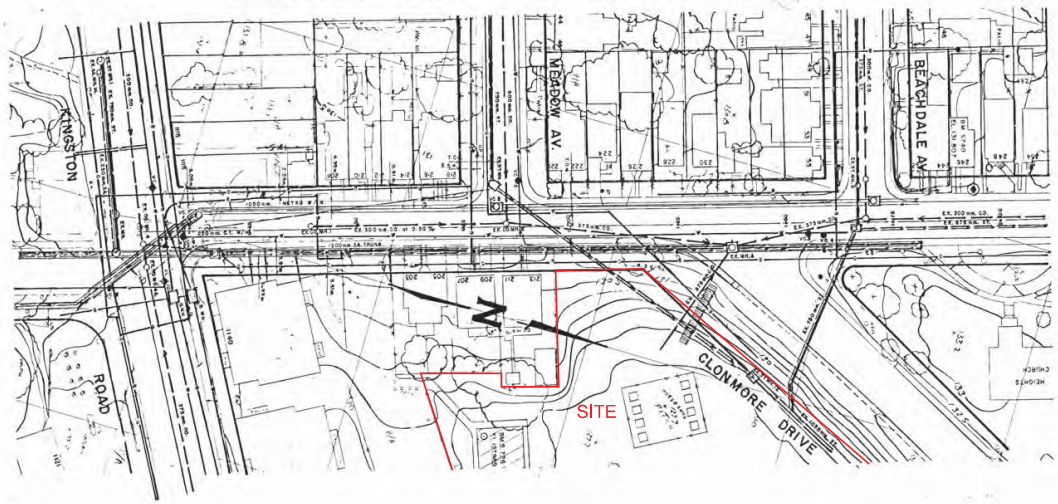
DWG 1980

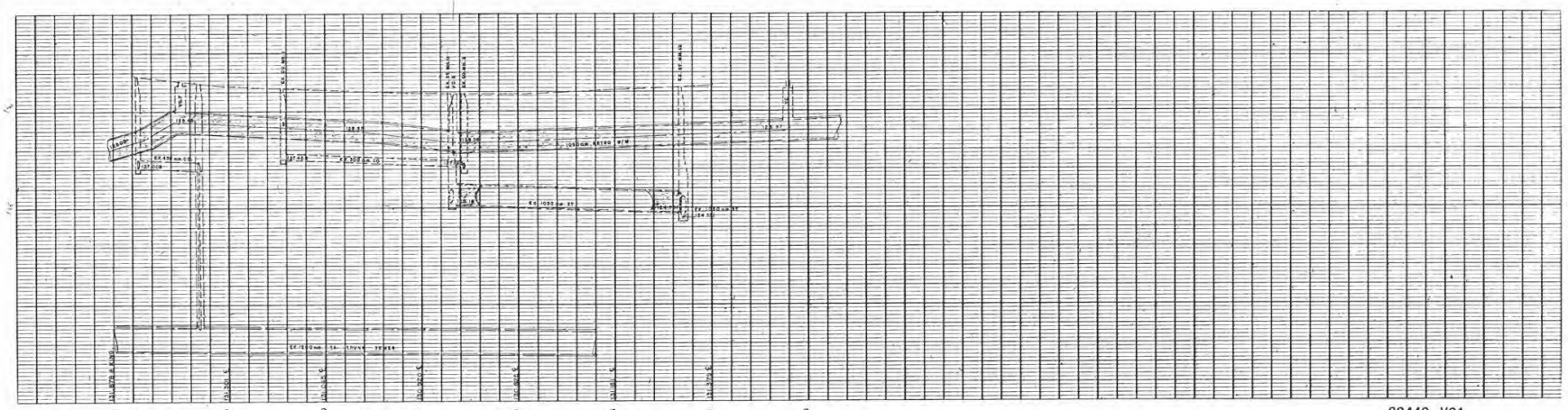



BLANTYRE AVENUE
KING HIGHWAY
GERRARD STREET
SITE
TRENCH TO BE TIGHT SHEATHED


SCARBOROUGH
WORKS DEPARTMENT
DESIGN
PLAN AND PROFILE
PROPOSED STORM RELIEF SEWERS
ON
BLANTYRE AVENUE
FROM GERRARD STREET TO GLENGARRY DRIVE

BLANTYRE AVENUE





08440 V01

UTILITIES				AS CONSTRUCTED
NAME		DATE SENT	DATE RECEIVED	FILE No.
S.P.U.C. HYDRO	1	90-05-24	90-06-11	CONTRACT No.
	2			CONTRACTOR
WATER	1	90-06-06	90-06-26	STARTED
	2			COMPLETED
CONS. GAS	1	90.05-24	90-06-15	LAYOUT BY
	2			PROJ. ENG.
BELL CANADA	1	90-05-24	90-06-13	INSPECTOR
	2			FINAL SURVEY BY
METRO	1	90-06-24	90-06-11	FINALIZED BY
	2			DATE
CABLE TV	1	90-05-24	90-06-04	CHECKED BY
	2			DATE
	1			
	2			

REF. DWG. | TITLE | No. | DATE | REVISIONS | BY | SEAL

CITY OF SCARBOROUGH
WORKS DEPARTMENT

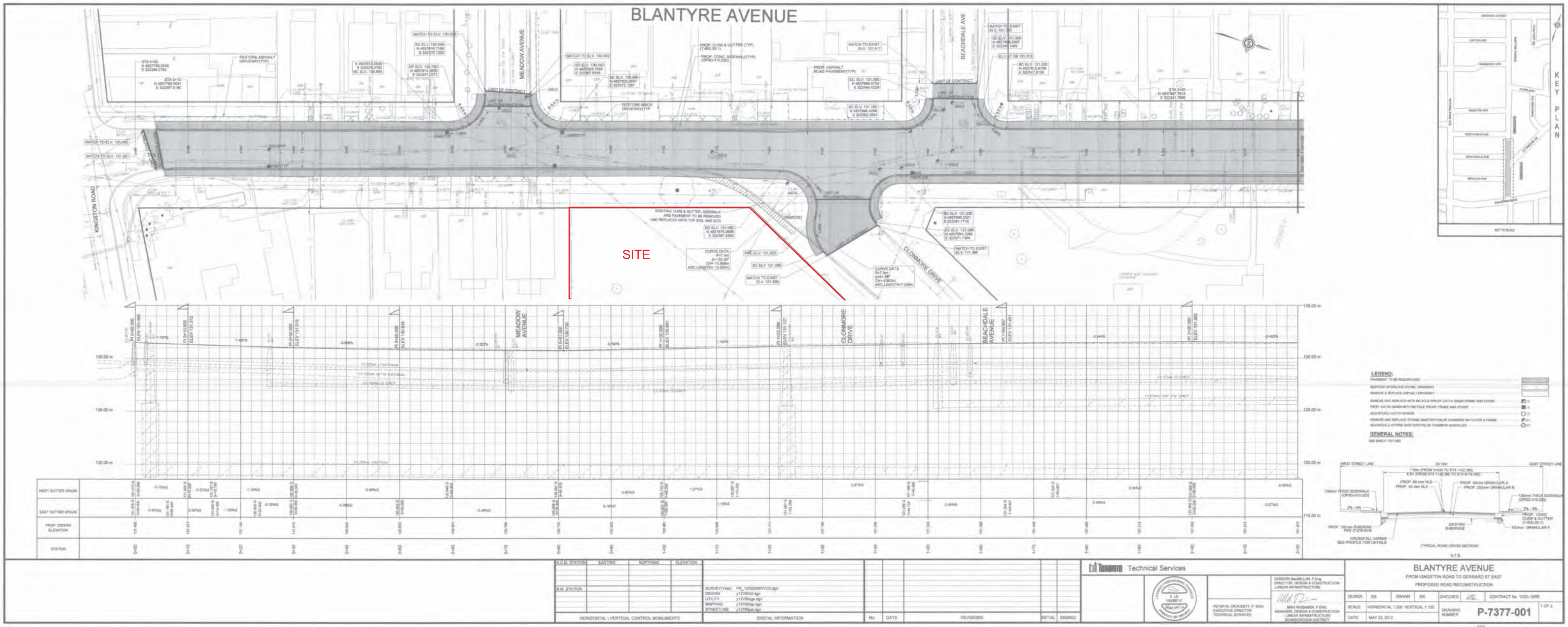
DIRECTOR OF DESIGN AND CONSTRUCTION

PLAN AND PROFILE
OF
BLANTYRE AVENUE
FROM KINGSTON ROAD TO CLONMORE DRIVE

DESIGN	B.TRAN	DRAWN	B.TRAN	CHECK	
SCALES	HOR. 1:500, VERT. 1:100			DRAWING NUMBER	2807-D
DATE					

Zoom: 70-131-733to

001



BLANTYRE AVENUE
MEADOW AVENUE
BEACHDALE AVE
KINGSTON ROAD
CLONMORE DRIVE
SITE
KEY PLAN
LEGEND:
GENERAL NOTES:
(TYPICAL ROAD CROSS SECTION)
N.T.S.
Toronto Technical Services
PETER M. CROCKETT, P. ENG. EXECUTIVE DIRECTOR TECHNICAL SERVICES
GORDON MacMILLAN, P.Eng. DIRECTOR, DESIGN & CONSTRUCTION -LINEAR INFRASTRUCTURE
MIKA RAISANEN, P.ENG. MANAGER, DESIGN & CONSTRUCTION - LINEAR INFRASTRUCTURE SCARBOROUGH DISTRICT
BLANTYRE AVENUE
FROM KINGSTON ROAD TO GERRARD ST EAST
PROPOSED ROAD RECONSTRUCTION
DESIGN GK
DRAWN GK
CONTRACT No. 12SC-10RD
SCALE HORIZONTAL 1:200 VERTICAL 1:100
DATE MAY 22, 2012
DRAWING NUMBER P-7377-001
1 OF 3
HORIZONTAL / VERTICAL CONTROL MONUMENTS
DIGITAL INFORMATION
No. DATE REVISIONS INITIAL SIGNED

Appendix B

Figures No. 4 & 5 - Modified Rational Method Calculations

STORMWATER MANAGEMENT ANALYSIS - FIGURE No. 4

JOB NUMBER:	23011
CLIENT:	Toronto Parks, Forestry & Recreation
LOCATION:	180 Fallingbrook Road
IDF STATION:	City of Toronto

SITE INFORMATION

Number of Subcatchment Areas: 2

This Analysis is for Subcatchment Area **North**

	AREA (m2)	RUNOFF COEFFICIENT
Proposed Pool Area	425.8	1.00
Building Area	232.0	0.90
Impervious Area	2,286.0	0.90
Pervious Area	7,056.2	0.25
Controlled Ground Surface Area	10,000.0	0.45

Allowable Release from Surface Areas (L/s):	40.10
Time of Concentration (tc) =	11.3 min

DETERMINATION OF NECESSARY STORAGE VOLUME - FIGURE No. 5

This Analysis is for Subcatchment Area North

Modified Rational Method used to determine storage volume:

Q=CiA/360, i= A / (tc/60)^B for: A = 59.7, B = 0.8

TIME	i	INFLOW	ACCUMULATED RUNOFF	ALLOWABLE	REQ'D
		(m3/sec)	VOLUME (m3)	RELEASE VOL. (m3)	STORAGE (m3)
(t)		(Q=CiA/360)	(Vacc = Q x tc)	(Vrel = Q100yr x (t + tc)/2	(Vreq'd = Vacc - Vrel)
(MIN.)	(mm/hr)	SURFACE	SURFACE	SURFACE	SURFACE
1	1579.4	1.955	117.3	14.8	102.5
5	435.8	0.539	161.8	19.6	142.2
10	250.3	0.310	185.9	25.6	160.3
15	181.0	0.224	201.6	31.6	170.0
20	143.8	0.178	213.6	37.7	175.9
30	103.9	0.129	231.6	49.7	181.9
45	75.1	0.093	251.2	67.7	183.4
60	59.7	0.074	266.0	85.8	180.3
120	34.3	0.042	305.6	158.0	147.6
240	19.7	0.024	351.0	302.3	48.7
360	14.2	0.018	380.7	446.7	0.0
720	8.2	0.010	437.3	879.8	0.0
1440	4.7	0.006	502.3	1745.9	0.0

Appendix C

Soils Test Data (by AllRock)

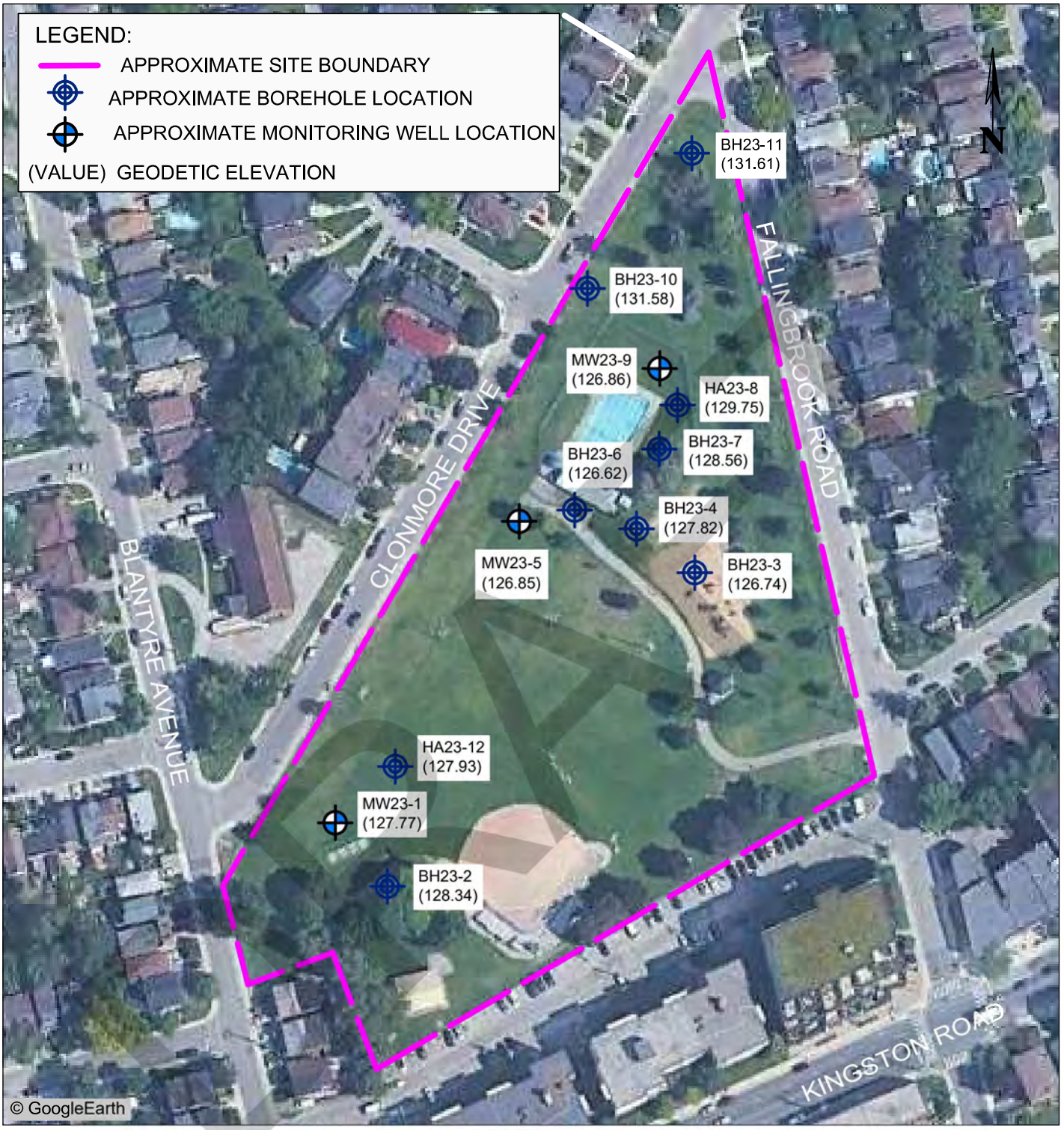


FIGURE TITLE:	BOREHOLE LOCATION PLAN
PROJECT:	GEOTECHNICAL INVESTIGATION
CLIENT:	CHERIE NG ARCHITECT
ADDRESS:	BLANTYRE PARK, TORONTO, ON
PROJECT NO:	23301
APPROXIMATE SCALE:	NTS

AllRock Consulting Ltd

DATE: DEC. 2023	FIGURE NO.: 2
DRAWN BY: ES	CHECKED BY: GD

WELL NUMBER MW23-5

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 126.849 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 1	75	3-5-6-6 (11)		0.08 Brown silty sand/sandy silt, contains organic material (TOPSOIL) 126.77 Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	Flushmount Protective Casing Backfilled with auger cuttings
	SS 2	75	7-7-7-7 (14)		1.37 125.48	50mm diameter PVC riser Bentonite Seal Filter Sand
2	SS 3	83	5-7-9-16 (16)		Brown fine to coarse grained SAND, trace silt and gravel -Dry	
	SS 4	83	9-14-25-25 (39)			
	SS 5	100	11-20-32-47 (52)			50mm diameter PVC screen
4	SS 6	100	6-15-21-24 (36)		4.42 122.43 End of Borehole Bottom of hole at 4.42 m.	

4.2 Topsoil

A surficial layer of topsoil material was encountered in all boreholes. The topsoil can be described as brown silty sand/sandy silt and contains organic material. The thickness of this layer was about 80 to 100 millimteres.

4.3 Fill Material

A layer of fill material was encountered in all boreholes below the surficial topsoil. The fill material can generally be described as brown, fine to coarse grained sand with trace to some gravel and silt. The fill layer extends to depths ranging from about 0.5 to 3.05 metres below existing grade.

HA23-12 was terminated within the fill material at a depth of about 1.5 metres below existing grade.

4.4 Sand

Native deposits of brown, fine to coarse grained sand, with trace silt, clay and gravel were encountered below the fill material at all borehole locations excluding HA23-8. The sand extends to depths of about 4.4 metres below existing grade in all boreholes excluding HA23-2, HA23-8, and HA23-12.

HA23-2 was terminated within the sand material at a depth of about 1.52 metres below existing grade.

Standard penetration tests carried out in the sand material gave N values of 3 to greater than 50 blows per 0.3 metres of penetration, which reflects very loose to very dense relative density.

4.5 Gravelly Sand

Native deposits of brown gravelly sand, with some silt were encountered in augerhole HA23-8 at a depth of about 0.9 metres below existing grade. This hand augerholes was terminated within the gravelly sand at a depth of about 1.5 metres below existing grade.

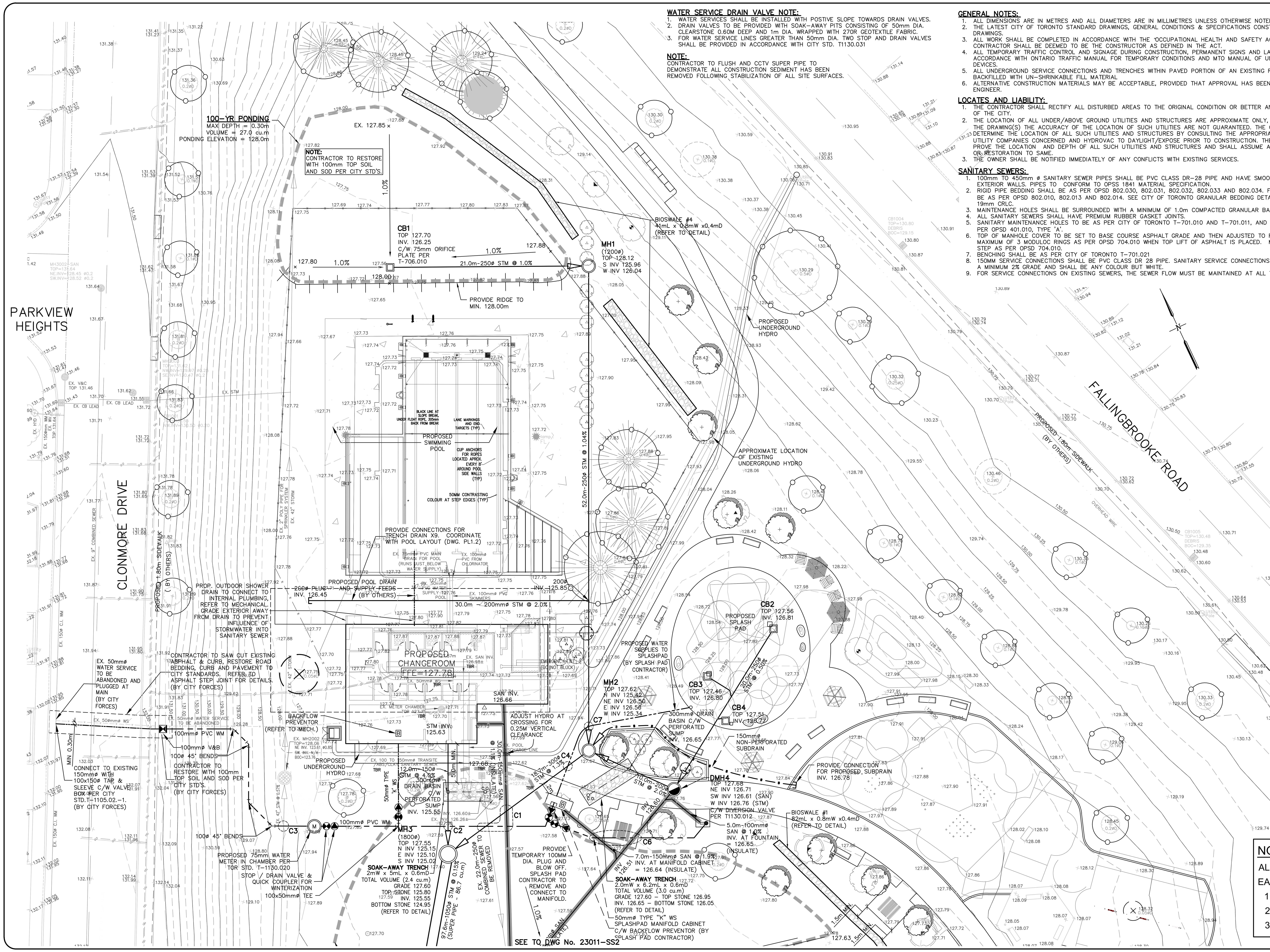
4.6 Groundwater Level

On December 8th, 2023, the groundwater levels were observed in the well screens installed in boreholes MW23-1, MW23-5, and MW23-9. It is noted that all wells were determined to be dry.

It should be noted that the groundwater levels may be higher during wet periods of the year such as the early spring or following periods of precipitation.

Appendix D

Site Servicing and Grading Drawings



SEE TO DWG No. 23011-SS2

WATER SERVICE DRAIN VALVE NOTE:

1. WATER SERVICES SHALL BE INSTALLED WITH POSTIVE SLOPE TOWARDS DRAIN VALVES.
2. DRAIN VALVES TO BE PROVIDED WITH SOAK-AWAY PITS CONSISTING OF 50mm DIA. CLEARSTONE 0.60M DEEP AND 1m DIA. WRAPPED WITH 270R GEOTEXTILE FABRIC.
3. FOR WATER SERVICE LINES GREATER THAN 50mm DIA. TWO STOP AND DRAIN VALVES SHALL BE PROVIDED IN ACCORDANCE WITH CITY STD. T1130.031

NOTE:

CONTRACTOR TO FLUSH AND CCTV SUPER PIPE TO DEMONSTRATE ALL CONSTRUCTION SEDIMENT HAS BEEN REMOVED FOLLOWING STABILIZATION OF ALL SITE SURFACES.

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METRES AND ALL DIAMETERS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. THE LATEST CITY OF TORONTO STANDARD DRAWINGS, GENERAL CONDITIONS & SPECIFICATIONS CONSTITUTE PART OF THE DRAWINGS.
3. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT". THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONSTRUCTOR AS DEFINED IN THE ACT.
4. ALL TEMPORARY TRAFFIC CONTROL AND SIGNAGE DURING CONSTRUCTION, PERMANENT SIGNS AND LANE MARKINGS SHALL BE IN ACCORDANCE WITH ONTARIO TRAFFIC MANUAL FOR TEMPORARY CONDITIONS AND MTO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
5. ALL UNDERGROUND SERVICE CONNECTIONS AND TRENCHES WITHIN PAVED PORTION OF AN EXISTING ROAD ARE TO BE BACKFILLED WITH UN-SHRINKABLE FILL MATERIAL
6. ALTERNATIVE CONSTRUCTION MATERIALS MAY BE ACCEPTABLE, PROVIDED THAT APPROVAL HAS BEEN OBTAINED FROM CITY ENGINEER.

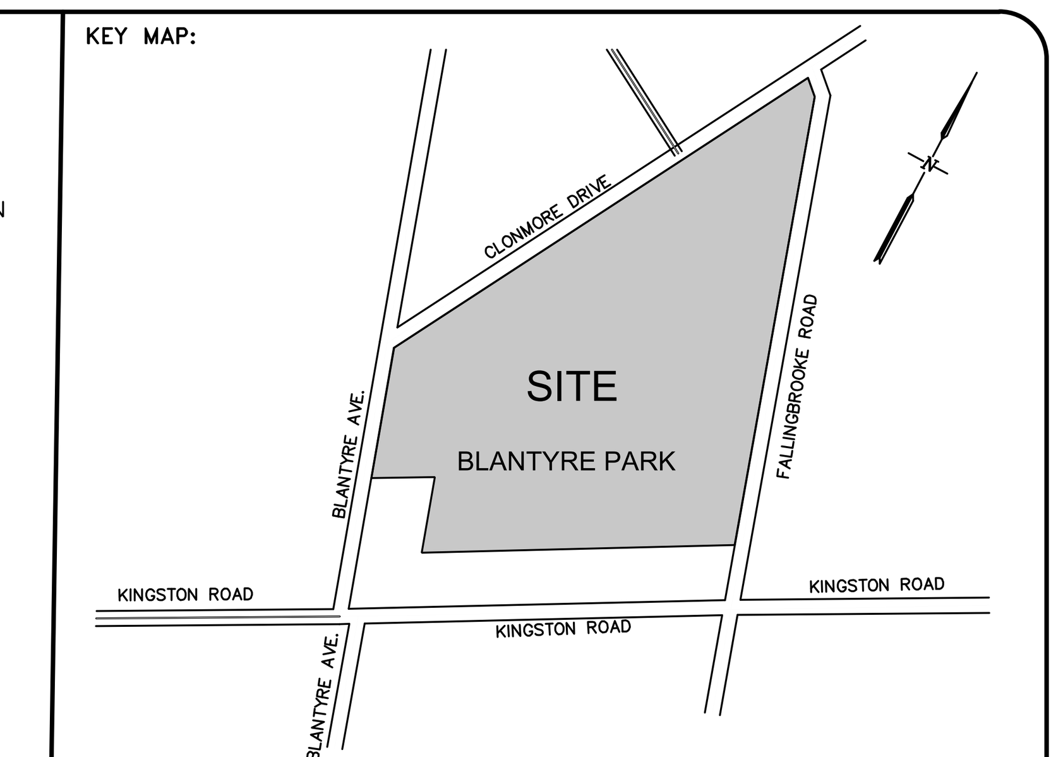
LOCATES AND LIABILITY:

1. THE CONTRACTOR SHALL RECTIFY ALL DISTURBED AREAS TO THE ORIGINAL CONDITION OR BETTER AND TO THE SATISFACTION OF THE CITY.
2. THE LOCATION OF ALL UNDER/ABOVE GROUND UTILITIES AND STRUCTURES ARE APPROXIMATE ONLY, AND WHERE SHOWN ON THE DRAWING(S) THE ACCURACY OF THE LOCATION OF SUCH UTILITIES ARE NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE THE LOCATION OF ALL SUCH UTILITIES AND STRUCTURES BY CONSULTING THE APPROPRIATE AUTHORITIES OR UTILITY COMPANIES CONCERNED AND HYDROVAC TO DAYLIGHT/EXPOSE PRIOR TO CONSTRUCTION. THE CONTRACTORS SHALL PROVE THE LOCATION AND DEPTH OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE OR RESTORATION TO SAME.
3. THE OWNER SHALL BE NOTIFIED IMMEDIATELY OF ANY CONFLICTS WITH EXISTING SERVICES.

SANITARY SEWERS:

1. 100mm TO 450mm ø SANITARY SEWER PIPES SHALL BE PVC CLASS DR-28 PIPE AND HAVE SMOOTH INTERIOR AND EXTERIOR WALLS. PIPES TO CONFORM TO OPSS 1841 MATERIAL SPECIFICATION.
2. RIGID PIPE BEDDING SHALL BE AS PER OPSD 802.030, 802.031, 802.032, 802.033 AND 802.034. FLEXIBLE PIPE BEDDING TO BE AS PER OPSD 802.010, 802.013 AND 802.014. SEE CITY OF TORONTO GRANULAR BEDDING DETAIL – CLASS 'B' TO BE 19mm CRLC.
3. MAINTENANCE HOLES SHALL BE SURROUNDED WITH A MINIMUM OF 1.0m COMPACTED GRANULAR BACKFILL.
4. ALL SANITARY SEWERS SHALL HAVE PREMIUM RUBBER GASKET JOINTS.
5. SANITARY MAINTENANCE HOLES TO BE AS PER CITY OF TORONTO T-701.010 AND T-701.011, AND FRAME AND COVER AS PER OPSD 401.010, TYPE 'A'.
6. TOP OF MANHOLE COVER TO BE SET TO BASE COURSE ASPHALT GRADE AND THEN ADJUSTED TO FINAL GRADE WITH MAXIMUM OF 3 MODULOC RINGS AS PER OPSD 704.010 WHEN TOP LIFT OF ASPHALT IS PLACED. MAXIMUM 450MM TO FIRST STEP AS PER OPSD 704.010.
7. BENCHING SHALL BE AS PER CITY OF TORONTO T-701.021
8. 150MM SERVICE CONNECTIONS SHALL BE PVC CLASS DR 28 PIPE. SANITARY SERVICE CONNECTIONS SHALL BE INSTALLED AT A MINIMUM 2% GRADE AND SHALL BE ANY COLOUR BUT WHITE.
9. FOR SERVICE CONNECTIONS ON EXISTING SEWERS, THE SEWER FLOW MUST BE MAINTAINED AT ALL TIMES.

KEY MAP:



NOTES:
1. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
2. SURVEY PREPARED BY: D. POPA SURVEY INV. O.L.S. DATED: OCTOBER 03, 2022
3. DO NOT SCALE DRAWINGS.
4. REPORT ALL ERRORS, OMISSIONS OR DISCREPANCIES TO URBAN WATERSHED GROUP LIMITED IMMEDIATELY UPON DISCOVERY.
5. USE ONLY LATEST REVISED DRAWINGS OR THOSE THAT ARE MARKED "ISSUED FOR CONSTRUCTION".
6. THE DRAWINGS ARE THE PROPERTY OF URBAN WATERSHED GROUP LIMITED AND MUST BE RETURNED ON COMPLETION OF THE PROJECT. ANY UNAUTHORIZED USE OF THIS PLAN IS PROHIBITED.
7. URBAN WATERSHED GROUP LIMITED SHALL NOT BE HELD RESPONSIBLE FOR ANY DAMAGES WHICH MAY ARISE FROM THE USE OF THIS DRAWING FOR TENDER, ESTIMATING, CONSTRUCTION OR OTHER PURPOSES PRIOR TO FINAL APPROVAL AND PRIOR TO PERMITS BEING GRANTED FROM ALL AUTHORITIES HAVING JURISDICTION.

WATERMAIN:

1. ALL WATERMAIN SERVICE CONNECTIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF TORONTO T-1104.01, T-1104.02-1, T-1104.02-2, T-1105.02-1, AND T-1105.02-2.
2. PVC WATERMAINS SHALL CONFORM TO CITY OF TORONTO WATER & WASTEWATER SERVICES MATERIAL SPECIFICATION T.S. 2.2 AND INCLUDE TRACER WIRE ON ALL NON DUCTILE IRON WATERMAINS, HYDRANTS, LATERALS AND WATER SERVICES, EXCEPT WHERE SUCH WATER SERVICES ARE OF COPPER MATERIAL.
3. WATERMAIN AND / OR WATER SERVICE MATERIALS RANGING IN SIZE FROM 100MM THROUGH 300MM IN DIAMETER MUST BE PVC CLASS 150 SDR-18, MANUFACTURED TO AWWA C900-97 COMPLETE WITH TRACER WIRE.
4. TRACER WIRE SHALL CONFORM TO CITY OF TORONTO & CONSTRUCTION SPECIFICATION FOR WATERMAIN AND WATER SERVICE TRACER WIRE TS 7.40.07.01, ITEMS TO IV INCLUSIVE.
5. WATERMAINS AND / OR SERVICE MATERIALS LESS THEN 100mm IN DIAMETER MUST BE TYPE "K" SOFT COPPER AS PER T-1104.01 AND CONFORM TO ASTM B88-05
6. WATERMAIN BEDDING SHALL BE AS PER CITY OF TORONTO STANDARD DRAWING T-708.04.
7. WATERMAINS SHALL HAVE A MINIMUM COVER OF 1.80M.
8. PROVISIONS FOR WATERMAIN FLUSHING PRIOR TO TESTING MUST BE PROVIDED WITH AT LEAST A 50MM (2") Ø OUTLET ON 100MM (4") Ø AND LARGER LINES AS PER CITY OF TORONTO T-1104.03-1. ALL PROPOSED WATERMAINS AND APPURTENANCES SHALL BE DISINFECTED AS PER STANDARD SPECIFICATION TS 7.30. AFTER PRESSURE TESTING AND CHLORINATION OF THE PROPOSED WATERMAIN, CUT TEE FITTING INTO EXISTING WATERMAIN AND MAKE CONNECTION. ISOLATION VALVE TO BE OPENED, EXTENSION STEM REMOVED, AND VALVE BURIED WITH GRANULAR FILL AS PER CITY OF TORONTO T-1104.03-1 AND T-1104.03-2.
9. WATERMAINS ARE TO BE INSTALLED AT GRADES AS SHOWN ON APPROVED PLANS; COPY OF GRADE SHEET MUST BE SUPPLIED TO INSPECTOR PRIOR TO COMMENCEMENT OF WORK, WHERE REQUESTED BY INSPECTOR.
10. ALL CURB BOXES SHALL BE LOCATED AT STREET LINE AS PER CITY OF TORONTO T-1104.01 OR AS SPECIFIED.
11. UNI-FLANGE SERIES 1300-C, EBBA SERIES 200PV OR ROMAC GRIP-RING SHALL BE INSTALLED AT ALL JOINTS BETWEEN CAST IRON MECHANICAL JOINT FITTINGS, BENDS, TEES, CROSSES, VALVES AND PVC PIPE RESTRAINERS MUST BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
12. ALL TEES, BENDS, AND REDUCERS TO BE COMPLETED WITH THRUST BLOCKING AS PER CITY OF TORONTO T-1103.01 AND T-1103.020.
13. WATERMAIN MUST HAVE A MINIMUM VERTICAL CLEARANCE OF 0.30M (12") OVER, 0.5M (20") UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.
14. ALL VALVE AND CHAMBERS AS PER CITY OF TORONTO T-1101.010, VALVE TIE DOWNS AS PER T-1100.010-3.
15. SACRIFICIAL ANODES WILL BE INSTALLED FOR ALL METAL PIPES AND FITTINGS AS PER CITY OF TORONTO T-1106.04, T-1106.05 AND T1106.06.
16. PIPE JOINT DEFLECTIONS ARE NOT ALLOWED.
17. ALL EXISTING WATER SERVICES THAT ARE TO BE ABANDONED ARE TO BE DISCONNECTED AT THE MAINLINE IN ACCORDANCE WITH CITY REQUIREMENTS.
18. ALL WATERMAIN APPURTENCES (VALVES, FITTINGS, ETC.) SHALL CONFORM TO CITY STANDARDS.

SERVICE CROSSING CHART

I.D.	GRADE	OBV. STM	INV. STM	OBV. SAN	INV. SAN	OBV. WM	INV. WM	COMMENTS:
C1	127.60	125.49	125.19	126.65	126.50	126.09	125.99	INSULATE WM AT CROSSING
C2	127.55	125.40	125.25	–	–	125.75	125.65	
C3	128.25	124.72±	123.67±	–	–	126.45	126.35	
C4	127.67	125.61	125.31	–	–	125.87	125.82	
C6	127.65	–	–	126.70	126.55	125.85	125.80	
C7	127.65	125.70	125.45	–	–	126.25	126.20	SEASONAL WATER SERVICE

NOTE:
THIS CHART SHALL ONLY BE USED AS A GUIDE. INVERTS INDICATED ON THE PLAN SHALL GOVERN. ON SITE CONDITIONS MAY CAUSE VARIANCES. WATERMAIN TO HAVE 1.80m COVER, MINIMUM VERTICAL 0.30m (12") OVER AND 0.5m (20") UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.

CONTRACTORS NOTES AND PRIOR TO CONSTRUCTION:

1. AT THE TIME OF TENDER, THE CONTRACTOR SHALL REVIEW THE DRAWINGS AND INVESTIGATE ALL EXISTING SERVICES, WATERMAINS, UTILITIES AND SEWERS AT POINTS OF CROSSING TO THEIR SATISFACTION AND MODIFY THEIR QUOTATION ACCORDINGLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE ADJUSTMENT OF ALL UTILITIES, SEWERS AND WATERMAINS AS REQUIRED TO COMPLETE THE CONSTRUCTION OF THE SITE SERVICING. THE CONTRACTOR SHALL REPORT IMMEDIATELY TO THE ARCHITECT, AND URBAN WATERSHED GROUP LTD. ANY DISCREPANCIES FOUND ON THIS DRAWING.
2. AT THE TIME OF TENDER THE CONTRACTOR AND THEIR SUPPLIERS SHALL REVIEW THE GEOTECHNICAL INFORMATION FOR THE PROJECT AND SHALL ALLOW FOR THE DESIGN AND INCORPORATION OF COUNTER BUOYANCY MEASURES FOR ALL SUBSURFACE SERVICING STRUCTURE.
3. CONTRACTOR SHALL SECURE A ROAD OCCUPANCY PERMIT FROM THE MUNICIPAL WORKS DEPARTMENT PRIOR TO ANY WORK WITHIN THE MUNICIPAL RIGHT-OF-WAY.
4. UPON COMPLETION OF THE SEWER INSTALLATION THE CONTRACTOR SHALL COMPLETE TESTING AS REQUIRED WHICH WILL INCLUDE, BUT NOT BE LIMITED TO, CCTV, DEFLECTION, INFILTRATION / EXFILTRATION AND AIR TESTING. THE WATERMAIN SHALL ALSO BE TESTED FOR CONTINUITY, PRESSURE AND CHLORINATION BY A QUALIFIED THIRD PARTY FIRM. ALL TESTING SHALL BE IN ACCORDANCE WITH APPLICABLE MUNICIPAL AND ONTARIO BUILDING CODE STANDARDS. RESULTS SHALL BE FORWARDED TO THE ARCHITECT AND URBAN WATERSHED GROUP IMMEDIATELY FOLLOWING THE TEST. THE CONTRACTOR SHALL ALSO SUBMIT AS-BUILT ELEVATIONS AND LOCATIONS OF THE SERVICING AND GRADING IMMEDIATELY FOLLOWING CONSTRUCTION OF EACH STAGE OF WORK
5. ALL EARTH MOVING OPERATIONS SHALL BE COMPLETED IN ACCORDANCE WITH O.REG. 406/19, REGARDING THE MANAGEMENT OF EXCESS SOIL. FILL MATERIAL SHALL BE CHEMICAL TESTED TO DETERMINE SUITABILITY TO PROVINCIAL STANDARDS FOR INTENDED USE / DESTINATION. THE CONTRACTOR SHALL BE HELD RESPONSIBLE TO PROPERLY DISPOSE OF UNSUITABLE OR CONTAMINATED MATERIALS.

NOTE:

ALL DRAWINGS IN THIS SET SHALL BE READ IN CONJUNCTION WITH EACH OTHER. DRAWINGS INCLUDE THE FOLLOWING:

1. SITE SERVICING PLAN - DWG No. 23011-SS1
2. SITE SERVICING PLAN - DWG No. 23011-SS2
3. EROSION & SEDIMENT CONTROL PLAN - DWG No. 23011-ESC1

NO.	DESCRIPTION	BY	DATE
7.	REVISED BIOSWALES PER TORONTO WATER	C.C.	2024/10/22
6.	REVISED WATER SERVICE CLEARANCE	C.C.	2024/10/08
5.	ISSUED FOR PERMIT AND TENDER	A.M.	2024/09/28
4.	REVISED PER TORONTO WATER COMMENTS	C.C.	2024/08/08
3.	ISSUED FOR TORONTO WATER REVIEW	B.K.	2024/07/19
2.	ISSUED FOR TORONTO WATER REVIEW	B.K.	2024/02/22
1.	ISSUED FOR CLIENT REVIEW	B.K.	2023/07/13

REVISIONS

BENCHMARK: BM = 127.969m

ALL ELEVATIONS SHOWN HEREON ARE GEODETIC AND REFFERED TO THE CITY OF TORONTO BENCHMARK (S726) HAVING AN ELEVATION OF 127.969m

BEARING NOTE:

LEGEND:
- PROPERTY LINE
- x252.55 EXISTING ELEVATION
- x191.28 PROPOSED ELEVATION
- EXISTING SHEET FLOW
- PROPOSED SHEET FLOW
- EXISTING STORM MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED CATCHBASIN MANHOLE
- EXISTING SINGLE/DOUBLE CATCHBASIN
- PROPOSED SINGLE/DOUBLE CATCHBASIN
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- EXISTING VALVE & BOX
- PROPOSED VALVE & BOX
- EXISTING HYDRANT & VALVE
- WATER METER ASSEMBLY (T-1130.020) TO BE INSTALLED IN CHAMBER PER TOR. STD.
- STOP/DRAIN VALVE
- QUICK COUPLER FOR WINTERIZATION
- TBR TO BE REMOVED
- 100-YR PONDING LIMIT

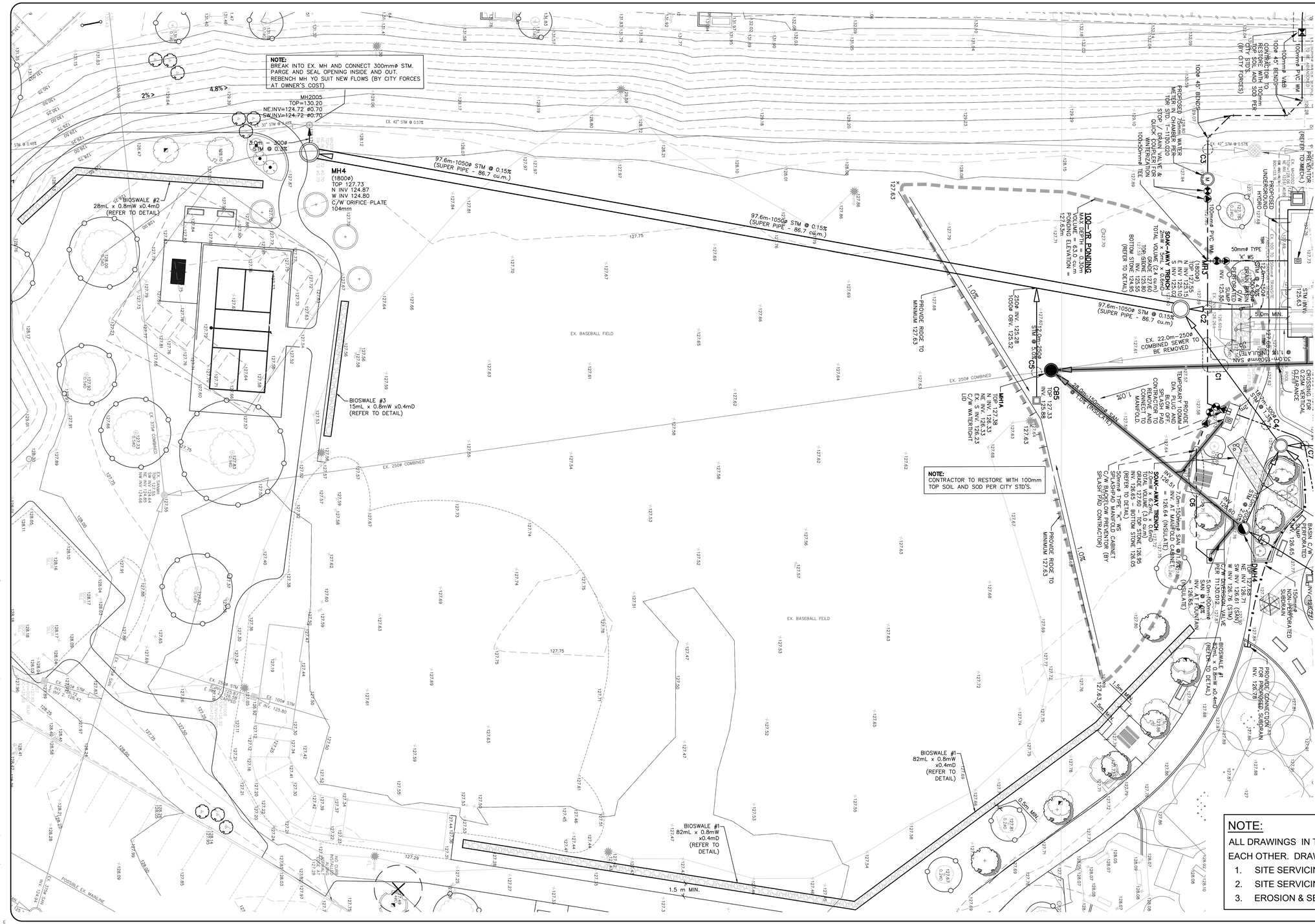
LICENSED PROFESSIONAL ENGINEER
A. W. MCEWEN
100505061
October 22, 2024
PROVINCE OF ONTARIO

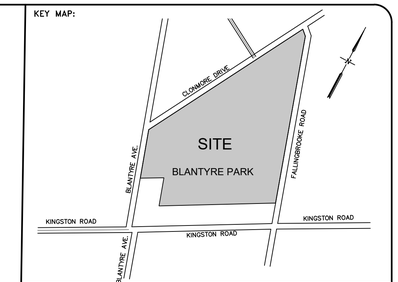
CONSULTANT:
15955 AIRPORT ROAD, SUITE 304
CALEDON EAST, ONTARIO, L7C 1H9
PHONE: (905) 584-1458 FAX: (905) 584-1461
Urban Watershed Group Ltd.
A Member of the GREENLAND Group of Companies
urbanwater@grnland.com

DESIGNED BY:	P. ELLIS	DATE:	JULY 11, 2023
DRAWN BY:	B. KLESS	SURVEYED BY:	D. POPA SURVEYING INC.
CHECKED BY:	A. McEWEN	DWG. No.	23011-SS1
SCALE:	1:200		

PROJECT NAME:
BLANTYRE PARK OUTDOOR POOL RENOVATIONS
180 FALLINGBROOK RD.
CITY OF TORONTO, ONTARIO

DRAWING NAME:
SITE SERVICING PLAN (1 OF 2)





NOTES:
1. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
2. SURVEY PREPARED BY: D. POPA SURVEY INV. O.L.S. DATED: OCTOBER 03, 2022
3. DO NOT SCALE DRAWINGS.
4. REPORT ALL ERRORS, OMISSIONS OR DISCREPANCIES TO URBAN WATERSHED GROUP LIMITED IMMEDIATELY UPON DISCOVERY.
5. USE ONLY LATEST REVISED DRAWINGS OR THOSE THAT ARE MARKED "ISSUED FOR CONSTRUCTION".
6. THE DRAWINGS ARE THE PROPERTY OF URBAN WATERSHED GROUP LIMITED AND MUST BE RETURNED ON COMPLETION OF THE PROJECT. ANY UNAUTHORIZED USE OF THIS PLAN IS PROHIBITED.
7. URBAN WATERSHED GROUP LIMITED SHALL NOT BE HELD RESPONSIBLE FOR ANY DAMAGES WHICH MAY ARISE FROM THE USE OF THIS DRAWING FOR TENDER, ESTIMATING, CONSTRUCTION OR OTHER PURPOSES PRIOR TO FINAL APPROVAL AND PRIOR TO PERMITS BEING GRANTED FROM ALL AUTHORITIES HAVING JURISDICTION.

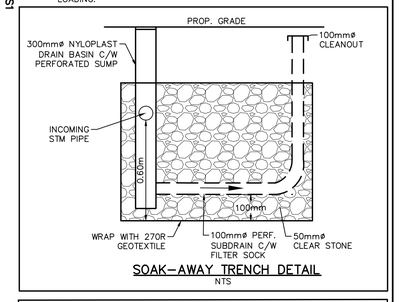
NOTE:
FOR GENERAL, STORM, SANITARY AND WATER MAIN NOTES REFER TO DWH No. 23011–SS1 (10F2)

I.D.	GRADE	OBV. STM	INV. STM	OBV. COMB.	INV. COMB.	COMMENTS:
C5	127.63	125.99	125.74	126.46	126.21	

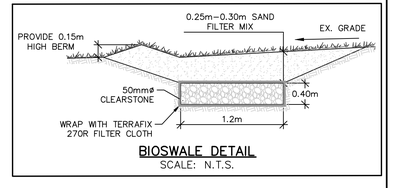
NOTE:
THIS CHART SHALL ONLY BE USED AS A GUIDE. INVERTS INDICATED ON THE PLAN SHALL GOVERN. ON SITE CONDITIONS MAY CAUSE VARIANCES.
WATERMAIN TO HAVE 1.80m COVER, MINIMUM VERTICAL 0.30m (12') OVER AND 0.5m (20') UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.

SAND FILTER MIX FOR BIOSWALE:
1. SAND FILTER MEDIA COMPOSITION IS TO ADHERE TO THE FOLLOWING REQUIRMENTS AND SHOULD BE PRE-MIXED FROM VENDOR.
   - SAND (2.0 TO 0.05mm DIA.) 85–88% BY WEIGHT
   - FINES (<0.05mm DIA.) 8–12% BY WEIGHT
   - ORGANIC MATTER 3–5% BY WEIGHT

   CEC GREATER THAN 10mg/100g
   pH = 5.5 – 7.5
   HYDRAULIC CONDUCTIVITY GREATER THAN 25mm/hr
   NO OBJECTS GREATER THAN 50mm – PHOSPHORUS (P–INDEX) >30 PPM
2. SAMPLES OF THE FILTER MEDIA SHOULD BE DRIED AND TESTED BY THE GOETECHNICAL CONSULTANT TO ENSURE THEY MEET THE SPECIFICATIONS.
3. GEOTECHNICAL CONSULTANT IS TO REVIEW THE PROPOSED FILTER MEDIA SPECIFICATION PRIOR TO CONSTRUCTION AND PROVIDE RECOMMENDATIONS FOR INSTALLATION AND COMPACTION CONSIDERING INTENDED SURFACE LOADING.



SOAK–AWAY TRENCH DETAIL
NTS



BIOSWALE DETAIL
SCALE: N.T.S.

NOTE:
ALL DRAWINGS IN THIS SET SHALL BE READ IN CONJUNCTION WITH EACH OTHER. DRAWINGS INCLUDE THE FOLLOWING:
1. SITE SERVICING PLAN - DWG No. 23011-SS1
2. SITE SERVICING PLAN - DWG No. 23011-SS2
3. EROSION & SEDIMENT CONTROL PLAN - DWG No. 23011-ESC1

NO.	DESCRIPTION	BY	DATE
7.	REVISED BIOSWALES PER TORONTO WATER	C.C.	2024/10/22
6.	REVISED WATER SERVICE CLEARANCE	C.C.	2024/10/08
5.	ISSUED FOR PERMIT AND TENDER	A.M.	2024/09/28
4.	REVISED PER TORONTO WATER COMMENTS	C.C.	2024/08/08
3.	ISSUED FOR TORONTO WATER REVIEW	B.K.	2024/07/19
2.	ISSUED FOR TORONTO WATER REVIEW	B.K.	2024/02/22
1.	ISSUED FOR CLIENT REVIEW	B.K.	2023/07/13

REVISIONS

BENCHMARK: BM = 127.969m
ALL ELEVATIONS SHOWN HEREON ARE GEODETIC AND REFFERED TO THE CITY OF TORONTO BENCHMARK (S726) HAVING AN ELEVATION OF 127.969m

BEARING NOTE:

LEGEND:
- PROPERTY LINE
- x252.55 EXISTING ELEVATION
- x191.28 PROPOSED ELEVATION
- EXISTING SHEET FLOW
- PROPOSED SHEET FLOW
- EXISTING STORM MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED CATCHBASIN MANHOLE
- EXISTING SINGLE/DOUBLE CATCHBASIN
- PROPOSED SINGLE/DOUBLE CATCHBASIN
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- EXISTING VALVE & BOX
- PROPOSED VALVE & BOX
- EXISTING HYDRANT & VALVE
- (M) WATER METER ASSEMBLY (1107.02–1) TO BE INSTALLED IN CHAMBER PER TOR. STD.
- (B) DOUBLE CHECK VALVE ASSEMBLY (BACKFLOW PREVENTOR) TO BE INSTALLED IN CHAMBER PER TOR. STD.
- TBR TO BE REMOVED

LICENSED PROFESSIONAL ENGINEER
A.W. MCEWEN
100505061
OCTOBER 22, 2024
PROVINCE OF ONTARIO

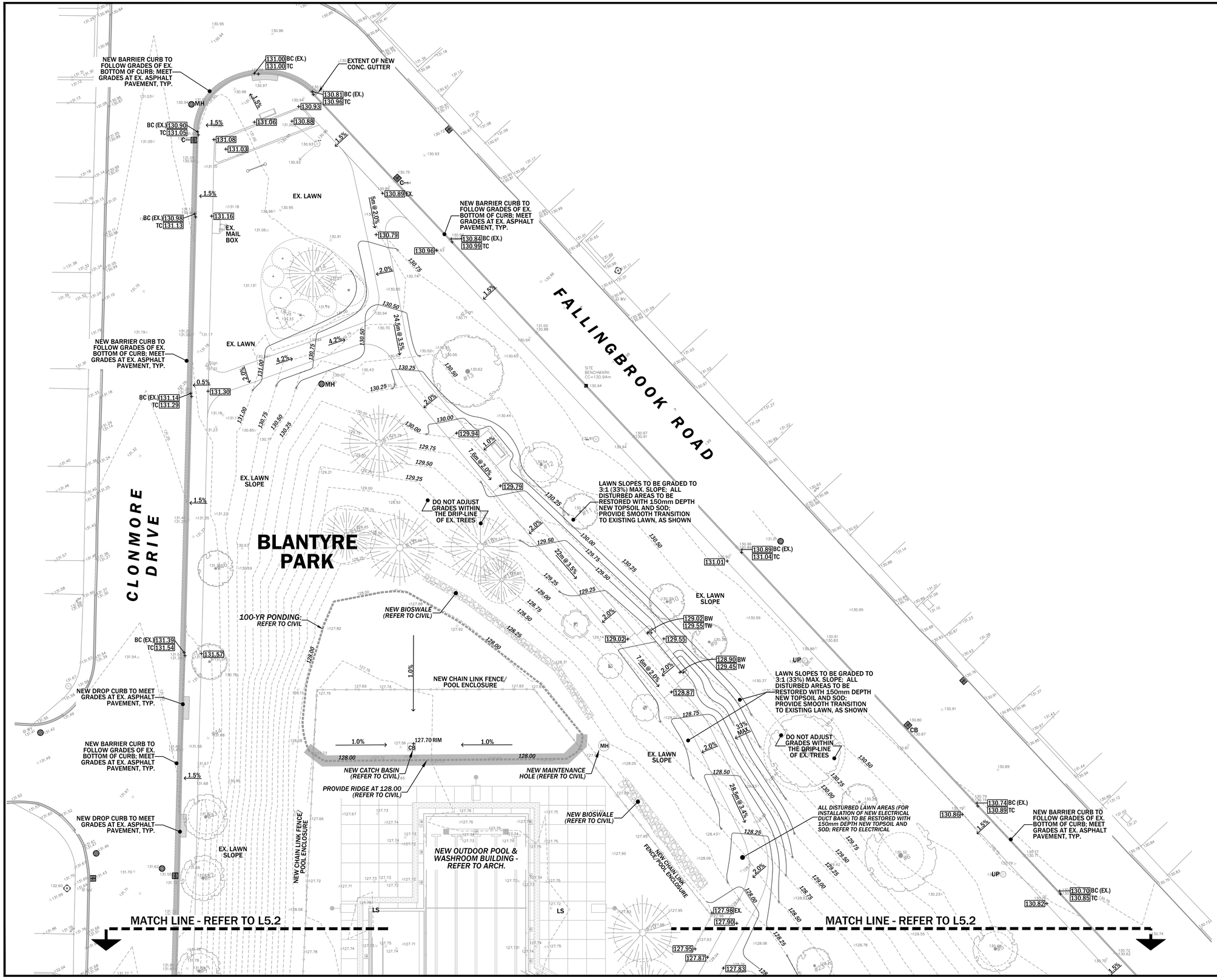
CONSULTANT:
15955 AIRPORT ROAD, SUITE 304
CALEDON EAST, ONTARIO, L7C 1H9
PHONE: (905) 584-1458 FAX: (905) 584-1461
rban Watershed Group Ltd.
A Member of the GREENLAND Group of Companies
urbanwater@grnland.com

DESIGNED BY:	P. ELLIS	DATE:	JULY 11, 2023
DRAWN BY:	B. KLESS	SURVEYED BY:	D. POPA SURVEYING INC.
CHECKED BY:	A. McEWEN	DWG. No.	23011-SS2
SCALE:	1:200		

PROJECT NAME:
BLANTYRE PARK OUTDOOR POOL RENOVATIONS
180 FALLINGBROOK RD.
CITY OF TORONTO, ONTARIO

DRAWING NAME:
SITE SERVICING PLAN (2 OF 2)

L:\URBAN WATERSHED GROUP\23011 – BLANTYRE PARK – Toronto\ENGINEERING\23011 – BLANTYRE PARK – 2024-10-22 – R7 – REVISED BIOSWALES\23011 – BLANTYRE PARK – 2024-10-22 – R7 – REVISED BIOSWALES.dwg
Date Plotted: Oct 22, 2024 – 9:08am



GENERAL NOTES:

1. Construction crews shall immediately notify the landscape architect of any discrepancies between the drawings and the actual conditions encountered on-site.
2. Construction crews shall contact the landscape architect to review any changes in design, proposed substitutions in materials, or deviances from construction methods as shown or described on the drawings or in the specifications.
3. Construction crews shall exercise extreme care when operating equipment in the vicinity of existing trees. Do not drive equipment or store any materials over root systems or anywhere within the dripline of existing trees.

GRADING PLAN NOTES:

1. COORDINATE THE WORKS OF THIS PLAN WITH ANY SERVICING INSTALLATIONS - REFER TO CIVIL DRAWINGS.
2. Coordinate locations, depths and elevations of in-ground works with the construction plan, grading plan, and all relevant details.
3. Stockpile all suitable excavated materials and any materials indicated to be salvaged for use on-site if applicable. Dispose of all unsuitable or excess materials.
4. Soil or granular materials stockpiled on site shall be protected from contamination by tarps or other means until they are installed elsewhere on site.

LEGEND

- EXISTING TREE TO BE PROTECTED
- LS LIGHT STANDARD
- MH MAINTENANCE HOLE
- CB CATCH BASIN
- UP UTILITY POLE
- MW MONITORING WELL
- ×127.00 EXISTING SPOT ELEVATION
- +127.00 PROPOSED SPOT ELEVATION
- EXISTING CONTOUR (0.25m)
- PROPOSED CONTOUR (0.25m)
- TW/BW TOP/BOTTOM OF WALL
- TC/BC TOP/BOTTOM OF CURB

NO	YYYY-MM-DD	REVISION	DN	CH
8	2024-10-28	FOR PERMIT & TENDER	LP	-
7	2024-05-22	FINAL REVIEW	LP	-
6	2024-03-13	REVIEW & COORDINATION	LP	-
5	2024-01-22	PUCC APPROVAL	LP	-
4	2023-12-06	REVIEW - SIDEWALK EXTENSION	LP	-
3	2023-11-23	FOR 75% REVIEW	LP	-
2	2023-11-02	FOR COORDINATION	LP	-
1	2023-10-30	PRELIMINARY REVIEW	LP	-

VICTOR FORD AND ASSOCIATES INC
LANDSCAPE ARCHITECTS
955 Queen Street West, Toronto, Ontario M6J 3X5
647.998.7914 | admin@victorford.ca

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS
DORI J. PHILP
OALA MEMBER

Blantyre Park:
Park Improvements

180 Fallingbrook Rd. Scarborough, ON., M1N 1N3

Toronto Parks, Forestry and Recreation

0 2 4 8
Scale = 1:200 metric

VFA Project: 2109
Sheet: 11 of 25

L5.1

GRADING PLAN
(north park)

MATCH LINE - REFER TO L5.1

MATCH LINE - REFER TO L5.1

FALLINGBROOK ROAD

CLONMORE DRIVE

NEW OUTDOOR POOL - REFER TO ARCH.

NEW WASHROOM BUILDING - REFER TO ARCH.

FFE = 127.80

NEW BARRIER CURB TO FOLLOW GRADES OF EX. BOTTOM OF CURB; MEET GRADES AT EX. ASPHALT PAVEMENT, TYP.

LAWN AREA ADJACENT TO NEW SIDEWALK TO BE RESTORED WITH 150mm DEPTH NEW TOPSOIL AND SOD; RE-GRADE AS REQUIRED AND PROVIDE SMOOTH TRANSITION TO EX. LAWN SLOPE

NEW ASPHALT PAVEMENT TO MEET FLUSH WITH TILED ENTRY, TYP.

NEW MH (RIM = 127.62) REFER TO CIVIL

(2) NEW CATCH BASINS AND (1) OVER-FLOW DRAIN WITHIN SPLASH PAD; AS SPECIFIED (REFER TO CIVIL FOR ALL DRAIN PIPE CONNECTIONS)

*SUPPLY AND INSTALL RAINWATER DIVERTER VALVE SYSTEM IN NEW COMBINED MH - REFER TO CIVIL

IN66E = 127.68

127.56 CB#2 RIM

127.46 CB #3 RIM

127.51 RIM CB#4 (OVER-FLOW)

NEW MH (RIM = 127.68) REFER TO CIVIL

INV. 126.78

NEW SOAK-AWAY TRENCH (REFER TO CIVIL)

NEW SERVICE CABINET (FOR SPLASH PAD MANIFOLD/ CONTROLLER); AS SPECIFIED - REFER TO CIVIL FOR SERVICE CONNECTIONS

*TO INCLUDE ELEC. CONNECTION OF CONTROLLER TO RAIN SENSOR KIT (LOCATION OF RAIN SENSOR TO BE VERIFIED ON-SITE WITH CONSULTANT) AND TO DIVERTER VALVE MOTOR AT COMBINED MH - REFER TO ELECTRICAL

NEW SOAK-AWAY TRENCH (REFER TO CIVIL)

150mm Ø SOLID DRAIN PIPE TO TIE INTO NEW MH (REFER TO CIVIL)

100-YR PONDING: (PONDING ELEVATION = 127.63) REFER TO CIVIL

RE-GRADED AREAS TO BE RESTORED WITH 100mm DEPTH NEW TOPSOIL AND SOD, TYP.

NEW CATCH BASIN (REFER TO CIVIL)

NEW MAINTENANCE HOLE (REFER TO CIVIL)

127.33 RIM

PROVIDE RIDGE AT 127.63 (REFER TO CIVIL)

PROVIDE RIDGE AT 127.63 (REFER TO CIVIL)

TOP OF SLOPE

BOTTOM OF SLOPE

ALL DISTURBED LAWN AREAS (FOR INSTALLATION OF NEW SUPER-PIPE ACROSS PARK) TO BE RESTORED WITH 150mm DEPTH NEW TOPSOIL AND SOD; REFER TO CIVIL

NEW BARRIER CURB TO FOLLOW GRADES OF EX. BOTTOM OF CURB; MEET GRADES AT EX. ASPHALT PAVEMENT, TYP.

LAWN AREA ADJACENT TO NEW SIDEWALK TO BE RESTORED WITH 150mm DEPTH NEW TOPSOIL AND SOD; RE-GRADE AS REQUIRED AND PROVIDE SMOOTH TRANSITION TO EX. LAWN SLOPE

MEET GRADE AT EX. CONCRETE PAD, TYP.

EX. LAWN SLOPE

EX. LAWN

EXISTING BASEBALL OUTFIELD

BLANTYRE PARK

USE FILL MATERIAL EXCAVATED FROM SITE TO BUILD UP NEW BERM (RE-COMPACT FILL IN 200mm LIFTS MAX. HEIGHT OF BERM = 0.9m); LAWN AREA TO BE RESTORED WITH 150mm DEPTH NEW TOPSOIL AND SOD

LAWN AREA TO BE RESTORED WITH 150mm DEPTH NEW TOPSOIL AND SOD; RE-GRADE TO PROVIDE SMOOTH TRANSITION TO EXISTING LAWN, AS SHOWN

NEW P.I.P. RUBBER SAFETY SURFACING; SLOPE SUBGRADE AT 1.5% TOWARDS SUB-DRAIN PIPES, AS SHOWN; MEET FLUSH WITH ALL ADJACENT PAVEMENTS AND CONCRETE EDGES, TYP.

3 / L9 150mm DIA. PERFORATED FLEXIBLE SUB-DRAIN PIPES; SLOPE AS SHOWN (0.5% MIN.)

SLOPE PIPE @ 1.5%

SLOPE PIPE @ 1.0%

SLOPE RUBBER SURFACE AWAY FROM EX. CONC. PAD, AS SHOWN

SLOPE PIPE @ 1.0%

3 / L9 150mm DIA. PERFORATED FLEXIBLE SUB-DRAIN PIPES; SLOPE AS SHOWN (0.5% MIN.)

*TIE INTO NEW SOAK-AWAY PIT; REFER TO SHEET L5.3

NEW BIOSWALE (REFER TO CIVIL)

NEW BIOSWALE (REFER TO CIVIL)

USE FILL MATERIAL EXCAVATED FROM SITE TO BUILD UP NEW PATHWAYS AND ADJACENT SLOPED LAWN AREAS (RE-COMPACT FILL IN 200mm LIFTS MAX.); ENSURE 25% MAX. SLOPE ON ALL AREAS; LAWN AREAS TO BE RESTORED WITH 150mm DEPTH NEW TOPSOIL AND SOD

LAWN AREA TO BE RESTORED WITH 150mm DEPTH NEW TOPSOIL AND SOD; RE-GRADE TO PROVIDE SMOOTH TRANSITION TO EXISTING LAWN, AS SHOWN

NEW ENGINEERED WOOD FIBRE SAFETY SURFACING; SLOPE AT 1.5%, AS SHOWN

126.80 INV.

126.80 INV.

126.60 INV.

NEW DROP CURB TO MEET GRADES AT EX. ASPHALT PAVEMENT, TYP.

GUY WIRE

GUY WIRE

PARK SIGN

BELL VAULT

BELL BOX

BELL BOX

ASPHALT PARKING LOT

ASPHALT PARKING LOT

MATCH LINE - REFER TO L5.3

MATCH LINE - REFER TO L5.3

LEGEND

- EXISTING TREE TO BE PROTECTED
- LS LIGHT STANDARD
- MH MAINTENANCE HOLE
- CB CATCH BASIN
- UP UTILITY POLE
- MW MONITORING WELL
- ×127.00 EXISTING SPOT ELEVATION
- +127.00 PROPOSED SPOT ELEVATION
- EXISTING CONTOUR (0.25m)
- PROPOSED CONTOUR (0.25m)
- 150mm Ø SOLID RIGID PVC DRAIN PIPE
- 150mm Ø FLEXIBLE PERFORATED PVC DRAIN PIPE
- TW/BW TOP/BOTTOM OF WALL
- TC/BC TOP/BOTTOM OF CURB

GRADING PLAN NOTES:

1. COORDINATE THE WORKS OF THIS PLAN WITH ANY SERVICING INSTALLATIONS.
2. Coordinate locations, depths and elevations of in-ground works with the construction plan, grading plan, and all relevant details.
3. Stockpile all suitable excavated materials and any materials indicated to be salvaged for use on-site if applicable. Dispose of all unsuitable or excess materials.
4. Soil or granular materials stockpiled on site shall be protected from contamination by tarps or other means until they are installed elsewhere on site.

NO	YYYY-MM-DD	REVISION	DN	CH
8	2024-10-28	FOR PERMIT & TENDER	LP	-
7	2024-05-22	FINAL REVIEW	LP	-
6	2024-03-13	REVIEW & COORDINATION	LP	-
5	2024-01-22	PUCC APPROVAL	LP	-
4	2023-12-06	REVIEW - SIDEWALK EXTENSION	LP	-
3	2023-11-23	FOR 75% REVIEW	LP	-
2	2023-11-02	FOR COORDINATION	LP	-
1	2023-10-30	PRELIMINARY REVIEW	LP	-

VICTOR FORD AND ASSOCIATES INC
LANDSCAPE ARCHITECTS
955 Queen Street West, Toronto, Ontario M6J 3X5
647.998.7914 | admin@victorford.ca

Blantyre Park:
Park Improvements

180 Fallingbrook Rd. Scarborough, ON., M1N 1N3

Toronto Parks, Forestry and Recreation

0 2 4 8

Scale = 1:200 metric

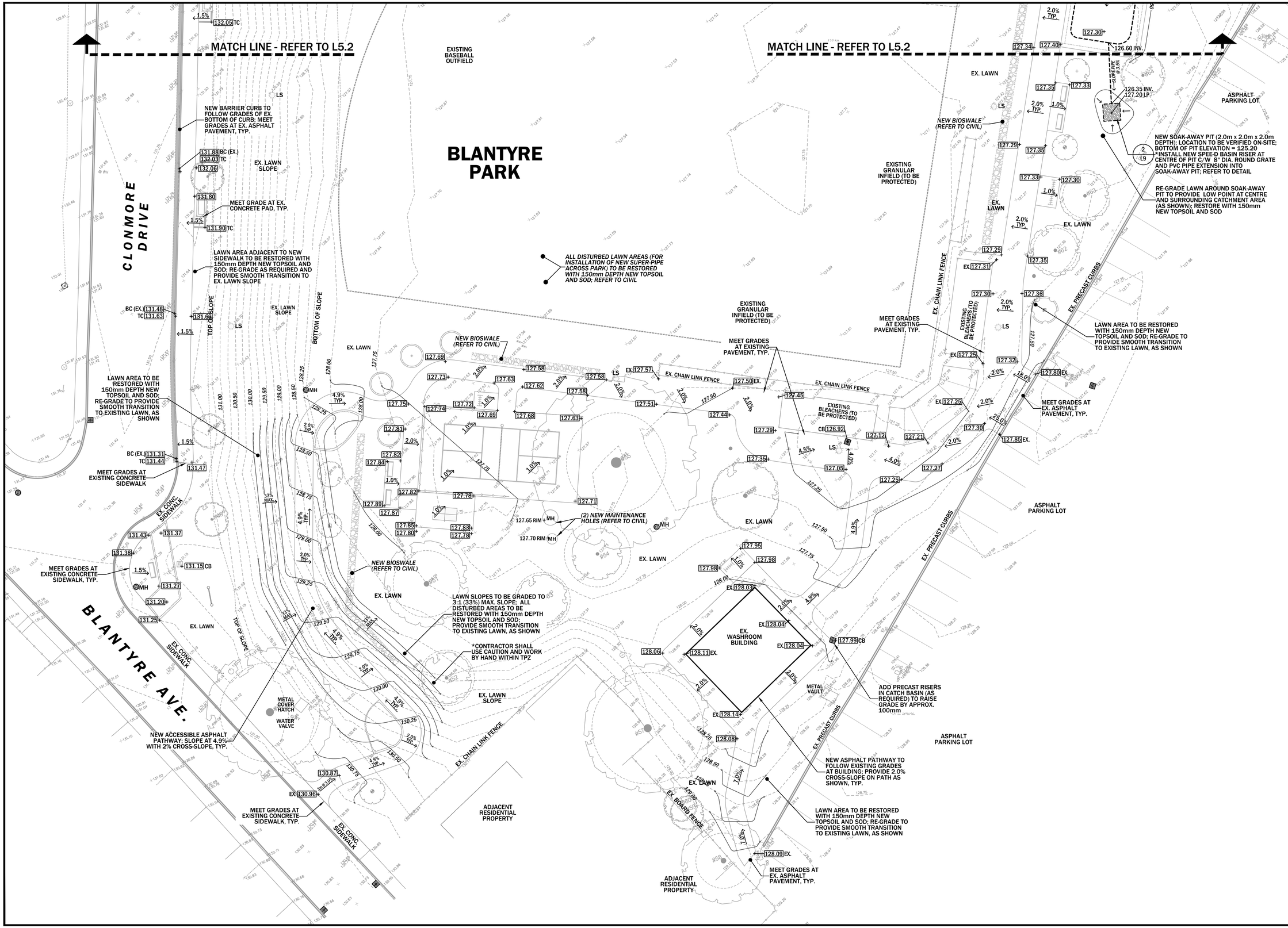
VFA Project: 2109

Sheet: 12 of 25

L5.2

GRADING & SUB-DRAINAGE PLAN

(central park)



LEGEND

- EXISTING TREE TO BE PROTECTED
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- C— CATCH BASIN
- .. UTILITY POLE
- MW MONITORING WELL
- ×127.00 EXISTING SPOT ELEVATION
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- EXISTING CONTOUR (0.25m)
- PROPOSED CONTOUR (0.25m)
- 150mm Ø FLEXIBLE PERFORATED PVC DRAIN PIPE
- TW/BW TOP/BOTTOM OF WALL
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GRADING PLAN NOTES:

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955 Queen Street West, Toronto, Ontario M6J 3X5
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Blantyre Park:
Park Improvements

180 Fallingbrook Rd. Scarborough, ON., M1N 1N3

Toronto Parks, Forestry and Recreation

0 2 4 8 Scale = 1:200 metric

VFA Project: 2109
Sheet: 13 of 25

L5.3

GRADING & SUB-DRAINAGE PLAN
(south park)

ARBORIST REPORT

Blantyre Park
180 Fallingbrook Road
Toronto, Ontario

May 23, 2024

Prepared for:

Victor Ford and Associates Inc
Attn: Lori Philp
955 Queen St. W., Loft 606
Toronto ON M6J 3X5

Prepared by:

Urban Forest Innovations Inc.
1331 Northaven Drive
Mississauga, ON L5G 4E8

URBAN FOREST INNOVATIONS INC

Contents

NB: This Arborist Report has been prepared using the latest drawings and information provided by the client and/or agents and may be intended for inclusion in a site plan approval or similar planning submission. Any subsequent design or site plan changes affecting trees may require revisions to this report. New drawings and information should be provided to UFI prior to report submission to municipal planning authorities.

Links (URLs) provided to web-based resources are current to the date of the report.

EXECUTIVE SUMMARY

Urban Forest Innovations Inc. (UFI) has been retained by Victor Ford and Associates Inc to prepare an arborist report for the proposed development application at Blantyre Park in Toronto, Ontario. The purpose of the arborist report is to document existing tree and site conditions, to evaluate anticipated impacts to site trees which may occur as a result of the proposed development, and to identify required and recommended tree protection measures and regulatory requirements associated with the proposed development.

In total, 68 trees are addressed in this report. Proposed tree removals and injuries requiring permit approval are summarized in Table 1, below. Based upon the results of the present assessment, it has been determined that 63 trees may be retained in place, 1 tree will require transplantation, and 4 trees will require removal. The proposed works will require the implementation of specific tree protection measures to ensure effective tree retention, including tree protection fencing, root-sensitive excavation and root pruning, and arborist site supervision.

Table 1: Summary of regulated tree actions at Blantyre Park, Toronto, ON.

Proposed Action	Municipal Trees	Subtotal	Private Regulated Trees	Subtotal	Total
Injure	#9, 10, 21, 40, 41, 42, 43, 45, 46, 47, 55	11	#58	1	12
Remove (Development)	#22, 36, 61, 67	4	-	0	4
Remove (Condition)	-	0	-	0	0
Transplant	#30	1	-	0	1

INTRODUCTION

Urban Forest Innovations Inc. has been requested by Victor Ford and Associates to prepare an arborist report for the proposed development at Blantyre Park in Toronto, Ontario. The proposed site works include the following activities:

- Demolition of selected existing hardscapes, sodded areas, and fencing.
- Construction of new accessible pathways, sidewalk, and recreational amenities such as a splash pad and pickleball court.
- Installation of related servicing and planting beds.

This arborist report reviews the potential impacts of the proposed works upon 68 trees within or close to the limits of disturbance, and outlines required and recommended tree protection measures and regulatory requirements associated with the proposed development. General tree maintenance recommendations are also provided where appropriate. The report should be read in conjunction with all other servicing, grading and landscaping plans prepared for the project.

SITE OBSERVATIONS

Field observations were made on September 7, 2022, by Anna Mernieks, ISA Certified Arborist ON-2224A. There was no construction activity on the site at the time of the field observations. Trees within 6 metres of the potential limits of disturbance are included in the inventory. Trees were located using the latest site drawings and information provided by the client; trees for which no surveyed locations were provided were positioned approximately with the aid of field reference markers. Tree diameter was measured at 1.4 metres above grade (DBH) and trees were assessed for health, structural condition, and risk potential. Tree groups were identified where appropriate. All trees were assessed from the ground level. No trees were tagged as part of the inventory. A full explanation of tree assessment categories is included in Appendix 2 – Tree Inventory Attributes.

RESULTS AND DISCUSSION

This section of the report outlines the key issues related to the proposed works from an arboricultural and tree preservation perspective. Specific recommendations regarding tree protection are outlined. General recommendations are also provided in Appendix 5.

By-laws and Legislation

By-laws and legislation enacted by the City of Toronto and/or the Province of Ontario regulate the injury or destruction of trees depending upon their location, size and other factors.

City of Toronto – Private Trees (Category 1 and 2)

2 inventoried trees (#57, 58) are regulated pursuant to the City of Toronto private tree by-law, officially known as City of Toronto Municipal Code, Chapter 813, Article III – 'Private Tree Protection'. This by-law regulates the injury and destruction of all trees equal to or greater than 30 cm diameter at breast height (DBH, or 1.4 m above grade) located on private property.

City of Toronto – Park Trees (Category 3)

66 inventoried trees (#1-56, 59-68) are regulated pursuant to the City of Toronto parks by-law, officially known as City of Toronto Municipal Code Chapter 608 – 'Parks', and specifically pursuant to Article VII – 'Trees'. This by-law regulates injury or destruction of any trees located within municipal parks.

City of Toronto – Ravine Trees (Category 4)

No inventoried trees are regulated pursuant to the City of Toronto ravine and natural feature protection (RNFP) by-law, officially known as City of Toronto Municipal Code Chapter 658 – 'Ravine and Natural Feature Protection.' This by-law regulates a number of activities within specially-designated areas, including injury or destruction of trees of *any* diameter.

City of Toronto – Street Trees (Category 5)

No inventoried trees are regulated pursuant to the City of Toronto street tree by-law, officially known as City of Toronto Municipal Code, Chapter 813, Article II – 'Trees on City Streets'. This by-law regulates injury and destruction of all trees within the municipal road right-of-way.

City of Toronto – Unregulated Trees

All inventoried trees are regulated pursuant to municipal tree protection by-laws.

Boundary Trees – Ontario Forestry Act, R.S.O. 1990

The Provincial *Forestry Act, R.S.O. 1990* states:

10. (2) Every tree whose trunk is growing on the boundary between adjoining lands is the common property of the owners of the adjoining lands. 1998, c. 18, Sched. I, s. 21.

    (3) Every person who injures or destroys a tree growing on the boundary between adjoining lands without the consent of the land owners is guilty of an offence under this Act. 1998, c. 18, Sched. I, s. 21.

No inventoried trees appear to be growing on the boundary between the subject site and the adjacent properties.

Endangered, Rare or Protected Species – Endangered Species Act, 2007

The Provincial *Endangered Species Act, 2007* (ESA) provides for the conservation of endangered or threatened species in Ontario. The ESA identifies Species at Risk (SAR) based on the best available scientific information, protects SAR and their habitats, promotes the recovery of species that are at risk, and promotes stewardship activities to assist in the protection and recovery of SAR.

No endangered, rare or otherwise protected tree species were observed within the limits of proposed works.

Tree Removal

Tree removal will be necessary to facilitate the proposed works. Recommendations for tree removal are based upon consideration of the anticipated impacts upon trees due to implementation of the proposed works, the immediate and forecasted health and structural condition of the tree, and the ability of the tree to make continued contributions to the newly modified landscape.

Project Works

The proposed works will require the removal of 4 trees:

- Tree #22, a City-owned 56 cm diameter white fir (*Abies concolor*), is proposed for removal to enable construction of a pool deck.
- Tree #36, a City-owned 18 cm diameter red oak (*Quercus rubra*), is proposed for removal to enable installation of servicing.
- Tree #61, a City-owned 43 cm diameter Norway maple (*Acer platanoides*), is proposed for removal to enable construction of an accessway.
- Tree #67, a City-owned 41 cm diameter Norway maple (*Acer platanoides*), is proposed for removal to enable construction of an accessway.

Tree Retention

All other trees addressed in this report are proposed for retention. This section outlines specific tree preservation and protection measures for retained trees. General tree protection recommendations and specifications are found in Appendix 5.

All trees to be retained within or adjacent to the limits of project works are designated for Preservation, Protection, Transplantation, or Injury.

Tree Preservation

No specific tree protection measures are recommended for 6 trees (#3, 4, 5, 14, 20, 44), which are located beyond anticipated construction limits, are protected by existing landscape features, and/or have been assessed as standing dead.

Tree Protection

Retained trees in proximity to the proposed works shall be protected by restricting access and land use within tree protection zones (TPZs), as through the installation of tree preservation fencing (or hoarding) that satisfies the minimum required distance (TPZ) for each tree, where possible. Minimum required TPZ distances are specified in Appendix 1, and recommended fencing configurations are illustrated in Appendix 4. Fencing is to be established in advance of all proposed works, including but not limited to material and equipment delivery, staging and storage, demolitions, excavation and grading work, and new construction activity.

Specifications for the establishment of protection fencing and signage are outlined further in Appendix 5 – Section 5.2.1.1.

Tree Injury

During site works, retained trees may undergo injury, which is understood to be the encroachment of established tree protection zones (TPZs), regardless of the extent of actual physical damage sustained by the retained tree.

In addition to tree protection fencing, trees designated for injury at Blantyre Park require the implementation of the following supplemental tree protection measures:

- **Tree-Sensitive Demolition** – The tree protection zone of by-law regulated tree #55 will be impacted by the demolition of an existing hardscape, resulting in injury. In order to minimize root zone disturbance, demolition of the hardscape must be undertaken in a tree-sensitive manner within the TPZ of tree #55. All works within TPZs should be supervised by a Certified Arborist to ensure potential root disturbance is minimized, and to enable timely root pruning if required to prevent root damage. Specifications for tree-sensitive demolition are outlined in Appendix 5 – Section 5.2.1.3.
- **Root-Sensitive Excavation and Root Pruning –** The tree protection zones of 12 by-law regulated, inventoried trees (#9, 10, 21, 40, 41, 42, 43, 45, 46, 47, 55, 58) will be impacted by excavation to enable the proposed works, resulting in injury. All excavation within TPZs shall be accomplished by root-sensitive excavation utilizing hand-digging, hydrovac or pneumatic soil excavation (e.g., Airspade). Excavations must be supervised by a Certified Arborist, who must be enabled to stop works if, during the course of excavation, significant structural or transport roots (greater than approximately 25mm diameter) are encountered, in order to properly prune the roots. Specifications for root-sensitive excavation and root pruning are outlined in Appendix 5 – Sections 5.2.1.4 and 5.2.1.5.

Tree Risk and Required Tree Maintenance

At the time of inspection, 1 inventoried tree was noted for the presence of one or more structural conditions requiring corrective action(s) to reduce or eliminate attendant risk.

- Tree #44, a 10 cm diameter unidentified species, located on the subject site, was assessed as standing dead at the time of field observations and should be considered for removal by City of Toronto Forestry staff. The City can be notified by calling 311. The work should be undertaken on a medium priority basis, i.e. before the commencement of site works.

At the time of inspection, there were no other immediate risks posed by any trees within the project limits.

By-law and Permit Requirements

A City of Toronto 'Application to Injure or Destroy Trees' must be filled out detailing the proposed injury, removal, or transplantation of 17 regulated trees (Table 2).

Table 2: Bylaw regulated trees proposed for removal, injury, or transplantation.

Tree Number	Diameter (cm)	Proposed Action	City/Private/Boundary/Neighbour
9	14	Injure	City
10	21	Injure	City
21	55	Injure	City
22	56	Remove	City
30	8	Transplant	City
36	18	Remove	City
40	27	Injure	City
41	29	Injure	City
42	26	Injure	City
43	21	Injure	City
45	14	Injure	City
46	25	Injure	City
47	14	Injure	City
55	82	Injure	City
58	45, 25	Injure	Neighbour
61	43	Remove	City
67	41	Remove	City

Permit applications must be submitted and approved prior to commencement of site works.

An 'Application to Injure or Destroy Trees' form and instructions for permit application submissions can be found online at:
http://wx.toronto.ca/inter/clerks/fit.nsf/0/b8c764c03d39912c852584d500725c4f/$File/Application%2Bto%2BInjure%2Bor%2BDestroy%2BTrees%2BJan%2B2020%2B.pdf

Compensation Planting

The approval of a permit to injure or destroy trees may be subject to the planting of replacement trees or payment of equivalent cash-in-lieu, which is currently valued at $583 per tree. The final compensation planting ratios or value of cash-in-lieu payments will be determined by the City of Toronto upon review of this report and associated project plans.

CONCLUSION

There are 68 trees associated with the proposed development at Blantyre Park in Toronto, Ontario. The proposed works will require the implementation of specific tree protection measures to ensure effective tree preservation. 4 by-law regulated trees will require removal and 12 by-law regulated trees will require injury to enable the proposed works. 1 tree is proposed for transplantation. A 'Permit to Injure or Destroy Trees' will likely be required to enable the proposed removals, injuries, and transplantations.

With the implementation of the recommendations provided in this report, no significant adverse effects are anticipated as a result of the proposed works upon the long-term health and condition of inventoried trees that have been designated for retention. It is important that good arboricultural practices be undertaken during the entire course of construction. No material storage or construction access shall take place within tree protection zones (TPZs); sensitive excavation and root pruning shall be undertaken, as required; and any necessary branch and/or root pruning shall be undertaken by an ISA Certified Arborist.

APPENDIX 1 – TREE INVENTORY

Table 3: Tree inventory, Blantyre Park, Toronto, Ontario. Tree assessments are based upon field observations undertaken on September 7, 2022, by Anna Mernieks, ISA Certified Arborist ON-2224A. Attribute definitions are provided in Appendix 2.

Tree	Common Name	Scientific Name	DBH	CW	TI	CS	CV	TPZ	Cat.	Loc.	Rec.	Comments
1	Pin Oak	*Quercus palustris*	14	4	G	G	G	1.8	3	S	P	
2	Pin Oak	*Quercus palustris*	21	4	G	G	G	1.8	3	S	P	
3	Pin Oak	*Quercus palustris*	17	4	G	G	G	1.8	3	S	-	
4	Freeman's Maple	*Acer* x *freemanii*	15	4	G	F	G	1.8	3	S	-	
5	Sugar Maple	*Acer saccharum*	19	5	G	G	G	1.8	3	S	-	
6	Norway Maple	*Acer platanoides*	34	8	G	G	G	2.4	3	S	P	
7	Sugar Maple	*Acer saccharum*	16	4	G	F	G	1.8	3	S	P	
8	Sugar Maple	*Acer saccharum*	61	8	G	F	G	4.2	3	S	P	
9	Red Oak	*Quercus rubra*	14	4	G	G	G	1.8	3	S	I	
10	Sugar Maple	*Acer saccharum*	21	4	G	F	G	1.8	3	S	I	
11	Red Oak	*Quercus rubra*	16	4	G	G	G	1.8	3	S	P	
12	Pin Oak	*Quercus palustris*	23	5	G	G	G	1.8	3	S	P	
13	Sugar Maple	*Acer saccharum*	51	8	G	G	G	3.6	3	S	P	
14	Colorado Spruce	*Picea pungens*	36	6	G	G	F	2.4	3	S	-	
15	White Fir	*Abies concolor*	46	8	G	G	G	3.0	3	S	P	
16	White Fir	*Abies concolor*	46	6	G	G	G	3.0	3	S	P	
17	Norway Spruce	*Picea abies*	47	8	G	G	G	3.0	3	S	P	
18	Colorado Spruce	*Picea pungens*	48	8	G	G	G	3.0	3	S	P	
19	Colorado Spruce	*Picea pungens*	33	5	G	F	G	2.4	3	S	P	
20	White Fir	*Abies concolor*	41	8	G	G	G	3.0	3	S	-	DBH measured at 1.0 m.
21	White Fir	*Abies concolor*	55	6	G	G	G	3.6	3	S	I	
22	White Fir	*Abies concolor*	56	8	G	G	G	3.6	3	S	R	
23	Honey Locust	*Gleditsia triacanthos*	20	4	G	G	G	1.8	3	S	P	
24	Honey Locust	*Gleditsia triacanthos*	17	4	G	G	G	1.8	3	S	P	
25	Honey Locust	*Gleditsia triacanthos*	17	4	G	G	G	1.8	3	S	P	
26	Honey Locust	*Gleditsia triacanthos*	20	4	G	G	G	1.8	3	S	P	
27	Honey Locust	*Gleditsia triacanthos*	13	4	G	G	G	1.8	3	S	P	
28	Linden	*Tilia cordata*	12	3	G	G	G	1.8	3	S	P	
29	Linden	*Tilia cordata*	27	5	G	G	G	1.8	3	S	P	
30	Sugar Maple	*Acer saccharum*	8	2	G	G	G	1.2	3	S	T	
31	Kentucky Coffee-tree	*Gymnocladus dioicus*	22	4	G	F	G	1.8	3	S	P	
32	Red Oak	*Quercus rubra*	24	5	G	G	G	1.8	3	S	P	
33	Freeman's Maple	*Acer* x *freemanii*	28	5	G	F	G	1.8	3	S	P	
34	Norway Maple	*Acer platanoides*	25	4	G	G	G	1.8	3	S	P	
35	Silver Maple	*Acer saccharinum*	6	2	G	G	F	1.2	3	S	P	
36	Red Oak	*Quercus rubra*	18	4	G	F	G	1.8	3	S	R	
37	London Plane-tree	*Platanus* x *acerifolia*	21	5	G	G	G	1.8	3	S	P	
38	Freeman's Maple	*Acer* x *freemanii*	26	5	G	F	G	1.8	3	S	P	
39	Red Oak	*Quercus rubra*	9,6	3	G	F	G	1.2	3	S	P	
40	Common Hackberry	*Celtis occidentalis*	27	5	G	G	G	1.8	3	S	I	

Tree	Common Name	Scientific Name	DBH	CW	TI	CS	CV	TPZ	Cat.	Loc.	Rec.	Comments
41	Common Hackberry	*Celtis occidentalis*	29	5	G	F	G	1.8	3	S	I	
42	Common Hackberry	*Celtis occidentalis*	26	5	G	F	G	1.8	3	S	I	
43	Swamp White Oak	*Quercus bicolor*	21	5	G	G	G	1.8	3	S	I	
44	Unidentified Species		10	1	P	P	-	1.8	3	S	-	Dead.
45	Swamp White Oak	*Quercus bicolor*	14	4	G	G	G	1.8	3	S	I	
46	Red Oak	*Quercus rubra*	25	4	G	G	G	1.8	3	S	I	
47	Kentucky Coffee-tree	*Gymnocladus dioicus*	14	4	G	G	G	1.8	3	S	I	
48	Swamp White Oak	*Quercus bicolor*	15	4	G	G	G	1.8	3	S	P	
49	Bur Oak	*Quercus macrocarpa*	20	4	G	G	G	1.8	3	S	P	
50	White Oak	*Quercus alba*	81	15	G	G	G	5.4	3	S	P	
51	Norway Maple	*Acer platanoides*	57	10	G	F	G	3.6	3	S	P	
52	Sugar Maple	*Acer saccharum*	49	6	G	F	G	3.0	3	S	P	
53	Sugar Maple	*Acer saccharum*	50	6	G	F	G	3.0	3	S	P	
54	Sugar Maple	*Acer saccharum*	51	6	G	F	G	3.6	3	S	P	
55	Silver Maple	*Acer saccharinum*	82	20	G	G	G	5.4	3	S	I	
56	Sugar Maple	*Acer saccharum*	56	8	G	F	G	3.6	3	S	P	
57	Manitoba Maple	*Acer negundo*	100	15	G	F	G	6.0	2	B	P	DBH estimated.
58	Manitoba Maple	*Acer negundo*	45, 25	10	G	F	G	3.0	2	N	I	DBH estimated.
59	White Mulberry	*Morus alba*	16	4	G	G	G	1.8	3	S	P	
60	European Hornbeam	*Carpinus betulus*	10	4	G	G	G	1.8	3	S	P	
61	Norway Maple	*Acer platanoides*	43	6	G	G	G	3.0	3	S	R	
62	Norway Maple	*Acer platanoides*	39	6	G	F	G	2.4	3	S	P	
63	Norway Maple	*Acer platanoides*	38	6	G	G	G	2.4	3	S	P	
64	Norway Maple	*Acer platanoides*	36	5	G	G	G	2.4	3	S	P	
65	Norway Maple	*Acer platanoides*	44	5	G	G	G	3.0	3	S	P	
66	Norway Maple	*Acer platanoides*	31	5	G	G	G	2.4	3	S	P	
67	Norway Maple	*Acer platanoides*	41	5	G	F	G	3.0	3	S	R	
68	Norway Maple	*Acer platanoides*	34	4	G	G	F	2.4	3	S	P	

APPENDIX 2 – TREE INVENTORY ATTRIBUTES

Species	The common and scientific names are provided for each tree.
Diameter at Breast Height (DBH)	The diameter of each tree, in centimetres, at breast height (1.4 m above grade).
Canopy Width (CW)	An estimation of the average diameter of the tree canopy, in metres.
Trunk Integrity (TI)	An assessment of the tree's trunk for any externally-visible defects or weaknesses. It is rated on an ascending scale of Poor-Fair-Good.
Canopy Structure (CS)	An assessment of the tree's main scaffold branches and the canopy of the tree for defects or weaknesses visible from ground level. It is also rated on an ascending scale of Poor-Fair-Good.
Canopy Vitality (CV)	An assessment of the general health and vigour of the tree, derived partly through a comparison of deadwood and live growth relative to a 100% healthy tree. The size and colour of foliage are also considered in this category. During the leaf-off season, the number and distribution of buds is an important determinant of canopy vitality. This indicator is also rated on an ascending scale of Poor-Fair-Good.
Tree Protection Zone (TPZ)	The tree protection zone, in metres, as measured from the base of the subject tree's stem.
Category (Cat.)	By-laws respecting trees provide for the protection of trees situated on both private and City property. The following five categories are outlined in the City of Toronto 'Guidelines for Completion of an Arborist Report'. 1. Trees with diameters of 30 cm or greater, situated on private property on the subject site. 2. Trees with diameters of 30 cm or greater, situated on private property, within 6 m of the subject site. 3. Trees of all diameters situated on City-owned parkland within 6 m of the subject site. 4. Trees of all diameters situated within lands designated under City of Toronto Municipal Code, Chapter 658, Ravine and Natural Feature Protection. 5. Trees of all diameters situated within the City road allowance adjacent to the subject site.
Location (Loc.)	The location of the tree relative to the subject site: on the subject site (S), on neighbouring property (N), on municipal property (M), or on a property boundary (B).
Recommendation (Rec.)	The recommendation for each tree: Protect (P), Injure (I), or Remove (R). Trees to be preserved with no active tree protection are denoted with a dash (-).
Comments	Comments pertaining to the tree provided as needed.

APPENDIX 3 – SELECTED FIGURES

Figure 1: Trees #1, 2, 28, 29 are recommended for protection, tree #30 is proposed for transplantation.

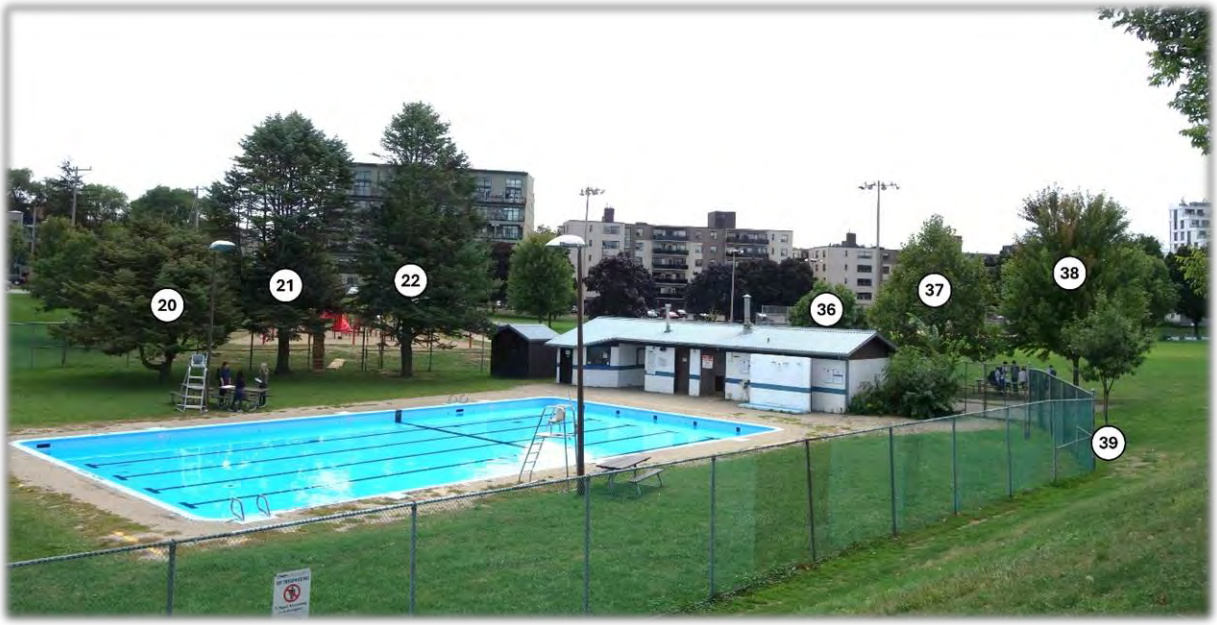


Figure 2: Tree #20 is recommended for preservation, tree #21 is recommended for retention with injury, trees #22 and 36 are proposed for removal, trees #37-39 are recommended for protection.

Figure 3: Tree #47 is recommended for retention with injury, trees #48 and 49 are recommended for protection.

Figure 4: Trees #51, 53, 54 are recommended for protection, tree #55 is recommended for retention with injury.

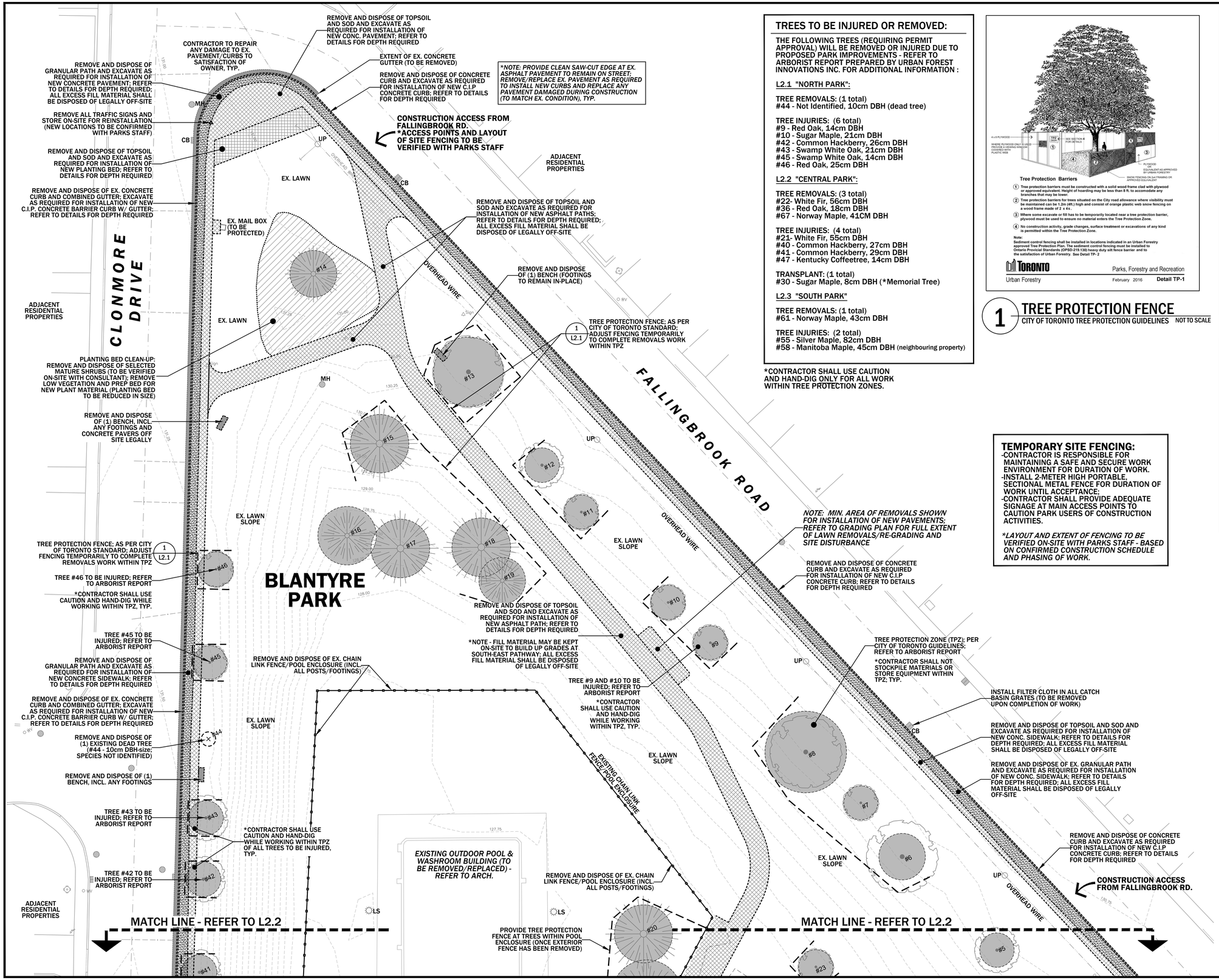
Figure 5: Trees #57, 59, 60 are recommended for protection, tree #58 is recommended for retention with injury.

Figure 6: Tree #67 is proposed for removal, tree #68 is recommended for protection.

APPENDIX 4 – TREE-RELATED PLANS

Inclusions:

1. Tree Protection, Demolition & Removals Plan, prepared by Victor Ford and Associates Inc. and dated May 22, 2024 (3 pages)



TREES TO BE INJURED OR REMOVED:

THE FOLLOWING TREES (REQUIRING PERMIT APPROVAL) WILL BE REMOVED OR INJURED DUE TO PROPOSED PARK IMPROVEMENTS - REFER TO ARBORIST REPORT PREPARED BY URBAN FOREST INNOVATIONS INC. FOR ADDITIONAL INFORMATION :

L2.1 "NORTH PARK":

TREE REMOVALS: (1 total)
#44 - Not Identified, 10cm DBH (dead tree)

TREE INJURIES: (6 total)
#9 - Red Oak, 14cm DBH
#10 - Sugar Maple, 21cm DBH
#42 - Common Hackberry, 26cm DBH
#43 - Swamp White Oak, 21cm DBH
#45 - Swamp White Oak, 14cm DBH
#46 - Red Oak, 25cm DBH

L2.2 "CENTRAL PARK":

TREE REMOVALS: (3 total)
#22- White Fir, 56cm DBH
#36 - Red Oak, 18cm DBH
#67 - Norway Maple, 41CM DBH

TREE INJURIES: (4 total)
#21- White Fir, 55cm DBH
#40 - Common Hackberry, 27cm DBH
#41 - Common Hackberry, 29cm DBH
#47 - Kentucky Coffeetree, 14cm DBH

TRANSPLANT: (1 total)
#30 - Sugar Maple, 8cm DBH (*Memorial Tree)

L2.3 "SOUTH PARK"

TREE REMOVALS: (1 total)
#61 - Norway Maple, 43cm DBH

TREE INJURIES: (2 total)
#55 - Silver Maple, 82cm DBH
#58 - Manitoba Maple, 45cm DBH (neighbouring property)

*CONTRACTOR SHALL USE CAUTION AND HAND-DIG ONLY FOR ALL WORK WITHIN TREE PROTECTION ZONES.

Tree Protection Barriers

1. Tree protection barriers must be constructed with a solid wood frame clad with plywood or approved equivalent. Height of hoarding may be less than 8 ft. to accomodate any branches that may be lower.
2. Tree protection barriers for trees situated on the City road allowance where visibility must be maintained can be 1.2m (4ft.) high and consist of orange plastic web snow fencing on a wood frame made of 2 x 4's.
3. Where some excavate or fill has to be temporarily located near a tree protection barrier, plywood must be used to ensure no material enters the Tree Protection Zone.
4. No construction activity, grade changes, surface treatment or excavations of any kind is permitted within the Tree Protection Zone.

Note:
Sediment control fencing shall be installed in locations indicated in an Urban Forestry approved Tree Protection Plan. The sediment control fencing must be installed to Ontario Provicial Standards (OPSD-219.130) heavy duty silt fence barrier and to the satisfaction of Urban Forestry. See Detail TP-2

TORONTO Parks, Forestry and Recreation
Urban Forestry February 2016 **Detail TP-1**

1 TREE PROTECTION FENCE
CITY OF TORONTO TREE PROTECTION GUIDELINES NOT TO SCALE

TEMPORARY SITE FENCING:
-CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A SAFE AND SECURE WORK ENVIRONMENT FOR DURATION OF WORK.
-INSTALL 2-METER HIGH PORTABLE, SECTIONAL METAL FENCE FOR DURATION OF WORK UNTIL ACCEPTANCE;
-CONTRACTOR SHALL PROVIDE ADEQUATE SIGNAGE AT MAIN ACCESS POINTS TO CAUTION PARK USERS OF CONSTRUCTION ACTIVITIES.

*LAYOUT AND EXTENT OF FENCING TO BE VERIFIED ON-SITE WITH PARKS STAFF - BASED ON CONFIRMED CONSTRUCTION SCHEDULE AND PHASING OF WORK.

GENERAL NOTES:

1. Construction crews shall immediately notify the landscape architect of any discrepancies between the drawings and the actual conditions encountered on-site.
2. Construction crews shall contact the landscape architect to review any changes in design, proposed substitutions in materials, or deviances from construction methods as shown or described on the drawings or in the specifications.
3. Construction crews shall exercise extreme care when operating equipment in the vicinity of existing trees. Do not drive equipment or store any materials over root systems or anywhere within the dripline of existing trees.

DEMOLITION AND REMOVALS PLAN NOTES:

1. All items and materials to be removed or demolished, including stripped surface soils, shall be removed from the site immediately and disposed of legally.
2. Stockpile all suitable excavated materials and any materials indicated to be salvaged for use on-site if applicable. Dispose of all unsuitable or excess materials.
3. Soil or granular materials stockpiled on site shall be protected from contamination by tarps or other means until they are installed elsewhere on site.
4. Existing pavement bases in Tree Protection Zones may be left in place where not in conflict with other work.

TREE PROTECTION PLAN NOTES:

1. The Contractor is responsible for maintaining a safe and secure work environment for duration of work.
2. Install 2-meter high portable, sectional metal fence for duration of work until acceptance.
3. Location and extent of fencing to be verified on-site.
4. The Contractor shall provide adequate signage at main access points to caution park users of construction activities.
5. Tree protection fencing shall be installed for areas shown on this plan, at a minimum.
6. Tree protection zones (TPZ) have been identified for all trees within the vicinity of proposed works for the Contractor's information. The Contractor is responsible to ensure that no works occur or materials are stockpiled within the TPZ.
7. Contractor shall refer to the City of Toronto's Tree Protection Policy and Specifications for Construction Near Trees.

LEGEND

- EXISTING TREE TO BE PROTECTED
- (TPZ) TREE PROTECTION ZONE
- TREE PROTECTION FENCE; AS PER CITY OF TORONTO STANDARDS
- LS LIGHT STANDARD
- MH MAINTENANCE HOLE
- CB CATCH BASIN
- UP UTILITY POLE
- MW MONITORING WELL
- TOPSOIL & SOD REMOVALS / EXCAVATION FOR NEW WORKS; REFER TO NOTES
- ASPHALT PAVEMENT REMOVALS; REFER TO NOTES
- GRANULAR PATH REMOVALS; REFER TO NOTES
- #1 TREE REFERENCE NO. (REFER TO ARBORIST REPORT FROM URBAN FOREST INNOVATIONS)

NO	YYYY-MM-DD	REVISION	DN	CH
7	2024-05-22	FINAL REVIEW	LP	-
6	2024-03-13	REVIEW & COORDINATION	LP	-
5	2024-01-22	PUCC APPROVAL	LP	-
4	2023-12-06	REVIEW - SIDEWALK EXTENSION	LP	-
3	2023-11-23	FOR 75% REVIEW	LP	-
2	2023-11-02	FOR COORDINATION	LP	-
1	2023-10-30	PRELIMINARY REVIEW	LP	-

VICTOR FORD AND ASSOCIATES INC
LANDSCAPE ARCHITECTS
955 Queen Street West, Toronto, Ontario M6J 3X5
647.998.7914 | admin@victorford.ca

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS — LORI J. PHILP — OALA MEMBER

Blantyre Park:
Park Improvements
180 Fallingbrook Rd. Scarborough, ON., M1N 1N3

TORONTO Parks, Forestry and Recreation

0 2 4 8 Scale = 1:200 metric

VFA Project: 2109
Sheet: 2 of 25

L2.1

TREE PROTECTION, DEMOLITION & REMOVALS PLAN (north park)

MATCH LINE - REFER TO L2.1

MATCH LINE - REFER TO L2.1

CLONMORE DRIVE

FALLINGBROOK ROAD

OVERHEAD WIRE

EX. LAWN SLOPE

REMOVE AND DISPOSE OF EX. CHAIN LINK FENCE/POOL ENCLOSURE (INCL. ALL POSTS/FOOTINGS)

TREE #41 TO BE INJURED; REFER TO ARBORIST REPORT

*CONTRACTOR SHALL USE CAUTION AND HAND-DIG WHILE WORKING WITHIN TPZ OF ALL TREES TO BE INJURED, TYP.

TREE #40 TO BE INJURED; REFER TO ARBORIST REPORT

EXISTING OUTDOOR POOL & WASHROOM BUILDING (TO BE REMOVED/REPLACED) - REFER TO ARCH.

EXISTING LAWN BERM: (APPROX. 0.75m Ht.); REMOVE AND DISPOSE OF SOD; STOCKPILE FILL MATERIAL ON-SITE FOR RE-USE (i.e. FOR BUILDING UP NEW BERM AND RE-GRADING AT NEW SOUTH-EAST PATHWAY); REFER TO GRADING PLAN

*ALL EXCESS OR UNSUITABLE FILL MATERIAL TO BE DISPOSED OF LEGALLY OFF-SITE

REMOVE AND DISPOSE OF (1) EXISTING TREE (#22 - 56cm DBH-SIZE, WHITE FIR) LEGALLY OFF-SITE, INCL. STUMP TO 600mm DEPTH

TREE #21 TO BE INJURED; REFER TO ARBORIST REPORT

*CONTRACTOR SHALL ADJUST TREE PROTECTION FENCE TEMPORARILY (USE CAUTION AND HAND-DIG WHILE WORKING WITHIN TPZ, TYP.)

NOTE: MIN. AREA OF REMOVALS SHOWN FOR INSTALLATION OF NEW PAVEMENT AND PLAY SURFACING; REFER TO GRADING PLAN FOR FULL EXTENT OF LAWN REMOVALS/RE-GRADING AND SITE DISTURBANCE

REMOVE AND DISPOSE OF EX. UNIT PAVERS; GRANULAR BASE SHALL BE STOCKPILED ON-SITE FOR REUSE

REMOVE AND DISPOSE OF EX. CHAIN LINK FENCE/POOL ENCLOSURE (INCL. ALL POSTS/FOOTINGS)

EX. POOL BUILDING

EX. SWINGS

EX. SWINGS

EX. SLIDE

EX. PLAY STRUCTURE

REMOVE AND DISPOSE OF EXISTING PLAY EQUIPMENT INCL. ALL FOOTINGS LEGALLY OFF-SITE *CONTRACTOR TO CONFIRM IF ANY EQUIPMENT/PARTS ARE TO BE SALVAGED WITH PARKS STAFF

REMOVE AND DISPOSE OF (1) EX. BENCH INCL. FOOTINGS OFF-SITE

REMOVE AND DISPOSE OF EXISTING SAND PLAY SURFACING OFF-SITE AND EXCAVATE AS REQUIRED FOR INSTALLATION OF PROPOSED WORKS: REFER TO DETAILS FOR DEPTH

NOTE: PROVIDE CLEAN SAW-CUT EDGE AT EX. ASPHALT PAVEMENT TO REMAIN ON STREET. REMOVE/REPLACE EX. PAVEMENT AS REQUIRED TO INSTALL NEW CURBS AND REPLACE ANY PAVEMENT DAMAGED DURING CONSTRUCTION (TO MATCH EX. CONDITION), TYP.

REMOVE AND DISPOSE OF EX. GRANULAR PATH AND EXCAVATE FOR INSTALLATION OF NEW CONC. SIDEWALK; REFER TO DETAILS FOR DEPTH REQUIRED; ALL EXCESS FILL MATERIAL SHALL BE DISPOSED OF LEGALLY OFF-SITE

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE FOR INSTALLATION OF LIMESTONE SCREENINGS SURFACE (TO MEET BIKE SHARE STATION)

REMOVE AND DISPOSE OF CONCRETE CURB AND EXCAVATE AS REQUIRED FOR INSTALLATION OF NEW PROPOSED C.I.P CONCRETE CURB; REFER TO DETAILS FOR DEPTH REQUIRED

EXISTING BIKE SHARE STATION (TO BE PROTECTED)

CONSTRUCTION ACCESS FROM FALLINGBROOK RD. *ACCESS POINTS AND LAYOUT OF SITE FENCING TO BE VERIFIED WITH PARKS STAFF

CONTRACTOR TO REPAIR ANY DAMAGE TO EX. PAVEMENT/CURBS TO SATISFACTION OF OWNER, TYP.

REMOVE AND DISPOSE OF TOPSOIL AND SOD

REMOVE AND DISPOSE OF ASPHALT PAVEMENT; GRANULAR BASE SHALL BE STOCKPILED ON-SITE FOR REUSE

TREE PROTECTION FENCE: AS PER CITY OF TORONTO STANDARD; ADJUST FENCING TEMPORARILY TO COMPLETE REMOVALS WORK WITHIN TPZ (1 / L2.1)

TREE PROTECTION ZONE (TPZ); PER CITY OF TORONTO GUIDELINES

SERVICING REMOVALS/ UPGRADES - REFER TO CIVIL

REMOVE AND DISPOSE OF (1) EXISTING TREE (#36 - 18cm DBH-SIZE, RED OAK) LEGALLY OFF-SITE, INCL. STUMP TO 600mm DEPTH

EX. LAWN

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE FOR INSTALLATION OF NEW CONCRETE PAD; REFER TO DETAILS FOR DEPTH REQUIRED

REMOVE AND DISPOSE OF ASPHALT PAVEMENT (GRANULAR BASE SHALL BE STOCK-PILED ON-SITE FOR REUSE IF SUITABLE); AND EXCAVATE AS REQUIRED FOR INSTALLATION FOR NEW ASPHALT PATHWAY; SUPPLY NEW BASE MATERIAL TO MEET SPECIFIED COMPACTION; REFER TO DETAILS FOR DEPTH REQUIRED

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE FOR INSTALLATION OF NEW CONCRETE PADS; REFER TO DETAILS FOR DEPTH REQUIRED

REMOVE AND DISPOSE OF EX. CONCRETE CURB AND COMBINED GUTTER; EXCAVATE AS REQUIRED FOR INSTALLATION OF NEW PROPOSED C.I.P CONCRETE CURB W/ GUTTER; REFER TO DETAILS FOR DEPTH REQUIRED

REMOVE AND DISPOSE OF GRANULAR PATH AND EXCAVATE AS REQUIRED FOR INSTALLATION OF PROPOSED SIDEWALK; REFER TO DETAILS FOR DEPTH REQUIRED

EX. LAWN SLOPE

TOP OF SLOPE

BOTTOM OF SLOPE

EX. LAWN

EX. LAWN

EX. LAWN

EX. LAWN SLOPE

EX. LAWN SLOPE

EX. LAWN SLOPE

EX. LAWN

EX. LAWN

EXISTING BASEBALL OUTFIELD

BLANTYRE PARK

REMOVE AND STORE EXISTING BENCH ON SITE FOR RE-INSTALLATION; REMOVE AND DISPOSE OF EX. BENCH PAD

REMOVE AND DISPOSE OF ASPHALT PAVEMENT (GRANULAR BASE SHALL BE STOCK-PILED ON-SITE FOR REUSE IF SUITABLE); AND EXCAVATE AS REQUIRED FOR INSTALLATION FOR NEW ASPHALT PATHWAY; REFER TO DETAILS FOR DEPTH REQUIRED

TREE PROTECTION FENCE: AS PER CITY OF TORONTO STANDARD; ADJUST FENCING TEMPORARILY TO COMPLETE REMOVALS WORK WITHIN TPZ (1 / L2.1)

EX. SHELTER, CONCRETE PAD AND BENCHES TO BE PROTECTED

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE AS REQUIRED FOR INSTALLATION OF NEW RUBBERIZED SAFETY SURFACE AND DRAINAGE LAYER: REFER TO DETAILS FOR DEPTH; ALL FILL MATERIAL TO BE DISPOSE OF OFF-SITE

REMOVE AND DISPOSE OF (1) EX. BENCH INCL. FOOTINGS OFF-SITE

NOTE: MIN. AREA OF REMOVALS SHOWN FOR INSTALLATION OF NEW PLAY SURFACING AND PAVEMENTS; REFER TO GRADING PLAN FOR FULL EXTENT OF LAWN REMOVALS/RE-GRADING AND SITE DISTURBANCE

TRANSPLANT (1) EXISTING "MEMORIAL" TREE: (#30 - 8cm DBH-SIZE, SUGAR MAPLE) USING 6-FOOT TREE SPADE *CONTRACTOR SHALL REMOVE AND SAFELY STORE MEMORIAL PLAQUE FOR REINSTALLATION (NEW LOCATION FOR TREE TO BE VERIFIED ON-SITE WITH CONSULTANT)

REMOVE AND DISPOSE OF ASPHALT PAVEMENT (GRANULAR BASE SHALL BE STOCK-PILED ON-SITE FOR REUSE IF SUITABLE); AND EXCAVATE AS REQUIRED FOR INSTALLATION FOR NEW ASPHALT PATHWAY; SUPPLY NEW BASE MATERIAL TO MEET SPECIFIED COMPACTION; REFER TO DETAILS FOR DEPTH REQUIRED

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE AS REQUIRED FOR INSTALLATION OF PROPOSED WORKS; REFER TO DETAILS FOR DEPTH REQUIRED - *REFER TO GRADING PLAN FOR FULL EXTENT OF GRADING AND SITE DISTURBANCE*

TEMPORARY SITE FENCING:
-CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A SAFE AND SECURE WORK ENVIRONMENT FOR DURATION OF WORK.
-INSTALL 2-METER HIGH PORTABLE, SECTIONAL METAL FENCE FOR DURATION OF WORK UNTIL ACCEPTANCE;
-CONTRACTOR SHALL PROVIDE ADEQUATE SIGNAGE AT MAIN ACCESS POINTS TO CAUTION PARK USERS OF CONSTRUCTION ACTIVITIES.

**LAYOUT AND EXTENT OF FENCING TO BE VERIFIED ON-SITE WITH PARKS STAFF - BASED ON CONFIRMED CONSTRUCTION SCHEDULE AND PHASING OF WORK.*

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE FOR INSTALLATION OF NEW FULL-DEPTH ASPHALT PATHWAY; REFER TO DETAILS FOR DEPTH REQUIRED

*ALL EXCESS FILL MATERIAL TO BE DISPOSE OF OFF-SITE

REMOVE AND DISPOSE OF (1) EXISTING TREE (#67 - 41cm DBH-SIZE, NORWAY MAPLE) LEGALLY OFF-SITE, INCL. STUMP TO 600mm DEPTH

ASPHALT PARKING LOT

ASPHALT PARKING LOT

CONTRACTOR TO REPAIR ANY DAMAGE TO EX. PAVEMENT/CURBS TO SATISFACTION OF OWNER, TYP.

TREE PROTECTION FENCE: AS PER CITY OF TORONTO STANDARD; (1 / L2.1)

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE AS REQUIRED FOR INSTALLATION OF NEW ENG. WOOD FIBRE SURFACING AND DRAINAGE LAYER; REFER TO DETAILS FOR DEPTH REQUIRED; ALL EXCESS FILL MATERIAL TO BE DISPOSED OF OFF-SITE

REMOVE AND DISPOSE OF EX. CONCRETE CURB AND COMBINED GUTTER; EXCAVATE AS REQUIRED FOR INSTALLATION OF NEW PROPOSED C.I.P CONCRETE CURB W/ GUTTER; REFER TO DETAILS FOR DEPTH REQUIRED

REMOVE AND DISPOSE OF GRANULAR PATH AND EXCAVATE AS REQUIRED FOR INSTALLATION OF PROPOSED SIDEWALK; REFER TO DETAILS FOR DEPTH REQUIRED

EX. BENCH AND CONCRETE PAD TO BE PROTECTED

REMOVE AND DISPOSE OF SOD AND TOPSOIL AND EXCAVATE FOR INSTALLATION OF EXPANDED CONCRETE PAD WITH CURB STOP

ALL TRAFFIC SIGNS TO BE REMOVED; STORED ON-SITE AND REINSTALLED FOLLOWING COMPLETION OF WORK

NOTE: EX. SURFACE/CURB REMOVALS TO EXTEND BEYOND PROPERTY LINE (APPROX. 25m BEYOND EXTENT SHOWN ON THIS PLAN); REFER TO L7.2 FOR FULL EXTENT OF REMOVALS AND PROPOSED WORKS

MATCH LINE - REFER TO L3.3

MATCH LINE - REFER TO L3.3

LEGEND

- EXISTING TREE TO BE PROTECTED
- (TPZ) TREE PROTECTION ZONE
- TREE PROTECTION FENCE; AS PER CITY OF TORONTO STANDARDS
- LS LIGHT STANDARD
- MH MAINTENANCE HOLE
- CB CATCH BASIN
- UP UTILITY POLE
- MW MONITORING WELL
- TOPSOIL & SOD REMOVALS / EXCAVATION FOR NEW WORKS; REFER TO NOTES
- ASPHALT PAVEMENT REMOVALS; REFER TO NOTES
- GRANULAR PATH REMOVALS; REFER TO NOTES
- #1 TREE REFERENCE NO. (REFER TO ARBORIST REPORT FROM URBAN FOREST INNOVATIONS)

NO	YYYY-MM-DD	REVISION	DN	CH
7	2024-05-22	FINAL REVIEW	LP	-
6	2024-03-13	REVIEW & COORDINATION	LP	-
5	2024-01-22	PUCC APPROVAL	LP	-
4	2023-12-06	REVIEW - SIDEWALK EXTENSION	LP	-
3	2023-11-23	FOR 75% REVIEW	LP	-
2	2023-11-02	FOR COORDINATION	LP	-
1	2023-10-30	PRELIMINARY REVIEW	LP	-

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LORI A. PHILP — ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS

Blantyre Park:
Park Improvements
180 Fallingbrook Rd. Scarborough, ON., M1N 1N3

Toronto Parks, Forestry and Recreation

0 2 4 8 Scale = 1:200 metric

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L2.2

TREE PROTECTION, DEMOLITION & REMOVALS PLAN (central park)

MATCH LINE - REFER TO L2.2

MATCH LINE - REFER TO L2.2

BLANTYRE PARK

CLONMORE DRIVE

BLANTYRE AVE.

REMOVE AND DISPOSE OF EX. CONCRETE CURB AND COMBINED GUTTER; EXCAVATE AS REQUIRED FOR INSTALLATION OF NEW C.I.P. CONCRETE BARRIER CURB W/ GUTTER; REFER TO DETAILS FOR DEPTH REQUIRED

**NOTE: PROVIDE CLEAN SAW-CUT EDGE AT EX. ASPHALT PAVEMENT TO REMAIN ON STREET. REMOVE/REPLACE EX. PAVEMENT AS REQUIRED TO INSTALL NEW CURBS AND REPLACE ANY PAVEMENT DAMAGED DURING CONSTRUCTION (TO MATCH EX. CONDITION), TYP.*

REMOVE AND DISPOSE OF EX.GRANULAR PATH AND EXCAVATE AS REQUIRED FOR INSTALLATION OF PROPOSED SIDEWALK; REFER TO DETAILS FOR DEPTH

TREE #47 TO BE INJURED; REFER TO ARBORIST REPORT

EX. BENCH AND CONCRETE PAD TO BE PROTECTED

REMOVE AND DISPOSE OF SOD AND TOPSOIL AND EXCAVATE FOR INSTALLATION OF EXPANDED CONCRETE PAD WITH CURB STOP

REMOVE AND DISPOSE OF EX. CONCRETE CURB AND COMBINED GUTTER; EXCAVATE AS REQUIRED FOR INSTALLATION OF NEW C.I.P. CONCRETE BARRIER CURB W/ GUTTER; REFER TO DETAILS FOR DEPTH REQUIRED

REMOVE AND DISPOSE OF EX. GRANULAR PATH AND EXCAVATE AS REQUIRED FOR INSTALLATION OF PROPOSED SIDEWALK; REFER TO DETAILS FOR DEPTH

TREE PROTECTION FENCE; AS PER CITY OF TORONTO STANDARD; ADJUST FENCING TEMPORARILY TO COMPLETE REMOVALS WORK WITHIN TPZ (1 / L2.1)

TREE PROTECTION ZONE (TPZ); PER CITY OF TORONTO GUIDELINES; REFER TO ARBORIST REPORT

ALL TRAFFIC SIGNS TO BE REMOVED; STORED ON-SITE AND REINSTALLED FOLLOWING COMPLETION OF WORK

EXTENT OF EX. CURB/GUTTER AND GRANULAR SURFACE REMOVALS

REMOVE AND DISPOSE OF EX.BENCH, INCL. FOOTINGS, AND PAVERS LEGALLY OFF-SITE

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE FOR INSTALLATION OF NEW CONCRETE PAVEMENT AND PLANTING BED; REFER TO DETAILS FOR DEPTHS REQUIRED

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE AS REQUIRED FOR INSTALLATION OF NEW ACCESSIBLE PATHWAY; REFER TO DETAILS FOR DEPTH REQUIRED - ** REFER TO GRADING PLAN FOR FULL EXTENT OF GRADING AND SITE DISTURBANCE*

EX. CONC. SIDEWALK AND CURB TO BE PROTECTED

CONSTRUCTION ACCESS FROM BLANTYRE AVENUE
***ACCESS POINTS AND LAYOUT OF SITE FENCING TO BE VERIFIED WITH PARKS STAFF**

CONTRACTOR TO REPAIR ANY DAMAGE TO EX. PAVEMENT/CURBS TO SATISFACTION OF OWNER, TYP.

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE FOR INSTALLATION OF PROPOSED ASPHALT PATHWAYS; REFER TO DETAILS FOR DEPTH REQUIRED; ALL EXCESS FILL MATERIAL TO BE DISPOSED OF OFF-SITE

REMOVE AND DISPOSE OF ASPHALT PAVEMENT (BASE TO REMAIN IN-TACT AND TOPPED UP TO MEET SPECIFIED COMPACTION)

PROVIDE CLEAN, SAW-CUT EDGE AT EX. PAVEMENT TO REMAIN

REMOVE AND DISPOSE OF ALL (6) HORSESHOE PITS (INCL. WOOD BACKBOARDS, SPIKES AND SAND SURFACING) OFF-SITE

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE FOR INSTALLATION OF PROPOSED WORK; REFER TO DETAILS FOR DEPTH REQUIRED; ALL EXCESS FILL MATERIAL TO BE DISPOSED OF OFF-SITE

REMOVE AND DISPOSE OF (4) EX. BENCHES INCL. FOOTINGS OFF-SITE

REMOVE AND DISPOSE OF EX. 1.2m HT. CHAIN LINK FENCE, INCL. FOOTINGS OFF- SITE

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE FOR INSTALLATION OF NEW PLANTING BED; REFER TO DETAILS FOR DEPTHS REQUIRED

TREE #55 TO BE INJURED; REFER TO ARBORIST REPORT

**CONTRACTOR SHALL USE CAUTION AND HAND-DIG WHILE WORKING WITHIN TPZ*

REMOVE ASPHALT PAVEMENT AND BASE TO FULL-DEPTH (AREA TO BE RESTORED WITH TOPSOIL AS REQUIRED AND NEW SOD)

REMOVE ASPHALT PAVEMENT AND BASE TO FULL-DEPTH; EXCAVATE FOR NEW CONCRETE PAD

EXISTING ASPHALT AND GRANULAR SURFACES TO REMAIN AND BE PROTECTED

EXISTING CHAIN LINK BACKSTOP AND ALL FENCING TO REMAIN AND TO BE PROTECTED

REMOVE AND DISPOSE OF 0.2m DIA. TREE STUMP (NOT SURVEYED) - TO 0.6m DEPTH

EXISTING BLEACHERS (TO BE PROTECTED)

EXISTING BLEACHERS TO BE PROTECTED

EXISTING BLEACHERS (TO BE PROTECTED)

ALL EX. LIGHT POLES TO BE PROTECTED

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE AS REQUIRED FOR INSTALLATION OF PROPOSED WORKS: REFER TO DETAILS FOR DEPTH

*ALL EXCESS FILL MATERIAL TO BE DISPOSED OF LEGALLY OFF-SITE

TREE PROTECTION FENCE; AS PER CITY OF TORONTO STANDARD (1 / L2.1)

REMOVE AND DISPOSE OF (1) EXISTING TREE (#61- NORWAY MAPLE, 43cm DBH-SIZE) LEGALLY OFF-SITE, INCL. STUMP TO 600mm DEPTH

REMOVE AND DISPOSE OF ASPHALT PAVEMENT (BASE TO REMAIN IN-TACT AND TOPPED UP TO MEET SPECIFIED COMPACTION)

PROVIDE CLEAN, SAW-CUT EDGE AT EX. PAVEMENT TO REMAIN

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE FOR INSTALLATION OF NEW ASPHALT PATH: REFER TO DETAILS FOR DEPTH REQUIRED

EXISTING ASPHALT AND GRANULAR SURFACES TO REMAIN AND TO BE PROTECTED

CONSTRUCTION ACCESS FROM ADJACENT CITY PARKING LOT
***ACCESS POINTS AND LAYOUT OF SITE FENCING TO BE VERIFIED WITH PARKS STAFF**

CONTRACTOR TO REPAIR ANY DAMAGE TO EX. PAVEMENT/CURBS TO SATISFACTION OF OWNER, TYP.

REMOVE AND DISPOSE OF EXISTING BIKE RACK OFF-SITE

REMOVE AND DISPOSE OF TOPSOIL AND SOD AND EXCAVATE AS REQUIRED FOR INSTALLATION OF NEW ASPHALT PATHWAY: REFER TO DETAILS FOR DEPTH; ALL FILL MATERIAL TO BE DISPOSED OF OFF-SITE

REMOVE AND DISPOSE OF ASPHALT PAVEMENT (GRANULAR BASE SHALL BE STOCK-PILED ON-SITE FOR REUSE IF SUITABLE); AND EXCAVATE AS REQUIRED FOR INSTALLATION FOR NEW ASPHALT PATHWAY: REFER TO DETAILS FOR DEPTH REQUIRED

ADJUST TREE PROTECTION FENCE WHILE WORKING WITHIN TPZ AND REINSTATE

CONSTRUCTION ACCESS FROM ADJACENT CITY PARKING LOT
***ACCESS POINTS AND LAYOUT OF SITE FENCING TO BE VERIFIED WITH PARKS STAFF**

CONTRACTOR TO REPAIR ANY DAMAGE TO EX. PAVEMENT/CURBS TO SATISFACTION OF OWNER, TYP.

TREE #58 (ON NEIGHBOURING PROPERTY) TO BE INJURED; REFER TO ARBORIST REPORT

**CONTRACTOR SHALL USE CAUTION AND HAND-DIG WHILE WORKING WITHIN TPZ*

TEMPORARY SITE FENCING:
- CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A SAFE AND SECURE WORK ENVIRONMENT FOR DURATION OF WORK.
- INSTALL 2-METER HIGH PORTABLE, SECTIONAL METAL FENCE FOR DURATION OF WORK UNTIL ACCEPTANCE.
- CONTRACTOR SHALL PROVIDE ADEQUATE SIGNAGE AT MAIN ACCESS POINTS TO CAUTION PARK USERS OF CONSTRUCTION ACTIVITIES.

**LAYOUT AND EXTENT OF FENCING TO BE VERIFIED ON-SITE WITH PARKS STAFF - BASED ON CONFIRMED CONSTRUCTION SCHEDULE AND PHASING OF WORK.*

EXISTING BASEBALL OUTFIELD

EXISTING GRANULAR INFIELD (TO BE PROTECTED)

EX. LAWN SLOPE

EX. LAWN

ASPHALT PARKING LOT

EX. CHAIN LINK FENCE

EX. BOARD FENCE

EX. PRECAST CURBS (TO BE PROTECTED)

EX. CONC. SIDEWALK/CURB (TO BE PROTECTED)

EX. CONC. SIDEWALK

EX. WASHROOM BUILDING (TO BE PROTECTED)

METAL VAULT

METAL COVER HATCH

WATER VALVE

DITCH INLET

MH

CB

LS

UP

TOP OF SLOPE

BOTTOM OF SLOPE

ADJACENT RESIDENTIAL PROPERTY

OVERHEAD WIRE

LEGEND

- EXISTING TREE TO BE PROTECTED
- (TPZ) TREE PROTECTION ZONE
- TREE PROTECTION FENCE; AS PER CITY OF TORONTO STANDARDS
- LS LIGHT STANDARD
- MH MAINTENANCE HOLE
- CB CATCH BASIN
- UP UTILITY POLE
- MW MONITORING WELL
- TOPSOIL & SOD REMOVALS / EXCAVATION FOR NEW WORKS; REFER TO NOTES
- ASPHALT PAVEMENT REMOVALS; REFER TO NOTES
- GRANULAR PATH REMOVALS; REFER TO NOTES
- .. TREE REFERENCE NO. (REFER TO ARBORIST REPORT FROM URBAN FOREST INNOVATIONS)

NO	YYYY-MM-DD	REVISION	DN	CH
7	2024-05-22	FINAL REVIEW	LP	-
6	2024-03-13	REVIEW & COORDINATION	LP	-
5	2024-01-22	PUCC APPROVAL	LP	-
4	2023-12-06	REVIEW - SIDEWALK EXTENSION	LP	-
3	2023-11-23	FOR 75% REVIEW	LP	-
2	2023-11-02	FOR COORDINATION	LP	-
1	2023-10-30	PRELIMINARY REVIEW	LP	-

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LORI J. PHILP — MEMBER — ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS

Blantyre Park:
Park Improvements

180 Fallingbrook Rd. Scarborough, ON., M1N 1N3

TORONTO
Toronto Parks, Forestry and Recreation

0 2 4 8 — Scale = 1:200 metric — NORTH

VFA Project: 2109
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L2.3

TREE PROTECTION, DEMOLITION & REMOVALS PLAN (south park)

APPENDIX 5 – TREE PROTECTION SPECIFICATIONS

5.1 Scope and Purpose

This section outlines specifications for tree protection, and **not all recommendations may apply to the subject project**. Refer to the main body of the arborist report for tree-by-tree protection recommendations.

5.2 General Provisions

5.2.1 Tree Protection

Four important tree protection measures should be undertaken on the project site if trees are to be preserved in a manner which will maintain their health over the long term. These include:

1. Establishment of tree protection fencing and/or hoarding around adequately-sized Tree Protection Zones (TPZs) prior to the commencement of any construction activity;
2. Installation of root zone compaction protection where compaction may be caused by construction traffic or materials/equipment storage and staging;
3. Implementation of root-sensitive excavation wherever Tree Protection Zones (TPZs) or significant rooting areas may be encroached upon by excavation and/or grading, and;
4. Root pruning in advance of conventional excavation, on an as-needed basis.

5.2.1.1 Tree Protection Zones (TPZs)

The purpose of a Tree Protection Zone (TPZ) is to prevent root damage, soil compaction and soil contamination, and workers and machinery must not encroach upon Tree Protection Zones in any way.

To prevent access and ensure that the TPZ is effective, the following steps shall be implemented in the establishment of TPZ fencing and/or hoarding.

1. The locations of TPZs should be clearly identified on the project Site Plan and associated tree-related plans. Typically, TPZs are to be shown as circles around tree location points, and drawn to scale in accordance with the minimum required TPZ radius, as specified in Appendix 1.
2. No groundbreaking activities or demolition should occur until all tree protection requirements have been met and the consulting arborist has confirmed the establishment of Tree Protection Zone fencing and/or hoarding.
3. Hoarding shall consist of 4’ x 8’ sheets of plywood lain lengthwise and supported using “L” shaped supports to prevent root damage. Hoarding shall be affixed to the frame in such a manner as to prevent removal of individual sections or movement of the entire hoarding structure. Construction fencing can be used where pedestrian or motorist sightlines may be obscured by solid hoarding. Framed construction fencing can also be used to frame large Tree Protection Zones or tree groups, with expressed prior approval of the municipal arborist or their designate. Framed

fencing must be supported by a solid 2' × 4' frame. Fencing and/or hoarding shall be maintained intact throughout the duration of the construction project, unless otherwise specified.

4. Upon installation, all tree protection fencing and/or hoarding must be approved by the municipal arborist or their designate.
5. All fencing and/or hoarding is to remain in place in good condition throughout the entire duration of the project. No fencing and/or hoarding is to be removed, relocated or otherwise altered without the written permission of the municipal arborist or their designate.
6. No grade change, excavation, or storage of fill, equipment or supplies is permitted within the TPZ at any time. Any encroachment of the TPZ shall not be undertaken without expressed written permission of the municipal arborist or their designate. TPZ encroachment may constitute Tree Injury as defined by various municipal tree protection policies and by-laws, and may subject the responsible parties to prescribed penalties.
7. All contractors and supervisors should be informed of the tree protection requirements, including potential penalties, at a pre-construction meeting.
8. Trees and TPZs should be regularly monitored by a consulting arborist throughout the duration of the project.
9. If TPZ encroachment should occur at any time during construction, the consulting arborist should evaluate the trees immediately so that appropriate treatment can be performed in a in a timely manner.
10. Signage similar to the figure shown below should be mounted on each side of TPZ fencing and/or hoarding immediately upon establishment and should be maintained for the duration of the project. Every sign should have minimum dimensions of 40 cm × 60 cm.

Figure 7: Sample TPZ information sign.

5.2.1.2 Root Zone Compaction Protection

Where traffic or access through the root zone is anticipated, a Root Zone Compaction Protection treatment should be installed.

Where limited non-vehicular access across the root zone is anticipated (e.g., occasional foot traffic, wheelbarrow), a Light Root Zone Compaction Protection specification should be implemented:

- Installation of medium-weight non-woven geotextile fabric or landscape cloth over affected area;
- Installation of 150 mm of wood chips over the fabric area;
- Installation of ½" plywood over wood chip mulch, and;
- Installation of appropriate covering material, if desired.

Where moderate non-vehicular access across the root zone is anticipated (e.g., materials staging) a Moderate Root Zone Compaction Protection specification should be implemented:

- Installation of medium-weight non-woven geotextile fabric or landscape cloth over affected area;
- 100 mm of granular clear stone lain over fabric area;
- Installation of medium-weight non-woven geotextile fabric or landscape cloth over the stone;
- Installation of 150 mm of wood chips over fabric area, and;
- Installation of ½" plywood over wood chip mulch.

In areas where frequent non-vehicular access or longer-term materials storage in the root zone is anticipated, or in areas where additional measures must be implemented to ensure complete exclusion of excavation activity, a Horizontal Hoarding/Excavation Exclusion specification should be implemented:

- Installation of medium-weight non-woven geotextile fabric or landscape cloth over affected area;
- Installation of 3 stacked and joined courses of 4" x 4" timbers around the area to be protected (including cross-members or joists, as required to maintain structural integrity);
- Installation of wood chip mulch in entire protected area, and;
- Installation of 2 layers of ¾" plywood or 1 steel plate over the protected area.

In areas where vehicular access or severe potential root zone compaction are anticipated, such as site access roads, temporary parking areas or heavy machine staging areas, a more robust Heavy Root Zone Compaction Protection specification should be developed and implemented on a site-specific basis. Key elements of such a specification may include multiple steel plates over load-dissipating materials, or modular geocellular systems such as Permavoid ArborRaft.

5.2.1.3 Tree-sensitive Demolition

Trees are often damaged by demolition activities undertaken during the clearing stage of the development process. For trees to be adequately protected during site demolitions, root-sensitive demolition protections must be implemented within Tree Protection Zones, as described below:

1. Prior to the commencement of site demolition, tree protection fencing must be established for retained trees.
2. Hardscape materials shall be broken up by hand or hand-operated machinery only (e.g., a hand-operated jackhammer to break up pavement, building foundations, etc.).
3. Machinery should be operated at shallow angles and broken-up materials should be removed by pulling away radially from the protected tree bases, or parallel to the direction of anticipated or observed root growth.
4. Upon removal of demolished materials, uncovered vertical soil profiles must be maintained in good structural integrity and prevented from disintegration (i.e. crumbling, erosion, fragmentation, etc.). Between the time of demolitions and new construction, exposed vertical soils may require shoring reinforcement, including a layer of burlap between shoring and exposed soil.
5. Following demolitions, affected TPZ areas should be reinstated with a high quality soil, such as triple mix soil, to provide a favourable growing medium for the development of new roots of the injured trees. Soil amendments, such as biochar, may also be considered for backfills inclusion. Soil depth should be sufficient to match existing surrounding soil grades.
6. Any roots exposed by demolition should be inspected and, where necessary, pruned by the supervising Certified Arborist in order to minimize permanent root damage.

5.2.1.4 Root-sensitive Excavation

Efforts should be made to exclude excavation or grade changes, including cutting or filling, from all TPZs. Where this is not possible, and unless otherwise specified, excavation shall utilize a root-sensitive methodology such as hand-digging, hydrovac or pneumatic (e.g., AirSpade) soil excavation, as specified in the arborist report.

Root-sensitive excavation must be conducted in advance of excavation using conventional excavation machinery. The objective of root-sensitive excavation is twofold: 1) to determine whether roots will be present beneath areas to be excavated and therefore determine the likely extent of damage to trees to be retained, and 2) to enable proper root pruning, as described below.

Root-sensitive excavation typically entails the creation of a trench approximately 200-300 mm wide between the subject tree (e.g., outside the established tree protection fencing) and the area to be excavated, without damaging existing significant roots. Unless otherwise specified, root-sensitive excavation should be undertaken to a minimum depth of 800 mm, unless excavation is proposed to a

shallower final depth. If excavation is for exploratory reasons and root pruning is not anticipated, equipment utilized during root-sensitive excavation should be operated at reduced pressures to prevent damage to root bark.

No excavation, whether undertaken by conventional or root-sensitive means shall take place within established tree protection zones without expressed written permission of the municipal arborist or their designate.

5.2.1.5 Root Pruning

Root pruning can help reduce the stresses experienced by a tree with root damage, encourage the growth of new fine and feeder roots, and prevent the spread of decay. Root pruning should be undertaken in conjunction with root-sensitive excavation in advance of conventional excavation, or immediately afterwards if unexpected roots are encountered. Root pruning should only be undertaken by an ISA Certified Arborist, and in the manner outlined below:

1. Roots that are severed, exposed, or diseased and are greater than 2.0 cm in diameter should be properly pruned. All roots must be pruned with clean and sharp hand tools only. Shovels, picks or other construction tools shall not be used to prune roots. Wound dressings or pruning paint must not be used to cover the ends of any cut.
2. Roots should be pruned in a similar fashion as branches, taking care to maintain the integrity of the root bark ridge. Root should be pruned back to native soil; root stubs must not be left upon completion of root pruning.
3. Prolonged exposure of tree roots must be avoided – exposed roots should covered and kept moist with soil, mulch, irrigation, or at least moistened burlap if they are to be exposed for longer than 3 hours. All cut roots should be covered with soil or excavated trenches should be backfilled with native material as soon as possible following root pruning.

5.2.1.6 Crown Pruning

During the course of project works, the branches of retained trees may interfere with project works, including site access, materials storage, and new construction. Where any project works present an unavoidable conflict with the branches of retained trees, appropriate clearance crown pruning shall be performed in the manner outlined below:

1. Wherever possible, branches found to be in conflict with construction and equipment should be temporarily tied back, using non-constricting knots to secure the branch. If branches cannot be safely tied back without causing branch damage, including breaking or bark stripping, pruning should be performed, as required.
2. No branches larger than 10 cm in diameter shall be removed, and no more than 20% of the total live crown volume shall be removed from the tree.

3. Crown pruning shall be conducted by an ISA Certified Arborist in accordance with good arboricultural practice, as detailed in the pruning standard *ANSI A300 Part 1 – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices, Pruning*, and in the ANSI Z133.1 safety standard.

5.2.2 Post-construction Care

The following recommendations should be implemented upon completion of construction to ensure that the health and condition of retained and newly-planted trees is maintained and improved.

5.2.2.1 Retained Trees

1. Trees which have been retained through the construction process should be regularly monitored by an ISA Certified Arborist for signs of construction-induced stress, which may not be apparent until 3-6 years after site disturbance.
2. Wherever possible, root zone amelioration including watering and mulching should be undertaken. However, treatments such as fertilization should be avoided unless directly specified by the project consulting arborist.
3. Any physical damage to retained trees should be assessed by the project consulting arborist and properly mitigated, as required. If necessary, broken limbs or exposed roots should be pruned, damaged bark should be traced, and soil decompaction and/or decontamination should be undertaken by an ISA Certified Arborist. Stability of trees with significant root zone disturbance should be assessed, and advanced stability assessment or mitigation should be implemented if necessary.

5.2.2.2 New Trees

1. All newly planted trees and shrubs should be provided with a bed of composted woodchip mulch 10-15 cm thick, extending to at least the dripline of the plant. Mulch should be periodically replaced as it decomposes, and weeds should be removed from the mulch bed manually. The mulch must not touch the bark of the tree and under no circumstances should it be mounded up against the stem in a “volcano” style. This is especially damaging for young trees with thin bark.
2. All new plantings should be watered at least once per week during the growing season within the first two years after planting. Watering intensity should be increased during periods of drought. Watering should be deep and slow, ensuring that water penetrates to deep roots. Trees should not be watered directly adjacent to the trunk, but rather in a circular pattern extending from the trunk to at least the dripline. The soil should be allowed to dry in between watering periods to allow air to reach the roots.
3. Minimal pruning should be undertaken in the first two years after planting. Foliage should be retained to allow for the roots to establish. Only dead, crossing and broken branches should be pruned back to an appropriate pruning point at the time of planting.

APPENDIX 6 – LIMITATIONS OF ASSESSMENT

It is the policy of Urban Forest Innovations to attach the following clause regarding limitations. We do this to ensure that the client is aware of what is technically and professionally realistic in assessing and retaining trees.

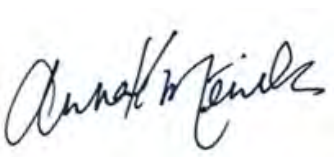
The assessment(s) of the tree(s) presented in this report has been made using accepted arboricultural techniques. These may include, among other factors, a visual examination of: the above-ground parts of the tree(s) for visible structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of pests or pathogens, discoloured foliage, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the proximity of property and people. Except where specifically noted, the tree(s) was not cored, probed, climbed or assessed using any advanced methods, and there was no detailed inspection of the root crown(s) involving excavation.

Notwithstanding the recommendations and conclusions made in this report, it must be recognized that trees are living organisms, and their health and vigour constantly change over time. They are not immune to changes in site or weather conditions, or general seasonal variations. Weather events such as wind or ice storms may result in the partial or complete failure of any tree, regardless of assessment results.

While reasonable efforts have been made to accurately assess the overall condition of the subject tree(s), no guarantee or warranty is offered, expressed or implied, that the tree(s) or any of its parts will remain standing or in stable condition. It is both professionally and practically impossible to predict with absolute certainty the behaviour of any single tree or its component parts, regardless of the assessment methodology implemented. Inevitably, a standing tree will always pose some level of risk. Most trees have the potential for failure under adverse weather conditions, and the risk can only be eliminated if the tree is removed.

Although every effort has been made to ensure that this assessment is reasonably accurate, the tree(s) should be re-assessed periodically. The assessment presented in this report is only valid at the time of inspection.

Respectfully submitted by,



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1 GEOTECHNICAL INVESTIGATION REPORT

1. A copy of a report of subsurface investigation and geotechnical evaluation made at the building siteis appended to this Section, titled as follows:

   Geotechnical Investigation
   Blantyre Park 180 Fallingbrook Road Etobicoke, Ontario
   Prepared by AllRock Consulting Ltd
   March 21, 2024

.1 Bidders are required to submit their bids upon the express condition that they shall have satisfied themselves before bidding, by personal examination of the location of the proposed works, or by such other means as they may prefer, as to the actual conditions and requirements of the Work.

.2 The sub-surface investigation information indicates properties of the soils and recommendations for the design of foundations and was prepared primarily for the use of the Consultant. The recommendations given shall not be construed as a requirement of the Contract unless also contained in the Contract Documents.

.3 This report does not form part of the Contract Documents.

.4 This report, by its nature, cannot reveal all conditions that exist or can occur on the site. Should sub-surface conditions, in the opinion of the Consultant, be found to vary substantially from the report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract Price accruing to the Owner.

.5 This subsurface investigation is furnished by the Owner to the Contractor and is included in these specifications only for the ease of reference. The Owner and the Consultant assume no responsibility for the accuracy or completeness of the information contained in the report.

.6 Direct all questions pertaining to the geotechnical investigation to the report's author.

END OF SECTION

AllRock Consulting Ltd

Blantyre Park
180 Fallingbrook Road
Etobicoke, Ontario

Geotechnical Investigation

March 21, 2024
Project: 23301

Submitted to:
Cherie Ng Architect
2662 Bloor Street West
Etobicoke, ON
M8X 2Z7

Prepared by:
AllRock Consulting Ltd
24 Brydon Drive, Unit #5
Toronto, Ontario
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March 21, 2024 Project: 23301

Cherie Ng Architect
2662 Bloor Street West,
Etobicoke, ON
M8X 2Z7

Attention: **Cherie Ng – OAA | MRAIC | B.Sc. Arch. | M. Arch.**
Founder, Interior Designer Architect

Re: **Geotechnical Investigation**
180 Fallingbrook Road
Blantyre Park
Etobicoke, Ontario

Enclosed is our geotechnical investigation report for the above noted project, in accordance with our proposal dated September 14th, 2023. This report was prepared by Gregory Davidson, P.Eng. and Scott Allen, P.Eng.

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VP – Geotechnical Lead
Project Manager
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1.0 INTRODUCTION

This report presents the results of a geotechnical investigation carried out for the proposed Blantyre Park public pool construction project located at 180 Fallingbrook Road in Etobicoke, Ontario.

The purpose of the investigation was to identify the general subsurface conditions at the site by means of a limited number of boreholes and, based on the factual information obtained, to provide engineering guidelines on the geotechnical design aspects of the project, including construction considerations that could influence design decisions.

This investigation was carried out in general accordance with our proposal dated September 14th, 2023.

2.0 BACKGROUND

2.1 Project Description

It is understood that the proposed scope for the project involves the construction of a new public pool at 180 Fallingbrook Road, in Etobicoke, ON.

AllRock notes no previous investigations have been conducted for the project.

3.0 SUBSURFACE INVESTIGATION

3.1 Geotechnical Investigation

The field work for this investigation was carried out on November 21 and 22, 2023. During that time, three (3) hand augerholes, numbered HA23-2, HA23-8, HA23-12 and ten (10) boreholes numbered, BH23-3, BH23-4, BH23-6, BH23-7, BH23-10, and BH23-11, as well as MW23-1, MW23-5 and MW23-9, were advanced to depths of approximately 1.5 to 4.4 metres below existing grade, using a rubber track mounted drill rig, owned, and operated by Terra Firma Environmental Services Ltd and manual sampling equipment by AllRock.

The borehole locations were selected by AllRock with direction from the Client and positioned on-site relative to existing features. The field work was observed throughout by a member of our engineering staff who directed the drilling operations and logged the samples.

Standard penetration tests (SPT) were carried out in the geotechnical boreholes and samples of the soils encountered were recovered using a 51-millimetre diameter split barrel sampler. It is noted that three (3) monitoring wells were installed in boreholes MW23-1, MW23-5 and MW23-9 to measure the groundwater levels at the site.

Following completion of the drilling, the soil samples were returned to our laboratory for examination by a geotechnical/ materials engineer. Selected samples were submitted for moisture content and grain size distribution testing. In addition, four (2) soil sample was for basic chemical testing relating to corrosion of buried concrete and steel. The results of the corrosion testing will be provided in Appendix B.

The approximate locations of the boreholes are shown on the Borehole Location Plan, Figure 2. The results of the boreholes and water levels are provided on the Record of Borehole Sheets in Appendix B. Laboratory testing results are provided in Appendix B.

3.2 Methodology

Materials and soil description have been made with reference to the following documents:

- Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) – ASTM D2487-06
- Standard Practice for the Description and Identification of Soils (Visual-Manual Procedure) – ASTM D2488-06

4.0 SUBSURFACE CONDITIONS

4.1 General

As previously indicated, the soil and groundwater conditions identified in the boreholes are given on the Record of Borehole sheets in Appendix A. The logs indicate the subsurface conditions at the specific test locations only. Boundaries between zones on the logs are often not distinct, but rather are transitional and have been interpreted. The precision with which subsurface conditions are indicated depends on the method of exploration, the frequency and recovery of samples, the method of sampling, and the uniformity of the subsurface conditions. Subsurface conditions at other than the borehole locations may vary from the conditions encountered in the boreholes.

The soil descriptions in this report are based on commonly accepted methods of classification and identification employed in geotechnical practice. Classification and identification of soil involves judgement and AllRock does not guarantee descriptions as exact but infers accuracy to the extent that is common in current geotechnical practice.

The groundwater conditions described in this report refer only to those observed at the place and time of observation noted in the report. It is noted that groundwater conditions can vary seasonally or as a result of construction activities in the area.

The following presents an overview of the subsurface conditions encountered in the boreholes advanced during this investigation.

4.2 Topsoil

A surficial layer of topsoil material was encountered in all boreholes. The topsoil can be described as brown silty sand/sandy silt and contains organic material. The thickness of this layer was about 80 to 100 millimteres.

4.3 Fill Material

A layer of fill material was encountered in all boreholes below the surficial topsoil. The fill material can generally be described as brown, fine to coarse grained sand with trace to some gravel and silt. The fill layer extends to depths ranging from about 0.5 to 3.05 metres below existing grade.

HA23-12 was terminated within the fill material at a depth of about 1.5 metres below existing grade.

4.4 Sand

Native deposits of brown, fine to coarse grained sand, with trace silt, clay and gravel were encountered below the fill material at all borehole locations excluding HA23-8. The sand extends to depths of about 4.4 metres below existing grade in all boreholes excluding HA23-2, HA23-8, and HA23-12.

HA23-2 was terminated within the sand material at a depth of about 1.52 metres below existing grade.

Standard penetration tests carried out in the sand material gave N values of 3 to greater than 50 blows per 0.3 metres of penetration, which reflects very loose to very dense relative density.

4.5 Gravelly Sand

Native deposits of brown gravelly sand, with some silt were encountered in augerhole HA23-8 at a depth of about 0.9 metres below existing grade. This hand augerholes was terminated within the gravelly sand at a depth of about 1.5 metres below existing grade.

4.6 Groundwater Level

On December 8th, 2023, the groundwater levels were observed in the well screens installed in boreholes MW23-1, MW23-5, and MW23-9. It is noted that all wells were determined to be dry.

It should be noted that the groundwater levels may be higher during wet periods of the year such as the early spring or following periods of precipitation.

4.7 Gradation Analysis and Moisture Content

The results of grain size distribution carried out on selected samples are provided in Appendix B and summarized in Table 4.1.

Table 4.1 – Summary of Grain Size Distribution Testing

Location	Sample Number	Sample Depth (m)	Test Type	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
BH 23-4	SS2	0.76-1.37	Hydro	9.0	76.0	8.6	6.4
BH 23-6	SS5	3.81-4.42	Hydro	0.0	92.0	2.2	5.8
BH 23-10	SS6	3.81-4.42	Hydro	10.0	79.0	2.7	8.3
BH 23-1	SS6	3.81-4.42	Grain	0.8	93.8	5.4	
BH 23-3	SS4	2.28-2.89	Grain	3.9	87.5	8.6	
BH 23-8	SS2	0.3-1.52	Grain	20.8	67.5	11.7	

Moisture content analysis conducted on these samples yielded a moisture content of 2.8 to 6.8 percent moisture content.

4.8 Soil Chemistry Relating to Corrosion

The results of chemical testing of four (4) soil samples are summarized in Table 4.2 and provided in Appendix C.

Table 4.2 – Summary of Chemistry Relating to Corrosion (Soil)

Borehole / Location	Sample Number	pH	Sulphate Content (percent)	Chloride Content (percent)	Electrical Conductivity (microsiemens per centimetre)	Electrical Resistivity (Ohm centimetres)
BH 23-9	SS4	8.02	<0.01	0.002	0.14	7,143
BH 23-10	SS4	9.06	<0.01	0.010	0.32	2,135
BH 23-6	SS4	8.89	<0.01	<0.002	0.08	12,500
BH 23-4	SS4	8.26	<0.01	<0.002	0.11	9,091

5.0 RECOMMENDATIONS AND GUIDELINES

5.1 General

The information in the following sections is provided for the guidance of the design engineers and is intended for the design of this project only. Contractors bidding on or undertaking the works should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction, and make their own interpretation of the factual data as it affects their construction techniques, schedule, safety, and equipment capabilities. The professional services retained for this project include only the geotechnical aspects of the subsurface conditions.

The National Building Code of Canada 2020 Guidelines (hereafter NBCC 2020), the 2012 Ontario Building Code (OBC 2012) and the 4th edition of the Canadian Foundation Engineering Manual, 2006 (hereafter CFEM 2006) were considered for these recommendations. Based on the collected information on boreholes drilling as part of this investigation, the geotechnical recommendations are presented in the following sections.

5.2 Proposed Public Pool and Structures

5.2.1 Excavation

The excavation for the proposed pool and any slab-on-grade structures will be carried out through topsoil, existing site fill material and sand/gravelly sand. The sides of the excavation should be sloped in accordance with the requirements in Ontario Regulation 213/91 under the Occupational Health and Safety Act. According to the act, soils at this site can be classified as Type 3. That is, open cut excavations within overburden deposits should be carried out with side slopes of 1 horizontal to 1 vertical, or flatter. Where excavation side slopes cannot be accommodated due to space constraints, a shoring system may be required. Additional guidelines for the design and selection of a suitable shoring system could be provided as the design progresses.

In the event that a granular pad is necessary below the foundations, the excavations should be sized to accommodate a pad of imported granular material which extends at least 0.6 metres horizontally beyond the edge of the footings and down and out from this point at 1 horizontal to 1 vertical, or flatter.

5.2.2 Groundwater and Pumping Management

Groundwater inflow, if any, from the overburden deposits should be controlled by pumping from filtered sumps within the excavation. It is not expected that short term pumping during excavation will have a significant effect on nearby structures and services. It is anticipated that groundwater inflow from the overburden deposits into the excavations could be handled from within the excavations.

It is noted that groundwater levels and surface water flows can increase during wet periods of the year such as the early spring or following periods of precipitation.

Suitable detention and filtration will be required before discharging water. The contractor should be required to submit an excavation and groundwater management plan for review.

5.2.3 Subgrade Preparation and Placement of Engineered Fill

Any existing topsoil, organic material, fill, and/or weathered/disturbed soil should be removed from below the proposed pool and any structures. Based on existing grades at this site, it is assumed that the required grade raise will be minimal (if any).

The native sands at this site could likely be re-used at this site; however, re-use material should be approved by geotechnical personnel at time of construction.

In the footprint of the proposed pool and any structures, all unsuitable soil must be removed to a competent subgrade prior to raising the grades with engineered fill. The exposed subgrade should be proof-rolled and inspected under geotechnical supervision. Any soft, wet, loose, organic or disturbed soil should be sub-excavated and replaced with clean, engineered fill material and compacted in maximum 200-millimetre-thick lifts to at least 95 percent of the standard Proctor maximum dry density. The engineered fill should extend at least 3 metres beyond the footprint of the structures.

It is noted that engineered fill in excess of 1 metre thick can be expected to experience post-construction settlement in the order of 0.5 to 1 precent of the height of the soil placed (depending on the composition of the engineered fill). It is anticipated that if engineered soil is sourced from the native onsite soils, it may take 2 to 4 months for the majority of post-construction settlement to occur; however, if imported granular fill as such as that meeting the (OPSS) requirements for Granular B Type II, settlement will likely occur within 1 to 2 weeks of placement.

Imported granular material (engineered fill) should be used to raise the grade in areas where the proposed founding level is above the level of the native soil, or where sub-

excavation of material is required below proposed founding level. The engineered fill should consist of granular material meeting Ontario Provincial Standard Specifications (OPSS) requirements for Granular B Type II and should be compacted in maximum 200-millimetre-thick lifts to at least 99 percent of the standard Proctor maximum dry density. To allow spread of load beneath the footings, the engineered fill should extend horizontally at least 0.6 metres beyond the footings and then down and out from the edges of the footings at 1 horizontal to 1 vertical, or flatter. The excavations should be sized to accommodate this fill placement.

5.2.4 Spread Footing Design

In general, the native sands and/or engineered fill above the native sands are considered suitable to support the proposed structures founded on conventional spread footing foundations. The existing fill layers are not considered suitable for the support of the proposed structures or concrete floor slabs and should be removed from the proposed building areas.

For design purposes, footings bearing on the native, undisturbed sand/gravelly sand material, or on a pad of engineered fill above native, undisturbed sand/gravelly sand should be sized using a geotechnical reaction at Serviceability Limit State (SLS) of 80 kilopascals and a factored geotechnical resistance at Ultimate Limit State (ULS) of 120 kilopascals.

The post construction total and differential settlement of footings should be less than 25 and 15 millimetres respectively, provided that all loose or disturbed soil is removed from the bearing surface and provided that any engineered fill material is compacted to the required density.

5.2.5 Frost Protection of Foundations

All exterior footings etc. should be provided with at least 1.2 metres of earth cover for frost protection purposes. Isolated, unheated exterior footings adjacent to surfaces which are cleaned of snow cover during the winter months should be provided with a minimum of 1.5 metres of earth cover. Alternatively, the required frost protection could be provided by means of a combination of earth cover and extruded polystyrene insulation. Further details regarding the insulation of foundations could be provided at the detailed design stage, if necessary.

5.2.6 Foundation Wall Backfill and Drainage

The backfill against structures should consist of free draining, non-frost susceptible material, such as sand/sand and gravel meeting OPSS Granular B Type I or II

requirements. The backfill should be compacted in maximum 300 millimetre thick lifts to at least 95 percent of the standard Proctor dry density value using suitable vibratory compaction equipment.

Where the backfill will ultimately support areas of hard surfacing (pavement, sidewalks or other similar surfaces), the backfill should be placed in maximum 200 millimetre thick lifts and should be compacted to at least 95 percent of the standard Proctor maximum dry density value using suitable vibratory compaction equipment. Light, walk behind compaction equipment should be used next to foundation walls to avoid excessive compaction induced stress on the foundation walls.

Where areas of hard surfacing (pavement, etc.) abut the proposed structure, a gradual transition should be provided between those areas of hard surfacing underlain by non-frost susceptible granular wall backfill and those areas underlain by existing frost susceptible materials to reduce the effects of differential frost heaving. It is suggested that granular frost tapers be constructed from the bottom of the excavation, or 1.2 metres below finished grade, whichever is less, to the underside of the granular base/subbase material for the hard surfaced areas. The frost tapers should be sloped at 1 horizontal to 1 vertical, or flatter.

Where future landscaped areas will exist next to the proposed structures and if some settlement of the backfill is acceptable, the backfill could be compacted to at least 90 percent of the standard Proctor maximum dry density value.

Perimeter foundation drainage is not considered necessary for slab on grade structures at this site, provided that the floor slab level is above the finished exterior ground surface level.

5.2.7 Concrete Slab Support

Based on the results of the investigation, the area in the vicinity of the proposed pool is generally underlain by topsoil, fill material, and native overburden deposits. The existing topsoil and fill material should be removed from the founding area. The grade below the pool or concrete slabs could be raised, where necessary, with granular material meeting OPSS requirements for Granular B Type I or II. The use of Granular B Type II material is preferred under wet conditions. The granular base for the proposed slab on grade should consist of at least 150 millimetres of OPSS Granular A.

All imported granular materials placed below the proposed floor slab should be compacted in maximum 200-millimetre thick lifts to at least 99 percent of the standard Proctor maximum dry density value.

Proper moisture protection with a vapour retarder should be used for any slab on grade where the floor will be covered by moisture sensitive flooring material or where moisture sensitive equipment, products or environments will exist. The “Guide for Concrete Floor and Slab Construction”, ACI 302.1R-04 should be considered for the design and construction of vapour retarders below the floor slab.

Underfloor drainage is not considered necessary provided that the floor slab level is above the finished exterior ground surface level.

Thermal protection of the concrete slabs is required in areas that will remain unheated during the winter period. The type of insulation used below the slabs will depend on the stresses imposed on the insulation. The stress on the insulation should not exceed about 35 percent of the insulation’s quoted compressive strength due to the time dependent creep characteristics of this material. Further comments could be provided as the design progresses.

5.2.8 Seismic Site Classification

According to Table 4.1.8.4.A of the Ontario Building Code, 2012, Site Class D should be used for the seismic design of the structures bearing on native soils or on engineered fill material over native soils.

6.0 ADDITIONAL CONSIDERATIONS

6.1 Effects of Construction Induced Vibration

Some of the construction operations (such as excavation, granular material compaction, etc.) will cause ground vibration on and off on the site. The vibrations will attenuate with distance from the source but may be felt at nearby structures. Assuming that any excavating is carried out in accordance with the guidelines in this report, the magnitude of the vibrations will be much less than that required to cause damage to the nearby structures or services in good condition but may be felt at the nearby structures. Consideration could be given to completing preconstruction surveys be carried out on the adjacent structures so that any damage claims can be addressed in a fair manner.

6.2 Excess Soil Management Plan

This report does not constitute an excess soil management plan. The disposal requirements for excess soil from the site will be provided under sperate cover from AllRock.

6.3 Design Review and Construction Observation

It is recommended that the final design drawings be reviewed by the geotechnical engineer to ensure that the guidelines provided in this report have been interpreted as intended.

The engagement of the services of the geotechnical consultant during construction is recommended to confirm that the subsurface conditions throughout the proposed excavations do not materially differ from those given in the report and that the construction activities do not adversely affect the intent of the design. The subgrade surfaces for the proposed pool and any structures should be inspected by experienced geotechnical personnel to ensure that suitable materials have been reached and properly prepared. The placing and compaction of earth fill and imported granular materials should be inspected to ensure that the materials used conform to the grading and compaction specifications.

7.0 CLOSURE

We trust this report provides sufficient information for your present purposes. If you have any questions concerning this report, please do not hesitate to contact our office.

G. Davidson

Gregory Davidson, P.Eng.
VP – Geotechnical Lead
Project Manger - Ottawa

Scott Allen, P.Eng.
President
Geotechnical Engineer

FIGURE TITLE:	KEY MAP
PROJECT:	GEOTECHNICAL INVESTIGATION
CLIENT:	CHERIE NG ARCHITECT
ADDRESS:	BLANTYRE PARK, TORONTO, ON
PROJECT NO:	23301
APPROXIMATE SCALE:	NTS

AllRock Consulting Ltd

DATE: DEC. 2023	FIGURE NO.: 1
DRAWN BY: ES	CHECKED BY: GD

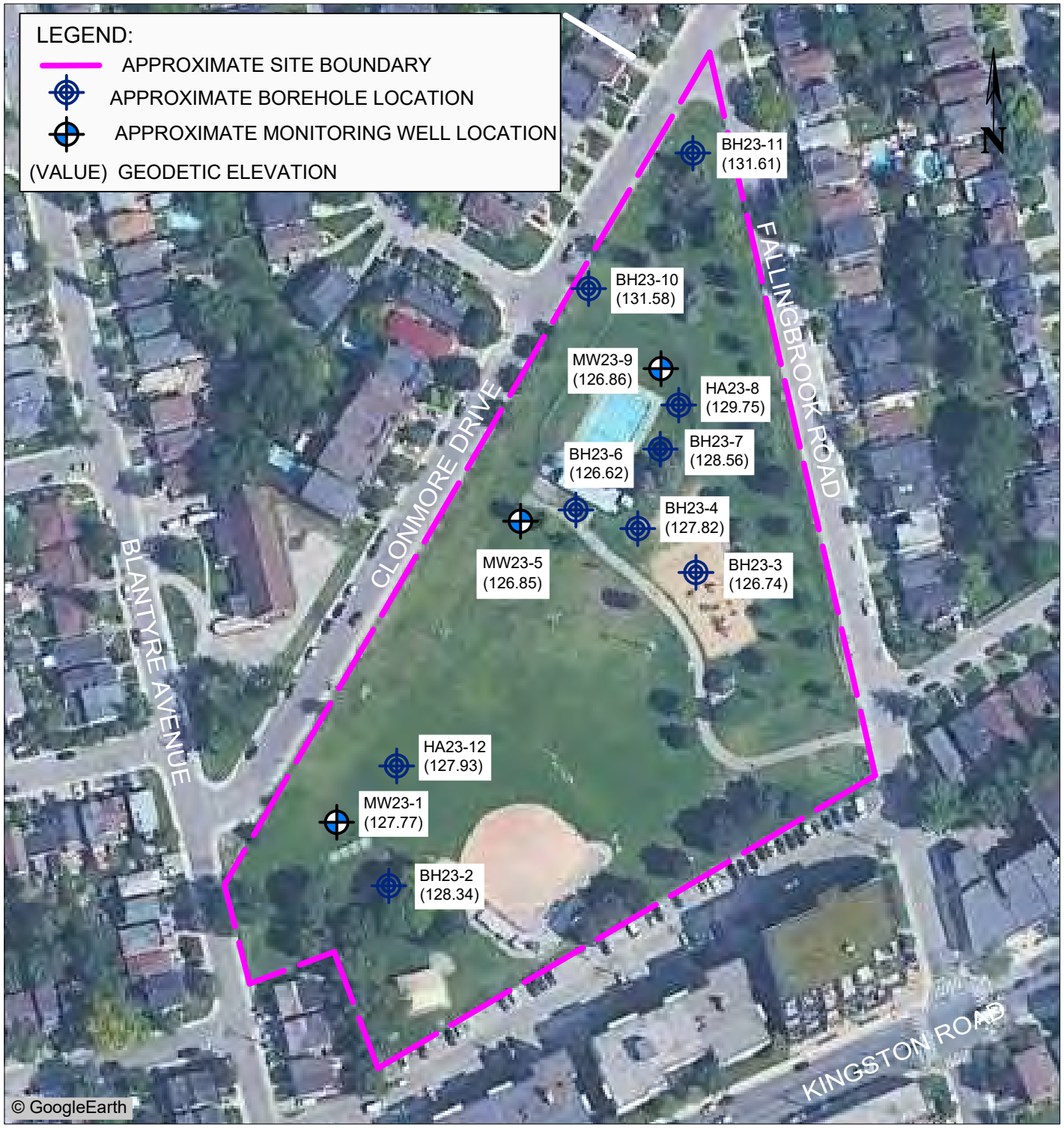

FIGURE TITLE:	BOREHOLE LOCATION PLAN
PROJECT:	GEOTECHNICAL INVESTIGATION
CLIENT:	CHERIE NG ARCHITECT
ADDRESS:	BLANTYRE PARK, TORONTO, ON
PROJECT NO:	23301
APPROXIMATE SCALE:	NTS

AllRock Consulting Ltd

DATE: DEC. 2023	FIGURE NO.: 2
DRAWN BY: ES	CHECKED BY: GD

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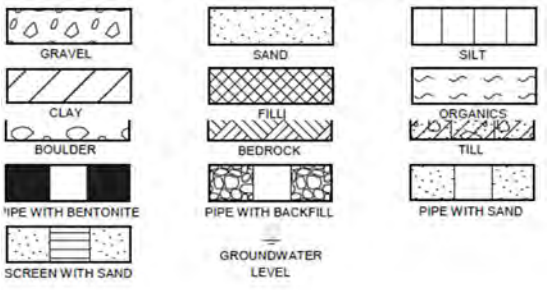
Appendix A

Record of Borehole Sheets

LIST OF ABBREVIATIONS AND TERMINOLOGY FOR LOGS

SAMPLE TYPES	
AS	Auger sample
BS	Block sample
CS	Chunk sample
DD	Diamond drilling
GS	Grab sample
MS	Manual sample
RC	Rock core
SC	Soil core
SS	Split spoon sampler – note size
ST	Slotted tube
TO	Thin-walled, open – note size (Shelby tube)
TP	Thin-walled, piston – note size (Shelby tube)
WS	Wash sample

SOIL TESTS	
w	Water content
PL, w_p	Plastic limit
LL, w_L	Liquid limit
C	Consolidation (oedometer test)
D_R	Relative density
DS	Direct shear test
GS	Specific gravity
M	Sieve analysis for particle size
MH	Combined sieve and hydrometer analysis
MPC	Modified proctor compaction test
SPC	Standard Proctor compaction rest
OC	Organic content test
UC	Unconfined compression test
γ	Unit Weight



PENITRATION RESISTANCE

Standard Penetration Resistance SPT (N):

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split-spoon sampler for a distance of 300 mm (12 in.). Values reported are as recorded in the field and are uncorrected.

Dynamic Penetration:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive a 50 mm (2 in.) diameter 60° cone attached to 'A' size drill rods for a distance of 300 mm (12 in.).

WH: Sampler advanced by static weight of hammer and drill rods

WR: Sampler advanced by static weight of drill rods

PH: Sampler advanced by hydraulic pressure from drill rig

PM: Sampler advanced by manual pressure.

Cohesionless Soil (Density)		Cohesive Soil (Consistency)	
SPT 'N'	**Description**	**Cu, kPa**	**Description**
0-4	Very loose	0-12	Very soft
4-10	Loose	12-25	Soft
10-30	Compact	25-50	Firm
30-50	Dense	50-100	Stiff
>50	Very Dense	100-200	Very Stiff
		>200	Hard

Percentage by Mass (%)	Description
>35	Noun and main fraction (i.e. sand)
>20 to 35	Adjective (i.e. silty)
>10 to 20	Some
0 to 10	Trace

Grain Size (mm)	Description
200 to 1000	**Boulder**
80 to 200	**Cobble**
5 to 80	**Gravel**
0.01 to 5	**Sand** Fine (0.08-0.4) Medium (0.4-2) Coarse (2-5)
0.01 to 0.08	**Silt and Clay**

AllRock Consulting Ltd

WELL NUMBER MW23-1

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 127.771 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 1	33	4-4-5-3 (9)		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL) 127.67 Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	Flushmount Protective Casing Backfilled with auger cuttings
	SS 2	50	2-2-1-2 (3)		1.52 126.25	50mm diameter PVC riser Bentonite Seal
2	SS 3	50	2-1-2-5 (3)		Brown fine to coarse grained SAND, trace silt and gravel -Dry	Filter Sand
	SS 4	83	4-8-9-10 (17)			
	SS 5	100	14-10-24-32 (34)			50mm diameter PVC screen
4	SS 6	100	13-24-50-50 (74)		4.42 123.35	

End of Borehole

Bottom of hole at 4.42 m.

BORING NUMBER HA23-2

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-22 **COMPLETED** 23-11-22
GROUND ELEVATION 128.34 m **HOLE SIZE** 35mm
DRILLING CONTRACTOR AllRock
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	
	GB 1		Brown silty sand/sandy silt, contains organic material (TOPSOIL)	128.24
0.10			Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	
0.76	GB 2		Brown fine to coarse grained SAND, trace silt and gravel -Dry	127.58
1.52			End of Borehole	126.82

Bottom of hole at 1.52 m.

BORING NUMBER 23-3

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 126.74 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
	SS 1	50	6-8-20-12 (28)		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL)	126.64
					Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	
	SS 2	58	2-1-2-4 (3)			
					1.52	125.22
2	SS 3	67	2-2-4-7 (6)		Brown fine to coarse grained SAND, trace silt and gravel -Dry	
	SS 4	62	3-4-4-5 (8)			
	SS 5	83	9-18-18-22 (36)			
4	SS 6	100	8-10-12-18 (22)		4.42	122.32
					End of Borehole	
					Bottom of hole at 4.42 m.	

BORING NUMBER 23-4

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-22 **COMPLETED** 23-11-22
GROUND ELEVATION 127.822 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
	SS 1	33	5-6-5-6 (11)		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL)	127.72
					Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	
	SS 2	50	9-7-4-6 (11)			
					1.52	126.30
2	SS 3	67	10-7-6-5 (13)		Brown fine to coarse grained SAND, trace silt, clay and gravel -Dry	
	SS 4	67	3-8-7-11 (15)			
	SS 5	75	7-11-21-33 (32)			
4	SS 6	83	9-21-24-25 (45)			
					4.42	123.40
					End of Borehole	
					Bottom of hole at 4.42 m.	

WELL NUMBER MW23-5

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 126.849 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 1	75	3-5-6-6 (11)		0.08 Brown silty sand/sandy silt, contains organic material (TOPSOIL) 126.77 Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	Flushmount Protective Casing Backfilled with auger cuttings
	SS 2	75	7-7-7-7 (14)		1.37 125.48	50mm diameter PVC riser Bentonite Seal Filter Sand
2	SS 3	83	5-7-9-16 (16)		Brown fine to coarse grained SAND, trace silt and gravel -Dry	
	SS 4	83	9-14-25-25 (39)			
	SS 5	100	11-20-32-47 (52)			50mm diameter PVC screen
4	SS 6	100	6-15-21-24 (36)		4.42 122.43 End of Borehole Bottom of hole at 4.42 m.	

BORING NUMBER 23-6

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 126.622 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
	SS 1	83	4-4-5-6 (9)		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL)	126.52
					0.50 Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	126.12
	SS 2	92	9-11-11-11 (22)		Brown fine to coarse grained SAND, trace silt and clay -Dry	
2	SS 3	100	6-12-15-23 (27)			
	SS 4	100	16-32-43-50 (75)			
	SS 5	100	20-26-22-40 (48)			
4	SS 6	100	6-19-18-22 (37)		4.42	122.20

End of Borehole

Bottom of hole at 4.42 m.

BORING NUMBER 23-7

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-22 **COMPLETED** 23-11-22
GROUND ELEVATION 128.575 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
	SS 1	50	5-4-5-7 (9)		0.08 Brown silty sand/sandy silt, contains organic material (TOPSOIL)	128.50
					Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	
					0.61	127.97
	SS 2	75	5-4-5-6 (9)		Brown fine to coarse grained SAND, trace silt and gravel -Dry	
2	SS 3	83	2-3-6-8 (9)			
	SS 4	100	10-15-16-20 (31)			
	SS 5	100	10-11-15-26 (26)			
4	SS 6	100	8-12-16-23 (28)		4.42	124.16
					End of Borehole	
					Bottom of hole at 4.42 m.	

BORING NUMBER HA23-8

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-22 **COMPLETED** 23-11-22
GROUND ELEVATION 129.747 m **HOLE SIZE** 35mm
DRILLING CONTRACTOR AllRock
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	
	GB 1		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL)	129.65
			Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	
	GB 2		0.90	128.85
			Brown GRAVELLY SAND, some silt -Dry	
			1.52	128.23
			End of Borehole	

Bottom of hole at 1.52 m.

WELL NUMBER MW23-9

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 129.679 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 1	92	4-6-8-10 (14)		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL) 129.58 Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	Flushmount Protective Casing Backfilled with auger cuttings
	SS 2	83	4-4-5-4 (9)			50mm diameter PVC riser Bentonite Seal Filter Sand
					1.52 128.16	
2	SS 3	100	4-3-2-3 (5)		Brown fine to coarse grained SAND, trace silt and gravel -Dry	
	SS 4	71	6-10-10-18 (20)			50mm diameter PVC screen
	SS 5	50	4-6-16-32 (22)			
4	SS 6	54	5-8-10-19 (18)		4.42 125.26	
					End of Borehole Bottom of hole at 4.42 m.	

BORING NUMBER 23-10

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-21 **COMPLETED** 23-11-21
GROUND ELEVATION 131.576 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
	SS 1	33	3-7-6-7 (13)		0.08 Brown silty sand/sandy silt, contains organic material (TOPSOIL)	131.50
					Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	
	SS 2	67	8-11-11-16 (22)			
2	SS 3	50	11-16-20-16 (36)			
	SS 4	97	6-6-5-10 (11)		3.05	128.53
	SS 5	83	6-8-8-8 (16)		Brown fine to coarse grained SAND, some sand, trace silt and clay -Dry	
4	SS 6	100	5-10-10-12 (20)		4.42	127.16
					End of Borehole	
					Bottom of hole at 4.42 m.	

BORING NUMBER 23-11

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-22 **COMPLETED** 23-11-22
GROUND ELEVATION 131.613 m **HOLE SIZE** 150mm
DRILLING CONTRACTOR Terra Firma Drilling
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
	SS 1	50	2-4-6-7 (10)		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL) 131.51 Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)
	SS 2	75	3-4-7-8 (11)		1.22 130.39
2	SS 3	70	10-8-7-9 (15)		Brown fine to coarse grained SAND, trace silt and gravel -Dry
	SS 4	83	11-12-12-14 (24)		
	SS 5	75	8-10-12-13 (22)		
4	SS 6	83	9-6-7-11 (13)		4.42 127.19
					End of Borehole Bottom of hole at 4.42 m.

BORING NUMBER HA23-12

AllRock Consulting

CLIENT Cherie Ng Architecture
PROJECT NAME Geotechnical Investigation - Blantyre Park
PROJECT NUMBER 23301
PROJECT LOCATION 180 Fallingbrook Road, Scarborough, ON
DATE STARTED 23-11-22 **COMPLETED** 23-11-22
GROUND ELEVATION 127.93 m **HOLE SIZE** 35mm
DRILLING CONTRACTOR AllRock
GROUND WATER LEVELS:
DRILLING METHOD
AT TIME OF DRILLING ---
LOGGED BY E.Syed **CHECKED BY** Greg Davidson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	
	GB 1		0.10 Brown silty sand/sandy silt, contains organic material (TOPSOIL)	127.83
			Brown fine to coarse grained sand, trace to soem gravel and silt (FILL MATERIAL)	
	GB 2			
			1.52	126.41
			End of Borehole	
			Bottom of hole at 1.52 m.	

AllRock Consulting Ltd
24 Brydon Drive, Unit #5
Toronto, ON M9W 5R6
1-844-440-7625
www.allrockconsulting.com

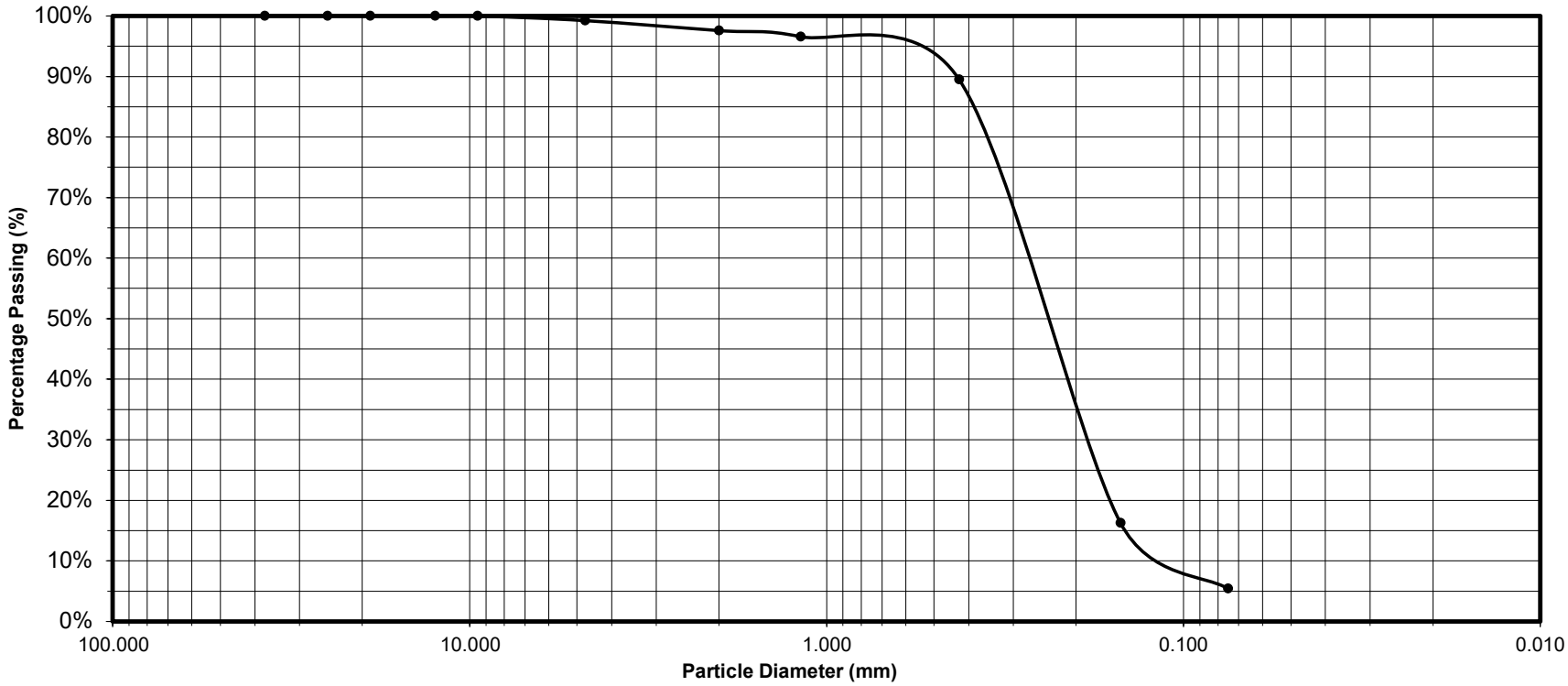
Appendix B

Laboratory Testing Results

Sieve Analysis
LS-602

AllRock Consulting Ltd
24 Brydon Drive, Unit #5
M9W 5R6, Toronto, Ont.

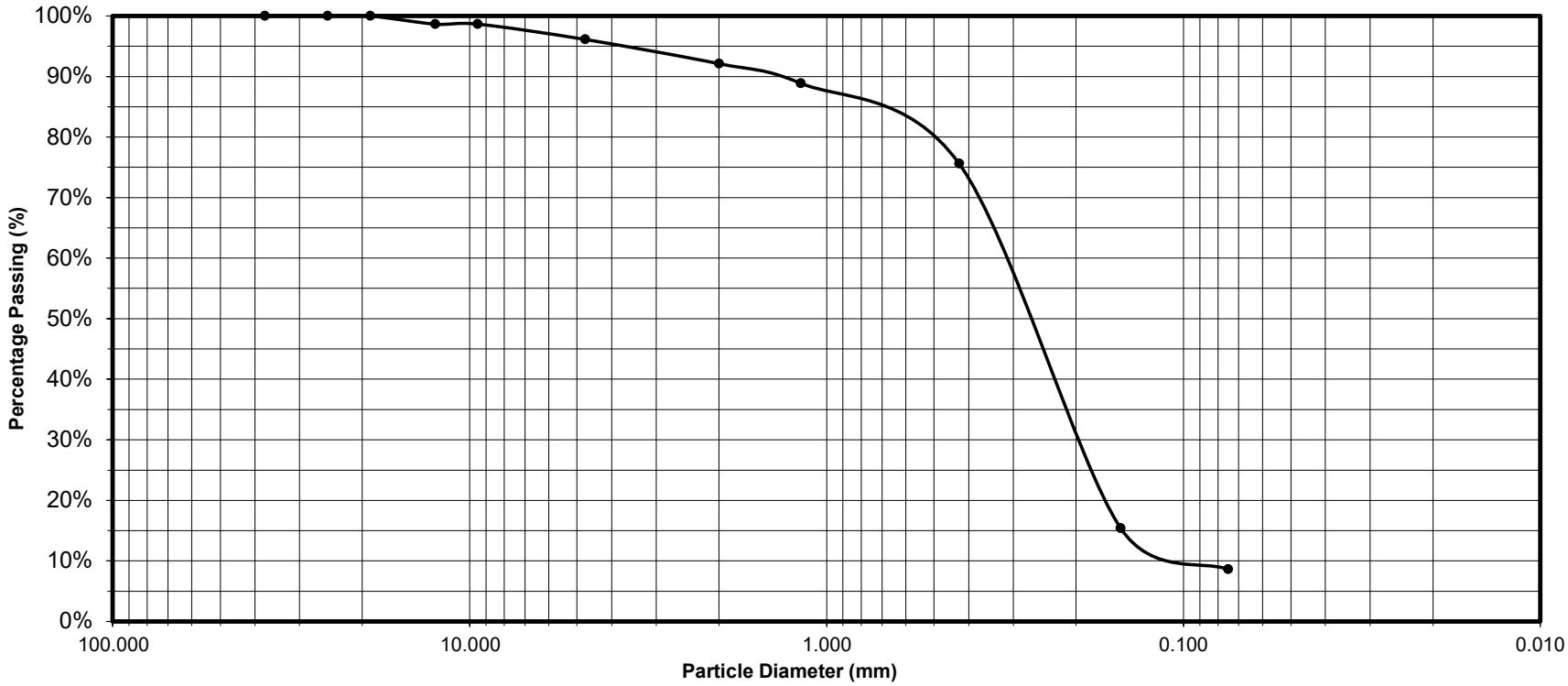
Project:	Geotechnical Services – Blantyre Park	**Project Number**	23301
Client:	Cherie Ng Architect Inc.	**Sample Classification:**	Sand
Sample No.	SS6	**Sample Depth**	3.81-4.42
Date Sampled	November 21, 2023	**Date Tested:**	December 7, 2023
		Moisture Content:	3.2%



Sieve Analysis
LS-602

AllRock Consulting Ltd
24 Brydon Drive, Unit #5
M9W 5R6, Toronto, Ont.

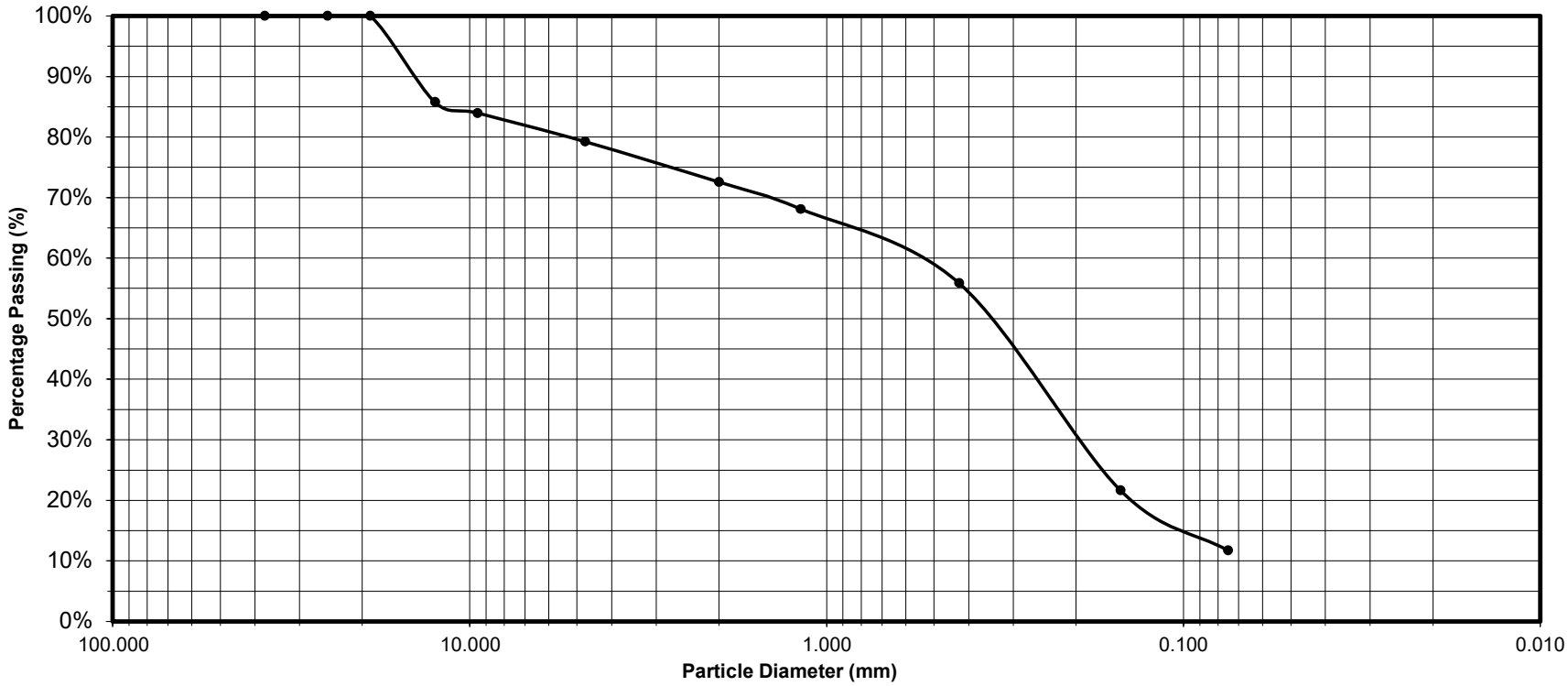
Project:	Geotechnical Services – Blantyre Park	**Project Number**	23301
Client:	Cherie Ng Architect Inc.	**Sample Classification:**	Sand
Sample No.	SS4	**Sample Depth**	2.28-2.89
Date Sampled	November 21, 2023	**Date Tested:**	December 7, 2023
		Moisture Content:	6.8%



Sieve Analysis
LS-602

AllRock Consulting Ltd
24 Brydon Drive, Unit #5
M9W 5R6, Toronto, Ont.

Project:	Geotechnical Services – Blantyre Park	**Project Number**	23301
Client:	Cherie Ng Architect Inc.	**Sample Classification:**	Gravelly Sand
Sample No.	SS2	**Sample Depth**	0.3-1.52
Date Sampled	November 22, 2023	**Date Tested:**	December 7, 2023
		Moisture Content:	4.3%



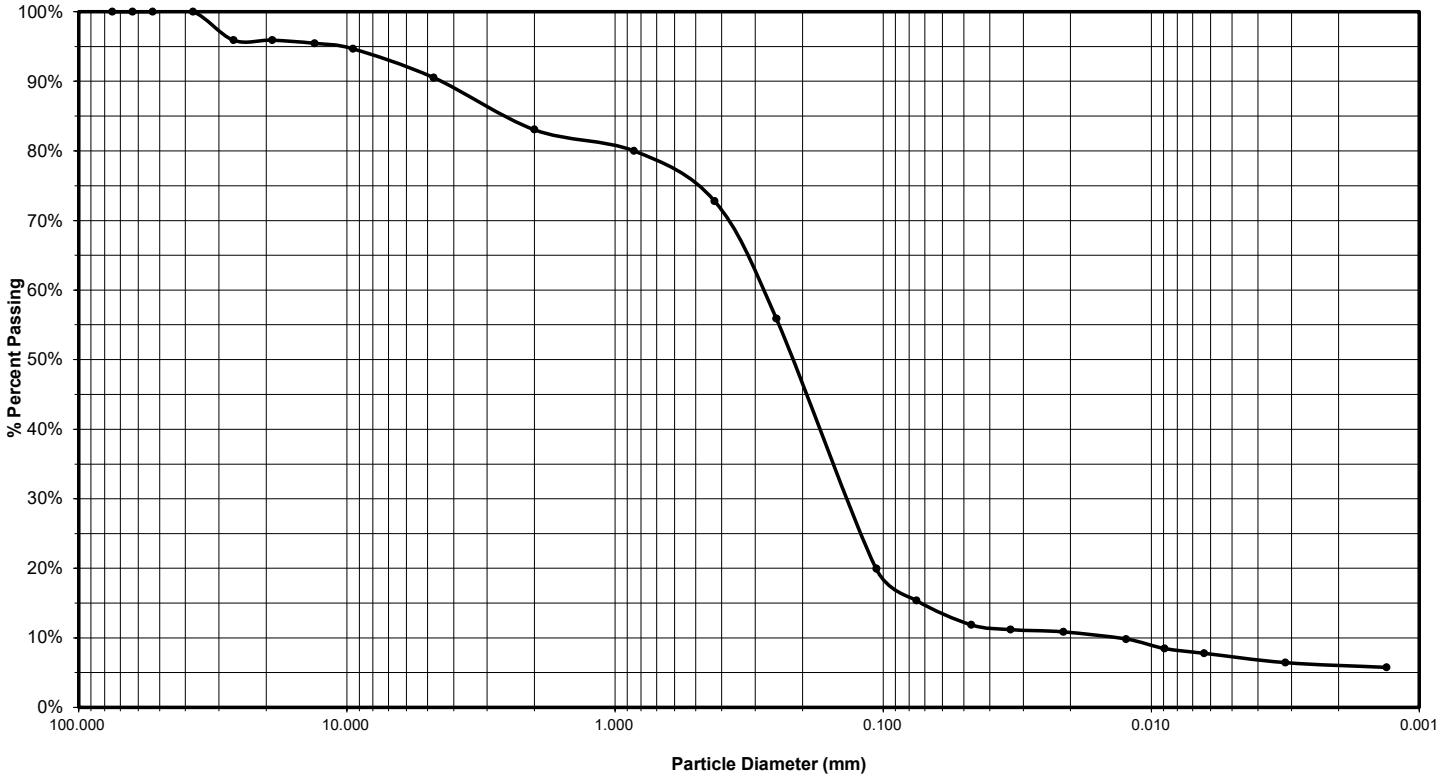
GRAIN SIZE ANALYSIS AND HYDROMETER TEST REPORT MTO LS-602, 702, AND 703/704

AllRock Consulting Ltd
24 Brydon Drive, Unit #5
Etobicoke, ON. M9W 5R6

Project Information	
Project Name:	Blantyre Park
Project No.:	23301
Client:	Cherie Ng Architecture
Borehole / Test Pit No.:	BH23-2
Sample Depth:	0.76-1.37
Sample No.:	SS6
Sampled By:	E.Syed
Sample Description:	Sand
Sample Natural M/C %:	6.8%
Date Sampled:	Monday, December 4, 2023
Tested By:	B. Miller
Date Tested:	Wednesday, November 22, 2023
Reviewed By:	G.Davidson

Grain Size Analysis		Hydrometer Analysis	
Sieve Size (mm)	% Passing	Diameter (mm)	% Passing
75.0	100%	0.046960307	11.9%
63.0	100%	0.033476694	11.2%
53.0	100%	0.021257619	10.8%
37.5	100%	0.012419321	9.8%
26.5	96%	0.008917788	8.5%
19.0	96%	0.006353366	7.8%
13.2	95%	0.003158564	6.4%
9.5	95%	0.00132556	5.8%
4.8	91%	ATTERBERG LIMITS, %	
2.0	83%	Plastic Limit	-
0.850	80%	Liquid Limit	-
0.425	73%	Plastic Index	-
0.250	56%		
0.106	20%		
0.075	15%		

PARTICLE SIZE DISTRIBUTION, MTO LS-702



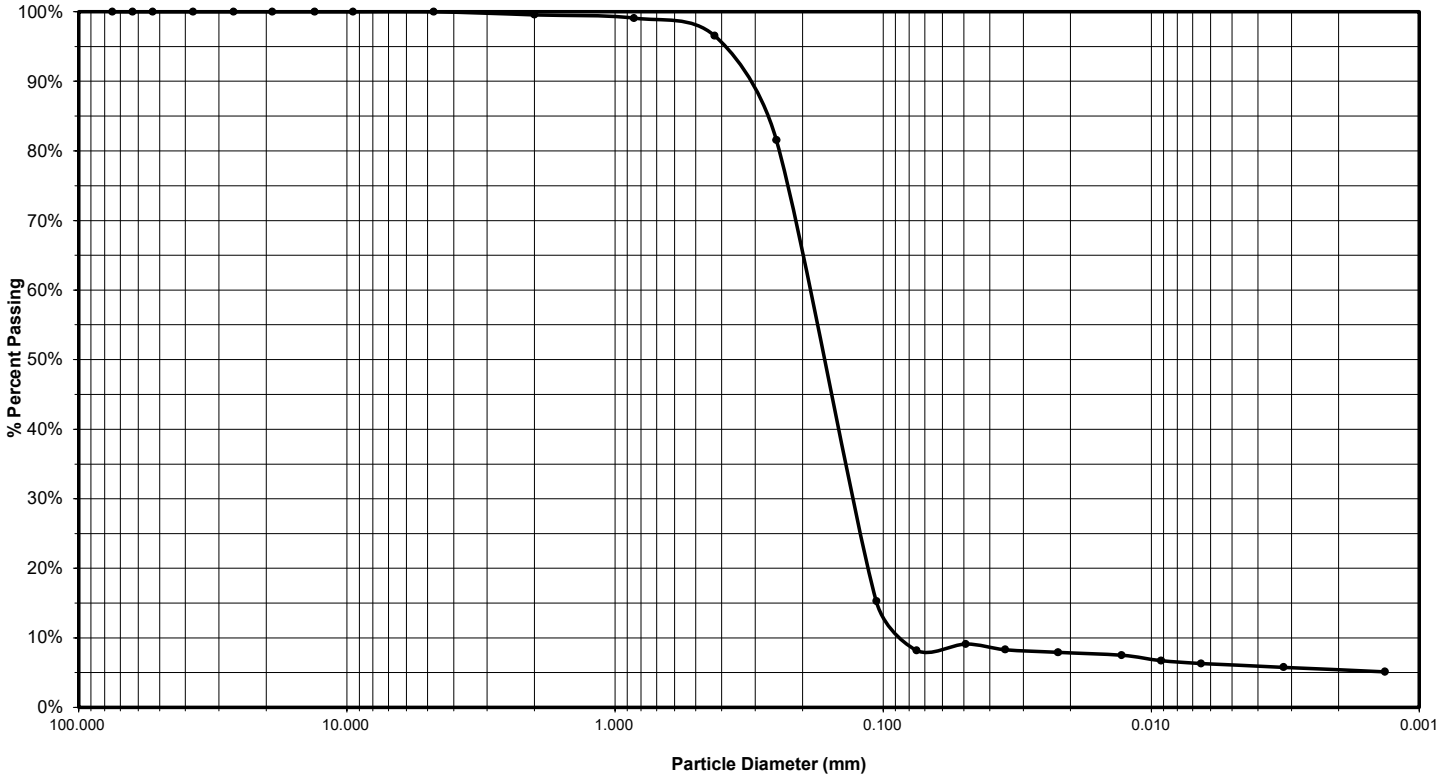
GRAIN SIZE ANALYSIS AND HYDROMETER TEST REPORT MTO LS-602, 702, AND 703/704

AllRock Consulting Ltd
24 Brydon Drive, Unit #5
Etobicoke, ON. M9W 5R6

Project Information	
Project Name:	Blantyre Park
Project No.:	23301
Client:	Cherie Ng Architecture
Borehole / Test Pit No.:	BH23-2
Sample Depth:	3.81-4.42
Sample No.:	SS6
Sampled By:	E.Syed
Sample Description:	Sand
Sample Natural M/C %:	3.7%
Date Sampled:	Tuesday, November 21, 2023
Tested By:	B. Miller
Date Tested:	Tuesday, December 5, 2023
Reviewed By:	G.Davidson

Grain Size Analysis		Hydrometer Analysis	
Sieve Size (mm)	% Passing	Diameter (mm)	% Passing
75.0	100%	0.049212965	9.1%
63.0	100%	0.035057264	8.3%
53.0	100%	0.022253437	7.9%
37.5	100%	0.012894782	7.5%
26.5	100%	0.009183751	6.7%
19.0	100%	0.006517019	6.3%
13.2	100%	0.003208469	5.8%
9.5	100%	0.001344344	5.1%
4.8	100%	ATTERBERG LIMITS, %	
2.0	100%	Plastic Limit	-
0.850	99%	Liquid Limit	-
0.425	97%	Plastic Index	-
0.250	82%		
0.106	15%		
0.075	8%		

PARTICLE SIZE DISTRIBUTION, MTO LS-702



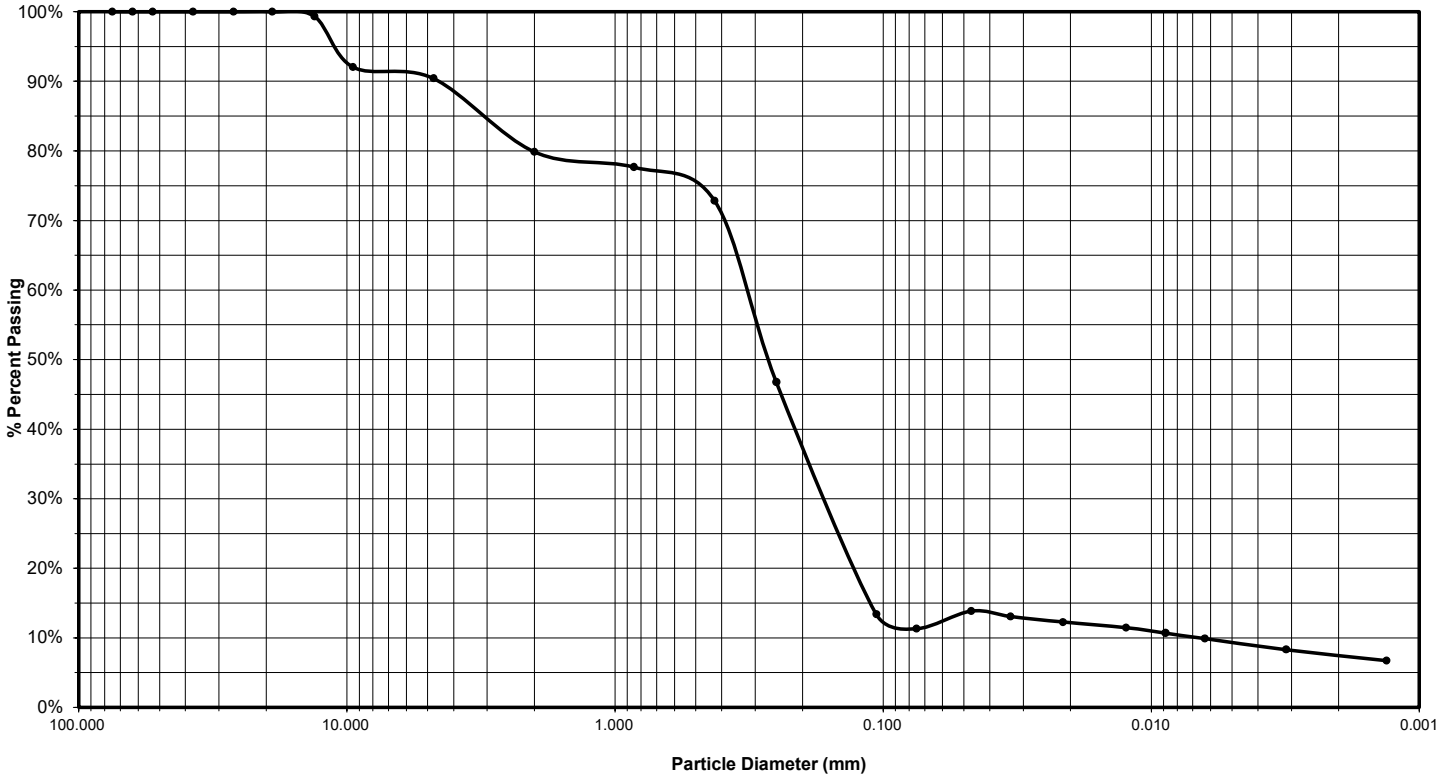
GRAIN SIZE ANALYSIS AND HYDROMETER TEST REPORT MTO LS-602, 702, AND 703/704

AllRock Consulting Ltd
24 Brydon Drive, Unit #5
Etobicoke, ON. M9W 5R6

Project Information	
Project Name:	Blantyre Park
Project No.:	23301
Client:	Cherie Ng Architecture
Borehole / Test Pit No.:	BH23-2
Sample Depth:	3.81-4.42
Sample No.:	SS6
Sampled By:	E.Syed
Sample Description:	Sand
Sample Natural M/C %:	2.8%
Date Sampled:	Tuesday, November 21, 2023
Tested By:	A. Patel
Date Tested:	Thursday, December 7, 2023
Reviewed By:	G.Davidson

Grain Size Analysis		Hydrometer Analysis	
Sieve Size (mm)	% Passing	Diameter (mm)	% Passing
75.0	100%	0.046960307	13.9%
63.0	100%	0.033476694	13.1%
53.0	100%	0.021342379	12.3%
37.5	100%	0.012419321	11.5%
26.5	100%	0.008850049	10.7%
19.0	100%	0.006305828	9.9%
13.2	99%	0.003135617	8.3%
9.5	92%	0.00132556	6.7%
4.8	90%	ATTERBERG LIMITS, %	
2.0	80%	Plastic Limit	-
0.850	78%	Liquid Limit	-
0.425	73%	Plastic Index	-
0.250	47%		
0.106	13%		
0.075	11%		

PARTICLE SIZE DISTRIBUTION, MTO LS-702



Certificate of Analysis

Client: All Rock Consulting Limited
24 Brydon Drive, Unit #5
Toronto, ON
M9W 5R6
Attention: Mr. Nathan Martin
Invoice to: AllRock Consulting Limited
PO#:

Report Number: 3003383
Date Submitted: 2023-11-22
Date Reported: 2023-11-29
Project:
COC #: 223608
Temperature (C): 3
Custody Seal:

Dear Nathan Martin:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Raheleh Zafari, Environmental Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at https://directory.cala.ca/

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

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Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1711511 Sample Matrix Soil153 Sample Type Sample Date 2023-11-21 Sampling Time Sample I.D. BH9 SS4	Lab I.D. 1711512 Sample Matrix Soil153 Sample Type Sample Date 2023-11-21 Sampling Time Sample I.D. BH10 SS4	Lab I.D. 1711513 Sample Matrix Soil153 Sample Type Sample Date 2023-11-21 Sampling Time Sample I.D. BH6 SS4	Lab I.D. 1711514 Sample Matrix Soil153 Sample Type Sample Date 2023-11-21 Sampling Time Sample I.D. BH4 SS4
Chloride	452983	0.002	%		0.002	0.010	<0.002	<0.002
Electrical Conductivity	452949	0.05	mS/cm		0.14	0.32	0.08	0.11
pH	452949	2.00			8.02	9.06	8.89	8.26
Resistivity	452949	1	ohm-cm		7143	3125	12500	9091
SO4	452948	0.01	%		<0.01	<0.01	<0.01	<0.01

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

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Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
452948	SO4	<0.01 %	93	70-130	103		0	-50-50
452949	Electrical Conductivity	<0.05	99	90-110			0	0-10
452949	pH	6.68	99	90-110			0	0-1
452949	Resistivity							
452983	Chloride	<0.002 %	99	90-110			0	

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

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Certificate of Analysis

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Date Submitted: 2023-11-22
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Project:
COC #: 223608

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
452948	SO4	Manual	2023-11-29	2023-11-29	IP	AG SOIL
452949	Electrical Conductivity	Electrical Conductivity Mete	2023-11-29	2023-11-29	IP	Cond-Soil
452949	pH	pH Meter	2023-11-29	2023-11-29	IP	Ag Soil
452949	Resistivity	Calculation	2023-11-29	2023-11-29	IP	Resistivity - soil
452983	Chloride	Manual	2023-11-28	2023-11-29	AsA	C CSA A23.2-4B

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

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CWS for Petroleum Hydrocarbons in Soil - Tier 1

Notes:

1. The laboratory method complies with CCME Tier 1 reference method for PHC in soil. It is validated for laboratory use.
2. Where the F1 fraction (C6 to C10) and BTEX are both measured, F1-BTEX is reported.
3. Where the F2 fraction (C10 to C16) and naphthalene are both measured, F2-naphthalene is reported.
4. Where the F3 fraction (C16 to C34) and PAHs* are both measured, F3-PAH is reported.
5. F4G is analyzed if the chromatogram does not descend to baseline before C50. Where F4 (C34 to C50) and F4G are both reported, the higher result is compared to the standard.
6. Unless otherwise stated in the sample comments, the following criteria have been met where applicable:

   - nC6 and nC10 response factors within 30% of response factor for toluene;
   - nC10, nC16, and nC34 response factors within 10% of each other;
   - C50 response factors within 70% of nC10 + nC16 + nC34 average; and,
   - Linearity is within 15%.

7. Unless otherwise stated in the sample comments, sampling requirements and analytical holding times have been met.
8. Gravimetric heavy hydrocarbons (F4G) cannot be added to the C6 and C50 hydrocarbons.
9. *PAHs = phenanthrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene and pyrene.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

1 GENERAL

1.1 The requirements of the Articles of Agreement, Conditions of the Contract, Division 1 apply to and from all Sections of the Contract Documents and the Work.

1.2 Work in this Specification is divided into descriptive sections which are not intended to identify absolute contractual limits between Subcontractors, nor between the Contractor and their Subcontractors. The Contractor is responsible for organizing division of labour and supply of materials essential to complete the Contract. The Consultant assumes no liability to act as an arbiter to establish subcontract limits between Sections or Divisions of Work.

1.3 It is intended that Work supplied under these Contract Documents shall be complete and fully operational in every detail for the purpose required. Provide all items, articles, materials, services and incidentals, whether or not expressly specified or shown on Drawings, to make finished Work complete and fully operational, consistent with the intent of the Contract Documents.

1.4 Work designated as “N.I.C.” is not included in this Contract.

1.5 Specifications, Schedules and Drawings are complementary and items mentioned or indicated on one may not be mentioned or indicated on the others.

1.6 Contractors finding discrepancies or ambiguities in, or omissions from the Drawings, Specifications or other Contract Documents, or having doubt as to the meaning and intent of any part thereof shall contact the Consultant for clarification. If the Consultant is not contacted for clarification, execute the Work in accordance with the most stringent requirements.

1.7 Mention in the specifications or indication on the drawings of materials, Products, operations, or methods, requires that the Contractor provide each item mentioned or indicated of the quality or subject to the qualifications noted; perform according to the conditions stated in each operation prescribed; and provide labour, materials, Products, equipment and services to complete the Work.

1.8 Where the singular or masculine is used in the Contract Documents, it shall be read and construed as if the plural, feminine or neuter had been used when the context or the statement so requires and as required to complete the Work, and the rest of the sentence, clause, paragraph, or Article shall be construed as if all changes in grammar, gender or terminology thereby rendered necessary had been made.

1.9 The terms “approved”, “review”, “reviewed”, “accepted”, “acceptance”, “acceptable”, “satisfactory”, “selected”, “directed”, “instructed”, “required”, “submit”, “permitted” or similar words or phases are used in standards or elsewhere in Contract Documents, it shall be understood, that words “by (to) the Consultant” follow, unless context provides otherwise.

1.10 Where the words 'submit', 'acceptable' and 'satisfactory' are used in the Contract Documents, they shall be considered to be followed by the words 'to the Consultant' unless the context provides otherwise.

1.11 The terms “exposed” or “exposed to view” refers to surfaces that are within the line of vision of persons from any accessible viewpoint, both within and without the building. Where any part of a surface is exposed to view, all other portions of that surface shall also be considered as exposed to view.

2 EXISTING SITE CONDITIONS

2.1 Make a careful examination of the site, and investigate and be satisfied as to all matters relating to the nature of the Work to be undertaken, as to the means of access and egress thereto and therefrom, as to the obstacles to be met with, as to the extent of the Work to be performed, any limitations under which the work has to be executed, and any and all matters which are referred to in the Contract Documents. Claims for additional costs will not be entertained with respect to conditions which could reasonably have been ascertained by an inspection prior to Tender closing.

2.2 Report any inconsistencies, ambiguities, discrepancies, omissions, and errors between Site conditions and Contract Documents to the Consultant prior to the commencement of Work. If inconsistencies, ambiguities, discrepancies, omissions, and errors are not reported and clarified, the most stringent requirement shall govern, as determined by the Consultant. Ensure that each Subcontractor performing work related to the site conditions has examined it so that all are fully informed on all particulars which affect the Work thereon in order that construction proceeds competently and expeditiously.

2.3 Before commencing the Work of any Section or trade, carefully examine the Work of other Sections and trades upon which it may depend, examine substrate surfaces, and report in writing to the Consultant, defects which might affect new Work. Commencement of Work shall constitute acceptance of conditions and Work of other sections, trades, and Other Contractors upon which the new Work depends. If repair of surfaces is required after commencement of specific work it shall be included in the work of the trade providing the specific system or finish.

3 **USE OF SITE**

3.1 Accept full responsibility for assigned work and storage areas from the time of Contract award until Substantial Performance of the Work.

3.2 Check means of access and egress, rights and interests which may be interfered with. Do not block lanes, roadways, entrances of exits. Direct construction traffic and locate access to site as directed by municipality.

3.3 Where encroachment beyond property limits is necessary make arrangements with respective property owners.

3.4 Before vehicles or equipment enter the Site, obtain permission from the Owner/Consultant for storage and appropriate access route. Appropriately barricade, stake off, or snow fence access route and storage area and around construction area in order to minimize damage to buildings, grounds, planting, turf, and surrounding facilities at the Site, and to restrict unauthorized persons from entering the construction area. Be responsible for making good any/all damages caused by operations at the Site. Restoration of such damages shall be to original condition and to the satisfaction of the Owner.

3.5 Cost of providing temporary protection, roads and services, including removal of same at completion of the Work and restoration of the involved areas to original state, shall be included in the Bid Price."

3.6 Maintain the exterior of the building during performance of the work. Proper housekeeping measures to maintain a neat and orderly site to eliminate any complaints from surrounding neighbours.

4 **ACCESS/PROPERTY CONSTRAINTS**

4.1 Refer to Owner's front end for additional requirements regarding access and property constraints.

4.2 Provide and maintain access facilities as may be required for access to the Work.

4.3 Minimize disruption, noise and dust to the functions of existing operational areas of existing buildings. Times of entry, routes of access and time required to complete the Work shall be arranged and scheduled in cooperation with the Owner.

4.4 Confine Work and operations of employees to limits indicated by the Contract Documents. Do not unreasonably encumber the premises with products.

4.5 Organize delivery of materials/equipment to and removal of debris and equipment from place of Work to permit continual progress of work and suitable for restricted site conditions.

4.6 Determine and make arrangement as required for loading and unloading of equipment and Products at times that will not affect public traffic flow and that will be permitted by the City of Toronto. Conform to City by-laws with regard to parking restrictions and other conditions.

4.7 Make provisions and arrangements and provide allowances if times for loading and unloading allowed by the City of Toronto are other than regular working hours.

4.8 All Products, materials and equipment required on Site shall be portable and/or size suitable for access and movement on Site and without causing damage to buildings.

4.9 The Work shall be confined to the area defined on the drawings and by the property lines except that services connections and certain portions of landscaping, hard paving and curb work shall be executed on Municipal property under regulation of authorities.

4.10 Provide locked doors in barriers, permit access by Owner and Consultant to Work areas and to areas Contractor is responsible for.

4.11 Workers shall not enter existing building beyond construction areas except where required for connection or modification to existing services or other such work. Arrange such requirements with Owner prior to entering existing occupied areas.

4.12 Advise the Owner 48 hours in advance of large or cumbersome item deliveries. Give particulars of item size and weight, protection to existing surfaces to be provided and safety precautions during movement.

5 **SECURITY**

5.1 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. Provide safe and secure access to and egress from existing premises at all times.

5.2 Provide suitable surveillance equipment and/or employ guard services, as required to adequately protect the work.

5.3 Make provisions to permit Owner's security personnel to view areas where all Work is being performed.

5.4 Use of facilities such as building entrances, washrooms, elevators and access corridors as directed by Owner's security personnel and as specified.

5.5 Take acceptable precautions to guard Work site, premises, materials and the public during and after working hours due to the Work of this Contract.

5.6 A regular full time watchman is generally not required on Site, however, if in the opinion of the Consultant the Work is not adequately protected, the Owner may request that a watchman be employed by the Contractor at no extra cost to the Contract.

6 CONTINUITY OF EXISTING SERVICES

6.1 Shutdowns and planning of operations that may affect Owner’s use of services shall be coordinated with, approved by, and in accordance with the Owner’s written directions. Provide advanced notice for all required interruptions to utility, heating, cooling, mechanical, electrical, and life safety systems.

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

6.3 Make written requests for shutdown at least 5 working days in advance, unless specifically stated herein or as otherwise instructed by the Owner.

6.4 Shutdowns shall be scheduled in advance with Owner and shutdown period shall be minimized to Owner’s convenience. Facilities in existing adjacent areas will be occupied during the Work.

6.5 Major shutdowns shall take place on weekends or at night by prior arrangement with and at no additional cost to the Owner.

6.6 Tag and mark switches and valves used by the Contractor to isolate services with name of Contractor, tradesman’s name, date and time of shut-off, and date and time to be turned back on.

6.7 Arrange work so that physical access to existing adjacent facilities is not unduly interrupted at any one time except as approved by the Owner.

6.8 Protect existing work to remain at the commencement of each work shift in occupied areas, as completely as possible to hold the replacing of damaged work to a minimum. Provide covering and other protection material. Include protection for access routes and temporary storage areas. Make good damage to existing surfaces caused by lack of adequate protection. Protection in such areas shall be removed at the end of each work shift.

6.9 All areas shall be cleaned and left in condition suitable for use by Owner and building operations before commencement of their work day.

6.10 Minimize disruption, vibration, noise and dust to the function of existing building. Refer to Owner's front end for additional noise regulation requirements.

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

7 WEATHER

7.1 Incorporate into the Contract Schedule allowances for the number of working days lost due to inclement weather, which can be anticipated, on the basis of analysis of information available from Environment Canada, for weather conditions on and near the Site, over the last ten (10) years. The Contractor may be entitled to a schedule extension for those activities on the critical path which are delayed on account of inclement weather, assessed on a quarterly basis, by the number of days in excess of the anticipated number of working days for the quarter in question by more than 20%. No additional payment will be made on account of any such schedule extension.

7.2 For the purpose of this clause the quarters are defined as January 1 to March 31, April 1 to June 30, July 1 to September 30, and October 1 to December 31.

8 WASTE AUDIT/PLANS FOR WASTE REDUCTION

8.1 Comply with requirements of authorities having jurisdiction.

8.2 Prepare and submit waste audit and waste reduction plan in accordance with Ontario Regulation 102/94 Waste Audits and Waste Reduction Workplans.

8.3 Prepare and submit source separation plan in accordance with Ontario Regulation 103/94 Industrial, Commercial and Institutional Source Separation Programs.

8.4 Deliver to nearest appropriate depot all materials accepted for recycling by the region or municipality having jurisdiction over the Place of Work, including but not limited to cardboard, paper, plastic, aluminum, steel, and glass. Deliver to nearest appropriate depot all scrap and excess gypsum wallboard for recycling of this material. Pay all costs for this work.

END OF SECTION

PART - 1 GENERAL

1.1 SUMMARY

.1 Includes a summary of the scope of work for construction and general contract requirements.

1.2 RELATED REQUIREMENTS

.1 Section 32 33 00 Site Furnishings

1.3 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises PARK IMPROVEMENTS at BLANTYRE PARK located at 180 Fallingbrook Road, Toronto.

.2 SCOPE OF WORK:

.1 Part A - Mobilization, Demolition, Removals & General Site Clean-Up

- Mobilization, demobilization, coordination of sub-trades, bonding, site security, temporary fences and tree protection fencing & facilities, utility locates, sediment control, dust control, staging, traffic control, signs and other costs required for compliance with General and Supplementary Requirements and Division 1.
- Stripping, removal and disposal of existing topsoil, lawns and sand, as indicated on drawings and in specifications, including haulage and disposal.
- Demolition, removal and disposal or relocation as indicated for various items including playground equipment, benches, chain link fencing, concrete pads, asphalt pavement, and any other site furnishing noted on drawings, inclusive of any footings.

.2 Part B - Site Work & Restoration

.1 Subsection 1 - Earthworks, Drainage, Finish Surfacing, and Restoration

- Grading and earthworks, including bulk excavation, rough grading, backfilling and fine grading.
- Supply & install new sub-drainage works.
- Supply and install new concrete pavement with integral colouring for new splash pad deck and concrete pavement (natural-grey colour) for all other paved areas, incl. pads for new benches, picnic tables and bike racks.
- Supply and install new concrete playground edges and raised curb/planter walls.
- Supply and install new concrete sidewalks and barrier curbs, including depressed curbs with tactile walking surface indicator pavers.
- Supply and install new medium-duty asphalt pavement and base for new park pathways.
- Supply and install new light-duty asphalt pavement for new pickleball court, including new net/post assembly and court line painting.
- Supply and install new armour stone retaining/seat-wall.
- Supply and install new rubber playground safety surfacing with EPDM wearing course including new granular base and interfaces with other surfaces.
- Supply and install engineered cedar wood fibre playground safety surface inclusive of filter fabric and drainage layer (for new adult fitness area).
- Supply and install new playground equipment as specified, including third-party testing.
- Supply and install new adult fitness equipment, including third-party testing.

- Supply and install new splash pad including all spray features, activator bollards, granite boulders, piping, drains, manifold, controller, rainwater diverter system, above-ground cabinet, incl. all servicing upgrades and connections (refer to Civil and Electrical) and testing.

.2 Subsection 2 - Site Furnishings and Planting

- Supply and install new accessible picnic tables.
- Supply and install new accessible park benches (backed and backless).
- Supply and install new permanent shade umbrellas and umbrella tables.
- Supply and install new Adirondack chairs.
- Supply and install new bike racks.
- Supply and install new water bottle filler, incl. water supply and sanitary drain connections.
- Supply and install new chain link fencing.
- Supply and install new precast ping pong table.
- Supply and install new 80mm cal. deciduous shade trees.
- Supply and install new multi-stem shrubs, perennials and grasses.
- Supply and install sod over 150 mm depth new topsoil over all disturbed lawn areas.
- Supply and install new double-shredded mulch.

1.4 SUBMITTALS

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

.2 Submit Project construction progress schedule in a format acceptable to the Owner and Consultant.

.1 Schedule shall include all major project activities including submittals and shop drawings preparation and review, off-site fabrication and all other relevant activities from date of receipt of purchase through final acceptance by the Owner.

.2 Schedule shall note any critical dependencies or works requiring materials, equipment or furnishings with long lead times.

.3 Schedule shall include contingency days for weather or unforeseen events at a rate of 1 day per every 10 business days or as agreed in writing by the Owner and/or Consultant.

.4 Schedule shall be updated whenever a change occurs.

.1 Work days lost due to weather or other unforeseen events shall be logged by the Contractor and reviewed at regular project meetings. Updated schedule is not required.

.3 Submit site-specific and Work Plan Health and Safety Plan if required by the General Conditions.

1.5 CONTRACTOR USE OF PREMISES

.1 Unrestricted use of designated parts of site until final acceptance by the Owner.

.2 Limit use of areas outside of the designated areas to access and staging activities only, to allow for safe use of those areas by the public and the Owner's personnel or contractors.

1.6 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy of each document as follows:

.1 Contract Drawings

.2 Separate copy of Contract drawings with red-lined markings for any changes to the work (this is to be maintained and submitted at the time of substantial completion.)

.3 Specifications.

.4 Addenda.

.5 Reviewed Shop Drawings.

.6 Change Orders.

.7 Field Test Reports.

.8 Copy of up-to-date Work Schedule.

.9 Other documents as may be required by the General Conditions or by individual Sections of the specifications.

PART - 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART - 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION 01 11 00

1 GENERAL

1.1 Coordination of the Work of all Sections of the specifications as required to complete the Project is the responsibility of the Contractor.

1.2 Cooperate and coordinate with Other Contractors including Other Contractor's employed by Owner.

1.3 Ensure that Subcontractors and trades cooperate with other subcontractors and trades whose work attaches to or is affected by their own work. Ensure that minor adjustments are made to make adjustable work fit fixed work.

1.4 Allow access of Owner's Other Contractors on site and to areas of Work. Cooperate and coordinate with such Other Contractors. Schedule work to complement work of such Other Contractors.

1.5 Entry by the Owner's own forces and by Other Contractors shall not mean acceptance of the Work and shall not relieve the Contractor of their responsibility to complete the Contract.

1.6 Placing, installation, application and connection of work by the Owner’s own forces or by Other Contractors on and to the Contractor's Work shall not relieve the Contractor of his responsibility to provide and maintain the specified warranties.

1.7 Coordinate with removals/installations specified in other Divisions and Other Contracts.

1.8 Coordination of the installation of systems specified in Divisions 13, 22, 23, 26, 27, 31, 32 and 33 including the interrelating operation and functioning between components of a system and between systems, is the responsibility of those performing the work of those Divisions, with final coordination the responsibility of the Contractor.

1.9 Coordinate relocation of existing mechanical and electrical items with work specified in Divisions 13, 22, 23, 26, 27, 31, 32 and 33.

1.10 Existing equipment shall remain in present locations unless designated otherwise. Protect from damage. Remove, store and reinstall existing fixed equipment, fixtures and components which interfere with construction and which are scheduled for relocation.

1.11 Pay particular attention to types of ceiling construction and clearances throughout, especially where recessed fixtures are required. Coordinate work with Other Contractors and Subcontractors wherever ventilation ducts or piping installations occur to ensure that conflicts are avoided.

1.12 Install ceiling mounted components in accordance with final ceiling plans. Inform Consultant of conflicting installations.

1.13 Install and arrange ducts, piping, tubing, conduit, equipment, fixtures, materials and product to conserve headroom and space with minimum interference and in neat, orderly and tidy arrangement. Run pipes, ducts, tubing and conduit, vertical, horizontal and square with building grid unless otherwise indicated. Install piping, ducts, and conduit as close to underside of structure as possible unless shown otherwise.

1.14 Make provision, without interference or restriction by items located within the ceiling space, for unrestricted relocation of light fixtures to replace ceiling panels at grid spaces of the same size.

1.15 Where supports or openings are to be left for the installation of various parts of the Work furnish the necessary information to those concerned in ample time so that proper provision can be made for such items. Have cutting, drilling and other remedial work, and the subsequent patching or other work required for failing to comply with this requirement, performed at a later date at no additional Cost to Owner.

1.16 Properly coordinate the work of the various Sections and trades, taking into account the existing installations to assure the best arrangement of pipes, conduits, ducts and mechanical, electrical and other equipment, in the available space. Under no circumstances will any extra payment be allowed due to the failure by the Contractor to coordinate the work. If required, in critical locations, prepare interference and/or installation drawings showing the work of the various Sections as well as the existing installation, and submit these drawings to the Consultant for review before the commencement of work. Proceed with work in these areas only as, and when directed by the Consultant.

1.17 Coordinate with mechanical and electrical trades to ensure protecting supporting, disconnecting, cutting off, capping, diverting, relocating or removing of existing services in areas of Work before commencement of alteration work.

1.18 In case of damage to active services on utilities, notify Consultant and respective authorities immediately and make all required repairs under direction of Consultant and respective authorities. Carry out repairs to such damaged services and utilities continuously to completion, including working beyond regular working hours. Costs to be borne by the Contractor.

2 METRIC DIMENSIONS

2.1 Measurements in this specification are expressed in metric (SI) units and depending on the progress made in the various sectors of the industry are either hard or soft converted units.

2.2 All metric units specified shall be taken to be the minimum acceptable unless otherwise noted.

2.3 It is the Contractor's responsibility to check and verify with manufacturers and suppliers on the availability of materials and products in either metric or imperial sizes. Be responsible for coordinating products supplied in metric (SI) and imperial units into the overall layout.

2.4 Where both metric and imperial sizes or dimensions are shown, the metric size or dimension shall govern.

3 BUILDING DIMENSIONS

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

3.2 Verify that work, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out by requirements of the Drawings, and ensure that work installed in error is rectified before construction resumes.

3.3 Check and verify dimensions referring to the work and the interfacing of services.

3.4 Do not scale directly from the Drawings. If there is ambiguity or lack of information, immediately inform the Consultant. Changes required through the disregarding of this clause shall be the responsibility of the Contractor.

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

3.6 Advise Consultant of discrepancies and if there are omissions on Drawings, particularly reflected ceiling plans and jointing patterns for surfaces finishes, which affect aesthetics, or which interfere with services, equipment or surfaces. Do not proceed with work affected by such items without direction from the Consultant.

3.7 Provide written requirements for site conditions and surfaces necessary for the execution of respective work, and provide setting drawings, templates and all other information necessary for the location and installation of material, holes, sleeves, inserts, anchors, accessories, fastenings, connections and access panels. Inform respective contractors whose work is affected by these requirements and preparatory work.

4 INTERFERENCE AND COORDINATION DRAWINGS

4.1 Coordinate placement of equipment to ensure that components will be properly accommodated within the spaces provided prior to commencement of work.

4.2 Prepare interference and equipment placing drawings to ensure that all components will be properly accommodated within the spaces provided. Provide copies of interference drawings to Consultant when requested by Consultant.

4.3 Prepare drawings to indicate coordination and methods of installation of a system with other systems where their relationship is critical. Ensure that all details of equipment apparatus, and connections are coordinated.

4.4 Take complete responsibility for any remedial work that results from failure to coordinate any aspect of the Work prior to its fabrication/installation.

4.5 Ensure that accesses and clearance required by jurisdictional authorities and/or for easy maintenance of equipment are provided in the layout of equipment and services.

5 SLEEVING AND INSERT DRAWINGS AND TEMPLATES

5.1 Prepare sleeving drawings for work of Divisions 13, 22, 23, 26, 27, 31, 32 and 33 showing size and location of all penetrations through load bearing elements. Submit sleeving drawings in the form of one transparency and 4 prints to Consultant for review not less than 15 days prior to construction of affected elements.

5.2 Prepare insert setting drawings for work to be cast into concrete and/or mortared into masonry elements. Submit insert setting drawings in the form of a transparency and 4 prints to Consultant for review not less than 15 days prior to construction of affected elements.

5.3 Ensure that setting drawings, templates, and all other information necessary for the location and installation of materials, fixtures, equipment, holes, sleeves, inserts, anchors, accessories, fastenings, connections, and access panels are provided by each Section whose work requires cooperative location and installation by other Sections, and that such information is communicated to the applicable installer.

5.4 Provide cutting, fixing and making good to the work of Other Contractors, Subcontractors and trades as required for sleeving and inserts and make up time lost as a result of failure to comply with this requirement, at no additional cost to the Owner.

END OF SECTION

1 PRE-CONSTRUCTION MEETING

1.1 The Owner will schedule a preconstruction meeting after award of Contract.

1.2 Co-ordinate and organize attendance by representatives of major Subcontractors and parties in contract with the Contractor.

1.3 Consultant will arrange attendance of other interested parties not responsible to the Contractor.

1.4 Agenda will include but not be limited to the following topics as are pertinent to the Contract.

- .1 Execution of Project Contract Agreement.
- .2 Submission of executed bonds and insurance certificates.
- .3 Distribution of Contract Documents.
- .4 Review project communications procedures.
- .5 Submission of List of Subcontractors, Contract, Price Breakdown, Construction Schedule and Proposed Product List.
- .6 Designation of the personnel representing the parties in the Contract.
- .7 Procedures and processing of field decisions, submittals, substitutions, applications for payments, Proposal Change Requests, Change Orders and Contract closeout.
- .8 Scheduling to identify all critical points on construction schedule for positive action.
- .9 Scheduling of activities of independent inspection and testing laboratories.
- .10 Identify any product availability problems and substitution requests.
- .11 Establish site arrangements and temporary facilities.
- .12 Terms of Payment and proposed cash flow for the project.
- .13 Project meeting procedures.

1.5 Be prepared to provide specific information relative to agenda items as they are pertinent to the Contract.

1.6 Record minutes of meeting and distribute type written copies to all participants and other interested parties, within one week of meeting date.

2 SITE MOBILIZATION MEETING

2.1 Schedule a mobilization meeting at the Project Site, prior to Contractor occupancy. Attendance by:

- .1 The Consultant
- .2 Specialized sub-consultants.
- .3 The Contractor
- .4 Major subcontractors.

2.2 Agenda:

- .1 Use of the premises by the Contractor.
- .2 Construction facilities and controls.
- .3 Temporary facilities.
- .4 Survey and building layout.
- .5 Security and housekeeping procedures.
- .6 Construction Schedule.
- .7 Application for payment procedures.
- .8 Procedures for testing.

.9 Procedures for maintaining record documents.
.10 Requirements for start-up of equipment.
.11 Inspection and acceptance of equipment put into service during the construction period.

2.3 Record minutes and distribute copies to meeting participants and affected parties not in attendance.

3 PROGRESS MEETINGS

3.1 Attend regularly scheduled progress meetings to be held on Site at times and dates that are mutually agreed to by the Owner, Consultant, and Contractor.

3.2 Co-ordinate and organize attendance of individual Subcontractors and material suppliers when requested. Relationships and discussions between Subcontractor participants are not the responsibility of the Consultant and do not form part of the meetings content.

3.3 Ensure that Contractor representatives in attendance at meetings have required authority to commit Contractor to actions agreed upon. Assign same persons to attend such meetings throughout the contract period.

3.4 Inform the Consultant in advance of meetings regarding all items to be added to the agenda.

3.5 Prepare and distribute copies of Agenda prior to meeting.

3.6 Be prepared to provide specific information relative to agenda items at each meeting as they are pertinent to the Contract.

3.7 Agenda will include but not be limited to the following topics as are pertinent to the Contract.
.1 Review of minutes of previous meetings.
.2 Review of Work progress.
.3 Field observations, problems and decisions. progress.
.4 Identification of problems which impede planned progress.
.5 Review of Schedule of Submittals and status of submittals.
.6 Review of off-site fabrication and delivery schedules.
.7 Maintenance of Progress Schedule.
.8 Corrective measures to regain projected schedules.
.9 Planned progress during succeeding work period.
.10 Coordination of projected progress.
.11 Maintenance of quality and work standards.
.12 Effect of proposed changes on the Progress Schedule and coordination.
.13 Other business relating to the Work.

3.8 Record minutes. Minutes shall include significant proceedings and decisions and will identify "action by" parties.

3.9 Distribute copies to meeting participants and affected parties not in attendance within 2 business days following the meeting.

4 PREINSTALLATION MEETINGS

4.1 When required by individual Sections of the Specification, the Contractor shall:

.1 Convene a preinstallation meeting at the site or at an appropriate location, prior to commencing the work of the Section.
.2 Provide minimum two week notice of meeting to all interested parties.
.3 Require the attendance of parties directly affecting or affected by the work of the Section.
.4 Distribute written notice of the meeting to all parties required to attend.
.5 Prepare the agenda and preside at the meeting to review conditions of installation, preparation and installation procedures and review coordination with related work.
.6 Record minutes and distribute copies to meeting participants and affected parties not in attendance.

END OF SECTION

1. GENERAL

.1 Be responsible for planning and scheduling of the Work. As a minimum, prepare and update the following schedules:

.1 Construction progress schedule.

.2 Submittal schedule for shop drawings, product data and samples.

.3 Product delivery schedule.

.4 Cash allowance schedule for purchasing products.

.2 Be responsible for ensuring that Subcontractors plan and schedule their respective portions of the Work. Subcontractor's schedules shall form part of the above mentioned schedules.

2. CONTRACT SCHEDULE

.1 Prepare and submit the Contract Schedule within 10 days following award of Contract. This schedule, once it is reviewed by the Consultant and if it meets the Consultant's project requirements, will form part of the Contract.

.2 Include schedule for submitting shop drawings, product data, samples, and other submittals called for in the individual specification sections.

.3 Include in the submittal schedule a complete list of all submittals required for the project.

.4 Indicate dates for submitting, review time, resubmission time, last date for meeting fabrication schedule.

.5 The Contract Schedule shall include the following information:

.1 Starting and ending dates of each activity including the float periods

.2 Labour force requirements for each activity

.3 Order and delivery dates for major or critical equipment

.4 Interdependency with activities of other Contractors

.5 Dates specified in the Contract Documents

.6 Dates on which specific data will be required for submittal, i.e., Vendor data, shop drawings, samples, etc.

.6 This schedule shall be reviewed and updated monthly by the Contractor so as to reflect any Contract changes as well as major changes to the schedule.

3. DETAILED CONSTRUCTION SCHEDULE

.1 Prepare and submit a detailed construction schedule within 10 days of final review and acceptance of the Contract Schedule. This schedule, once reviewed and accepted by the Consultant, will be updated and submitted monthly with the Contract Schedule and weekly once the Contractor starts on Site.

.2 This schedule shall cover the construction period. It will show, in detail, activities on a daily basis indicating durations, manpower and constraints. The activities shown on this schedule shall further clarify or detail the activities shown on the Contract Schedule.

.3 The detailed construction schedule shall be presented in a bar chart form.

4. DAILY REPORTS

.1 Provide Daily Report (to be submitted weekly)

.1 Number of workers on site by trade

.2 Work performed by each trade

.3 Material delivery

.4 Machinery on site

.5 Caily photographs for all activities on site

5. CASH FLOW CHART

.1 Within 10 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.

END OF SECTION

1 GENERAL

1.1 Provide labour, Products, equipment, services tools and supervision necessary for submittals. Make submittals specified in this Section to Consultant unless otherwise specified.

.1 Verify accuracy and completeness of submittals prior to submission.

.2 Verify field measurements, field construction criteria, catalogue numbers and similar data.

.3 Co-ordinate each submittal with requirements of the Work and the Contract Documents.

.4 Notify Consultant in writing at time of submission, of any deviation in submittals from requirements of the Contract Documents.

.5 Generally, submittals shall be in .pdf digital format. For shop drawings, scanned documents are not acceptable.

.6 For submittals that cannot be transmitted digitally (i.e. samples), arrange and pay for all deliveries and pick-ups to and from the office of the Consultant.

.7 Name each submittal file with the project acronym (Blanytre), the specification section number, the sequence number, the sequence revision number and a brief description of the content. i.e.: **Blantyre – Progress Draw Application**

.8 Title emails sending submittals the same as the file name (i.e. **Blantyre-ProgressDrawApplicationNo.1).**

1.2 Maintain an email inbox capable of accepting minimum 15 Mb of data.

1.3 Submit in accordance with dates established under Section 01 32 16 for shop drawings, fabrication, manufacture, erection and installation to provide adequate time for reviews, securing necessary approvals, possible revisions and resubmittals, placing orders, securing delivery and to avoid construction delays.

1.4 Accompany each submittal with a letter of transmittal in duplicate containing all pertinent information required for identification and checking of submittals including but not limited to the following:

.1 Date of initial submission and date of each subsequent submission if required.

.2 Project title and Consultant’s project number.

.3 Names of:
- .1 Contractor.
- .2 Subcontractor.
- .3 Supplier/manufacturer/fabricator as applicable.

.4 Specification section numbers to which submission is related.

.5 Countersigned stamp of Contractor certifying that they have reviewed the submission.

.6 Location (room number, etc)

.7 On submissions subsequent to the first, the following additional identification:

.1 The revised submission number.

.2 Identification of the item(s) revised.

1.5 Allow two weeks for the Consultant's review of each submission.

1.6 When submittals are resubmitted, transmit under a new letter of transmission.

1.7 Do not carry out Work until Consultants review of submittals has been completed.

1.8 Be responsible for payment of charges for delivery of submissions and resubmission to Consultant.

2 SHOP DRAWINGS AND PRODUCT DATA

2.1 Shop drawings to be originals prepared by the Contractor, Subcontractor, Supplier or Distributor, which illustrate the appropriate portion of the Work; showing fabrication, layout, setting or erection details, as specified in the appropriate Sections.

2.2 Identify content of shop drawings by the .pdf file name as specified above.

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

2.4 Drawing Format Submissions:

.1 Digital files in .pdf format.

.2 Upon return to the Contractor of reviewed digital submissions, the Contractor shall be responsible for printing and distribution of reviewed submissions to the appropriate Subcontractors and affected parties.

.3 Location (room number, etc).

2.5 Arrange for the preparation of Shop Drawings as called for in the Contract Documents or as may be reasonably requested by the Consultant. The Contractor and each Subcontractor shall operate as experts in their respective fields and all Shop Drawings and samples shall conform to the requirements of the Contract Documents.

2.6 The term “Shop Drawings” means drawings, diagrams, schematics, illustrations, schedules, performance charts, brochures and other data which are required to illustrate

details of the Work.

2.7 In addition to Shop Drawings specified in the specification sections, submit Shop Drawings required by jurisdictional authorities in accordance with their requirements.

2.8 Shop Drawings for openings, sleeving and conduit:

.1 Prior to preparation of Shop Drawings, coordinate sizes of all structural openings and sleeves with respective fabricators for mechanical ducting. Adjustments to the opening sizes indicated on the Contract Drawings shall not be made without the approval of the Consultant.

.2 Prior to detailing structural reinforcement on Shop Drawings, arrange for the Structural Engineer to review formed holes, recesses and sleeving. Completely dimension openings, recesses and sleeves and relate to appropriate grid line(s) and elevation(s).

.3 Prior to forming of the structure, arrange for the preparation of Shop Drawings for review by the Consultant showing embedded conduit to be cast within the structure. Shop Drawings shall include conduit from all sources.

2.9 Shop Drawings shall indicate the following minimum criteria and any additional criteria indicated in the individual specification sections requiring Shop Drawings:

.1 Clear and obvious notes of any proposed changes from the Contract Documents.

.2 Fabrication and erection dimensions.

.3 Provisions for allowable construction tolerances and deflections provided for live loading.

.4 Details to indicate construction arrangements of the parts and their connections, and interconnections with other work.

.5 Location and type of anchors and exposed fastenings.

.6 Materials, physical dimensions including thicknesses, and finishes.

.7 Descriptive names of equipment.

.8 Mechanical and electrical characteristics where applicable

.9 Information to verify that superimposed loads will not affect function, appearance, and safety of the work detailed as well as of interconnection work.

.10 Assumed design loadings, and dimensions and material specifications for load-bearing members.

.11 Include in Shop Drawing submissions detailed information, templates, and installation instructions required for incorporation and connection of the Work.

.12 Before submitting to the Consultant, review all Shop Drawings to verify that the Products illustrated therein conform to the Contract Documents. By this review, the Contractor agrees that it has determined and verified all field dimensions, field construction criteria, materials, catalogue numbers and similar data and that it has checked and coordinated each Shop Drawing with the requirements of the Work and of the Contract Documents. The Contractor's review of each Shop Drawing shall be indicated by stamp, date and signature of a qualified person possessing the appropriate authorization from the Contractor.

.13 Be responsible for dimensions, confirmed at the Site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of the Work of all subtrades.

.14 Submit Shop Drawings for the Consultant's review with reasonable promptness and in orderly sequence so as to cause no delay in the Work nor in the work of Other Contractors. At the time of submission, notify the Consultant in writing of any deviations in the Shop Drawings from the requirements of the Contract Documents. The Contractor will be held responsible for changes made from the Contract Documents which are not indicated or otherwise communicated in writing with the submission.

.15 Drawings submitted by the Contractor as required herein are the property of the Owner who may use and duplicate such drawings where required in association with the Work.

.16 Submit Shop Drawings signed and sealed by a licensed Professional Engineer registered in the place of the Work where indicated in individual Sections.

.17 Shop Drawings shall have distinct, uniform letters, numerals and line thicknesses that will ensure the production of clear legible prints at original as well as reduced size.

.18 Provide submissions in electronic Portable Document Format (PDF) format delivered via electronic means as directed by the Consultant.

.19 Dimensions and designations of elements shall be shown in the same system of measurement used on the applicable Contract Drawings.

.20 The Consultant reserves the right to refuse acceptance of drawing submissions not meeting the above requirements.

.21 The Consultant's review will be for conformity to the design concept and for general arrangement only and such review shall not relieve the Contractor of responsibility for errors or omissions in the Shop Drawings or of responsibility for meeting all requirements of the Contract Documents unless a deviation on the Shop Drawings has been approved in writing by the Consultant. Review does not mean that Consultant approves detail inherent in Shop Drawings, responsibility which shall remain with Contractor submitting same.

.22 The Contractor shall make any changes in Shop Drawings which the Consultant may require consistent with the Contract Documents and re-submit unless otherwise directed

by the Consultant. When re-submitting the Shop Drawings, the Contractor shall notify the Consultant in writing of any revisions other than those requested by the Consultant.

.23 Only drawings noted for revision and resubmission need be resubmitted.

.24 File one copy of each submitted Shop Drawing at the Site.

2.10 Product Data:

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

.2 The above will be accepted only if they conform to the following:

.1 Delete information which is not applicable to project
.2 Supplement standard information to provide additional information applicable to project
.3 Show dimensions and clearances required
.4 Show performance characteristics and capacities
.5 Show wiring diagrams (where applicable) and controls

.3 Submit as .pdf files, named as specified for shop drawings.

3 SHOP DRAWINGS REVIEW

3.1 The review of shop drawings by the Consultant is for the sole purpose of ascertaining conformance with the general 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 such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and contract documents.

3.2 Without restricting the generality of the foregoing, 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 installation and for coordination of the work of all subtrades.

4 SAMPLES AND MOCK-UPS

4.1 Before delivery of Products to the Site, submit samples of Products as specified or as requested by the Consultant. Label samples as to origin and intended use in the Work and in accordance with the requirements of the Specification Sections. Samples must represent physical examples to illustrate materials, equipment or work quality and to establish standards by which completed Work is judged.

4.2 Ensure samples are of sufficient size and quantity, if not already specified, to illustrate:

.1 The quality and functional characteristics of Products, including integrally related parts and attachment devices.

.2 The full range of colours available.

4.3 Notify the Consultant in writing, at time of submission, of any deviations in samples from requirements of the Contract Documents, and state the reasons for such deviations.

4.4 Identify samples with Project name, Contract number, date, Contractor's name, number and description.

4.5 If samples are not acceptable, both samples will be returned. If samples are acceptable, one sample will be so indicated and returned. Be responsible for the cost of samples that are not accepted and for resubmission of samples.

4.6 Acceptable samples shall serve as a model against which the products incorporated in the work shall be judged.

4.7 Each Product incorporated in the Work shall be precisely the same in all details as the acceptable sample.

4.8 Should there be any change to the accepted sample, submit in writing for approval of the revised characteristics and resubmit samples of the Product for approval if requested.

4.9 When samples are very large, require assembly, or require evaluation at the Site, they may only be delivered to the Site with approval and as directed.

4.10 Construct field samples and mock-ups at locations acceptable to the Consultant.

4.11 Construct each sample or mock-up complete, including work of all trades required to finish work.

4.12 Reviewed samples or mock-ups will become the standards of workmanship and material against which installed work will be checked on the project.

5 COORDINATION OF SUBMISSIONS

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

5.2 Verify:

.1 Field measurements.

.2 Field construction criteria.

.3 Catalogue numbers and similar data.

5.3 Coordinate each submission with the requirements of the Work and the Contract Documents. Individual shop drawings will not be reviewed until all related drawings are available.

5.4 The Contractor's responsibility for errors and omissions in submission is not relieved by the Consultant's review of submittals.

5.5 The Contractor's responsibility for deviations in submission from the requirements of the Contract Documents is not relieved by the Consultant's review of the submission, unless the Consultant gives written acceptance of specified deviations.

5.6 Notify the Consultant, in writing at the time of submission, of deviations from the requirements of the Contract Documents.

5.7 After the Consultant's review, the .pdf file will be returned to the Contractor who shall distribute copies.

5.8 Originators preparing more than one submission, shall prepare a list of all shop drawings, complete with submission dates to the Consultant. Include this list with the first submission.

6 SUBMISSION REQUIREMENTS

6.1 Schedule submissions at least twenty 15 working days before the dates reviewed submissions will be needed.

6.2 Accompany each electronic submission with an email, titled as specified above.

6.3 Submissions shall include:

.1 Date and revision dates.

.2 Project title and number.

.3 Name of:
- .1 Contractor
- .2 Subcontractor
- .3 Supplier
- .4 Manufacturer
- .5 Separate detailer when pertinent

.4 Identification of product or material.

.5 Relation to adjacent structure or materials.

.6 Field dimensions, clearly identified as such.

.7 Specification section number.

.8 Applicable standards, such as CSA or CGSB numbers.

.9 Where applicable, the code used in the Contract Documents to identify the product

.10 Originator's stamp and signature, certifying review of submission, verification of field measurements and compliance with the Contract Documents.

.11 Contractor's stamp and signature, certifying review of submission.

.12 Professional engineer's stamp and signature, where specific sections of the specification so direct. Note that drawings will not be reviewed unless the Professional Engineer's stamp and signature is present.

.13 CSA/CGSB/ASTM or other conformance certificates where applicable.

6.4 The Contractor's stamp and signature, certifying review of the Submission shall be interpreted to mean that the Contractor has reviewed the drawings and coordinated them with the work of other trades. Drawings which have not been so reviewed and coordinated by the Contractor will be returned for resubmission before Consultant review will be undertaken.

7 REQUESTS FOR INFORMATION (RFI)

7.1 All RFIs must be submitted in PDF digital format. Each RFI shall address a single subject only. **RFIs submitted as plain text in the body of an email will not be accepted or reviewed.** This requirement is intended to ensure clarity, consistency, and proper documentation. Non-compliant RFIs will be returned to the sender without review.

7.2 Name each RFI file with the project acronym (Blantyre), RFI, the sequential number, and the Subject of the RFI. i.e.: **Blantyre–RFI-01-TileColour**

7.3 Title emails sending RFI's the same as the file name (i.e. **Blantyre –RFI-01-TileColour**).

8 SUBSTITUTIONS

8.1 Specific products establish a standard of acceptance. Unless substitutions are excluded in the individual Specification Sections, equivalent products by other manufacturers are acceptable as substitutions, provided the properties and compliances of the substitutions meet or exceed the properties and compliances of the specified products in all respects and that items exposed to sight are of the same appearance as the specified items.

8.2 Requests for substitution of alternative products to those described in the Bid Documents, shall be submitted in writing no less than ten (10) days before the bid closing date.

8.3 A request shall include the following:

.1 A description of the proposed substitution.

.2 A direct comparison between the properties and compliances of the specified product(s) with the properties and compliances of the proposed substitution, arranged in tabular form, in the same sequence as specified in the applicable specification section or in the sequence listed in the specified manufacturer's published literature, as appropriate.

.3 Country of manufacture.

.4 Shop drawings, product data and certified test results attesting to the proposed material or product equivalence.

.5 A list of no less than five (5) projects of comparable size and complexity, where the proposed substitution has been used in a similar application in Canada, including the name and current telephone number of the Prime Consultant for each project.

8.4 The burden of proof is on the Bidder. In the event that the Consultant/Owner deems the provided information to be inadequate, the request may be rejected.

8.5 A request constitutes a representation that the Bidder:

.1 Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.

.2 Will provide the same warranty for the Substitution, as for the specified Product.

.3 Will coordinate installation and make the required changes for the Work to be completed with no additional cost to the Owner.

.4 Assumes full responsibility that the substitute products will not exceed the space requirements allocated on the drawings.

.5 Waives claims for additional costs or time extension which may subsequently become apparent.

.6 Will reimburse the Owner for the cost of review or redesign services associated with re-approval by authorities.

8.6 Where the terms "or equal", "or equivalent" or terms of similar meaning are used in the specifications, this shall not release/relieve the Subcontractor from the responsibility to follow the stated procedures for approval of substitutions specified herein.

8.7 No substitutions will be permitted after award of the Contract, except under the following circumstances:

.1 If a material or product becomes unavailable through no fault of the Contractor.

.2 If the delivery date of the specified products unduly delays the completion of the Contract.

.3 Alternative products to those specified, which are brought to the attention of and considered by the Consultant/Owner as equivalent and, which will result in a credit to the Contract Sum.

8.8 Regardless of the above, no substitutions will be permitted without the prior written approval of the Consultant/Owner.

9 CERTIFICATES

9.1 Submit certificates that are required by authorities having jurisdiction or that are requested in the applicable specification sections.

9.2 Clearly show on each certification the name and location of the Work, name and address of Contractor, quantity and date of shipment and delivery and name of certifying company.

9.3 Certificates shall verify that Products and/or methods meet the specified requirements and shall include test reports of testing laboratories approved to validate certificates.

9.4 Submit certificates in duplicate and signed by an authorized representative of the certifying company.

10 CERTIFICATION OF SKILLED TRADES WORKERS

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

11 EXTENDED WARRANTIES

11.1 Submit extended warranties as requested in sections of the Specifications showing title and address of Contract, warranty commencement date and duration of warranty.

11.2 Extended warranties shall commence on termination of the standard warranty specified in the conditions of the contract and shall be an extension of these provisions. Clearly indicate what is being warranted and what remedial action is to be taken under the warranty. Ensure warranty bears the signature and seal of the Contractor.

11.3 Submit each extended warranty on a form that is acceptable to the Owner and Consultant.

12 INSPECTION AND TEST REPORTS

12.1 Submit inspection and test reports as specified in the Sections of the specifications for “Source Quality Control” and “Field Quality Control” within 2 working days of inspection or testing. If immediate action is required by the Contractor or Consultant inform the Consultant immediately and submit inspection and testing report within one working day.

12.2 Submit report with certificates of compliance indicating but not limited to the following:

.1 Project name and number.

.2 Date of inspection or test and date report is issued.

.3 Name and address of inspection and testing company.

.4 Name and signature of inspector or tester.

.5 Identification of Product and Specification Section covering inspected or tested work.

.6 Specified requirements for which the inspection or testing was performed and results of inspections or tests.

.7 Location of inspection or from which tested material was derived.

.8 Overview of inspection and testing methods and procedures.

.9 Remarks and observations on compliance with Contract Documents.

12.3 Inspection and test reports shall be signed by a responsible officer for the inspection and testing company.

13 PROGRESS PHOTOGRAPHS

13.1 Concurrently with monthly application for payment submit digital photos illustrating the progress of the Work as follows:

.1 A minimum of 50 photos that best illustrate the progress on the site.

.2 Photos shall be in focus and properly illuminated; view shall be unobstructed.

.3 The photos shall either have an accurate date-stamp present in the photo or be numbered and dated in the digital filename.

13.2 PROGRESS REPORTS

.1 Prepare a monthly progress report current to the last Friday of each month. The report shall indicate the period covered and include but not be limited to the following:

.1 Executive Summary
.2 Areas of Concern/Action Required
.3 Work Accomplished This Period
.4 Work Planned Next Period
.5 Schedule Status
.6 Budget Status
.7 Status of Submittals
.8 Quality Control
.9 Contract Changes
.10 Outstanding Actions

.2 Submit the monthly progress report such that it is received by the Consultant no later than the Wednesday following the last Friday of the month, regardless of whether or not the Monday is a public holiday.

13.3 **OPERATION AND MAINTENANCE MANUALS**

.1 Submit Operation and Maintenance Manuals in accordance with Section 01 78 23.

13.4 **RECORD DOCUMENTS**

.1 Submit record documents in accordance with Section 01 78 39.

END OF SECTION

1 GENERAL

1.1 Provide labour, Products, equipment, services tools and supervision necessary for submittals. Make submittals specified in this Section to Consultant unless otherwise specified.

2 REFERENCES

2.1 South Coast Air Quality Management District (SCAQMD)

.1 Amendment to South Coast Rule 1168, VOC Limits

.2 Rule 1113, VOC Limits

2.2 CDPH Standard Method v1.2–2017

.1 ISO Guide 65

.2 ISO 16000 parts 3, 6, 7, 11

.3 Canadian VOC Concentration Limits for Architectural Coatings 2009

.4 CARB 93120 ATCM

.5 ANSI/BIFMA M7.1 Standard Test Method for Determining VOC Emissions from office Furniture Systems, Components and Seating

.6 ANSI/BIFMA e3–2011 Furniture Sustainability Standard

2.3 **DEFINITIONS**

.1 Acrylonitrile-butadiene-styrene (ABS): A type of plastic produced by the chemical reaction of acrylonitrile, butadiene, and styrene monomers, often identified by its ABS marking.

.2 Adhesive: A material designed to bond surfaces together through attachment. This category includes bonding primers and adhesive primers for various materials like plastics.

.3 Adhesive Primer for Plastic: A preparatory material applied to plastic surfaces to enhance the adhesion of subsequent adhesives.

.4 Anti-corrosive / Anti-rust Paints: Protective coatings formulated to prevent corrosion on ferrous metal surfaces.

.5 Architectural Nonporous Sealant Primer: A primer designed for sealants used on nonporous materials.

.6 Architectural Porous Sealant Primer: A primer specifically for sealants applied to porous materials.

.7 Architectural Sealant: A sealing material applied to architectural elements like ducting, railings, cabinetry, or fixtures such as sinks and windows.

.8 Bond Breakers: Materials applied between concrete layers to prevent the top layer from adhering to the substrate below.

.9 Ceramic Tile Adhesive: Adhesives intended for affixing ceramic or porcelain tiles.

.10 Clear Brushing Lacquer: A clear finish for wood, excluding lacquer sanding sealers, that forms a protective film as it dries through solvent evaporation.

.11 Clear Wood Finishes: Transparent or semi-transparent finishes, such as varnishes and

lacquers, used to enhance and protect wood surfaces.

.12 Chlorinated Polyvinyl Chloride (CPVC): A polymer containing 67% chlorine, often marked as CPVC, used in various applications.

.13 Coating: A substance applied to surfaces to protect, beautify, or serve as a barrier.

.14 Concrete-Curing Compounds: Coatings used on newly poured concrete to slow water evaporation.

.15 Contact Adhesive: Adhesives applied to two surfaces, allowed to dry, then joined under pressure for bonding.

.16 Corner Guard Adhesive: Adhesive used to attach corner guards, typically made of vinyl or rubber, to wall edges.

.17 Cove Base Adhesive: Adhesive for installing cove base materials along walls, commonly made from vinyl or rubber.

.18 Drywall Adhesive: Adhesive used for securing gypsum drywall to studs or solid surfaces.

.19 Dry-Fog Coatings: Specially designed coatings for spray application, drying before reaching other surfaces as overspray.

.20 Faux Finishing Coatings: Decorative glazes used to mimic textures like wood grain or marble or to create artistic effects.

.21 Flat Paints and Coatings: Paints or coatings with low gloss levels, below 15 on an 85-degree meter or below 5 on a 60-degree meter.

.22 Fiberglass Substrate Adhesive: Adhesive governed by specific VOC limits when applied to fiberglass substrates.

.23 Floor Coatings: Protective coatings designed for floors, including both opaque and clear varieties for concrete surfaces.

.24 Graphic Arts (Sign) Coatings: Hand-applied paints, such as lettering enamels and poster colors, used for artistic or signage purposes.

.25 High-Temperature Industrial Maintenance Coatings: Coatings made for surfaces exposed to temperatures exceeding 400°F.

.26 Indoor Adhesive, Sealant, or Sealant Primer: Products used inside a building's weatherproofing system during application.

.27 Indoor Paints or Coating Products: Paints or coatings applied within the building’s weatherproofing system.

.28 Industrial Maintenance Coatings: Coatings designed for substrates requiring enhanced durability against chemicals, moisture, or high temperatures.

.29 Interior of the Building: Areas within a building’s weatherproof envelope, encompassing materials and spaces inside.

.30 Lacquers: Wood finishes that dry through solvent evaporation, including sanding sealers and pigmented varieties.

.31 Low-Solids Coatings: Coatings with minimal solids content, measured in VOC per litre, including water.

.32 Magnesite Cement Coatings: Coatings for protecting magnesite cement decking from water erosion.

.33 Mastic Coatings: Thick coatings used to conceal imperfections or fill gaps, applied in layers at least 10 mils thick.

.34 Metal to Metal Substrate: Adhesives governed by specific VOC limits when applied between metal surfaces.

.35 Multi-purpose Construction Adhesive: Adhesive for diverse materials like drywall, subflooring, and ceiling tiles.

.36 Non-flat Paints and Coatings: Paints with gloss levels above 5 on a 60-degree meter and

above 15 on an 85-degree meter.

.37 Nonporous Sealant: Sealants for surfaces that do not absorb or discharge fluids, such as plastic or metal.

.38 Off-gassing: Emission of VOCs from materials like synthetic or natural products.

.39 Paint: A liquid or semi-liquid substance that forms a protective or decorative film upon drying.

.40 Panel Adhesive: Adhesive for mounting panels like plywood or fiberglass-reinforced plastic to surfaces.

.41 Plastic Foam Substrate Adhesives: Adhesives intended for use with plastic foam substrates, regulated by applicable VOC limits when no other specific definitions apply.

.42 Plastic Cement Welding: A bonding method using solvent-based adhesives to dissolve and bond plastic surfaces, excluding ABS, CPVC, and PVC.

.43 Pre-treatment Wash Primers: Primers containing at least 0.5% acid by weight, applied directly to bare metal to achieve surface etching.

.44 Porcelain Tile Adhesive: Adhesives formulated for installing ceramic or porcelain tiles.

.45 Porous Materials: Materials like wood or fabric with microscopic openings that allow fluids to be absorbed or discharged.

.46 Porous Material Substrate Adhesive (except wood): Adhesives regulated by VOC limits for porous materials when specific definitions do not apply.

.47 Primer: A preparatory coating applied to a surface to improve the adhesion of subsequent layers.

.48 Polyvinyl Chloride (PVC): A plastic polymer containing 57% chlorine, commonly identified by PVC markings.

.49 Quick-Dry Enamels: High-gloss coatings that set to touch within two hours, dry hard in eight hours, and become tack-free within four hours.

.50 Quick-Dry Primers: Primers designed to dry to touch in 30 minutes and allow recoating within two hours.

.51 Rubber Flooring Adhesive: Adhesives used for installing rubber flooring in sheet or tile form.

.52 Sanding Sealers: Clear coatings applied to bare wood for sanding and sealing before applying additional coatings.

.53 Sealant: A material with adhesive properties designed to fill or waterproof gaps and joints between surfaces, including caulks and primers.

.54 Sealant Primer: A primer applied to a surface before using a sealant to improve adhesion.

.55 Sealers: Coatings used to block materials from penetrating or leaching out of substrates or to protect subsequent coatings from substrate materials.

.56 Sheet-applied Rubber Lining Operation: The manual application of rubber sheets to metal or plastic substrates for corrosion or abrasion resistance.

.57 Shellac: Quick-drying, resin-based coatings derived from lac insect secretions, used for priming, sealing, and wood finishing (excluding floors).

.58 Special Purpose Contact Adhesive: Adhesives for specialized applications involving substrates like melamine board, metal, Teflon, or ultra-high molecular weight polyethylene.

.59 Specialty Primers: Primers designed to seal surfaces affected by fire, smoke, or water damage.

.60 Stains: Coatings that alter a surface’s color without obscuring its grain or texture.

.61 Structural Glazing Adhesive: Adhesives used for attaching structural elements such as glass, metal, or stone to building frames.

.62 Structural Wood Member Adhesive: Adhesives used for constructing load-bearing wood components like beams and trusses.

.63 Subfloor Adhesive: Adhesives for securing subflooring materials over joists.

.64 Substrate-Specific Applications: VOC limits applicable to adhesives or primers used on substrates without specific categorization elsewhere.

.65 Undercoaters: Coatings that create a smooth base layer for subsequent finishes.

.66 Varnishes: Transparent finishes for wood that dry through chemical reaction, providing durability and protection.

.67 VCT (Vinyl Composition Tile): Flooring material made from thermoplastic resins, fillers, and pigments.

.68 Volatile Organic Compounds (VOCs): Carbon-based compounds that vaporize at room temperature and participate in photochemical reactions (excluding carbon monoxide, carbon dioxide, and similar inert compounds).

.69 Waterproofing Concrete / Masonry Sealers: Sealers that protect concrete and masonry from water, alkalis, acids, ultraviolet light, and stains.

.70 Wood Preservatives: Coatings designed to protect wood from decay or insect damage through the addition of specialized chemicals.

.71 Wood Substrate Adhesive: Adhesives regulated by VOC limits when used with wood substrates, provided no specific definitions apply.

.72 Waterproofing Sealers: Coatings primarily formulated to prevent water penetration into porous substrates.

.73 Weatherproofing System: The barrier that shields a building from external environmental conditions such as wind and water, typically comprising the air barrier within wall and roof assemblies.

.74 Wood Flooring Adhesive: Adhesives formulated for installing wood flooring, including parquet tiles, planks, or strip-wood flooring.

.75 Zinc-Rich IM Coatings: Primers with at least 65% metallic zinc powder by weight, used on metal substrates for enhanced corrosion resistance.

2.4 **SUBMITTALS**

.1 Submit manufacturer letters, technical data sheets and/or MSDS (Material Safety Data Sheets, providing the following information:

.1 VOC contents in g/L format

.2 Description of applications and intended uses

.3 Confirmation that products are compliant with the requirements listed within the product section of this specification.

3 PRODUCTS

3.1 All adhesives, sealants, paints, coatings, ceiling materials, wall materials, flooring materials, composite wood, and furniture installed on the interior side of the building (i.e., within the weatherproofing system and applied on-site) must adhere to the requirements outlined in this specification, regardless of the construction phase (including prior to building enclosure).

3.2 All insulation materials, whether for acoustic or thermal purposes and regardless of their location within the building, must comply with the requirements of this specification during all construction phases, including prior to building enclosure.

3.3 If there is uncertainty about whether a product must meet the requirements of this specification section, it must be submitted for review by the consultant to provide clarity and direction.

3.4 Insulation, Ceilings, Flooring, and Walls

.1 All insulation products, whether used on the building's interior or exterior, must comply with these requirements, with the exception of ductwork insulation, both internal and external.

.2 Ceilings encompass overhead structural components (finished, unfinished, or exposed), direct-applied systems, suspended systems (e.g., canopies or clouds), and glazed skylights. Examples include painted drywall, plaster, acoustical suspension systems, and specialty systems made from materials like plastic, metal, or wood. Structural components that are painted or otherwise finished also fall under this category. When there is ambiguity between classifying an element as a wall or ceiling, the project team may decide based on practicality.

.3 Flooring materials include finished surfaces such as subflooring, fluid-applied adhesives, troweled grouts (for full spreads only), engineered wood, resilient flooring, carpeting, and mineral-based tiles.

.4 Wall materials refer to generally vertical structural elements, whether exposed, finished, or unfinished. This includes finishes, interior columns, exterior and interior glazing, doors, partial-height partitions (e.g., bulkheads, transoms, pony walls, knee walls), architectural woodwork, cabinetry, and floor-to-ceiling movable partitions. Ambiguities between wall and ceiling classification may be resolved by the project team as deemed appropriate.

.5 Insulation, ceiling, flooring, and wall products must be tested for compliance based on the California Department of Public Health (CDPH) Standard Method v1.2–2017, using the relevant exposure scenario (default: private office scenario). Manufacturer or third-party certification must state the testing scenario used to verify compliance. For wet-applied products, claims must specify the applied mass per surface area. Additionally, the compliance documentation must indicate total VOC concentrations at 14 days (336 hours), categorized as ≤0.5 mg/m³, 0.5–5.0 mg/m³, or ≥5.0 mg/m³.

3.5 Composite Wood Products

.1 Composite wood is defined as a material comprising wood or plant fibers/particles bonded using synthetic resins or adhesives. Examples include particleboard, medium-density fiberboard (MDF), plywood, oriented strand board (OSB), wheatboard, and strawboard.

.2 Composite wood products must meet the California Air Resources Board (CARB) Airborne Toxic Control Measure (ATCM) for ultra-low-emitting formaldehyde (ULEF) resins or no-added formaldehyde resins.

.3 Architectural millwork that is salvaged or reused and over one year old at the time of occupancy is considered compliant, provided that any site-applied finishes such as paints, adhesives, or sealants meet the specification requirements.

3.6 Adhesives, sealants, paints, and coatings applied inside the weatherproofing system must meet the requirements specified herein.

3.7 Sealants are materials formulated with adhesive properties, primarily for filling, sealing, or waterproofing gaps and joints between surfaces. This includes primers and caulks.

3.8 Adhesives, sealants, paints, and coatings must be tested and verified for compliance based on the CDPH Standard Method v1.2–2017 using the applicable exposure scenario. The private office scenario serves as the default. Documentation must include the exposure scenario and applied mass per surface area for wet-applied products. Compliance must specify total VOC concentrations at 14 days as ≤0.5 mg/m³, 0.5–5.0 mg/m³, or ≥5.0 mg/m³.

3.9 In addition to meeting CDPH Standard Method v1.2–2017 requirements, adhesives, sealants, paints, and coatings must comply with the VOC limits specified in the accompanying tables.

3.10 Definitions provided in this specification are intended to assist in categorizing the products used in this project.

3.11 Products that fall under any of the definitions in this specification must be submitted for review.

3.12 If there is ambiguity regarding a product's classification or whether it must be submitted for review, it should be referred to the consultant for guidance.

3.13 Product compliance shall be measured in grams per liter (g/L).

3.14 When calculating VOC content, pigments are not required to be included.

3.15 The methods used to determine VOC content are not limited to those specified here, as long as they measure VOC in g/L, excluding water.

3.16 Test methods must include VOC measurements expressed in g/L, excluding water content.

3.17 VOC Maximum Limits for Adhesives, Sealants, Paints and Costings:

.1 Adhesives

.1 Carpet Adhesives: 50
.2 Carpet Pad Adhesives: 50
.3 Wood Flooring Adhesives: 100
.4 Rubber Floor Adhesives: 60
.5 Subfloor Adhesives: 50
.6 Porcelain / Ceramic Tile Adhesives: 65
.7 VCT & Asphalt Tile Adhesives: 50
.8 Drywall & Panel Adhesives: 50
.9 Cove Base Adhesives: 50
.10 Corner Guard Adhesives: 50
.11 Multipurpose Construction Adhesives: 70
.12 Structural Glazing Adhesives / Sealants: 100
.13 PVC Welding: 510

.14 CPVC Welding: 490
.15 ABS Welding: 325
.16 Plastic Cement Welding: 250
.17 Adhesive Primer for Plastic: 550
.18 Contact Adhesive: 80
.19 Special Purpose Contact Adhesive: 250
.20 Structural Wood Member Adhesive: 140
.21 Sheet Applied Rubber Lining Operations: 850
.22 Top and Trim Adhesive: 250

.2 Sealants
.1 Architectural Sealant: 250
.2 Structural Glazing Adhesive / Sealant: 100
.3 Sealant Primer - Non-Porous: 250
.4 Sealant Primer - Porous: 775
.5 Roadway Sealant: 250

.3 Substrate Specific Sealants (Note: Substrate-specific limits apply only for materials not governed in other sections of this table.)
.1 Metal to Metal: 30
.2 Plastic Foams: 50
.3 Porous Material (Except Wood): 50
.4 Wood Flooring Adhesives: 30
.5 Fiberglass: 80

.4 Paints and Coatings
.1 Metallic Pigmented Coating: 150
.2 Extreme High Durability Coating: 800
.3 Faux Finish: 350
.4 Shellac, Clear: 730
.5 Shellac, Opaque: 550
.6 Clear Lacquer for Wood: 275
.7 Other Lacquer: 275
.8 Oil Varnish for Wood: 275
.9 Any Other Varnish: 350
.10 Wood Conditioners: 100
.11 Wood Preservatives: 350
.12 Sanding Sealer: 275
.13 Specialty Primer, Sealer, or Coating: 100
.14 Waterproofing Sealer for Concrete or Masonry: 100
.15 Any Other Waterproofing Sealer: 100
.16 Any Other Primer, Sealer, or Undercoater: 100
.17 Quick-Dry High-Gloss Enamel: 250
.18 Recycled Coating: 250
.19 Any Flat Coating Not Listed Above: 50
.20 Any Non-Flat Coating (Not High Gloss): 50
.21 Any High Gloss Coating: 150

.5 Additional Paint and Coating VOC Limits
.1 Rust Preventative Coating: 100
.2 Stains: 250
.3 Floor Enamel, High Gloss: 100

.4 Any Other Opaque Floor Coating: 100
.5 Mastic Texture Coating: 100
.6 Fire Resistant Coating: 150
.7 Graphic Arts Coatings: 150
.8 Dry Fog Coating: 50
.9 Floor Coatings: 50
.10 Multi-Color Coatings: 250
.11 Magnesite Cement Coatings: 450
.12 Tile and Stone Sealer: 100
.13 Zinc Rich Primers: 100
.14 Industrial Maintenance Coatings: 100
.15 High Temp Industrial Maintenance Coatings: 420
.16 Roof Primers: 350
.17 Bond Breaker: 350
.18 Concrete Curing Compound: 100
.19 Concrete Surface Retarder: 50
.20 Form Release Compound: 250
.21 Traffic Coating: 100

END OF SECTION

1 **CONSTRUCTOR**

1.1 For the purposes of the Contract, the term "Constructor", as defined in the Occupational Health and Safety Act, shall mean the Contractor who shall be responsible for ensuring that the provisions of the statutes, regulations and by-laws pertaining to the safe performance of the Work are to be observed. The "Constructor" shall submit the Notice of Project.

1.2 In the event of conflict between any of the provisions of Statues, Regulations and By- laws, and other requirements of authorities, the most stringent provision applies.

1.3 the Contractor's representative shall be responsible for ensuring that the provisions of statutes, regulations and by-laws pertaining to safe performance of the Work and the work of Other Contractors and Owner's own forces working on the Site are observed and that the methods of performing the Work do not endanger the personnel employed thereon nor the general public, and are in accordance with the latest edition of the Occupational Health and Safety Act. Include on the Joint Health and Safety Committee representatives of Other Contractors working on Site.

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

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

2 **PROJECT RESPONSIBILITIES**

2.1 The Contractor's representative shall ensure that:

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

.1 The Occupational Health and Safety Act;

.1 worker safety is given first priority in planning, pricing and performing the Work;

.2 its officers and supervisory employees have a working knowledge of the duties of a "constructor and "employer" as defined by the Act and the provisions of the Regulations applicable to the Work, and a personal commitment to comply with them;

.3 A copy of the most current version of the Act and the Regulations are available at the Contractor's office at the Place of Work, in the absence of an office, in possession of the supervisor responsible for the performance of the Work;

.4 workers employed to carry out the Work possess the knowledge, skills and protective devices required by law or recommended for use by a recognized industry association to allow them to work in safety;

.5 supervisory employees carry out their duties in a diligent and responsible manner with due consideration for the health and safety of the workers; and

.6 all Subcontractors and their employees are properly protected from injury while they are at the Place of Work.

.2 The Regulations for Construction Projects;

.3 WHMIS Regulations;

.4 The Environmental Protection Act and regulations,

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

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

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

2.5 **WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)**

2.6 Be familiar with and comply with WHMIS regulations.

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

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

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

2.10 Be responsible for all applicable requirements of the regulations.

2.11 Before commencing any Work on Site, attend the pre-construction meeting and provide the Consultant with a proposal as to how hazardous materials will be

stored and dispensed on Site. In addition, specifically outline the measures which will be undertaken to prevent damage or injury in the event of an accidental spill.

2.12 Provide “Handling Procedure for Hazardous Materials”.

3 **JOINT HEALTH AND SAFETY COMMITTEE**

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

4 **DELIVERABLES**

4.1 The Contractor shall deliver to the Consultant:

.1 The Contractor's Occupational Health and Safety Policy.

.2 The Contractor's safety program to implement the Occupational Health and Safety Policy for the Contract, which will effectively prevent and control accidents for the Contract.

.3 A copy of all communications with, and including all orders by, the Ministry of Labour or other occupational health and safety enforcement authority.

.4 A copy of all accident/injury investigation reports, not just the WSIB Form 7. Each report must contain a statement of actions that will be taken to prevent a recurrence.

.5 A copy of all inspection reports made by the Contractor in compliance with the employer's responsibility under the Occupational Health and Safety Act.

.6 A copy of all safety information pertaining to the Contract made and furnished by the Contractor's own "Safety Personnel" or outside consultants/advisers engaged for the purpose of inspecting the workplace for occupational health and safety.

.7 A verification that all workers in the employ of the Contractor on Site, have had a WHMIS training or refresher course within the last twelve months.

.8 A verification that all workers in the employ of the Contractor have had "Explosive Activated Tool Training" on the type of tools being used.

.9 A verification that the instruction manuals are on Site for all tools and equipment being used.

.10 A copy of the most recent workers compensation experience rating account, i.e.CAD-7, NEER, and/or an insurance carrier's experience rating account.

.11 Statistical information for the purpose of determining injury frequency and severity rates (hours worked, first-aid injuries, medical aid injuries, lost time injuries, restricted workday injuries, near-miss accident/incident and significant occurrence data), in a timely manner as required by the Consultant.

.12 The immediate reporting to the Consultant of all instances that are defined in the Occupational Health and Safety Act as "Notices of Injuries" and "Occurrences" and any occasion that a worker exercises their "Right to Refuse Unsafe Work".

4.2 The Consultant reserves the right to require additional or amended deliverables pertaining to safety during the duration of the Work at no additional cost to the Owner.

4.3 Items specified above shall be delivered to the Consultant prior to the Contractor commencing Work on the Site.

5 **DUE DILIGENCE**

5.1 The Contractor acknowledges that it has read and understands the measures and procedures relating to occupational health and safety as prescribed above. The Contractor acknowledges and understands its duties as therein set out and hereby expressly undertakes and agrees to comply with all such requirements and standards in their entirety and at the Contractor's expense.

5.2 The Contractor further agrees to fully cooperate with all health and safety requirements, rules, regulations, standards and criteria set out in the Contract Documents, which agreement is in furtherance of the Contractor's duties and responsibilities under occupational health and safety legislation.

5.3 The Contractor agrees that if, in the opinion of the Consultant or Owner, the health and safety of a person or persons is endangered or the effective operation of the system put in place to ensure the health and safety of workers on the Site is not being implemented, the Consultant or Owner may take such action as it deems necessary and appropriate in the circumstances, including, without limitation, the following:

.1 Require the Contractor to remedy the condition forthwith at its own expense;

.2 Require that the Site be shut down in whole or in part until such time as the condition has been remedied;

.3 Remedy the problem and the Owner shall back-charge the Contractor for the cost of such remedial work, together with an appropriate overhead factor as determined by the Owner in its sole discretion; and

.4 Terminate the Contract without further liability in the event the Contractor fails to comply with these provisions;

.5 If a lien is registered, in respect to any monies held back, back-charged or assessed in accordance with these paragraphs, the Contractor shall consent to an order vacating such registration and shall indemnify the Owner for any and all loss, whereby direct or consequential which the Owner may sustain as a consequence of such registration

6 HEALTH AND SAFETY PLAN

6.1 Submit a project-specific health and safety policy and program during the preconstruction meeting. Promptly address requests from the Consultant or Owner for verification that the methods and procedures used to execute the Work are in compliance with applicable Acts and Regulations.

6.2 Collaborate with the Consultant and the Owner's designated representatives responsible for enforcing health and safety regulations during any investigations related to worker safety in the course of the Work. Assume responsibility for and indemnify the Owner against any additional costs incurred to complete the Work due to the Contractor’s non-compliance with the Acts and Regulations.

6.3 Before starting the Work, provide a list of products regulated under the Workplace Hazardous Materials Information System (WHMIS) that will be used on the project, along with the associated Material Safety Data Sheets (MSDS). Ensure all containers for WHMIS-regulated products are appropriately labeled. Notify the Consultant in writing of any changes and submit updated Material Safety Data Sheets as required.

7 SITE SAFETY PERSONNEL

7.1 Designate an authorized representative to be present on-site whenever work is being conducted. This individual shall serve as the Health and Safety Coordinator for the project, acting on behalf of the Contractor to ensure adherence to the project-specific health and safety policy by all construction personnel. They will also be responsible for implementing any additional health and safety measures required.

7.2 Before construction begins, provide the Consultant with a list containing the names, addresses, positions, and contact numbers of the Contractor's representatives who are available to address any matters related to the Contract at all times.

END OF SECTION

1 **GENERAL**

1.1 Be responsible for inspection and testing as required by the Contract Documents, statutes, regulations, by-laws, standards or codes or any other jurisdictional authority. Give the Consultant timely notice of the readiness for inspection, date and time for such inspection for attendance by the Consultant.

2 **FIRES**

2.1 The lighting of fires and burning of waste materials on-site is strictly prohibited.

3 **DISPOSAL OF WASTE**

3.1 Do not bury waste or debris on the project site.

3.2 Waste or volatile substances, including mineral spirits, oil, or paint thinner, must not be discharged into waterways, storm drains, or sanitary sewers.

3.3 Hazardous waste and volatile materials must be disposed of in compliance with the regulations of the relevant authorities. Ensure that all disposal methods safeguard construction personnel, site visitors, and the general public from potential hazards.

4 **DRAINAGE**

4.1 Provide temporary drainage and pumping to keep excavations and the site free of water accumulation.

4.2 Avoid discharging water with suspended solids into waterways, sewers, or drainage systems.

4.3 Manage the runoff or disposal of water containing suspended solids or harmful substances in line with local regulations.

4.4 The Contractor is responsible for obtaining all necessary permits for water pumping activities (e.g., Permit to Take Water).

5 **POLLUTION CONTROL**

5.1 Ensure that emissions from equipment and machinery comply with the standards set by local authorities.

5.2 Prevent contamination of the air beyond the immediate work area by using temporary enclosures for activities such as sandblasting.

5.3 Cover or moisten dry materials and waste to control the spread of dust and debris. Implement dust control measures for temporary roads as needed.

END OF SECTION

1 GENERAL

1.1 Be responsible for inspection and testing as required by the Contract Documents, statutes, regulations, by-laws, standards or codes or any other jurisdictional authority. Give the Consultant timely notice of the readiness for inspection, date and time for such inspection for attendance by the Consultant.

1.2 Verify by certification that specified products meet the requirements of reference standards specified in the applicable specification sections.

1.3 Conduct testing, balancing and adjusting of equipment and systems specified in applicable mechanical and electrical specifications sections by independent testing company.

2 CANADA GREEN BUILDING COUNCIL's (CaGBC) Zero Carbon Building – Design ZERO CARBON BUILDING - DESIGN REQUIREMENTS

2.1 CAGBC Zero Carbon Building - Design requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

2.2 Compliance with requirements needed to obtain CAGBC Zero Carbon Building - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

3 INSPECTION AND TESTING BY THE OWNER

3.1 The Consultant, on behalf of the Owner may appoint an independent inspection and testing company to carry out inspection and testing of the Work for conformance to the Contract Documents. Such costs for inspection and testing will be paid by the Owner. However, any additional inspection and testing due to non-conformance to the Contract Documents shall be at the Contractor's expense.

3.2 Inspections and testing by the independent inspection an testing company will be promptly made. Uncover for examination any Work covered up prior to inspection or without approval of the Consultant. Make good such Work at no cost to the Owner.

3.3 The Owner may inspect and test Products during manufacture, fabrication, shop testing, installation, construction and testing phases of the Contract. The Consultant will ascertain the quantity and quality of testing to be performed. Inspection and testing may be performed at the place of manufacture/fabrication, storage, or at the Site as designated by the Consultant. Where inspection and testing is done either during manufacture, fabrication, or at Site, ensure that proper facilities and assistance are provided.

4 INDEPENDENT INSPECTION AND TESTING AGENCIES

4.1 Source and Field Quality Control specified in Other Sections:

.1 This Section includes requirements for performance of inspection and testing specified under Source Quality Control and Field Quality Control in other Sections of the specifications.

.2 Do not include in work of this Section responsibilities and procedures that relate solely to an inspection and testing company's functions that are specified in another Section which is paid for directly by the Owner.

5 **INSPECTION AND TESTING PROCEDURES**

5.1 Perform specified inspection and testing only in accordance with specified reference standards, or as otherwise approved.

5.2 Observe and report on compliance of the Work to requirements of Contract Documents.

5.3 Ensure that inspectors are on site or at fabricator's operations for full duration of critical operations, and as otherwise required to determine that the Work is being performed in accordance with the contract Documents.

5.4 Identify samples and sources of materials.

5.5 Review and report on progress of the work. Report on count of units fabricated and inspected at fabricator's operations.

5.6 Observe and report on conditions of significance to work in progress at time of inspection or at fabricator's operations. Include where applicable and if critical to the work in progress:

.1 Time and date of inspection.

.2 Temperature of air, materials, and adjacent surfaces.

.3 Humidity of air, and moisture content of materials and adjacent materials.

.4 Presence of sunlight, wind, rain, snow and other weather conditions.

5.7 Include in reports all information critical to inspection and testing.

5.8 Ensure that only materials from the work and intended for use therein are tested.

5.9 Determine locations for work to be tested.

6 **TOLERANCES FOR INSTALLATION OF WORK**

6.1 Unless specifically indicated otherwise, work shall be installed plumb, level, square and straight.

6.2 Unless acceptable tolerances are otherwise specified in specification sections or are otherwise required for proper functioning of equipment, site services, and mechanical and electrical systems:

.1 "Plumb and level" shall mean plumb or level within 1 mm in 1 m.

.2 "Square" shall mean not in excess of 10 seconds lesser or greater than 90 degrees.

.3 "Straight" shall mean within 1 mm under a 1 m long straightedge.

.4 "Flush" shall mean within:

.1 6 mm for exterior concrete, masonry, and paving materials.

.2 1 mm for interior concrete, masonry, tile and similar surfaces.

.3 0.05 mm for other interior surfaces.

6.3 Allowable tolerances shall not be cumulative.

6.4 Be advised that room dimensions for this project are closely coordinated with furniture dimensions. Dimensions indicated on the drawings must be maintained within a tolerance of $\pm$ 12 mm throughout the project.

6.5 Monitor fabrication and installation tolerance control of products to produce acceptable work. Do not permit tolerances to accumulate.

6.6 Comply with manufacturers' tolerances. Should a manufacturer's tolerances conflict with the Contract Documents, request clarification from the Consultant before proceeding.

6.7 Adjust products to appropriate dimensions; position products before securing in place.

7 **REFERENCE STANDARDS**

7.1 Perform inspection and testing in accordance with Standards quoted and as required by procedures described in specified reference standards that are applicable to the work being inspected and tested.

7.2 Perform the Work in accordance with the latest edition, including all revisions, of applicable codes and regulations of federal, provincial, or local application, provided that, in any case of conflict or discrepancy, the more stringent requirements shall apply.

7.3 Meet or exceed the requirements of specified standards, codes and referenced documents.

7.4 For materials, products or workmanship specified by association, trade or other consensus standards, comply with the requirements of the standard, except where more rigid requirements are specified or are required by applicable codes.

7.5 In each case, where a standard, code or other document is referenced, the latest edition or revision shall apply, unless specified otherwise, except where a specific date of issue is established by code.

7.6 Neither the contractual relationships, duties or responsibilities of the parties in the Contract shall be altered from those defined by the Contract Documents by mention or inference otherwise in any referenced document.

8 **DEFECTS**

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

9 **MOCK UPS**

9.1 Where required by Contract Documents construct, unless indicated herein, mock- ups of work on Site, in size and at location directed by Consultant.

9.2 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-ups.

9.3 Construct mock-ups to include all related specified materials and workmanship. Make revisions as directed by Consultant, in accordance with the intent of the Contract Documents, until mock-ups are acceptable.

9.4 Mock-ups, reviewed and accepted by Consultant, shall become the standard of quality against which installed work will be measured.

9.5 Mock-ups, by prior arrangement, may be incorporated into finished work if approved by Consultant only.

9.6 Procedures for the preparation and submission of mock-ups are specified in Section 01 33 00 "Submittal Procedures".

9.7 Tests will be performed under the provisions identified in this Section.

10 **DOCUMENTS ON SITE**

10.1 Maintain at job site, one copy of each of the following:

.1 Contract Documents including Drawings, Specifications, Addenda, and other

modifications to the Contract.

.2 'Reviewed' or 'Reviewed as Modified' Shop Drawings.

.3 Project Construction and Shop Drawing Schedules.

.4 Site Instructions and Change Orders.

.5 Field Test Reports.

.6 Reports by Authorities having Jurisdiction.

.7 Building and other applicable permits.

.8 Daily log including:

.1 Weather conditions.

.2 Excavation conditions

.3 Start and finish date of each Trade Contractor.

.4 Erection and removal dates of formwork.

.5 Date, quantities and particulars of each concrete pour.

.6 Dates and quantities and particulars of roofing and waterproofing work.

.7 Visits to the Site by Owner, Consultants, Jurisdictional Authorities, Testing and Inspection companies, and material and equipment supplier representatives.

.8 Material Safety Data Sheet pursuant to WHMIS (Occupational Health & Safety Act).

.9 As-built drawings recording as-built conditions, instructions, changes for structure, equipment, wiring, plumbing, etc., as called for in Section 01 78 39 and in other Divisions, prior to being concealed.

.10 Copies of applicable codes.

10.2 The above material shall be made available to the Consultant at their request.

11 **BUILDING ENVELOPE**

11.1 The requirements outlined in this section are applicable to all components of the exterior building envelope.

11.2 Maintaining the continuity of the air barrier, vapor retarder, and insulation systems is essential at all locations. Where different systems interface, ensure proper integration and continuity by utilizing appropriate construction methods and ensuring the use of compatible materials.

11.3 The maximum allowable air leakage rate is 0.10 L/(s·m²), tested under conditions of a warm-side relative humidity between 27% and 55% at 21°C, with an air pressure differential of 75 Pa. Alternatively, the requirements of the latest version of the Canada Green Building Council's (CaGBC) Zero Carbon Building – Design Standard shall be followed if they are more stringent.

11.4 Secure exterior cladding elements to the structure in a manner that accommodates structural movement, deflection, and creep while resisting temperature gradient loads. The anchorage system must be designed to withstand positive and negative wind pressures in compliance with relevant regulations.

11.5 Ensure that air spaces within exterior building components are appropriately firestopped, adhering to all applicable codes and regulations.

11.6 Provide adequate drainage systems for air spaces external to vertical air barrier/vapor retarder systems, window assemblies, and curtain wall systems to direct water to the exterior effectively.

11.7 Owner reserves the right to perform a thermographic scan of the building envelope

upon project completion. The Contractor will be responsible for rectifying any thermal anomalies identified during this process.

12 **DRAINAGE**

12.1 Layout and construct work to ensure that positive drainage is provided to floor drains, ditches, site drains and catch basins, as set in their final position, preventing undrained areas and ponding.

12.2 Ensure that allowable construction tolerances and structural deflection do not cause ponding of water.

12.3 Report to Consultant in writing prior to executing work affected, in case adequate drainage cannot be provided.

END OF SECTION

1 GENERAL

1.1 Provide Labour, Products, equipment, services, tools and Supervision to ensure that Work complies with minimum acceptable standards of materials and performance of Work in accordance with codes and standards referenced in the Specification.

1.2 Consider contract forms, codes, Specifications, standards, manuals, and installation and application instructions referred to in these specifications to be the latest published editions at the date of submission of the bid unless otherwise stated in the Specifications or otherwise required by the authorities having jurisdiction.

2 BY-LAWS, PERMITS, AND FEES

2.1 The Building Code - Ontario Regulation 332/12, including all amendments, shall govern the construction of the Work.

2.2 Comply with all By-Laws and regulations of authorities having jurisdiction. These codes and regulations constitute an integral part of the Contract Documents.

2.3 Owner shall apply and pay for Municipal Building Permit, and Contractor shall obtain and pay for all other permits, licenses, deposits, and certificates of inspection as part of the Contract Price as per Conditions of the Contract. Ensure that permits, licenses, deposits, and certificates included under specific Sections are provided as specified.

2.4 If required, pay for construction damage deposit required by authorities having jurisdiction.

2.5 Where permits, licenses, and inspection fees are required by authorities having jurisdiction for specific trade functions, they shall be obtained by particular subtrade responsible for that work.

2.6 Arrange for inspection, testing of Work and acceptance required by the authorities having jurisdiction. Be responsible for necessary preparations, provisions and pay all associated costs.

2.7 Be responsible for ensuring that no work is undertaken which is conditional on permits, approvals, reviews, licenses, fees, until all applicable conditions are met. No time extension will be allowed for delay in obtaining necessary permits.

2.8 Any additional work or changes to the materials due to Work not complying with the Ontario Building Code and Regulations as indicated by the Building Inspector shall be changed. All costs involved shall be borne by Contractor.

2.9 Obtain permit required to work on Municipal rights of way. Provide damage deposits for sidewalks, roads and services work, as applicable.

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

3 **EXISTING PUBLIC SERVICE LINES**

3.1 Where existing public services are indicated to be removed and/or relocated, perform Work in compliance with authorities having jurisdiction.

3.2 Make good public roads, walkways and curbs soiled or damaged due to construction to the requirements of local authorities.

4 **CODES**

4.1 Reference is made to standards in the specifications to establish minimum acceptable standards of materials, products and workmanship. Ensure that materials, products and workmanship meet or exceed requirements of the reference standards specified.

4.2 In the event of conflict between documents specified herein, execute the Work in accordance with the most stringent requirements.

5 **STANDARDS**

5.1 Where a material or product is specified in conjunction with a referenced standard, do not supply the material or product if it does not meet the requirements of the standard. Supply another specified material or product, or an acceptable material or product of other approved manufacture which does meet the requirements of the standard, at no additional cost to the Owner.

5.2 Where no standard is referred to, provide materials, products and workmanship which meet requirements of the applicable standards of the Canadian Standards Association, Canadian General Standards Board, Ontario Provincial standard specifications (OPSS), Ontario Provincial Standard Drawings (OPSD) and the applicable building code. References to "Measurement for Payment" and "Basis of Payment" in OPSS standard documents are not applicable to this Contract.

5.3 If there is question as to whether a material, product or system is in conformance with applicable standards, the Consultant reserves the right to have such materials, products or systems tested to prove or disprove conformance. The cost for such testing will be paid by the Owner in the event of conformance with contract Documents or by the Contractor in the event of non-conformance.

5.4 Where application, installation and workmanship standards are cited, it is intended that referenced standards form the basis for minimum requirements of the specified item and specifications supplement the standards unless specified otherwise.

5.5 Matters may be dealt with in part by these specifications which are also dealt with, under the same or similar headings in cited standard. It is not intended that these specifications take the place of the standards but supplement them, unless specified otherwise.

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

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

AA: The Aluminum Association
AAMA: Now part of FGIA (Fenestration and Glazing Industry Alliance)
AASHTO: American Association of State Highway and Transportation Officials
ACI: American Concrete Institute
AFBMA: Anti-Friction Bearing Manufacturer's Association
AIEE: Merged with IRE to form IEEE (Institute of Electrical and Electronics Engineers)
AISI: American Iron and Steel Institute
AMCA: Air Movement and Control Association
AMEU: Association of Municipal Electric Utilities
ANSI: American National Standards Institute
ARI: Now AHRI (Air-Conditioning, Heating, and Refrigeration Institute)
ASA: Now ANSI (American National Standards Institute)
ASHRAE: American Society of Heating, Refrigeration and Air Conditioning Engineers
ASME: American Society of Mechanical Engineers
ASTM: Now ASTM International
AWMAC: Architectural Woodwork Manufacturers Association of Canada
AWWA: American Water Works Association
CAGBC: Canada Green Building Council
CEMA: Canadian Electrical Manufacturer's Association
CGA: Canadian Gas Association
CGSB: Canadian General Standards Board
CISC: Canadian Institute of Steel Construction
CMHC: Canadian Mortgage and Housing Corporation
CMPA: Canadian Paint Manufacturers Association
COFI: Council of Forest Industries of British Columbia
CRCA: Canadian Roofing Contractors Association
CSA: Canadian Standards Association
CSSBI: Now part of CISC (Canadian Institute of Steel Construction)
CWB: Canadian Welding Bureau
CWC: Canadian Wood Council
EEMAC: Electrical and Electronic Manufacturers Association Canada
FHIA: Florida Home Improvement Association
FM: Factory Mutual
FGIA: Fenestration and Glazing Industry Alliance (formerly AAMA and IGMA)
IGMA: Now part of FGIA (Fenestration and Glazing Industry Alliance)
IEEE: Institute of Electrical and Electronics Engineers
MFMA: Maple Flooring Manufacturers Association
MIL: Often replaced with specific DoD Standards (Department of Defense Standards or MIL-SPECs)
MSS: Manufacturer's Standardization Society
MTO: Ministry of Transportation Ontario
NAAMM: National Association of Architectural Metal Manufacturers

NFPA: National Fire Protection Association
NEMA: National Electrical Manufacturer's Association
NLGA: National Lumber Grades Authority
NRC: National Research Council of Canada
OCBA: Ontario Concrete Block Association
OHESC: Ontario Hydro Electrical Safety Code
OPSS: Ontario Provincial Standard Specification
PEI: Porcelain Enamel Institute
PDI: Plumbing Drainage Institute
PHA: Public Health Act
SMACNA: Sheet Metal and Air Conditioning Contractors National Association
SSPC: Now part of AMPP (Association for Materials Protection and Performance)
TEMA: Tubular Exchange Manufacturer's Association
TTMAC: Terrazzo, Tile and Marble Association of Canada
UL: Underwriters Laboratories Inc.
ULC: Underwriters Laboratories of Canada

6 FIRE RATINGS, ASSEMBLIES AND SEPARATIONS

6.1 Where a material, component, assembly, or separation is required to be fire rated, the fire rating shall be as determined or listed by one of the following testing authorities acceptable to the authorities having jurisdiction:

.1 Underwriters' Laboratories of Canada.
.2 Underwriters' Laboratories Inc.
.3 Factory Mutual Laboratories.
.4 The National Research Council of Canada.
.5 The National Board of Fire Underwriters.
.6 Intertek Testing Services.

6.2 Where reference is made to only one testing authority an equivalent fire rating as determined or listed by another of the aforementioned testing authorities is acceptable if approved by authorities having jurisdiction. Obtain and submit such approval of authorities, in writing when requesting acceptance of a proposed equivalent rating or test design.

6.3 Fire rated door assemblies shall include doors, frame, anchors, and hardware and shall bear label of fire rating authority showing opening classification and rating.

6.4 Material having a fire hazard classification shall be applied or installed in accordance with fire rating authorities printed instructions. Fire rated assemblies shall be constructed in

6.5 accordance with applicable fire test report information issued by fire rating authority. Deviation from fire test report will not be allowed.

6.6 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.

6.7 Fire separations may be pierced by openings for electrical and similar service outlets provided such boxes are non-combustible and are tightly fitted and sealed with a ULC approved sealant for the assembly being sealed.

6.8 Construction that abuts on or is supported by a non-combustible fire separation shall be constructed so that its collapse under fire conditions will not cause the collapse of the fire separation.

6.9 Do not use combustible members, fastenings, attachments and similar items to anchor electrical, mechanical or other fixtures to fire separations.

6.10 At penetration through fire rated walls, ceilings or floors, completely seal voids with ULC approved firestopping material; full thickness of the construction element. In locations that require a smoke seal, provide appropriate ULC approved system installed in accordance with the manufacturer's recommendations.

END OF SECTION

1 **GENERAL**

1.1 The provisions outlined in the Contract, including the general and supplementary conditions as well as Division 1 Specification Sections, are applicable to this section.

2 **INDEPENDENT INSPECTION AND TESTING AGENCIES**

2.1 Independent inspection and testing agencies may be retained by the Owner to inspect and test specific portions of the Work.

2.2 The Owner will cover the cost of initial inspections and tests.

2.3 Any reinspection or retesting required due to non-compliance with the Contract Documents during the initial inspection or test shall be at the Contractor's expense.

3 **SCOPE OF WORK**

3.1 Inspections and tests will be overseen by the Contractor.

3.2 The involvement of inspection and testing agencies does not absolve the Contractor or Subcontractors of their obligation to perform the Work in full compliance with the Contract Documents, schedules, and approved shop drawings. Inspections and tests serve only as a verification aid.

3.3 Subcontractors remain responsible for supplying the specified products and ensuring that the Work meets the Contract Documents, regardless of inspection and testing.

3.4 Inspection and testing agencies must report any observed deviations from the Contract Documents to the Contractor. Instructions to these agencies will be provided by the Contractor.

3.5 Inspection and testing agencies are not responsible for supervising, teaching current methods, or determining acceptance or rejection of Work; their role is solely to examine and report on conditions.

4 **CONTRACTOR'S RESPONSIBILITIES**

4.1 Provide a complete set of Contract Documents, including all addenda, for use by inspection and testing agencies. Notify Subcontractors and the Consultant of scheduled inspections and testing appointments.

4.2 Notify the appropriate inspection and testing agencies at least 48 hours before any Work requiring inspection or testing begins. Ensure facilities are available and cooperate fully with the agencies and their inspectors.

4.3 Ensure the following:

.1 Provide unrestricted access to the Work at all times.
.2 Facilitate inspections by providing sufficient, safe, and suitable facilities.
.3 Ensure access to off-site Work when applicable.
.4 Supply material samples, design mixes, tools, storage, and incidental

labor as required.

.5 Provide reasonable notice to the Consultant and relevant inspection agencies about when Work requiring inspection or testing will be ready.

.6 Notify the Consultant in advance about inspection times by other authorities.

.7 Ensure inspection and testing agencies are present at the start of all Work that requires inspection or testing.

.8 Arrange and pay for additional samples and tests as needed.

.9 Do not cover completed Work with subsequent construction until it has been reviewed by the inspection and testing agency or the Consultant.

5 SUBCONTRACTORS' RESPONSIBILITIES

5.1 Subcontractors must notify the Contractor at least 72 hours before commencing Work requiring inspection or testing.

5.2 Provide full access and cooperate with inspectors during required inspections and tests.

5.3 Replace any products deemed non-compliant in inspection and test reports as instructed by the Contractor, at no additional cost to the Contract.

5.4 Rectify improper installations noted in inspection and test reports as directed by the Contractor, without affecting the Contract Price.

5.5 Cover the cost of reinspection and testing of replaced Work as directed by the Contractor. Subcontractors are responsible for any delays caused by the need to correct Work.

5.6 Notify the Contractor, Consultant, and inspection agencies at least 48 hours prior to starting Work that requires inspection or testing.

5.7 Ensure the presence of authorized inspection and testing agencies at the beginning of Work requiring their involvement.

5.8 Do not cover completed Work with subsequent construction until reviewed by the inspection and testing agency or the Consultant.

5.9 Ensure inspection and testing reports are issued promptly, typically within 48 hours, and inform the Contractor and Consultant immediately if issues arise.

5.10 Provide necessary facilities and equipment for inspection and testing, including proper storage for concrete specimens as instructed by inspection agencies. Cover testing costs for unidentified reinforcing steel.

6 INSPECTION AND TESTING AGENCIES' RESPONSIBILITIES

6.1 Inspection and testing agencies and their personnel must be independent and unaffiliated with the Contractor, Subcontractors, suppliers, or others involved in the Work. Agencies must provide evidence of experience if requested by the Contractor.

6.2 Review and understand the intent and requirements of the Contract Documents, including addenda.

6.3 Perform all required inspections and tests as specified in the Contract Documents and individual specification sections.

6.4 Notify the Contractor of each visit to the site, plant, or mill.

6.5 Promptly provide inspection and test reports to the Contractor, Consultant, and any other parties designated by them.

6.6 Inform the Contractor immediately of any non-compliance observed during inspections. Decisions on acceptance or rejection of Work remain the responsibility of the Consultant.

7 MANUFACTURERS' FIELD SERVICES

7.1 When specified, suppliers or manufacturers must provide qualified personnel to assess site conditions, installation quality, equipment startup, and testing. They must offer guidance as needed.
7.2 Document and report observations or any instructions given on-site that deviate from the manufacturer’s written guidelines.

8 REPORTS AND DISTRIBUTION

8.1 Inspection and test reports must be comprehensive, individually documented, and signed by an authorized representative of the inspection/testing agency. Distribute reports to Consultant.

8.2 Reports must include:

.1 Name of the inspection/testing agency
.2 Project, Owner, Consultant, and Contractor details
.3 Dates of inspection and reporting
.4 Weather and temperature conditions
.5 Exact test locations
.6 Comments on workmanship
.7 Deviations from Contract Documents or accepted practices

9 SPECIFIC INSPECTION AND TESTING REQUIREMENTS

9.1 Inspection and testing by Owner-appointed agencies will be conducted for select building elements, including:

.1 Earthwork
.2 Concrete
.3 Reinforcing steel
.4 Waterproofing
.5 Membrane air/vapor/moisture barriers
.6 Roofing and sheet metal flashing
.7 Building envelope

9.2 Refer to individual specification sections for detailed requirements on inspection and testing.

END OF SECTION

1 TEMPORARY CONTROLS

1.1 Hoarding and Barriers

.1 Before initiating construction activities, supply, erect, and maintain hoarding around the entire perimeter of the site. Ensure the exterior is painted in a Consultant-approved color and display "POST NO BILLS" signage.

.2 Provide temporary enclosures to shield the building or parts thereof from adverse weather, maintain necessary environmental conditions, and protect materials stored inside.

.3 Install lockable gates in the hoarding or barriers to allow controlled access for workers and vehicles.

1.2 Prevent unauthorized entry to the site by barricading, guarding, or locking access points. Display "NO TRESPASSING" signs prominently.

1.3 Install hoarding, barriers, and covered walkways as required by authorities to safeguard public areas, access routes, and adjacent properties. Use materials other than snow fencing for sidewalk protection.

1.4 Ensure temporary ramps, guardrails, and handrails are provided to facilitate safe, barrier-free access for the public to existing facilities during construction.

1.5 Install and maintain clear directional signage to guide individuals through or around the worksite, as directed by the Consultant.

1.6 Provide secure, rigid guide rails and barriers around excavations, open shafts, stairwells, and floor edges to protect workers and the public.

1.7 Upon completion of the project, remove all hoarding, barriers, and other temporary structures unless otherwise specified by contract drawings or the Consultant.

1.8 Construct and maintain hoardings, barriers, guardrails, overhead protection, and safety signage to secure the site and protect public safety.

1.9 Ensure compliance with applicable federal, provincial, and municipal regulations. Obtain necessary permits and approvals for all safety measures.

1.10 Supply and maintain construction facilities and temporary controls to ensure efficient execution of the Work.

1.11 Before achieving Substantial Completion, remove all temporary facilities and controls from the site.

1.12 Repair or restore any damage or disruption to existing property caused by construction activities, ensuring the restored property meets or exceeds its original condition.

2 SERVICE AND UTILITY SYSTEMS

2.1 Coordinate with utility companies and local authorities to determine the exact location of existing services in or near the construction site.

2.2 Information shown in the project drawings regarding utilities does not eliminate the Contractor's responsibility to verify exact locations.

2.3 Provide necessary notifications and coordinate with relevant authorities for service connections.

2.4 Bear any associated charges for utility work, unless stated otherwise in the contract.

2.5 Maintain active utility systems affected by construction activities until project handover or specific portions are accepted by the Owner.

2.6 Report any unknown services encountered during excavation to the Consultant and follow their directives for further action.

3 SCAFFOLDING, HOISTS, AND CRANES

3.1 Choose, operate, and maintain scaffolding, hoists, and cranes in compliance with safety standards to avoid risks to structures, utilities, and public areas.

3.2 Ensure scaffolding is designed and constructed according to CAN/CSA S269.2-M standards.

4 TEMPORARY WORKS

4.1 Supply and maintain temporary utilities, including electrical, water, and heating, required to execute construction. Remove all temporary facilities after their use is complete.

4.2 Provide and maintain a continuous supply of potable water for construction activities. Arrange water connections to meet project needs, including connections on each floor where applicable.

4.3 Disconnect temporary water lines and repair any associated damages upon project completion.

4.4 Temporary Water Service

.1 Arrange and pay for water supply needed during construction, connecting to delivery points approved by the relevant authorities.

.2 Install all necessary temporary piping and hoses to transport water to required locations.

4.5 Temporary Heating

.1 Provide heating as required to maintain at least 10°C in active work areas, unless otherwise specified.

.2 Use flameless or vented heaters to ensure adequate ventilation and prevent gas accumulation.

4.6 Temporary Ventilation

.1 Provide adequate ventilation in enclosed spaces to facilitate material curing, reduce humidity, and prevent accumulation of fumes, vapors, or dust.

4.7 Electrical and Lighting Systems

.1 Install temporary electrical systems in compliance with the Ontario Hydro Electrical Safety Code. Obtain inspection certificates for all installations.

.2 Provide sufficient lighting to ensure safe construction activities and public access during nighttime.

4.8 Temporary Electrical Power

.1 Arrange and cover costs for temporary electrical power required during the construction phase, including lighting and power tools.

.2 Ensure connections are compliant with the Canadian Electrical Code and approved by the relevant local authority. Provide necessary equipment and temporary wiring to deliver power to points of use, including flexible power cords.

.3 Utilize the building's permanent electrical system for construction purposes only if doing so does not compromise warranties.

4.9 Temporary Lighting

.1 Install and maintain temporary lighting to achieve a minimum illumination level of 2 watts per square foot (21 watts per square meter) for construction operations.

.2 Arrange and pay for additional task-specific lighting where needed. Extend wiring from power sources to distribution points with appropriate conductors, pigtails, and lamps.

.3 Provide adequate lighting for staging and storage areas, including security lighting after dark.

.4 Use the building's permanent lighting systems only if warranties remain unaffected.

4.10 Temporary Telecommunication

.1 Install telephone, computer and high-speed internet services for use by construction personnel, the Consultant, and the Owner.

.2 Costs for long-distance calls or transmissions shall be borne by the party initiating them.

4.11 Temporary Sanity Facilities

.1 Provide adequate temporary washroom facilities for construction worker.

.2 Ensure these facilities are cleaned and maintained in compliance with municipal and provincial health and safety guidelines.

5 PROTECTION

5.1 Protect adjacent properties, public areas, and existing infrastructure from potential damage due to construction activities. Immediately address any damages at the Contractor's expense.

5.2 Shield finished and in-progress work from potential harm using temporary covers, barriers, and protective measures. Ensure damaged materials or finishes are replaced with matching products at no additional cost to the Owner.

5.3 Implement fire protection measures, including on-site extinguishers and compliance with local fire codes. Prohibit the open burning of materials.

5.4 Erect temporary enclosures to seal openings in the building, such as doors, windows, and shafts, protecting interiors from weather exposure.

5.5 Ensure the interior work area is enclosed to support temporary heating requirements.

5.6 Install dust-tight partitions to confine dust-generating activities and safeguard workers, finished areas, and the public.

5.7 Adjust and maintain these protections as necessary until the relevant tasks are complete.

5.8 Safeguard completed work by employing specified protective measures, including removable protections.

5.9 Cover surfaces such as walls, openings, floors, and stairs to prevent dirt, damage, or wear from ongoing construction activities.

5.10 Prohibit unauthorized traffic or material storage on waterproofed or landscaped surfaces unless appropriately protected.

6 PEST CONTROL

6.1 Implement pest control measures to prevent the spread of rodents, insects, or other pests during construction. Follow Canada Pest Control Products Act and local regulations for pesticide use.

7 FIRST-AID FACILITIES

7.1 Provide and maintain first-aid equipment and medical facilities on-site, as mandated by the Workplace Safety and Insurance Act.

7.2 USE OF PERMANENT SERVICES AND EQUIPMENT

7.3 Obtain Owner's written permission before using any permanent services or equipment.

7.4 Ensure services and equipment used temporarily are returned in “like-new” condition without impacting warranties.

8 SITE IDENTIFICATION

8.1 Do not display signs without prior written approval from the Consultant and Owner. Maintain signage in good condition throughout the project duration.

9 SITE MAINTENANCE

9.1 Keep the site and surrounding areas clean and orderly. Dispose of debris and waste promptly to avoid accumulation.

9.2 If the site is not cleaned within 48 hours of receiving a directive, the Consultant may arrange cleaning at the Contractor’s expense.

10 SITE STORAGE AND OVERLOADING

10.1 Store materials and equipment only in designated areas approved by the Consultant. Do not store items in public view or areas not allocated for such use.

10.2 Ensure no portion of the site or structure is overloaded beyond its designed capacity. Address damages resulting from overloading immediately and at no cost to the Owner.

10.3 Avoid obstructing the site with excessive materials or equipment. Follow storage instructions provided by the Consultant.

10.4 Secure additional storage areas as necessary, bearing the associated costs.

10.5 Do not overload any part of the structure or site with materials beyond its safe capacity.

11 PUBLIC CONVENIENCE AND SAFETY

11.1 Maintain safe sidewalks and access routes throughout construction. Promptly remove snow and debris to ensure public safety.

11.2 Keep haul routes clean of materials and debris resulting from construction activities. Clean roads and sidewalks within 24 hours of receiving instructions from the Consultant.

12 ACCESS AND EGRESS TO SITE

12.1 Where required, construct access roads capable of handling construction traffic and equipment. Maintain these roads in a safe and operable condition throughout the project.

12.2 Remove access roads upon project completion unless otherwise indicated in the contract documents. Restore affected areas as specified in the drawings.

13 PUBLIC TRAFFIC FLOW

13.1 Provide and maintain traffic control measures such as flag personnel, police officers, traffic signals, barricades, and appropriate lighting to ensure the safety of the public and construction workers. Comply with the requirements of authorities having jurisdiction.

14 PUBLIC UTILITIES AND SERVICES

14.1 Confirm limitations and restrictions imposed by the presence of utilities and services on or near the site. Ensure no damage occurs to these facilities during construction activities.

14.2 Notify relevant utility providers for any required relocation, protection, or discontinuation of services.

14.3 Arrange and pay for connections to utility services required for the project. Ensure that service installations are placed in inconspicuous locations or as directed by the Consultant.

15 ROADS, CURBS, GUTTERS, AND WALKS

15.1 Perform necessary modifications, such as curb cuts and repairs, to existing municipal infrastructure to meet the requirements of authorities having jurisdiction. Ensure all approaches are properly paved and finished.

16 CONSTRUCTION PARKING

16.1 Parking for construction personnel is permitted on-site provided it does not obstruct construction progress, compromise site safety, or hinder pedestrian or vehicular movement. Parking arrangements must be acceptable to the Consultant.

17 SITE VISITORS

17.1 Allow authorized visitors, as designated by the Consultant, access to the site during the course of the work. Facilitate inspections or testing as required. Maintain a logbook to record all visitors to the site.

17.2 Ensure all visitors wear appropriate safety equipment in compliance with site safety protocols.

18 SECURITY

18.1 Implement security measures, including lockable facilities, to prevent unauthorized access, vandalism, or theft.

18.2 Media or news outlets are strictly prohibited from accessing the site without obtaining prior written authorization from the Owner. Enhanced security measures will be implemented to prevent unauthorized entry to the site. Only individuals with explicit clearance from the Owner or designated authorities will be permitted access, and all personnel must strictly comply with the established security protocols at all times.

19 EROSION AND SEDIMENTATION CONTROL

19.1 Control site drainage to prevent flooding, erosion, or run-off onto adjacent properties. Dispose of water containing silt or other suspended materials in accordance with jurisdictional requirements.

19.2 Install and maintain sediment control devices at catch basins, drainage courses, and other designated locations until the completion of construction or as directed by the Consultant.

19.3 Protect storm drain inlets with sediment barriers or excavated ponding areas. Inspect and maintain these protections after each rainfall, removing sediment as needed.

20 TEMPORARY DRAINAGE AND DEWATERING

20.1 Keep drainage lines and gutters open and functional at all times. Prevent water from flowing across pavements by using pipes or properly constructed troughs.

20.2 Keep trenches and other excavations free of water using suitable methods to maintain soil stability. Dispose of water in a manner that does not endanger public health, property, or construction progress.

21 SNOW REMOVAL

21.1 Prevent accumulation of snow and ice on-site, especially on roof decks or areas scheduled for roofing operations.

21.2 Remove snow and ice from access roads, pathways, and parking areas to ensure uninterrupted construction activities.

22 POLLUTION CONTROL

22.1 Cover or wet down dry materials and rubbish to prevent dust from becoming airborne. Provide effective dust control measures for temporary roads and work areas.

22.2 Remove waste materials from the site in compliance with local regulations. Arrange and pay for the proper disposal of construction debris.

22.3 Limit noise levels generated by construction equipment and activities in accordance with local bylaws and regulations.

22.4 Prevent emissions from construction activities, such as abrasive blasting, from contaminating air beyond the immediate work area. Use temporary enclosures or other containment measures as needed.

23 TREE PROTECTION

23.1 Protect existing trees and vegetation designated to remain by installing a minimum 1.8-meter-high chain-link fence around the drip line of trees or groups of plants.

23.2 Avoid disturbing fenced-off areas or using them for storage or dumping. Do not attach rigging or cables to trees.

23.3 Where tree limbs or roots are affected by construction, prune or treat them in accordance with accepted arboricultural practices to minimize harm.

23.4 Obtain approval from the Consultant before altering grades or performing work near existing trees and vegetation.

24 FIELD OFFICES

24.1 Provide adequately sized offices to accommodate site meetings and administrative needs. Equip necessary furniture, and washroom facilities.

25 PROJECT CLEANLINESS

25.1 Maintain a clean and organized site by regularly disposing of waste materials and debris.

25.2 Clear debris from concealed spaces, such as attics and pipe chases.

25.3 Sweep and vacuum interiors before finishing work begins to ensure a dust-free environment.

25.4 Prohibit the use of open chutes; instead, ensure waste is directed into proper containers with lids.

END OF SECTION

PART - 1 GENERAL

1.1 SUMMARY

.1 Section includes general protection and arboricultural works for existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

1.2 RELATED REQUIREMENTS

.1 Section 32 11 23 Aggregate Base Courses

1.3 REFERENCE STANDARDS

.1 City of Toronto Tree Protection Policy and Specifications for Construction Near Trees, July 2016 or latest version.

.2 Toronto Urban Forestry Permit:

.1 n/a

.3 Toronto Ravine and Natural Feature Protection (RNFP) Permit:

.1 n/a

.4 Canadian Society of Landscape Architects (CSLA)/ Canadian Nursery Landscape Association (CNLA)

.1 Canadian Landscape Standard, Second Edition

.2 Canadian Nursery Stock Standard, Ninth Edition

1.4 REFERENCE DOCUMENTS

.1 ARBORIST REPORT:

.1 "ARBORIST REPORT" prepared by Urban Forest Innovations Inc, appended to these specifications.

1.5 DEFINITIONS

.1 Tree-Protection Zone (aka TPZ): Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings.

.1 For by-law regulated trees, dimensions of TPZ shall conform to the "Tree Protection Policy and Specifications for Construction Near Trees" unless otherwise indicated.

1.6 QUALITY ASSURANCE

.1 Furnish proof of Arborist's qualifications upon request:

.1 Certified Arborist as certified by ISA

.2 Minimum of 5 years arboricultural experience.

.2 Furnish proof of professional tree care personnel qualifications upon request:

.1 Personnel or company employed for tree care work shall be primarily engaged in such work and shall be a member in good standing of Landscape Ontario.

.2 Supervisor / crew leader to have minimum of 5 years professional tree care experience.

1.7 CLOSEOUT SUBMITTALS

.1 Submit arborist report summarizing all arboricultural works completed. Report shall include the following information:

.1 Name of supervising arborist.

.2 Date or dates for each measure implemented.

.3 Observations of any exposed conditions (ie roots uncovered by excavations)

.4 Photographs, drawings and/or plan mark-ups as necessary to illustrate the work completed.

.2 The report may include recommendations for additional work to preserve or improve the condition of trees on or near the site, however no additional work shall be undertaken without written authorization from the Consultant, Owner or authorities having jurisdiction where applicable.

PART - 2 PRODUCTS

2.1 PROTECTION-ZONE FENCING

.1 Tree protection fencing for by-law regulated trees shall comply with Toronto Urban Forestry Detail TP-1 unless otherwise indicated.

.1 Portable, sectional metal fencing is not an acceptable protection fence for by-law regulated trees.

.2 Tree protection fencing for all trees shall conform to one of the following types, as indicated on the drawings:

.1 Plywood Protection-Zone Fencing:

.1 Plywood sheathing securely attached to a 2-by-4-inch preservative-treated wood frame, with posts spaced not more than 2400 mm apart

.2 Provide supports fixed in place at each post on the outside of the tree protection zone unless otherwise indicated.

.3 Height: 2400 mm.

.4 Provide inspection windows as detailed.

.2 Gates: Swing access gates matching material and appearance of fencing, to allow for maintenance activities within protection zones.

.1 Do not provide gates unless indicated on the drawings.

2.2 PROTECTION-ZONE SIGNAGE

.1 Shop-fabricated, rigid plastic sign with attachment holes pre-punched and reinforced; signs to be professionally printed with nonfading lettering.

.1 Content of sign shall be as detailed in "Tree Protection Policy and Specifications for Construction Near Trees"

.2 Signs are available free-of-charge from the City.

2.3 OTHER MATERIALS

.1 Any other materials required to perform the work of this section shall be new and of the best available quality.

.1 Product and manufacturer information for all materials proposed for use must be submitted to the Consultant for review prior to delivery to the site.

PART - 3 EXECUTION

3.1 PROHIBITED ACTIVITIES

.1 The following are prohibited within protection zones:

.1 All construction activities are prohibited.

.2 Excavation or alteration of grades.

.3 Storage of construction materials, debris, or excavated material.

.4 Moving, parking or refuelling vehicles or equipment.

.5 Foot traffic (access by Contractor's personnel on foot for maintenance activities is permitted).

.6 Erection of sheds or structures.

.7 Impoundment of water.

.8 Excavation or other digging unless otherwise indicated.

.9 Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

3.2 EXAMINATION

.1 Verification of Conditions: verify that site conditions match the drawings and reports furnished to the Contractor.

.1 Inform Owner and Consultant immediately of unexpected conditions.

.2 Owner will not entertain costs or delays resulting from Contractor's failure to verify conditions.

3.3 EROSION AND SEDIMENTATION CONTROL:

.1 Examine the site to verify that temporary erosion- and sedimentation-control measures are in place.

.2 Verify that flows of water redirected from construction areas or generated by construction activity will not enter or cross protection zones.

.3 If flows of water are found to enter or cross protection zones, adjust temporary erosion- and sedimentation-control measures to control flows.

3.4 PROTECTION ZONES

.1 Protection-Zone Fencing shall be accepted by the Consultant and any authority having jurisdiction prior to the commencement of any demolition or excavation works.

.1 Protection zone fencing shall not be relocated at any time for any reason without approval of the Owner and any authority having jurisdiction.

.2 Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones as indicated.

.1 Protection-Zone Signage: Install protection-zone signage in visibly prominent locations as detailed.

.3 Maintain protection zones free of weeds and trash.

.4 Maintain protection-zone fencing and signage in good condition.

.5 Remove fencing and signage only when construction operations are complete, equipment has been removed from the site and written authorization has been received from Owner or Consultant.

3.5 ARBORIST SUPERVISION

.1 The certified arborist shall supervise or personally carry out all indicated works whether within the protection zone or not. These may include but are not limited to the following:

.1 Stem Protection.

.2 Root zone compaction protection.

.3 Cutting or pruning of trees to be preserved.

.4 Removal of trees having shared root zones wit trees to be preserved.

.5 Root-sensitive excavations.

.6 Root pruning.

.7 Soil decompaction and amendment.

3.6 STEM PROTECTION

.1 Where indicated, stem protection shall be installed at the same time as the protection zone fencing, prior to any works in the vicinity of the subject trees.

.1 Stem protection shall be maintained until the work had been completed and accepted, or earlier if so directed in writing by the Consultant or Owner.

.2 Stem protection shall consist of:

.1 Three layers of burlap continuous from the base of the tree to the height indicated.

.2 Continuous 2x4 lumber cladding the stem in a vertical direction to the height indicated and fastened securely with wire.

.1 To avoid undesirable pressure on the bark, the lumber members may start above the root flare or they may be made up of shorter lengths or furred-out with pieces of rigid insulation to accommodate irregularly-shaped trunks.

3.7 ROOT ZONE COMPACTION PROTECTION

.1 Where construction activity is indicated to take place within a protection zone, such activity must be preceded by installation of root zone compaction protection.

.2 LIGHT ROOT ZONE COMPACTION PROTECTION

.1 Light Root Zone Compaction Protection is appropriate for non-vehicular access inside a protection zone such as occasional foot traffic, wheelbarrows, etc.

.2 Light Root Zone Compaction Protection shall consist of:

.1 Installation of geotextile over indicated area.

.2 Installation of 150 mm depth of mulch spread over the fabric.

.3 Installation of continuous 3 mm plywood over the mulch.

.3 MODERATE ROOT ZONE COMPACTION PROTECTION

.1 Moderate Root Zone Compaction Protection is appropriate for non-vehicular access in a protection zone such as temporary materials staging.

.2 Moderate Root Zone Compaction Protection shall consist of:

.1 Installation of geotextile over indicated area.

.2 100 mm depth of 20 mm size clear stone spread over the fabric.

.3 Installation of medium-weight non-woven geotextile fabric or landscape cloth over the stone.

.4 Installation of 150 mm depth of mulch spread over the fabric.

.5 Installation of continuous 13 mm plywood over the mulch.

.4 HEAVY ROOT ZONE COMPACTION PROTECTION

.1 Heavy Root Zone Compaction Protection is appropriate for occasional vehicular access and long-term materials storage inside the root zone.

.2 Heavy Root Zone Compaction Protection shall consist of:

.1 Installation of geotextile over indicated area.

.2 Installation of 3 stacked and joined courses of 4” x 4” timbers around the area to be protected where loss of material may be expected. (Provide cross-members as required to maintain structural integrity)

.3 Installation of 300 mm depth of mulch spread over the fabric.

.4 Installation of 2 layers of continuous 13 mm plywood or 1 layer of continuous 13 mm steel plates over the protected area.

3.8 ROOT SENSITIVE EXCAVATION

.1 Root-sensitive excavation must be conducted in advance of any excavation using conventional excavation machinery.

.2 Root sensitive excavation shall only be performed by an ISA Certified Arborist using professionally accepted methods.

.3 Acceptable methods of root-sensitive excavation include hand-digging or pneumatic excavation such as AirSpade. Hydrovac excavation is not acceptable.

.1 Excavate trenches 200-300 mm wide and 600 mm apart where indicated.

.2 Excavate to a minimum depth of 600 mm, or the maximum depth of excavation for the proposed adjacent works, whichever is greater.

.3 Any roots encountered must be properly pruned prior to any adjacent excavation using conventional machinery.

.4 Post holes within tree root zones must be excavated by root-sensitive methods as described above.

3.9 ROOT PRUNING

.1 Root pruning shall only be undertaken in conjunction with root-sensitive excavation in advance of conventional excavation, or immediately afterwards if unexpected roots are encountered.

.2 Root pruning requirements apply only to roots that are severed, exposed, or diseased and are greater than 2.0 cm in diameter should be properly pruned.

.3 Root pruning shall only be performed by an ISA Certified Arborist using professionally accepted methods.

.1 All roots must be pruned with clean and sharp hand tools only. Shovels, or other construction tools shall not be used to prune roots.

.2 Roots should be pruned in a similar fashion as branches, taking care to maintain the integrity of the root bark ridge.

.3 Roots should be pruned back to native soil; root stubs must not be left upon completion of root pruning.

.4 Wound dressings or pruning paint must not be used to cover the ends of any cut.

.4 All cut roots should be covered with soil or excavated trenches should be backfilled with native material as soon as possible following root pruning. Exposed roots should be covered with soil or mulch and kept moist if they are to be exposed for longer than 3 hours.

3.10 SOIL DE-COMPACTION AND AMENDMENT

.1 The area to be de-compacted shall be no less than the area shown on the drawings.

.2 Preparation:

.1 Install plywood hoarding or filter fabric attached to portable sectional metal fences to prevent spreading of dust and/or debris beyond the work area.

.2 Spread a layer of compost shall be spread to 150 mm depth over the entire area indicated.

.3 De-Compaction and Amendment

.1 De-Compaction and Amendment shall only be performed by an ISA Certified Arborist using professionally accepted methods.

.2 Soil is to be de-compacted and amended using pneumatic excavation equipment (e.g., Airspade, Supersonic Air Knife, or approved equal).

.1 Set air pressure to 90 psi or as appropriate to prevent penetration of root bark or visible damage to roots larger than fine feeder roots.

.3 De-compact where indicated in a grid pattern composed of 300 mm wide air-excavated 'windrows' spaced 600 mm in both directions.

.1 Within the windrows, existing soil and composted mulch shall be fully blended to a depth of 300 mm below existing grades.

.4 The de-compaction grid shall not encroach within 1000 mm of any tree trunk.

.1 Within this area the air excavation equipment nozzle shall be inserted in random locations to effectively loosen soil and incorporate the finished compost soil amendment to a depth of approximately 150 mm below existing grades.

.4 Following de-compaction and soil amendment, a layer of partly composted mulch shall be spread to a depth of 150 mm over the entire indicated area.

3.11 PRUNING

.1 Prune all existing trees to the satisfaction of the Consultant.

.1 Pruning shall include removal of all dead limbs and any preventive maintenance pruning required as a result of adjacent construction works.

.2 Pruning shall only be performed by an ISA Certified Arborist using professionally accepted methods.

.1 Prune heavy bleeders such as birch, maples, lindens and honey locust when in full leaf only (early summer).

.2 Maintain the natural form of trees. Dead or diseased limbs are to be cut off flush to the nearest living limb. Leaving small stubs is not acceptable.

.3 When necessary, thin out crown of deciduous trees without changing their natural shape or habit.

.4 Employ clean, sharp, sterile tools.

.1 Pruning saws should be used on limbs 25 mm in diameter or greater.

.5 Undercut larger branches to prevent tearing of bark.

.6 Make cuts flush with main branch, smooth and sloping to prevent accumulation of water on cut.

3.12 UNINTENDED TREE INJURY

.1 Where trees are injured during the course of work, the Consultant shall be immediately notified. Injuries requiring notification include the following.

.1 Breaking of limbs over 25 mm.

.2 Exposure or breaking of roots over 25 mm.

.3 Damage to bark.

.2 Tree injuries shall be inspected by a certified arborist within 24 hours of damage occurring. The arborist’s recommendations for remedial work shall be carried out as soon as possible by, or under the supervision of a certified arborist.

.1 All works in the vicinity of any injured tree shall be stopped until the required remedial work has been completed.

.3 All costs or delays associated with injuries to trees shall be the responsibility of the Contractor.

.4 Compensation:

.1 Consultant will report damage or destruction of by-law regulated trees to the authorities having jurisdiction.

.1 Contractor will be responsible for costs of any compensation that may be required by the authority.

.2 For privately-owned trees, the Contractor is responsible for replacement or compensation as described below, even in the event that the authority having jurisdiction does not require it.

.2 Any privately-owned trees intended to remain that are injured or destroyed due to the Contractor's activities shall be replaced with such number of 60 mm size trees as may be required to replace the full caliper size of the tree or trees injured or destroyed.

.3 Alternately, trees injured or destroyed may be assessed by the certified Arborist and the Consultant for value of compensation as per the International Arboriculture System of Valuation.

.4 Compensation to be paid by the Contractor to Owner.

END OF SECTION 01 56 39.01

1. REFERENCE STANDARDS

1.1 Within the individual specifications Sections, reference standards are identified. Conform to these standards, in whole or part, as specifically specified.

1.2 Conform to latest date of issue of referenced standards in effect on the date of submission of tenders, except where a date or issue is specifically noted.

2. SPECIFIED PRODUCTS

2.1 Work of this Contract is based on Products specified by:

.1 Manufacturer's catalogued trade names and/or;

.2 References to standards (i.e. CAN, CGSB, CSA, ASTM) or;

.3 Prescriptive Specifications or;

.4 Performance Specifications.

2.2 A product identified by one or more manufacturer's trade names is acceptable, and any of the listed products can be used. Products from other manufacturers require approval by the Consultant as equivalent substitutions and must meet the specified substitution criteria.

2.3 Multiple trade-named products listed alongside a referenced standard are acceptable, provided they adhere to the referenced standard.

2.4 A product specified solely by reference to a standard allows the Contractor to select any product that satisfies or exceeds the standard's requirements for its intended use. The Contractor bears the responsibility of demonstrating compliance with the referenced standard. Products exceeding the minimum requirements of the standard are accepted if they are compatible with the overall Work.

2.5 A product specified using prescriptive or performance-based criteria must meet or exceed the specified criteria to be accepted.

2.6 For products specified by reference to a standard or through prescriptive or performance criteria, the Contractor must provide a verification report from the manufacturer or an independent testing laboratory upon the Consultant's request, confirming that the product meets or exceeds the required specifications.

2.7 Uniformity in manufacturing is required for similar or specific items throughout the Work, unless the Specifications indicate otherwise.

3. PRODUCT AVAILABILITY

3.1 Immediately assess material and product delivery requirements and identify any foreseeable supply delays. Inform the Consultant immediately.

3.2 Failure to notify the Consultant at the start of the Work may result in the Consultant substituting readily available products of similar quality and character without any increase to the Contract Sum.

4. SUBSTITUTIONS

4.1 Requests for substitutions will not be accepted prior to the Notification of Award. Substitutions will be considered by the Consultant provided that:

.1 Proposed substitutions must be thoroughly investigated, with complete data provided. All aspects meeting the specifications must be clearly highlighted.

.2 Only complete and detailed data submissions will be reviewed. Incomplete submissions will not be considered.

.3 Any potential impacts on the Contract Schedule or interactions with other Work must be submitted for review.

.4 The substitution must carry the same warranty as the originally specified product.

.5 All claims for additional costs arising from the substitution will be waived.

.6 Installation of the approved substitution must be coordinated with the overall Work, and full responsibility is assumed for any effects on other work. Any necessary changes to complete the Work must be made by the Contractor.

.7 The Consultant will revise the drawings to incorporate accepted substitutions, with all associated revision costs borne by the Contractor.

4.2 Substitutions for methods or processes specified in the Specifications or drawings may be proposed to the Consultant for consideration, subject to the following conditions:

.1 Time spent by the Consultant in evaluating the substitution shall not be the basis for a claim by the Contractor for extensions to the Contract Time.

.2 Contractor cannot claim extensions to the Contract Time for time spent by the Consultant evaluating the substitution.

.3 Proposal must clearly demonstrate how the substitution benefits the Owner or improves the operation of the installation as perceived by the Contractor.

.4 Contractor assumes full responsibility for the substitution and must ensure that warranties for all aspects of the Work remain unaffected.

.5 Contractor will bear the cost of any necessary changes to the work of Other Contractors resulting from the accepted substitution.

.6 The substituted methods or processes must fit within the space allocated for the originally specified methods or processes. Any required revisions to the drawings to accommodate the substitution will be made by the Consultant, with all associated costs borne by the Contractor.

4.3 Substitutions will not be considered under the following circumstances:

.1 They are implied or indicated in shop drawings or Product data without a formal request.

.2 Their acceptance would necessitate significant revisions to the Specifications and Drawings.

4.4 Do not incorporate substitute Products, methods, or processes into the Work unless the Consultant has expressly approved them for the specific project.

4.5 Approved substituted Products shall be subject to inspection and testing by the Consultant. Installation of such Products may only proceed upon receipt of the Consultant's written approval.

4.6 Contract Price shall be adjusted to reflect any and all credits resulting from the approved substitutions.

5. APPROVAL OF PRODUCTS AND INSTALLATION METHODS

5.1 Wherever in the Specifications it is specified that Products and installation methods shall meet the approval of Authorities Having Jurisdiction, Underwriters, the Consultant, or others, such approval shall be provided in writing.

6. PRODUCT DELIVERY CONTROL

6.1 It is the responsibility of the Contractor to ensure that the Supplier or Distributor of Materials specified, or Alternatives accepted, which the Contractor intends to use, has Materials available on the Site when required. The Contractor shall obtain confirmed Delivery Dates from the Supplier.

6.2 Contractor shall contact the Consultant immediately upon receiving information indicating that any Material or Item will not be available on time, in accordance with the original Schedule. Similarly, it shall be the responsibility of all Subcontractors and Suppliers to inform the Contractor accordingly.

6.3 Consultant reserves the right to request, at any time, copies of actual Purchase Orders or related documentation for any Materials or Products to be supplied for the Work.

6.4 If Materials and Products have not been placed on order, the Consultant may instruct the Contractor to place such Items on order. If direct communication in writing from the Manufacturer or prime suppliers is not available indicating that Delivery of the Materials will occur in time for the orderly completion of the Work, this directive shall be followed.

6.5 Consultant's review of Purchase Orders or related documentation shall in no way release the Contractor, Subcontractors, or Suppliers from their responsibility for ensuring the timely ordering and necessary expediting of all Materials and Items required to complete the Work as Scheduled and in accordance with the Contract Documents.

6.6 In the event of failure to notify the Consultant at the commencement of the Work, and if it appears that delays may occur due to such failure, the Consultant reserves the right to direct the Contractor to take the following measures at no increase in the Contract Price:

.1 Substitute more readily available Products of similar or better Quality and Character; or

.2 Temporarily install another Product until the specified Product becomes available, at which point the temporarily installed Product shall be removed and the specified Product installed.

7. TRADEMARKS AND LABELS

7.1 Permanent Labels, Trademarks, and Nameplates on Products shall not be permitted in the finished Work, except where required by Authorities Having Jurisdiction, for operating instructions, or when located within Service Rooms.

7.2 Such Trademarks and Labels shall be removed by grinding, if necessary, or by painting over where the specific surface is being painted. For plated parts, replace the marked components with new plain plated or non-ferrous metal parts.

8. DELIVERY, STORAGE, HANDLING AND PROTECTION

8.1 Contractor is responsible for the handling and delivery of Products. Ensure protection from damage during handling, storage, and installation. Deliver, store, and handle Products in accordance with manufacturer’s instructions and Specifications. Costs for delivery, loading, off-loading, and any returns for correction due to damage or defect shall be borne by the Contractor. Reject any damaged materials or Products delivered to the Site.

8.2 Products shall be manufactured, packaged, shipped, delivered, and handled to prevent damage to structural qualities, finish appearance, or any aspect detrimental to their function or appearance.

8.3 During transportation, ensure Products are not exposed to environmental conditions that may exceed their specified moisture content limits.

8.4 Organize the delivery of materials, Products, and equipment to the Site and arrange for the removal of debris and equipment in a manner that minimizes disruption.

8.5 Schedule early delivery of Products to avoid delays. Arrange for receiving at the Place of the Work prior to delivery.

8.6 Coordinate delivery of mechanical and electrical equipment with manufacturers and suppliers to ensure timely delivery to the Site or suitable storage within the building, protected from weather exposure.

8.7 Deliver work prefabricated for ease of handling and to ensure passage through building openings.

8.8 Deliver packaged Products in original, unopened packaging with intact seals and labels.

8.9 Label packaged Products to indicate contents, quantity, and other required information.

8.10 Labels verifying compliance with reference standards will be acceptable as validation of conformity. In the absence of labels, provide affidavits confirming compliance as requested by the Consultant.

8.11 Clearly label fire-rated Products to indicate Underwriters' Laboratories approval.

8.12 Store and handle materials and Products to prevent damage to the materials, the Work, the Site, or surrounding property.

8.13 Ensure local traffic flow is not obstructed or disrupted during the construction period.

8.14 Designate an area within the Work limits, approved by the Owner, for Product storage. Maintain this area in an organized and tidy state. Arrange and pay for off-site storage if required.

8.15 Store Products on Site to minimize interference with Work and building operations.

8.16 Store Products off the ground to prevent damage, adulteration, deterioration, and soiling. Follow manufacturer’s storage instructions, where applicable.

8.17 Keep packaged or bundled Products in original and undamaged condition, complete with written application instructions, until required for installation.

8.18 Do not store materials or Products in corridors, public areas, streets, passageways, or similar locations.

8.19 Avoid creating overloading conditions when storing Products within the building or on temporary structures.

8.20 Store Products vulnerable to weather in weatherproof enclosures.

8.21 Store cementitious materials off the ground and away from walls to prevent contact with moisture.

8.22 Keep sand intended for mortar or grout dry and clean. Store sand on raised platforms and cover with waterproof tarpaulins in adverse weather.

8.23 Store sheet materials and lumber on flat supports, clear of the ground, and sloped for moisture runoff.

8.24 Store flammable liquids and hazardous materials in approved containers per safety authority requirements. Do not store such materials in bulk within the Work.

8.25 Designate a secure, ventilated, and heated area for paint storage and mixing. Ensure this area is locked when unattended, and remove combustible debris daily to prevent fire hazards.

8.26 Protect prefinished metal surfaces with easily removable coatings or wrappings until final cleanup, ensuring no damage to finishes. Avoid using tapes or coatings that may bake onto the surfaces.

8.27 Repair factory-finished surfaces damaged during handling or installation using primer and paint to match the original finish, to the Consultant’s satisfaction.

8.28 Use adequate shielding to protect glass and other finishes from heat, slag, and weld splatter. Avoid visible markings on exposed or transparent finishes.

8.29 Protect exposed surfaces of completed Work from staining, disfigurement, and other damage through restricted access or suitable physical protection methods.

8.30 Protect trowelled concrete floors from damage. Take precautions when moving heavy equipment over them.

8.31 Keep finished concrete floors free from oils, grease, or materials that could discolor them or affect bonding. Once enclosed, keep floors dry after curing.

8.32 Protect finished flooring from pedestrian traffic using reinforced kraft paper, securely taped at joints. Maintain protection until Work is complete.

8.33 Protect flooring from ongoing construction and deliveries with 6 mm plywood panels, sealing joints with reinforced tape. Maintain this protection until all construction and deliveries are complete.

8.34 Repair or replace damaged materials to the Consultant’s satisfaction.

8.35 Comply with Workplace Hazardous Materials Information System (WHMIS) regulations for handling, storing, and disposing of hazardous materials. Ensure proper labeling and provide Material Safety Data Sheets (MSDS) to the Consultant for all controlled Products intended for use in the Work.

9. MANUFACTURER'S INSTRUCTIONS

9.1 Unless otherwise noted within the Specifications, ensure fabrication, application, connection, installation, erection, use, cleaning, and conditioning of Products align with manufacturer's written instructions, except where more stringent requirements are provided. Avoid reliance on labels or enclosures accompanying the Products and obtain detailed instructions directly from the manufacturer.

9.2 Notify the Consultant in writing regarding any discrepancies or conflicts between the Specifications and the manufacturer's instructions. This will allow the Consultant to determine the appropriate course of action. Upon request, provide a copy of the manufacturer's instructions at the site for reference.

9.3 In instances where improper installation or erection of Products occurs due to a failure to follow the outlined requirements, the Consultant reserves the authority to mandate the removal and re-installation of such Products at no additional cost to the Contract Price.

10. WORKMANSHIP

10.1 Ensure all Workmanship is of the highest quality, performed by workers who are experienced and skilled in their respective duties. Notify the Consultant immediately if the required Work cannot be executed to produce the desired results.

10.2 Employ only fit and skilled personnel for the assigned duties. The Consultant retains the right to dismiss from the Place of the Work any worker deemed incompetent, careless, insubordinate, or otherwise unsuitable.

10.3 Decisions concerning the quality or suitability of workmanship in the event of disputes shall rest solely with the Consultant, whose decision is final.

10.4 Pay close attention to the finished dimensions and elevations of the Work. Ensure the finished Work accurately fits the indicated spaces and that it is flush, plumb, true to lines and levels, and precise in every respect.

10.5 Conceal pipes, ducts, conduits, and wiring within floors, walls, ceilings, chases, or behind furring in finished areas, unless specified otherwise.

10.6 Position service poles, fill pipes, vents, regulators, meters, and similar installations in discreet locations. Where such locations are not indicated on the drawings, confirm with the Consultant before proceeding with the installation.

10.7 Maintain the integrity of fire separations where penetrations occur.

10.8 Access panels and doors must match adjacent wall or ceiling finishes unless otherwise specified or indicated in the Contract Documents.

10.9 Prepare all surfaces intended for finished materials by ensuring they are free from grease, oil, and other contaminants that could interfere with the application or durability of finish materials.

10.10 Implement and enforce fire prevention protocols on-site. Open flames, heating devices, or debris accumulation are strictly prohibited. Use flammable materials only under strict safety precautions. Maintain ULC-labeled fire extinguishers suitable for specific fire hazards in working order and in prominent locations approved by jurisdictional authorities.

10.11 For areas involving flammable material application, ensure adequate ventilation, use spark-proof equipment, and strictly prohibit smoking and open flames.

10.12 Store packaged or bundled materials and products in their original, undamaged condition, with manufacturer’s seals and labels intact. Do not unpackage or unbundle until they are required for the Work.

10.13 Sensitive materials and products must be stored in weather-tight, climate-controlled enclosures that provide a favorable environment for their condition and longevity.

10.14 Store fabricated products intended for exterior use on sloped supports, elevated above ground level.

10.15 Remove and replace damaged materials or products at no additional cost, ensuring the Consultant’s satisfaction.

10.16 Arrange for off-site storage and protection of products when on-site storage is unavailable. Use impervious sheet coverings for materials prone to deterioration and ensure proper ventilation to prevent condensation or degradation.

10.17 Store loose granular materials on solid, flat surfaces in well-drained areas, ensuring they remain uncontaminated by foreign substances.

10.18 Provide the necessary equipment and personnel to store materials and products in a manner that prevents soiling, damage, or disfigurement.

10.19 Organize storage to facilitate inspection and conduct periodic checks to verify that materials and products remain undamaged and in acceptable condition.

10.20 Adequately protect completed or in-progress Work from potential damage. Any Work that becomes damaged or defaced due to inadequate protection must be repaired or replaced as directed by the Consultant, without an increase in the Contract Price.

11. DIMENSIONS

11.1 Verify all dimensions at the Site prior to commencing fabrication and installation. Report any discrepancies immediately to the Consultant for resolution.

11.2 For dimensions unavailable prior to fabrication, ensure agreement on the required dimensions among all relevant parties before proceeding.

11.3 Confirm that all clearances required by jurisdictional authorities are maintained before commencing Work.

11.4 Wall thicknesses and openings shown on drawings are considered nominal. Ascertain and confirm actual dimensions at the Site before proceeding with related Work.

11.5 Validate dimensions of shop-fabricated portions of the Work at the Site before initiating shop drawings or fabrication. The Owner will reject claims for additional costs arising from failure to comply with this requirement.

11.6 Fabricate and install manufactured, shop-fabricated, and on- or off-site fabricated items to accommodate actual Site dimensions and conditions.

11.7 In areas designated for equipment installation, confirm dimensional data on the equipment to ensure compatibility with provided space, access, and clearance requirements. Ensure all supplied equipment is dimensionally suitable for the allocated space.

11.8 Mechanical and electrical drawings are intended to depict approximate locations of apparatus, fixtures, equipment, piping, duct runs, and conduit in diagrammatic form. For items not dimensioned, consider these locations approximate. Review the drawings and consult with the Consultant to confirm actual placements based on aesthetic and site-specific conditions. Relocate as needed without adjustments to the Contract Price.

11.9 Maintain clear space where indicated for future equipment installations, ensuring accessibility for such future equipment.

11.10 Regardless of the Drawings, provide adequate space and provisions for equipment servicing and for the removal and reinstallation of replaceable components, such as motors, coils, and tubes. Ensure these requirements are incorporated into the Work.

12. RELOCATION OF MECHANICAL AND ELECTRICAL ITEMS

12.1 Owner and the Consultant retain the authority to adjust the location of outlets prior to their installation, without incurring additional costs to the Owner, provided that each relocation does not exceed 5000 mm from the originally specified location. No credits will be issued for reductions in materials, products, or labour resulting from relocations within this range.

12.2 For relocations exceeding 5000 mm per outlet from the original position, adjustments to the Contract Price will be made in accordance with the provisions outlined in the Contract Documents regarding changes.

12.3 Alter the position of pipes and other equipment, without additional cost to the Owner, when such changes are approved and implemented prior to installation.

12.4 Ensure all necessary adjustments to accommodate structural and building conditions are completed, with proper approval, at no additional cost to the Owner, addressing any lack of coordination as required.

13. CONCEALMENT

13.1 In all finished areas, ensure that pipes, ducts, and wiring are concealed within floors, walls, and ceilings, unless explicitly specified otherwise in the Contract Documents.

14. REMEDIAL WORK

14.1 Carry out all remedial tasks necessary to repair or replace any parts or portions of the Work deemed defective or unacceptable. Coordinate with adjacent Work to ensure proper integration and minimal disruption.

14.2 Engage specialists experienced with the materials involved to perform remedial tasks. Ensure that the Work is executed in a manner that prevents any damage or risk to other portions of the Work.

15. EXPANSION, CONTRACTION, AND DEFLECTION

15.1 Follow the manufacturer's recommended installation temperatures. When items, components, assemblies, systems, and finishes are installed at temperatures differing from their operation or service temperatures, provide provisions for expansion and contraction as approved by the manufacturer and Consultant. Repair any damage caused by inadequate provisions for expansion and contraction.

15.2 Account for expansion and contraction due to temperature fluctuations within components, Products, and assemblies, as well as between adjacent components, Products, and assemblies. Consider building movements such as creep, column shortening, deflection, sway, and twist to ensure no damage occurs to or within these elements.

15.3 Allow sufficient clearance at wall and partition heads to accommodate structural deflection. Obtain specific requirements from the Consultant where further clarification is needed. When partitions meet the underside of floor assemblies or structural framing, ensure clearances are determined based on the span of the supporting structural members. Maintain the integrity of walls and partitions as sound and/or fire barriers by using appropriate methods.

15.4 Incorporate provisions in pipes, plenums, ducts, and vessels containing air and fluids to prevent damage from pressure, surges, and vibrations. Ensure these provisions protect pipes, plenums, ducts, and vessels, as well as adjacent components, assemblies, and construction through which they are attached or pass.

16. DIELECTRIC SEPARATION

16.1 Provide a permanent dielectric separator over all contact surfaces between dissimilar materials to prevent electrolytic action (galvanic corrosion).

16.2 Ensure aluminum is protected from corrosion when in contact with alkaline materials, such as those found in cementitious products, by implementing appropriate preventive measures.

17. PRODUCTS AT SOUND ATTENUATING PARTITIONS

17.1 Prevent sound transfer at sound-attenuating partitions by ensuring precise placement and treatment of mechanical and electrical components, including ducts, grilles, diffusers, electrical outlets, and boxes.

17.2 When electrical boxes serve both sides of a partition and are placed back-to-back, ensure a minimum lateral separation of 300 mm.

17.3 Use flexible connections for interconnected electrical boxes to further minimize sound transfer.

18. FASTENINGS

18.1 Provide metal fastenings and accessories matching the material, texture, color, sheen, and finish of adjacent materials unless otherwise indicated.

18.2 Ensure prevention of electrolytic action between dissimilar metals and materials.

18.3 Utilize non-corrosive hot-dip galvanized steel fasteners and anchors for securing exterior Work unless stainless steel or an alternative material is specified in the applicable Specification Section. Leave steel anchors bare where cast in concrete.

18.4 Include all required fastenings, anchors, inserts, attachment accessories, and adhesives in each Section's Work. Deliver and locate devices in ample time for installation where required in other Sections.

18.5 Avoid using fiber, plastic, or wood plugs or blocking for fastenings in masonry, concrete, or metal construction unless specifically specified or shown on Drawings

18.6 Install fastenings or adhesives in sufficient quantities to ensure permanent, secure anchorage under static conditions. Fastenings must withstand building thermal movement, creep, and vibration.

18.7 Conceal fasteners where indicated. Minimize the use of exposed fastenings, ensuring they are spaced evenly and arranged in an organized, symmetrical pattern.

18.8 Ensure fastenings do not cause spalling or cracking of the material to which anchorage is made.

18.9 Powder Actuated Fastenings:

.1 Prohibit the use of powder-actuated fasteners for ceiling support.

.2 Do not utilize powder-actuated fastenings in any portion of the Work unless written consent for a specific application is provided by the Consultant.

.3 Only low-velocity tools are permissible. Operators must be qualified and possess a valid operator's certificate.

19. ADJUSTING

19.1 Ensure that all components of assemblies fit snugly, align accurately, and remain in true planes, with all moving parts operating freely without binding or scraping.

19.2 Verify the proper functioning of all Work and make necessary adjustments to ensure optimal performance.

19.3 Lubricate Products as recommended by the manufacturer to maintain smooth operation.

20. MANUFACTURERS' INSTRUCTIONS

20.1 Unless otherwise stated in the Specifications, install or erect materials and Products in strict accordance with the manufacturers' instructions.

20.2 Failure to comply with these requirements, resulting in improper installation or erection, authorizes the Consultant to mandate removal and reinstallation at no increase in the Contract Price.

21. OVERLOADING

21.1 Prevent overloading of any portion of the building.

21.2 Avoid cutting, drilling, or sleeving load-bearing structural members unless explicitly detailed in the Contract Documents and approved in writing by the Consultant.

22. EXISTING UTILITIES

22.1 Perform Work involving breaking into or connecting to existing utilities or services at times specified by local authorities, minimizing disruption to pedestrian and vehicular traffic.

22.2 Protect, relocate, or maintain active services encountered during the Work.

22.3 Cap off inactive services in a manner approved by the authority having jurisdiction, ensuring proper staking and recording of the capped service's location.

END OF SECTION

1. DEMONSTRATION AND INSPECTION OF PRODUCTS AND SYSTEMS

1.1 Arrange for a full demonstration of systems and operational Products upon completing 100% of their installation and prior to certification of Substantial Performance.

1.2 Include arrangements for the attendance of the Consultant, Owner, jurisdictional authorities, and personnel designated by the Owner to operate the systems and/or Products.

1.3 Conduct demonstrations by the Subcontractor responsible for the system and/or Product installation, with assistance from manufacturer or supplier representatives. Personnel conducting the demonstration shall possess complete knowledge of all operational, functional, and maintenance requirements of the systems and/or Products.

1.4 Obtain acknowledgment from the Owner's representative of the successful completion of each demonstration on a form provided by the Contractor. This form shall be agreed upon by the Owner, Consultant, and Contractor before demonstration and testing.

1.5 Submit letters from manufacturers of systems and/or Products prior to applying for a certificate of Substantial Performance. These letters shall verify that the Products are correctly installed, connected, and operating satisfactorily. Certification shall be based on inspections and testing conducted by qualified technical personnel and include the names of personnel, methods of inspection, and locations of the certified Products within the building.

1.6 Following submission and acceptance of certification letters, grant the Owner the right to use the Products on a trial basis and for instructing their personnel in their use.

2. FINAL INSPECTIONS AND CLOSEOUT

2.1 Submit proposed closeout procedures and an inspection schedule to the Consultant for approval before initiating final demonstrations and inspections.

2.2 Provide layout and survey documentation required by the Owner and jurisdictional authorities.

2.3 Arrange, conduct, and document final demonstrations, inspections, closeout, and take-over procedures upon Work completion, adhering to OAA/OGCA TAKE-OVER PROCEDURES as outlined in OAA/OGCA Document No. 100.

.1 For the purposes of Document No. 100, references to "Architect" shall be understood as "Consultant."

3. CERTIFICATE OF COMPLIANCE

3.1 Prior to applying for Substantial Performance, submit Certificates of Compliance for the following items.

3.2 An affidavit confirming the use of lead-free solder for all domestic water lines.

3.3 Products accompanied by accepted Material Safety Data Sheets (MSDS).

3.4 Any other Work or Products identified in the Contract Documents as requiring a Certificate of Compliance.

3.5 Certificates of Compliance shall include:

.1 Names and addresses of the project and the Owner.

.2 Date of issue.

.3 Detailed product description, including name, number, and manufacturer.

.4 A statement verifying that the installed Work/Product meets specified requirements and complies with accepted MSDS, when applicable.

.5 Each Certificate of Compliance shall be issued on the Subcontractor's letterhead, properly executed, under whose scope the Work/Product was provided.

.6 The Contractor shall endorse each Certificate of Compliance with their authorized stamp/signature. Submissions must allow sufficient time for review to prevent delays in scheduled completion.

3.6 **FINAL CLEANING**

.1 Refer to SECTION 01 74 00 "Cleaning".

3.7 **PROJECT CLOSEOUT SUBMITTALS**

.1 Prior to application for Certificate of Substantial Performance, submit the following documents in accordance with the requirements of the Contract Documents:

.2 Project Record Documents: Refer to SECTION 01 78 23.

.3 Operation and Maintenance Manual: Refer to SECTION 01 78 23.

.1 Complete set of warranties and maintenance service agreements: Refer to SECTION 01 78 23.

.2 Complete set of final shop drawings: Refer to SECTION 01 33 00.

.4 Spare Parts and Maintenance Materials: Refer to SECTION 01 78 23.

.5 The Certificate of Substantial Performance will not be issued until the above documents have been submitted and are deemed by the Consultant to be acceptable.

END OF SECTION

1. **FIELD ENGINEERING**

1.1 The Contractor assumes responsibility for all survey and field engineering Work required for the Project.

1.2 Engage a Registered Ontario Land Surveyor, approved by the Owner, to perform all field engineering tasks.

1.3 Records

.1 Maintain an accurate and comprehensive log of control and survey Work as it progresses.

.2 Upon foundation completion, prepare a certified survey outlining dimensions, locations, angles, and elevations of the Work.

.3 Submit a certificate, signed by the Surveyor, verifying that completed Work aligns with, or deviates from, the Contract Documents.

2. **LAYOUT AND SURVEY**

2.1 Existing grades, lines, and site conditions shown on the drawings are based on survey data established by personnel directly engaged by the Owner. The Consultant assumes no responsibility for the accuracy of this survey information. The Contractor shall establish the location of property lines.

2.2 Contractor is responsible for setting out the Work. Before commencing, verify dimensions and elevations indicated in the Contract Documents and notify the Consultant of any unsatisfactory conditions that may impede the proper completion of the Work.

2.3 Establish and maintain permanent reference points, ensuring their accuracy throughout the duration of the project. Set lines and levels required for the execution of the Work.

2.4 Accurately set out the Work using established levels and lines. For any Work that depends on grades and elevations of existing structures or facilities, prioritize the existing conditions over reference elevations. Notify the Consultant of any discrepancies.

2.5 Engage a licensed Land Surveyor, certified to practice in the place of Work, to perform layout and verification of the following project elements:

.1 Lay out the building addition on the site.

.2 Establish a permanent benchmark or widely separated markers.

.3 Set and maintain temporary benchmarks in appropriate locations.

.4 Provide general dimensions, lines, and elevations required by Subcontractors.

.5 Establish lines and levels, and conduct location and layout by instrumentation.

.6 Stake batter boards for foundations.

.7 Establish foundation, column locations, and floor elevations.

.8 Establish lines and levels for mechanical and electrical Work.

.9 Verify elevations of floor and roof levels as construction progresses, ensuring consistency with benchmark datum.

.10 Confirm elevations of finished floors at connections between existing buildings and additions.

.11 Ensure that construction on the site does not violate current or anticipated restrictions, including lines of traverse to public utilities.

.12 Align geodetic elevation of benchmark datum with elevations used by adjacent public utilities.

.13 Verify the accuracy of site dimensions shown on the drawings.

.14 Conduct a survey to confirm footing locations adjacent to property lines before footing construction begins.

.15 Survey the building location relative to property lines once foundation walls are completed to grade level.

.16 Survey asphalt and concrete paving areas prior to placement to confirm conformance with grades indicated on the drawings.

.17 Provide a final survey to verify the completed building's location on the site.

2.6 Protect and preserve established benchmarks throughout the project. Should a benchmark be lost or displaced, re-establish it using a licensed Land Surveyor at no additional cost to the Owner. Assume full responsibility for setting out the Work.

2.7 In the event of a discrepancy regarding horizontal or vertical alignment conditions exceeding allowable tolerances, the Owner may engage an independent Land Surveyor to investigate. The determination of responsibility and associated costs for this service, whether borne by the Owner or Contractor, will depend on the investigation's findings.

2.8 All costs incurred to correct conditions resulting from errors made by the Contractor shall be borne by the Contractor.

3. DIMENSIONS

3.1 Verify and check all dimensions related to the Work. Dimensions that pertain to other Sections must be confirmed with the relevant Section. On-site measurements are required for Work that must align or conform with previously installed Work.

3.2 Avoid scaling drawings. Consult the Consultant immediately to resolve ambiguities, lack of information, or inconsistencies. The Contractor bears responsibility for extra costs resulting from non-compliance with this requirement.

4. EXISTING UTILITIES

4.1 The Contractor is responsible for gathering all necessary information regarding sewer, gas, water, telephone, electrical signal systems, and any other utilities within the building or surrounding locations.

4.2 Protect piping, sewer lines, conduit, and similar utilities owned by others during construction activities.

5. **EXAMINATION**

5.1 Inspect areas and conditions where Work is to be performed. Notify the Consultant in writing of conditions that may hinder proper and timely completion of the Work.

5.2 Confirm that existing site conditions and substrate surfaces are suitable for subsequent Work.

5.3 Verify the structural capability of existing substrates to support or attach new Work.

5.4 Confirm specific conditions as detailed in individual Specification Sections.

5.5 Ensure utility services are available, possess the correct characteristics, and are located appropriately.

5.6 Do not commence Work until all unsatisfactory conditions are corrected to the installer's satisfaction.

5.7 Starting installation implies acceptance of the site conditions.

6. **PREPARATION**

6.1 Clean substrate surfaces thoroughly before applying any subsequent material or substance.

6.2 Allow substrate surfaces to cure or dry to moisture content limits specified by the manufacturer of the material or substance to be applied.

6.3 Seal cracks and openings in the substrate before applying subsequent materials or substances.

6.4 Apply the primer, sealer, or conditioner recommended or required by the manufacturer to the substrate before adding new materials or substances.

END OF SECTION

1. **WORKMANSHIP**

1.1 Ensure all Workmanship is executed by experienced and skilled workers for their respective duties. Notify the Consultant immediately when required Work conditions make achieving the required results impractical.

1.2 Do not employ unfit personnel or individuals unskilled in their designated duties.

1.3 In case of disputes, the Consultant will decide on the quality or fitness of Workmanship, and their decision shall be final.

2. **CONCEALMENT**

2.1 Conceal pipes, ducts, and wiring within floors, walls, and ceilings in finished areas unless specified otherwise.

2.2 Notify the Consultant prior to installation when contradictions arise, and proceed with installation as directed by the Consultant.

3. **LOCATION OF FIXTURES**

3.1 Treat fixture, apparatus, equipment, fittings, outlets, conduits, pipes, and duct locations shown or specified without dimensions as approximate.

3.2 Seek clarification from the Consultant to establish precise locations. Any relocations due to lack of clarification requests will be completed by the Contractor at no additional cost.

3.3 Coordinate Work across Sections to conserve space and ensure ducts, pipes, and conduits fit within designated wall and ceiling spaces.

3.4 Install exposed ducts, piping, and conduits neatly and uniformly parallel to building lines and one another. Obtain Consultant’s review before proceeding. Alter installations not conforming to the Consultant's review at no additional cost.

3.5 Organize exposed mechanical and electrical installations, such as outlets, switches, and panels, orderly and neatly. Secure the Consultant’s review of proposed layouts before rough-in Work begins. Make relocations as needed, without extra cost, where prior review was not requested.

4. **REMOVED MATERIAL**

4.1 Materials marked for removal, unless specified otherwise, become the Contractor’s property and must be removed from the Site.

4.2 Deposit unsalvageable materials in designated garbage containers daily or as directed by the Consultant.

4.3 Obtain Consultant’s approval for garbage container placement.

4.4 Remove containers as soon as they are full and dispose of contents legally.

5. **CONSTRUCTION SAFETY REQUIREMENTS**

5.1 Execute all Work in full compliance with the construction health and safety requirements outlined in Section 01 35 29, "Health and Safety Requirements."

6. POWDER ACTUATED FASTENING DEVICES

6.1 Do not use powder-actuated tools employing explosives unless explicitly permitted by the Consultant. Comply with CAN3-Z166.2-M85, "Use and Handling of Powder Actuated Tools." SLEEVES, HANGERS, AND INSERTSSLEEVES, HANGERS, AND INSERTS

7. SLEEVES, HANGERS, AND INSERTS

7.1 Coordinate the placement of sleeves and the installation of hangers and inserts. Obtain the Consultant’s approval before proceeding.

END OF SECTION

1. **GENERAL**

1.1 Provide all necessary labour, Products, equipment, services, tools, and supervision to perform cutting and patching Work in strict compliance with the Contract Documents.

1.2 Obtain the Consultant's approval before performing any cutting, boring, or sleeving of load-bearing members.

2. **DEFINITIONS**

2.1 The terms “make good,” “making good,” “made good,” “restore to existing,” “patch,” “repair,” and similar phrases, unless context specifies otherwise, are defined as.

.1 Restoring materials and finishes damaged or disturbed during additions or reconstruction to their original condition.

.2 Matching new Work to existing materials, form, construction, and finish unless otherwise specified.

.3 Ensuring no visible differences in appearance between existing and new Work, discernible by the naked eye from a distance of 3 metres, and achieving equivalent performance characteristics.

3. **SUBMITTALS**

3.1 Submit a written request before performing any cutting or alteration affecting:

.1 Structural integrity of the Structure or Contract.

.2 Integrity of weather-exposed or moisture-resistant elements.

.3 Efficiency, maintenance, or safety of operational elements.

.4 Visual qualities of sight-exposed elements.

.5 Work of the Owner or Other Contractors.

3.2 Include in the submission:

.1 Identification of the Contract.

.2 Location and description of the affected Work.

.3 Statement of the necessity for cutting or alteration.

.4 Detailed description of the proposed method and materials.

.5 Alternatives to cutting and patching.

.6 Impact on Work of the Owner or Other Contractors.

.7 Proposed date and time for execution.

3.3 Obtain the Consultant's approval of the proposed cutting method before commencing Work.

4. INSPECTION

4.1 Thoroughly examine existing conditions, including elements susceptible to damage or movement during cutting and patching activities.

4.2 Upon uncovering, assess conditions that may influence the performance of the Work.

4.3 Commencement of cutting or patching Work will be deemed as acceptance of the existing conditions.

5. PRODUCTS

5.1 Use Products of the same or better quality than those originally installed.

6. PREPARATION

6.1 Inspect existing conditions to identify elements subject to damage or movement during cutting and patching.

6.2 After uncovering, inspect conditions impacting the performance of the Work.

6.3 Commencement of cutting or patching Work signifies acceptance of existing conditions.

6.4 Ensure the structural integrity of surroundings through proper support systems and protect adjacent areas from damage.

6.5 Protect exposed areas from elements during uncovering, ensuring excavations remain dry.

7. EXECUTION

7.1 Perform Work carefully to prevent damage to other areas or elements.

7.2 Complete cutting, fitting, and patching, including excavation and filling, to achieve a professional finish.

7.3 Employ skilled labour appropriate for the type of cutting Work being performed.

7.4 Integrate Work segments seamlessly, accommodating penetrations through surfaces.

7.5 Remove and replace defective or non-conforming Work.

7.6 Ensure all drilling, cutting, fitting, patching, and finishing is executed professionally and creates watertight connections with adjoining structures.

7.7 Provide openings in non-structural elements for mechanical and electrical penetrations.

7.8 Use methods to avoid damage to other Work and create appropriate surfaces for patching and finishing.

7.9 Employ proper equipment for cutting. For rigid materials, use masonry saws or core drills. Avoid pneumatic or impact tools on masonry without prior approval.

7.10 Match new Work to existing structures by cutting, patching, and making good with materials that replicate the original condition.

7.11 Ensure proper formation and bridging of masonry and structural wall openings.

7.12 Guarantee compatibility and secure installation of all Products.

7.13 Restore Work with new Products that meet Contract Document requirements.

7.14 Create airtight seals for penetrations through pipes, sleeves, ducts, and conduits.

7.15 Prepare surfaces appropriately to receive patching and finishing materials.

7.16 Refinish surfaces to match adjacent finishes. For continuous surfaces, extend refinishing to the nearest intersection. For assemblies, refinish the entire unit.

END OF SECTION

1. GENERAL

1.1 Ensure the assigned Work areas are kept clean and maintained in an orderly condition to the satisfaction of the Consultant.

1.2 Regularly remove rubbish and waste materials from the Work areas, or as directed by the Consultant.

1.3 Burning or burying of rubbish and waste materials on-site is strictly prohibited.

1.4 Use only cleaning materials specifically recommended by the manufacturer for the surface being cleaned.

1.5 Apply cleaning materials only on surfaces for which they are explicitly approved by the cleaning material manufacturer.

2. CLEANING DURING CONSTRUCTION

2.1 Remove spatters, droppings, soil, labels, and debris from finished Work promptly before they harden or set.

2.2 Use only cleaning materials recommended by both the manufacturer of the surface to be cleaned and the manufacturer of the cleaning material.

2.3 Maintain Work areas "broom clean" daily and ensure they are cleaned immediately before starting any finishing work.

2.4 Burning or burying of waste materials on-site is strictly prohibited. Remove waste materials and debris as frequently as needed to prevent accumulation, and no less than at the end of each working day.

2.5 Immediately remove packaging materials and debris from the site after unwrapping or uncrating products and equipment.

2.6 Volatile fluid wastes shall not be disposed of in storm or sanitary sewers, open drain courses, or anywhere on the site.

2.7 Prevent waste material and debris from accumulating in an unsightly or hazardous manner. Sprinkle dusty areas with water as necessary. Provide containers for collecting waste and debris, and ensure hazardous products are disposed of in compliance with jurisdictional authority requirements.

2.8 Adhere to the Regulatory Requirements article in Quality Requirements, Section 01 40 00.

2.9 Schedule cleaning operations to prevent dust or foreign matter from settling on surfaces during finishing work and until tacky or wet finishes are completely cured.

2.10 Include final cleaning instructions for finishing Work in the Maintenance and Operating Manuals.

2.11 Maintain Work areas free of waste products, packaging, and debris.

2.12 Deposit waste material, packaging, and debris into designated waste containers at the end of each working day, or more frequently, as required.

2.13 Control dust and dirt levels to meet acceptable standards, as directed by the Consultant.

2.14 Remove oily rags, waste, and hazardous substances from the premises daily or more frequently, as necessary.

2.15 Arrange and obtain necessary permits for debris disposal from the relevant authorities.

2.16 Perform cleanup promptly upon receiving verbal or written instructions from the Consultant.

3. FINAL CLEANING

3.1 Prior to Substantial Performance, remove all surplus Products, tools, construction machinery, and equipment not required for the remaining Work.

3.2 Eliminate stains, dirt, and smudges from all finished surfaces.

3.3 Clean exposed finished surfaces as per the recommendations provided by respective material manufacturers.

3.4 Polish and clean glass, mirrors, hardware, wall tiles, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace any glass that is broken, scratched, or otherwise disfigured.

3.5 Remove all stains, spots, marks, and dirt from decorative elements, electrical and mechanical fixtures, furniture fitments, walls, floors, and other surfaces.

3.6 Thoroughly vacuum and dust building interiors, including spaces behind grilles, louvres, and screens.

3.7 Wax, seal, shampoo, or prepare floor finishes as per manufacturer recommendations.

3.8 Inspect all finishes, fitments, and equipment to ensure compliance with specified workmanship and operational standards.

3.9 Broom-clean and wash exterior walkways, steps, and other surfaces.

3.10 Remove dirt and any disfiguration from exterior surfaces.

3.11 Clean and sweep roofs, gutters, areaways, and sunken wells.

3.12 Sweep and wash all paved exterior areas.

3.13 Clean mechanical and electrical fixtures, removing all labels, wrappings, paper, and other foreign materials.

3.14 Replace heating, ventilation, and air conditioning filters if units were operated during construction.

3.15 Clean ducts, blowers, and coils in cases where HVAC systems were operated without filters during construction.

3.16 Clean all roofs, downspouts, and drainage systems to ensure proper functioning.

3.17 Upon Total Performance of the Work, remove all surplus Products, tools, construction machinery, equipment, waste Products, and debris.

4. Additional Final Cleaning Requirements:

4.1 Replace any damaged or defective glass and mirrors before final inspection.

4.2 Engage skilled cleaning specialists for final cleaning upon construction completion.

4.3 Remove all temporary protections and correct defects prior to the start of final cleaning operations.

4.4 Perform final cleaning to remove dust, stains, paint spots, soil, grease, fingerprints, and accumulations of construction materials, both interior and exterior, across all new and existing building areas. Cleaning methods shall comply with manufacturer instructions for each material.

5. Scope of Final Cleaning Work:

5.1 Wash exterior paved surfaces and clean interior stone, brick, and concrete floors.

5.2 lean and polish glass, mirrors, porcelain, enamel, and finished metals.

5.3 Vacuum ceilings, walls, and floors thoroughly.

5.4 Clean and polish ceramic and quarry tile floors.

5.5 Clean resilient flooring and buff it with two light coats of wax as recommended by the flooring manufacturer, each coat buffed to finish.

5.6 Wash glazed wall surfaces to remove any residual construction materials.

5.7 Clean hardware, mechanical fixtures, plumbing fixtures, lighting fixtures, cover plates, and equipment, polishing all metal, porcelain, vitreous, and glass finishes.

5.8 Clean windows, entrances, and skylights, ensuring all interior and exterior surfaces are spotless.

6. Maintain the cleanliness of the building and its premises until the Owner assumes possession of the building or its portions.

END OF SECTION

1. REFERENCES

1.1 European Commission Waste Framework Directive 2008/98/EC

1.2 Industrial Emissions Directive (IED) 2010/75/EU

1.3 EN 303 Series Standards for heating boilers and other relevant equipment

2. DEFINITIONS

2.1 Alternative Daily Cover: Material (other than earthen material) that is placed on the surface of the active face of municipal solid waste landfills at the end of each operating day to control vectors, fires, odours, blowing litter, and scavenging.

2.2 Biomass: Plant material from trees, grasses, or crops that can be converted to heat energy to produce electricity.

2.3 Construction and Demolition Debris: Includes waste and recyclables generated from construction and from the renovation, demolition, or deconstruction of pre-existing structures. It does not include hazardous materials or land-clearing debris, such as soil, vegetation, and rocks.

2.4 Construction Waste Calculation: Used to determine the percentage of waste diverted from landfill and incineration facilities on a metric tonne basis.

2.5 Construction Waste Management Plan: A document specific to a building project that outlines measures and procedures that divert construction waste materials from landfill and incineration facilities. It describes specific end use locations and purposes for the material diverted.

2.6 Construction Waste Management Summary Spreadsheet: A spreadsheet used to track waybill information provided by all of the construction / demolition waste haulers used on the project.

2.7 Eligible Biofuels: Untreated wood waste, agricultural crops or waste, landfill gas, animal waste and other organic waste.

2.8 Hazardous Materials: As defined by relevant regulations in the location of the project. Hazardous materials should be excluded from calculations and should be disposed of according to relevant regulations.

2.9 Incineration Facilities: Waste management operations that use combustion as a means of reducing the volume of waste materials.

2.10 Recycling: The collection, reprocessing, marketing, and use of materials that were diverted or recovered from the solid waste stream.

2.11 Reuse: The return of materials to active use in the same or a related capacity as their original use, thus extending the lifetime of materials that would otherwise be discarded.

2.12 Tipping Fees: Charged by a landfill for disposal of waste, typically quoted per tonne.

3. SUBMITTALS

3.1 Construction and Demolition Waste Management (CWM) Plan

.1 Provide an electronic copy to the Consultant for review before waste removal.

.2 Include at least five materials targeted for diversion.

.3 Outline on-site/off-site diversion strategies.

.4 Ensure compliance with European directives and EN 303 standards for waste-to-energy systems.

.5 Obtain Consultant approval prior to waste removal.

3.2 Monthly Submissions

.1 Submit a tracking spreadsheet with waybill details, including bin weights and material composition.

.2 Provide monthly diversion rates for commingled waste, categorized by weight or volume.

3.3 Close-Out Submittals

.1 Submit a certified letter confirming cessation of waste removal from the project site.

.2 Provide completed waste diversion calculations and supporting documentation for Consultant review.

4. EXECUTION

4.1 Diversion of Materials

.1 Recycle and salvage non-hazardous construction and demolition debris.

.2 Prevent contamination of reusable and recyclable materials.

4.2 Construction Waste Calculations

.1 Convert all waste documentation to weight (metric tonnes).

.2 Provide defensible conversion metrics for estimating weights.

.3 Include salvaged materials such as furniture, fixtures, and construction debris in calculations.

.4 Exclude soil, rocks, and hazardous materials from waste diversion calculations.

4.3 Material Sorting and Separation

.1 Separate materials from general waste streams into designated containers.

.2 Ensure commingled waste facilities provide project-specific diversion rates based on measured components.

4.4 **On-Site Implementation**

.1 **D**esignate on-site recycling locations.

.2 Educate subcontractors about recycling requirements.

.3 Maintain a hard copy of the Construction Waste Management Plan on-site.

4.5 **Waste Diversion Goals**

.1 Divert 75% or more waste from four or more material streams, including concrete, asphalt, rubble, cardboard, metals, and gypsum board.

4.6 **Collaboration with Manufacturers**

.1 Minimize packaging waste and coordinate pallet reclamation efforts.

4.7 **Final Documentation**

.1 Ensure accurate and complete tracking of all diverted and disposed materials.

.2 Provide certified waste management summaries for project close-out.

END OF SECTION

1. **INSPECTION AND DECLARATION PROCEDURES**

1.1 Follow the recommended procedures concerning substantial performance of construction contracts and completion take-over of projects as prescribed in OAA/OGCA Document 100 "Take Over Procedures".

2. **REINSPECTION**

2.1 Should the status of the Work necessitate reinspection by the Consultant due to the failure of the Work to comply with the Contract Documents, the Owner shall deduct the costs associated with reinspection services from the payment due to the Contractor.

3. **FINAL CLEANING**

3.1 Refer to SECTION 01 74 00 "Cleaning".

4. ADJUSTING

4.1 Adjust operating products and equipment to ensure smooth and unhindered operation.

5. **PROJECT CLOSEOUT SUBMITTALS**

5.1 Prior to application for Certificate of Substantial Performance, submit the following documents in accordance with the requirements of the Contract Documents:

.1 Project Record Documents: Refer to SECTION 01 78 23.

.2 Operation and Maintenance Manual: Refer to SECTION 01 78 23. Include:

.1 Complete set of warranties and maintenance service agreements: Refer to SECTION 01 78 00.

.2 Complete set of final shop drawings: Refer to SECTION 01 33 00.

.3 Spare Parts and Maintenance Materials: Refer to SECTION 01 78 23.

.4 The Certificate of Substantial Performance will not be issued until the above documents have been submitted and are deemed by the Consultant to be acceptable.

END OF SECTION

1. **GENERAL**

1.1 Provide two (2) copies of a comprehensive Operations and Maintenance Manual to the Consultant, containing material suitable for the Owner's maintenance staff. Manuals shall include all Products supplied and installed under the Contract.

1.2 Submit a draft version of the Operations and Maintenance Manuals for the Consultant's review at least 2 weeks before testing systems and equipment. Incorporate any alterations and additions identified during the review process and testing, and prepare the final version of the manual based on the corrected draft.

1.3 Submit the final version of the Operations and Maintenance Manuals before Contract Completion.

1.4 Testing of systems and equipment will not be considered complete until the Consultant has received the requisite number of copies of the finalized manuals.

1.5 Remove irrelevant information from standard literature included in the Operations and Maintenance Manual, or clearly mark such sections as not applicable.

1.6 Ensure that the manuals contain sufficient detail to enable the Owner to fully maintain the equipment without the need for external assistance.

1.7 All submitted materials must be in English.

2. **FORMAT**

2.1 Organize all data into a clear and comprehensive instructional manual format.

2.2 Use commercial-quality binders, sized 219 x 279 mm, with a maximum "D" ring size for durability and usability.

2.3 When multiple binders are required, ensure data is grouped into related and consistent categories.

2.4 Label each binder with the printed title "Contract Record Documents," including the title of the Contract and an identifier for the subject matter within.

2.5 Organize the content by systems or process flow, aligned with the sequence and section numbers in the Table of Contents.

2.6 Include a tabbed fly leaf for each separate Product and system, containing a typed description of the Product and major component parts of the equipment.

2.7 Provide a tabbed fly leaf for Products and systems supplied by the Owner but installed under the Contract, clearly distinguishing them.

2.8 Use the manufacturer’s printed data or typewritten information on 20-pound paper for consistency and readability.

2.9 Include drawings with reinforced punched binder tabs. Bind these drawings alongside the text, folding larger drawings to match the size of the text pages for ease of use.

2.10 **CONTENTS**

.1 Operation and maintenance manuals shall include the following minimum information and data:

.2 Table of contents: Provide the title of the Contract, names, addresses, and telephone numbers of Consultants and Contractor, along with the name of responsible parties. Include a schedule of Products and systems, indexed to the content of the volume.

.3 For each Product or system: List the names, addresses, and telephone numbers of Subcontractors, suppliers, and service representatives. Include local sources of replacement supplies and parts with telephone numbers.

.4 Warranties: Warranties are between the Contractor and Owner and shall include:
- .1 Description of warranty coverage.
- .2 Date warranty starts, being the date of Contract Completion.
- .3 Date warranty expires.
- .4 Contact name, address, and phone number (Contractor shall notify the Owner of any changes to contact information during the warranty period).
- .5 Equipment and components performance curves.
- .6 Hydro certificates.

.5 Reports: Provide the following for each Product or system:
- .1 Manufacturer’s certified reports.
- .2 Factory test reports.
- .3 Field testing reports.

.6 Design, construction, and/or fabrication details: Include features, component functions, and maintenance requirements to support effective start-up, operation, maintenance, repair, modification, extension, and expansion of installations.

.7 Technical data: Include Product data, bulletins, component illustrations, detailed views, technical descriptions, and parts lists.

.8 Schematics and interconnection lists: Include schematic and wiring diagrams, interconnection lists, printed circuit board layouts with component identification, component parts lists with electronic substitutions, cross-referenced components lists, and sequences of operations.

.9 Troubleshooting and fault location guide: Provide instructions to quickly return malfunctioning equipment to operation.

.10 Routine servicing and preventative maintenance schedule: Include required tasks and estimated hours for servicing and preventative maintenance.

.11 Complete set of reviewed shop drawings.

.12 Product data: Clearly mark each sheet to identify specific Products and component parts. Delete inapplicable information.

.13 Drawings: Supplement Product data to illustrate relationships between component

parts, control diagrams, and flow diagrams as required.

.14 Typed text: Provide additional instructions as required to supplement Product data. Include a logical sequence of instructions for each procedure, incorporating the manufacturer's instructions and those required by the Specifications.

3. **DRAWINGS**

3.1 Prepare all required drawings on CAD(.dwg format), using CAD Version 2019 or higher.

3.2 Ensure CAD drawings comply with the CAD Standards and Procedures provided by the Owner or Consultant.

3.3 Deliver one external hard drive containing all final drawings prepared under this Contract to the Consultant. Include, but do not limit to, circuit drawings, equipment layout drawings, and shop drawings.

3.4 Final drawings shall be sized at 560 mm x 860 mm. Provide half-size reproductions measuring 280 mm x 430 mm as well.

3.5 Before Contract Completion, provide the Consultant with one complete set of CAD Drawing Files in AutoCAD format, stored on media acceptable to the Consultant. Include all final drawings prepared under this Contract, such as circuit drawings, equipment layout drawings, and shop drawings.

3.6 Text files shall be prepared in a word processing program approved by the Owner.

3.7 Authorized deviations from drawings shall be marked in red accurately on one set of drawing prints in a neat, legibly printed manner and shall be dated. Prior to final inspection, neatly transfer the recorded information to a second set of drawing prints of the most recent revision to the drawings and submit both sets to the Consultant.

3.8 Maintain as-built drawings up to date as Work progresses. Status of maintained as-built drawings may be considered as a condition for validation of applications for payment.

3.9 Identify each as-built drawing as "As-Built Copy" and maintain the as-built drawings in good condition. Make as-built drawings available to the Consultant at all times.

3.10 As-built drawings shall include accurate dimensioned record of deviations and changes in Work from drawings.

3.11 As-built drawings shall be signed and dated by Contractor.

3.12 Submit as-built drawing to Consultant for review and make corrections as directed by Consultant.

3.13 Record accurately all deviations in the Work.

3.14 Accurately record locations of concealed structure, mechanical and electrical services and similar Work not clearly in view, the location of which is required for

maintenance, alteration Work and future additions. Do not conceal such Work until the location has been recorded.

3.15 Accurately record locations of equipment bases, anchors, concrete pads and roof curbs, sleeves, piping, conduits, ducts, maintenance holes and valves, etc. located either below, outside or within structure.

3.16 Where piping, conduits and ducts are underground, underfloor, embedded in concrete or otherwise in inaccessible locations, accurately record with respect to structure column lines or walls and elevations with respect to finished floor levels or grades referenced to the centre line of components.

3.17 Integrate all changes and additional information marked on record prints.

3.18 Redraw and annotate changes where necessary. Clearly bubble revisions, note them in the revision column, and submit for Consultant review before Substantial Completion.

3.19 Accurately record any components which will be in inaccessible locations for Consultant's review before the component is covered, or buried, or made inaccessible.

3.20 CAD (Dwg) 2D drawings of Contract Drawings can be obtained from Consultant at a cost of $750.00 plus HST per sheet drawing and with a signed CAD Wavier.

3.21 Clearly and prominently mark each drawing “AS-BUILT DRAWING prepared by _____ (name of Contractor)”

4. TRANSMITTAL

4.1 Forward storage media to the Owner through the Consultant, accompanied by a transmittal form. The transmittal form shall include a list of all file names contained on the storage media.

4.2 Data submitted to the Owner shall include the following files in addition to the design information:

.1 Library parts or cells utilized in the design files.

.2 Level conventions employed for each design file.

.3 Plotting instructions, including color tables, pen tables, and plot scale, used to prepare hard copies.

.4 Working units defined within the design files.

.5 Font library, if non-standard fonts were utilized in the design files.

5. RECORDING ACTUAL SITE CONDITIONS

5.1 Record information on a set of black-line opaque drawings and in the Project Record copy of the drawings and project manual.

5.2 Use felt-tip pens, assigning a distinct color for each major system to ensure clarity.

5.3 Record information as construction progresses. Do not conceal Work before recording all required data.

5.4 Legibly mark Contract Drawings and shop drawings to document:

.1 Measured depths of foundation elements relative to the finished first-floor datum.

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.3 Field changes to dimensions or details.

.4 Modifications made by addenda or change orders.

.5 Additional details not included in the original drawings.

.6 References to related shop drawings and modifications.

5.5 Clearly annotate specifications to reflect actual construction, such as:

.1 Manufacturer, trade name, and catalog number of installed products, including optional or substituted items.

.2 Modifications introduced through addenda and change orders.

5.6 Retain manufacturer certifications, inspection certifications, and field test records as required by specification sections.

6. FINAL SURVEY

6.1 Provide a final site survey certificate in compliance with Section 01 71 23, certifying that all elevations and locations meet the Contract Documents.

7. MATERIALS AND FINISHES

7.1 Include details such as catalog numbers, sizes, composition, colors, and texture designations. Provide reordering information for custom-manufactured products.

7.2 Provide guidance on cleaning agents, precautions, and schedules for cleaning and maintenance.

7.3 Include the manufacturer’s recommendations for cleaning and maintaining weather-exposed items.

7.4 Comply with individual specification sections.

8. SPARE PARTS

8.1 Provide spare parts in the quantities specified.

8.2 Ensure items match the quality and manufacture of installed products.

8.3 Deliver to the specified location, catalog items, and submit an inventory listing to the Consultant.

8.4 Obtain receipts for delivered items and submit them before the Final Certificate of Measurement.

9. **MAINTENANCE MATERIALS**

9.1 Provide maintenance and extra materials as specified.

9.2 Deliver items of the same quality and manufacture as installed products. Catalog and inventory items for submission to the Consultant.

9.3 Obtain and submit receipts before the Final Certificate of Measurement.

10. **STORAGE, HANDLING, AND PROTECTION**

10.1 Store spare parts, materials, and tools in a way that prevents damage or deterioration.

10.2 Store items in original packaging, with seals and labels intact. Weatherproof enclosures should be used where required.

10.3 Replace damaged items at no cost, ensuring Consultant satisfaction.

11. **WARRANTIES AND BONDS**

11.1 Separate each warranty or bond with index tabs matching the Table of Contents.

11.2 Include details such as subcontractor and manufacturer names, addresses, and phone numbers.

11.3 Obtain and submit warranties and bonds in duplicate, ensuring proper form and notarization where required.

11.4 Retain all warranties and bonds until the specified submission time.

12. **PRE-WARRANTY CONFERENCE**

12.1 Schedule a meeting with the Consultant before contract completion to understand warranty requirements.

12.2 Establish procedures for defect notifications, prioritization, and response times.

12.3 Provide the name, address, and phone number of an authorized company for warranty actions, ensuring responsiveness and availability within the local service area.

END OF SECTION

1. ADMINISTRATIVE REQUIREMENTS

1.1 Demonstrate the operation and maintenance of equipment and systems to the Owner's personnel before the date of Substantial Performance of the Contract.

1.2 Coordinate with the Owner to identify personnel for instructions and arrange their attendance at agreed times.

2. PREPARATION

2.1 Confirm conditions for demonstration and instructions meet requirements.

2.2 Ensure designated personnel are present.

2.3 Verify equipment has been inspected, started, and is operational per specifications and manufacturer recommendations.

2.4 Confirm testing, adjusting, and balancing have been completed as per SECTION 01 91 10 "Commissioning Cx," and all systems are fully functional.

3. DEMONSTRATION AND INSTRUCTIONS

3.1 Demonstrate start-up, operation, control, adjustment, troubleshooting, servicing, and maintenance of each equipment item at its location.

3.2 Instruct personnel on all phases of operation and maintenance, using operation and maintenance manuals as reference.

3.3 Review the manual contents thoroughly, explaining operation and maintenance aspects.

3.4 Add supplementary data to operation and maintenance manuals if necessary during instructions.

3.5 Time Allocated for Instructions:

.1 Door Hardware: 4 hours

.2 Domestic Water Heaters and Storage Tanks: 4 hours

.3 Plumbing Fixtures: 4 hours

.4 Variable Frequency Drives: 4 hours

.5 Pumps - Hydronic Systems: 4 hours

.6 Commercial Fans System: 4 hours

.7 Packaged Boilers: 4 hours

.8 Pool Equipment: 8 hours

4. Action and Informational Submittals

4.1 Submit in accordance with SECTION 01 33 00 "Submittal Procedures."

4.2 Provide a schedule of demonstration dates and times for each equipment item and system at least two weeks in advance for Owner approval.

4.3 Submit reports within one week after each demonstration, confirming satisfactory completion of demonstrations and instructions.

4.4 Include the time, date, and attendees for each demonstration.

4.5 Supply completed operation and maintenance manuals for use during demonstrations and instructions.

5. **QUALITY ASSURANCE**

5.1 For Sections specifying manufacturer-provided demonstrations:

.1 Ensure the manufacturer’s authorized representative instructs the Owner's personnel.

.2 Submit a written report verifying completion of demonstrations and instructions.

END OF SECTION

1. **RELATED DOCUMENTS**

1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, are applicable to this Section.1

1.2 The OPR and BoD documentation prepared by the Owner and the Design Team includes requirements relevant to this Section.

2. **SUMMARY**

2.1 This Section specifies general requirements for commissioning without reference to specific systems, subsystems, and equipment.

3. **DEFINITIONS**

3.1 BoD: Basis of Design.

3.2 CxA: Commissioning Authority, responsible for planning, scheduling, and coordinating the commissioning team.

3.3 OPR: Owner's Project Requirements.

3.4 Systems, Subsystems, and Equipment: "As-built" systems, subsystems, and equipment.

3.5 TAB: Testing, Adjusting, and Balancing.

3.6 Design Team: Includes architects, engineering consultants, and others involved in the project design process.

4. **COMMISSIONING TEAM**

4.1 Individuals, each having authority to act on behalf of the entity they represent, explicitly organized to implement the commissioning process through coordinated actions.

4.2 The commissioning team shall include, but not be limited to, representatives of Mechanical and Electrical disciplines, various Specialty Contractors, Project Superintendent, subcontractors, installers, suppliers, and specialists deemed appropriate by the CxA.

4.3 Members Appointed by the Owner

.1 CxA: The designated person, company, or entity responsible for planning, scheduling, and coordinating the commissioning team to implement the commissioning process. The Owner will engage the CxA under a separate contract.

.2 Representatives of the facility user and operation and maintenance personnel.

.3 Architect and Engineering design professionals.

5. **OWNER’S RESPONSIBILITIES**

5.1 Provide the OPR documentation to the CxA and the Contractor to assist in developing the commissioning plan, systems manual, operation and maintenance training plan, and testing plans and checklists.

5.2 Assign operation and maintenance personnel and schedule their participation in commissioning team activities, including:

.1 Coordination meetings.

.2 Training in operation and maintenance of systems, subsystems, and equipment.

.3 Testing meetings.

.4 Demonstration of operation of systems, subsystems, and equipment.

5.3 Provide utility services required for the commissioning process unless otherwise specified as the Contractor's responsibility.

5.4 Provide the BoD documents, prepared by the Design Team and approved by the Owner, to the CxA and Contractors participating in the commissioning process to facilitate development of the commissioning plan, systems manual, and operation and maintenance training plan.

6. CONTRACTOR'S RESPONSIBILITIES

6.1 Provide utility services required for the commissioning process if not the responsibility of the Owner.

6.2 The Contractor shall assign representatives with expertise and authority to act on behalf of the Contractor and schedule them to participate in and perform commissioning team activities including, but not limited to, the following

.1 Participate in construction-phase coordination meetings.

.2 Participate in maintenance orientation and inspection.

.3 Participate in operation and maintenance training sessions.

.4 Participate in final review at acceptance meeting.

.5 Certify that the Work is complete and systems are operational according to the Contract Documents, including calibration of instrumentation and controls.

.6 Evaluate performance deficiencies identified in test reports and, in collaboration with the entity responsible for system and equipment installation, recommend corrective action.

.7 Review and approve final commissioning documentation.

6.3 Subcontractors shall assign representatives with expertise and authority to act on behalf of Subcontractors and schedule them to participate in and perform commissioning team activities including, but not limited to, the following:

.1 Participate in construction-phase coordination meetings.

.2 Participate in maintenance orientation and inspection.

.3 Participate in procedures meetings for testing.

.4 Participate in the final review at the acceptance meeting.

.5 Provide schedules for operation and maintenance data submittals, equipment start-up, and testing to the CxA for incorporation into the commissioning plan. Update the schedule on a weekly basis throughout the construction period.

.6 Provide information to the CxA for developing the construction-phase commissioning plan.

.7 Participate in training sessions for the Owner's operation and maintenance personnel.

.8 Provide updated Project Record Documents to the CxA on a daily basis.

.9 Gather and submit operation and maintenance data for systems, subsystems, and equipment to the CxA, as specified in Section 01 78 23 Operation and Maintenance Manuals".

.10 Provide technicians who are familiar with the construction and operation of installed systems and who shall develop specific test procedures and participate in testing of installed systems, subsystems, and equipment.

7. CxA’s RESPONSIBILITIES

7.1 Coordinate the activities of the commissioning team, ensuring clear organization and direction throughout the process.

7.2 Develop a detailed plan for the construction phase, including test and inspection protocols, incorporating updates to designs, and scheduling commissioning tasks in alignment with the project timeline. Clearly outline responsibilities for team members, specifying names, organizations, and areas of expertise.

7.3 Review contractor and subcontractor submissions to verify alignment with the Owner's Project Requirements (OPR), Basis of Design (BoD), contract specifications, and the construction-phase commissioning plan. Provide detailed feedback on system performance and integration with other components.

7.4 Organize meetings with the commissioning team to ensure effective collaboration, address conflicts, and track progress. Coordinate logistics, prepare agendas and attendance records, and notify participants. Record and distribute meeting notes to all attendees within ten working days.

7.5 At the start of the construction phase, convene an initial meeting to outline commissioning activities, establish schedules for submissions, training sessions, testing, and final project milestones.

7.6 Conduct site inspections to monitor construction progress, identifying and documenting any deficiencies. Assess installations for compliance with the OPR, BoD, and contract specifications, ensuring systems and equipment are accessible for maintenance and repair.

7.7 Create specific procedures and checklists for system testing and inspection tasks.

7.8 Plan, oversee, and document all tests, inspections, and start-up operations for systems and equipment.

7.9 Collect and organize test data, inspection records, and relevant certificates into the commissioning documentation.

7.10 Certify the acceptance and operational start date for equipment, initiating warranty coverage periods.

7.11 Review project documentation to confirm accuracy and request corrections where necessary. Ensure compliance with closeout submittal requirements for project records.

7.12 Evaluate and provide comments on operation and maintenance documentation to ensure it meets project requirements and aligns with established design and operational goals.

7.13 Design and implement a training program for operational and maintenance personnel, supported by skilled instructors. Record training sessions for future reference.

7.14 Document construction progress, including concealed elements, through video recordings.

7.15 Generate comprehensive commissioning reports detailing outcomes and processes.

7.16 Compile final documentation, integrating all relevant commissioning reports and updated project records into a cohesive deliverable.

8. COMMISSIONING DOCUMENTATION

8.1 The Commissioning Authority is responsible for preparing, organizing, and maintaining documentation related to the commissioning process, ensuring all information is systematically stored and accessible.

8.2 An index must be created that specifies the location of all commissioning documents.

8.3 The Owner's Project Requirements (OPR) must be documented by the Commissioning Authority based on the owner's input. This document outlines the project's functional needs, operational expectations, and includes goals, measurable criteria, schedules, budgets, and success benchmarks.

8.4 The Basis of Design (BoD) is prepared by the Design Team, providing detailed explanations of design decisions, calculations, and product selections that address the OPR. It includes narrative descriptions and itemized specifics supporting the design approach.

8.5 The commissioning plan, prepared by the Commissioning Authority, must define the schedule, resource allocation, and documentation requirements for the commissioning process. This includes:

.1 Delivery and review timelines for submittals, manuals, and reports, ensuring alignment with overall commissioning activities.

.2 Organization and structure of all commissioning documentation, specifying responsible parties.

.3 Systems and equipment selected for commissioning.

.4 Testing procedures and schedules, identifying involved parties.

.5 Preconditions for subsequent tasks.

.6 Responsibilities of commissioning team members.

.7 Observations to be performed.

.8 Requirements for training, including necessary materials.

.9 Expected performance criteria for systems, equipment, and controls.

.10 Specific dates for commissioning tasks, coordinated with the overall project schedule.

.11 Installed systems, including updates and changes during construction.

.12 Continuous updates to project record documents.

.13 Prestart and startup checklists with verification and testing processes.

.14 Detailed testing procedures with data collection methods.

8.6 Custom test checklists must be developed for each system, subsystem, and equipment, including interlocks and operational modes. These checklists should provide space for recording results, comments, and tester signatures.

8.7 Certificates of Readiness must be signed by all relevant contractors and installers, certifying that systems and components are prepared for testing. These are to be accompanied by completed and verified test checklists.

8.8 The Commissioning Authority must compile test results, observations, and data into detailed reports, supplemented with relevant documentation such as photographs. Reports should be included in both the commissioning report and the systems manual.

8.9 For systems or equipment that fail tests, corrective action documentation must detail the required modifications and provide retesting outcomes.

8.10 An issues log must track discrepancies from the OPR, BoD, or Contract Documents. Each entry should include a unique identifier, a description of the issue, recommended corrective actions, and a record of resolution.

8.11 A commissioning report must consolidate all findings, including test results, unresolved issues, and evaluations of performance relative to the OPR and BoD. It should include:

.1 Explanations of substitutions, compromises, and variances from the OPR, BoD, and Contract Documents.

.2 A record of all conditions, with recommendations for resolution where necessary.

.3 OPR and BoD documentation.

.4 Final commissioning plan.

.5 Testing plans and results.

.6 Corrective action documentation.

.7 Issues log and resolutions.

.8 Completed test checklists.

.9 Details of off-season testing not completed, with scheduled completion dates.

8.12 The systems manual must compile all necessary information for the operation and maintenance of the facility. It includes:

.1 OPR and BoD documents with updated system narratives and schematics.

.2 Project record documents as required by SECTION 01 78 23.

.3 Final commissioning plan and report.

.4 Comprehensive operation and maintenance data.

9. **SUBMITTALS**

9.1 The CxA shall be responsible for submitting all required documentation to ensure the commissioning process is thoroughly documented.

9.2 The Commissioning Plan Pre-final Submittal must include six hard copies of the pre-final commissioning plan. One copy shall be delivered to the Contractor, one to the Owner, one to the Architect, and one to the Engineer. The submittal must provide sufficient detail to evaluate the data collection and arrangement process. One copy, with review comments, shall be returned to the CxA for preparation of the final construction-phase commissioning plan.

9.3 The Commissioning Plan Final Submittal shall consist of three hard copies and three sets of electronically formatted files of the final commissioning plan. One hard copy and one set of electronic files shall be delivered to the Owner, the Architect, and the Engineer. The final submittal must address all comments from the pre-final submittal and shall include a copy of the pre-final submittal review comments along with responses to each item.

9.4 Test Checklists and Report Forms must include sample checklists and forms provided by the CxA to the Contractor, the quality-control manager, and Subcontractors for review and comment. Two master copies of each checklist and report form shall be submitted.

9.5 Certificates of Readiness must be submitted by the CxA to confirm that systems, subsystems, and equipment are prepared for testing. These certificates must be accompanied by completed and signed checklists.

9.6 Test and Inspection Reports shall document all test data, observations, and measurements. These reports must be supplemented with photographs, forms, and any additional relevant documentation.

9.7 Corrective Action Documents must be submitted by the CxA to outline modifications required for systems or equipment that do not meet performance standards during testing. These documents shall include retesting plans and outcomes.

9.8 The Pre-final Commissioning Report Submittal must include three hard copies of the pre-final commissioning report. One copy shall be delivered to the Owner, one to the Architect, and one to the Engineer. The submittal must include the preliminary submittal review comments and responses. One copy, with additional comments, shall be returned to the CxA for preparation of the final submittal.

9.9 The Final Commissioning Report Submittal shall include three hard copies and three sets of electronically formatted files. One hard copy and one electronic set shall be delivered to the Owner, the Architect, and the Engineer. The final submittal must address all review comments from the pre-final report and include a copy of the reviewed pre-final submittal along with responses to each item.

10. QUALITY ASSURANCE

10.1 Instructor Qualifications: Factory-authorized service representatives experienced in training, operation, and maintenance procedures for installed systems, subsystems, and equipment.

10.2 Test Equipment Calibration: Comply with test equipment manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately whenever instruments have been repaired following damage or dropping. Affix calibration tags to test instruments. Instruments shall have been calibrated within six months prior to use.

11. COORDINATION

11.1 Coordinating Meetings: The CxA shall conduct biweekly coordination meetings of the commissioning team to review progress on the commissioning plan, to discuss scheduling conflicts, and to discuss upcoming commissioning process activities.

11.2 Pretesting Meetings: The CxA shall conduct pretest meetings of the commissioning team to review start-up reports, pretest inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested.

11.3 Testing Coordination: The CxA shall coordinate the sequence of testing activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid the necessity of removing and replacing construction to accommodate testing and inspecting.

.1 Schedule times for tests, inspections, obtaining samples, and similar activities.

11.4 Manufacturers' Field Services: The CxA shall coordinate the provision of manufacturers' field services.

12. OPERATION AND MAINTENANCE TRAINING REQUIREMENTS

12.1 Training Preparation Conference: Prior to conducting operation and maintenance training, the CxA will organize a preparation conference with the Owner's operation and maintenance staff, the Contractor, and Subcontractors participating in the Commissioning Process. In addition to meeting the requirements outlined in Section 01 79 00 "Demonstration and Training," the following tasks will be completed:

.1 Review the OPR and BoD to ensure alignment with training objectives.

.2 Verify the installation of all relevant systems, subsystems, and equipment.

.3 Assess the qualifications of training instructors.

.4 Evaluate instructional methods and the planned procedures for training delivery.

.5 Examine the outlines and content of training modules for completeness.

.6 Review all course materials, including operation and maintenance manuals.

.7 Inspect and confirm the readiness of locations and facilities to be used for training sessions.

.8 Confirm the training schedule and ensure the availability of all necessary educational resources, instructors, audiovisual tools, and facilities to prevent delays.

.9 For outdoor training sessions, evaluate weather conditions and establish contingency procedures to manage unfavorable conditions.

12.2 Training Modules: Develop a structured training program comprising individual modules that address the operation and maintenance of each system, subsystem, and piece of equipment as specified in SECTION 01 79 00 "Demonstration and Training."

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for demolition and removals Work in accordance with the Contract Documents.

.2 Work included: Requirements for demolishing, salvaging and removing wholly or in part the various items designated on the drawings or required to be removed or partially removed for the receipt of the Work of this Contract, including not necessarily limited to:

.1 Alteration and renovations to existing building.

.2 Cutting and removing of walls, floors, ceilings, doors and frames, in the existing buildings as indicated on Drawings.

.3 Patching, making good openings and chases in walls, floors, ceilings, including the supply and installation of lintels, channels and finishes.

.4 Removal of rubbish, debris, demolished fixtures, fitments and items not scheduled to remain the Owner's property, resulting from the demolition and preparatory work.

.5 Remove abandoned services such as conduits, pipes, wiring, ducts, fixtures, equipment, etc. where required for the work or indicated on the drawings.

.6 Removal of all mechanical items including plumbing fixtures, services etc. where required for the work or indicated on drawings and or where not required to be relocated.

.7 Removal of existing electrical items including fixtures, etc. where required for the work or indicated on the drawings and not required to be relocated.

.8 Dust control during the operations of the work of this Section.

.9 Removal shall mean removal from site and safe disposal in a legal manner

1.2 **REFERENCES**

.1 CSA S350-M, Code of Practice for Safety in Demolition of Structures.

.2 OPSS, Ontario Provincial Standard Specification.

1.3 **SUBMITTALS**

.1 Where required by Authorities having jurisdiction, submit a Fire Plan to local fire department for review and approval.

.2 Submit shop drawings, diagrams and details in accordance with Section 01 33 00.

.3 30 calendar days prior to start of demolition and removals work, submit for review, drawings, diagrams or details showing sequence of disassembly work and shoring of supporting structures in accordance with authorities having jurisdiction.

.4 Submit for approval, a plan showing impacts, interruptions and delays to Owners operations

.5 Submit Dust Control Plan conforming to requirements of the City of Toronto’s Public Health Services.

.6 Have submissions signed and sealed by Professional Engineer licensed in Province of Ontario.

.7 Submit to Consultant, details of where rubble, debris and other materials are to be disposed or reused. Include each disposal/reuse site location, operator's name and business address, type of license under which site operates, and criteria used by site to assess suitability of rubble, debris and other materials for disposal.

.8 Give notice to Utility Authorities controlling services and appurtenances which will be affected by demolition work.

1.4 **QUALITY ASSURANCE**

.1 Prepare waste audits, waste reduction workplans, source separation programs and recycling programs as required by jurisdictional authorities and update programs and implement such programs as required.

.2 Perform the work of this section in accordance with the 'Environmental Protection Act' including Ontario Regulation 102 and the 'Environmental Assessment Act' including Ontario Regulation 103.

.3 Conform to Fire Code, Regulation under the Fire Marshals Act.

.4 The demolition contractor must engage a registered professional engineer who holds a certificate of authorization and an appropriate level of liability insurance to prepare demolition procedures.

.5 As part of the contract requirements, the engineer for the demolition contractor should be required to sign the general review commitment required by city building departments.

1.5 **SITE CONDITIONS**

.1 Interruptions to Owners operations will not be permitted.

.2 Perform operations, machine and equipment movements, deliveries and removals at time or times that will permit uninterrupted operations in and around structures, including parking, deliveries, and Site access and egress.

.3 Take over structures to be demolished based on condition on date that Tenders close.

.4 Contractor shall photo document all existing conditions prior to demolition and make such material available to Cons

2 Products

2.1 **MATERIALS**

.1 All materials requiring removal shall become the Contractor's property and shall be removed and disposed of from the site, as the work progresses, unless indicated otherwise.

.2 Salvaged material:

.1 Salvage and stockpile Products, materials, and equipment as specified herein, indicated on Site or indicated on drawings.

.2 Coordinate items to be salvaged with Owner. Dispose of items Owner deems to be of no further use.

.3 Salvaged materials shall not be chipped, cracked, split, stained or damaged.

.4 Store items off of moist surfaces.

3 Execution

3.1 **GENERAL**

.1 Schedule skylight removal work to coincide with commencement of new roofing system installation.

.2 Clean up rubble and debris, resulting from work promptly and dispose at end of day or place in waste disposal bins. Empty bins on regular basis.

.3 Stockpiling of rubble, debris, and surplus Products on Site will not be permitted.

.4 Remove, handle and transport Products indicated to be salvaged and stored for future use. Transport Products to storage area(s) designated by Consultant. Perform work to prevent any damage to Products during removal and in storage. Products damaged during removal, will be inspected by Consultant. Consultant will determine extent of damage and accept or refuse Products.

.5 List and description of items to be removed and stored or reused:

.1 Items as indicated on the drawings or by the Consultant.

.6 Tag and log all items to be salvaged to the satisfaction of the Consultant. Ensure identification tags do not damage items to be salvaged and are non-permanent, removable and durable.

.7 Communicate Dust Control Plan procedures to all appropriate personnel on site and their head offices and due diligence measures to be maintained to control all fugitive emissions.

.8 Take precautions to guard against movement, settlement or collapse of adjacent services, sidewalks, driveways, or trees. Be liable for such movement, settlement or collapse caused by failure to take necessary precautions. Repair promptly such damage when ordered.

3.2 EXAMINATION

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

.2 Examine adjacent structures and other installations prior to commencement of demolition and removals work.

3.3 PRESERVATION OF REFERENCES

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

3.4 PROTECTION

.1 Prevent movement or damage of adjacent structures, services, walks, paving, trees, landscaping, adjacent grades, and parts of existing structure to remain. Supply and install bracing and shoring as required. Make good damage caused by demolition to acceptance of Consultant.

.2 Protect adjacent structures and property against damage which might occur from falling debris or other causes. Repair or replace damage caused from work of this Section to acceptance of Consultant.

.3 Do not interfere with use of adjacent structures and Work areas. Maintain free, safe passage to and from adjacent structures and Work areas.

.4 Take precautions to support affected structures. If safety of structure being demolished, adjacent structures or services are endangered, cease demolition operations and take necessary action to support endangered item. Immediately inform Consultant. Do not resume demolition until reasons for endangering have been determined and corrected and action taken to prevent further endangering.

.5 If movement or settlement occurs, install additional bracing and shoring as necessary and make good damage to acceptance of Consultant.

.6 Hang tarpaulins where debris and other materials are lowered. Build in around openings with wood and plywood at locations used for removal of debris and materials.

.7 Prevent debris from blocking surface drainage system, elevators, mechanical, and electrical systems which are required to remain in operation.

.8 Pay particular attention to prevention of fire and elimination of fire hazards which would endanger Work or adjacent structures and premises.

.9 Supply and install adequate protection for materials to be re-used, set on ground and prevent moisture pick-up. Cover stockpiles of materials with tarpaulins.

.10 Close off access to areas where demolition is proceeding by barricades and post warning signs.

.11 Supply, install and maintain legal and necessary barricades, guards, railings, lights, warning signs, security personnel and other safety measures, and fully protect persons and property.

.12 Dust/weather partitions:

.1 Prior to demolition work proceeding in existing structures, temporarily enclose Work areas, access and supply and install dustproof and weatherproof partitions. Design partitions to prevent dust and dirt infiltration into adjoining areas, prevent ingress of water, and to resist loads due to wind.

.2 Prevent dust, dirt and water from demolition operations entering operational areas.

.3 Adjust and relocate partitions as required for various operations of work.

.4 Upon completion of work, remove and dispose of partitions from Site.

.13 Dust protection:

.1 Perform dust control procedures in accordance with approved Dust Control Plan and work of this Section.

.2 Clean water to be applied to hard and soft surfaces and on open excavation faces on Site daily to eliminate dust.

.3 Roadways and sidewalks to be cleaned daily or as required.

.4 A designated truck loading area on granular material or existing asphalt to be used to mitigate tracking of potentially contaminated soil and demolition debris off Site. Contaminated loading points to be cleaned or re-established.

.14 Removed skylights:

.1 Provide temporary protective sheeting over removed skylights.

.2 Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights or temporary fasteners.

.3 Provide for surface drainage from sheeting to roof drains.

.4 Do not permit traffic over unprotected or repaired deck surface.

.15 Blasting is not permitted

3.5 PREPARATION

.1 Disconnect and/or re-route electrical data, communication and telephone service lines entering structures to be demolished. Remove abandoned lines as indicated on Contract Drawings. Post warning signs on electrical lines and equipment which is required to remain energized.

.2 Disconnect and cap designated mechanical services:

.1 Natural gas supply lines: As indicated on drawings, to be removed by qualified workers in accordance with gas company instructions.

.2 Sewer and water lines: Remove and dispose of as indicated on Contract Drawings.

.3 Other underground services: Remove and dispose of as indicated on Contract Drawings.

.3 Disassemble and remove mechanical equipment, ductwork and piping complete with supports and associated components.

.4 Do not disrupt active or energized utilities designated to remain undisturbed

.5 Perform rodent and vermin control to comply with health regulations

3.6 **DEMOLITION**

.1 Perform demolition with extreme care. Confine effects of demolition to those parts which are to be demolished.

.2 Perform work and prevent inconvenience to persons outside those parts which are to be demolished.

.3 Carry out demolition in accordance with the requirements of CSA S350-M.

.4 Demolish parts of structure to permit remedial work as indicated

.5 Demolition shall proceed safely in systematic manner from roof to grade and as necessary to accommodate remedial work indicated. Work on each floor level shall be complete before commencing work on supporting structure and safety of its supports are impaired. Parts of building which would otherwise collapse prematurely shall be securely shored. Walls and piers shall not be undermined.

.6 Do not overload floor or wall with accumulations of material or debris or by other loads.

.7 Perform work to minimize dusting. Keep work area wetted down with fog sprays to prevent dust and dirt rising. Supply and install temporary water lines and connections that may be required. Upon completion, remove installed temporary water lines. Use covered chutes, water down.

.8 Do not sell or burn materials on Site.

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

.10 At end of day's work, leave Work in safe condition with no part in danger of toppling or falling. Protect interiors of parts not to be demolished from exterior elements.

.11 Drainage and sewer system protection:

.1 Ensure that no dust, debris or slurry enters drainage and sewer system on Site.

.2 Remove and dispose of debris and slurry promptly from Site.

.3 Comply with City of Toronto Sewer Use By-Law.

.12 Concrete:

.1 Demolish concrete by methods which avoid impact loads on items which are not to be demolished.

.2 Where only part or parts of a concrete floor, wall, or other items are to be demolished, use saw cuts to isolate areas which are to be demolished except where existing reinforcing steel is to be left in place. Prior to such isolating, install suitable support to prevent premature movement of area(s) being isolated and undesirable transfer of loads as cutting progresses. If necessary, remove area(s) to be demolished by successively isolating small sections.

.3 Where reinforcing steel is to be left in place, use saw cuts from surface of concrete around perimeter(s) of area(s) to be demolished, chip concrete without damaging reinforcing steel. Retouch damaged epoxy coating of existing reinforcing steel.

.13 Steel: Where only part or parts of structure is to be demolished, dismantle and maintain structure stable. Do not place excessive loads on components. Install adequate temporary guys and supports to ensure stability and to prevent excessive loading. Support each component being disconnected from structure, and lower, do not drop, component after it is disconnected.

.14 Cut openings through existing walls, partitions and floors. Establish exact location of steel reinforcing in existing concrete slabs or walls before cutting. Be responsible for damage to existing steel reinforcing and be liable for structural failure. Make good surfaces disturbed with materials to match existing.

.15 Cladding:

.1 Remove cladding, girts, channels, and additional components as indicated or necessary for new cladding work, unless otherwise indicated.

.2 Form openings in cladding such that edges are left straight, clean and not ragged. Where openings abut flashings, ducts or similar items projecting through, or forming integral part of cladding system, preserve and support as required unless otherwise shown.

.3 Take care to not damage existing cladding material that is to remain.

.4 Where doors are scheduled to be removed, include removal of door frames and door hardware.

.5 Remove interior partitions, fittings, fixtures and accessories as indicated on drawings. Partitions and walls shall be removed full height to structure above.

.6 Remove interior finishes, such as ceiling and floor finishes, where new finishes are indicated on Contract Drawings.

.7 Removal of existing ceilings shall include complete removal including bulkheads and suspension system.

.8 Removal of adhesive applied finishes shall include complete removal to substrate including adhesive. Take adequate care to prevent damage to substrate.

.9 Remove existing floor finishes, include mortar bed, underlayment or other cleavage membranes, underpad, base, floor moulding and transition strips.

.16 Demolish all other items indicated or required.

.17 Cut openings through existing walls, partitions, roofs and floors. Establish exact location of steel reinforcing in existing concrete slabs or walls before cutting. Be responsible for damage to existing steel reinforcing and be liable for structural failure. Make good surfaces disturbed with materials to match existing.

.18 Where doors are scheduled to be removed, include:

.1 Removal in re-usable condition of door hardware.

.2 Removal of doors and door frames.

.19 Remove interior partitions, fittings, fixtures and accessories as indicated on drawings. Partitions and walls shall be removed full height to structure above.

.20 Remove interior finishes, such as ceiling and floor finishes, where new finishes are indicated on Room Finish Schedule.

.1 Removal of existing ceilings shall include complete removal including bulkheads and suspension system.

.2 Removal of adhesive applied finishes shall include complete removal to substrate including adhesive. Take adequate care to prevent damage to substrate.

.21 Remove existing floor finishes, include mortar bed, underlayment or other cleavage membranes, base, floor moulding and transition strips.

.22 Demolish all other items indicated or required.

3.7 DISPOSAL OF MATERIALS

.1 Remove from Site, rubble, debris, and other materials resulting from demolition and removals work in accordance with Authorities having Jurisdiction, except where specified or indicated on Contract Drawings to be reused.

.2 Conform to requirements of municipality's Works Department regarding disposal of waste materials.

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

3.8 RESTORATION

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

END OF SECTION

PART - 1 GENERAL

1.1 SUMMARY

.1 Section includes descriptions for demolishing, salvaging, recycling and removing site work items identified for removal in whole or in part, and for backfilling trenches and excavations resulting from site demolition activities.

.1 Section includes requirements for abandonment of monitoring wells existing on site.

.2 Project specific requirements are to be as indicated on the drawings and in other Sections of the Specifications.

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Coordinate with Owner for the material ownership including the following:

.1 Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor ’s property and shall be removed from Project site.

.2 Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during demolition remain Owner’s property:

.1 Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.

.2 Coordinate with Owner, who will establish special procedures for removal and salvage operations.

.2 Well records:

.1 Existing well record has been appended to these specifications. An original digital file can be provided upon request.

.2 Submit completed well record to Ministry of the environment in accordance with *Ontario Water Resources Act* within 30 days of completion of well abandonment.

.1 Submit copy of completed well record to Owner and Consultant.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Shop Drawings: not required.

.2 Schedule of Site Demolition Activities (incorporate into project schedule as may be applicable)

.1 Detailed sequence of site demolition and removal work, with starting and ending dates for each activity

.2 Interruption of utility services

.3 Coordination for shutoff, capping, and continuation of utility services

.4 Locations of temporary hoarding and means of egress

.3 Proposed Noise and Dust Control Measures: Submit statement or drawing that indicates measures proposed for use, proposed locations, and proposed time frame for their operation.

.4 Inventory: Submit a list of items that have been removed and salvaged after site demolition is complete

.5 Pre demolition Photographs: Submit photographs indicating existing conditions of adjoining areas prior to starting Work. Include finish surfaces that may be misconstrued as damage caused by site demolition operations.

.6 Disposal Records: indicate receipt and acceptance of materials designated to be recycled or materials required by law to be disposed at licensed facilities.

.2 Informational submittals:

.1 Submit qualifications of monitoring well removal personnel before commencing work to remove monitoring wells.

1.4 QUALITY ASSURANCE

.1 Regulatory Requirements: ensure Work is performed in compliance with Province of Ontario Regulations and City of Toronto Bylaws.

.1 Abandonment of monitoring wells shall be performed in compliance with all regulations of the *Ontario Water Resources Act* including:

.1 *Water Supply Wells: Requirements and Best Practices* as published online at https://www.ontario.ca/document/water-supply-wells-requirements-and-best-practices

.2 *Well Abandonment: How to Plug and Seal a Well (technical bulletin)* as published online at https://www.ontario.ca/page/wells-regulation-well-abandonment-how-plug-and-seal-well-technical-bulletin

.2 Comply with hauling and disposal regulations of all Authorities Having Jurisdiction.

1.5 SITE CONDITIONS

.1 Environmental protection:

.1 Ensure Work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.2 Fires and burning of waste or materials is not permitted on site.

.3 Burying of rubbish waste materials is not permitted.

.4 Disposal of waste of volatile materials including but not limited to, mineral spirits, oil, petroleum-based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers, is not permitted.

.5 Ensure proper disposal procedures are maintained throughout the project.

.2 Pumping of water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties, is not permitted.

.3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction.

.4 Protect trees, plants and foliage on site and adjacent properties where indicated.

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

.6 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

.7 Maintain access to existing walkways, and other adjacent facilities:

.8 Closing or obstructing walkways, or other facilities without written permission from Owner or Consultant is not permitted.

.9 Owner and Consultant assume no responsibility for elements being demolished:

1.6 EXISTING CONDITIONS

.1 Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work:

.2 If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Owner and Consultant. Hazardous materials may be removed by Owner under a separate contract or as a change to the Work.

.3 If material resembling spray or trowel applied asbestos or other designated substance is encountered in course of demolition, stop work, take preventative measures, and notify Owner and Consultant immediately. Proceed only after receipt of written instructions have been received from Owner or Consultant.

.4 Site elements that will be demolished are based on their condition on date that tender is accepted.

PART - 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART - 3 EXECUTION

3.1 EXAMINATION

.1 Survey existing conditions and correlate with requirements indicated to determine extent of site demolition required.

.2 Consultant and Owner do does not guarantee that existing conditions are the same as those indicated in Project Record Documents.

.3 Inventory and record the condition of items being removed and salvaged.

.4 When unanticipated mechanical, electrical, or structural elements are encountered; investigate and measure the nature and extent of the element. Promptly submit a written report to Owner and Consultant.

.5 Where applicable, perform an engineering survey of condition of adjacent structures to determine whether removing any site element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during site demolition operations.

.6 Verify that hazardous materials have been remediated before proceeding with site demolition operations.

3.2 PREPARATION

.1 Temporary Erosion and Sedimentation Control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.

.2 Protection of in-place conditions:

.1 Prevent movement, settlement or damage of adjacent structures, services, walkways, paving, trees, landscaping, properties.

.1 Provide bracing, shoring and underpinning as required.

.2 Repair damage caused by demolition as directed by Owner or Consultant.

.2 Support affected site elements and, if safety of site element being demolished, or of services or adjacent structures appears to be endangered, take preventative measures, stop Work and immediately notify Owner and Consultant.

.3 Prevent debris from blocking surface drainage system, or mechanical and electrical systems which must remain in operation.

.3 Surface Preparation:

.1 Disconnect and if applicable, re-route electrical and service lines within the site to be demolished.

.1 Post warning signs on electrical lines and equipment which must remain energized to serve other properties during period of site demolition.

.2 Disconnect and cap designated services.

.1 Remove and dispose of or abandon in-place as indicated on the drawings.

.4 Disruption of active or energized utilities designated to remain undisturbed is not permitted.

3.3 ABANDONMENT OF MONITORING WELL

.1 All work to be done by qualified personnel.

.2 If the well has a well tag, it must be removed and returned to the Ministry of the Environment within 30 days of completion of well abandonment.

.1 Inform the Owner and Consultant if a tag has been recovered and returned to the Ministry.

.3 Wells shall be abandoned such that the top of the required abandonment barrier is below the bottom of proposed excavation.

.4 Location of abandoned well shall be marked on as-built drawings, with finished elevation and elevation of top of barrier or seal both noted.

3.4 REMOVAL AND DEMOLITION OPERATIONS

.1 Remove items as indicated.

.2 Disruption of items designated to remain in place is not permitted.

.3 Removal of pavements, curbs and gutters:

.1 Square up adjacent surfaces to remain in place by saw cutting or other method indicated by Consultant or Owner.

.2 Protect adjacent joints and load transfer devices.

.3 Protect underlying and adjacent granular materials if indicated to be retained.

.4 Excavate at least 300 mm below pipe invert, when removing pipes under existing or future pavement area.

.5 Decommission water wells and monitoring wells in accordance with regulations.

.6 Remove only designated trees during demolition.

.7 Stockpile topsoil for final grading and landscaping if indicated:

.1 Provide erosion control if not immediately used.

.8 Salvage:

.1 Items to be salvaged: n/a

.2 Dismantle items containing materials for salvage and stockpile salvaged materials at locations as agreed by Owner.

.9 Disposal of Material:

.1 Dispose of materials not designated for recycling, salvage or reuse legally off-site.

3.5 STOCKPILING

.1 Designate appropriate security resources/measures to prevent vandalism, damage and theft.

.2 Locate stockpiled materials convenient for use in new construction to eliminate double handling wherever possible.

3.6 RESTORATION

.1 Restore areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas or conditions that existed prior to beginning of Work, as indicated.

END OF SECTION 02 41 13

1 General

1.1 **SECTION INCLUDES**

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

1.2 **DEFINITIONS**

.1 Hazardous Materials: Designated Substances as covered by the Ontario Occupational Health and Safety Act as well PCBs, CFCs, HCFCs, and Fuel Oil.

.2 PCBs: Polychlorinated Biphenyls.

.3 PCB equipment: Equipment designed or manufactured to operate with PCB liquid or to which PCB liquid was added or drums or other containers used for the storage of PCB liquid.

.4 PCB liquid: Material containing PCBs at a concentration of more than 50 mg/kg

.5 PCB material: Material containing PCBs at a concentration of more than 50 mg/kg whether the material is liquid or not

.6 PCB waste: PCB equipment, PCB liquid, or PCB material, but does not include:

.1 PCB material or PCB equipment after it has been decontaminated pursuant to guidelines issued by the Ministry of Environment or instructions issued by the director.

.2 PCB equipment that is:

.1 An electrical capacitor that has never contained over one kilogram of PCBs.

.2 Electrical, heat transfer of hydraulic equipment or a vapour diffuser pump that is being put to the use for which it was originally designed or is being stored for such use by a person who uses such equipment for the purpose for which was originally designed.

.3 Machinery or equipment referred to in Clause 1.2.6.3.1.

.3 PCB liquid that:

.1 Is at the site of fixed machinery or equipment, the operation of which is intended to destroy the chemical structure of PCB’s by using the PCB’s as a source of fuel or chlorine for purposes other than the destruction of PCB’s or other wastes and with respect to which a certificate of approval has been issued under Section 9 of the Act after the 1st day of January 1981 specifying the manner in which PCB liquid be processed in the machinery or equipment.

.2 Is in PCB equipment referred to in subclause (b) (2) Ontario Regulation 11/82.

.3 HCFC: Hydrochlorofluorocarbons.

.4 CFC: Chlorofluorocarbons.

1.3 **REGULATORY AGENCIES**

.1 Comply with Federal, Provincial, and local requirements pertaining to the handling, management, haulage, and/or disposal fo Hazardous Materials including but not limited to the following:

.1 Ontario Regulation 356, Highway Traffic Act.

.2 R. R. O. 1990, Regulation 347, General - Waste Management.

1.4 **SUBMITTALS**

.1 Submit proof satisfactory to the Consultant that suitable arrangements have been make to dispose of Hazardous Materials in accordance with requirements of authorities having jurisdiction.

.2 Submit notifications to applicable authorities having jurisdiction regarding the handling, storage, haulage, and/or disposal of Hazardous Materials as required by Regulations.

.3 Submit proof satisfactory to the Consultant that the Hazardous Waste materials were appropriately disposed of.

1.5 **EXISTING CONDITIONS**

.1 Information pertaining to the presence of Hazardous Materials to be handled; removed, or otherwise disturbed during this project is identified in the report: Section A1000 Removal and Disposal of Designated Substance dated 2020-07-10 prepared by Fisher Environmental

.2 Assessment:

.1 Employ an Asbestos Abatement Consultant to conform the presence of asbestos in the materials being demolished and to remove hazardous materials in accordance with authorities having jurisdiction.

.2 Submit Asbestos Abatement Consultant's certificate that hazardous materials have been removed in accordance with Authorities having Jurisdiction

1.6 **INSTRUCTION AND TRAINING**

.1 Before commencing work, provide to the Consultant satisfactory proof that every worker has had instruction and training in the hazards of handling and storage of Hazardous Materials, in personal hygiene and work practices, and in the use, cleaning, and disposal, of respirators and protective clothing as required.

.2 Instruction and training related to respirators shall include instruction and training related to:

.1 The limitations of the equipment.

.2 The inspection and maintenance of the equipment.

.3 The fitting of the equipment.

.4 The disinfecting of the equipment.

1.7 **WORKER PROTECTION**

.1 Respirators: Provide workers with personally issued and marked as to efficiency and purpose non-powered reusable or replaceable filter type air purifying respirators suitable for the materials being handled and acceptable to the Provincial Authority having jurisdiction (as required).

.2 Protective Clothing: Provide workers with full body disposable type coveralls (as required).

.3 Eating, drinking, chewing, and smoking are not permitted in the work area.

.4 Store protective clothing in clean plastic bag for reuse or if protective clothing is not to be reused, dispose of as contaminated waste.

.5 Workers shall wash hands and face when leaving the work area and before eating or drinking.

2 Products

2.1 **MATERIALS**

NOT USED

3 Execution

3.1 **EXAMINATION**

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

3.2 **ASBESTOS CONTAINING MATERIALS**

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

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

.1 Related Work Specified Elsewhere:

.1 Concrete Reinforcement, Section 03 20 00.

.2 Cast-in-Place Concrete, Section 03 30 00.

.3 Concrete Floor Finishes, Section 03 35 00.

.2 Work Installed but Furnished Elsewhere:

.1 Structural Steel anchor assemblies, bolts and the like supplied under Section 05 12 00.

.2 Vertical dovetail masonry anchor slots where masonry walls abut reinforced concrete members. Anchor slots are supplied under Section 04 20 00.

1.2 STANDARDS, CODES AND ACTS

.1 Conform with the Ontario Building Code 2012 under Ontario Regulation 332/12, including Ontario Regulation 88/19, and any applicable acts of any authority having jurisdiction and the following (most recent edition, including any applicable supplements):

.1 CAN/CSA-A23.1 - Concrete Materials and Methods of Concrete Construction, Canadian Standards Association

.2 CAN/CSA-S269.1 - Falsework for Construction Purposes, Canadian Standards Association

.3 ACI-347R - Guide to Formwork for Concrete, American Concrete Institute.

.4 CAN/CSA-S269.3 - Concrete Formwork, Canadian Standards Association

.5 CAN/CSA-O86 - Engineering Design in Wood (Limit States Design), Canadian Standards Association.

.6 CAN/CSA-O121 - Douglas Fir Plywood, Canadian Standards Association.

.7 CSA STANDARD O151, Canadian Softwood Plywood.

.8 CAN/CSA O153, Poplar Plywood.

.9 CAN/CSA 3-O188.0, Standard Test Methods for Mat-Formed Wood Particleboards and Waferboard.

.10 CSA STANDARD O437.0, Standards for OSB and Waferboard.

.11 COFI Exterior Plywood for Concrete Formwork

.2 Where there are differences between the specifications, drawings, codes, standards or acts, the most stringent shall govern.

1.3 TOLERANCES

.1 Perform forming operations and place hardware so that finished concrete will be within the tolerances set out in CAN/CSA-A23.1 and as listed below:

.1 Variations in building lines which result in extension of the building over lot lines or restriction lines will not be permitted.

.2 These tolerances are acceptable with regard to visual and structural requirements. Interfacing tolerances may not be compatible with the above. Review and coordinate interfacing tolerances so that the various elements come together properly.

.1 Note the need for accurate alignment of perimeter slab edges both horizontally and vertically.

1.4 DESIGN OF FORMS AND RESHORING

.1 Design forms and reshoring to safely support vertical and lateral loads until they can be supported by the structure. Design formwork for loads and lateral pressures recommended in ACI 347R/CAN/CSA-S269.3. Wood design to conform to CAN/CSA-O86.

.2 Where required by the local authorities, arrange with the local building by-law authorities for approval of forms and shop drawings.

1.5 SUBMITTALS

.1 As-Built Drawings

.1 Mark on two complete sets of final drawings any changes, additions or deletions that occur during construction as a result of the Contractor's work, change orders, or for any other reason.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 00- Waste Management and Disposal and the Waste Reduction Workplan.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away from children.

.4 Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low VOC's.

PART 2 – PRODUCTS

2.1 MATERIALS

.1 Forms

.1 Formwork lumber: plywood and wood formwork materials to CAN/CSA-A23.1

.2 Falsework materials: to CSA Standard S269.1, Table 1, bearing grade marks or accompanied with certificates, test reports or other proof of conformity.

.3 Sheathings for exposed surfaces: New, Douglas Fir Plywood not less than 18 mm thick, concrete form grade, solid one side, conforming to CSA Standard O121.

.2 Waterstops:

.1 Ribbed PVC Waterstops by Durajoint

.1 Floor to wall joints (vertical installations): Type 3, 100 mm length, 4.7 mm thickness

.2 Floor to floor and wall to wall construction joints (cold joints): Type 5, 150 mm length, 9.5 mm thickness.

.3 Floor to wall joints (horizontal installations): Type 500 Split ribbed type, 150 mm length, 9.5 mm thickness.

.2 Waterstops for expansion joints

.1 Baseal Type 62 Heavy Duty for expansion joints, as supplied by Durajoint.

.3 Expansion Joint Filler:

.1 Non-extruding resilient bituminous preformed expansion joint filler conforming to MTO Form 1308 Type A.

.2 Non-extruding resilient non-bituminous preformed expansion joint filler conforming to MTO Form 1308 Type B.

.4 Dovetail anchor slots: minimum 0.6 mm thick galvanized steel with insulation filled slots.

.5 Rigid insulation for protection of foundations from frost adjacent to foundation walls and under normal paving slabs: Extruded Polystyrene, Styrofoam SM or equivalent.

.6 Rigid insulation for protection of foundations from frost under footings and rafts and heavy use normal paving slabs: Extruded Polystyrene, Styrofoam Highload 100 or equivalent.

.7 Form release agent: non-toxic, biodegradable, low VOC product such as Clean Strip WB (J-4) distributed by Dayton Superior, Clean Strip Ultra (J-3 V.O.C.), Euro Wax or approved equivalent.

PART 3 – EXECUTION

3.1 FORMS

.1 General

.1 Design, erect, support, brace and maintain formwork to safely support vertical and lateral loads until they can be supported by the structure.

.2 The reinforced concrete members designated on the drawings as retaining earth are not structurally stable until walls and slabs intersecting with them have been constructed to the level and the concrete has reached at least 70% of the specified strength.

.2 Construction

.1 Form footing sides unless footings are shown to be placed against undisturbed soil.

.2 Build top forms on sloping concrete where required to prevent flow of the concrete out of the forms. Provide vents to top forms to permit air or bleed water to escape from the forms.

.3 Where concrete is poured against structural steel beams causing unbalanced horizontal pressures, provide sufficient horizontal support to resist such pressures and to prevent deflection of the steel beams.

.4 Where shown, camber formwork such that hardened concrete, prior to stripping of forms, is cambered as shown. Maintain beam depth and slab thickness from cambered surface.

.5 Camber slabs and beams 1 in 500 of span unless shown otherwise.

.6 Mark building, grid or other lines on forms as required to permit the accurate positioning of reinforcing steel.

.7 Construct templates and supports as required to rigidly fix reinforcing dowels in the forms prior to concreting.

.8 Where necessary, provide suitable markers to indicate the location and configuration of continuing concrete members so that dowels can be positioned accurately in relation to their position in the continuing members.

.9 Set anchor bolts, templates, steel connection units or other inserts into the forms and secure them rigidly so that they do not become displaced during concreting. Set and secure these items to the tolerances specified and required in the appropriate Sections.

.3 Sleeves, Chases and Formed Openings

.1 All openings, sleeves, recesses are not necessarily shown on the structural drawings nor are their sizes or locations shown. Refer to architectural, mechanical and electrical drawings for openings and sleeving requirements not shown, located and dimensioned on the structural drawings.

.2 No sleeves, chases and openings through structural members shall be formed without the Consultant's approval.

.3 Where pipes or services pass through walls, beams or slabs, form the openings by an approved sleeve or form as necessary, except where such openings are specified to be formed or sleeved by the appropriate trade. Form chases or recesses as shown or required.

3.2 STRIPPING OF FORMS AND RESHORING

.1 Where forms are stripped from horizontal or sloping members before concrete has reached its specified 28 day strength, reshore the members so that they can safely support their own load plus construction loads. In addition, ensure that the stripped member is of sufficient strength to safely carry its own weight over the area stripped out at any instant, together with any superimposed construction loads.

.2 As a minimum, conform to requirements of CSA Standard S269.1 and the following:

.3 As a rough guide, under specified curing conditions, 70% of the 28 day strength should be attained 7 days after concreting in normal weather and 14 days after concreting in "Cold Weather".

.4 Notify the Consultant of intention to strip forms in advance of removal.

.5 Stripping of forms is to be based upon satisfactory results of 7 day concrete cylinder tests and on site curing conditions.

.6 Maintain reshoring or formwork in place for 28 days or for such longer time as may be required to ensure that the concrete has reached its designated 28 day strength.

.7 Side forms for vertical members may be stripped as soon as the concrete is sufficiently strong to stand unsupported and safely resist imposed loads.

.8 Do not strip within one and a half bays of a construction joint until new concrete beyond

.9 Provide and install adequate shoring to safely support horizontal or inclined members after the 28 day specified strength is achieved where superimposed loads exceed design loads.

3.3 CONSTRUCTION JOINTS

.1 Obtain approval from the Consultant for location and details of construction joints not shown.

.2 Provide reglets in joints as shown.

3.4 WATERSTOPS

.1 Install continuous waterstops where indicated or required to prevent leakage, and to manufacturer’s instructions. Build waterstops into forms and support against displacement during pouring of concrete. Do not displace concrete reinforcing when installing waterstops.

.2 Use butted, welded connections in accordance with manufacturer's recommendation. Only straight heat sealed welds shall be performed in the field. Use preformed or shop welded corners and intersections.

3.5 EXPANSION AND CONTROL JOINTS

.1 Construct expansion and control joints at the locations indicated and in accordance with the details shown.

.2 Construct clean expansion joints free of foreign material likely to impair the proper operation of the joint.

.3 Provide a non-extruding joint filler in expansion joints for the full area between adjacent concrete members. Anchor the filler material to one of the adjacent members or between concrete members and adjacent members of other materials.

.4 Where shown, provide waterstops in expansion joints. Make waterstops continuous for the full length of the joint and splice where necessary, in accordance with the manufacturer's instructions so that the waterstopping action will not be interrupted. Rigidly fix waterstops in forms to prevent their displacement during concreting.

.5 Expansion joints in walks shall be placed vertically at intervals at intervals of 6 m or as indicated on the drawings prior to placing concrete.

.6 Divide sections between expansion joints in walks transversely into lengths not more than 1.5 m. Provide a radiused edge on all finish edges and divisions with a standard edger or groover, respectively.

.7 Provide expansion joints in curbs transversely at intervals of 6 m, unless ordered otherwise by the Consultant. Such joints shall be asphalt impregnated felt, 12 mm, set perpendicularly to the surface of the curb and gutter and firmly secured to act as a bulkhead. Place the top of the felt 12 mm thick below the surface. Place removable cap pieces securely in position and remove when the concrete has achieved its initial set. Fill the groove thus formed after being thoroughly cleaned, with a bituminous filler material.

END OF SECTION 03 10 00

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

.1 Provide all material and labour required for the completion of the Contract. Breakdown of Work by Section is for guidance only and is not necessarily complete.

.2 Work Furnished and Installed:

.1 Concrete reinforcement.

.2 Reinforcing bars for masonry.

.3 Work Furnished but not Installed:

.1 Reinforcing bars for masonry, including lintels, band courses, and piers.

.4 Work Installed but Furnished By Other Sections:

.1 Anchor bolts.

.5 Related Work Specified Elsewhere:

.1 Concrete Formwork and Falsework, Section 03 10 00.

.2 Cast-in-Place Concrete, Section 03 30 00.

.3 Concrete Floor Finishes, Section 03 35 00.

1.2 EMBODIED CARBON DOCUMENTATION REQUIREMENTS

.1 Refer to the GWP (global warming potential) maximum limits on embodied carbon referenced in the General Notes within the structural Contract Documents.

.1 The GWP limits are expressed in kg $CO2_e$ per metric tonne (1000 kg) of fabricated rebar.

.2 The GWP limits represent stages A1-A3 in the life cycle analysis of the rebar production process.

.2 Rebar is only to be sourced from suppliers that provide a Type III EPD (environmental product declaration) for their products. Industry average, Type II EPDs are not acceptable.

.3 These limits apply to a minimum of 85% of the rebar in the project on a per tonne basis.

1.3 STANDARDS, CODES AND ACTS

.1 Conform to the Ontario Building Code 2012 under Ontario Regulation 332/12, including Ontario Regulation 88/19 and any applicable acts of any authority having jurisdiction and the following:

.1 Manual of Standard Practice (2020), Reinforcing Steel Institute of Canada (RSIC).

.2 CAN/CSA-A23.1 - Concrete Materials and Methods of Concrete Construction, Canadian Standards Association.

.3 CSA STANDARD A23.3 - Design of Concrete Structures, Canadian Standards Association.

.4 CSA G30.18 – Carbon Steel Bars for Concrete Reinforcement, Canadian Standards Association.

.5 ASTM A1064/A1064M – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete, ASTM International.

.6 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction, Canadian Standards Association.

.2 Where there are differences between the specifications, drawings, codes, standards or acts, the most stringent shall govern.

1.4 TOLERANCES

.1 Perform fabrication and setting so that completed work will be within the tolerances set out in CSA Standard A23.1, and RSIC Manual.

.2 These tolerances are acceptable with regard to structural requirements. Interfacing tolerances may not be compatible with the above. Review and coordinate interfacing tolerances so that the various elements come together properly.

1.5 QUALIFICATIONS

.1 Welding Reinforcement

.1 The organization and personnel undertaking the welding of reinforcement shall be qualified by the Canadian Welding Bureau under the requirements of CSA-W186.

1.6 SAMPLES AND ASSISTANCE

.1 General

.1 Supply samples of all materials and the following, the cost of which shall be paid for by this trade.

.2 Reinforcement

.1 Provide the Consultant access to the reinforcement fabricator's plant. Inform the Consultant of the period during which fabrication will be undertaken.

.2 Cut samples of reinforcing steel designated by the Consultant from steel shipped to jobsite. Replace cut reinforcement or splice where permitted by the Consultant. Maintain an adequate supply of representative steel to permit immediate replacement of steel removed from the site as test specimens.

.3 Coordinate sampling and testing so that test results are received by the Consultant before concrete is placed in the members from which the samples are taken.

1.7 SUBMITTALS

.1 Embodied Carbon Documentation Submittal:

.1 Refer to the GWP (global warming potential) maximum limits on embodied carbon referenced in the General Notes within the structural Contract Documents.

.1 The GWP limits are expressed in kg $CO2_e$ per metric tonne (1000 kg) of fabricated rebar.

.2 The GWP limits represent stages A1-A3 in the life cycle analysis of the rebar production process.

.2 Rebar is only to be sourced from suppliers that provide a Type III EPD (environmental product declaration) for their products. Industry average, Type II EPDs are not acceptable.

.3 These limits apply to a minimum of 85% of the rebar on the project on a per tonne basis.

.2 Submit opening information, shop drawings for reinforcement, and certificates for review by the Consultant:

.1 Refer to Section 01 30 00.

.2 All submissions to be in digital pdf format. Leave room on drawings for the stamps of the Consultants. Check and sign before submission.

.3 Opening Information:

.1 Prior to detailing reinforcement, submit drawings of the structure showing formed holes, openings, recesses and sleeving required under all Sections.

.2 New structure:

.1 Review typical details on structural drawings with respect to openings in walls, slabs, openings at tiebacks, sleeve and conduit placement in concrete structures.

.2 For slabs and vertical sleeves through beams, dimension openings, recesses and sleeves, and relate to suitable grid lines.

.3 For horizontal sleeves through beams, provide elevation with sleeve location, dimensioned to grid lines, or nearest support, and top of beam.

.4 Shop Drawings for Reinforcement

.1 After Consultant has reviewed and returned opening drawings, prepare reinforcement placing drawings and bar lists taking into account all openings and recesses.

.2 Prepare placing drawings to a minimum scale of 1:50 in a clear complete manner that will permit placing of reinforcement to be performed without reference to contract drawings. Do not reproduce the structural drawings.

.3 Detail reinforcement in accordance with the contract documents, CAN/CSA-A23.1 and detailing standards in RSIC Manual.

.4 Except as noted otherwise on the drawings, provide standard hooks on reinforcement in accordance with CSA Standard A23.3.

.5 Provide templates of column dowels to be fully butt welded to structural steel base plates under Section 05 12 00.

.6 Amongst other items, indicate the following:

.1 Bar sizes

.2 spacing

.3 location and quantities of reinforcing

.4 mesh

.5 chairs

.6 spacers

.7 hangers

.8 Identify each bar with a code mark corresponding to the bar lists.

.7 Detail sections to fully illustrate placement of reinforcement at areas such as openings, change of levels, spandrels, stairs and wherever else required.

.8 Large scale detail sections at areas of congested steel such as at intersections of beams and columns, column splices or wherever else required.

.9 Placing sequence for reinforcement such as intersections of beams and beams, slabs and beams and within flat and two-way slabs.

.10 Minimum clearances between reinforcement and minimum concrete protection to reinforcement.

.11 Location and embedment of dowels.

.12 Location, number and type of support accessories, including support bars suitably sized and spaced to rigidly support the weight of reinforcement and construction loads.

.13 Details of bending, cutting or placing to special tolerances.

.5 Shop Drawings for Welding Reinforcement

.1 Submit installation drawings showing, amongst other items, location, type and size of welds, welding procedures and techniques, stamped as approved by the Canadian Welding bureau.

.6 Certificates

.1 Mill certificates are to be reviewed by the testing agency. Their review comments submitted to Consultant for records.

.2 Steel of Canadian Manufacture: Mill test certificates properly correlated to the reinforcement used for fabrication.

.3 Steel of other than Canadian Manufacture: Test data that each size and grade of reinforcement proposed meets specification requirements. Reinforcement approved for use by the Consultant shall be identified in a manner suitable to the Consultant. Only steel that has been approved will be accepted on jobsite.

.4 Weldable Reinforcement: Chemical composition and verification of weldability.

.5 Submit code marks or symbols used on reinforcement of each manufacturer so that Consultant may readily identify grades and sizes of reinforcement.

.7 Substitutions

.1 Substitution of different size bars permitted only upon written approval of Consultant.

.8 Contractor to submit to the Consultant and the Architect, detailed quality control measures for placement of reinforcing in accordance with structural drawings. They're to include methodology and qualifications of persons performing this work. These measures are to be independent of Consultant's and testing agency's review and performed prior to Consultant's review.

PART 2 – PRODUCTS

2.1 MATERIALS

.1 Reinforcement

.1 Deformed steel to CSA G30.18 and to the material specification shown on the drawings.

.2 Reinforcement to be welded shall conform to the material recommendations contained in CSA-W186.

.3 Grade 400W weldable reinforcement shall have maximum yield stress of 525 MPa and maximum yield strain of 0.5%. Grade 500W weldable reinforcement shall have a maximum yield stress of 625 MPa and a maximum yield strain of 0.35%.

.2 Welded Wire Fabric

.1 Conform to ASTM A1064/A1064M.

.3 Support Accessories

.1 Chairs, bolsters or spacers of sufficient strength to rigidly support the weight of reinforcement and construction loads. In the case of concrete exposed to view or weather the accessories shall be such that no metal is permitted to come closer than 38 mm from a formed face and 50 mm from a trowelled surface. Use precast concrete supports for exposed concrete beams and soffits and concrete cast against soil.

.4 Headed Anchor Ends

.1 Headed anchor ends shall develop the full capacity of the rebar in tension per CSA A23.3, CL. 7.1.4

.1 Fusion-welded HRC 110/120/150 series T-headed bars by Head Reinforcement Corp. or approved equivalent.

PART 3– EXECUTION

3.1 FABRICATION

.1 Fabricate reinforcing in accordance with CAN/CSA-A23.1.

.2 Identify with a metal tag each bar with code mark corresponding to that appearing on bar list.

.3 Bend reinforcement once only and at room temperature. Do not straighten or rebend reinforcement. Do not use bars with kinks or bends not shown on the drawings.

.4 Replace bars which develop cracks or splits.

3.2 PLACING

.1 Prior to concreting, place reinforcement, support and secure against displacement in accordance with the requirements contained in RSIC Manual and to the tolerances specified in CSA-A23.1. Tolerances shall be non-cumulative.

.2 Conform to requirements shown for concrete cover to reinforcement.

.3 Place reinforcement accurately and secure against displacement by using annealed iron wire ties or clips, or as otherwise specified, at intersections. Tack welding of reinforcement to secure in place will not be permitted.

.4 Secure reinforcement in walls using sufficient spacers on each face to maintain the requisite distance between reinforcement and wall face and so that vertical bars are plumb. Provide a minimum of 10 mm diameter spreader bars spaced at 2 m centres in both directions.

.5 Set column and wall dowels prior to concreting with wooden templates or other approved means.

.6 Where toppings are placed on waterproof membranes, vapour barriers and the like, prevent reinforcement or tie wire contacting these items.

.7 Do not drive or force reinforcement into fresh concrete.

.8 Preassemble column and beam cages as necessary. Do not "spring" or bend ties and stirrups in order to place longitudinal reinforcement.

.9 Pre-tie reinforcement for footings and lower into place so as not to disturb the soil at founding elevation.

3.3 REVIEW

.1 At their discretion, the Consultant will review the reinforcing steel once it has been placed for general conformity with the contract documents.

.2 Notify the Consultant a minimum of two working days in advance of the date of the proposed review.

.3 The Consultant’s review does not relieve the Contractor of its responsibility for correctly placing and adequately supporting the reinforcing steel, and shall not be regarded as a component of the Contractor’s quality control program.

3.4 FIELD BENDING

.1 Do not field bend reinforcement except where indicated or authorized in writing by Consultant.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars which develop cracks or splits.

3.5 WELDED WIRE FABRIC

.1 Supply welded wire fabric in flat sheets on grade.

.2 Lap ends and sides of fabric not less than 150 mm.

3.6 CONSTRUCTION JOINTS

.1 Obtain approval from the Consultant for locating and details of construction joints not shown.

.2 Continue reinforcement through the joint in its normal position. Add additional reinforcement across the joint as shown or directed.

END OF SECTION 03 20 00

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

.1 Provide all material and labour required for the completion of the Contract. Breakdown of Work by Section is for guidance only and is not necessarily complete.

.2 Work Furnished and Installed:

.1 Cast-in-place concrete.

.3 Work Furnished but not Installed:

.1 Concrete for masonry including lintels, band courses and piers.

.4 Related Work Specified Elsewhere:

.1 Concrete Formwork and Falsework, Section 03 10 00.

.2 Integral Crystalline Waterproofing, Section 03 15 20.

.3 Concrete Reinforcement, Section 03 20 00.

.4 Concrete Floor Finishes, Section 03 35 00.

.5 Backfilling below base course beneath slabs and behind walls under Section 31 23 23.13.

.6 Sub-grade material including moisture barrier, Section 31 23 23.13.

.7 Grouting beneath base plates bearing on masonry, Section 04 05 16.

.8 Lifting of structural steel plates, Section 05 12 00.

1.2 ENVIRONMENTAL / SUSTAINABLE DESIGN REQUIREMENTS

.1 Refer to the GWP (global warming potential) benchmark and target values referenced in the General Notes within the structural Contract Documents.

.1 Submit Type III EPD (environmental product declaration) documents for each mix referenced in the Contract Documents.

.2 GWP targets may consider carbon mineralization in concrete: Concrete that has undergone active carbonation treatment during mixing such that carbon dioxide (CO_2) is injected during mixing and chemically converted into a mineral. The concrete may undergo mix optimization whereby the strength enhancement property of the mineralized CO_2 is used to adjust the cementitious materials content so long as the optimized concrete mix meets the concrete performance criteria required in the Contract Documents. Provide concrete producer's certificate outlining quantity, location and supplier of carbon dioxide. This technology is a complementary approach to reducing the GWP of concrete mixes. Acceptable technologies: CarbonCure Technologies.

1.3 STANDARDS, CODES AND ACTS

.1 Conform with the Ontario Building Code 2012 under Ontario Regulation 332/12, including Ontario Regulation 88/19 and any other applicable acts of any authority having jurisdiction and the following (latest edition, including any supplements):

.1 CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction, Canadian Standards Association.

.2 CAN/CSA-A23.3, Design of Concrete Structures for Buildings, Canadian Standards Association.

.3 CAN/CSA-A3000, Cementitious Materials Compendium, Canadian Standards Association.

.4 CAN/CSA-A3001, Cementitious Materials for Use in Concrete, Canadian Standards Association.

.5 ASTM C260, Standard Specification for Air-Entraining Admixtures for Concrete, ASTM International.

.6 ACI-347 - Guide to Formwork for Concrete, American Concrete Institute.

.7 CAN/CSA-S269.3 - Concrete Formwork, Canadian Standards Association.

.2 Where there are differences between the specifications, drawings, codes, standards or acts, the most stringent shall govern.

1.4 TOLERANCES

.1 Perform placing operations so that completed work will be within the tolerances set out in CAN/CSA-A23.1 and as listed below:

.1 Variations in building lines which result in extension of the building over lot lines or restriction lines will not be permitted.

.2 These tolerances are acceptable with regard to visual and structural requirements. Interfacing tolerances may not be compatible with the above. Review and coordinate interfacing tolerances so that the various elements come together properly.

.3 Note the need for accurate alignment of perimeter slab edges both horizontally and vertically.

1.5 CONCRETE MIX DESIGN

.1 Design of Mix

.1 Design the mix in accordance with CSA Standard A23.1 so that concrete will be homogeneous, uniformly workable, and readily placeable into corners and angles of forms and around reinforcement by the methods of placing and consolidation employed on the work, but without permitting materials to segregate or excessive free water to collect on the surface. The concrete, when hardened, shall have the qualities specified.

.2 Cement Type: Type GUL or GUb-SF, General Use.

.3 Specified Strength: As called for on drawings. Where walls are integral with columns such as foundation walls pour walls and columns with concrete of the specified strength for columns.

.4 Water Cement Ratio, Slump and Air Content: As called for on the Drawings. These requirements are for concrete at the point of placing.

.5 Admixtures: Type WN water reducing admixture.

.6 Supplementary Cementitious Materials:

.1 Slag Cement: Cementing materials for concrete may contain ground granulated blast-furnace slag (GGBFS).

.2 Fly Ash: Cementing materials for concrete may contain fly ash.

.3 Do not use recycled concrete aggregate in slabs or in concrete exposed to view. Except as noted, recycled concrete may constitute up to 100% of the coarse aggregate for concrete.

.7 Use of calcium chloride is not permitted.

.8 Corrosion inhibiting admixture. Refer to drawings for scope.

.9 Integral Crystalline Waterproofing:

.1 Refer to Section 03 15 20.

.2 Apply to pits and sumps.

.10 CO_2 mineralization: Supply CO2 mineralized concrete, such that post-industrial carbon dioxide (CO2) is injected into the concrete like an admixture and chemically converted into a mineral. The concrete may undergo mix optimization whereby the strength enhancement property of the mineralized CO2 is utilized to adjust cementitious content, pending that the optimized concrete mix meets concrete performance requirements as outlined in this specification document. Acceptable technologies: CarbonCure Technologies.

.1 The injection and subsequent mineralization of CO2 meets the requirements of ASTM C494 Type S admixture.

.2 For Canadian projects, see CAN/CSA-A23.1 Annex S, Concrete made with carbon dioxide as an additive (revised June 2018)

.2 Design concrete mixes to meet the humidity requirements of the finishes installed on the concrete. Refer to architectural drawings and specifications for finishes schedules.

1.6 SAMPLES AND ASSISTANCE

.1 General

.1 Supply samples of all materials and the following, the cost of which shall be paid for by this trade.

.2 Concrete Test Cylinders

.1 Cooperate in the execution of the concrete cylinder testing program. Furnish concrete required, protect specimens against injury and loss, and assist in the sampling and storage of specimens.

.2 Sample concrete and cast cylinders in accordance with CAN/CSA-A.23.1 where directed by the Consultant.

.3 In accordance with requirements of CAN/CSA-A.23.1, provide storage facilities for the initial 24 hours of site storage of all cylinders and the subsequent site storage of field cured cylinders. Suitably equip the 24 hour storage facility with humidity and temperature control equipment and maximum/minimum thermometers. It shall be sufficiently large to handle the maximum number of cylinders required at any one time.

.4 If required, provide sufficient field curing storage facilities so that cylinders representing the various areas can be safely stored in locations representing the curing conditions for those areas. Move the field-cured cylinder storage facilities from area to area as the work progresses.

.3 Soil or Rock Inspection

.1 Assist the testing company or soils investigation firm to make their inspections or tests.

.4 Cold Weather Concreting Plan

.1 Submit for review a plan for cold weather concreting. Included as a minimum:

.1 Slag replacement level to be used in the mix design.
.2 Curing period for concrete selected if accelerators are to be used to reduce the length of time winter heat is required.
.3 Method of application of winter heat to the concrete and soil for the initial curing period, be it through construction of a heated enclosure or application of radiant, hydronic heaters such as Ground Heaters® or approved equivalent.
.4 Method of protection of the concrete and soil for the balance of the curing period, be it through the use of insulating blankets, straw, fill or other methods.
.5 Method of pre-heating of embedded elements such as reinforcing steel and cast-in inserts.

1.7 SUBMITTALS

.1 Environmental Product Declarations:

.1 Provide Type III EPDs for all concrete mixes used on the project.

.2 If CO_2 mineralization is used, provide documentation verifying the following:

.1 Quantity, location and and supplier of chemically sequestered CO_2.
.2 Total GWP of mixes using injected and mineralized CO_2.

.2 Submit the following for review by the Consultant:

.1 Certified mix designs for each type of concrete to be used, stating the specific location, using gridlines as a reference, or structural element for which the mix applies.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 and the Waste Reduction Workplan

.2 Use excess concrete for: additional paving, post footing anchorage, swale rip-rap reinforcing, mud slab, flowable fill, footing bottom, retaining wall footing ballast, storm structure covers, underground utility pipe kickers, storm pipe flared end section, toe wash protection, shoulder and toe outfall restraints for temporary erosion pipes, and the like.

.3 Use trigger operated spray nozzles for water hoses.

.4 Designate a cleaning area for tools to limit water use and runoff. Cleaning area should be a portion of the site which is be paved at a later date.

.5 Carefully coordinate the specified concrete work with weather conditions.

.6 Ensure emptied containers are sealed and stored safely for disposal away from people.

.7 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, non-combustible material and remove for disposal. Dispose of all waste in accordance with applicable local, provincial and national regulations.

.8 Choose least harmful, appropriate cleaning method which will perform adequately.

PART 2 – PRODUCTS

2.1 MATERIALS

.1 Concrete

.1 Conform to CAN/CSA-A.23.1.

.2 Carbonation of concrete: Concrete that has undergone treatment with carbon dioxide (CO2) during mixing, such that CO2 is chemically sequestered into concrete as solid minerals. Acceptable technologies: CarbonCure Technologies (www.carboncure.com, 902-442-4020).

.3 Coarse Aggregate: from locally quarried non-alkali reactive rock, mineral or air-cooled blast furnace slag

.4 Low density aggregate for insulating concrete: Conform to CAN/CSA-A23.1 and ASTM C332 group I group II

.5 Blended Hydraulic Cement: Conform to CAN/CSA A3001

.6 Supplementary Cementing Materials:

.1 Type F Fly Ash to CAN/CSA-A23.5

.2 Cementitious Hydraulic Slag to CAN/CSA-A363

.7 Water: Conform to CAN/CSA-A23.1

.8 Admixtures: Air entraining agents or water reducing admixtures conforming to CSA CAN3-A266.1.

.9 Chemical admixtures: to ASTM C494. Consultant to approve accelerating or set retarding admixtures during cold and hot weather placing.

.10 Concrete retarders: to ASTM C494 water based, low VOC, solvent free. Do not allow moisture of any kind to come in contact with the retarder film.

.11 Curing Compound: Water based curing compound conforming to CSA Standard A.23.1. such as Safe Cure & Seal (J-18, J-19) by Dayton/Richmond or approved equivalent.

.12 Grout Beneath Base Plates: Non-shrink flowable grout In-Pakt or equal having a compressive strength at 28 days of at least 35 MPa. Where grout is exposed to view or weather, use non-ferrous grout.

.13 Corrosion Inhibitors:

.1 Corrosion Inhibiting Admixture complying with ASTM C1582 and ANSI/NSF 61 such as MCI 2005NS, as supplied by Cortec Corporation. The corrosion inhibiting admixture should be dosed at fixed rate of 1 litre per cubic meter.

.2 DCI Corrosion Inhibiting Admixture, as supplied by W.R. Grace & Co. Dosage in accordance with manufacturer’s recommendations, but at least 11 litres per cubic metre.

.14 Crystalline Waterproofing Admixture:

.1 In accordance with 03 15 20.

.2 AQUAFIN-IC integral concrete admixture.

.15 Bonding agent: Sikadur 32 Hi-Mod epoxy-based protective coating and bonding adhesive, as supplied by Sika Canada, or approved equivalent.

.16 Non-shrink grout: minimum 30 MPa grout, as supplied by CPD Construction Products, or approved equivalent.

PART 3– EXECUTION

3.1 FOOTINGS

.1 Refer to drawings for soil criteria for bearing of footings.

.2 Founding elevations, based upon the report of the sub-surface investigation, at which it is presumed these conditions pertain are shown.

.3 Founding elevations must be verified by the sub-surface investigation firm before footings are placed.

.4 See Section 31 23 23.13 for excavation and backfilling requirements for footings and for the procedure of adjusting contract price where changes to foundations are required.

.5 Prior to proceeding with the work, determine the exact founding elevations of existing footings adjacent to the new work. Report these findings to the Consultant before proceeding further.

.6 If, upon excavating to the elevations shown, the required soil conditions are not fulfilled, or if they are fulfilled at a higher elevation, the Consultant will provide instructions as to how to proceed.

.7 Keep a record of footing founding elevations.

.8 Construct footings in a particular area commencing from the lowest footing elevation and proceeding to the higher elevation.

.9 Proceed in a similar manner for continuous footings to walls which vary in founding elevation by commencing with the continuous footing at the lowest elevation.

.10 Remove water, disturbed soil or loose rock or foreign matter from footing excavations before placing concrete. Do not permit the soil at founding elevations to soften due to the presence of water in the excavations or construction activity.

.11 During cold weather, prevent soil or rock adjacent to and beneath all footings from freezing. Do not pour footings on frozen soil on soil which has been allowed to freeze and thaw. If the soil at specified founding elevations is frozen or was frozen and thawed, remove affected material and found footings on unaffected soil with the required characteristics at no extra cost to the Owner.

.12 If the actual founding elevations differ from those shown by more than 600 mm, the Contractor may be reimbursed for the extra cost of such work, except as stipulated below, or shall credit the Owner for deletions based upon the unit prices quoted for concrete reinforcing steel and formwork. Extras or credits shall be calculated by establishing the total net extras or credit for the footings for each material and then multiply by the appropriate unit price.

.13 Extras will be paid only if upon excavating to the specified founding elevations, it is found that soil conditions do not meet the requirements set forth. No extras will be paid if soil becomes weakened through agencies within the control of the Contractor, such as through the action of ground water, inadequate protection from weather, construction activity, over-excavation, or through undermining by the installation of nearby electrical or mechanical services.

.14 Depending upon the degree of defective workmanship, corrective measures may include such measures as redesign of footings and their increase in size as the Consultant may direct. Corrective measures required to overcome defective workmanship shall be made at no extra cost to the Owner.

.15 Where excavations for mechanical or electrical services, pits adjacent to foundations and the like encroach upon a 7 in 10 slope between corners of footings and bottom corners of excavations, lower footings a suitable amount so as not to exceed the 7 in 10 slope at no extra cost to the Owner.

3.2 CONSTRUCTION JOINTS

.1 Obtain approval from the Consultant for location and details of construction joints not shown.

.2 The maximum length of a concrete pour shall be 40 m.

.3 The maximum height of a concrete pour shall be 5 m.

3.3 WATERSTOPS

.1 Setting waterstops: In order to eliminate faulty installation that may result in joint leakage, take care in the correct positioning of the waterstops during placing of concrete. Support the waterstops during the progress of the work to ensure the proper embedment in the concrete. Equally divide the symmetrical halves of the waterstops between the concrete pours at the joints. The centre axis of the waterstops shall coincide with the joint openings at the plane of installation of the waterstop. Ensure maximum density and imperviousness of the concrete by thoroughly working it in the vicinity of all joints.

.2 Placement of concrete around waterstops: Take care in placing concrete around waterstops by careful working, routing, and vibrating to ensure that all air and rock pockets have been eliminated.

.3 Use butted, welded connections in accordance with manufacturer's recommendation. Only straight heat sealed welds shall be performed in the field. Use preformed or shop welded corners and intersections.

3.4 SHRINKAGE STRIPS

.1 Do not place concrete in the shrinkage strips until at least 28 days after concrete in adjacent areas is poured and until the mean daily ambient temperature is approximately 18 degrees C.

3.5 PLACING CONCRETE

.1 Conform to requirements of CAN/CSA-A.23.1 and the following:

.2 Immediately before placing concrete, clean forms and reinforcement of foreign matter.

.3 During hot weather conditions, do not use concrete mixed more than 1 hour after introduction of mixing water or 1-1/2 hours during other periods.

.4 Allow 24 hours minimum after placing concrete in columns, piers or walls before placing concrete in beams or slabs supported thereon.

.5 Ensure waterproof membranes are not damaged during placing of concrete over them.

.6 Remove concrete spilled onto forms around hoisting equipment before depositing concrete in these areas.

.7 Where concrete members are case on or against precast concrete panels, protect the panels from staining with a plastic membrane protective cover.

.8 Sloped Slabs

.1 In the case of sloped slabs slabs, employ suitable concrete placing and compaction procedures to ensure that completed concrete has the specified design characteristics, and in particular, to prevent movement of plastic concrete resulting in cracking, loss of bond, etc., and to achieve a surface equivalent to a fine wood float finish suitable to receive the roofing membrane.

.2 Pumping or pneumatic placing of concrete shall only be used if the velocity of discharge is reduced to a point where no separation or scattering of the concrete occurs, and the consistency of the mix has been designed to allow such a system with no adverse effects on the quality of concrete.

.3 Well in advance of the work, submit concrete mix design certification by an independent testing firm as specified in Clause that the mix proposed is suitable for pumping with the proposed equipment.

.9 Co-ordinate with general contractor placement procedures to ensure the humidity levels in concrete meet warranty requirements of the finishes at time of installation.

3.6 PROTECTION

.1 General

.1 Conform to the requirements of CAN/CSA-A.23.1 and the following to protect freshly deposited concrete from freezing, premature drying and extremes of temperature. Maintain concrete with minimal moisture loss at a relatively constant temperature for the period of time necessary for the hydration of the cement and to achieve the specified strength of the concrete.

.2 Cold Weather Concreting

.1 Between the 15th of October of any year and the 15th of April of the following year, provide on hand and ready for use all equipment necessary for adequate cold weather protection and curing before concrete placement is begun.

.2 When fresh concrete is to be cast against existing concrete, prevent the loss of heat by extending the protection for the fresh concrete at least 600 mm over the existing.

.3 Insulate, or enclose within the protective housing, tie rods, reinforcement or metal which projects from the concrete being protected.

.4 Construct enclosures tight and safe for wind and snow loadings.

.5 Maintain housing, enclosures and supplementary heat in place for entire period of protection, except that sections may be temporarily removed as required to permit placing additional forms or concrete provided the uncovered concrete is not permitted to freeze. Make up time lost from the required period of protection at the required temperature before protection is discontinued and removed.

.6 Dispose heating units to avoid heating concrete locally or drying it excessively. Avoid high temperature and dry heating within enclosures.

.7 Take particular care to maintain edges and corners of concrete at the required temperature owing to their greater vulnerability to freezing.

.3 Hot weather concreting

.1 Between the 15th of April and the 15th of October, the contractor shall establish and follow procedures to ensure proper mix temperatures and curing conditions as specified in CSA A23.1.

.4 Slabs on Grade

.1 See Slabs on Grade Section for additional cold weather protection execution requirements for placing concrete slabs on grade.

.5 Protection of Completed Work

.1 At all times during the work, protect exposed concrete, exposed masonry and other exposed members from staining or becoming coated with concrete leakage due to continuing concreting operations. Members which become coated may be classed as defective work by the Consultant.

.2 Protect exposed members from staining due to rusting of reinforcement projecting beyond construction joints.

.3 Take suitable measures to prevent spalling and cracking damage occurring to the structure due to water freezing in expansion joints, small holes, slots, depressions and take suitable measures to prevent damage occurring to foundations and the like due to frost action in the soil or backfill.

.4 The application of de-icing salts on completed work is not permitted.

.5 During the curing period, take suitable measures to protect the surface of the concrete from pitting and loss of fines due to rain.

.6 Co-ordinate with general contractor concrete protection measures to ensure the humidity levels in concrete meet warranty requirements of the at time of installation.

3.7 SLABS ON GRADE

.1 General

.1 Do not place concrete slabs on grade until the specified sub-floor material has been placed, inspected and approved.

.2 Do not place concrete on a frozen sub-grade, or on one that contains frozen materials.

.3 Do not place concrete on a sub-grade that has been frozen and thawed until the sub-grade has been reviewed by the Consultant and approved. If, in the Consultant's opinion, the safe bearing capacity of the sub-grade has been reduced to below 24 kPa, remove the affected materials and replace with compacted granular fill at no additional cost to the Owner.

.4 Refer to drawings and geotechnical report for preparation of base to receive slab.

.5 Place bond breaker, minimum of 1 layer of building paper between edges of slab on grade and abutting surfaces.

.6 Upon approval of the placement of the sub-floor material and setting of reinforcing, place and consolidate concrete and finish and cure as specified herein.

.7 Where two pour method is specified on the drawings, upon approval of the placement of the sub-floor material, place and consolidate a uniform thickness of slab on grade concrete to within 40 mm of top. Coordinate with Section 03 20 00 the immediate placement of reinforcement on top of the first layer of concrete. Place, consolidate, finish and cure the final 40 mm thickness of slab to the tolerances specified.

.2 Joints

.1 Where slabs abut adjacent construction, provide a layer of joint filler between.

.2 Saw-cut slabs on grade exposed to view in the finished building into panels as shown with a maximum length between saw-cuts equal to 25 times the slab thickness. e.g. a 100 mm thick slab will required saw-cuts at 2.5m c/c. Arrange panels as shown or to the Consultant's approval.

.3 Carry out cutting in accordance with recommendations contained in ACI 302.1R but in any event between 6 and 18 hours after placement of concrete.

.4 After a curing period of at least 90 days, and after the building is under permanent temperature control, fill saw-cuts with a compatible joint sealer or filler.

.5 Ensure that joints to be filled are clean, dry and free of foreign matter.

.6 Fill joints in slabs subject to wheeled traffic with SikaLoadFlex 524 EZ or equivalent.

.7 Fill joints in slabs not subject to wheeled traffic with Sikaflex 1CSL or equivalent.

.8 Ensure the joint filler or sealer is flush with the adjacent concrete; a concave profile on the top of the joint is unacceptable.

.9 Mask edges of saw-cuts to prevent concrete floors from becoming stained.

.10 Construction joints may be provided in slabs on grade so that pours on any one day may be kept to reasonable sizes. Locate construction joints to the Consultant's approval.

.11 In exposed concrete, provide a reglet at construction joints of the approximate width of a saw-cut and fill the reglet as specified for saw-cuts.

3.8 GROUTING BENEATH BASE PLATES

.1 Grout beneath plates bearing on concrete with an approved non-shrink flowable grout. Conform with the manufacturer's directions for mixing and placing grout. Completely fill voids below plates. Fill voids left by shims after shims are removed.

.2 During cold weather, preheat base plates and footings and maintain temperature at minimum 12 degrees C. for 6 days after grouting.

3.9 REINFORCED BLOCK LINTELS

.1 Supply and place concrete and reinforcing steel for reinforced block lintels in accordance with the requirements of Typical Detail and this specification.

.2 Accurately place and secure reinforcement in the cavity prior to concreting. Trowel top of lintel as required to permit laying of succeeding block course.

3.10 OPENINGS THROUGH COMPLETED MEMBERS

.1 Do not cut openings through completed members without the Consultant's approval.

.2 If directed, where the location of openings is approved, mark their position on each side of members to be perforated. In the case of slabs over 75 mm thick, cut two-thirds of the thickness by drilling from the top and remaining one-third by drilling from the bottom. Drill walls similarly from each side.

.3 Where the location of openings is approved, locate the reinforcing by x-ray, cover meter or other positive means and adjust the location of the opening so that no reinforcement is cut unless specifically approved otherwise in writing by the Consultant.

.4 Maintain the axis of the hole at right angles to the surface of the member.

.5 In the case of precast concrete slabs, holes shall be cut or drilled only by the precast concrete fabricator.

3.11 MAKING GOOD

.1 Where directed by the Consultant, make good temporary openings left in concrete construction around pipes, ducts and the like using a mortar of the same proportions as the surrounding work. Reinforce mortar with mesh or the like where openings exceed 75 mm. Roughen existing surfaces to receive mortar or apply suitable bonding agent such that mortar will be securely bonded to existing concrete.

3.12 TREATMENT OF FORMED SURFACES

.1 General

.1 After stripping for forms, the bared surface of concrete will be inspected by the Consultant. Do not proceed with repairs or surface treatment to concrete prior to the Consultant's inspection.

.2 After the Consultant's inspection, remove or cut back 25 mm, bolts, ties, nails or other metal not specifically required for construction purposes.

.3 Where no serious defects are revealed by the Consultant's inspection, cut out areas of moderate honeycombing to sound concrete. Saturate with water and fill with cement mortar of the same general composition as that used in the concrete.

.4 Where serious defects are found, such as large voids or extensive honeycombing, repair the defect as directed by the Consultant.

.5 Where surfaces are to be plastered, damp-proofed, waterproofed or similarly finished, remove fins, ridges or bulges which would interfere with the application of the final finishes.

.6 Remove traces of form lining compound from concrete surfaces which may affect the bonding of following surface application.

END OF SECTION 03 30 00

PART - 1 GENERAL

1.1 SUMMARY

.1 This Section includes requirements for exterior cast-in-place concrete, including forming and reinforcing.

1.2 RELATED REQUIREMENTS

.1 Section 03 35 20 Integrally-Coloured Concrete

.2 Section 31 23 33.01 Excavating, Trenching and Backfilling

1.3 REFERENCE STANDARDS

.1 American Concrete Institute (ACI)

.1 ACI 301, Specifications for Concrete Construction

.2 ACI PRC-309-05: Guide for Consolidation of Concrete

.3 ACI SP-66, ACI Detailing Manual 2004.

.2 ASTM International (ASTM)

.1 ASTM A123/A123M Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products, latest version.

.2 ASTM A143/A143M, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement, latest version.

.3 ASTM A641 / A641M, Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire, latest version.

.4 ASTM A1064 / A1064M Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete, latest version.

.5 ASTM C920 Standard Specification for Elastomeric Joint Sealants, latest version.

.6 ASTM D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non extruding and Resilient Bituminous Types), latest version.

.3 CSA Group (CSA)

.1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete, latest version.

.2 CAN/CSA A23.3, Design of Concrete Structures), latest version.

.3 CAN/CSA A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005), latest version.

.4 CAN/CSA G30.18-[09(R2014)], Billet-Steel Bars for Concrete Reinforcement, latest version.

.5 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel, latest version.

.6 CAN/CSA O86, Engineering Design in Wood.

.7 CSA O121, Douglas Fir Plywood.

.8 CSA O151, Canadian Softwood Plywood.

.9 CAN/CSA O325.0, Construction Sheathing.

.10 CSA S269.1, Falsework and Formwork.

.11 CAN/CSA S269.3, Concrete Formwork.

.12 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction, latest version.

.4 Reinforcing Steel Institute of Canada (RSIC)

.1 RSIC, Reinforcing Steel Manual of Standard Practice, latest version.

.5 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for proprietary materials used in Cast-In-Place Concrete and additives and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit WHMIS Safety Data Sheet (SDS)

.3 Shop Drawings:

.1 Shop drawings shall be stamped and signed by professional engineer registered or licensed in Ontario unless otherwise indicated.

.2 Reinforcing: submit shop drawings for concrete reinforcing.

.1 Comply with RSIC Manual of Standard Practice.

.2 Indicate placing of reinforcement and:

.3 Detail lap lengths and bar development lengths to CAN/CSA A23.3.

.4 Indicate position and size of openings in slabs and walls. Coordinate with trades requiring openings.

.3 Accessories: include any indicated or required accessories on the relevant shop drawings.

.4 Provide manufacturer's product data for each type of concrete indicated and do not proceed without written acceptance.

.1 Include source of fly ash, if applicable.

.5 Quality Assurance Submittals:

.1 Submit in accordance with Section 01 45 00 - Quality Control

.2 Mill Test Report: upon request, submit to Consultant certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.

.3 Upon request submit in writing to Consultant proposed source of reinforcement material

1.5 QUALITY ASSURANCE

.1 Provide to Consultant, 4 weeks minimum prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

.2 Quality Control Plan: provide written report to Consultant verifying compliance concrete in place meets performance requirements.

.3 Mock-Ups:

.1 Provide site mock-up for architectural finished concrete indicating forming methods and materials, and procedures proposed to achieve architectural finish in accordance with Section 01 45 00 - Quality Control, and to comply with following requirements, using materials indicated for completed work:

.1 Build mock-ups in location and of size as agreed by Owner and Consultant.

.2 Obtain Owner's and Consultant's acceptance of mock-ups before starting construction; mock-up used throughout construction period and used as standard of acceptance for subsequent architectural concrete work.

.3 Mock-up may form part of permanent structure when accepted by Owner and Consultant; repair or replace unacceptable mock-ups at no additional cost to Owner.

.4 In presence of Consultant, damage part of exposed face for each finish, colour, and texture, and demonstrate materials and techniques proposed for repairs to match adjacent undamaged surfaces.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Formwork, reinforcing and accessories:

.1 Delivery and Acceptance Requirements:

.1 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

.2 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.2 Storage and Handling Requirements:

.1 Store materials in off-ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

.2 Concrete:

.1 Concrete hauling time: deliver to site of Work and discharge within 120 minutes maximum after batching.

.1 Modifying maximum time limit without receipt of prior written agreement from Consultant and concrete producer as described in CSA A23.1/A23.2 is prohibited.

.2 Deviations shall be submitted for review with submittals.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

1.7 AMBIENT CONDITIONS

.1 Placing concrete during rain or weather events damaging to concrete is prohibited.

.2 Protect newly placed concrete from rain or weather events in accordance with CSA A23.1/A23.2.

.3 Cold weather protection:

.1 Maintain protection equipment, in readiness on Site.

.2 Use such equipment when ambient temperature below 5°C, or when temperature may fall below 5°C before concrete cured.

.3 Placing concrete upon or against surface at temperature below 5°C is prohibited.

.4 Hot weather protection:

.1 Protect concrete from direct sunlight when ambient temperature above 27°C.

.2 Prevent forms of getting too hot before concrete placed. Apply accepted methods of cooling not to affect concrete adversely.

.5 Protect from drying.

PART - 2 PRODUCTS

2.1 DESIGN CRITERIA

.1 Alternative 1 - Performance: to CSA A23.1/A23.2 and as described in MIXES of PART 2 - PRODUCTS.

2.2 PERFORMANCE CRITERIA

.1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Consultant and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

2.3 REINFORCING MATERIALS

.1 Fabricate reinforcing steel in accordance with CSA A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

- .1 Upon request, provide Consultant with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.
- .2 Upon request inform Consultant of proposed source of supplied material.

.2 Reinforcing steel: weldable low alloy steel deformed bars to CSA G30.18.

.3 Cold-drawn annealed steel wire ties: to ASTM A1064/A1064M.

.4 Deformed steel wire for concrete reinforcement: to ASTM A1064/A1064M.

.5 Welded steel wire fabric:

- .1 Plain or deformed as indicated, in accordance ASTM A1064/A1064M and fabricated from as drawn steel wire into flat sheets; sizes as indicated on Drawings.
- .2 Finish:
  - .1 Galvanized: Hot dip galvanized after welding having Class A coating in accordance with ASTM A1064/A1064M.
  - .2 Provide in flat sheets only, unless otherwise indicated.

.6 Galvanizing of non-prestressed reinforcement: to ASTM A123/A123M, Coating Grade 85, minimum zinc coating 610 g/m2.

- .1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.
- .2 If chromate treatment carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic acid.
  - .1 Temperature of solution minimum 32 degrees and galvanized steels immersed for minimum 20 seconds.
- .3 If galvanized steels at ambient temperature, add sulphuric acid as bonding agent at concentration of 0.5% to 1%.
  - .1 No restriction applies to temperature of solution.
- .4 Chromate solution sold for this purpose may replace solution described above, provided if of equivalent effectiveness.
  - .1 Provide product description as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

.7 Chairs, bolsters, bar supports, spacers: to CSA A23.1/A23.2.

.8 Tie wire: 1.5 mm diameter annealed wire.

.9 Mechanical splices: subject to review by Consultant.

.10 Plain round bars: to CSA G40.20/G40.21.

2.4 FORMWORK MATERIALS

.1 For concrete without special architectural features, use wood and wood product formwork materials meeting CAN/CSA O86.

.2 For concrete with special architectural features, use formwork materials to CSA A23.1/A23.2.

.3 Rigid insulation board: to CAN/ULC-S701.

.4 Tubular column forms: round, spirally wound, polyethylene impregnated virgin kraft interior layer and a waxed exterior, internally treated with release material.

.5 Form ties:

.1 Snap ties complete with plastic cones and light grey concrete plugs.

.6 Form liner:

.1 Plywood: high density overlay Canadian Softwood Plywood to CSA O151, grade and thickness as determined by formwork designer or as indicated on the drawings.

.7 Form release agent: Proprietary, non volatile material not to stain concrete or impair subsequent application of finishes or coatings to surface of concrete, derived from agricultural sources, non petroleum containing.

2.5 CONCRETE MATERIALS

.1 Portland Cement: Normal Portland Cement in accordance with CAN/CSA A3000, Type GU Sulphate Resisting Portland Cement in accordance with CAN/CSA A3000, Type MS.

.2 Contractor may propose supplementary cementing materials per CAN/CSA A3001 subject to Consultant's review.

.3 Water: to CSA A23.1/A23.2.

.4 Other concrete materials: to CSA A23.1/A23.2.

2.6 MIXES

.1 Alternative 1 - Performance Method for specifying concrete: to meet indicated performance criteria to CSA A23.1/A23.2.

.1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as described in PART 3 - VERIFICATION.

.2 Contractor and supplier to propose plastic state criteria suitable for the work, including uniformity, workability, finish-ability and set time, subject to Consultant's review.:

.3 Provide concrete mix to meet following hard state requirements:

.1 Durability and class of exposure: C-2.

.2 Compressive strength at 28 days: 32 MPa minimum.

.3 Intended application: Landscape elements: curbs, gutters, sidewalks, fencepost footings, etc.

.4 Aggregate size 20 mm maximum.

.4 Concrete supplier's certification.

.5 Provide quality management plan to ensure verification of concrete quality to specified performance.

2.7 OTHER MATERIALS

.1 Expansion Joint Filler: pre-moulded bituminous fibre board, conforming to ASTM D1751.

.2 Joint sealer/filler: grey to ASTM C920, Type M, Grade NS.

.3 Sealer: proprietary poly-siloxane resin blend, where indicated.

PART - 3 EXECUTION

3.1 PREPARATION

.1 Verify lines, levels, and centres before proceeding with formwork and ensure dimensions agree with drawings.

.2 Excavate and prepare base for footings in accordance with Section 31 23 33.01.

.1 Obtain Consultant's review for use of mud slabs or similar where not indicated on drawings.

.2 Obtain Consultant's review for use of earth forms framing openings not indicated on drawings.

.3 Provide Consultant 48 hours notice before each concrete pour.

.1 Contractor shall not proceed with pour until formwork and reinforcing have been reviewed by Consultant or designate.

.2 Contractor to arrange attendance by representative of designated testing and inspection company.

3.2 FORMWORK

.1 Refer to architectural drawings for concrete members requiring architectural exposed finishes.

.2 Do not place shores and mud sills on frozen ground.

.1 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.3 Fabricate and erect formwork in accordance with CAN/CSA S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA A23.1/A23.2.

.4 Align form joints and make watertight.

.1 Keep form joints to minimum.

.5 Use 25 mm chamfer strips on external corners and 25 mm fillets at interior corners, joints, unless specified otherwise.

.6 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.7 Construct forms for architectural concrete, and place ties as indicated or as directed.

.1 Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.

.8 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.

.1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.9 Form liners:

.1 Line forms for exposed faces of walls: do not stagger joints of form lining material and align joints to obtain uniform pattern.

.2 Secure lining taut to formwork to prevent folds.

.3 Pull down lining over edges of formwork panels.

.4 Ensure lining is new and not reused material.

.5 Ensure lining is dry and free of oil when concrete is poured.

.6 If concrete surfaces require cleaning after form removal, use only pressurized water stream so as not to alter concrete's smooth finish.

.7 Cost of lining is included in price of concrete for corresponding portion of Work.

.10 Clean formwork in accordance with CSA A23.1/A23.2, before placing concrete.

3.3 REINFORCING

.1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA A23.1/A23.2.

.2 Do not field bend or field weld reinforcement except where indicated or authorized by Consultant.

.1 When field bending authorized, bend without heat, applying slow and steady pressure.

.2 Replace bars which develop cracks or splits.

.3 Use plain round bars as slip dowels in concrete.

.1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.

.2 Apply thick even film of mineral lubricating grease when paint is dry.

.4 Touch up damaged and cut ends of galvanized reinforcing steel with compatible finish to provide continuous coating.

.5 Prior to placing concrete, obtain review or inspection of reinforcing material and placement.

.6 Maintain cover to reinforcement during concrete pour.

3.4 CONCRETE INSTALLATION

.1 Do cast-in-place concrete work in accordance with CSA A23.1/A23.2.

.2 Sleeves and inserts:

.1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, water-stops, joint fillers and other inserts required to be built-in.

.3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.4 During concreting operations:

.1 Development of cold joints not allowed.

.2 Concrete delivery and handling to facilitate placing with minimum of rehandling, and without damage to existing structure or Work.

.5 Consolidation:

.1 Internal or external vibrators or both shall be used to thoroughly consolidate concrete at the point of deposit within 15 minutes of placing.

.2 Each layer of concrete shall be vibrated. Vibrators shall extend into the previous layer to produce a homogenous mixture at the layer interface.

.3 Vibration shall not be used to make the concrete flow or to spread the concrete more than 1.5 m from the point of deposit.

.6 Protect previous Work from staining.

.7 Clean and remove stains prior to application of concrete finishes.

3.5 FINISHES

.1 Formed surfaces exposed to view: shall be finished as indicated in accordance with CSA A23.1/A23.2.

.2 Depressions in slabs between high spots shall not be greater than 5 mm below a 3 m straight edge and in accordance with CSA A23.1/A23.2, Clause 7.6.1.2 and Table 21, finish classification Class B.

.3 Slabs to receive mortar bed: screed to correct grade and provide broomed texture.

.4 Equipment pads: provide smooth trowelled surface.

.5 Splash pad deck: provide medium-broom “wavy” pattern finish; ensure non-slip surface.

.6 Pavements, walks, curbs and exposed site concrete:

.1 Screed to plane surfaces and use aluminum floats.

.2 Provide round edges and joint spacings using standard tools.

.3 Trowel smooth and provide indicated non-slip finish.

3.6 CONTROL JOINTS

.1 Cut or form control joints in concrete work on grade at locations indicated, to CSA A23.1/A23.2 and install specified joint sealer/filler, if specified.

3.7 EXPANSION AND ISOLATION JOINTS

.1 Install pre-moulded joint filler in expansion and isolation joints full depth of slab flush with finished surface to CSA A23.1/A23.2.

3.8 CURING

.1 Use curing compounds compatible with applied finish on concrete surfaces free of bonding agents and to CSA A23.1/A23.2.

3.9 FORMWORK REMOVAL

.1 Leave formwork in place for minimum of 2 days after placing concrete unless otherwise directed.

.2 Remove formwork when concrete has reached 70 % of its 28 day design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring if applicable.

.3 Provide necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.

.4 Re-use formwork only with written agreement of Owner and/or Consultant and subject to meeting the requirements of CSA A23.1/A23.2.

3.10 SEALING APPLICATION

.1 Do not seal concrete.

3.11 SITE TOLERANCES

.1 Concrete slab finishing tolerance to CSA A23.1/A23.2.

3.12 FIELD QUALITY CONTROL

.1 Concrete testing: to CSA A23.1/A23.2 by testing laboratory designated and paid for by Consultant.

3.13 CLEANING

.1 Conform to Section 01 74 00.

.2 Use trigger operated spray nozzles for water hoses.

.3 Use designated cleaning area for tools to limit water use and runoff.

.4 Waste Management:

.1 Do not use excess concrete on site.

.2 Use designated area on job site where concrete trucks can be safely washed.

.3 Divert admixtures and additive materials from landfill to approved official hazardous material collections site.

.4 Disposal of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location posing health or environmental hazard is prohibited.

.5 Final cleaning:

.1 Ensure concrete has fully cured before cleaning.

.2 Clean concrete of marks, stains, or efflorescence using only purpose made cleaners that pose no environmental risk on site or downstream.

END OF SECTION 03 30 00.09

PART - 1 GENERAL

1.1 SUMMARY

.1 This Section includes requirements for integral colouring of exterior concrete works.

1.2 RELATED REQUIREMENTS

.1 Section 03 30 00.09 Cast-in-place concrete short form

.2 Section 31 23 33.01 Excavating, Trenching and Backfilling

1.3 REFERENCE STANDARDS

.1 ASTM International (ASTM)

.1 ASTM C 309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.2 ASTM C 494 Standard Specification for Chemical Admixtures for Concrete.

.3 ASTM C 979 Standard Specification for Pigments for Integrally Colored Concrete

.2 CSA Group (CSA)

.1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete, latest version.

.2 CAN/CSA A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005), latest version.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's specifications and instructions for color additives and curing compounds.

.2 Samples for concrete color selection or verification:

.1 Color additive manufacturer's color chart or sample chip set; with specified color additive number code and dosage rate indicated if applicable.

.3 Samples for verification of concrete color:

.1 Sample blocks of concrete formed using specified colors and dosage rates and bearing labels indicating color additive manufacturer, product name, number codes and dosage rates.

.4 Concrete mix designs:

.1 Provide separate mix design in accordance with section 03 30 00.09 for each colour of concrete (including uncoloured concrete if applicable).

.2 Mix designs shall note colour additives including manufacturer, product name, number code and dosage rate.

.5 Other materials:

.1 Form Facing Materials: provide manufacturer product data. Provide physical sample only if requested.

.2 Surface Retarder: provide manufacturer product data if proposed for use.

.3 Form Release Agents: provide manufacturer product data if proposed for use.

.6 Submit WHMIS Safety Data Sheet (SDS) for all applicable materials.

.3 Quality Assurance Submittals:

.1 Upon request submit manufacturer and installer qualifications in writing to Consultant.

.1 Manufacturer Qualifications: Manufacturer with 10-years experience in manufacture of specified products.

.2 Installer Qualifications: Installer must have minimum 5 years experience with work of similar scope and quality. Supporting information regarding specific project experience (ie. project name, date, location and/or photos) may be requested.

1.5 QUALITY ASSURANCE

.1 Provide quality assurance in accordance with Section 01 45 00 - Quality Control

.2 Provide to Consultant, 4 weeks minimum prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

.3 Quality Control Plan: provide written report to Consultant verifying compliance concrete in place meets performance requirements.

.4 Mock-Ups:

.1 Provide site mock-up for integrally-coloured concrete indicating forming methods and materials, and procedures proposed to achieve indicated finish in accordance with Section 01 45 00 - Quality Control, and to comply with following requirements, using materials indicated for completed work:

.1 Build mock-ups in location and of size as agreed by Owner and Consultant.

.2 Construct mock-up using processes and techniques intended for use on permanent work, including jointing, finishing, edging and curing procedures. Mock-ups shall be produced by the individual workers who will perform the work for the Project.

.3 Mock up shall be at least 2 metres X 2 metres in size and shall incorporate each type of finishing treatment to a minimum size of 1 metre X 1 metre (or larger if required to effectively demonstrate workmanship).

.4 For accurate color, the quantity of concrete mixed to produce the sample should not be less than 3 cubic yards (or not less than 1/3 the capacity of the mixing drum on the ready-mix truck) and should always be in full cubic yard increments. Excess material shall be discarded according to local regulations or used elsewhere on-site for foundations, footings, or other approved sub-grade or obscured works on-site.

.5 If requested, retain samples of cements, sands, aggregates and color additives used in mock-up for comparison with materials used in remaining work.

.6 Unacceptable mock-ups shall be immediately removed from the site and a new mock-up constructed at no additional cost to Owner.

.7 Obtain Owner's and Consultant's acceptance of mock-ups before starting construction; mock-up shall remain in place throughout construction period and used as standard of acceptance for subsequent architectural concrete work.

.8 Mock-up may form part of permanent work when accepted by Owner and Consultant.

.9 In presence of Consultant, damage part of exposed face for each finish, colour, and texture, and demonstrate materials and techniques proposed for repairs to match adjacent undamaged surfaces.

.10 Do not remove mock-up without written agreement of Consultant and/or Owner.

.2 Schedule mock-up a minimum of twenty (20) business days prior to anticipated installation of concrete areas to be so treated.

.5 Obtain each specified material from same source as accepted mock-up and maintain high degree of consistency in workmanship for all work.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Delivery and acceptance requirements for pre-mixed concrete shall conform to section 03 30 00.09

.2 Delivery and acceptance requirements for colour additives shall comply with manufacturer's instructions.

.1 Deliver materials in the manufacturer’s original unopened containers, with labels clearly identifying manufacturer, product name, number code, quantity, and mixing instructions.

.2 Retain containers for Consultant or Owner inspection if requested.

.3 Storage:

.1 Store materials in clean, dry area in accordance with manufacturer’s instructions.

.2 Keep containers sealed until ready for use.

.4 Handling:

.1 Handle materials in accordance with manufacturer’s instructions.

.2 Protect materials during handling and mixing to prevent damage or contamination.

1.7 PROJECT CONDITIONS

.1 Conform to section 03 30 00.09 or with more stringent requirements if noted below or recommended by colour admixture manufacturer.

.1 Do not place integrally-coloured concrete in temperatures less than 10 degrees Celsius unless accepted by Owner or Consultant in writing.

.2 Do not place integrally coloured concrete during rain or weather events.

.3 Do not place integrally coloured concrete if rain or weather events or temperatures below 5 degrees Celsius are forecast within 24 hours.

.2 Schedule delivery of concrete to provide consistent mix times from batching until discharge. Mix times shall meet manufacturer’s written recommendations.

.3 Formed Concrete: Schedule work to minimize differences in curing conditions. When possible, apply curing compound as soon as forms are stripped.

.4 Protect newly placed concrete from rain or weather events or excessive heat or sunlight in accordance with CSA A23.1/A23.2.

.1 Where the same colour of concrete is used in areas with varying sun and shade conditions, all concrete shall be shaded to ensure consistent drying conditions.

.2 Do not apply water to the concrete surface during drying or curing.

.3 Do not use wet coverings, plastic sheeting, waterproof paper

.4 Use liquid membrane curing compounds only if they have been specifically designed for use with the colouring admixtures used and with written acceptance of Consultant.

.1 Use according to manufacturer's directions.

PART - 2 PRODUCTS

2.1 MATERIALS

.1 Concrete materials shall conform to section 03 30 00.09 or with more stringent requirements if noted below or recommended by colour admixture manufacturer.

.2 Concrete Mix:

.1 Use same concrete mix design throughout the project for each colour.

.1 Mix color additives in accordance with manufacturer's instructions, until color additives are uniformly dispersed through-out mixture and disintegrating bags, if used, have completely disintegrated.

.2 Minimum Cement Content shall be as recommended by the colour additive manufacturer.

.3 Minimum Air Content shall be as recommended by the colour additive manufacturer.

.4 Slump of concrete to be 100mm (4-inches) unless otherwise recommended by the manufacturer.

.5 Supplemental admixtures shall not be used unless approved by manufacturer.

.6 Do not add water to the concrete mix in the field.

.3 Colored Concrete Additive:

.1 Pure, concentrated mineral pigments especially processed for mixing into concrete and complying with ASTM C 979.

.2 Additive shall be resistant to fading caused by exposure to ultra-violet light.

.3 Manufacturer:
Interstar Pigments, Admixtures & Fibers
4255 Portland Boulevard
Sherbrooke, Quebec J1L 3A5
Tel. 819-563-9975 or 800-567-1857
Email: info@interstar-paf.com

.4 Colour: **"Bamboo" – JN-4411R**
Use "Interstar Integral Colour for Ready Mix Concrete" standard colours as and where indicated on the drawings, or approved equal.

.5 Color additives containing carbon black are not acceptable.

.6 Submissions for approved equal will be reviewed after award and must be submitted within 10 business days of purchase order issuance. Submissions must include complete manufacturer documentation to allow for comparison with the specified product. In the event of rejection of submission, Contractor will be responsible to provide the specified product. The Owner will not accept any cost or delay due to rejection of submission.

.4 Curing Compound: Use curing compound from same manufacturer as colour additives and manufactured to be used in conjunction with colour additives used for this project.

.5 Form Facing Material: Non-porous surface; steel, plastic, or high-density overlaid plywood; with watertight joints, sealed to prevent leakage.

.6 Form Ties: Fiberglass rods tinted to match concrete.

.7 Supports for Reinforcing Bars: Use corrosion-resistant types at locations in contact with exposed surfaces.

.8 Calcium chloride: Do not use admixtures containing calcium chloride.

PART - 3 EXECUTION

3.1 MEASURING, BATCHING, MIXING, AND DELIVERING CONCRETE:

.1 Measure, batch, mix, and deliver concrete with pigment according to manufacturer's instructions.

.1 Ensure mixer is clean and free of washout water before loading.

.2 Load mixer to a minimum of 40 percent capacity.

.3 Do not load mixer beyond recommended capacity.

.4 Add concrete materials to mixer in same order for each batch.

.5 Do not add pigment to mixer as first concrete material.

.6 Maintain consistent amounts of batch water in each batch.

3.2 PREPARATION

.1 Conform to section 03 30 00.09 or with more stringent requirements if recommended by colour admixture manufacturer.

3.3 INSTALLATION/APPLICATION

.1 Conform to section 03 30 00.09 or with more stringent requirements if noted below or recommended by colour admixture manufacturer.

.2 Do not add water to concrete mix in the field.

.3 Do not spray, mist, fog or soak concrete with water, or use wetted materials to cool or prevent from drying.

.4 Do not apply calcium chloride containing materials to the concrete surface.

.5 Do not place any protective covering directly on the concrete surface for a minimum of 48 hours.

3.4 FINISHES

.1 Conform to section 03 30 00.09 or with more stringent requirements if noted below or recommended by colour admixture manufacturer.

.2 Provide finishes as indicated on drawings and to match accepted mock-up(s).

.3 Allow excess surface water to evaporate before finishing.

.4 Do not over-finish surface. Avoid burning surface.

.5 Surfaces shall be finished uniformly.

.6 Stripping of forms:

.1 Leave forms in place as long as practical.

.2 Remove forms when concrete has reached a consistent age to maintain uniformity of curing conditions throughout Project.

.3 Minimize differences in curing conditions.

.4 Apply curing compound as soon as forms are stripped. Do not strip forms if curing compound cannot be promptly applied.

.7 Broomed Finish: Do not dampen brooms.

.8 Trowel Finish: Do not over-trowel or start troweling late.

3.5 CURING

.1 Conform to section 03 30 00.09 or with more stringent requirements if noted below or recommended by colour admixture manufacturer.

.2 A. Integrally Coloured Concrete: Apply curing compound for integrally coloured concrete according to manufacturer's instructions using manufacturer’s recommended application techniques. Apply curing compound at consistent time for each pour to maintain close colour consistency.

.1 Maintain concrete within manufacturer's recommended temperature range during curing.

3.6 PATCHING

.1 If indicated, fill holes and defects in concrete surface within 48 hours of form removal.

.2 Use the same patching materials and techniques that were approved on mock-up.

.3 Make patches with a stiff mortar made with materials from the same sources as the concrete. Adjust mortar mix proportions so dry patch matches dry adjacent concrete. Add white cement to mortar mix if necessary to lighten it.

3.7 TOLERANCES

.1 Installation and finishing tolerances shall conform to section 03 30 00.09 or with more stringent requirements if noted below or recommended by colour admixture manufacturer.

.2 At 28 days, colour shall match the mock-up, in the opinion of the consultant.

.1 Slight variations are acceptable within a range similar to natural variations in color and appearance of uncolored concrete.

3.8 CLEANING

.1 Conform to sections 01 74 00 and 03 30 00.09.

.2 Ensure concrete has fully cured before cleaning.

.3 Clean concrete of efflorescence in accordance with manufacturer’s instructions.

.4 Use only cleaning agents approved by the colour additive manufacturer.

.1 Do not use cleaners containing acid.

.2 Apply cleaner in accordance with cleaner manufacturer’s instructions.

3.9 PROTECTION OF FINISHED WORK:

.1 Protect finish work from damage and from any conditions that may lead to discoloration until final acceptance by Owner.

.2 Prohibit foot or vehicular traffic on coloured concrete surfaces using such barricades as may be required.

.1 Do not place barricades on the coloured concrete surface.

END OF SECTION 03 35 20

1 General

1.1 **SECTION INCLUDES**

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

1.2 **REFERENCES**

.1 CSA A165 Series – CSA Standards on Concrete Masonry Units.

.2 CAN/CSA A23.1/A23.2 – Concrete Materials and Methods of Concrete Construction, Methods of Test, and Standard Practices for Concrete.

.3 CAN/CSA A3000 – Cementitious Materials Compendium.

.4 CSA A179 – Mortar and Grout for Unit Masonry.

.5 CSA A370 – Connectors for Masonry.

.6 CSA A371 – Masonry Construction for Buildings.

.7 CSA G30.18 – Carbon Steel Bars for Concrete Reinforcement.

.8 CSA S304.1 – Design of Masonry Structures.

.9 ASTM A82/A82-M – Specification for Steel Wire, Plain, for Concrete Reinforcement.

.10 ASTM A167 – Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.11 ASTM C90-02 – Standard Specification for Loadbearing Concrete Masonry Units.

.12 ASTM C207 – Specification for Hydrated Lime for Masonry Purposes.

1.3 **SUBMITTALS**

.1 Shop drawings:

.1 Submit shop drawings in accordance with Section 01 33 00.

.2 Include wall sections, details, reinforcing, anchors, special detailing, patterning, and control joint locations.

.3 Proposed control joint locations.

.4 Masonry unit types, grades, textures, typical dimensions, colors, special shapes, and their dimensions.

.5 Layout and coursing details for each masonry unit type. Units must not be cut without Consultant's approval. Layout to use full masonry veneer units.

.6 Provide engineered shop drawings for masonry unit wall assemblies serving as guards.

.7 Submit engineered shop drawings detailing:

.1 Non-axial-load-bearing masonry assemblies.

.2 Masonry reinforcement.

.3 Masonry ties and connectors.

.2 Samples:

.1 Submit samples as per Section 01 33 00.

.2 Provide samples of each type of masonry unit prior to ordering.

.3 Submit colored mortar samples that match masonry samples.

.4 Provide two samples of each specified type of concrete masonry unit, including corner units, showcasing varying levels of "roughness" or texture.

.5 Provide one sample of each specified masonry accessory.

.6 Provide one sample of each proposed masonry reinforcement and tie.

1.4 QUALITY ASSURANCE

.1 Installers / applicators / erectors: Work under this Section shall be performed by qualified personnel with a minimum of 5 years of experience in applying the specified products, systems, and assemblies, and who have approval from the respective product manufacturers. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

.2 Perform plain and reinforced masonry work in compliance with CSA A370, CSA A371, and CSA S304.1 standards.

.3 Mock-ups:

.1 Provide concrete block partition mock-ups for partitions with transparent sealer or paint finishes as follow:

.1 Construct sample panels measuring approximately 900 mm x 900 mm (36" x 36") of concrete masonry partition assemblies.

.2 Accepted mock-ups may not be retained as part of the final completed Work.

.4 Cold Weather Protection:

.1 Perform work in accordance with CAN/CSA-A371 and as outlined below:

.1 Ensure mortar temperature remains between 5°C and 50°C until used or stabilized.

.2 Maintain ambient temperature of masonry work and its materials between 5°C and 50°C, with protection from windchill.

.3 Keep masonry at a temperature above 0°C for at least 3 days after mortar application.

.4 Preheat unheated wall sections within enclosures to a minimum of 10°C for at least 72 hours prior to mortar application.

.5 Avoid using scorched aggregate, salts, or anti-freezes. Use only

.6 Grout shall be placed in masonry at a temperature range of 20°C to 50°C.

.7 Ensure mortar temperature does not exceed 50°C to prevent flash setting.

.8 Maintain dry bedding for masonry and use only dry masonry units. Do not wet masonry units during winter conditions.

.5 Hot Weather Requirements:

.1 Perform work in accordance with CAN/CSA-A371 and as detailed below:

.1 Prepare for hot weather conditions by planning in advance and protecting freshly laid masonry from rapid drying using waterproof, non-staining coverings.

.2 Avoid the use of dry masonry units in hot weather. Employ predampened units that are nominally saturated but surface dry at the time of laying. Do not immerse masonry units in water.

.3 Limit mortar spread to the amount necessary for soft setting of masonry units. Avoid over-mixing mortar materials. Do not retemper mortar after two hours of initial use or retemper pigment-colored mortar. Ensure no more than 900 mm of mortar is spread for masonry placement at any time.

.6 The Zero Carbon Building – Design Standard v4- Design Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

.7 **DELIVERY, STORAGE, AND HANDLING**

.1 Ensure delivery, storage, and handling of products comply with the Conditions of the Contract and requirements specified in this section.

.2 Remove and replace materials deemed unacceptable by the Consultant. Store materials off the ground, shielded from rain, snow, groundwater, or contamination by earth or other materials. Protect metal ties and reinforcement from corrosion during storage.

.3 Avoid concentrating material storage in any location that may exceed the structure's design load. Exercise caution to prevent overloading unsupported portions of the structure that may not have reached full design strength.

.4 Adhere to CSA A371 standards. Refrain from using salt or calcium chloride for ice removal on masonry surfaces.

.5 Deliver mortar materials in their original, intact, and undamaged packaging, with the manufacturer's name and brand clearly labeled. Take precautions to prevent damage to masonry units.

.6 Maintain masonry materials free from ice and frost. Protect units from exposure to concrete, mortar, or other substances that could cause staining.

1.2 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 Construction Waste Management and Disposal.

2 Products

2.1 **MASONRY CONCRETE BLOCK UNITS**

.1 Acceptable Masonry Concrete block unit manufacturer:

.1 Concrete Block (CB-1), (CB-2), (CB-3):

.1 CarboClave CO2 Smooth Ledge by Brampton Brick or approval equivalent.

.2 Provide normal weight concrete block units conforming to CSA A165 Series, with dimensions as indicated on the Contract Drawings. Include H/15/A/M, S/15/A/M, and Sc/15/A/M classifications as required, with thicknesses specified on the drawings.

.3 Supply normal weight concrete block units per CSA A165 Series, with the following classifications and thicknesses:

.1 CB-1: 190mm x 390mm x 190mm concrete block combined with 190 mm thick x 102 mm high ashlar concrete block. Install in Stack Bond unless otherwise specified.

.2 CB-2: 90mm x 390mm x 190mm concrete block combined with 90 mm thick x 102 mm high ashlar concrete block. Install in Stack Bond unless otherwise specified.

.3 CB-3: 75mm x 390mm x 190mm concrete block. Install in Stack Bond unless otherwise specified.

.4 Provide special shapes unless otherwise noted, including corner returns, bull-nosed or double bull-nosed units for exposed and external corners, bond beams, sash blocks for control joints, solid blocks where specified, concrete block lintels for openings in walls, and any additional special shapes indicated.

.5 Obtain all masonry unit types from a single manufacturer to ensure consistency. Install units with uniform texture and colour for each specified type.

.6 Ensure all masonry units supplied have exposed surfaces free of cracks, chips, blemishes, and broken corners.

2.2 **MASONRY VENEER UNITS**

.1 Masonry Veneer Unit (BR-1): Shouldice Stone “Polar Urban Brick Smooth”

.1 Manufactured by Shouldice Stone, Polar Urban Brick Smooth is available at I-XL Building Products or approved equivalent

.2 Masonry Veneer Units shall meet CSA-A165.2 Series-94 and ASTM C90-02 Grade N, Specifications.

.3 Manufacturer shall supply test data to support Specifications requirements

.4 Masonry Veneer Units shall be manufactured with integral water repellent additive.

.5 Masonry Veneer Units shall be used for non-load-bearing exterior applications**.**

.6 Masonry Veneer Units shall maintain uniform and consistent colour throughout all supplied units.

.7 Masonry Veneer Units shall be installed in a ½ running bond pattern unless otherwise specified.

.8 Dimensions:

.1 Height: 2.25” (57 mm)

.2 Length: 15.625” (397 mm)

.3 Thickness: 3.5” (90 mm)

2.3 **ACCESSORIES**

.1 Reinforcement: Ensure compliance with CSA A370, CSA A371, ASTM A82, and ASTM A167 standards. All components shall be hot-dip galvanized and stainless steel, Type 304, unless otherwise specified. Provide separators or isolators to prevent galvanic reactions:

.1 This specification references products manufactured by Blok-Lok Limited. Products by Dur-O-Wal Ltd. and Fero Corporation are acceptable alternatives.

.2 Type 1 (single wythe): Truss-type reinforcement, galvanized steel; specified as ‘Blok-Trus BL30’.

.3 Connectors: Conform to CSA A370 and CSA S304.1.

.4 Reinforcing steel: CSA G30.18, Grade 400. Refer to Contract Drawings for the number, size, and location of reinforcing steel.

.5 Loose Steel Lintels and Lateral Support Angles: Provide as part of the scope under Section 05 50 00.

.6 Through wall flashings: prefinished metal flashings in accordance with Section 07 62 00, continuous strips with a 19 mm min. folded drip edge.

.7 Dampproof Course and Flashing: Utilize reinforced SBS rubberized asphalt compound laminated to a cross-laminated polyethylene film, 40 mils thick. Acceptable product is 'Airshield Thru Wall Flashing' by W.R. Meadows or an approved alternative, with primer and adhesive recommended by the flashing manufacturer.

.8 Compressible Filler: 75 x 6 mm thick preformed polyurethane foam; specified as 25V by Emseal Joint Systems Ltd.

.9 Control Joint Filler: Prefabricated extruded rubber joint matching wall thickness;

specified as RS Series Rubber Control Joint by Blok-Lok or an approved alternative.

.10 Mortar Net: 250 mm high, with thickness suited to cavity dimensions; specified as Mortar Net by Mortar Net USA Ltd.

.11 Special shapes: Unless indicated otherwise, supply and install corner returns, bull-nosed or double bull-nosed units for exposed and external corners, bond beams, sash blocks for control joints, solid block where noted, concrete block lintels over openings in concrete block walls and any additional special shapes as indicated.

.12 Obtain each masonry unit type from same manufacturer. Supply and install units of uniform texture and colour for each kind required.

.13 Supply masonry units with exposed surfaces free of cracks, chips, blemishes, and broken corners.

2.4 **MORTAR MATERIALS**

.1 Loadbearing masonry: Conform to CSA A179, Type S, using the proportion method.

.2 Interior non-loadbearing masonry: Conform to CSA A179, Type N, using the proportion method.

.3 Cement: Use CAN/CSA A3000, normal Portland cement, Type GU. Provide white cement for white or light-colored mortars as required.

.4 Masonry aggregate: Meet the requirements of CSA A179. Use white aggregate for white or light-colored mortars as necessary.

.5 Hydrated lime: Conform to ASTM C207, Type S.

.6 Water: Use clean, potable water free from deleterious elements and salts that may cause efflorescence.

.7 Mortar pigment: Use 'Bay Ferrox' by Bayer Inc. or an approved alternative by Elementis Pigments. Final color to be selected by the Consultant.

.8 Concrete fill and grout: Utilize 20 MPa concrete in accordance with CAN/CSA A179.

3 Execution

3.1 **EXAMINATION**

.1 Verify the condition and dimensions of previously installed Work that this Section depends upon. Report any defects or discrepancies to the Consultant. Commencement of Work will indicate acceptance of the existing conditions.

.2 Before commencing masonry work, verify required limitations for wall heights, wall thicknesses, openings, bond, anchorage, lateral support, and compressive strengths of masonry units and mortars.

3.2 **PROTECTION**

.1 Provide and install temporary waterproof, non-staining coverings that are securely fastened to prevent displacement. Extend coverings over walls and down sides to shield masonry Work from snow, wind-driven rain, and excessive drying until the masonry Work is completed and permanently protected by flashings or other construction.

.2 Provide and install non-staining protective coverings on both horizontal and vertical surfaces to safeguard the Work of this Section from damage, staining, marking, and mortar droppings.

3.3 **WORKMANSHIP**

.1 Execute masonry Work in full compliance with CSA A371 and as specified in the Contract Documents.

.2 Provide masonry Work that is plumb, level, and aligned accurately. Ensure vertical joints are in proper alignment, and horizontal courses are uniform, level, and straight.

.3 Construct masonry to meet the requirements and standards established by jurisdictional authorities.

.4 Do not incorporate admixtures into the masonry without obtaining prior written approval from the Consultant.

3.4 **MASONRY - GENERAL INSTALLATION**

.1 Construct masonry in compliance with requirements established by jurisdictional authorities.

.2 Prior to starting masonry work, confirm limitations regarding wall heights, thicknesses, openings, bond, anchorage, lateral support, and compressive strengths of masonry units and mortar.

.3 Construct fire-resistant masonry and separations as specified on Drawings, conforming to the Fire-Performance Ratings in Appendix ‘D’ of the National Building Code of Canada.

.4 For fire separations and those with fire resistance ratings, ensure walls are tightly constructed to adjacent surfaces and at the perimeter without voids or reductions in thickness that would compromise the required ratings.

.5 Avoid buttering corner units, excessive furrowing, or throwing mortar into joints. Do not adjust masonry units after the mortar sets; replace if adjustment is required.

.6 Admixtures shall not be used unless approved in writing by the Consultant.

.7 Tool mortar joints with a slightly concave profile using non-staining tools unless noted otherwise. In unexposed areas or where specified, strike joints flush. Ensure joints are properly compressed and clean excess mortar.

.8 Maintain a 25 mm clearance between masonry walls and underside of structural steel elements and a 19 mm gap beneath shelf angles, filling the gap with compressible filler.

.9 Cut masonry units with a wet saw to ensure precise, clean, and unchipped edges. Cut as needed to fit work neatly, including flush-mounted outlets and conduit, leaving no more than 3 mm clearance. Use full-size units whenever possible.

.10 Install adjustable wall reinforcement in veneer walls at 400 mm vertical and 600 mm horizontal intervals. Extend reinforcement across cavities into exterior wythes and ensure additional reinforcement around openings as indicated.

.11 Reinforce block walls with continuous wire reinforcement every second course. Utilize prefabricated L and T sections, cutting and lapping per manufacturer's instructions. Do not

bend reinforcement.

.12 Install vertical reinforcing steel in block walls per Drawings and fully grout cores.

.13 Provide extra reinforcement above and below openings in block walls, extending 600 mm beyond each side.

.14 Reinforce corners and intersections with strap anchors spaced 400 mm apart.

.15 Do not run reinforcement continuously across masonry wythes at control joints.

.16 Lay masonry with 10 mm thick joints unless otherwise specified, ensuring uniform joint thickness and alignment.

.17 Form control joints using specified units or details. Fill joints with joint filler to their full height, leaving 13 mm depth for sealant unless otherwise noted.

.18 Install control joints as shown on drawings, and at projections or directional changes. Where not indicated, provide joints at 6100 mm intervals for exterior walls and 9150 mm for interior walls.

.19 Where required, install movement joints between areas with different support conditions.

.20 Place solid blocks or metal lath under block and fully grout block cells for lintel bearing or anchor installations.

.21 Avoid toothing wall intersections unless specifically noted.

.22 Install weep hole vents per manufacturer’s instructions at maximum 600 mm intervals, ensuring they remain free from mortar or debris.

.23 Coordinate masonry installation with air barrier and vapor retarder systems to maintain system continuity.

3.5 DAMPPROOF COURSES AND FLASHING

.1 Trim dampproofing to ensure it is fully concealed within the masonry.

.2 Install flashings in compliance with CSA A371 standards, ensuring alignment with all specified requirements.

.3 Position flashings under exterior masonry bearings, including foundation walls, slabs, shelf angles, and steel angles above openings or other areas as indicated. Extend flashings a minimum of 200 mm beyond wall openings, turning up at least 150 mm at each end to create a watertight dam to prevent water drainage into the cavity.

.4 Overlap dampproofing and flashings by at least 150 mm, ensuring all laps are sealed in accordance with the manufacturer's recommendations.

.5 Install a mortar net at the bottom of the cavity, following the manufacturer’s instructions for placement. Apply additional layers of the mortar net if required to fill the cavity thickness. Ensure the net is installed in a continuous layer to maintain proper drainage and performance.

.6 Prior to the start of masonry work, place the specified dampproofing beneath the first masonry course. Install the dampproofing continuously, with lapped ends cut flush with the exterior wall face. Apply similar dampproofing to the top course of masonry to ensure consistent protection.

3.6 MORTAR MIXING

.1 Thoroughly mix mortar ingredients in precise quantities to meet the immediate requirements of CSA A179 standards.

.2 Measure and batch mortar materials using either volume or weight to ensure accurate control and maintain proper proportions. Avoid measuring materials using a shovel.

.3 Mix mortar with the maximum water content necessary to achieve optimal workability while maintaining the required tensile bond strength within the mortar's capacity.

.4 Do not use mortar that has started to set. Use the mixed mortar within 2 hours of its initial preparation. Re-temper the mortar during this 2-hour window only to restore workability as needed.

.5 Add mortar colorants and admixtures strictly according to the manufacturer's instructions.

.6 Ensure consistency and uniformity in both the mortar mix and its color throughout the application process.

3.7 BLOCK

.1 Lay blocks in a running bond pattern unless otherwise specified. Align block webs vertically, ensuring the thicker ends of face shells are positioned upward.

.2 Apply a full bed of mortar for the initial courses of masonry, particularly for masonry units 100 mm thick or less, as well as for solid units. For subsequent courses, fully bed the face shells and vertical end joints in mortar.

.3 Install specially shaped and sized concrete block units as required and as indicated on drawings to ensure a complete, coordinated assembly and to minimize the need for cut units.

.4 Place and install two courses of solid block beneath lintel bearings to provide proper support.

.5 Stagger end joints in each course and align joints plumb in alternating courses.

.6 Bond intersecting block walls by overlapping alternate courses. For blockwork adjoining concrete, anchor each course securely to the concrete structure.

.7 Tool mortar joints slightly concave using non-staining tools unless specified otherwise. Strike joints flush in non-exposed areas or as shown in the Contract Drawings. Apply sufficient pressure to mortar joints to ensure a tight bond with masonry units on both sides. Clean off excess mortar and burrs.

.8 Cut masonry units using a wet saw to achieve straight, clean, and even edges without chipping. Cut units as needed to fit adjacent work neatly or for flush-mounted electrical outlets, grilles, pipes, or conduits, maintaining a maximum clearance of 3 mm. Use full-size units wherever possible to minimize cutting.

3.8 MASONRY STONE VENEER

.1 Prior to installation of masonry stone veneer, coordinate installation of air and vapour retarder with Section 07 26 00.

.2 Prior to installation of cavity insulation, examine air and vapour retarder and make good damage. Install cavity wall insulation in accordance with Section 07 21 00.

.3 Lay masonry veneer in running bond, unless indicated otherwise, and in a full bed of mortar.

.4 Form angle corners with special shaped units; cutting of units is not permitted.

.5 Erect exterior cavity wall construction as shown on Contract Drawings.

.6 Install masonry veneer to prevent mortar droppings and protrusions from impeding drainage and pressure equalization of rainscreen cavities and drained walls.

.7 Apply sufficient mortar on end of stretchers to ensure end joints are compressed full when masonry unit is pressed into place.

3.9 LINTELS

.1 Install concrete block lintels above masonry openings unless steel lintels are specified.

.2 Position lintels with a minimum bearing of 200 mm evenly distributed at each end. Place a bond breaker beneath the bearing ends to prevent adhesion.

.3 Incorporate reinforcing steel and concrete fill within block lintels as required to provide structural integrity.

.4 Install loose steel lintels as detailed in the Contract Drawings, ensuring they are centered over the width of the opening.

3.10 LATERAL SUPPORT ANGLES

.1 Provide lateral supports at the top of non-load-bearing unit masonry partitions where they meet structural elements, in compliance with the Ontario Building Code and Structural details.

.2 In areas with scheduled ceilings, install 150 mm lengths of steel angles on each side of the partition at 1200 mm intervals, staggered to ensure stability and compliance with design requirements.

3.11 LATERAL SUPPORTS

.1 In addition to the requirements outlined in the Contract Documents, provide horizontal and vertical wall and partition lateral support anchors in compliance with CAN/CSA A370-15 standards.

3.12 TEMPORARY BRACING

.1 Provide sufficient temporary bracing to support masonry walls until the installation of floor and roof decks is complete and sufficient diaphragm action is achieved to adequately brace the walls.

3.13 MOVEMENT / CONTROL JOINTS

.1 Space vertical movement joints at a maximum of 7500 mm (25') on center for masonry without openings.

.2 For masonry with multiple openings, position movement joints symmetrically, reducing spacing to no more than 6000 mm (20') on center.

.3 Install movement joints at changes in wall direction, variations in building height, door and window locations as necessary, and at major changes in wall thickness.

.4 Extend movement joints to the top of masonry, including parapets.

.5 Coordinate and confirm movement joint locations with the Consultant before commencing masonry installation.

3.14 PRECAST SHAPES

.1 Ensure continuous installation of dampproofing or flashings beneath the full length of precast shapes to maintain waterproofing integrity.

.2 Set precast shapes in a full mortar bed, securing them to one another with stainless steel dowels and attaching to masonry units using stainless steel hook anchors. Fully grout the connections to ensure stability and structural integrity.

3.15 PATCHING

.1 Lay masonry to replicate the existing pattern unless specified otherwise.

.2 Apply a full bed of mortar for the initial courses of masonry, for units 100 mm thick or less, and between solid masonry units to ensure a stable foundation.

.3 Stagger end joints in each course, ensuring alignment of joints plumb with every alternate course for uniformity and structural integrity.

3.16 INSTALLATION TOLERANCES

.1 Ensure masonry work achieves a plane flatness and exposed end tolerance of 3 mm over 3000 mm.

.2 Maintain a maximum variation in alignment between adjacent units of 1.5 mm.

.3 Ensure plumb alignment within 6 mm over 3 m or 6 mm over 6 m for external corners, expansion joints, or other prominent lines.

.4 Maintain level alignment within 6 mm for any bay or 6 m maximum span and within 12 mm for spans of 12 m or more.

.5 Position masonry within 12 mm of specified locations relative to columns, walls, and partitions in any bay or 6 m maximum span, and within 19 mm for spans of 12 m or more.

.6 Construct openings with a maximum deviation of 6 mm from the specified dimensions.

.7 Ensure column and wall cross-section dimensions are within a range of minus 6 mm to plus

12 mm.

.8 Maintain joint widths as indicated, not exceeding 12 mm, with mortar joint thickness variation limited to 1 mm per metre.

.9 Install masonry walls with a 25 mm clearance beneath steel building frames, roof, or floor decks. Ensure a 19 mm space is maintained beneath shelf angles, filled with compressible filler.

3.17 BUILT-IN ITEMS

.1 Coordinate and position built-in items required for incorporation into masonry or provided under other sections, including elevators, doors, lintels, sleeves, inserts, and similar components. Ensure all built-in items are installed neatly, rigidly, accurately, and plumb.

.2 Create wall openings, slots, and recesses as necessary for ducts, grilles, pipes, and other elements.

.3 Align installation of conduit, outlet boxes, and other built-ins for refrigeration, mechanical, and electrical systems with the work specified under Divisions 21, 22, 23, 24, 26, 27, and 28.

.4 Ensure built-in items remain in position throughout construction. Regularly verify plumb, location, and alignment as work progresses to avoid displacement.

.5 Metal Door Frames

.1 Construct masonry around metal door frames to ensure proper integration.

.2 Secure anchors firmly, ensuring that frames remain true and plumb.

.3 Fill voids behind frames using Type N or Type S mortar unless otherwise specified.

.4 Protect frames with appropriate coverings to prevent damage, ensuring no mortar is left on exposed frame surfaces.

3.18 JOINTING

.1 Form tooled mortar joints where exposed to view and behind cabinets, fitments, or wall accessories. Tool joints when mortar reaches thumb-print hardness, using tools with long bearing surfaces to ensure uniformity and avoid uneven depressions. Ensure all cracks and crevices are closed.

.2 Use non-staining pointing tools to achieve smooth, compressed, and uniformly formed joints:

.3 For exposed concrete unit masonry:

.1 Concave.

.4 For concealed masonry: Strike flush joints within concealed areas, including walls receiving plaster, stucco, tile, insulation, resilient bases, or similar applied materials, except paint or thin finish coatings. Ensure no mortar protrudes from joints on surfaces receiving coatings or materials.

.5 Maintain mortar joint thickness as follows:

.1 Standard mortar joint thickness: 10 mm (3/8"), unless otherwise indicated or specified.

.2 Maximum joint size around masonry cuts for obstructions: 13 mm (1/2").

.6 Ensure all joints are of uniform thickness, with vertical joints aligned.

.7 Trowel point joints for unparged masonry at below-grade locations in contact with earth.

.8 Form reglets for metal flashing in masonry where indicated.

.9 Remove loose or defective mortar from areas where masonry is removed and replace with new mortar.

.10 Rake out joints at junctions of masonry with concrete walls, columns, and intersections of masonry walls and partitions where joint reinforcement is installed. Seal these joints in accordance with Section 07 91 00.

3.19 REPAIR AND POINTING

.1 Remove and replace masonry units that are loose, chipped, broken, cracked, marked, stained, discoloured, or otherwise damaged.

.2 Provide and install new masonry units that match adjacent units in texture, colour, and appearance. Install these units using fresh mortar and ensure pointing is done to eliminate any visual evidence of replacement.

.3 During joint tooling, enlarge any cracks, holes, or defects as necessary. Fully fill these areas with mortar to ensure a seamless repair.

.4 Point all joints, including those at corners, openings, and adjacent work areas, to achieve a neat, uniform appearance. Prepare all pointed joints appropriately for the subsequent application of sealant compounds.

3.20 CLEANING

.1 Follow the unit masonry manufacturer's written instructions for proper cleaning procedures specific to the masonry materials used.

.2 Clean exposed masonry surfaces by removing excess mortar as the work progresses. Allow mortar droppings to partially dry before using a stiff fiber brush to dry-brush the surface, ensuring no residue or debris remains.

.3 Protect masonry and surrounding work from damage during cleaning operations.

.4 Perform cleaning in accordance with the masonry manufacturer's printed instructions. Replace any damaged masonry with new materials if cleaning causes harm to the work.

.5 Use a proprietary pH-neutral cleaning solution mixed with water as approved by the masonry unit manufacturer, adhering to their printed directions.

.6 Conduct a cleaning test on a small, inconspicuous area to evaluate the cleaning agent and procedure. Review the test area with the Consultant and secure written approval before proceeding with the full cleaning scope.

.7 Saturate walls with clean water to flush off loose dirt and mortar prior to applying the cleaning solution.

.8 Apply the specified cleaning agent per the manufacturer's instructions, working systematically from top to bottom.

.9 Rinse all cleaned areas thoroughly with clean water to remove residual cleaning solutions, dirt, and mortar.

.10 Remove mortar from exposed masonry surfaces immediately after pointing and prior to setting fully to prevent staining. Replace masonry if stains cannot be removed without causing damage.

.11 Promptly clean mortar droppings from flashings and adjacent materials to prevent discoloration or damage.

3.21 **PROTECTION**

.1 Protect masonry and adjacent work from marking, damage, and mortar droppings using non-staining coverings.

.2 Safeguard other materials and finishes from contamination by mortar droppings to maintain their integrity and appearance.

.3 Provide temporary bracing for masonry during and after construction until permanent lateral supports are securely in place.

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

.1 Provide all material and labour required for the completion of the Contract. Breakdown of Work by Section is for guidance only and is not necessarily complete.

.2 Work Furnished and Installed:

.1 Structural steel work, including steel joists and bridging.

.3 Related Work Specified Elsewhere:

.1 Grouting beneath column bases and bearing assemblies on concrete members: Section 03 30 00.

.2 Grouting beneath baseplates bearing on masonry: Section 04 05 16.

.3 Concrete reinforcement: Section 03 20 00.

.4 Paint and steel preparation for paint systems: Section 09 91 00

.4 Work Furnished but not Installed:

.1 Anchor bolts, bearing assemblies and other structural steel connections to be cast into concrete.

.2 Shelf angles and related connections to be built into concrete to receive masonry.

.3 Bearing plates and related connections for metal deck to be built into masonry or concrete.

.4 Loose lintels, shelf angles and plates to be built into masonry.

1.2 EMBODIED CARBON DOCUMENTATION REQUIREMENTS

.1 Refer to the GWP (global warming potential) maximum limits on embodied carbon referenced in the General Notes within the structural Contract Documents.

.1 The GWP limits are expressed in kg $CO2_e$ per metric tonne (1000 kg) of fabricated steel.

.2 The GWP limits represent stages A1-A3 in the life cycle analysis of the steel production process.

.2 Structural steel is only to be sourced from suppliers that provide a Type III EPD (environmental product declaration) for their products. Industry average, Type II EPDs are not acceptable.

.3 These limits apply to a minimum of 85% of the steel on the project on a per tonne basis.

1.3 STANDARDS, CODES AND ACTS

.1 Conform to the Ontario Building Code 2012 under Ontario Regulation 332/12, including Ontario Regulation 88/19 and any applicable acts of any authority having jurisdiction and the following (latest edition including any and all supplements):

.1 CSA S16 - Limits States Design of Steel Structures, Canadian Standards Association.

.2 CSA G164 - Hot Dip Galvanizing of Irregularly Shaped Articles, Canadian Standards Association.

.3 CSA S136 - North American Specifications for the Design of Cold Formed Steel Structural Members (using the Appendix B provisions applicable to Canada)

.4 CSA W47.1 - Certification of Companies for Fusion Welding of Steel Structures, Canadian Standards Association.

.5 CSA W48 – Filler Metals and Allied Materials for Metal Arc Welding, Canadian Standards Association.

.6 CSA W59 – Welded Steel Construction (Metal Arc Welding), Canadian Standards Association.

.7 CSA W178.1 – Certification of Welding Inspection Organizations, Canadian Standards Association.

.8 CSA W178.2 – Certification of Welding Inspectors, Canadian Standards Association.

.9 CISC/CPMA 1-73a – A Quick-drying One-coat Paint for Use on Structural Steel, Canadian Institute of Steel Construction.

.10 SSPC SP1, Solvent Cleaning, The Society for Protective Coatings.

.11 SSPC-SP2, Hand Tool Cleaning, The Society for Protective Coatings

.12 SSPC-SP6/NACE No. 3, Commercial Blast Cleaning, The Society for Protective Coatings

.13 SSPC-SP7/NACE No. 4, Brush-Off Blast Cleaning, The Society for Protective Coatings

.14 SSPC-SP10/NACE No. 2, Near-White Blast Cleaning, The Society for Protective Coatings

.15 SSPC-SP16, Brush-Off Blast Cleaning of Non-Ferrous Metals, The Society for Protective Coatings

.16 ASTM D6386, Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting

.17 ASTM A780 / A780M Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings

.18 CISC Code of Standard Practice for Structural Steel

.2 Where there are differences between the specifications, drawings, standards, codes or acts, the most stringent shall govern.

1.4 TOLERANCES

.1 Conform to erection tolerances specified in CSA S16 Clause 29.3.

.2 Interfacing tolerances may not be compatible with the above. Review and coordinate interfacing tolerances so that the various elements come together properly.

1.5 QUALIFICATIONS

.1 Be certified under the requirements of Division 1, or Division 2.1 of CSA Standard W47.1.

1.6 DESIGN

.1 General

.1 Design connections, bridging, and the like in accordance with the requirements of CSA S16 and the following for the loads shown or implied.

.2 Design cold-formed steel members, their connections, bracing and the like in accordance with CSA Standard S136 for the loads shown or implied.

.3 Design calculations shall be carried out by a professional engineer licensed to practice in the Province of Ontario.

.2 Connections

.1 Use types of shop or field connection shown, or in absence of such indication, use most appropriate type of connection.

.2 Design of connections shall include not only those between columns, beams, girders, and braces, but also between such members as spandrel angles and beams, hangers, stiffeners, etc., and their supporting members (be they steel or concrete).

.3 Design connections to safely withstand the combined effects of shear, moment and torque at applicable design stresses.

.4 Do not weld galvanized members without the Consultant's approval.

.5 Design bracing member connections for positive adjustability.

.6 Design connections that are exposed to weather so that moisture, dirt and the like cannot gain entry to the interior of hollow built-up members.

.7 Design and detail connections so as not to interfere with architectural clearance lines or finishes.

.8 Where connections between beams and columns and the like result in loss of bearing to the wood deck or the like, design and provide support as required.

.9 Design and provide end bearing connections of inclined members and joists such that the bearing plane between them and their supporting members is horizontal.

.10 Design connections of cold-formed structural members for the loads shown or implied.

.1 Design connections between galvanized members and cold-formed members to employ powder actuated fasteners, unless noted otherwise

.11 Design connections that are to be cast into concrete to provide for the maximum deviation that can occur in erection and based on the following:

.1 Specified steel erection tolerances.

.2 Maximum permissible tolerances in the location of inserts cast into concrete of plus or minus 15 mm in any direction.

.12 Design interconnection between built up members as noted, or where note noted, interconnect as required to ensure adequate capacity for the design forces shown or implied in the drawings.

.13 Design connection of single angle members for the forces shown or implied in the drawings, such that connection are made to the same leg each end by welding or with a minimum of two bolts.

.3 Bearing Assemblies

.1 The configuration, loads to be transmitted and movements to be permitted are shown. Design the bearings so that they can safely transmit the loads or permit the movements noted.

1.7 SUBMITTALS

.1 Coordinate submittal requirements with Section 01 33 00

.2 Environmental Product Declaration (EPD) Submittal:

.1 Submit Type III EPDS for steel procured for the project.

.3 Submit for review by the Consultant the following shop drawings:

.1 Standard Connection Design Details – when requested.

.2 Non-standard and Exposed Connection Design Details.

.3 Erection Diagrams.

.4 Include the outline of foundation walls with anchor bolt shop drawings for context.

.5 Shop Details – when requested.

.6 Erection Procedures – when requested.

.7 Field Work Details.

.8 Calculations – when requested.

.9 Do not reproduce the structural drawings to serve as erection or setting drawings.

.10 Shop drawings shall bear the signature and stamp of a qualified professional engineer licensed to practice in the Province of Ontario responsible for design of their respective work. Alternatively, a sealed memo to same effect can be provided.

.4 Standard Connection Design Details

.1 Connection design details shall be prepared before the preparation of shop details and submitted to the Consultant for review that the intent of the design is met.

.5 Non-standard and Exposed Connection Design Details

.1 Moment and torsion connections.

.2 All connections exposed to view.

.3 Connection design details shall bear the signature and stamp of a qualified professional engineer licensed to practice in the Province of Ontario.

.6 Erection Diagrams

.1 Amongst other items show the following:

.1 General arrangement of the structure including all steel load-resisting elements essential to the integrity of the completed structure

.2 Principal dimensions of the structure

.3 Piece marks

.4 Sizes of the members

.5 Bearing details.

.6 Holes.

.7 Surface preparation, primer or other coatings.

.8 Grades of steel.

.9 Size and type of bolts and bolt installation requirements

.10 Shop and field welds

.11 Elevations of column bases

.12 All necessary dimensions and details for setting anchor rods

.13 Required clearances and other details to receive correlative items

.14 Any other information necessary for the assembly of the structure

.2 Show necessary dimensions and details for setting structural steel bearings, anchorages, assemblies and the like where they interface with other building components.

.3 Co-ordinate with shop drawings of cast-in-place concrete, masonry, miscellaneous metal work, metal deck and other interfacing work.

.7 Shop Details

.1 Shop details shall provide complete information for the fabrication of various members and components of the structure, including the required material and product standards; the location, type, and size of all mechanical fasteners; bolt installation requirements; and welds.

.8 Erection Procedures

.1 Erection procedures shall be prepared before erection and submitted to the Consultant for review.

.2 Erection procedures shall outline the construction methods, erection sequence, temporary bracing requirements, and other engineering details necessary for shipping, erecting, and maintaining the stability of the steel frame.

.3 Drawings and sketches that identify the location of permanent and temporary load-resisting elements essential to the integrity of the partially completed structure shall supplement erection procedures.

.4 Submit details of method proposed to apply and verify the magnitude of tension to bracing members within the specified tolerances.

.5 Submit procedures proposed when erection is carried out at temperatures greatly differing from 20 degrees C.

.9 Fieldwork Details

.1 Sealed fieldwork details shall be submitted for review by the Consultant whenever modifications to the original details shown on shop drawings are required.

.2 Fieldwork details shall provide complete information for modifying fabricated members in the shop or on the job site. All operations required to modify the member shall be shown on the fieldwork details.

.10 Calculations

.1 Submit calculations bearing the signature and stamp of a qualified professional engineer licensed to practice in the Province of Ontario and such further proof as may be necessary to show that non-standard connections and the like conform to the requirements set forth herein.

.11 Substitution

.1 If the Contractor wishes to make substitutions for steel materials or sizes indicated, submit proposals with the tender with necessary calculations for review of the Consultant. Time spent by the Consultant on this review will be billed hourly.

.12 Drawings for Inspection Company

.1 Furnish inspection company with a copy of erection diagrams, shop details, erection procedures and fieldwork details bearing the Consultant's reviewed stamp.

.13 As-Built Drawings

.1 Mark on 2 complete sets of final drawings any changes, additions or deletions that occur during the construction as a result of the Contractor's work, change orders or for any other reason.

.2 If the Contractor wishes to make use of the structural CAD drawings, the cost of each drawing's CAD file is $150, payable directly to Blackwell. The Contractor is required to sign a waiver stating the intended use prior to release of the drawings.

.14 Mill Test Reports

.1 Submit copies of mill test reports properly correlated to the materials available to the testing agency for review and to the Consultant for records.

PART 2 – PRODUCTS

2.1 MATERIALS

.1 Unless otherwise approved, all structural steels shall be produced in Canada, the United States or EU countries.

.2 Rolled Wide Flange Sections: Conform to ASTM A992/A992M, Fy=345MPa, unless otherwise noted.

.3 Rolled channels and angles: Conform to CAN/CSA-G40.21 350W, unless otherwise noted.

.4 Steel plate, bars and rods: Conform to CAN/CSA-G40.21-04 300W, unless otherwise noted.

.5 Hollow Structural Sections: Conform to CAN/CSA-G40.21-04 Grade 350W, Class C

.1 ASTM A500 is not an acceptable alternate and shall not be used as a substitute unless approved; all HSS sections will require review to be resized (increased wall thickness or increased section size) if ASTM A500 is proposed. The cost of review shall be borne by the contractor.

.2 HSS produced to ASTM A1085 is an acceptable alternate to CSA G40.21 Grade 350W Class C.

.6 Bolts, nuts and washers: ASTM F3125, grade A325, galvanized when used with galvanized material, and produced in Canada, the United States or EU countries.

.7 Coated cold-formed steel: ASTM A653/A653M Grade 340, Fy 345 MPa.

.8 Uncoated cold-formed steel: ASTM A1011/A1011M Grade 340 (Grade 50), Fy=345 MPa.

.9 Nominal Grade paint protection: in accordance with CISC/CPMA 1-73a – A Quick-drying One-coat Paint for use on Structural Steel.

.10 DTM primer/finish: Direct to Metal (DTM) Acrylic Primer/Finish:

.1 Acceptable products:

.1 Sherwin Williams B66W1 DTM Acrylic Primer/Finish

.2 PPG Pitt-Tech 90-712 DTM Primer/Finish

.11 Universal Shop primer: Phenolic Alkyd Primer

.1 Acceptable products:

.1 Devguard 4360 Low VOC Universal Primer.

.2 Sherwin Williams B50 Kem Bond HS Universal Metal Primer.

.3 PPG Amercoat 185H Universal Phenolic Primer.

.12 Repair primer for application in the field:

.1 Water Based Acrylic Primer. Acceptable Products:

.1 PPG Devflex 4020PF Direct to Metal Primer

.2 Sherwin Williams Pro-Cryl B66-310 Series Universal Primer

.3 PPG Pitt-Tech Plus 90-912 Series DTM Industrial Primer

.13 Primer for steel to receive Intumescent fireproofing:

.1 Coordinate with Section 07 81 23 and Section 09 91 00.

.2 Determined to be acceptable based on adhesion and compatibility characteristics under laboratory conditions in accordance with ASTM D3359-09e2, Method A and / or ASTM D4541-09e1, and approved by manufacturer of Intumescent fireproofing to be applied.

.14 Primer for steel to be galvanized and receive a paint finish:

.1 Acceptable products:

.1 Sherwin Williams B71Y1 DTM Wash Primer.

.2 Carboline Sanitile120 Heavy Duty Bonding Primer.

.3 PPG Pitt-Tech 90-712 Series DTM Primer.

.15 Cold Galvanizing Coating for repair of galvanized surfaces:

.1 Acceptable Products:

.1 ZRC Zero-VOC Galvanizing Compound as manufactured by ZRC Worldwide, Marshfield, MA

.2 Aervoe Industries, Inc. ‘Low VOC Cold Galvanize Coating 93% Zinc

.3 Tru-Galv Ultra Silver by HUB Industrial Supply 69% Zinc

.16 Heavy bituminous coating for exterior steel extending below grade:

.1 WOHL Coatings BB-110 or equivalent.

PART 3– EXECUTION

3.1 WORKMANSHIP AND FABRICATION

.1 Conform to CSA S16 and the following:

.2 Camber

.1 Provide camber to beams and girders as noted on the drawings.

.2 Provide camber in a manner that will not reduce the safe load carrying capacity of the members.

.3 If no camber is indicated, orient the section so that any natural camber in the member counteracts the dead load deflection.

.3 Provide holes to 15mm in diameter indicated at any time before shop drawings are reviewed, as required to permit the attachment of other materials.

.4 Plates and shelf angles supporting masonry shall be continuous and extend full length of masonry openings. At splices, grind welds smooth where exposed to view.

.5 Unless noted or required otherwise, provide a minimum 6mm thick cap plate on all HSS and other closed column sections. Galvanized HSS are to have vent holes as required.

.6 Openings

.1 Conform to requirements shown for location, size, reinforcing and cutting of openings through structural members.

.2 Obtain written permission of Consultant prior to field cutting or altering of structural members not shown on the drawings.

.7 Galvanized Steel

.1 Detail and fabricate steel such that it will not trap the galvanizing material.

.2 Detail so that welding of galvanized material is not required.

.3 Provide with vent holes as required.

.4 Clean of all weld slag prior to galvanizing.

.5 Upon completion of erection, touch up with cold galvanizing coating at all locations where galvanizing is damaged.

3.2 PROTECTION

.1 Primers and paints used in multi-coat systems where a final shop or field paint finish is to be applied shall be selected and pre-approved by the Architect based on surface preparation, exposure conditions, and compatibility with other coatings.

.2 Refer to Architectural Drawings and Specifications for locations of applicable paint and anti-corrosion systems.

.1 References:

.1 Section 09 91 00 - Painting

.3 Painted Steel – Nominal Grade

.1 This steel type applies to concealed interior structural steel which is not exposed to weather or high humidity environments and scheduled to receive additional paint coats.

.1 Preparation: Clean structural steel in accordance with SSPC SP1, Solvent Cleaning

.2 Apply quick-drying one coat paint, in accordance with CISC/CPMA 1-73a.

.4 Steel to Receive Intumescent Fireproofing:

.1 This steel type applies to structural steel exposed to view and to receive an intumescent fireproofing coating:

.1 Preparation: Clean structural steel in accordance with SSPC SP6, Commercial Blast Cleaning

.2 Coordinate with requirements of Section 07 81 23 and Section 09 91 00.

.5 Primed Steel – Architectural Grade

.1 Refer to architectural for locations.

.1 Clean structural steel in accordance with SSPC SP6, Commercial Blast Cleaning.

.2 Apply Universal shop primer within one hour following cleaning.

.3 Touch-up primer and top coats in accordance with Section 09 91 00.

.6 Steel Encased in concrete or coated with spray applied fire proofing

.1 This steel type applies to structural steel which is to be encased in spray applied fire proofing or concrete.

.1 No cleaning or painting is required for this steel type.

.7 Shop Applied Intumescent Fireproofing system

.1 Preparation, shop primer, and field applied paint systems in accordance with 07 81 23.

.2 Clean structural steel in accordance with SSPC SP6, SSPC SP11, or SSPC SP16 as scheduled in Section 07 81 23.

.8 Galvanized Steel

.1 Unless noted otherwise, this steel type applies to exterior structural steel which is fully or partially outside the building envelope, and interior structural steel which is exposed to moisture in the finished building but is not designated as “architectural”. Examples include, but are not limited to:

.1 Exterior elements

.2 Interior steel in unconditioned buildings

.3 Steel within the cavity of cavity walls

.4 lintels

.5 shelf angles

.6 plates, hangers, braces etc. outside the building envelope

.7 connection materials and inserts associated with the above.

.2 Fully galvanize, in accordance with CSA G164 to a minimum zinc coating of 600 g/m^2.

.3 Repair any damage to galvanizing arising from mechanical connections of deck or other attachments using specified cold galvanizing compound in accordance with ASTM A780.

.9 Provide two coats of heavy bituminous coating on all steel exterior to the building envelop that extends below grade, including where it is encased in concrete.

.10 Except for steel which is to be left uncoated, upon completion of erection, apply specified field primer to welds, bolts and at locations where original primer is damaged. Prepare steel in strict accordance with the manufacturers' recommendations. For galvanized steel, touch up with specified zinc rich coating.

.11 Protect all steel from damage during storage, transportation and erection.

.12 Protect weep holes at base of closed column sections that have base plates, but no cap plates.

.13 During cold weather, protect members from damage due to water freezing in confined areas.

.14 Provide drain holes in closed sections to prevent water build-up during erection.

3.3 ERECTION

.1 General

.1 Conform to requirements of CSA S16 and the following:

.2 Bracing members and anchor bolts shown are for the finished structure and may not be adequate to resist forces present during construction.

.3 Maintain temporary bracing until completion of entire structure including floor and roof decks, slabs, masonry walls and other elements which are part of the wind resisting system.

.4 Carry out erection operations, including installation of any temporary guying and shoring required, without loading portions of the existing structure already constructed in excess of its safe load carrying capacity.

.5 During erection, forces or reactions in the steel frame members and their connections may exceed those on which the design is based.

.6 Determine the magnitude of such forces and reactions and take such measures as are necessary to ensure that the safety and stability of the structure is maintained until the entire structure, including floor and roof slabs is complete.

.7 Splices, other than those shown, shall not be permitted in members without the Consultant's approval. If approval is given to permit welded splices, they shall be non-destructively tested at no extra cost to the Owner.

.8 Report to the Consultant where members cannot be erected within the specified tolerances without modification or special procedures. Take corrective measures to the Consultant's approval.

.2 Install bracing members by applying a nominal tension such that they will be initially under tension in the completed building.

.3 Bearing on Concrete or masonry

.1 Set steel bases and bearing assemblies true and level at the proper elevation so that upon grouting, they will have full bearing.

.2 Unless a specific method is shown, levelling devices or steel shimming may be used to support bases prior to grouting. Subsequent to grouting, loosen the leveling devices so that all loads pass only through the bases, or remove the steel shims so that the resulting voids can be fully grouted.

.4 Lintels

.1 Unless a reinforced block or concrete lintel is noted, provide loose steel lintels, as shown, over openings and recesses in masonry walls or partitions including those for mechanical or electrical services.

.5 Openings

.1 Conform to the requirements shown for location, size, reinforcing and cutting of openings through structural members.

.2 No openings through structural steel members will be permitted without the Consultant's approval.

END OF SECTION 05 12 00

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for the installation of wind-bearing and axial load-bearing metal stud and joist systems for roofs and parapets, in full compliance with the requirements set forth in the Contract Documents.

1.2 **REFERENCES**

.1 Conform with the Ontario Building Code 2012 under Ontario Regulation 332/12, including Ontario Regulation 88/19 and any applicable acts of authority having jurisdiction and the following:

.1 CSA S136, North American Specifications for the Design of Cold Formed Steel Structural Members (using Appendix B provisions applicable to Canada), Canadian Standards Association.

.2 CAN/CSA S16, Limits States Design of Steel Structures, Canadian Standards Association.

.3 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures, Canadian Standards Association.

.4 CSA W59 Welded Steel Construction (Metal Arc Welding), Canadian Standards Association.

.5 ANSI/AWS D1.3 Structural Welding Code – Sheet Steel

.6 CSA A370, Connectors for Masonry, Canadian Standards Association.

.7 CSA S304, Design of Masonry Structures, Canadian Standards Association.

.8 ASTM A123/A123M-13, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.9 ASTM A446/A446M Standard Specification for Steel Sheet, American Society for Testing and Materials.

.10 ASTM A653/A 653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process, American Society for Testing and Materials.

.11 ASTM A792/A792M Standard Specification for Sheet Steel, 55% Aluminum-Zinc Alloy Coated by the Hot-Dip Process, American Society for Testing and Materials.

.12 ASTM A1003/A1003M Standard Specification for Sheet Steel, Carbon, Metallic and Non-Metallic Coated for Cold-Formed Steel Framing Members, American Society for Testing and Materials.

.13 ASTM C1007 Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories, American Society for Testing and Materials.

.14 CAN/ULC-S101, Standard Methods of Fire Endurance Tests of Building Construction and Materials.

.15 CAN/CGSB-1.181, Ready-Mixed Organic Zinc-rich Coating

.16 CSSBI 50M-1987, Lightweight Steel Framing Manual.

.17 All building envelop-related aspects provided by Architectural Sections, including insulation, air-vapour barrier, flashing, etc.

.2 Where there are differences between the specifications, drawings, codes, standards or acts, the most stringent shall govern.

1.3 **DESIGN**

.1 The design and review of the Lightweight Steel Framing System shall be performed by a Professional Engineer registered in the Province of Ontario.

.2 Conform to the requirements of fire-rated assemblies which have been tested in accordance with CAN/ULC-S101. Refer to the Architectural drawings for fire rating requirements.

.3 Stud and joist depths are shown on the drawings. Changes to specified depths are subject to the approval of the Consultant.

.4 Space wall studs and floor joists at a maximum of 400mm o/c; space roof joists at a maximum of 600mm o/c. Use lesser spacings as required by the design criteria.

.5 For studs, track and joists, conform to the design thicknesses in Table 1. Use greater stud, track and joist design thicknesses if require by the design criteria.

Table 1: Minimum Thicknesses

Stud, Track or Joist Depth (mm)	Min. Base Steel Thickness, Exclusive of Coating (mm)	Design Thickness Exclusive of Coating (mm)
64, 92, 102, 140, 152	0.836	0.879
203	1.087	1.146
254	1.367	1.438
305, 356	1.720	1.811

.6 The minimum thickness for bridging channels shall be 1.087mm for studs and 1.367mm for joists.

.7 The minimum thickness for clip angles shall be 1.367mm for studs and 1.720mm for joists.

.8 Deflections under specified live or wind loads shall conform to the following:

.1 As a minimum, design joist members such that the live load deflection shall not exceed 1/360 of the span. Design floor systems to ensure acceptable vibration performance in accordance with CL. 4.1.3.6 of the Building Code.

.2 Design studs for exterior walls such that the deflection due to wind load does not exceed 1/360 of the span of the stud. Wall studs backing masonry veneer shall meet the requirements of CSA S304.

.3 For wind-bearing studs, design connections to accommodate vertical deflection of the structure above due to live loads, creep deflections, etc., without imposing axial loads onto the framing. Provide a minimum gap of 19mm.

.9 Design wind bearing studs for exterior walls to resist the specified wind load, and not less than 1.0 kPa. Design load bearing studs for exterior walls to resist the specified wind load, and not less than 1.25 kPa.

.10 Design interior walls for a minimum nominal pressure difference of 0.25kPa.

.11 Interior walls in loading docks and other rooms with significant openings which cannot be relied on to remain shut, shall be designed to the same criteria as wind bearing exterior walls.

.12 Design anchorage of roof joists to the walls or supporting framework to safely resist net uplift forces shown, but not less than 0.50 kPa.

.13 Design bridging between studs for the accumulated torsion between bridging lines in combination with 2% of the factored total axial force in the studs between the location of bridging supports.

.14 Design bridging between joists to align members during erection and to prevent rotation and translation about the minor axis.

.15 Design connections to studs be concentric and bearing equally across the total area of the stud.

.16 Design designated walls to act as shear walls. The locations and applied factored lateral loads are indicated on the drawings.

.17 Design lintels, sills, jambs, headers, and all connections to frame openings larger than the typical member spacing. Integrate structural steel members as required into the lightweight framing system.

.18 Design and construct the installation to resist pressure and suction of windloads, snow loads, snow build-up, and temperature range expected in the geographical area of this Project, in accordance with OBC latest edition climatic information for thirty (30) year probability, without any detrimental effectson appearance or performance.

.19 Design and construct the installation to provide for thermal expansion and contraction of components without causing buckling, failure of joint seals, undue stress on fasteners, or other effects detrimental to the appearance or performance of the work of this Section or other work attached to the work of this Section.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Conduct a pre-installation meeting in accordance with Section 01 31 19.

1.5 QUALITY ASSURANCE

.1 Installer Qualifications

.1 Has a minimum of five years of proven experience in the field.

.2 Demonstrates thorough knowledge of relevant laws, bylaws, and regulations applicable to the work.

.3 Is capable of delivering high-quality workmanship consistent with contemporary shop and field practices recognized by reputable manufacturers in the industry.

.4 Has successfully completed projects involving cold-formed metal framing comparable in material, design, and scale to this Project, with a proven track record of effective in-service performance.

.5 Assign a qualified senior representative to oversee the work on-site full-time, ensuring proper supervision and adherence to quality expectations.

.2 Welding Certification and Standards

.1 Firms engaged in welding must:

.2 Be certified by the Canadian Welding Bureau (CWB) in compliance with CSA W47.1 standards.

.3 Ensure that welders are qualified for the specific base materials and procedures required.

.4 Perform all welding in accordance with CSA-W59 guidelines.

.3 The Zero Carbon Building – Design Standard v4- Design Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

1.6 **SUBMITTALS**

.1 Shop Drawings**:**

.1 Submit erection and fabrication drawings for review by the Consultant in accordance with 01 33 00.

.2 Each drawing submitted shall bear the signature and stamp of a qualified Professional Engineer licensed in the Province of Ontario.

.3 Include all necessary shop details and erection diagrams. Amongst other items, show the following:

.1 Types, sizes and spacings of studs or joists and their locations

.2 Dimensions

.3 Design loads

.4 Net uplift pressures

.5 Openings and their reinforcement

.6 Gauge of steel

.7 Surface protective coating

.8 Tracks and closures

.9 Construction details for welding, screwing or bolting

.10 Temporary bracing required for erection purposes

.4 Do not reproduce the structural drawings to serve as shop drawings.

.5 Furnish the inspection company with a copy of each shop drawing bearing the Consultant's reviewed stamp.

.6 Mill Test Reports: Submit mill test reports properly correlated to the materials.

.7 Field Review Reports: Submit copies of all field review reports.

.8 Post-installation certification: After installation, provide written certification, signed by the structural engineer responsible for the shop drawings, that all items have been installed in accordance with the shop drawings.

.9 As-Built Drawings: Mark a complete set of final drawings (PDF format) with any changes, additions or deletions that occur during the construction as a result of the Contractor's work, change orders or for any other reason.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Safeguard all cold-formed metal framing materials from corrosion, deformation, and any potential damage throughout delivery, storage, and handling processes.

.2 Use methods that ensure materials remain in their original condition until installation.

.3 Upon delivery, inspect materials to verify they meet project specifications and are free from defects.

.4 Store cold-formed metal framing components off the ground on suitable supports to prevent bending or warping.

.5 Cover stored materials with a durable, waterproof covering to shield them from environmental elements such as rain, snow, and dust.

.6 Ensure proper ventilation under the waterproof covering to prevent condensation buildup, which could lead to corrosion or other moisture-related damage.

.7 Handle materials with care to avoid bending, scratching, or otherwise compromising their structural integrity.

.8 Use equipment and techniques suitable for the weight and length of the framing members to prevent distortion.

1.8 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 Construction Waste Management and Disposal.

2 Products

2.1 **SYSTEM DESCRIPTION**

.1 Provide a complete exterior stud wall system compliant with CSA-S136, incorporating all components supplied by a single manufacturer. This includes formed studs, floor and ceiling tracks, bridging, clips, fasteners, and other necessary accessories.

.2 Ensure proper sizing, thickness, and spacing of studs for the specified wall height and loading as detailed on shop drawings and in accordance with manufacturer recommendations.

.3 The system shall include the following elements as applicable:

.1 Studs.

.2 Single bottom track.

.3 Double top track designed for vertical movement accommodation.

.4 Horizontal bridging.

.5 Angle reinforcement for electrical boxes located in exterior walls.

2.2 **ACCEPTABLE MANUFACTURERS**

2.3 Provide load-bearing lightweight steel framing and accessories manufactured by any of the following:

.1 Bailey Metal Products;

.2 I-Span Systems;

.3 Magest Building Systems;

.4 Consultant-approved equivalent

2.4 **MATERIALS**

.1 Lightweight Steel Framing Members and Accessories

.1 Steel shall conform to the requirements of CAN/CSA-S136 and shall be identified as to specification, grade, mechanical properties, coating type and thickness.

.2 Steel shall have metallic coatings that conform to one of the following:

.1 ASTM A653/A653M

.2 ASTM A792/A792M

.3 ASTM A1003/A1003M

.3 Lightweight steel framing members forming part of the exterior building envelope shall have a minimum coating of Z180 galvanizing in accordance with ASTM-A653/A653M. Other coatings providing equal or better corrosion protection may be used. Ensure compatibility of coatings to prevent galvanic reaction.

.4 Fasteners and Welds

.1 Bolts and nuts shall conform to the requirements of ASTM A307 or ASTM F3125.

.2 Sheet metal screws and concrete anchors shall have a minimum coating thickness of 0.008mm of zinc. Other coatings providing equal or better corrosion protection may be used.

.3 Welding materials shall conform to the requirements of CSA W59.

.4 Zinc-rich paint for touching up welds and damaged metallic coatings shall conform to CAN/CGSB-1.181.

.5 Install No. 15 asphalt-impregnated building paper in accordance with CAN/CGSB-51.32.

.6 Provide a rubberized, moisture-resistant foam strip, 3 mm thick and 12 mm wide, with self-adhesive backing on one side. Cut lengths as required for the application.

.5 Floor and ceiling tracks must be fabricated from the same material and finish as the steel studs, with widths corresponding to stud sizes. Gauges should meet design requirements and align with reviewed shop drawings but must not be less than the gauge of the studs. Flange heights are as follows:

.1 Bottom channel: 65 mm.

.2 Deflection channel (attached to the underside of the structure where applicable): 65 mm.

.3 Top channel: 50 mm.

.6 Plates, bridging, gussets, and clips must also be fabricated from the same material and finish as the steel studs. Gauges, shapes, and sizes must meet design requirements and align with reviewed shop drawings.

.7 For special conditions, provide heavier gauge framing members, additional reinforcing, or special connections where stud length and loading conditions demand. Reinforce members subjected to concentrated loads, such as those at window or door jambs.

3 Execution

3.1 **EXAMINATION**

.1 Examine areas and conditions where work is to be performed and notify the Consultant in writing of any conditions that may hinder the proper and timely completion of the work. This includes defects in work prepared by other trades and other unsatisfactory site conditions that could result in defective product installation or latent defects in workmanship and functionality.

.2 Examine the areas and conditions where the work is to be executed. Notify the Consultant in writing of any conditions that could hinder the proper and timely completion of the work.

.3 Coordinate steel stud assemblies, which act as infill panels supported by adjacent structural framing, with other relevant Sections to ensure a seamless interface between structural framing and steel stud assemblies.

.4 Do not begin work until all unsatisfactory conditions have been addressed to the installer’s satisfaction.

.5 Starting the installation will be deemed as acceptance of the site conditions, making the Contractor fully responsible for ensuring the work meets the specified standards.

.6 Install windload-bearing steel stud systems in all exterior walls and other locations as indicated, specified, or required by the Contract Documents.

3.2 **QUALITY CONTROL**

.1 Provide a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and state their recommendations in writing.

3.3 **NOTIFICATION**

3.4 Prior to the commencing significant segments of the work, give the Consultant and independent inspection and testing agencies appropriate notification to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify this work as defective.

3.5 **FABRICATION**

.1 Coordinate with other trades to accommodate services through members.

3.6 **CONSTRUCTION REVIEW**

.1 The Consultant's general review during construction and inspection and testing by independent inspection and testing agencies reporting to the Consultant are both undertaken to inform the Owner of the Contractor’s performance and shall in no way augment the Contractor’s quality control or relieve him of contractual responsibility.

3.7 **INSPECTION AND TESTING**

.1 The lightweight steel framing design Engineer, responsible for the production of the shop drawings, shall provide periodic field review during construction and shall submit reports in accordance with Section 1.5.7.

.2 Appointment of Independent Inspection Agencies

.1 The Consultant may appoint the inspection and testing agency to make inspections or perform tests as the Consultant directs. The inspection agency shall be responsible only to the Consultant, shall address their reports to the Consultant and shall make only such inspections or tests as the Consultant may direct. Authorized inspection and testing shall be charged against the cash allowance carried in the contract paid for by the owner, except that the Contractor will be required to pay for tests and inspections which show results not meeting the requirements of the drawings or specifications and for subsequent tests and inspections made necessary thereby.

.3 The review provided in this section does not relieve the Contractor of their responsibility for the performance of the contract and shall not be regarded as part of the Contractor’s quality control procedures.

3.8 DEFECTIVE MATERIAL AND WORKMANSHIP

.1 Where factual evidence exists that defective workmanship has occurred or that work has been carried out incorporating defective material, the Consultant may have tests, inspections or surveys performed, analytical calculation of structural strength made and the like in order to help determine whether the work must be replaced. Tests, inspections or surveys carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant’s opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of the Ontario Building Code, except where this would in the Consultant’s opinion cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or workmanship which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to the final acceptance of the work regardless of previous inspection. If rejected, defective materials or work incorporating defective material or workmanship shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

3.9 INSTALLATION

.1 Ensure that construction loads caused by the erection of the framing will not load structural members in excess of their design loads.

.2 Erect framing such that it is free of dirt, scale, foreign matter, dents or deformations.

.3 Erection

.1 Wind-bearing studs may be erected piece by piece. Load-bearing studs shall be pre-fabricated into panels.

.2 Erect framing true and plumb within the specified tolerances. Temporary bracing shall be used wherever necessary to withstand all loads to which the structure may be subject during erection and subsequent construction.

.3 Erect components following the manufacturer's instructions and reviewed shop drawings.

.4 Install the system either piece by piece (stick-built) or prefabricated into panels (panelized) on or off-site. Handle prefabricated panels carefully to prevent distortion of components or collateral materials.

.5 Before installing stud walls, apply two full beads of acoustical sealant or insulating strip to the back side of the floor, wall, and ceiling tracks, as specified in Section 07 91 00

.6 Precisely position floor tracks and securely anchor them to the structure at a maximum spacing of 600 mm o.c. unless shop drawings indicate closer spacing. Apply a continuous dampproof course under the bottom track and use self-drilling anchors.

.7 Align ceiling tracks with floor tracks where applicable, securing them to the structure at a maximum of 600 mm o.c., or as specified in shop drawings.

.8 Position studs within the top and bottom tracks, ensuring alignment and accurate placement. Secure each stud with at least one No.8 screw or weld on both sides of the flange at the top and bottom tracks.

.1 Screws must penetrate with at least three exposed threads.

.2 Select screw diameter, thread type, and drilling capability per manufacturer's recommendations.

.3 Use low-profile head screws for areas covered by sheathing.

.9 Install full-length, one-piece studs. Splicing is not permitted.

.10 Maintain clearance under beams, structural decks, and slabs to prevent structural loads from transferring to the studs. Use double-track slip joints:

.1 Install a 50 mm deep deflection channel at the top of partitions.

.2 Nest a 65 mm deep top track into the deflection channel by 30-40 mm without fastening the tracks together.

.3 Align and secure each stud to the bottom and top tracks using screws.

.11 Position studs within 50 mm of abutting walls, openings, corners, and terminations with dissimilar materials.

.12 Brace steel studs with horizontal internal bridging spaced no more than 1220 mm apart. Ensure one line of bridging is at least 300 mm below the top slip connectors. Fasten bridging using 16-gauge steel clips with four No.8 screws or welds.

.13 Frame wall openings with additional framing and bracing as detailed in shop drawings to adequately support loads.

.14 Coordinate stud erection with service line installation, ensuring web openings are aligned. Field-cut holes must conform to specified dimensions.

.15 Work in tandem with other trades to install door and window frames, as well as supports and anchorages required for other sections.

.16 For openings wider than the specified stud spacing, install two floor-to-slab studs on either side, securing them 50 mm apart using approved fasteners or column clips.

.17 Construct corners with a minimum of three studs.

.18 Install track at the heads and sills of door and window openings to accommodate intermediate studs. Secure track ends to studs and maintain consistent stud spacing above and below openings.

.19 Provide 41 mm studs, furring channels, or wood blocking between studs for attaching fixtures behind lavatories, toilets, grab bars, and other bathroom accessories. Coordinate wood blocking with Section 06 10 00 "Rough Carpentry."

.20 Perform welding per CSA W59 or ANSI/AWS D1.3 standards, as applicable.

.21 Touch up all welds with a zinc-rich primer.

.4 Tolerances:

.1 For axial load-bearing studs, plumbness and out of straightness (camber and sweep) shall not exceed 1/1000th of the member length.

.2 For wind-bearing studs, plumbness shall not exceed 1/500th of the member length. Out of straightness (camber and sweep) shall not exceed 1/1000th of the member length.

.3 For joists, out of straightness (camber and sweep) shall not exceed 1/1000th of the member length.

.4 For trach, camber shall not exceed 1/1000th of the member length.

.5 Align axially-loaded members vertically to allow for full transfer of the loads down to the foundation. Vertical alignment shall be maintained at roof/wall and floor/wall intersections. Alternatively, a load distribution member shall be provided to transfer loads. The use of track as a load distribution member is not permitted.

.6 Fabricate studs and joists in such a way that there is at least 300 mm from the end of the member to the centre of the first perforation.

.7 Reinforce webs of joists at points of concentrated loads and reactions.

.8 Detail ends of joists to provide lateral restraint.

.9 Provide horizontal bridging for studs spaced at not more than 1200 mm.

.10 Provide bridging for joists at a maximum spacing of 2100 mm.

3.10 FIELD QUALITY CONTROL

.1 The steel stud design engineer, responsible for preparing shop drawings, shall conduct regular field reviews throughout construction and provide field reports to the consultant.

.2 The cost of field reviews shall be included in the contract price.

.3 The steel stud design engineer shall at minimum oversee and review the following:

.1 Mill test reports.

.2 Welded connections.

.3 Member sizes and thicknesses.

.4 Screwed and bolted connections.

.5 Erection tolerances.

.6 Field cutting required by other sections.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Design, labour, Products, equipment and services necessary for the miscellaneous and metal fabrication Work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ANSI/BHMA A156.21, American National Standard for Thresholds.

.2 ASTM A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished

.3 ASTM A123, Specification for Zinc (Hot Dip Galvanized) Coatings on Iron & Steel Products.

.4 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.5 ASTM A269, Specification for Seamless and Welded Austenitic Stainless Steel Sanitary Tubing for General Service.

.6 ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

.7 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.

.8 CAN/CSA-G40.20/G40.21-M, General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steels.

.9 CAN/CSA S16.1-M, Limit States Design of Steel Structures.

.10 CSA S136.1-M, Commentary on CAN/CSA S136-M, Cold Formed Steel Structural Members.

.11 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.

.12 CSA W48, Filler Metal and Allied Materials for Metal Arc Welding.

.13 CSA W59-M, Welded Steel Construction (Metal Arc Welding).

.14 CAN/CSA W117.2-M, Safety in Welding, Cutting and Allied Processes.

.15 CGSB 1-GP-181, Organic Zinc Rich Primer.

.16 NAAMM, The National Association of Architectural Metal Manufacturers.

.17 Steel Structures Painting Council (SSPC), Steel Structures Painting Manual, Vol. 2.

1.3 **DESIGN REQUIREMENTS**

.1 Design details and connections, where not shown on Drawings, in accordance with CAN/CSA-S16.1 and CSA S136.1.

.2 All exposed metal, including both steel and aluminum to have eased edges and corners. No sharp edges are permitted.

1.4 SUBMITTALS

.1 Shop drawings: Submit shop drawings for fabrication and erection of miscellaneous and metal items in accordance with Section 01 33 00 indicating:

.1 Materials, core thicknesses, class of finish (AMP 555), connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

.2 Ensure shop drawings are of one uniform size and based on field measurements.

.2 Samples: Submit samples of the following:

.1 Two 300 x 300 samples of metal demonstrating finish and colour of galvanized steel with clear finish for the Consultant's approval.

1.5 QUALITY ASSURANCE

.1 Retain a Professional Engineer, licensed in the Province of Ontario, with experience in Work of comparable complexity and scope, to perform the following services as part of the Work of this Section:

.1 Design oversized hollow metal frames, hollow metal doors, hollow metal glazing transom, hollow metal sidelite, and metal fabrication items that are required to resist live, dead, lateral, wind, or seismic loads.

.2 Design millwork, bench, sliding grills supports

.3 Review, stamp, date and sign shop drawings.

.2 Workmanship: Fabricate Work of this Section to meet the required class of workmanship indicated below in accordance with AMP 555, Section 8.

.1 Class 1: for use on direct exposed to view fabricated items:

.1 Exposed surfaces are finished smooth with pitts, mill marks, nicks, burrs, sharp edges, and scratches filled or ground off. Defects should not show when painted, polished, or finished. .

.2 Welds should be concealed where possible. Exposed welds are ground to small radius with uniform sized cove unless otherwise noted.

.3 Distortions should not be visible to the eye.

.4 Exposed joints are fitted to a hairline finish.

.3 Execute welding by firms certified in accordance with CSA W47.1 Division 1 or 2.1. Ensure welding operators are licensed per CSA W47.1 for types of welding required by Work.

.4 The Zero Carbon Building – Design Standard v4- Design Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

1.6 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 Construction Waste Management and Disposal.

2 Products

2.1 **MATERIALS**

.1 General:

.1 All materials under Work of this Section, including but not limited to, primers and paints are to have low VOC content limits.

.2 Unless detailed or specified herein, standard products will be acceptable if construction details and installation meet intent of Drawings and Specifications.

.3 Include all materials, products, accessories, and supplementary parts necessary to complete assembly and installation of Work of this Section.

.4 Incorporate only metals that are free from defects which impair strength or durability, or which are visible. Install only new metals of best quality, and free from rust or waves and buckles, and that are clean, straight, and with sharp defined profiles.

.2 Structural shapes, plates, and similar items:

.1 Conforming to CAN/CSA-G40.20/G40.21-M, Grade 350W.

.2 Hollow structural sections: CAN/CSA-G40.20/G40.21-M, Grade 350W, Class H.

.3 Provide cold rolled steel for exposed metal items.

.4 Standard field painted finish: In accordance with Section 09 91 00.

.5 High performance steel coatings on steel material accordance with Section 09 91 00 changeroom steel supports and additional wet areas.

.3 Galvanized sheet steel: ASTM A653/A653M Grade A, Z275 Commercial Quality zinc coating, size and shape as shown.

.1 G90 galvanized steel (STL-1).

.4 Aluminum (AL-1):

.1 Aluminum extrusions and channels: ASTM B211 and ANSI H35.1 AA6063 alloy, T6 temper. Profile and dimensions as indicated on drawings.

.2 Aluminum sheet: ASTM B209 and ANSI H35.1 AA1100 aluminum alloy, H14 temper, minimum 1.29 mm for sheets less than 610 mm wide and minimum 2.05 mm for

sheets of a greater dimension.

.1 Welding materials: CSA W48 and CSA W59-M.

.2 Fasteners: Conforming to ASTM A307, Grade A, in areas not exposed to view, use unfinished bolts with hexagon heads and nuts. In areas exposed to view, use bolts, nuts, washers, rivets, lock washers, anchor bolts, machine screws and machine bolts Z275 zinc coated in accordance with ASTM A653/A653M. Supply bolts of lengths required to suit thickness of material being joined, but not projecting more than 6 mm beyond nut, without the use of washers.

.3 Galvanized primer paint: Inorganic zinc rich primer. For use on galvanized fabrications where touch up is to remain unpainted in finished work; Carbozinc 11WB by Carboline Company, Catha-Coat 305 by Devoe Coatings or Zinc Clad XI by Sherwin Williams.

.4 Drilled inserts: Mega by ITW Construction Products or HSL by Hilti Inc. heavy-duty anchors, sizes as shown.

.5 Sleeve anchors: Sleeve anchors, ‘HLC Sleeve Anchors, Flat Phillips Head - HLC-FPH 3.8 x 4' by Hilti or approved alternative with countersink flush. Provide sleeve anchors for bolting of steel posts to floor where bolts indicated to be exposed.

2.2 **FABRICATION**

.1 Verify dimensions of existing Work before commencing fabrications and report any discrepancies to the Consultant.

.2 Fit and assemble Work in shop where possible. Execute Work in accordance with details and reviewed shop drawings.

.3 Use self-tapping shake-proof screws on items requiring assembly by screws or as indicated. Use screws for interior metal work. Use welded connections for exterior metal Work unless otherwise found acceptable by the Consultant.

.4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush. Seal exterior steel fabrications against corrosion in accordance with CAN/CSA S16.1-M.

.5 Execute shop welding to requirements specified.

.6 Carefully make and fit details. Take special care with exposed finished Work to produce a neat and correct appearance to the Consultant's acceptance.

.7 Assemble members without twists or open joints.

.8 Correctly size holes for connecting Work of other trades where such can be determined prior to fabrication. Where possible, show holes on shop drawings. Place holes not to cause appreciable reduction in strength of member.

.9 Draw mechanical joints to hairline tightness and seal countersunk screw and access holes for locking screws with metal filler where these occur on exposed surfaces.

.10 Exposed metal edges shall be eased to prevent sharp edges and corner conditions.

2.3 FABRICATED ITEMS

.1 Refer to Drawings for details of metal fabrication work and related items not specifically listed in this Section.

.2 Review architectural, structural, mechanical, electrical and geothermal drawings and specifications. Provide all necessary miscellaneous metalwork items required for the successful execution of the project. These items include, but are not limited to, those specified within this section.

.3 Where work is required to be built into work of other Sections supply such members to respective Sections.

.4 Provide metal fabrication items indicated below and items not indicated to be supplied under other Sections. The following items includes miscellaneous and metal fabrication including but not limited to the items listed below.

.5 MW-1A, MW-1B, MW-1C, MW-1D Change Room Bench, MW-2 Change Room Open Bench

.1 Provide supports for benches. Construct support as detailed. Where indicated, conceal supports within cavity of partition.

.2 Provide all drill holes required for concealed anchorage and for anchoring to building structure.

.3 Supports to be field painted

.4 Coordinate with SECTION 06 20 00.

.6 MW-4 Office Desk, MW-7 Reception Desk supports:

.1 Provide supports for MW-4 office desk millwork and MW- 7 Reception Desk Supports. Construct support as detailed.

.2 Provide all drill holes required for concealed anchorage of counters and for anchoring to building structure.

.3 Powder painting:

.1 Apply powder paint in accordance with the manufacturer’s instructions and recommendations.

.2 Cleaning: Clean surfaces to be coated as follows:

.1 Remove all dust, dirt, and other surface debris by vacuuming, wiping dry with clean cloths or compressed air.

.2 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

.3 Allow surfaces to drain completely and allow to thoroughly dry.

.3 If the above procedures do not clean the substrate surfaces, clean the surfaces with high pressure water washing.

.4 Apply pretreatment as soon as possible after cleaning and before surface deterioration occurs.

.5 Pre-treat iron phosphate for steel, zinc phosphate for galvanized or steel structures, and yellow or green chromating, or approved chrome-free for aluminum substrates.

.6 Application:

.1 Apply coating to requirements of coating manufacturer's written application instructions.

.2 Method of Application: as recommended by paint system manufacturer.

.7 Spray application.

.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly fluidizing powder coating to be applied.

.2 Apply coating materials to clean surfaces to minimum 2.5 - 3.5 mil dry film thickness or as specified by manufacturer.

.3 Ensure coating adheres to internal corners and recessed areas.

.4 Allow surfaces to cure for minimum time period as required by manufacturer.

.5 Cure in accordance with manufacturer's cure curves.

.7 Steel Plate: 10MM thick steel plate at u/s structure at all openings

.8 Sliding Grilles: Curved metals required to support coiling sliding grilles

.9 Shelf Angles: Of size indicated on Drawings and as specified in structural steel specifications, with adjustable inserts for vertical adjustment and slotted holes for horizontal; galvanized.

.10 Metal support framing for general millwork, concealed items

.11 Metals requested to support glazed screens, partitions and doors.

.12 Floor Sump Pit

.1 Refer to architectural, structural, and mechanical drawings for layout and details.

.2 Fabricate solid and grating covers to the sizes specified or required, complete with perimeter frames and anchor bolts for casting into concrete.

.3 Provide hinged units where indicated on the drawings.

.4 Hot-dip galvanize all steel components after fabrication to ensure corrosion resistance.

.13 Grating and Checker Plates

.1 Steel Grating, Non-Vehicular Loading: Fabricated from 38mm x 5mm bars and rods with either a smooth or serrated (antiskid) surface, in a regular mesh pattern. Acceptable product or equivalent: Type 19-W-4 by Russel Metals Inc.

.2 Steel Checker Plates, Non-Vehicular Loading: Constructed from cold-formed steel, 3mm to 6mm thick, with a diamond-shaped anti-skid surface. Fold and reinforce plates as required to suit specified applications. Acceptable product or equivalent: Manufactured by Mascot Steel & Tools.

.3 Fiber Reinforced Polymer (FRP) Grating, Anti-Skid: Molded gratings with a 38mm thick mesh pattern and anti-skid nosing. Acceptable product or equivalent: Duragate Stair Tread by Fiberman Inc.

.14 Overhead Door Frames:

.1 Fabricate from 10mm thick bent steel plate to frame openings, including heads and jambs, to match wall thickness. Extend plates 75mm on either side of the wall face. Provide additional extension plates at the sides and head to accommodate tracks and operators for the specified doors.

.2 Finish: Hot-dip galvanized after fabrication, followed by a paint finish.

.15 Miscellaneous steel brackets, supports and angles:

.1 Supply and install or supply for installation by trades responsible, all loose steel brackets, supports and angles where indicated, except where such brackets, supports and angles are specified under work of other Sections. Drill for countersunk screws, expansion anchors and anchor bolts.

.2 Unless otherwise specified, prime paint for interior installation; hot dipped galvanized steel galvanized finish for exterior installation.

.16 Lintels: Fabricated from CAN/CSA-G40.20/G40.21-M, Grade 350W, size and location as shown, width to be not less than 25 mm less than width of wall and extend 200 mm beyond opening at each end. Unless otherwise shown, fabricate lintels in block walls of steel sections.

.17 Masonry lateral support angles:

.1 Supply only, to Section 04 20 00, Unit Masonry for installation, all horizontal lateral support anchors at top of non-load-bearing masonry walls.

.2 Refer to Structural Drawings for size and spacing of required support anchors. Provide drilled holes as required for anchorage.

.3 Galvanized for all exterior wall and unheated and high humidity locations.

2.4 ANCHORS AND FASTENING

.1 Use weld studs of size not larger than 10 mm for attaching miscellaneous materials and equipment to building steel. If weight of item requires larger fasteners use clips or brackets and secure by welding or through bolting.

.2 Use self drilling expansion type concrete anchors for attaching to masonry and concrete

.3 Do not secure items to steel deck.

2.5 WELDING

.1 Perform welding by electric arc process.

.2 Execute welding to avoid damage or distortion to Work. Execute welding in accordance with following standards:

.1 CSA W48 - for Electrodes. If rods are used, only coated rods are allowed.

.2 CSA W59-M and CSA W59S1-M for design of connections and workmanship.

.3 CAN/CSA W117.2-M - for safety.

.3 Thoroughly clean welded joints and expose steel for a sufficient distance to perform welding operations. Finish welds smooth. Supply continuous and ground welds which will be exposed to view and finish paint.

.4 Test welds for conformance and remove Work not meeting specified standards and replace to Consultant's acceptance.

2.6 HOT DIP GALVANIZING

.1 After fabrication, hot dip galvanize specific miscellaneous steel items as indicated. After galvanizing, plug relief vents air tight with appropriate aluminum plugs as suitable and required for intended metal fabricated item. Straighten shapes and assemblies true to line and plane after galvanizing. Repair damaged galvanized surfaces with zinc rich primer in accordance with manufacturer's printed directions.

.2 Hot-dip galvanize members in accordance with requirements of the following ASTM, with minimum coating weights or thicknesses as follows:

.1 Rolled, pressed and forged steel shapes, plates, bars and strips: ASTM A123; average weight of zinc coating per square/metre of actual surface, for 4.8 mm and less thickness members 600 g/m2 for 6 mm and heavier members 640 g/m2.

.2 Iron and steel hardware: ASTM A153; minimum weight of zinc coating, in ounces per square foot of surface, in accordance with ASTM A153,Table 1 for the various classes of materials used in the Work.

2.7 SHOP PAINTING

.1 Clean steel to SSPC SP6 and remove loose mill scale, weld flux and splatter.

.2 Shop prime steel with one coat of primer paint to dry film thickness of 0.07 mm. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 deg C. Paint items under cover and leave under cover until primer is dry. Follow paint manufacturer's recommendations regarding application methods, equipment, temperature, and humidity conditions.

.3 Shop prime galvanized steel in accordance with CGSB 85-GP-16M.

.4 Clean but do not paint surfaces being welded in field.

.5 Do not paint surfaces embedded in concrete, but clean as if they were to be primed.

.6 Do not prime steel to be fireproofed or to receive intumescent paint coating.

.7 Do not prime machine finished surfaces, but apply an effective anti-rust compound.

.8 Take precautions to avoid damage to adjacent surfaces.

3 Execution

3.1 **EXAMINATION**

.1 Examine previously installed Work, upon which this Section depends, verify dimensions and condition of existing Work, and coordinate repairs, alterations, and rectification if necessary. Commencement of Work of this Section is deemed to signify acceptance of existing, prior conditions.

.2 Obtain Consultant's written approval prior to field cutting or altering of structural members.

.3 Conduct field measurements to confirm or complement provided dimensions.

.4 Beginning installation will indicate acceptance of site conditions, with the Contractor assuming full responsibility for completing the work as specified.

3.2 **ERECTION**

.1 Install metal fabrications in accordance with reviewed shop drawings and manufacturer's written instructions.

.2 Fit joints and intersecting members accurately. Make Work in true planes with adequate fastenings. Build and erect Work plumb, true, square, straight, level and accurate to sizes detailed, free from distortion or defects detrimental to appearance or performance.

.3 Install all metal fabrications unless otherwise specified.

.4 Ensure metalwork is erected square, plumb, straight, and true, with accurate fitting and tight joints and intersections.

.5 Use approved anchorage methods, including dowels, anchor clips, bar anchors, expansion bolts, shields, and toggles.

.6 Perform field connections using bolts conforming to CAN/CSA S16 standards or weld as required.

.7 After erection, touch up rivets, field welds, bolts, and any burnt or scratched surfaces with primer.

.8 For galvanized surfaces affected by field welding, touch up with zinc primer.

3.3 **METAL WORK INTEGRATED INTO THE WORK OF OTHER SECTIONS**

.1 Coordinate with relevant Sections to ensure proper integration of metalwork into their scope of work.

.2 Fabricate items under this Section and provide them to other trades for installation when necessary.

.3 Deliver items for embedding in concrete or masonry, along with appropriate setting templates, to the responsible trades.

.4 Supply items intended for inclusion in casework to the casework fabricator.

3.4 FLOOR PIT COVERS

.1 Supply and install frames for floor pit covers designed for casting into concrete.

.2 Place and secure solid or grating covers as required by project specifications and drawings.

3.5 **ADJUSTING AND CLEANING**

.1 Perform touch-up painting immediately after erection, cleaning field welds, bolted connections, and abraded areas. Apply the same material used for shop painting per SSPC-PA1 requirements, using brush or spray, ensuring a minimum 0.05mm dry film thickness.

.2 For galvanized surfaces, clean field welds, bolted connections, and abraded areas, repairing the galvanizing in accordance with ASTM A780.

.3 Clean installed metalwork promptly to remove construction residue and environmental dirt.

.4 Upon completion of the installation, clear the site of surplus materials, debris, tools, equipment, and temporary barriers.

.5 Paint bolt heads, washers, nuts, field welds and previously unpainted items. Touch up is to remain unpainted in finished work; Carbozinc 11WB by Carboline Company, Catha-Coat 305 by Devoe Coatings or Zinc Clad XI by Sherwin Williams.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for rough carpentry Work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.2 ASTM A325, Specification for Bolts Quenched/Tempered Steel Nominal Thread Diameter M16 - M36 For Structural Steel Joints.

.3 ASTM A653, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.4 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.

.5 ASTM F1667, Driven Fasteners: Nails, Spikes and Staples.

.6 CAN/CSA O80 Series M, Wood Preservation.

.7 CSA O121-M, Douglas Fir Plywood.

.8 CAN/CSA O141, Softwood Lumber.

.9 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.10 NLGA, Standard Grading Rules for Canadian Lumber, National Lumber Grades Authority.

1.3 **QUALITY ASSURANCE**

.1 Lumber identification: Grade stamp of an agency certified by the Canadian Lumber Standards Accreditation Board.

.2 Plywood identification: Grade mark in accordance with applicable CSA standards.

.3 Lumber quality: Carefully select individual pieces so that knots and obvious defects will not interfere with placing bolts, proper nailing or making proper connections.

.4 Moisture Content of wood at time of construction shall be 19% maximum.

.5 Each piece of pressure treated lumber and fire retardant treated lumber shall be shop marked with the pressure treatment brand and ULC monogram respectively, in accordance with CAN/CSA O80-M.

.6 Dimensions of lumber shall conform to dressed sizes specified in CAN/CSA-0141 unless actual dimensions are otherwise indicated or specified.

.7 Dimensional references to lumber on Drawings and in Specifications are to nominal sizes unless actual dimensions are indicated. Such actual dimensions shall be dry size.

.8 Lumber defects: Discard wood with defects which will render a piece unable to serve its intended function. Lumber will be rejected by Consultant for excessive warp, twist, bow, crook, mildew, fungus, or mould, as well as for improper cutting and fitting, whether or not it has been installed.

1.4 **ENVIRONMENTAL REQUIREMENTS**

.1 When it is required that wood maintain dimensional stability and tolerances to ensure

accurate installation of later work, store and install it only in dry areas, and where no further installation of moist materials is contemplated.

.2 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 "Construction Waste Management and Disposal".

1.5 **PRODUCT DELIVERY, STORAGE AND HANDLING**

.1 Store materials in a dry area. Cover materials with tarpaulins or polyethylene sheets to prevent moisture absorption and impairment of structural and aesthetic properties. Vent to allow air movement. Tie covering to keep in place.

2 Products

2.1 **MATERIALS**

.1 General: All materials under Work of this Section, including but not limited to, adhesives are to have low VOC content limits.

.2 Lumber: Softwood, G4S, moisture content 19% or less at time of installation, in accordance with the following:

.1 Lumber shall be of same species and grade, equally seasoned and shall be processed and stamped at same mill. .

.2 CSA O141 and NLGA Standard Grading Rules for Canadian Lumber.

.3 Board quality: Construction or better.

.4 Glued end-jointed (finger-jointed) lumber is not acceptable.

.5 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:

.1 S4S.

.2 Board sizes: "Standard" or better grade.

.3 Dimension sizes: "Standard" light framing or better grade.

.4 Post and timbers sizes: "Standard" or better grade.

.5 Grade No.2 or better, exterior wood pressure preservative treated

.6 Dimension quality:

.1 Structural joists, planks, and framing: No. 1 Select Structural.

.2 Light framing: Construction

.3 Panel Materials:

.1 Douglas fir plywood (DFP): to CSA-O121, standard construction.

.2 Canadian softwood plywood (CSP): to CSA-O151, standard construction.

.3 Sheathing grade, telephone and electrical panels CSA-0153 19mm thick S1S, (FRT).

.4 Wood Preservative

.1 Pressure impregnate with alkaline copper quartenary (ACQ) to CSA-O80 Series, maximum allowable VOC limit 350 g/L.

.5 Plywood:

.1 Plywood (WD-7): Pressure treated plywood, thickness as indicated on drawings, with pressure treatment as specified in this Section.

.6 Surface applied wood preservative: Green coloured copper napthenate or 5% pentachlorophenol solution, water repellant preservative or same copper based preservative as used for shop impregnation, in accordance with CAN/CSA O80.

.7 Rough hardware: Conforming to ASTM F1667; Nails, bolts, screws, anchors, expansion shields, and other fastenings required to frame and fix rough carpentry as follows: .

.1 Nails, spikes and staples: Spiral type.

.2 Bolts: ASTM A325; 12.7 mm diameter minimum with nuts and washers unless noted otherwise.

.3 Screws: Countersunk head, full thread type.

.4 Proprietary fasteners: Toggle bolts, expansion shields, lag bolts, screws, inorganic fibre plugs, recommended for purpose by manufacturer.

.5 Galvanize rough hardware used in fire treated wood and hardware exposed to the atmosphere.

.8 Fire Retardant Treatment (FRT)

.1 Pressure impregnation fire retardant treatment (FRT): Wood and plywood where necessary to comply with OBC fire performance requirements, to the satisfaction of the authorities having jurisdiction.

.2 Vacuum pressure impregnate wood with fire retardant treatment in accordance with CAN/CSA- O80, C20 for lumber and C27 for plywood.

.3 Provide flame spread rating of 25 or less. Provide ULC or WHI label for treated lumber and plywood as received from the pressure treatment plant. Include identification colour dye in fire retardant chemicals for wood which is concealed in the final work.

.4 Pressure treat materials before final milling and kiln-dry after treatment to the specified moisture content.

.5 Do not expose pressure-treated materials to dampness between time of treatment and time finish is applied. Remove surface salt deposits before finishing.

.6 Fire retardant treatment of lumber and plywood (interior and protected locations): ‘Dricon FRT’ fire retardant treatment by Biewer Lumber or approved alternative, conforming to ASTM E84, to provide a flame spread rating of 25 or less.

.9 Accessories

.1 General purpose adhesive: to CSA-O112.

.2 Nails, spikes and staples: to CSA-B111.

.3 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.

.4 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fiber plugs, explosive actuated fastening devices, recommended for the purpose by the manufacturer.

.5 Fasteners for use in pressure treated wood: Provide hot dipped galvanized fasteners complying to ASTM A153 and connectors in accordance with ASTM A653, Class G185 for non-structural members. Provide type 304 or 316 stainless steel fasteners and connectors for use in Structural, pressure treated wood.

3 Execution

3.1 **EXAMINATION**

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

3.2 **GENERAL**

.1 Lay out work carefully and to accommodate work of others. Cut and fit accurately: erect in position indicated by Drawings.

.2 Install rough carpentry to allow for expansion and contraction of the materials.

.3 Cut work into lengths as long as practicable and with square ends. Align, level, square, plumb, and secure work permanently in place. Brace work temporarily as required. Join work only over solid backing.

.4 Bore holes true to line and to same size as bolts. Drive bolts into place for snug fit, and use plates or washers for bolthead and nut bearings. Turn up bolts and lag screws tightly when installed, and again just before concealed by other work or at completion of Work.

.5 Provide anchors, bolts, and inserts required for attachment of the work of this Section, to those performing the work of other Sections and who are responsible for their installation.

.6 Do not attach work by wood plugs or blocking in concrete or masonry. Use lead shields, expansion shields, or similar methods only as approved by Consultant.

3.3 **FURRING AND BLOCKING**

.1 Install furring and blocking, as required, to space-out and support windows, facings, fascia, soffit, siding and other work as required.

.2 Provide wood blocking and shims as required at gaps between overhead steel supports and supported items below.

.3 Coordinate with the applicable other trades and provide wood and/or plywood back-up within the metal stud framing as required to provide proper support for wall-mounted items, including but not necessarily limited to:

.1 Wall-mounted casework.

.2 Corner guards

.4 Align and plumb faces of furring and blocking to tolerance of 1:600.

.5 Coordinate with the applicable other sections and provide plywood panels to be built into other work for support of windows and other items as indicated.

3.4 **MISCELLANEOUS WOODWORK**

.1 Fit and install wood furring, strapping, grounds and blocking. Adequately size, correctly place and conceal members for finishes, fitments and for Work under other Sections. Do not assume that Drawings show required work exactly or completely. Anchor wood members

securely in place.

.2 Install rough bucks, nailing strips and linings to rough openings as required for backing for frames and other Work.

.3 Except where steel supports are specifically shown, provide wood blocking and supports in metal stud partitions for fastening of item such as casework and other wall mounted accessories. Have respective trades approve the location of such wood blocking.

.4 Bolt wood blocking or nailing strips to steel framing.

.5 Align and plumb faces of furring and blocking to tolerance of 1:600.

.6 Use fire retardant lumber for blocking/framing in ceiling\spaces, partitions and bulkheads.

.7 Miscellaneous blocking: Provide miscellaneous wood blocking in wall cavities for securing millwork and Smart Boards, Washroom accessories, partitions, baby and adult change tables, drinking fountains, basketball hoop framing, washroom partitions and screens, flat screen televisions, wall hung sinks and toilets and any additional areas as indicated and required.

.8 At all hollow metal frames, install wood blocking at header and jambs to ensure rigid installation and to prevent doors and frames from rattling.

3.5 **WALL SHEATHING**

.1 Provide plywood wall sheathing for interior wall assemblies as required and indicated on Contract Drawings.

.2 Apply lumber wall sheathing so that all ends are supported with end joints staggered.

.3 Apply panel-type sheathing board so that vertical joints are staggered if the sheathing is applied horizontally and a gap of not less than 1.5 mm left between sheets of plywood.

3.6 **BACKBOARDS**

.1 Install plywood backboards, primed and painted white on both sides, with fire retardant paint.

.2 Use minimum 19 mm thick plywood on 19 x 38 mm furring around perimeter and at maximum 300 mm intermediate spacing.

3.7 **NAILING STRIPS, GROUNDS AND ROUGH BUCKS**

.1 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

3.8 **FASTENERS**

.1 Frame, anchor, fasten, tie and brace members for required strength and rigidity.

.2 Use hot dipped galvanized fasteners for exterior Work and Work below grade.

.3 Countersink bolts and bolt heads as required for clearance of other Work.

.4 Size fasteners to penetrate base member by half of fastener length minimum. Minimize splitting of wood members by staggering nails in direction of grain.

.5 For plywood use spiral, annular or resin coated nails and staples.

3.9 **SURFACE-APPLIED WOOD PRESERVATIVE**

.1 Treat raw surfaces, drilled holes and cut ends of pressure treated wood with 2 coats of wood

preservative immediately after cutting.

.2 Treat surfaces of pressure impregnated material (PT and FRT) which are exposed by cutting, trimming or boring, with wood preservative or fire retardant chemical, as applicable, before installation.

.3 Apply preservative by dipping, by brush or by pouring into plugged holes to completely saturate surface for minimum 3 minute soak on lumber and one minute soak on plywood.

.4 Apply fire retardant chemical to the requirements of the labelling authority and the authorities having jurisdiction.

3.10 **EQUIPMENT BACKBOARDS**

.1 Provide backboards, 2400 mm high, throughout all communications rooms for mounting owner's equipment. Electrical room for panel installation coordinate with electrical equipment layouts. Use 19 mm thick G1S FRT plywood on 19 x 38 mm furring around perimeter and at maximum 400 mm intermediate spacing. Prepare for paint finish by Section 09 91 00. Coordinate mounting height with the Owner.

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

.1 Provide all material and labour required for the completion of the Contract. Breakdown of Work by Section is for guidance only and is not necessarily complete.

.2 Where steel members connect to wood members, the CLT sub-contractor shall cooperate with the steel sub-contractor.

.3 Work Furnished and Installed:

.1 Cross-laminated Timber (CLT) structural units

.2 Holes for other trades

.3 Connection hardware

.4 Related Work Specified Elsewhere:

.1 Concrete reinforcement, Section 03 20 00

.2 Installation of anchors in concrete, Section 03 30 00

.3 Structural Steel, Section 05 12 00

.4 Protection of steel saddles, plates, brackets and the like forming part of wood connections, Section 05 12 00

.5 Glued Laminated Timber, Section 06 18 00

.6 Staining and finishing, Section 09 96 00

.7 Shop applied staining, finishing, and fire-retardant treatment, Section 09 96 00

.8 Moisture Control Plan, Section 01 33 00

1.2 STANDARDS, CODES AND ACTS (most recent edition)

.1 Conform with the Ontario Building Code 2012 under Ontario Regulation 332.12, including Ontario Regulation 88/19 and any applicable acts of any authority having jurisdiction, and the following (latest edition including any and all supplements):

.1 CAN/CSA-G40.21, Structural Quality Steel, Canadian Standards Association.

.2 CSA G164, Hot Dip Galvanizing of Irregularly Shaped Articles, Canadian Standards Association.

.3 CAN/CSA Standard O86, Engineering Design in Wood, Canadian Standards Association.

.4 CSA O112.10, Evaluation of Adhesives for Structural Wood products (Limited Moisture Exposure), Canadian Standards Association.

.5 CAN/CSA-O122, Structural Glued-Laminated Timber, Canadian Standards Association.

.6 CAN/CSA-O177, Qualification Code for Manufacturers of Structural Glued-Laminated Timber Canadian Standards Association.

.7 A307 Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

.8 ANSI/APA PRG 320, Standard for Performance-Rated Cross-Laminated Timber.

.2 Where there are differences between the specifications, drawings, standards, codes or acts, the most stringent shall govern.

1.3 QUALIFICATIONS OF MANUFACTURER

.1 Manufacture structural cross-laminated timber panel members in a plant qualified in accordance with ANSI/APA PRG 320.

.2 Fabricator for welded steel connections to be certified in accordance with CSA Standard W47.1.

1.4 DESIGN

.1 Connections are to be designed by a Professional Engineer registered in the province of Ontario, in accordance with CSA Standard O86 and CSA S16.

.2 Provide temporary intermediate support mid-span of every composite CLT panel spanning over three meters, and at third points of every composite CLT panel spanning over seven and a half meters.

.3 Design and detail temporary intermediate supports to safely support the weight of the CLT panel, concrete, reinforcing steel, and other construction loads until the concrete has achieved 70% of its 28 day strength.

1.5 SUBMITTALS

.1 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 33 23.

.2 Shop drawings are to be submitted in PDF format or equivalent, compatible with Adobe Acrobat 9.0.

.3 Drawings shall include:

.1 panel location and orientation plans, including same identification mark placed on panels

.2 stress grade, service grade and appearance grade

.3 shop applied finishes

.4 temporary intermediate supports of composite CLT panels

.5 lifting connections

.6 locations, tolerances and details of anchorage to supporting structure

.7 locations of all proposed openings larger than 250mm

.4 If requested by the Consultant, submit connection design calculations, stamped by the Engineer responsible for the design.

.5 Each shop drawing submitted shall bear stamp of a qualified Professional Engineer registered in the Province of Ontario.

.2 Calculations

.1 Submit sketches and calculations bearing the stamp and signature of a Professional Engineer licensed in the Province of Ontario as may be necessary to show design and loading assumptions including, but not limited to, all connection designs and details including hardware, appearance and member net section design.

.3 Certificates

.1 Submit manufacturer's certification for CLT in accordance with ANSI/APA PRG-320.

1.6 DELIVERY AND HANDLING

.1 Arrange delivery of members and/or panels in accordance with construction schedule to designated delivery location.

.2 Individually wrap commercial, quality or architectural appearance grade members prior to leaving plant with a moisture resistant wrapping.

.3 Affix authorized label to all CLT panels supplied. Identify each panel with mark number.

.4 Use padded, non-marring slings for handling members.

.5 Protect corners with wood blocking.

.6 Slit underside of membrane covering during storage at site.

.7 Store CLT panels well blocked off ground and separated with stripping, so air may circulate around all four sides of members.

.8 Cover top and sides with opaque moisture resistant membrane if unprotected.

1.7 PROTECTION

.1 Maintain protection CLT panels until protected by building membrane/finishes, etc.

.2 CLT Panels are to be stored off-site in conditioned space to maintain average manufacturing Moisture Content (MC) of 12% +/-3%. Deliver to site for same day erection when possible. Inform consultant if members are to be stored on site, or if members exceed 15% average MC prior to erection.

.1 Panels exceeding 19%average MC are not to be erected until dried to the consultant's approval.

.2 Panels with surface moisture content greater than 25% are not to be erected until dried to the consultant's approval

.3 Average MC refers to average moisture content across the depth of a panel.

.3 Protect panels from wetting once erected, refer to the Mass Timber Temporary Moisture Protection Plan, Section 01 33 30.

.1 Inform the consultant of any panels exceeding 15% average MC and await instruction prior to enclosing/finishing.

.2 Panels exceeding 19% average MC are not to be enclosed by any finishes until dried to the consultant's approval.

.3 Panels with a surface moisture content greater than 25% are not to be enclosed by any finishes until dried to the consultant's approval.

.4 Average MC refers to average moisture content across the depth of a panel.

.4 Bolts, nuts, washers, timber rivets, split rings, shear plates and all other connectors are to be hot-dip galvanized where the connection and or connected member are exposed to view in the finished building.

.5 Coat faces and edges of all CLT members with two coats of clear sealer.

PART 2 – PRODUCTS

2.1 SUPPLY/FABRICATION

.1 The CLT supplier/fabricator carried by the General Contractor shall be named in the bid submission, and shall not be changed following award of contract unless approved by the Consultant on behalf of the Owner.

2.2 MATERIALS

.1 CLT Panels

.1 Laminating stock: Sustainably harvested Spruce-Pine-Fir to CAN/CSA O122. Refer to section 3 for stress grade, appearance grade etc.

.2 Adhesive: to CAN/CSA O122.10, and Sections 2.1.3 and 3.3 (ASTM D7247 heat durability) of AITC 405. In addition, adhesives shall be evaluated for heat performance in accordance with Section 6.1.3.4 of DOC PS1.

.2 Steel for connections: to CSA Standard G40.21M Grade 300W.

.3 Bolts, nuts and washers: ASTM A307, galvanized.

.4 Galvanizing: to CAN/CSA G164-M92 hot dipped, minimum zinc coating of 600 g/m^2.

.5 Sealer for untreated CLT members: penetrating type, clear, non-yellowing liquid which will protect wood against moisture entry. Acceptable products: Sansin Wood Sealer as distributed by The Sansin Corporation, Strathroy, Ontario, Toll-Free: 1-877-SANSIN-1 (726-7461) or Olympic Premium Semi-transparent Stain. Product code 59594 or 51760 (clear)]

2.3 ALTERNATE GRADES

.1 If the contractor wishes to provide an alternate grade of material, a complete proposal, including calculations and certified material specifications shall be provided to the Consultant for review.

.2 The cost of reviewing any proposed alternate and coordinating such substitutions in order to make any resulting changes to the design will be billed directly to the Contractor on an hourly basis.

PART 3 – EXECUTION

3.1 FABRICATION

.1 CLT Panels: Fabricate CLT panels in accordance with ANSI/APA PRG 320 and to the following classifications:

.1 Stress grade: V2

.2 Appearance grade. Conform to the following, unless otherwise noted on the structural drawings:

.1 Members exposed to view in the finished building:

Architectural

.2 Members concealed from view in the finished building:

Industrial

.3 Mark CLT panels for identification during erection so that marks will be concealed in final assembly. Clearly mark top surface of all floor and roof panels.

.4 Custom CLT panels meeting the minimum requirements outlines in this specification and on the structural drawings may be acceptable subject to the approval of the consultant.

.2 Apply sealer to all sides and ends of members. As soon as possible after cutting apply sealer to cut ends of members.

.3 Connections:

.1 Types of connections are shown.

.2 Connections are to be designed by a Professional Engineer registered in the Province of Ontario, in accordance with CSA Standard O86 and CSA S16.

.3 If requested by the Consultant, submit calculations, stamped by the Engineer responsible for the design.

.4 Cut openings as required for pipes, ducts and the like in accordance with the following:

.1 Indicate openings on the fabrication and erections drawings

.2 Do not overcut corners on square openings.

.3 Holes not conforming to the above shall be approved by the Consultant prior to cutting.

3.2 ERECTION

.1 Erect CLT panels level, plumb to correct positions indicated in accordance with CSA Standard O86.

.2 Brace and anchor materials until permanently fixed.

.3 Make adequate provisions for erection stresses.

.4 Make splicing and jointing only in locations shown.

.5 Fit members closely and accurately to other members and other assemblies.

.6 Conform to erection tolerances specified in CAN/CSA-S16 Clause 29.3

.7 Interfacing tolerances may not be compatible with the above. Review and coordinate interfacing tolerances so that the various elements come together properly.

.8 Field cutting and alteration of members not permitted without Engineer’s approval.

.9 During construction, protect members, paying particular attention to columns and corners of walls, from damage.

.10 Maintain wrapping on CLT members as long as possible and tarp floors to prevent staining from rain until building enclosure is complete.

.11 Repair construction damage to timber members as required to maintain consistent appearance in the finished structure.

.12 Avoid rapid changes in temperature and humidity when commissioning building HVAC systems to minimize checking of members. Gradually increase heat in the building. Do not direct any forced air heating systems onto CLT panels.

.13 Clean exposed surfaces of CLT panels after erection and completion of field touch up.

.1 Do not use cleaning materials or processes that could change the appearance of exposed CLT panels or damage adjacent materials.

.14 Re-tightening Connections:

.1 Connection steel assemblies shall be inspected at 6 and 12 months after completion of the building envelope and commissioning of the HVAC systems, and tightened sufficiently to bring the faces of the connected materials into close contact without deformation.

.2 Any paint or other finishes damaged by these operations shall be made good.

.3 The cost of this work shall be included in the general contract tender price, but also identified as a separate price.

END OF SECTION 06 15 43

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

.1 Provide all material and labour required for the completion of the Contract. Breakdown of Work by Section is for guidance only and is not necessarily complete.

.2 Where steel members connect to wood members, the glued laminated sub-contractor shall cooperate with the steel sub-contractor.

.3 Work Furnished and Installed:

.1 Glue-laminated structural units.

.2 Holes for other trades

.4 Related Work Specified Elsewhere:

.1 Structural Steel, Section 05 12 00

.2 Protection of steel saddles, plates, brackets and the like forming part of wood connections, Section 05 12 00

.3 Cross Laminated Timber Panels, Section 06 15 43

.4 Staining and finishing, Section 09 96 00

1.2 STANDARDS, CODES AND ACTS

.1 Conform with the Ontario Building Code 2012 under Ontario Regulation 332.12, including Ontario Regulation 88/19 and any applicable acts of any authority having jurisdiction, and the following (latest edition including any and all supplements):

.1 CAN/CSA-G40.21, Structural Quality Steel, Canadian Standards Association.

.2 CSA G164, Hot Dip Galvanizing of Irregularly Shaped Articles, Canadian Standards Association.

.3 CAN/CSA Standard O86, Engineering Design in Wood, Canadian Standards Association.

.4 CSA O112.10, Evaluation of Adhesives for Structural Wood products (Limited Moisture Exposure), Canadian Standards Association.

.5 CAN/CSA-O122, Structural Glued-Laminated Timber, Canadian Standards Association.

.6 CAN/CSA-O177, Qualification Code for Manufacturers of Structural Glued-Laminated Timber Canadian Standards Association.

.7 A307 Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

.2 Where there are differences between the specifications, drawings, standards, codes or acts, the most stringent shall govern.

1.3 QUALIFICATIONS OF MANUFACTURER

.1 Manufacture structural glue-laminated members in plant certified by Administrative Board Structural Glue-Laminated Timber Division, to CAN/CSA O177 to manufacture Class 1 (interior) members and Class X (exterior) members

.2 At completion of project submit certificate in accordance with CAN/CSA O177, Appendix B.

.3 Fabricator for welded steel connections to be certified in accordance with CSA Standard W47.1.

1.4 DESIGN

.1 Connections are to be designed by a Professional Engineer registered in the province of Ontario, in accordance with CSA Standard O86 and CSA S16.

1.5 SUBMITTALS

.1 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 33 23.

.2 Shop drawings are to be submitted in PDF format or equivalent, compatible with Adobe Acrobat 9.0.

.3 Clearly indicate stress grade, service grade, appearance grade, shop applied finishes, and shop and erection details, including cuts, holes, fastenings and connection hardware and camber.

.4 If requested by the Consultant, submit connection design calculations, stamped by the Engineer responsible for the design.

.5 Each shop drawing submitted shall bear stamp of a qualified Professional Engineer registered in the Province of Ontario.

.2 Calculations

.1 Submit sketches and calculations bearing the stamp and signature of a Professional Engineer licensed in the Province of Ontario as may be necessary to show design and loading assumptions including, but not limited to, all connection designs and details including hardware, appearance and member net section design.

.3 Certificates

.1 Submit manufacturer’s certification for glulam in accordance with CSA O177.

1.6 DELIVERY AND HANDLING

.1 Arrange delivery of members and/or panels in accordance with construction schedule to designated delivery location.

.2 Individually wrap commercial, quality or architectural appearance grade members prior to leaving plant with a moisture resistant wrapping.

.3 Use padded, non-marring slings for handling members.

.4 Protect corners with wood blocking.

.5 Slit underside of membrane covering during storage at site.

.6 Store glued-laminated timber well blocked off ground and separated with stripping, so air may circulate around all four sides of members.

.7 Cover top and sides with opaque moisture resistant membrane if unprotected.

1.7 PROTECTION

.1 Maintain protection of glue laminated members until protected by building membrane/finishes, etc.

.2 Glue laminated members are to be stored off-site in conditioned space to maintain average manufacturing Moisture Content (MC) of 12% +/-3%. Deliver to site for same day erection when possible. Inform consultant if members are to be stored on site, or if members exceed 15% average MC prior to erection.

.1 Members with a depth greater than 400mm exceeding 15%average MC are not to be erected until placement is confirmed with the consultant.

.2 Members exceeding 19% average MC are not to be erected until dried to the consultant's approval.

.3 Members with surface moisture content greater than 25% are not to be erected until dried to the consultant's approval.

.4 Average MC refers to the average moisture content over the depth and width of a member

.3 Protect members from wetting once erected, refer to the Mass Timber Temporary Moisture Protection Plan, Section 01 33 30.

.1 Inform the consultant of any members exceeding 15% average MC and await instruction prior to enclosing/finishing.

.2 Members exceeding 19% average MC are not to be enclosed by any finishes until dried to the consultant's approval.

.3 Members with surface moisture content greater than 25% are not to be enclosed until dried to the consultant's approval.

.4 Average MC refers to the average moisture content over the depth and width of a member

.4 Bolts, nuts, washers, timber rivets, split rings, shear plates and all other connectors are to be hot-dip galvanized where the connection and or connected member are exposed to view in the finished building.

.5 Where exposed to view in the finished building, steel saddles, plates, brackets etc. forming parts of wood connections are to be prepared and painted in accordance with CICS/CPMA 1-73a.

.6 Where concealed from view in the finished building steel saddles, plates, brackets etc. forming parts of wood connections are to be prepared and painted in accordance with CICS/CPMA 1-73a.

.7 All steel materials outside the building envelope are to be galvanized in accordance with section 05 12 00 and as noted on the drawings.

.8 Coat ends of all glue laminated lumber with two coats of clear sealer. For preservative treated lumber allow an appropriate curing/drying time prior to application of sealer.

PART 2 – PRODUCTS

2.1 GLULAM SUPPLY/FABRICATION

.1 The glulam supplier/fabricator carried by the General Contractor shall be named in the bid submission and shall not be changed following award of contract unless approved by the Consultant on behalf of the Owner.

2.2 MATERIALS

.1 Glue-Laminated Members:

.1 Glue-laminated member laminating stock. Conform to the following, unless otherwise noted on the structural drawings: Sustainably harvested Lodgepole Pine and/or Eastern white spruce to CAN/CSA O122. Refer to section 3 for stress grade, appearance grade etc.

.2 Adhesive: to CAN/CSA O122, Clause 5.3 as per service grade requirement. Use only phenol-based adhesive. The use of urea-based adhesive will not be permitted.

.3 Adhesive: Jowat 686.60 polyurethane resin (white) adhesive or equivalent to meet the requirements of CSA Standard O177-06 “Qualification code for manufacturers of structural glued-laminated timber”

.2 Steel for connections: to CSA Standard G40.21M Grade 300W.

.3 Bolts, nuts and washers: ASTM A307, galvanized.

.4 Galvanizing: to CAN/CSA G164 hot dipped, minimum zinc coating of 600 g/m^2.

.5 Sealer for exterior glued-laminated members: two coats of Sansin SDF plus one coat of Sansin SDF Top-coat as distributed by The Sansin Corporation, Strathroy, Ontario, or equivalent.

.6 Sealer for untreated glued-laminated members: penetrating type, clear, non-yellowing liquid which will protect wood against moisture entry. Acceptable products: Sansin Wood Sealer as distributed by The Sansin Corporation, Strathroy, Ontario, Toll-Free: 1-877-SANSIN-1 (726-7461) or Olympic Premium Semi-transparent Stain. Product code 59594 or 51760 (clear)]

2.3 ALTERNATE GRADES

.1 If the contractor wishes to provide an alternate grade of material, a complete proposal, including calculations and certified material specifications shall be provided to the Consultant for review.

.2 The cost of reviewing any proposed alternate and coordinating such substitutions in order to make any resulting changes to the design will be billed directly to the Contractor on an hourly basis.

PART 3 – EXECUTION

3.1 FABRICATION

.1 Glue-laminated Members: Fabricate glued laminated members in accordance with CSA O122 and to the following classifications:

.1 Stress grade. Conform to the following, unless otherwise noted on the structural drawings:

.1 Bending members where significant hogging moments are anticipated, i.e. tension in the top fibres: 20f-EX

.2 Bending members where significant hogging moments are not anticipated i.e. limited tension in the top fibres: 20f-E

.3 Tension members: 18t-E

.2 Appearance grade. Conform to the following, unless otherwise noted on the structural drawings:

.1 Members exposed to view in the finished building:

Quality

.2 Members concealed from view in the finished building:

Industrial

.3 Service Grade: interior or exterior as indicated on the drawings.

.4 Mark laminated members for identification during erection so that marks will be concealed in final assembly.

.5 Modified layup for fire-rating

.1 For all bending members indicated on the drawings as requiring a fire-resistance rating, modify the lamination layup as follows:

.1 Less than 1 hour rating: no modification required.

.2 1 hour rating: remove one core (lowest grade) lamination, move the tension zone inward, and add one additional outer tension (highest grade) lamination to the tension side of the beam.

.3 Up to 2 hour rating: remove two core (lowest grade) laminations, mover the tension zone inward, and add two additional outer tension (highest grade) laminations to the tension side of the beam.

.4 Bending members using a balanced layup (i.e. 24f-EX or 20f-EX) with both top and bottom faces exposed to fire require the modified layup on both top and bottom faces.

.2 Apply sealer to all sides and ends of members. As soon as possible after cutting apply sealer to cut ends of members.

.3 Connections:

.1 Types of connections are shown.

.2 Connections are to be designed by a Professional Engineer registered in the Province of Ontario, in accordance with CSA Standard O86 and CSA S16.

.3 If requested by the Consultant, submit calculations, stamped by the Engineer responsible for the design.

.4 Cut openings as required for pipes, ducts and the like in accordance with the following:

.1 Indicate openings on the fabrication and erections drawings

.2 Holes in glued-laminated beams:

.1 Provide holes as required up to a maximum diameter of 10% of the beam depth.

.2 Locate holes within the middle third of the span and within the middle third of the depth of the beam.

.3 Space adjacent holes at five times the largest diameter.

.3 Do not overcut corners on square openings.

.4 Holes not conforming to the above shall be approved by the Consultant prior to cutting.

3.2 ERECTION

.1 Erect glued-laminated members level, plumb to correct positions indicated in accordance with CSA Standard O86.

.2 Brace and anchor materials until permanently fixed.

.3 Make adequate provisions for erection stresses.

.4 Make splicing and jointing only in locations shown.

.5 Fit members closely and accurately to other members and other assemblies.

.6 Conform to erection tolerances specified in CAN/CSA-S16 Clause 29.3

.7 Interfacing tolerances may not be compatible with the above. Review and coordinate interfacing tolerances so that the various elements come together properly.

.8 Field cutting and alteration of members not permitted without Engineer's approval.

.9 During construction, protect members, paying particular attention to columns and corners of walls, from damage.

.10 Maintain wrapping on glulam members as long as possible and tarp floors to prevent staining from rain until building enclosure is complete.

.11 Repair construction damage to timber members as required to maintain consistent appearance in the finished structure.

.12 Avoid rapid changes in temperature and humidity when commissioning building HVAC systems to minimize checking of glue-laminated members. Gradually increase heat in the building. Do not direct any forced air heating systems onto glued laminated members.

.13 Re-tightening Connections:

.1 Connection steel assemblies of the glued laminated members shall be inspected at 6 and 12 months after completion of the building envelope and commissioning of the HVAC systems, and tightened sufficiently to bring the faces of the connected materials into close contact without deformation.

.2 Any paint or other finishes damaged by these operations shall be made good.

.3 The cost of this work shall be included in the general contract tender price, but also identified as a separate price.

END OF SECTION 06 18 00

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products equipment and services necessary for the finish carpentry Work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ANSI A208.1, Particleboard.

.2 ANSI/HPVA HP-1, Hardwood and Decorative Plywood.

.3 ANSI A208.2, Medium Density Fibreboard for Interior Use.

.4 ANSI/NEMA LD 3, High-Pressure Decorative Laminates.

.5 APA - The Engineered Wood Association.

.6 ASTM F1667, Driven Fasteners: Nails, Spikes and Staples.

.7 Architectural Woodwork Manufacturers Association of Canada (AWMAC).

.8 Architectural Woodwork Standards (AWS) - Quality Standards for Architectural Woodwork.

.9 CAN/CSA O141, Softwood Lumber.

.10 CSA O151-M, Canadian Softwood Plywood.

.11 National Hardwood Lumber Association (NHLA) Rules for the Measurement and Inspection of Hardwood and Cypress.

.12 National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber.

.13 AAMA 611, Voluntary Standards for Anodized Architectural Aluminum.

.14 ASTM B211, Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire

1.3 **SUBMITTALS**

.1 Shop drawings: Submit shop drawings of finish carpentry Work in accordance with Section 01 33 00 indicating materials, thicknesses, sizes, finishes, wood species, grades, profiles, connection attachments, shop jointing, field jointing, reinforcing, anchorage, fastener types and sizes, location of exposed fastenings, mechanical and electrical service routes, service outlets, cutout locations, and sizes. Include erection drawings, plans, elevations, sections, and details as applicable.

.2 Samples: Submit samples of the following in accordance with the requirements of Section 01 33 00:

.1 Two representative pieces of each type of wood to receive a stained or natural finish.

.2 Two representative pieces of each type of wood finished as specified.

.3 Two of each colour, pattern, gloss, and texture of plastic laminate, in manufacturer's standard tag size.

.4 Two samples of laminated plastic joints, edging, cutouts and postformed profiles.

.5 Two of each solid surface, in 100 x 75 x 12 mm samples.

.6 Two samples of melamine surfaced board, edging and postformed profiles.

.7 One of each item of finish carpentry hardware.

1.4 QUALITY ASSURANCE

.1 Execute Work of this Section by member of AWMAC, with 5 years experience in finish carpentry Work of comparable complexity and scope. Submit proof of experience upon Consultant’s request.

.2 Fabricate finish carpentry Work in accordance with AWS Quality Standards, Premium Quality materials and installation unless otherwise indicated. Perform Work in accordance with the definition of Good Workmanship as defined in the AWS Quality Standards.

.3 Remove and replace finish carpentry Work which does not conform to the AWS Quality standards or as amended by these Specifications.

.4 Mock-up:

.1 Shop fabricate 6 samples of stain finish of WD-1 to match existing, complete with joints between panels, corner condition, installed in location acceptable to Consultant.

.2 Arrange for Consultant's review and acceptance, allow 48 hours after acceptance before proceeding with Work.

.3 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.

.5 The Zero Carbon Building – Design Standard v4- Design Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

1.5 **DELIVERY, STORAGE, AND HANDLING**

.1 Deliver, store, and handle finish carpentry in accordance with the AWS Quality Standards. Control the temperature and humidity in accordance with the AWS recommendations, before, during, and after finish carpentry delivery, and also during storage and installation.

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

1.6 **EXTENDED WARRANTY**

.1 Submit an extended warranty for plastic laminate work of this Section in accordance with General Conditions, except that warranty period is extended to 5 years from date of Substantial Performance of the Work.

.1 Warrant against defects in material and workmanship including but not limited to opening of joints, cracking, shrinkage, warpage, and delamination of plastic laminate.

.2 Coverage: Complete replacement including affected adjacent Work.

1.7 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 Construction Waste Management and Disposal.

2 Products

2.1 **MATERIALS**

.1 General: All materials under Work of this Section, including but not limited to, adhesives and mastics, are to have low VOC content limits.

.2 Hardwood lumber: Ash, unless otherwise indicated, to NHLA and AWS Premium Grade, S4S, average moisture content 7% +/- 2% at installation.

.3 Plywood, core substrate: APA plywood, Grade A-D, in sizes, thickness and shapes

.4 Plastic Lumber Board (WD-9): Wood Plastic Composite, Premium Capped Polymer from Vintage Collection by TimberTech PRO or approved equivalent for use of benches in Changerooms as indicated sized as shown on Contract Drawings. Provide Premium Capped Polymer from Vintage Collection by TimberTech PRO continuous stripping at 2 levels of wall mounted hooks (CH-1), length to match with wall-mount bench length.

.5 Solid Wood and Wood Panel at **MW-08A, MW-08B, MW-08C, MW-08D, MW-08E, MW-08F**: Clear Solid Cedar

.1 Timber member: Kiln-dried clear Grade “A” or better, Western Red Cedar, as supplied by Fairbank lumber of approved equivalent. Sized exactly to dimensions

with existing or as indicated, matching for uniform grain and colour, maintaining grain direction as shown. Maintain hairline joints. Horizontal joints at right angles to grain in panel field are not permitted. Provide protection for exposed corners and edges. Timber as supplied shall have moisture content not exceeding 19%.

.6 Plastic laminate (PLAM): Provide plastic laminates conforming to ANSI/NEMA LD 3 as follows:

.1 Flatwork face sheet: 1.2 mm thick, heavy wear resistance.

.2 Vertical interior face sheets: 0.8 mm thick.

.3 Postformed face sheet: 0.8 mm thick.

.4 Backing sheet: thickness to match face sheet, high pressure laminate, manufactured by same manufacturer as face sheet.

.5 Plastic laminate: As manufactured by Arborite, Formica, Forbo, Nevamar, Pionite and Wilsonart.

.6 Colours:

.1 PLAM-1: Laminates by Egger Wood Products. Selected by Consultant from full range of Wood Reproductions standard colours.

.2 PLAM-2: Laminates by Egger Wood Products. Selected by Consultant from full range of Wood Reproductions standard colours.

.3 PLAM-3: Laminates by Egger Wood Products. Selected by Consultant from full range of Wood Reproductions standard colours.

.4 PLAM-4: Laminates by Egger Wood Products. Selected by Consultant from full range of Wood Reproductions standard colours.

.7 Edge banding: All exposed edges to be banded with PVC edging as follows: PVC shall be 3MM solid polyvinyl chloride, colour to be selected by Consultant from manufacturer's full range of standard colors and finishes by Egger Wood Products.

.7 Melamine Surfaced Particleboard/Plywood (MEL-1): ANSI A208.1, Grade M2 particleboard with a melamine impregnated decorative paper thermofused onto the surface. Edging to be done in minimum 0.5 mm thin PVC to match melamine colour. ‘Panval Thermofused Melamine Panels’ by Uniboard Canada Inc. or approved alternative. Colour: to be selected by Consultant.

.8 Melamine Surfaced Particleboard/Plywood (MEL-2): ANSI A208.1, Grade M2 particleboard with a melamine impregnated decorative paper thermofused onto the surface. Edging to be done in minimum 0.5 mm thin PVC to match melamine colour. ‘Panval Thermofused Melamine Panels’ by Uniboard Canada Inc. or approved alternative. Colour: to be selected by Consultant.

.9 Melamine Surfaced Particleboard/Plywood (MEL-3): ANSI A208.1, Grade M2 particleboard with a melamine impregnated decorative paper thermofused onto the surface. Edging to be done in minimum 0.5 mm thin PVC to match melamine colour. 'Panval Thermofused Melamine Panels' by Uniboard Canada Inc. or approved alternative. Colour: to be selected by Consultant.

.10 Solid Surfacing (SOL):

.1 13 mm thick sheet stock, provide with bullnose edge and all cutouts as required. 'Corian' solid surfacing by DuPont or approved alternative. Allow for three colours to be selected by Consultant.

.2 Installation and seam adhesives to be as recommended by solid surfacing manufacturer, colour matched to solid surfacing.

.3 Colours:

.1 SOL-1: 13 mm for flat surface, Colour to be selected by Consultant from the full range of standard colour by Corian Solid Surfacing or SOL-1: 6mm for curved surface, Colour to be selected by Consultant from the full range of standard colour by Corian Solid Surfacing

.2 SOL-2: 13 mm, Colour to be selected by Consultant from the full range of standard colour by Corian Solid Surfacing

.3 SOL-3: 13 mm, Colour to be selected by Consultant from the full range of standard colour by Corian Solid Surfacing

.11 Particle board core: ANSI A208.1, Grade M2 of thickness indicated with WD-5 veneer at cabinet doors. Particleboard to be bound with waterproof adhesive and meeting the following minimum criteria:

.1 Density: minimum 705 kg/m3.

.2 Internal bond: 0.45 N/mm2.

.3 Modulus of rupture: 14.5 N/mm2.

.4 Modulus of elasticity: 2250 N/mm2.

.5 Face screw holding: 1000 N.

.6 Edge screw holding: 900 N.

.12 Laminating adhesive: CSA O112 Series, water resistant type, low VOC content, selected by laminate manufacturer for intended end use.

.13 Fire retardant coating: Provide clear fire retardant coating to plywood panels at the underside of the new furnace installations. Two component, VOC free coating providing

Class A Flame Spread rating to ASTM E84. ‘Safecoat Clear Fire Retardant Coating' as manufactured by Quantum Group of Companies or approved alternative.

.14 Draw bolts and splines: Type as recommended by fabricator.

.15 Nails and staples: Conforming to ASTM F1667; Size and type to suit application, galvanized for exterior work, interior humid areas and for treated lumber; plain finish elsewhere.

.16 Bolts, nuts, washers, blind fasteners, lags and screws: Size and type to suit application. Stapling is not acceptable.

.17 Adhesive and bituminous mastic: Selected by the millwork fabricator with low VOC content.

.18 Miscellaneous metals: In accordance with Section 05 50 00.

.19 Finishing: In accordance with Section 09 91 00.

2.2 **HARDWARE**

.1 The following hardware is the minimum quality standard for the work of this Section. Alternatives may be considered provided they are approved by Consultant prior to ordering of products.

.2 Drawer slides: Full extension, 8400 Series by Knape & Vogt.

.3 Pilasters: Clear anodized aluminum recessed shelf standards with 12 mm divisions, Model 233 by Knape & Vogt.

.4 Clips: Bright zinc plated, adjustable height shelf supports, Model 256 by Knape & Vogt.

.5 Corner unity cabinet hinges: Blind Corner Concealed Hinge, Salice, 110 degree Opening Angle, Nickel-Plated to suit the application by Hafele or approved alternative.

.6 Cabinet hinges: Institutional grade, pramatic with exposed axle and 3 mm gap, Single Pivot Institutional Hinge Arm, Aximat 300, Grade 1, with Expanding Dowels to suit the application by Hafele or approved alternative.

.7 Drawer and cabinet pulls (Pull-1): 10 mm dia. x 138 mm wide, stainless steel with matt finish, 115.61.602 by Hafele.

.8 Locks: Cam locks/deadbolt locks complete with lock core by Hafele, type to suit application and installation.

.9 Wood Cabinet Locks: Cam locks/deadbolt locks complete with lock core by Hafele, type to suit application and installation.

.10 Shelfing support with PLAM -1 on 25mm plywood shelving

.11 Heavy–Duty bracket #182 shelfing support. Model 1821430 14.4in, total quantities 120 by Richelieu or approved alternative.

.12 Heavy- Duty double standard, Series #82. Model 829430 94in, total quantities 15 by Richelieu or approved alternative.

.13 Metal Grommet at Reception Desk: Model: 20694170 by Richelieu or approved alternative.

.14 Desk Legs: Model: 624705174: 705MM (27-3/4") – Isola Adjustable Table Leg with High Adjustment – 624 by Richelieu or approved alternative. Provide three (3) in total.

2.3 RECESSED BASE AT MILLWORK AND WALL

.1 Resilient base type (B-1):

.1 Acceptable Products/manufacturers:

.1 Forbo

.2 Johnsonite

.3 Roppe 'Pinnacle Rubber Base'.

.2 Rubber wall base, 3.2 mm (1/8") thick, 101.6 mm (4") high, with cove profile. Colour: to later selection by Consultant from manufacturer's full range. coved profile, in lengths as long as possible including premoulded end stops and inner and outer corners.

2.4 PLASTIC LUMBER BENCH

.1 Provide all specified benches square, straight, plumb and true, complete as detailed and as per manufacturer's instructions. Safeguard surface of benches from abrasions during installation.

.2 Determine locations of benches and contact Consultant for verification. Notify any conflicts with other trades or amenity elements.

.3 Contractor to provide all required stainless-steel anchors required to install all surface mount benches to meet or exceed manufacturers specification.

.4 Ensure mounting surface is smooth and level. Drill the appropriate size pilot holes into the steel brackets surface with a new, sharp steel drill bit to ensure a clean hole free of steel surface chips. Apply Bakor 7 mil rubber gasket between mounting flange and steel surface. Trim of excess so as not to be visible. Touch-up paint all exposed bolt head to match colour of framework.

.5 Co-ordinate and execute all work in accordance with other trades and in sequence as required by the construction schedule. Make good any damage to any other Sections caused by this Work of this Section and remove excess materials and other debris from the Site.

2.5 PLASTIC LAMINATE WORK

.1 Perform plastic laminate Work in accordance with AWS Quality Standards and ANSI/NEMA LD 3.

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

.3 Laminate plastic laminates to core materials in accordance with manufacturer's instructions.

.4 Fabricate core surfaces and profiles with continuous support and bond over entire surface to receive plastic laminate.

.5 Apply plastic laminate backing sheets to balance shrinkage stresses induced by plastic laminate face sheets.

.6 Minimize joints in plastic laminate Work; do not install joints in plastic laminate Work in less than 2400 mm o.c. Locate joints minimum 610 mm from cut-outs. Offset core and plastic laminate facing joints.

.7 Form shaped profiles and bends as indicated, using postformed grade laminate to laminate manufacturer's instructions.

.8 Edging to be done using straight self-edging laminate strip to match adjacent colour, finish, gloss, and pattern to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.

.9 Apply laminated plastic liner sheet to interior of cabinetry and where indicated.

.10 Fabricate units by solid surfacing manufacturer's certified or approved fabricator/ installer. Fabricate built-up profiles as indicated.

2.6 ENTRANCE STAINLESS STEEL LETTERS

.1 Custom waterjet-cut brushed stainless steel letters, size as per the drawings. Concealed pin-mounting with ¾” spacers. The text is “BLANTYRE PARK POOL”, fonts as noted on drawings and including all required fasteners (pin connectors, or support channel) and preparation of masonry veneer unit substrate.

2.7 FABRICATION

.1 Be responsible for methods of construction and for ensuring that materials are rigidly and securely attached and will not be loosened by the work of other sections.

.2 Coordinate locations of concealed supports and blocking with other parts of Work. Provide cutouts for outlet boxes and other fixtures.

.3 Fabricate work in a manner which will permit expansion and contraction of the materials without visible open joints. Conceal joints and connections in wherever possible.

.4 Set nails and countersink screws, apply wood filler to indentations, sand smooth and leave ready to receive finish.

.5 Mitre exposed corners, no end grain shall be visible in completed installation.

.6 Finish millwork in accordance with Section 09 91 00. Finished millwork shall be free from bruises, blemishes, mineral marks, knots, shakes and other defects and shall be selected for uniformity of colour, grain and texture.

.7 Shelving to cabinetwork to be adjustable unless otherwise noted.

.8 Recess shelf standards, unless noted otherwise. Stagger recessed shelf standards on opposite sides of divider.

.9 Do not exceed maximum 760 mm unsupported span for 19 mm thick shelving. House fixed shelving into gables and divisions.

.10 Shop assemble finish carpentry to accommodate delivery and handling and to ensure passage through building openings.

.11 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.

.12 Fabricate sills, screens, frames, benches and moldings to profiles shown.

.13 Fire retardant coating: Apply fire retardant fire coating to floor plywood panels at the underside of new furnace installations in accordance with manufacturer's written instructions.

3 Execution

3.1 **EXAMINATION**

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

3.2 **INSTALLATION**

.1 Install Work in accordance with AWS Quality Standards and tolerances for Architectural Woodwork. Set and secure finish carpentry in place, rigid, plumb, square, and level.

.2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate columns, fixtures, outlets, or other projecting, intersecting or penetrating objects leaving a 0.8 mm gap maximum.

.3 Coordinate cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures, in finish carpentry. Round internal corners of cut-outs and seal exposed cores.

.4 Form joints to conceal shrinkage.

.5 Install draw bolts and splines in laminated plastic counter top joints at maximum spacing 450 mm o.c., and 75 mm from edge. Make joints flush, hairline butt joints.

.6 Install finishing hardware accurately and securely in accordance with manufacturer's directions, adjust and clean.

.7 Install prefinished millwork at locations shown on drawings. Position accurately, level, plumb straight.

.8 Apply bituminous coating over wood framing members in contact with masonry or cementitious construction.

.9 Bulletin Board (BB-1):

.1 Verify substrate surfaces are solid, free from surface water, dust, oil, grease, projections and other foreign matter detrimental to performance.

.2 Install bulletin board level and securely and rigidly anchored to substrate in accordance with authorities having jurisdiction, reviewed shop drawings and manufacturer’s written instructions.

.3 Bulleting Board trim: Provide extruded aluminum (AL-1) for perimeter of bulletin board as indicated on Contract Drawings.

.10 Melamine panels: Assemble melamine millwork using dowelled/wafered-and-glue construction. Installed melamine panels shall not show any exposed fasteners on finished/exposed surfaces.

.11 Solid Wood and Wood Panel at **MW-08A, MW-08B, MW-08C, MW-08D, MW-08E, MW-08F**: Supply and install clear kiln-dried clear Grade “A” Western Red Cedar (refer to drawings for details).

.12 Solid surfacing:

.1 Install solid surfacing in accordance with manufacturer's instructions.

.2 Align work plumb and level.

.3 Seal perimeter of fabrication to adjacent construction in accordance with Section 07 91 00.

.13 MW-1A, MW-1B, MW-1C, MW-1D Change Room Bench:

.1 Construct plastic lumber benches of sizes and details as noted.

.2 Bench top to be plastic lumber.

.3 Anchor wood to supports in a concealed manner.

.4 Mitre joints at corners. Keep joints to a minimum.

.5 Install brackets and supports supplied under work of Section 05 50 00.

.14 MW-2 Change Room Open Bench

.1 Construct plastic lumber benches of sizes and details as noted.

.2 Bench top to be plastic lumber.

.3 Mitre joints at corners. Keep joints to a minimum.

.4 Install brackets and supports supplied under work of Section 05 50 00.

.15 MW-3A, MW-3B Office Lower and Upper Cabinets

.1 Construct sink countertop sizes and details as noted.

.2 Construct upper and lower storage sizes and details as noted.

.3 Countertop to be SOL.

.4 Anchor wood to supports in a concealed manner.

.5 Mitre joints at corners. Keep joints to a minimum.

.6 Round all corners, edges and ends.

.16 MW-4 Office Desk

.1 Construct countertop sizes and details as noted.

.2 Countertop to be SOL.

.3 Anchor wood to supports in a concealed manner.

.4 Mitre joints at corners. Keep joints to a minimum.

.5 Round all corners, edges and ends.

.6 Install brackets and supports supplied under work of Section 05 50 00.

.17 MW-5A, MW-5B Meeting Room Upper and Lower Millwork

.1 Construct millwork sizes and details as noted.

.2 Construct upper and lower storage sizes and details as noted.

.3 Countertop to be SOL.

.4 Anchor wood to supports in a concealed manner.

.5 Mitre joints at corners. Keep joints to a minimum.

.6 Round all corners, edges and ends.

.7 Install brackets and supports supplied under work of Section 05 50 00.

.18 MW-7 Reception Desk

.1 Construct countertop sizes and details as noted.

.2 Countertop to be SOL.

.3 Anchor wood to supports in a concealed manner.

.4 Mitre joints at corners. Keep joints to a minimum.

.5 Round all corners, edges and ends.

.6 Install brackets and supports supplied under work of Section 05 50 00.

.19 MW-08A, MW-08B, MW-08C, MW-08D, MW-08E, MW-08F – Exterior Millwork

.1 Construct Solid Wood and Wood Panel sizes and details as noted.

.2 Anchor wood to supports in a concealed manner.

.3 Mitre joints at corners. Keep joints to a minimum.

.4 Round all corners, edges and ends.

.5 Install brackets and supports supplied under work of Section 05 50 00.

.20 Fastening:

.1 Coordinate wall securement, anchorage, and blocking for finish carpentry items.

.2 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.

.3 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.

.4 Provide heavy duty fixture attachments for wall mounted cabinets.

.5 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round cleanly cut hole and plug with wood plug to match material being secured.

.21 Remove and replace damaged, marked, or stained finish carpentry.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour Products, equipment and services necessary for sheet waterproofing Work in accordance with the Contract Documents.

1.2 **SUBMITTALS**

.1 Product Data: Submit manufacturer's product data in accordance with Section 01 33 00. Include information on characteristics, performance criteria, and limitations, as well as preparation, installation requirements and techniques, product storage, and handling criteria.

.2 Shop Drawings: Submit shop drawings in accordance with Section 01 33 00, indicating:

.1 Location and extent of the system and system finish applications.

.2 System and joint sealant treatment materials.

.3 Details of terminations at the end of each day’s work.

.4 Large-scale details, including relationships with adjacent construction.

.5 Installation sequence and methods.

.6 Connections, edge treatment at discontinuous edges, accessories, and other relevant details for proper and complete installations.

.7 Samples: Submit the following samples in accordance with Section 01 33 00:

.1 Two 300 x 300 mm samples of waterproofing membrane.

.2 Two 300 mm long samples of fastening bar.

.3 Two 300 x 300 mm samples of protection board.

.8 Mock-Up:

.1 Construct a representative area of typical waterproofing installation for approval, located at the Place of the Work as part of the final installation.

.2 Do not proceed with the work until the mock-up has been reviewed and accepted by the Consultant.

.9 Certification: Submit installer’s certification verifying compliance with specification requirements.

1.3 **QUALITY ASSURANCE**

.1 Work under this section shall be performed by a Subcontractor with sufficient plant, equipment, and skilled workers to perform the work expeditiously. The Subcontractor must have at least 5 years of documented experience in satisfactory installations similar to the specified work and who have approval in writing by the self-adhered waterproofing system manufacturer for installing their Product. Submit proof of qualifications upon request. Proof of

qualifications shall not be required for tender evaluation.

.2 The Zero Carbon Building – Design Standard v4- Design Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

1.4 **SITE CONDITIONS**

.1 Do not perform the work of this section outside the environmental ranges recommended by the manufacturer unless written acceptance is obtained from both the Consultant and the Product manufacturer.

.2 Supply and install temporary protection and facilities to maintain the environmental conditions required by the Product manufacturer and the specifications outlined above, before, during, and after installation.

.3 Provide forced air circulation during curing periods for enclosed applications.

.4 Apply only when air and surface temperatures are maintained above 4°C for at least 48 hours before, during, and after installation unless otherwise approved.

.5 Work may proceed at temperatures below 4°C only with mutual documented agreement among the inspection and testing company, manufacturer, and applicator, ensuring that specified installation standards will be met with the materials and methods used.

.6 Maintain application temperature and humidity conditions as recommended by the material manufacturer before, during, and after installation.

.7 Provide adequate natural ventilation or forced air circulation during installation and curing periods for enclosed applications.

.8 Do not expose materials vulnerable to water or sun damage in quantities greater than can be installed within the same day.

.9 Install waterproofing only on dry surfaces, free from snow and ice, and during weather conditions that will not introduce moisture into the waterproofing system.

1.5 **DELIVERY, STORAGE, AND HANDLING**

.1 Package materials with labels identifying the manufacturer, contents, and material specification number.

.2 Store solvent-based liquids and surface conditioners away from excessive heat and open flames. Maintain surface conditioners at a temperature above 5°C.

.3 Do not double-stack pallets of waterproofing membranes.

1.6 **EXTENDED WARRANTY**

.1 Submit an extended warranty for sheet waterproofing work in accordance with the Conditions of the Contract, extending the warranty period to five (5) years from the date of Substantial Performance of the Work.

.2 Warrant the Work against defects, including but not limited to adhesive failure, cohesive failure, waterproofing failure, and water leakage.

.3 Coverage: Ensure the warranty includes complete replacement of defective waterproofing and any affected adjacent work.

1.7 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 Construction Waste Management and Disposal.

2 Products

2.1 **MATERIALS**

.1 All materials under Work of this Section, including but not limited to, primers are to have low VOC content limits.

.2 The waterproofing system shall provide watertight protection, preventing the passage of water under hydrostatic pressure.

.3 All components of the waterproofing system shall be supplied by one manufacturer.

.4 Vertical Waterproofing membrane system; self-adhering polymeric waterproofing membrane **(AVB-2)**

.5 Thickness:

.1 Total Thickness: 1.5 mm (1/16").

.2 Film: 4 mils.

.3 Polymeric Membrane: 56 mils.

.6 Tensile Strength (to ASTM D412-15a):

.1 Film: Minimum 40.71 MPa (5,900 psi).

.2 Polymeric Membrane: Minimum 4.07 MPa (590 psi).

.7 Elongation (to ASTM D412-15a): Polymeric Membrane: Minimum 455 percent.

.8 Water Vapour Transmission (to ASTM E96/E96M-10, Method B): 0.05 grains/ft²/hour.

.9 Water Absorption (to ASTM D570-98(2010)e1): Maximum 0.1% after 72 hours.

.10 Resistance to Hydrostatic Head: Equivalent to 45.72 m (150 ft) of water.

.11 Puncture Resistance (to ASTM E154/E154M-08a(2013)e1): 67 pounds.

.12 Sheet waterproofing Acceptable Products:

.1 ‘Blueskin WP 200’ by Henry Company Canada Inc.

.2 CCW Miradri 860/861’ by Carlisle Coatings and Waterproofing.

.3 ‘Colphene 3000’ by Soprema.

.4 ‘Mel-Rol’ by W.R. Meadows.

.13 Primer/Surface Conditioner: As per the membrane manufacturer's printed installation instructions.

.14 Primer Acceptable Products:

.1 ‘Aquaprime’ by Henry Company Canada Inc.

.2 ‘CCW AWP’ by Carlisle Coatings and Waterproofing.

.3 ‘Elastocol Stick H20’ by Soprema.

.4 ‘Mel-Prime WB Primer’ by W.R. Meadows.

.15 Bonding Asphalt: Single-component bonding asphalt. Use the manufacturer's proprietary mastic.

.16 Mastic for Self-Adhered Membrane Systems: Single-component, utility-grade, rubber-based sealant. Use the manufacturer's proprietary mastic.

.17 Mastic Acceptable Products:

.1 ‘HE925 - BES Sealant’ by Henry Company Canada Inc.

.2 ‘CCW 704 Mastic’ by Carlisle Coatings and Waterproofing.

.3 ‘Sopramastic 200’ by Soprema.

.4 ‘Pointing Mastic’ by W.R. Meadows.

.18 Horizontal Vapour Barrier Membrane **(AVB-4)**

.1 Performance Criteria:

.1 Permeance: Not greater than 0.5700 ng/(Pa·s·m²) (0.010 perms (gm/ft²/in-Hg)) as tested after conditioning, in accordance with ASTM E1745-11, paragraphs 7.1.2 through 7.1.5.

.2 Strength: Class A, in accordance with ASTM E1745-11.

.3 Thickness of Plastic: Minimum 0.38 mm (15 mils).

.2 Acceptable Products:

.3 Stego Industries 'Stego Wrap Vapor Barrier' at the specified thickness.

.4 W.R. Meadows 'PERMINATOR' at the specified thickness.

.5 Substitutions: In accordance with Section 01 25 00.

.6 Vapour Barrier Membrane Joint Tape:

.1 Description: High-density polyethylene tape, pressure-sensitive, 100 mm (4") wide, to be used as per the vapour barrier membrane manufacturer's installation instructions.

.2 Penetration Flashing: Use vapour barrier membrane material and joint tape in accordance with the manufacturer’s instructions.

.19 Fastening Bar: Continuous aluminum bar, 25 mm wide x 3 mm thick, predrilled for mechanical attachment.

3 Execution

3.1 **EXAMINATION**

.1 Verify the condition and dimensions of previously installed work upon which this section depends. Report any defects to the Consultant. Commencement of work indicates acceptance of existing conditions.

.2 Ensure existing substrates receiving waterproofing are clean, dry, sound, smooth, and continuous.

.3 Coordinate sealing of interruptions and protrusions through the waterproofing membrane. Confirm that other work items projecting through the waterproofing membrane are in place and securely installed.

3.2 **MASTIC AND PRIMER**

.1 Fill substrate voids, gaps, depressions, cracks, and joints with mastic to create a continuous, smooth substrate suitable for waterproofing.

.2 Condition surfaces to receive the waterproofing membrane by applying primer or surface conditioner using a spray or roller, following the manufacturer's mixing and application instructions.

.3 Allow the primer or surface conditioner to dry adequately before proceeding with the application of the waterproofing membrane. Avoid pooling or excessive application of primer or surface conditioner. Re-prime surfaces not covered by the waterproofing membrane on the same day.

.4 Prime substrate surfaces to receive waterproofing in accordance with the manufacturer’s instructions, applying primer at the recommended rate and allowing it to dry. Adjust coverage to match surface porosity.

.5 Re-prime surfaces if they are not covered with waterproofing membrane within 4 hours.

3.3 VERTICAL WATERPROOFING MEMBRANE INSTALLATION

.1 Apply mastic where necessary to ensure the integrity of the waterproofing installation at protrusions and other complex details.

.2 Apply the waterproofing membrane system in accordance with the manufacturer's instructions to create a permanent, monolithic vapour seal, ensuring no voids or open seams.

.3 Overlap ends and edges of waterproofing by a minimum of 50 mm. Roll waterproofing and laps using the manufacturer’s recommended roller to ensure continuous adhesion over the entire substrate.

.4 Apply the waterproofing membrane system in strict accordance with the manufacturer’s instructions.

.5 Establish a square start location using a chalk line or alternate method. Align the first sheet of membrane with a straight edge, remove the first few feet of release paper from the roll, and lay the membrane onto the substrate. Continue removing the release paper while adhering the membrane, ensuring no air becomes trapped between the membrane and substrate.

.6 Align subsequent rolls with the previous roll along the lap lines provided on the membrane, maintaining a minimum overlap of 64 mm (2-1/2").

.7 For end laps and splices at roll ends, overlap the previous membrane by a minimum of 150 mm (6"). Stagger end laps and point exposed edges and terminations with pointing mastic to prevent water infiltration. Ensure laps shed water effectively.

.8 Lay the membrane carefully to ensure uniform application and minimize fishmouths (wrinkles extending to the membrane's edge).

.9 Pre-treat horizontal-to-vertical inside corner transitions with the manufacturer’s proprietary fillet, extending 19 mm (3/4") vertically and horizontally from the corner. Apply a minimum 225 mm (9") strip of membrane centered at the joint.

.10 Immediately after placement, roll the membrane entirely to ensure continuous adhesion to the substrate. For vertical applications, use the manufacturer-recommended membrane roller.

.11 Inspect the membrane thoroughly before placing the protection course. Patch any tears, inadequately lapped seams, or other defects using additional waterproofing membrane.

.12 Apply edge dressing of waterproofing mastic to all vertical and horizontal membrane terminations to protect against water undermining due to ponding or vertical drainage.

.13 Cracks Detail Work**:**

.1 For non-working joints or cracks up to 5 mm wide, apply a 300 mm wide reinforcing strip of waterproofing membrane centered over the joint or crack.

.2 For non-working joints or cracks greater than 5 mm wide, notify the Consultant. Fill joints flush to the surrounding deck surface before applying a 300 mm reinforcing strip of waterproofing membrane. Use a liquid waterproofing membrane to fill voids.

.3 For cold-pour joints, grind or chip the surface as necessary to smooth the joint or crack before applying the field membrane. Treat these joints in the same manner as non-working joints/cracks less than 5 mm wide.

.14 Inspect vertical and horizontal inside/outside corners to ensure smoothness and regularity.

.1 Ensure outside corners are continuous and free of sharp edges.

.2 Ensure inside corners are free of rough edges resulting from formwork placement. Repair as required.

.15 Apply a reinforcing ply of waterproofing membrane over outside corners, using a strip at least 300 mm wide centered over the corner. Press the membrane into full contact with the substrate. Install reinforcing strips prior to the application of the field membrane.

.16 Extend waterproofing as required to connect to other components of the waterproofing system.

.17 Cut and fit waterproofing as necessary for protrusions, ensuring continuous adherence to the substrate.

.18 Install a continuous mechanical fastening bar to clamp waterproofing on both sides of unfilled gaps, cracks, and joints.

3.4 **VERTICAL DRAINAGE SHEET**

.1 For backfilled applications, attach the vertical drainage sheet to the waterproofing assembly using the manufacturer’s recommended adhesive, ensuring it is compatible and approved by the waterproofing manufacturer. Avoid puncturing or damaging the waterproofing membrane.

.2 Position the drainage sheet with the flat side against the wall and the filter fabric facing the soil or drainage side. Install the sheet in a manner that prevents soil migration into the drainage channels.

.3 Connecting Adjacent Sheets**:**

.1 Connect adjacent sheets at the longitudinal edges and sheet ends by pulling back the filter fabric to expose the flange.

.2 Butt the sheet edge to the adjacent sheet edge, dimple to dimple, or overlap the edge of the next panel over two dimples and interlock them.

.3 Ensure connections are made in a shingle fashion to direct moisture flow into the lower sheet core.

.4 Overlap the filter fabric in the direction of water flow.

.5 Cover terminal edges with the filter fabric flap by tucking it behind the core. If there is insufficient fabric, cut out a depth of three dimples from the core to provide additional fabric for wrapping the core.

.4 Do not cover the completed vertical drainage installation until the quality control inspection has been completed.

3.5 HORIZONTAL VAPOUR BARRIER MEMBRANE INSTALLATION

.1 Install the vapour barrier membrane in accordance with the manufacturer's instructions and ASTM E1643-11.

.2 Extend the vapour barrier to the perimeter of the slab and seal it to the perimeter and penetration conditions. Seal around penetrations such as utilities and columns to create a monolithic membrane between the slab surface and moisture sources below and at the perimeter.

.3 Use the largest practicable sheet size for the vapour barrier membrane to minimize joints over compacted fill.

.4 Inspect the vapour barrier membrane sheets for continuity. Repair punctures and tears with sealing tape before concealing the work.

.5 Ensure the vapour barrier membrane installation is continuous and vapour-tight.

.6 Overlap vapour barrier membrane joints by a minimum of 150 mm (6") and seal with vapour barrier joint tape.

.7 Unroll the vapour barrier membrane with the longest dimension parallel to the direction of concrete placement.

.8 Lap the vapour barrier membrane up foundation walls by a minimum of 100 mm (4") and tape-seal the edges with vapour barrier joint tape.

.9 Centre vapour barrier joint tape over membrane laps and joints, ensuring adhesion areas are free of dust, dirt, and moisture.

.10 For penetrations such as pipes, ductwork, rebar, and wires:

.1 Cut a slit in the vapour barrier membrane around the penetration to position the initial layer.

.2 Cut a piece of vapour barrier membrane at least 300 mm (12") wide and 1.5 times the circumference of the pipe. Create "fingers" by cutting halfway through the width of the film.

.3 Wrap the membrane around the pipe, tape the collar onto the pipe, and secure the "fingers" to the bottom layer of the vapour barrier membrane with joint tape.

.11 If the vapour barrier membrane is damaged during or after installation, make repairs as follows:

.1 Cut a piece of vapour barrier membrane large enough to overlap the damaged area by at least 150 mm (6").

.2 Clean the adhesion areas of dust, dirt, and moisture.

.3 Secure the patch by taping down all edges with vapour barrier joint tape.

3.6 FIELD QUALITY CONTRAL

.1 Upon completion of the work in this section, arrange for the entire installation to be inspected by the membrane manufacturer's authorized representative in the presence of the Consultant.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for the thermal insulation work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM C612-10, Standard Specification for Mineral Fibre Block and Board Insulation.

.2 Health Canada / Workplace Hazardous Materials Information System (WHMIS): Material Safety Data Sheets (MSDS).

.3 CAN/ULC-S701-01, Thermal Insulation, Polystyrene Boards and Pipe Covering.

.4 CAN/ULC-S702-97, Thermal Insulation, Mineral Fibre, for Buildings.

SUBMITTALS

.1 Product data: Submit manufacturer's Product data in accordance with Section 01 33 00 indicating characteristics, performance criteria, and limitations. Indicate installation requirements and techniques, storage, and handling criteria and installation procedure acceptable to manufacturer.

.2 Certification: Submit installer's certification verifying compliance with specification requirements.

.3 Provide the manufacturer's material safety data sheets for the specified materials and products, ensuring compliance with Workplace Hazardous Materials Information System (WHMIS) requirements for safe handling.

.4 Submit applicable supporting documentation for CAGBC Zero Cabron Building - Design requirements for the Consultant's approval.

1.2 **QUALITY ASSURANCE**

.1 The CAGBC Zero Carbon Building requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve CAGBC Zero Carbon Building certification will be used as one criterion to evaluate requests for substitutions or alternates.

1.3 **DELIVERY, STORAGE & HANDLING**

.1 Deliver products in their original, unopened packaging with legible manufacturer identification. Store materials in full compliance with the manufacturer's recommendations.

1.4 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 Construction Waste Management and Disposal.

2 Products

2.1 BOARD INSULATION MATERIALS

.1 Below Grade Insulation and Where Not Otherwise Indicated (**INS-2**):

.1 Extruded polystyrene board to CAN/ULC-S701, Type IV, with square ends and shiplap edges unless otherwise specified.

.2 Thickness: As indicated.

.3 Thermal Resistance: Minimum RSI 0.87 m²·°C/W per 25 mm thickness.

.4 Compressive Strength: 210 kPa.

.5 Standard of Acceptance: Styrofoam XPS.

.2 Horizontal Insulation Below Ground Surfaces (**INS-2**):

.1 Extruded polystyrene board to CAN/ULC-S701, Type IV, with square ends and shiplap edges unless otherwise specified.

.2 Thickness: As indicated.

.3 Thermal Resistance: Minimum RSI 0.87 m²·°C/W per 25 mm thickness.

.4 Compressive Strength: 413 kPa.

.5 Standard of Acceptance: Styrofoam Highload 60 or Owens Corning “Formular 600”

.3 Above Grade Exterior Wall Insulation (**INS-1**):

.1 Extruded polystyrene board to CAN/ULC-S701, Type IV, with square ends and shiplap edges unless otherwise specified.

.2 Thickness: As indicated.

.3 Thermal Resistance: Minimum RSI 0.87 m²·°C/W per 25 mm thickness.

.4 Compressive Strength: 210 kPa.

.5 Standard of Acceptance: Styrofoam XPS.

.4 Roof Insulation (INS-4 and INS-5): Specified in Section 07 52 00.

2.2 SEMI-RIGID INSULATION METAL STUD (INS-3)

.1 Metal Stud Wall Assemblies:

.1 Mineral wool fibre batt insulation for wood frame applications, made from basalt rock and steel slag.

.2 Conforming to CAN/ULC-S702, Type 1, with a minimum of 40% recycled content.

.3 Standard of Acceptance: Comfortbatt by Rockwool, Thermafiber "Fire and Sound Guard Plus".

.2 Acoustical Fire Batts:

.1 Mineral wool fibre batt insulation for interior partitions requiring acoustical insulation or where the batt insulation is part of a fire-resistant assembly.

.2 Made from basalt rock and steel slag, conforming to CAN/ULC-S702, Type 1, with a minimum of 40% recycled content.

.3 Standard of Acceptance: Rockwool AFB acoustical fire batt, Thermafiber "SAFB".

2.3 **FORMED-IN-PLACE INSULATION** (gap filler) (**INS-7**)

.1 Foam insulating sealant: Two-component polyurethane foam insulating sealant, ULC Class I (flame spread of 25 or less) conforming to CAN/ULC-S102. Standard of Acceptance: CF 812 by Hilti or approved equivalent.

2.4 **ACCESSORIES**

.1 Provide mechanical fasteners, insulation clips, and other accessories as recommended by the insulation manufacturer to securely retain the insulation in position for each specific application.

.2 Insulation Fasteners:

.1 Impaling clip made of plastic or nylon with a washer retainer and clips.

.2 Designed to be mechanically fastened or adhered to the surface receiving board insulation.

.3 Length: Suitable for the insulation thickness and substrate.

.4 Capable of securely and rigidly fastening insulation in place.

3 Execution

3.1 **EXAMINATION**

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

.2 Ensure substrate surfaces are dry, clean, suitable to receive adhesive and free from other deleterious substances.

.3 Where applicable, verify that the air/vapour barrier is in place, undamaged, and has been reviewed and accepted by the Consultant.

.4 Do not proceed with the work until all unsatisfactory conditions have been corrected to the satisfaction of the installer.

.5 Commencement of the installation shall be construed as acceptance of the site conditions, making the Contractor fully responsible for completing the work satisfactorily as specified herein.

3.2 **WORKMANSHIP**

.1 Do not install insulation until the work behind it has been reviewed and accepted by the Consultant.

.2 Install insulation in strict accordance with the manufacturer’s written instructions to ensure continuity of thermal, acoustical, and fire protection across building elements and spaces.

.3 Apply a single layer of insulation to achieve the thickness indicated, except where multiple layers are specified or required to meet the total thickness. Offset both vertical and horizontal joints in multiple-layer applications.

.4 Use only insulation that is undamaged, dry, clean, free from chipped or broken edges, and has not been exposed to ice or snow.

.5 Cut and trim insulation to create a neat compression-fit in spaces. Do not compress insulation excessively to fit spaces. Butt joints tightly, using the largest possible dimensions to reduce the number of joints.

.6 Fit insulation closely around electrical boxes, pipes, ducts, frames, and other objects passing through or within the insulation, following the manufacturer’s instructions.

.7 Maintain a minimum clearance of 75 mm from heat-emitting devices such as recessed light fixtures and 50 mm from the sidewalls of chimneys and vents.

.8 Where necessary, retain insulation in position with mechanical fasteners recommended by the insulation manufacturer for the specific application.

.9 Arrange for Consultant to review thermal insulation before it is enclosed.

3.3 **BELOW-GRADE INSULATION**

.1 Install below-grade insulation where indicated.

.2 On vertical surfaces, set insulation units using the manufacturer’s recommended adhesive and follow the manufacturer’s written instructions.

.3 Follow the manufacturer's printed instructions for installation, ensuring that the concrete is fully cured prior to starting.

.4 Install insulation with tight shiplap joints.

.5 For horizontal applications, ensure the subgrade surface is flat and free of high and low spots to provide a firm base for the insulation.

.6 On horizontal surfaces, loosely lay insulation units in accordance with the manufacturer’s written instructions. Stagger end joints and tightly abut insulation units.

.7 Where necessary to hold insulation boards in place, apply adhesive compatible with polystyrene to the boards. Press the insulation boards into position before the adhesive skins over.

.8 Coordinate with the excavating, trenching, and backfilling contractor to ensure suitable subgrade preparation for below-grade horizontal insulation.

.9 Butt adjacent insulation boards tightly and ensure that corners are fully lapped.

.10 Trim insulation boards as needed to fit around openings and projections.

.11 Omit adhesive bonding of foam board insulation over expansion and control joints.

.12 Concrete-Faced Below-Grade Perimeter Foundation Insulation:

.1 Install concrete-faced insulation using corrosion-resistant concrete fasteners and clips as per the manufacturer’s written recommendations.

.2 Extend panels to a minimum of 150 mm (6") below finished grade unless otherwise indicated.

.3 Layout concrete-faced insulation boards to maximize board sizes. Do not use boards less than 305 mm (12") wide. Orient boards vertically.

.4 Apply sealant around penetrations as specified in Section 07 92 00.

3.4 ABOVE-GRADE WALL INSULATION: STEEL STUD WALLS

.1 Do not install insulation until the air barrier is in place and has been reviewed and accepted by the Consultant.

.2 Install the insulation between wall ties. Coordinate with Section 05 41 00 "Structural Steel Stud Systems" to ensure wall ties are located to minimize cutting of the insulation.

.3 Where applicable, secure insulation boards with the specified insulation retention devices.

.4 Mechanically fasten semi-rigid insulation to the substrate using a minimum of 5 insulation fasteners per insulation board in a dice pattern, with a maximum spacing of 610 mm (24") on center.

3.5 FORM-IN-PLACE APPLICATION

.1 Install two-component foam insulation at locations where indicated, in accordance with the CAN/ULC-S711.2 application standard.

.2 Apply foam insulating sealant in strict accordance with the manufacturer's printed directions, using the dispensing gun provided by the material manufacturer. Ensure all voids in the exterior wall insulation are completely filled with the sealant.

.3 Apply foam insulating sealant in all locations necessary to maintain the continuity of the insulation and/or the vapour barrier, including, but not limited to:

.1 Sealing voids in the exterior envelope of the building and at all locations where the continuity of insulation is interrupted.

.2 Sealing junctions between materials and components comprising the air barrier to maintain its continuity.

.3 All locations indicated on the drawings.

.4 Note that the material expands up to 2.5 times its original volume when applied. Avoid overfilling voids.

.5 If required, apply the sealant in several layers, allowing each layer to cure before applying the next.

.6 To accelerate curing in deep cavities, lightly moisten surrounding surfaces before application.

.7 While curing, tool the foam as needed.

.8 If leakage occurs after curing, trim the foam flush with the surrounding surfaces or recess it to a sufficient depth to allow for finishing with caulking.

3.6 PROTECTION

.1 Comply with manufacturer's printed recommendations respecting protection.

.2 Protect polystyrene insulation from extended exposure to sunlight.

.3 Repair damage resulting from performance of work of this section in manner acceptable to Consultant.

3.7 CLEANING

.1 Upon completion of the work under this Section, remove all surplus materials, dirt, and debris from the premises and leave the installation clean.

.2 Remove masking and temporary protection from adjacent surfaces.

.3 Clean and repair any damage to adjacent surfaces caused by the work of this Section.

END OF SECTION

1. General

1.1 **SECTION INCLUDES**

.1 Labour, Products equipment and services necessary for interior air and vapour barrier Work in accordance with the Contract Documents.

1.2 **REFERENCES**

1.3 CAN/CSA-ISO 9001-00(R2005), Quality Management Systems - Requirements.

.1 ISO 9972:2006 / EN 13829 -– Determination of air permeability of buildings, Fan pressurization method

.2 ASTM E779 – Standard Test Method for Determining Air Leakage Rate by Fan Pressurization

.3 ASTM E84 - Standard test method for surface burning characteristics of of building materials.

.4 ASTM E2178 - Standard Test method for. Air Permeance of Building Materials

.5 AATCC 127 – Hydrostatic pressure test

.6 ISO 12572 - Hygrothermal performance of building materials and products

.7 EN 1849-2 - Flexible sheets for waterproofing - Determination of thickness and mass per unit area

.8 EN 12114 - Thermal performance of buildings - Air permeability of building components and building elements

.9 EN 12310-1 - Flexible sheets for waterproofing. Determination of resistance to tearing (nail shank)

.10 EN 12311-2 - Flexible sheets for waterproofing. Determination of tensile properties.

.11 EN 13859-1 - Flexible sheets for waterproofing - Underlays for discontinuous roofing/(sheathing)

.12 EN 1296 - Flexible sheets for waterproofing - Method for artificial ageing by long term exposure to elevated temperature

.13 EN 1931: Determination of water vapor transmission properties

1.4 **SUBMITTALS**

.1 Product data: Submit manufacturer's Product data in accordance with Section 01 33 00 indicating installation details, physical properties and detailed application and installation instructions.

.2 Submit shop drawings in accordance with Section 01 33 00 indicating:

.1 Adjacent construction and typical details, dimensions, thickness, method of

application, protection and penetration details.

.2 Location of each membrane penetration.

.3 Mock-Up: Provide a mock-up for evaluation of installation techniques and application workmanship.

.1 Prior to installation of airtight layer, mock up airtight layer as follows to verify details and to demonstrate connections to adjoining construction elements, and other termination conditions.

.2 Install mockup of airtight layer in location designated by Consultant.

.3 Do not proceed with remaining work until workmanship and application technique are approved by Consultant.

.4 Construct typical interior wall, 8 feet wide by 8 feet long, illustrating materials interface and connections (tape, adhesives, gaskets), incorporating specified options including but not limited to the following:

.1 junctions of walls, foundations, ceilings, floors and roof,

.2 corner conditions

.3 curtain wall and doorframe connections, and

.4 blow-in insulation seals/battens.

1.5 QUALITY ASSURANCE

.1 Installer's qualifications: Work under this Section shall be performed by company, approved by Product manufacturer and having 5 years recent experience in Work of comparable complexity and scope. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

.1 The (sub-)contractor installing the interior airtight layer shall have as minimum experience with at least two buildings that was independently tested below 0.15CFM/sf75

.2 Pre-installation meeting: Arrange with Consultant and manufacturer's representative to inspect substrates and review installation procedures 48 hours in advance of installation.

.3 Performance target: Minimum acceptable air-tightness level is 0.15CFM/sf75 for buildings over 20,000SF.

.4 The Zero Carbon Building – Design Standard v4- Design Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

1.6 SEQUENCING AND COORDINATION

.1 Sequence the work to allow for the installation of materials in conjunction with related materials and seals.

.2 Coordinate the work of this section with other related sections to ensure the continuity of the air seal.

1.7 PRECONSTRUCTION MEETING

.1 Preconstruction Meeting: Convene a meeting with all subcontractors affected by the Work of this Section a minimum of one week prior to commencing work of this section. Agenda shall include materials, details of construction, compatibility of materials, sequencing of construction/installation of membranes, the airtightness goal and emphasize that the success during the blower door test is dependent on the collaboration of all subcontractors.

.2 Coordinate Work with other subcontractors (plumbers, electricians, carpenters, HVAC), operations and installation of finish materials to install correct-sized gaskets on pipes, ducts and cable when these elements pass through the interior airtight layer, and to avoid damage to installed materials. Before they commence work on site, provide each effected trade with sufficient gaskets.

.3 After meeting, post the following warning in a prominent location at all building entrances and top of each stair – 1/2” letter height minimum for header, 1/4” for all other text

1.8 DELIVERY, STORAGE AND HANDLING

.1 Protect materials from direct exposure to sunlight and physical damage.

.2 Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

.3 Store materials on pallets. in clean and dry areas, not exposed to direct sunlight and in accordance with manufacturer's instructions. Store adhesives and primers at temperatures at or above 4 degrees Celsius to facilitate handling.

.4 Protect materials during handling and application to prevent damage, puncturing or contamination.

1.9 ENVIRONMENTAL REQUIREMENTS

.1 Do not perform installation work during rainy or inclement weather or on frost-covered or wet surfaces.

.2 Maintain environmental conditions (temperature, humidity, and ventilation) as per manufacturers recommendations. Do not install products under environmental conditions outside manufacturer's absolute limits.

.3 Minimize exposure of airtight membranes to direct sunlight. Use blinds or covers over curtain wall openings to block direct sunlight to prevent UV damage to membranes, if membranes will not be covered by sheetrock within 2 weeks or use exterior grade products (INTELLO X or SOLITEX line)

.4 Minimize exposure to water. If exposure is likely, expected or cannot be avoided, use

exterior grade products (INTELLO X or SOLITEX Line).

1.10 **EXTENDED WARRANTY**

.1 Extend the warranty period for the entire building envelope air/vapour/moisture barrier system to 5 years for labour and 10 years for materials, superseding the 2-year warranty period prescribed in the General Conditions of the Contract.

.2 Warrant the system against performance failure.

1.11 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 Construction Waste Management and Disposal.

2. Products

2.1 **MATERIALS**

.1 All materials under Work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.

2.2 **MATERIALS**

.1 All materials under Work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.

.2 Vapour permeable air barrier (AVB-1): Single-ply, self adhering membrane consisting of engineered film and permeable adhesive with poly-release film; ‘Delta-Vent SA’ by Cosella-Dorken, ‘Blueskin VP160’ by Henry Company Canada Inc. or ‘WrapShield SA’ by Vaproshield. Primer as recommended by membrane manufacturer.

.3 Peel and Stick Membrane: Single-ply, self adhering membrane consisting of engineered film and permeable adhesive with poly-release film; ‘Delta-Vent SA’ by Cosella-Dorken, ‘Blueskin VP160’ by Henry Company Canada Inc. or ‘WrapShield SA’ by Vaproshield. Primer as recommended by membrane manufacturer.

.4 Sealant: ASTM C920, Type S, Grade NS, Class 25; Moisture sure, medium modulus polymer modified sealing compound ‘HE925 BES’ by Henry Company Canada Inc. or approved alternative by Cosella-Dörken Products, Inc. or VaproShield.

3. Execution

3.1 **EXAMINATION**

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

3.2 **APPLICATION**

.1 Ensure surfaces to receive membrane are sound, dry, clean, and free from oil, grease, dirt, excess mortar or other contaminates.

.2 Fill substrate voids, gaps, depressions, cracks, and joints with mastic until continuous, smooth, substrate for air barrier is achieved.

.3 Prime substrate surfaces to receive air barrier in accordance with manufacturer's instructions, at recommended application rate, allow to dry. Vary coverage to suit surface porosity.

.4 Prime surfaces. Re-prime surfaces if not covered with air barrier within 4 hours.

.5 Install mastic where required to ensure integrity of air barrier installation at protrusions and other complex details.

.6 Install air barrier in accordance with reviewed shop drawings and manufacturer's instructions in locations indicated.

.7 Lap air barrier ends and edges 50 mm minimum. Roll air barrier and laps for continuous adhesion over entire substrate area; use manufacturer's recommended roller.

.8 Extend air barrier as required to connect to other components of Work comprising air barrier system.

.9 Provide end-dams and terminations fabricated from same material as air barrier or material recommended by membrane manufacturer at sills, lintels, openings, and where horizontal surfaces intersect with vertical surfaces to ensure moisture is shed to exterior.

.10 Cut and fit air barrier as required for passage of protrusions, ensuring continuous adherence to substrate.

.11 Seal around masonry reinforcing or ties and all penetrations with termination mastic.

.12 At end of days' Work, trowel mastic water cut-off along uppermost edge of incomplete air barrier assembly, to prevent loss of adhesion and damage air barrier.

.13 Do not expose air barrier to sunlight for more than 30 days prior to enclosure.

3.3 **FIELD QUALITY CONTROL**

.1 Do not cover or permit to be covered any portion of the membranes until they have been inspected by the Consultant or by an inspection agency appointed by the Consultant.

END OF SECTION

1 General

1.1 **DESCRIPTION**

.1 This section provides the installing 2-ply Modified Bitumen membrane, including but not limited to the following:

.1 Roof Type RF1

.1 Mechanically fastened gypsum sheathing boards

.2 Self-adhesive vapour retarder (AVB-3)

.3 Rigid insulation in adhesive

.4 Composite panel of asphaltic board and Base Sheet in adhesive

.5 Self-adhesive Base Sheet Flashing

.6 Torched Cap and Cap Sheet Flashing

1.2 **REFERENCES**

.1 Use most current version of listed standards.

.2 Perform roofing and sheet metal work in conformance with roofing manufacturer's written recommendations as well as requirements of ULC laboratories Class C, and Canadian Roofing Contractor’s Association (CRCA).

.3 ASTM C1177/C1177M, Standard Specification for Glass Mat Gysum Substrate for Use as Sheathing.

.4 ASTM C1289, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation board.

.5 ASTM E96, Standard Test Method for Water Vapour Transmission of Materials.

.6 CGSB 37-GP-9M, Primer, Asphalt Roofing, Dampproofing and Waterproofing.

.7 CGSB 37-GP-56M, Membrane Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

.8 CGSB-37.5-M89, Cutback Asphalt Plastic Cement.

.9 CSA A123.21, Standard Test Method for the Dynamic Wind Uplift Resistance of Membrane-Roofing Systems.

.10 CSA A123.23, Product Specification for Polymer-modified Bitumen Sheet, Prefabricated and Reinforced.

.11 CRCA Roofing Manual, Canadian Roofing Contractors Association.

.12 OIRCA, Ontario Industrial Roofing Contractors Association.

1.3 **ADMINISTRATIVE REQUIREMENTS**

.1 Roof Drains: Coordinate with Divisions 21, 22, and 23 to verify that roof drains are compatible with the roofing system design and will function as required.

.2 Roof-Mounted Items: Collaborate with installers of roof-mounted items, equipment, and mechanical and electrical components to ensure their installation does not compromise the integrity of the roofing system.

.3 Air Barrier Continuity: Coordinate the installation of the air barrier at walls to ensure seamless integration with the roofing system. Overlap the roofing air barrier membrane with the wall system air barrier membrane by a minimum of 75 mm (3") and terminate securely to maintain a continuous air barrier system for the building.

.4 Electrical Coordination: Work with electrical contractors to ensure proper routing and protection of wiring for solar panels, including coordination with other roof-mounted systems to avoid conflicts and maintain system integrity.

1.4 Pre-Installation Meeting for Roofing System

.1 Conduct the meeting in accordance with Section 01 31 19, ensuring all relevant parties are present to discuss the roofing installation process.

.2 Conduct a meeting with Consultant, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, solar panel installer, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment, 72 hours prior to installation.

.3 Review methods and procedures related to roofing installation, including manufacturer's written instructions.

.4 Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

.5 Examine substrates and existing conditions for compliance with requirements, including flatness and fastening.

.6 Review structural loading limitations of roof deck during and after roofing.

.7 Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect the roofing system.

.8 Review governing regulations and requirements for insurance and certificates, if applicable.

.9 Review temporary protection requirements for roofing system during and after installation.

.10 Review roof observation and repair procedures after roofing installation.

.11 Forecasted weather conditions.

1.5 **SUBMITTALS**

.1 Product data: Submit copies of manufacturer's product data in accordance with Section 01 33 00 indicating:

.1 Systems, materials, and methods of installation proposed for use.

.2 Identify systems and component

.3 Certify compliance of each component with applicable standards.

.4 Submit cold weather construction procedures and methods of protection which will be initiated, installed and maintained when ambient temperature falls below 0^0C.

.2 Shop drawings; general details:

.1 Include plans, elevations, sections, details, and attachments to other work for the following:

.1 Base flashings, cants, and membrane terminations.

.2 Tapered insulation, including slopes.

.3 Crickets, saddles, and tapered edge strips, including slopes.

.4 Insulation fastening patterns.

.5 Partitioning water cut-offs.

.2 Certificates:

.1 Installer certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

.2 Manufacturer certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

.3 Submit evidence of compliance with performance requirements.

.3 Roofing manufacturer’s warranty and design criteria:

.1 Submit copy of completed roofing manufacturer’s pre-installation notification form at least 15 Working Days prior to commencement of roofing installation.

.2 Submit copy of roofing manufacturer’s warranty specimen and warranty design criteria for roofing system prior to commencement of roofing installation.

.4 Samples:

.1 Submit samples complete with manufacturer's labels intact, of materials to be used for work of this section prior to commencement of work. Allow ample time for review and acceptance by Consultant and roofing inspection company. Do not proceed with work until samples are accepted.

1.6 QUALITY ASSURANCE

.1 Manufacturer’s reports:

.1 ISO 9001 and ISO 14001 certification.

.2 Ensure materials of this section are provided by one single source

.3 Perform Work of this Section by a company that is a member in good standing of the Ontario Industrial Roofing Contractors Association (OIRCA) and has a minimum of 10 years proven acceptable roofing experience on installations of similar complexity and scope. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

.4 Roofing Subcontractor must be approved by the membrane manufacturer for the warranty program specified. Submit the Subcontractor's certification letter prepared by the membrane manufacturer.

.5 Execute work of this section only under the full-time supervision of the qualified Subcontractor's site supervisor.

.6 Ensure roofing system has been tested and conforms to CAN/CSA A123.21 to ensure wind uplift resistance applicable to the Place of Work.

.7 Perform roofing Work in accordance with CRCA Roofing Specifications Manual and applicable CSGB Specifications, except where indicated otherwise.

.8 Ensure membrane manufacturer's representative has full access to this Work for proper inspection prior to and during membrane installation. Roof inspections shall be conducted at a minimum when the roof is 10%, 25%, 50%, 75% and 100% complete. Membrane manufacturer must certify that roof installation conforms to the manufacturer's written requirements.

.9 Pre-installation meetings: Arrange a meeting on Site to be attended by the Consultant, Contractor, and roofing manufacturer's representative to inspect substrates and review installation procedures 48 hours prior to installation.

.2 The Zero Carbon Building – Design Standard v4- Design Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver and store materials in dry location in their original packaging, displaying the manufacturer's name, product name, weight, and reference standards, as well as all other indications or references considered standard.

.2 Store adhesives and sealants at a minimum $+5^0$C. Store adhesives and solvent-based mastics at sufficiently high temperatures to ensure ease of application.

.3 Keep membrane materials stored in rolls standing on end, selvage edge up elevated from moisture at temperatures no less than 5^0C.

.4 Deliver roofing materials to the Project site in original containers with seals unbroken and labeled with the manufacturer's name, product brand name and type, date of manufacture, and storage directions.

.5 Protect roof insulation materials from physical damage and deterioration caused by sunlight, moisture, soiling, and other sources. Store in a dry location and comply with the insulation manufacturer's written instructions for handling, storage, and protection during installation.

.6 Handle and store roofing materials and place equipment in a manner that avoids permanent deflection of the deck.

.7 Handle materials carefully to prevent damage, following the manufacturer's written recommendations.

.8 Label each container of asphalt bitumen or provide a certificate with each load of bulk bitumen to attest to flash point (FP), finished blowing temperature (FBT), softening point (SP), and equiviscous temperature (EVT) of the bitumen supplied for the work.

.9 Package materials with attached labels identifying the manufacturer, brand, contents, weight (as applicable), and product and specification numbers.

.10 Protect the edges of roll goods from damage during handling and store rolls upright to prevent flattening.

.11 Avoid storing roofing materials on the roof. Store materials in a dry area protected from inclement weather when roofing installation is not in progress. Use opaque, breathable, and waterproof tarpaulins or sheds for storage.

.12 Prevent compression of insulation panels at any point and protect edges and corners from breakage. Discard wet, cupped, bowed, or otherwise damaged insulation from the Place of Work.

.13 Protect the edges and corners of precast concrete paving slabs to prevent damage.

.14 Place 19 mm thick plywood runways over Work to enable movement of Product and other traffic.

.15 Have a minimum 9 kg. dry chemical fire extinguisher fully charged and in operable condition at every location where open flames are used.

.16 Use warning signs and barriers. Maintain in good order until completion of Work.

.17 Clean off drips and smears of bituminous immediately. .13 Dispose of rain water off roof and away from face of building until roof drains or hoppers are installed and connected.

.18 At end of each day's Work or when stoppage occurs due to inclement weather, protect completed Work and Products.

1.8 **SITE CONDITIONS**

.1 Proceed with installation only when current and forecasted weather conditions comply with the roofing system manufacturer's written instructions and warranty requirements.

.2 Ensure all roofing materials are dry, properly stored, and protected from adverse weather conditions before and during installation.

1.9 **EXTENDED WARRANTIES**

.1 Provide written document in the owner's name, valid for a twenty (20), year period, stating that manufacturer will repair any leaks in the roofing membrane to restore the roofing system to a dry and watertight condition, to the extent that membrane manufacturing or installation deficiencies caused water infiltration. The warranty must cover for the entire cost of the repair(s) during the entire warranty period. Ensure warranty is transferable, at no extra cost, to subsequent building owners starting from the date of acceptance.

.2 Provide contractor's workmanship warranty valid for a period of two (2) years.

.3 Warranty shall include for labour, materials, and workmanship.

1.10 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 Construction Waste Management and Disposal.

2 Products

2.1 **FASTENERS**

.1 Roofing fasteners to steel decking: Use # 12, FM approved, with 3" round metal plates

.2 Roofing nails: spiral nails with steel round-top cap 25 mm in diameter and 3 mm diameter shank; long enough to penetrate solid wood supports by at least 38 mm and plywood substrates by at least 20 mm.

.3 **Termination Bars:** Provide pre-punched aluminum termination bars measuring 25 mm (1") wide x 1.5 mm (1/16") thick x 3000 mm (10 ft) long. Bars shall have 6.4 mm (1/4") x 9.5 mm (3/8") slotted holes spaced at 200 mm (8") centers.

2.2 **GYPSUM SHEATHING BOARDS**

.1 ASTM C1177/C1177M. Minimum 16 mm thick, glass mat faced, exterior grade gypsum board. Primed finish.

.2 Specified product: 16mm DensDeck Prime by Georgia Pacific or approved equivalent.

2.3 **PRIMER**

.1 CGSB 37-GP-9M, Stabilised primer used to enhance adhesion of membranes.

.2 Specified product: ELASTOCOL STICK by SOPREMA (for self adhesive membranes) or approved equivalent.

.3 Specified product: ELASTOCOL 500 by SOPREMA (for heat welded membranes) or approved equivalent.

2.4 **VAPOUR RETARDER (AVB-3)**

.1 ASTM E96, Self-adhesive air/vapour barrier membrane composed of tri-laminated woven polyethylene facer and SBS modified bitumen. Water vapour permeability: 2.5 ng/Pa•s•m2 (0.04 perm)

.2 Specified product: SOPRAVAP'R by SOPREMA or approved equivalent.

2.5 **ADHESIVE**

.1 Low-rise two-part urethane adhesive with no solvent content.

.2 Specified product: DUOTACK INSULATION ADHESIVE by SOPREMA or approved equivalent

2.6 **INSULATION (INS-4 and INS-5)**

.1 INS-4 (Bottom Layers) CAN/ULC S704, ASTM C1289. Closed cell, polyisocyanurate foam core between organic facers reinforced with glass fibres.

.2 INS-5 (Upper Layers) Specified product: SOPRA-ISO and SOPRA-ISO tapered by SOPREMA or approved equivalent.

.3 Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where required to ensure proper drainage. Fabricate to the slopes indicated in the Contract Documents, ensuring a minimum slope of 1:48 (1/4 inch per 12 inches) in addition to the slope of the roof structure or the tapered insulation slope, as applicable.

2.7 **ASPHALTIC DECK COVER BOARD WITH LAMINATED BASE SHEET MEMBRANE**

.1 CSA A123.23, SBS modified base sheet membrane and polyester reinforcement, factory-laminated on asphaltic board. Top surface covered with thermofusible poly film. Side laps 60% self-adhesive and 40% thermofusible. 7 mm total thickness.

.2 Specified product: 2-1 SOPRASMART BOARD by SOPREMA or approved equivalent.

2.8 **COVER STRIP**

.1 CSA A123.23, Membrane strip of 330 mm (13 in) made of SBS modified bitumen with a composite reinforcement. Top surface covered with thermofusible poly film, underface self-adhesive. The strip ensures watertightness in the end laps.

.2 Specified product: SOPRALAP by SOPREMA or approved equivalent.

2.9 **MEMBRANES**

.1 Base Sheet Flashing:

.1 CGSB 37-GP-56M, Type 2, Class C, Grade 2 (CSA A123.23, Type C, Grade 3)

.2 Roofing membrane with glass and polyester reinforcement and SBS modified bitumen. Top face covered with thermofusible poly film, under side self-adhesive. Top face marked with three (3) distinctive blue chalk lines to ensure proper roll alignment.

.3 Specified product: SOPRAPLY FLAM STICK by SOPREMA or approved equivalent.

.2 Cap Sheet and Cap Sheet Flashing:

.1 CGSB 37-GP-56M, Type 1, Class A, Grade 2 (CSA A123.23, Type C, Grade 1)

.2 Roofing membrane with glass and polyester reinforcement and SBS modified bitumen. Top surface covered with ceramic granules, underface with thermofusible poly film.

.3 Specified products: SOPRAPLY TRAFFIC CAP by SOPREMA or approved equivalent.

.3 **WATERPROOFING MASTICS**

.1 CGSB-37.5-M89, Mastic made of synthetic rubbers, plasticized with bitumen and solvents.

.1 Specified product: SOPRAMASTIC by SOPREMA or approved equivalent.

.2 Specified product: SOPRAMASTIC ALU by SOPREMA. (for exposed areas) or approved equivalent.

.4 **WATERPROOFING OF PENETRATIONS**

.1 One component polyurethane /bitumen resin.

.2 Specified product: Alsan Flashing and Alsan Flashing reinforcement by Soprema or approved equivalent.

.5 **PREFABRICATED CURB SYSTEMS**

.1 Provide a prefabricated curb system designed for field assembly. The system shall be filled with fast-setting, solvent-free mastic filler and sealants to ensure a watertight and durable installation.

.2 Specified product: Inter Clip System by SOPREMA or approved equivalent.

.6 **EXPANSION JOINTS**

.1 Expansion joint system shall be manufactured from a proprietary copolymer with internal polyester reinforcement and monolithic seam vulcanization.

.2 Movement and Fabrication: System shall allow tri-directional movement and serve as a waterproofing joint system. Joints shall be factory-fabricated in one piece for the entire contiguous expansion joint. For joints exceeding the manufacturer’s shipping and handling guidelines, sections shall be lapped and vulcanized on-site by the manufacturer’s authorized personnel. Any damaged materials shall be repaired by the manufacturer’s authorized personnel.

.3 Ensure compatibility with adhesives and membranes used in expansion joint construction, as per the manufacturer’s installation instructions.

.4 Provide a manufacturer’s warranty covering the full duration specified in this section.

.5 Hydrostatic Pressure Limit: The system shall perform under static hydrostatic pressure not exceeding 10 m (33 ft) of water.

.6 Expansion joint system to meet the roofing assembly type and movement design requirements, by Situra Inc. ‘RedLINE’ or approved equivalent.

3 Execution

3.1 **EXAMINATION**

.1 Conduct an examination of substrates, areas, and conditions with the roofing installer present to confirm compliance with the following requirements and any other conditions affecting the performance of the roofing system:

.1 Verify that roof openings and penetrations are properly positioned, and curbs are set, braced, and securely anchored.

.2 Ensure roof drain bodies are securely clamped in place.

.3 Confirm that blocking, curbs, and nailers are securely fastened to the roof deck at penetrations and terminations.

.4 Ensure nailers match the thickness of the insulation.

.5 Verify that the surface plane flatness and fastening of the steel roof deck comply with the requirements of Section 05 31 00.

.6 Test for moisture by pouring 0.5 L (1 pint) of hot roofing asphalt onto the substrate at the start of each day's work and at the beginning of each roof area or plane.

.7 Do not proceed with roofing work if the test sample foams or can be easily.

.8 Do not proceed with installation until all unsatisfactory conditions have been identified and corrected to meet the project specifications.

3.2 **SURFACE EXAMINATION AND PREPARATION**

.1 Complete surface examination and preparation in conformance with manufacturer’s recommendations, particularly for fire safety precautions.

.2 Do not begin any work before surfaces are smooth, dry, and exempt of ice and debris. Do not use calcium or salt for ice or snow removal.

.3 Do not install materials during rain or snowfall.

.4 Prevent materials, debris, and substances from entering and clogging roof drains and conductors. Protect surrounding surfaces from spills or material migration during preparation and installation. Remove roof drain plugs only when no work is taking place or when rain is forecast, to ensure proper drainage.

3.3 **METHOD OF INSTALLATION**

.1 Install roofing elements on clean and dry surfaces, in conformance with manufacturer's instructions and recommendations.

.2 Complete installation in a continuous fashion as surfaces are prepared and weather conditions permit.

.3 Ensure watertight conditions for roofs at all times, including protection during installation work by other trades and progressive protection as work is completed (e.g. vents, drains, etc.)

.4 Prepare surfaces and complete waterproofing work in accordance with the roofing manufacturer’s printed installation instructions.

.5 Install roofing elements on clean and dry surfaces, following the manufacturer’s instructions and recommendations.

.6 Complete roofing work in a continuous manner as surfaces are prepared and weather conditions allow.

.7 Seal seams that are not covered by a cap sheet membrane on the same day of installation. Do not install the cap sheet if moisture is present on or within the base sheet seams.

.8 Lay roofing membrane free of wrinkles, air pockets, fishmouths, tears, and prominent lap joints. Ensure full bonding of the cap sheet to the base sheet. Overlap seams and bond them fully.

.9 Before installing the base sheet and cap sheet, unroll and allow the sheet to relax for the duration recommended by the manufacturer, based on the ambient temperature at the time of installation.

.10 Extend roofing to the outer edges of the roof and up vertical surfaces at least 200 mm (8") above horizontal roofing, and the full height beneath counter flashing and top of curb flashing.

.11 Complete roofing up to the line of termination for each day’s work.

.12 For roofing systems with adhered field base sheet, insulation, and/or sheathing board using oxidized asphalt:

.1 Secure mechanical attachments (screws and plates) at 305 mm (12") centers at the base of the upstand.

.13 For roofing systems adhered with cold adhesive, bitumen, or asphalt, where insulation at the base of the vertical upstand exceeds 150 mm (6") in thickness:

.1 Install a continuous fastening bar and anchors at the base of the vertical upstand.

.2 Screws and plates longer than 150 mm (6") are not permitted in these applications.

3.4 CLEANING

.1 Immediately before roofing materials are applied, clean decks of roughness, rubbish, dust, dirt, oil, grease, snow, and ice.

.2 Clean the substrate thoroughly, removing dust, debris, moisture, and other substances detrimental to the roofing installation, in accordance with the roofing manufacturer's written

instructions. Remove all sharp projections to ensure a smooth and safe surface for roofing application.

3.5 EQUIPMENT FOR WORK EXECUTION

.1 Maintain all roofing equipment and tools in good working order.

.2 Use tools recommended by membrane's manufacturer.

3.6 APPLICATION OF GYPSUM SHEATHING BOARDS

.1 Lay sheathing board with tightly butted joints. Ensure longitudinal joints are at right angles to flute direction. Joints occurring along widths of board to be continuously supported on top flute of metal deck.

.2 Ensure the substrate board is promptly protected with a membrane immediately after installation.

.3 Mechanically fasten sheathing to deck with self-tapping, non-corroding screws, spaced evenly to each board and to only top flutes. Use 8 fasteners per 4' x 8 ' panels and 12 fasteners per corner panels

.4 Ensure sheathing is immediately protected with membrane.

.5 Tape all seams in the substrate board before installing the air/vapour barrier. Apply 150 mm (6") wide strips of self-adhering base sheet to prevent leakage into the building.

3.7 APPLICATION OF PRIMER

.1 Roofing substrate surfaces shall be primed with a coat applied at the rate specified in the roofing manufacturer's printed installation instructions.

.2 Ensure all surfaces to be primed are free of rust, dust, or any residue that may hinder adhesion.

.3 Cover primed surfaces with the roofing membrane as soon as possible, ensuring same-day coverage for self-adhesive membranes.

3.8 APPLICATION OF VAPOUR RETARDER (AVB-3)

.1 Beginning at the bottom of the slope, without adhering the membrane, unroll onto the substrate for alignment. Do not immediately remove the silicone release sheet.

.2 Align the roll parallel to the corrugations of the steel deck. Make sure the membrane overlaps are supported along their entire length.

.3 Peel back one end of the silicone release sheet and adhere this part of the membrane to the substrate. Peel back the remaining release sheet at a 45º angle to avoid wrinkles in the membrane.

.4 If the membrane is not properly aligned, do not try to adjust it. Instead, cut the roll and start again, making sure that it is properly aligned and that it overlaps the end of the misaligned piece by 150 mm.

.5 Overlap adjacent membranes by 75 mm. Overlap end laps by 150 mm. Stagger end laps by at least 300 mm.

.6 Completely seal the air and vapour barrier at all terminations, obstructions, and penetrations to prevent air infiltration into the roofing system.

3.9 INSULATION INSTALLATION

.1 Install insulation with adhesive in conformance with manufacturer's written recommendations.

.2 Install only as much insulation as can be covered in the same day.

.3 Install insulation in two layers and stagger seams between layers.

.4 Around the drains lower insulation by 1” to create a sump 4’ X 4’ in area. Bevel the edge of the 3” insulation on a 45° angle.

.5 Stagger and offset vertical joints of insulation boards by 305 mm (12") from those in the preceding layer.

.6 Trim the surface of insulation as needed around roof drains to ensure the completed surface is flush and does not impede water flow.

.7 Place insulation boards with edges in moderate contact without forcing. Fill any gaps greater than 6 mm (1/4") with insulation material.

.8 Cut insulation to fit tightly around blocking, upstands, and penetrations. Fill gaps greater than 6 mm (1/4") with insulation material.

.9 Install tapered insulation in roofing areas as required to achieve the slopes indicated in the design documents:

.1 Provide tapered insulation in adhesive throughout.

.2 Apply insulation adhesive to the underside of tapered insulation and immediately bond it to the substrate.

.10 Protect insulation from moisture and maintain it in a dry, new condition. Do not install insulation that is wet or damaged.

3.10 ROOF AREA DIVIDERS

.1 Locate roof area dividers to limit roofing sections while ensuring they do not obstruct or restrict the flow of water to drainage outlets.

3.11 ROOFING DETAILS

.1 Install as indicated in the drawings and in accordance with the various roofing details specified in the roofing manufacturer’s printed installation instructions.

3.12 APPLICATION OF ASPHALTIC OVERLAY BOARD WITH LAMINATED BASE SHEET MEMBRANE

.1 Install composite board with adhesive in continuous strips spaced 30 cm (12 in) on the field. Decrease the spacing between ribbons to a minimum of 15 cm (6”) at the perimeter and 10 cm (4”) at the corners.

.2 Adhere the first 60 mm (2.5 in) of the self-adhesive side and end laps by removing the silicone release paper and using a membrane roller, then heat-weld the last 40 mm (1.5 in) (self-adhesive, heat-welded side laps).

.3 Seal end laps by installing a 330-mm (13-in) wide protection strip centered on the joint.

.1 Ensure all boards are evenly and tightly butted together

.2 Avoid forming wrinkles, swelling or fishmouths

3.13 APPLICATION OF BASE-SHEET FLASHING

.1 Apply primer to the substrate at a rate of .25 L/m2. Allow primer to dry before installation of Base Sheet.

.2 Install reinforcing gussets at all inside and outside corners.

.3 Install base sheet flashing in one- (1) metre widths to cover roofing substrate over 100 mm. Overlap side laps by 75 mm. Stagger side laps by at least 100 mm from base sheet overlaps on roof to avoid excessive layering.

.4 Apply base sheet flashing directly onto substrate by removing siliconed paper cover sheet. Proceed from top to bottom. Once in place, apply pressure manually in a uniform fashion to obtain homogenous adherence over entire surface. Preferably seal seams with rubber roller. Nail outside edge at 300 mm o/c.

.1 Avoid forming wrinkles, air pockets or fishmouths.

.2 Always seal overlaps at the end of the workday.

3.14 APPLICATION OF CAP SHEET

.1 Once base sheet is applied and no defects are apparent, proceed with cap sheet installation, starting at the roof drains.

.2 Unroll cap sheet at drain. Carefully align first side lap (parallel to roof edge).

.3 Weld cap sheet onto base sheet with torch recommended by membrane manufacturer. During application, simultaneously melt both designated contact surfaces so a bead of bitumen is apparent as cap sheet unrolls.

.4 Avoid overheating.

.5 Unless overlap widths differ between cap and base sheets, make sure joints between the two layers are staggered by at least 300 mm.

.6 Overlap cap sheet side laps by 75 mm and end laps by 150 mm. Cut off corners at end laps to be covered by next roll. All overlap surfaces must be granule-free or degranulated.

.7 Complete perfect welds between two membranes. Leave no zone unwelded. In cold weather, adjust welding time to obtain homogenous seam (it may be necessary to slow down.)

.8 Once cap sheet is installed, carefully check all overlapped joints.

.9 During installation, care should be taken to avoid excessive bitumen bleed-out at joints.

3.15 **APPLICATION OF CAP SHEET FLASHING**

.1 Install cap sheet in one (1) -metre width. Overlap sied laps by 75 mm. Stagger base and cap sheet overlaps on roof by at least 100 mm to avoid excessive layering. Roof overlaps will be 200 mm wide.

.2 Draw parallel chalk line 150 mm from upstand or parapet bases.

.3 Sink surface granules into bed of hot bitumen with torch and round-nosed trowel [from chalk line on roof to upstand or parapet base as well as] over granulated vertical parts to be overlapped.

.4 Torch weld cap sheet directly onto base sheet from top to bottom to soften both membranes and obtain homogenous seal.

.5 During installation, avoid overheating membrane and excessive bitumen bleed-out at joints.

3.16 **APPLICATION OF WATERPROOFING OF PENETRATIONS**

.1 Ensure substrate is clear of loose granules and all foreign substances that can impair adhesion.

.2 Apply a base coat of liquid waterproofing.

.3 Trim reinforcing material to conform to shape of penetrations and embed in base coat.

.4 Apply a second coat fully saturating the reinforcement.

.5 To add colour or match existing granules, apply a thin coat of liquid waterproofing and embed granules before it dries.

3.17 **BALLAST INSTALLATION**

.1 Install filter fabric as per manufacturer’s recommendations.

.2 Install gravel where indicated on drawings

3.18 **ROOF DRAIN INSULATION**

.1 Ensure roof drains are positioned to allow proper drainage, located at the lowest possible point, and securely fastened. Cut and slope insulation around each drain to form a sump and accommodate flashing immediately surrounding the drain. Confirm final drain locations with the Consultant prior to installation.

.2 Provide drain sumps as specified by the tapered insulation manufacturer.

.3 Temporarily block drain pipes during membrane application. Remove the blocking when work is not in progress and after the work in this section is complete.

.4 Extend the membrane and insulation to the edge of the drain base, trimming around the drain opening. Apply a granulated cap sheet flashing to extend a minimum of 200 mm (8") from the edge of the drains.

.5 Perform drain and membrane installation in accordance with the recommendations of the drain manufacturer.

.6 Prime the drain flange and allow it to dry completely before proceeding.

.7 Embed the first ply of felt into a coat of waterproofing mastic. Extend the plies of felt into the drain opening and trim as required.

.8 Fill the void between the drain body and roof insulation board or base structure support with two-component polyurethane foam insulation.

3.19 ROOF PENETRATIONS

.1 Install curb flashings around ducts, pipes, structural steel, and other projections through membrane systems in accordance with the manufacturer’s written instructions and as detailed in the drawings.

.2 Install penetration flashings supplied under the scope of mechanical work and this section, following the roofing manufacturer’s installation instructions.

.3 Prime metal flanges with the specified primer and allow solvents to flash off completely before installation.

.4 Remove poly film from areas where metal flashing will be applied. Set the metal flange in a full layer of waterproofing mastic to ensure a positive bond and seal.

.5 Install the base ply up to the base of the metal flashing, ensuring it does not extend onto the curved metal section.

.6 Install the cap ply over the base ply flashing, ensuring a full bond to the base ply. Apply a bead of waterproofing sealer at the termination point for a secure and watertight seal.

3.20 APPLICATION OF ROOF PAVERS

.1 Place each concrete roof paver on extruded expanded polystyrene insulation pads, ensuring alignment such that the pads are set 25 mm (1") from the edge of the paver. Maintain 3 mm (1/8") joints between pavers.

.2 Maintain proper roof drainage by providing 50 mm x 50 mm drainage channels through the extruded expanded polystyrene insulation, spaced at a minimum of 200 mm on center.

3.21 FIELD QUALITY CONTROL

.1 Conduct quality control in accordance with Section 01 45 23 and the following inspection and testing procedures:

.1 Cap Sheet Membrane Review:

.1 Prior to the installation of the cap sheet membrane, the base sheet membrane installation shall be reviewed by the manufacturer and an independent inspection and testing company.

.2 Both the manufacturer and the inspection company shall submit field review reports to the Consultant.

.2 Independent Inspection and Testing:

.1 The independent inspection and testing company shall perform the following:

.2 Inspections: Provide detailed inspection reports.

.3 Tests: Conduct and document the results of tests, including: Core cuts (if requested) and patching.

.3 Moisture Survey:

.1 Submit results of a non-destructive moisture test of the roof system conducted by an approved third party using one of the following methods: Infrared Thermography and/or Nuclear Backscatter.

.4 If the test results or inspections indicate non-compliance, remove and replace or repair the roofing as recommended in writing by the manufacturer. Retest and re-inspect until the roofing installation passes.

.2 Manufacturer's field review shall be conducted in accordance with Section 01 45 23.

3.22 **ADJUSTING AND CLEANING**

.1 Clean roofing, metal, masonry, and similar surfaces of dirt, debris, stains, and foreign matter upon completion of the Work. Clean bituminous markings from finished surfaces.

.2 Repair or replace any finishes that are defaced or disfigured as a result of the work performed under this section.

END OF SECTION

1 General

1.1 **DESCRIPTION**

.1 This section provides the metal materials with associated fasteners and their implementation.

1.2 **REFERENCES**

.1 CSA B111, Wire Nails, Spikes and Staples.

.2 CAN/CSA G164-M81, Hot Dip Galvanizing of Irregularly Shaped Articles

.3 CGSB 93-GP-5 "Installation of Residential Siding, Soffits, and Fascia"

.4 Factory Mutual Loss Prevention Data Sheet 1-49

.5 SMACNA (Sheet metal and Air Conditioning Contractors National Associations Inc.), latest edition

.1 AAMA/WDMA/CSA 101/I.S.2/A440-2008, Standard/Specification for Windows, Doors, and Unit Skylights.

.2 ASTM A167-99(2004), Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.3 ASTM A240/A240M-23, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

.4 ASTM A606-04, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.

.5 ASTM A653/A653M-07, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.6 ASTM A792/A792M-06a, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.7 ASTM B32-04, Standard Specification for Solder Metal.

.8 ASTM B370-03, Standard Specification for Copper Sheet and Strip for Building Construction.

.9 ASTM D523-89(1999), Standard Test Method for Specular Gloss.

.10 ASTM D822-01(2006), Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

.11 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.

.12 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.

.13 CSA A123.3-05, Asphalt Saturated Organic Roofing Felt.

.14 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.15 Roofing Specifications Manual 2011 by the Canadian Roofing Contractors Association (CRCA).

1.3 **ACTION AND INFORMATIONAL SUBMITTALS**

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Mock-up:

.1 Submit 2400mm long samples of each type of sheet metal detail, finishes and colours. Install using specified fasteners. The mock-up shall be installed two weeks after start of work or three weeks before completion, whichever is shorter.

1.4 **DELIVERY, STORAGE AND HANDLING**

.1 Sheet metal mechanics shall be certified by Provincial certification program for sheet metal work. Maximum ratio of sheet metal mechanics to apprentices is 1 to 1.

.2 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling.

1.5 **QUALITY ASSURANCE**

.1 The Zero Carbon Building – Design Standard v4- Design Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

1.6 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 Construction Waste Management and Disposal.

2 Products

2.1 **SHEET METAL MATERIALS**

.1 Zinc coated steel sheet: 26 gauge thickness, commercial quality to ASTM A 653/A 653M, with Z275 designation zinc coating.

2.2 PREFINISHED STEEL SHEET

.1 Prefinished steel with factory applied silicone modified polyester.

.1 Prefinished steel shall be 22 gauge galvanized prefinished sheet steel sized to project requirements.

.2 Any chipped, scratched or dented material shall be rejected.

.3 Light scuffs can be buffed and/or sprayed on site with colour matched paint supplied by the sheet metal coating manufacturer, only where permitted by the Consultant.

.4 Approved products Perspectra by Agway Metals or approved alternate.

.5 Colour(s) are to be selected from the standard Series Colour Chart by the Owner.

.6 Shop painting of sheet metal is not allowed.

.7 FL-1: Minimum base steel thickness 0.8 mm (22 GAUGE), typical.

.8 FL-2 and FL-4: Minimum base steel thickness 0.7 mm (24 GAUGE), at parapets, at sills.

.9 FL-3: Galvanized sheet steel, ASTM A653M, Grade 230, Z275 coating, prepainted 10,000 Series. 18 GA minimum base metal thickness, colour to be selected by the Consultant from the manufacturer's complete colour range.

.10 PREFINISHED METAL CAP FLASHING: Minimum base steel thickness 0.7 mm (24 GAUGE), at parapets and at skylights.

.11 MEMBRANE THROUGH WALL FLASHING: Same as FL-3 Galvanized sheet steel.

2.3 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint.

.2 Underlay for metal flashing: dry sheathing to CAN/CGSB-51.32, asphalt laminated 3.6 to 4.5 kg kraft paper or No. 15 perforated asphalt felt to CSA A123.3.

.3 Continuous Cleats: galvanized sheet metal, a minimum of two gauges heavies than the sheet metal.

.4 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

.5 Solder: to ASTM B 32, alloy composition Sn

.6 Flux: rosin, cut hydrochloric acid, or commercial preparation suitable for materials to be soldered.

.7 Touch-up paint: as recommended by prefinished material manufacturer.

2.4 FABRICATION

.1 Form pieces in 2400 mm maximum lengths. Reduce length to 1200mm maximum at all perimeter roof corners and where panel height exceeds 600mm, such as at parapets or wall upturns. Cross break panels where the height exceeds 600mm.

.2 Make allowance for expansion at joints. Form all joints using “S”-Pocket type joints unless indicated otherwise with minimum 25mm depth, 50mm back flange and 2 to 4mm allowance for expansion. Slot holes around fasteners where required to accommodate movement.

.3 Hem exposed edges on underside 12 mm to form straight sharp lines without deflection. Seal over raw edges that cannot be hemmed.

.4 Form drip flashings at maximum 30 degree angle out from vertical surface to achieve a minimum drip clearance of 25mm.

.5 Mitre and seal corners with sealant.

.6 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.7 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

.8 Use competent sheet metal mechanics and work accurately to details indicated and specified.

2.5 METAL FLASHINGS

.1 Form flashings, copings and fascia’s to profiles indicated of prefinished galvanized.

.2 Include flashings for roof dividers in alignment with the general specifications outlined in CRCA Detail FL.14 and for curbs in accordance with the guidelines provided in CRCA Detail FL.23.

2.6 PIPE OR SCUPPER PENETRATIONS

.1 Provide and install 1.6 mm (16 GAUGE) spun aluminum flashings and caps for all vent stacks. For miscellaneous mechanical and electrical penetrations through the roof membrane, provide:

.2 Factory prefabricated, insulated aluminum sleeve flashings with matching aluminum collar, sized appropriately for each item requiring flashing.

.1 Sleeves and collars fabricated from aluminum with pre-molded urethane insulation on the inner surface. Interior surfaces to be coated with bituminous paint to prevent galvanic action with dissimilar metals. Sleeve aluminum thickness to be 1.6 mm (16 GAUGE), and collar aluminum thickness to be 1.4 mm (17 GAUGE).

.2 Include an integral deck flange with each sleeve.

.3 Standard of acceptance: Roof accessories manufactured by Thaler Metal Industries Inc., selected to suit the specific application.

.4 Pitch pockets are not acceptable for this project.

2.7 FASTENERS

.1 Fasteners: of same material as sheet metal unless otherwise stated and length and thickness suitable for metal flashing application.

.1 Sheet Metal Substrate: Steel/Electro-zinc No.8 Pan Head self-tapping Sheet Metal Screw, Teks by ITW Buildex or approved alternate.

.2 Wood Substrate: Steel/Electro-zinc No. 8 Oval Head wood screw, Teks by ITW Buildex or approved alternate.

.3 Concrete/Masonry Substrate: Blue Climaseal Steel No. 10 Pan head, Tapcon by ITW Buildex or approved alternate. Nail anchors only where approved by the Consultant may zinc nails with zinc aluminum alloy sleeve 6mm in diameter, Nailcon by ITW Buildex or approved alternate may be used.

.4 Wood Substrate (when Exposed): Climaseal Steel with colour matched heads No. 12 hex head with fully bonded EPDM washer, Trugrip by ITW Buildex or approved alternate.

.5 Metal Connection: Stainless steel size to suite application to CSA B111, and coat to match metal coating where exposed.

.6 Wood Substrate: Only where approved by the Consultant use common annual threaded hot dipped galvanized nails with flat head to CSA B111 and CAN/CSA G164-M81.

2.8 **SELF-ADHERING MEMBRANE FLASHINGS**

.1 Use one of the following products where the roof membrane does not extend continuously over parapets, under door/window sills, roof joints, etc., prior to installing metal flashing. Approved products include:

.1 Blueskin P.E. 200 HT with Aquatac Primer by Henry;

.2 Ice and Water Shield HT with Perm-A-Barrier WB Primer by Grace Construction Products; Lastobond Shield HT with Elastocol Stick Zero Primer by Soprema;

.3 or approved equivalent

2.9 **RAINWATER LEADERS**

.1 Rainwater leaders shall be prefinished aluminum with colour to be selected by the Owner unless otherwise noted.

.2 Rainwater leader be 100mm minimum square, and secured to the wall with concealed prefinished galvanized pipe clips.

.3 Rainwater splash guards, a minimum of 100m high and 200mm wide are to be installed at the base of each valley flashing.

3 Execution

3.1 **MANUFACTURER'S INSTRUCTIONS**

.1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 Install sheet metal work in accordance with the guidelines of the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) standards and the Canadian Roofing Contractors Association (CRCA) as specified in the project details, adhering to the more stringent of the two requirements.

.2 Secure continuous cleats with No. 8 minimum screws with 19mm embedment at 400mm o/c.

.1 Secure each "S"-Pocket using No. 8 screw with 19mm embedment at 200mm o/c.

.3 Provide underlay under sheet metal.

.1 Ensure all horizontal surfaces have positive slope towards the interior of the building or roof. Secure in place and lap joints 100 mm.

.4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs.

.1 Flash joints using folded standing seams forming tight fit over hook strips, as detailed.

.5 Lock end joints and caulk with sealant.

.6 Install metal cap flashing locked onto out cleat forming the drip edge and secure the inside face with No. 10 hex head screws at 600mm o/c.

.7 Insert metal flashing into reglets and under cap flashing to form weather tight junction.

.8 Install surface mounted reglets true and level, and caulk top of reglet with sealant. Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm. Secure with No. 8 masonry screw with 25mm embedment at 900mm o/c.

.9 Caulk flashing at reglet with sealant.

.10 Install pans, where shown around items projecting through roof membrane.

3.3 RAINWATER LEADERS AT SCUPPER

.1 Where the gutters and rainwater leaders are being replaced, match the existing configuration and downspout placement unless otherwise noted.

.2 Position gutter a minimum of 25mm below the projected roof slope line.

.3 Positively slope the gutter to the rainwater leader outlet.

.4 Secure the gutter with concealed hangers at 1200mm on centre.

.5 Position the downspout from the rainwater leaders a minimum of 300mm away from the building spilling with a maximum height above ground of 100mm. Place splash pad under all downspouts.

.6 Secure rainwater leaders with concealed pipe clips at 1800mm on centre with a minimum of two clips per rainwater leader.

3.4 FIELD QUALITY CONTROL

.1 Use competent sheet metal mechanics and work accurately to details indicated and specified.

3.5 CLEANING

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Leave work areas clean, free from grease, finger marks and stains.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for firestopping and smoke seals work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM C303, Standard Test Method for Dimensions and Density of Preformed Block and Board–Type Thermal Insulation.

.2 ASTM C920, Standard Specification for Elastomeric Joint Sealants.

.3 ASTM C1104, Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation.

.4 ASTM E814, Test Method for Fire Tests of Through-Penetration Fire Stops.

.5 ASTM E2174, Standard Practice for On-Site Inspection of Installed Fire Stops.

.6 ASTM G21, Standard Test for Determining Resistance of Synthetic Polymeric Materials to Fungi.

.7 CAN/CGSB 19.13, Sealing Compound, One Component, Elastomeric, Chemical Curing.

.8 CAN/ULC S102, Surface Burning Characteristics of Building Materials and Assemblies.

.9 CAN/ULC S114, Standard Method of Test for Determination of Non-Combustibility in Building Materials.

.10 CAN/ULC S115, Standard Method of Fire Tests of Firestop Systems.

.11 CAN/ULC S129, Standard Method Of Test For Smoulder Resistance Of Insulation (Basket Method).

.12 CAN/ULC S702, Thermal Insulation, Mineral Fibre for Buildings.

1.3 **DEFINITIONS**

.1 Fire Separation: A construction assembly, plane or device, either vertical or horizontal, which is required to prevent the passage of fire and smoke for a prescribed period of time. Proof of compliance to required time rating shall be by ULC, Warnock Hersey (or similar approved) certification or shall be as listed in the Ontario Building Code Supplementary Standard SB-2.

.2 Smoke Separation: A construction assembly, plane or device, either vertical or horizontal, which is not required to prevent the passage of fire for a prescribed period of time but is required to prevent the passage of smoke. A "Smoke Separation" is also known as a "Fire Separation with No Rating" or a "Zero Hour Rated Separation".

.3 Non-Rated Separation: A construction assembly, plane or device, either vertical or horizontal, which is not required to prevent the passage of fire for a prescribed period of time and is not required to prevent the passage of smoke.

1.4 **SYSTEM DESCRIPTION**

.1 Firestopping and smoke seals: ULC or Intertek Testing Services listed Products and systems in accordance with CAN/ULC S115 suitable to actual application and installation conditions.

.2 Firestop applications that exist for which no ULC or cUL tested system is available through a manufacturer, a manufacturer's engineering judgment derived from similar ULC or cUL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council.

.3 Firestop and smoke seal system shall achieve a fire resistance rating and smoke seal rating equal to that of assemblies into which they are installed.

.4 Provide smoke sealants over firestopping materials or combination smoke seal/firestop seal material to form air tight barriers to retard the passage of gas and smoke.

.5 Firestopping and smoke seals located at movement joints shall be designed with movement capability.

.6 Provide penetration firestopping with mould and mildew resistance rating of 0 in accordance with ASTM G21.

.7 Firestopping and smoke seals within mechanical and electrical assemblies shall be provided as part of the work of Divisions of mechanical, and electrical respectively.

1.5 SUBMITTALS

.1 Product data:

.1 Submit copies of manufacturer's Product data in accordance with 01 33 00 indicating:

.1 Performance criteria, compliance with appropriate cUL or ULC reference standard, characteristics, limitations.

.2 Product transportation, storage, handling and installation requirements.

.3 Submit firestop and smoke seal manufacturer's Product data for materials and prefabricated devices, including manufacturer's printed installation instructions.

.2 Shop drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 indicating:

.1 Fire rated and smoke sealed systems for each typical application.

.2 Construction details, accurately reflecting actual job conditions.

.3 ULC or Intertek Testing assembly listing.

.4 Each floor and wall assembly requiring firestop system with each corresponding ULC firestop system.

.3 Certification:

.1 Submit certified documentation from manufacturer for each worker performing work of this Section.

.2 Submit installer's and Product manufacturer's certification verifying compliance with the Contract Documents and conformance with ASTM E814 and CAN/ULC S115.

1.6 QUALITY ASSURANCE

.1 Installers qualifications: Perform work of this Section by a company that has a minimum of five years proven experience in the installation of firestopping and smoke seal work of a similar size and nature and that is approved by manufacturer. Submit to Consultant, applicator’s current certificate of approval by the material manufacturer as proof of compliance.

.2 Manufacturer's direct representative and/or fire protection specialist shall be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures conforming to manufacturer's written recommendations published in their literature and drawing details.

.3 Pre-construction meetings: Arrange with manufacturer's representative, Contractor, Consultant and Field Engineer to determine responsibility for handling such issues as FT rated partitions, firestop custom details, compatibility, mixed penetrations, and to review installation procedures 48 hours in advance of installation.

1.7 **DELIVERY STORAGE AND HANDLING**

.1 Deliver materials to Place of Work in manufacturer's unopened containers, containing classification label with labels intact and legible at time of use.

.2 Do not use damaged or adulterated materials exceeding their expiry date.

1.8 **SITE CONDITIONS**

.1 Conform to manufacturer's requirements and maintain a minimum temperature of 5℃ for a minimum period of 24 hour before application, during, and until application is fully cured.

.2 Maintain sealant at a minimum 18℃ for best workability.

2 Products

2.1 **ACCEPTABLE MANUFACTURERS**

.1 Acceptable manufacturers of rated systems include:

.1 AD Fire Protection Systems Inc.

.2 Hilti Canada Corporation.

.3 3M Canada Inc.

.4 Tremco Ltd.

2.2 **GENERAL SYSTEM REQUIREMENTS**

.1 All materials under work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.

.2 Do not use Products containing asbestos.

.3 Firestopping components shall not contain volatile solvents or require special application to protect plastic pipe from firestopping compound.

.4 Provide smoke seal sealant in following colours:

.1 Grey or white in finished areas.

.2 Red in unfinished areas.

.5 Smoke sealant for overhead and vertical joints for floor to be self-levelling and non-sagging sealant.

.6 Smoke sealant at vertical through penetrations in areas with floor drains shall be waterproof type.

2.3 **MATERIALS**

.1 Following materials have been provided for convenience. Contractor shall provide complete system with all components and accessories as required for fire resistant and smoke seal installation.

.2 Firestop sealant: single component, low modulus, silicone rubber, moisture curing sealant to ASTM C920, ULC labelled to CAN/ULC S115.

.3 Pre-Installed firestop devices for use with non-combustible and combustible pipes, conduit and/or cable bundles penetrating concrete floors and walls.

.1 Cast-in place firestop device complete with aerator adaptor when used in conjunction with aerator system. Model CP 680-P by Hilti or approved alternative.

.2 Cast-in place firestop device for use with non-combustible penetrants. Model CP 680-M by Hilti or approved alternative.

.3 Speed sleeve for use with cable penetrations. Model CP 653 by Hilti or approved alternative.

.4 Firestop block. Model CFS-BL by Hilti or approved alternative.

.4 Re-penetrable, round cable management devices for use with new or existing cable bundles penetrating walls:

.1 Speed sleeve with integrated smoke seal fabric membrane. Model CP 653 by Hilti or approved alternative.

.2 Firestop Sleeve. Model CFS-SL SK by Hilti or approved alternative.

.3 Retrofit sleeve for use with existing cable bundles. Model CFS-SL RK by Hilti or approved alternative.

.4 Gangplate for use with multiple cable management devices. Model CFS-SL GP by Hilti or approved alternative.

.5 Gangplate Cap for use at blank openings in gangplate for future penetrations. Model CFS-SL GP CAP by Hilti or approved alternative.

.5 Firestop insulation: to CAN/ULC S702, Type 2; mineral fibre manufactured from rock or slag, suitable for manual application.

.1 Density: Minimum 64 kg/m^3 when tested to ASTM C303.

.2 Combustibility: Noncombustible to CAN/ULC S114.

.3 Melt temperature: >1175 degrees C.

.4 Surface burning characteristics: to CAN/ULC S102, maximum flame spread of 0, smoke developed of 0.

.5 Moisture Absorption: 0.04 percent when tested to ASTM C1104.

.6 Smoulder Resistance: 0.01 percent when tested to CAN/ULC S129.

.6 Damming, back-up, supports, and anchorage: In accordance with manufacturer's fire rated systems and to acceptance of authorities having jurisdiction.

.7 Primer: As recommended by firestopping sealant manufacturer.

3 Execution

3.1 **EXAMINATION**

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

.2 Verify that substrates and surfaces to receive firestopping and smoke seals are clean, dry, and frost free.

3.2 **PREPARATION**

.1 Prepare, modify, and adjust void sizes, proportions, and conditions to conform to fire rated and smoke sealed assembly requirements such as assembly opening size and dimensional restrictions.

.2 Clean surfaces to remove material detrimental to bond including dust, paint, rust, oil, grease, moisture, frost and other foreign matter to manufacturers recommendations.

.3 Mask adjacent surfaces to avoid spillage and over-coating of adjacent surfaces. Remove stains from adjacent surfaces.

3.3 INSTALLATION

.1 Install firestopping and smoke seal systems in accordance with reviewed Shop Drawings, manufacturer's instructions and fire rated assembly to establish continuity and integrity of fire separations.

.2 Install firestop insulation in compacted thicknesses required by ULC design. Compress insulation approximately 50 percent.

.3 Install primers as recommended by firestop and smoke seal Product manufacturers.

.4 Install temporary forming, damming, back-up as required, remove after materials have achieved initial cure and will resist displacement.

.5 Install firestop and smoke seal filler in horizontal joints providing 25% compression fit.

.6 Use resilient, elastomeric firestopping and smoke seal systems in following locations:

.1 Openings and sleeves for future use.

.2 Penetration systems subject to vibration or thermal movement.

.3 Penetration systems in acoustical containment enclosures.

.7 Trowel and tool exposed firestop and smoke seal. Product surfaces to uniform, smooth finish.

.8 Seal joints to ensure an air and water resistant seal capable of withstanding compressions and extensions due to thermal wind or seismic joint movement.

.9 Taped joints will not be acceptable.

.10 Repair damaged firestopped and smoke sealed surfaces to acceptance of Consultant.

.11 Identify each firestop and smoke seal penetration assembly with permanent label listing following:

.1 Assembly and rating in hours.

.2 Date of installation.

.3 Installing company's name and telephone number.

.12 Do not cover materials until full cure has taken place.

3.4 INSPECTION AND TESTING

.1 Inspection of through-penetration firestopping shall be performed in accordance with ASTM E2174 to ensure that firestopping and smoke seals have been installed in accordance with Contract documents and to tested and listed firestop system.

3.5 CLEAN-UP

.1 Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

.2 Remove excess materials and debris immediately after application.

3.6 SCHEDULE OF FIRESTOP AND SMOKE SEAL LOCATIONS

.1 Following firestop and smoke seal location schedule is included for convenience and may not be complete. Examine Contract Drawings and other specification sections and determine entire extent of work of this Section. Generally provide systems with required fire and smoke ratings at following locations:

.1 Gaps at intersections of fire-resistance rated walls and partitions.

.2 Control and sway joints in fire-resistance rated walls and partitions.

.3 Gaps at top of fire-resistance rated partitions and walls.

.4 Penetrations through fire-resistance rated walls and partitions including mechanical and electrical services and openings and sleeves for future use.

.5 Penetrations through fire-resistance rated floor slabs, ceilings, and roofs.

.6 Gaps at edge of floor slabs at exterior walls.

.7 Perimeter of retaining angles on rigid ducts greater than 0.012 m^2, firestopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

.8 Where indicated on drawings.

.9 At non-rated assemblies that require a smoke seal.

.10 Where required by Ontario Building Code.

END OF SECTION

1 General

1.1 **DESCRIPTION**

.1 This section provide the elastomeric sealants and their implementation that are used to seal building joint assemblies.

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

.3 Work of this Section does not include sealants in firestopping and smoke sealed assemblies.

.4 Work of this Section does not include sealant work identified in individual specification sections.

1.2 **REFERENCES**

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C 919-[08], Standard Practice for Use of Sealants in Acoustical Applications.

.2 ASTM C834, Specification for Latex Sealants.

.3 ASTM C920, Specification for Elastomeric Joint Sealants.

.4 ASTM C1330, Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

.2 Canadian General Standards Board (CGSB)

.1 CGSB 19-GP-5M-[1984], Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).

.2 CAN/CGSB-19.13-[M87], Sealing Compound, One-component, Elastomeric, Chemical Curing.

.3 CGSB 19-GP-14M-[1984], Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).

.4 CAN/CGSB-19.17-[M90], One-Component Acrylic Emulsion Base Sealing Compound.

.5 CAN/CGSB-19.24-[M90], Multi-component, Chemical Curing Sealing Compound.

1.3 **ACTION AND INFORMATIONAL SUBMITTALS**

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Product data: Submit copies of Product data in accordance with Section 01 33 00 describing type, composition and recommendations or directions for surface preparation, material preparation and material installation.

.3 Manufacturer's product to describe:

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.2 Samples:

.1 Submit samples of each type of material and colour.

.2 Cured samples of exposed sealants for each colour where required to match adjacent material.

.3 Two samples of sealant/caulking, for colour selection. Two samples of back-up material and primer for physical characteristics.

.3 Manufacturers' Instructions

.1 Submit instructions to include installation instructions for each product used.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Arrange delivery of materials in original, unopened packages with labels intact, including batch number, and ensure that on-site storage is kept to a minimum. Do not store materials on site where there exists any danger of damage from moisture, direct sunlight, freezing and other contaminants.

.2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.3 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.4 Storage and Handling Requirements:

.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect joint sealants from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

1.5 QUALITY ASSURANCE

.1 Qualifications: Work of this Section shall be executed by trained applicators approved by sealant manufacturer and having a minimum of 5 years proven experience. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

1.6 EXTENDED WARRANTY

.1 Submit an extended warranty for Sealant Work in accordance with General Conditions, except that warranty period is extended to 2 years from date of Substantial Performance of the Work.

.1 Warrant against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion and staining adjacent surfaces.

.2 Coverage: Complete replacement including affected adjacent Work.

1.7 SITE CONDITIONS

.1 Do not install materials when ambient air temperature is less than 5 degrees Celsius, when recesses are wet or damp, or to manufacturer's recommendations.

.2 Ambient Conditions:

.1 Proceed with installation of joint sealants only when:

.1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.

.2 Joint substrates are dry.

.3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.3 Joint-Width Conditions

.1 Proceed with installation of joint sealants only where joint widths are as allowed by joint sealant manufacturer for applications indicated.

.4 Joint-Substrate Conditions:

.1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

2 Products

2.1 **SEALANT MATERIALS**

.1 All materials under Work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.

.2 Use materials as received from manufacturers, without additives or adulterations. Use one manufacturer's Product for each kind of Product specified.

.3 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.4 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

.5 Where sealants are qualified with primers use only these primers.

.6 Where exposed the colours shall match the substrate, as approved by the Owner.

2.2 Sealant Type A: ASTM C920, Type S, Grade NS, Class 25; One-part, non-sag type, silicone sealant, in standard colours selected.

.1 ‘DC CWS’ by Dow Corning Inc.

.2 ‘Sikasil 305CN' by Sika.

.3 ‘Tremsil 400' by Tremco.

2.3 Sealant Type B: ASTM C920, Type S, Grade NS; One-part mildew-resistant silicone, in standard colours selected.

.1 ‘786 Mildew Resistant Silicone Sealant’ by Dow Corning Inc.

.2 ‘Sikasil GP Mildew Resistant' by Sika.

.3 ‘Tremsil 200 Silicone Sealant’ by Tremco Ltd.

2.4 Sealant Type C: ASTM C834; Pure acrylic siliconized sealant; in standard white colour (paintable).

.1 ‘950A Siliconized Acrylic Latex Caulk’ by Sherwin Williams.

.2 ‘Tremflex 834 Silconized Sealant’ by Tremco Ltd.

2.5 Sealant Type D: Urethanes one part: Non-sag: to CAN/CGSB-19.13, Type 2, approved products include:

.1 Dymonic by Tremco;

.2 SikaFlex 15LM by Sika;

.3 or approved alternate.

.2 Preformed compressible and non-compressible back-up materials:

.1 Polyethylene, urethane, neoprene or vinyl foam:

.1 Extruded closed cell foam backer rod.

.2 Size: oversize 30 %.

.2 Neoprene or butyl rubber:

.1 Round solid rod, Shore A hardness 70.

.3 High density foam:

.1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/mü density, or neoprene foam backer, size as recommended by manufacturer.

.4 Bond breaker tape:

.1 Polyethylene bond breaker tape which will not bond to sealant.

2.6 **ACCESSORIES**

.1 Primers: Type recommended by material manufacturers for various substrates, primers to prevent staining of adjacent surfaces encountered on project.

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

.3 Bond breaker: Type recommended by material manufacturers.

.4 Void filler around the window frames to be one part expanding polyurethane foam.

.5 Cleaning agents: As recommended by material manufacturer, non-staining, harmless to substrates and adjacent finished surfaces.

2.7 **MIXING**

.1 Follow manufacturers instructions on mixing, shelf and pot life.

2.8 **JOINT CLEANER**

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.

.2 Primer: in accordance with sealant manufacturer's written recommendations.

3 Execution

3.1 **EXAMINATION**

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence prior to sealant installation.

.2 Inform the Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied. Proceeding with the installation will be the acceptance of the substrate by the Contractor.

3.2 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

.6 Prepare joints to receive sealants to manufacturer's instructions. Ensure that joints are clean and dry and ferrous surfaces are free from rust and oil.

.7 Clean recesses to receive sealant, to be free of dirt, dust, loose material, oil, grease, form release agents and other substances detrimental to sealant's performance.

.1 Remove lacquer or other protective coatings from metal surfaces, without damaging metal finish, using oil-free solvents. Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sand blasting. Ensure recess is dry.

.2 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings. Remove incompatible coatings as required.

.8 Ensure that all materials in contact with sealant are compatible. Test substrate for adhesion.

.9 Depth of recess: Maintain depth to ½ joint width up to a maximum of 13 mm and not less than 6 mm at centre of joint. For greater depth, use joint backing under. Where recess is less than specified depth, cut back surface of recess to specified recess depth.

.10 Install polyethylene backing rod in joints 6 mm or more in width. Roll backing rod into joint. Do not stretch or bend backing rod. Install bond breaker to back of recess.

.11 Prime sides of recess, in accordance with sealant manufacturer's instructions.

.12 Condition products for use in accordance with manufacturer’s recommendations.

3.3 INSTALLATION

.1 Apply sealant immediately after adjoining Work is in condition to receive such Work. Apply sealant in continuous bead using gun with correctly sized nozzle. Use sufficient pressure to evenly fill joint.

.2 Ensure sealant has full uniform contact with, and adhesion to, side surfaces of recess. Superficial painting with skin bead is not acceptable. Tool sealant to smooth surface, free from ridges, wrinkles, sags, air pockets, embedded impurities, dirt, stains or other defects.

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

.2 At recesses in flush surfaces, finish compound with concave face, flush with face of material at each side.

.3 Make sealant bead uniform in colour.

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

.5 Immediately remove excess compound or droppings which would set up or become difficult to remove from adjacent finished surfaces, using recommended cleaners, as work progresses. Do not use scrapers, chemicals or other tools which could damage finished surfaces. Remove defective sealant.

.6 Clean recesses and re-apply sealant.

.7 Remove masking tape immediately after joints have been sealed and tooled.

3.4 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.5 BACKUP MATERIALS

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.6 APPLICATION

.1 Sealant:

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

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle to achieve a minimum 6mm depth over the joint profile and adhesive to substrate a minimum of 9mm, and 10mm minimum joint width, while maintaining a consistent depth-to-width ratio.

.5 Use sufficient pressure to fill voids and joints solid.

.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Remove excess compound promptly as work progresses and upon completion.

.9 Apply multiple application of sealant to build up the required joint-to-width ratio for joints in access of 19mm wide, and within the manufacturer’s recommendations.

.2 Curing:

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

3.7 CLEANING

.1 Clean surfaces adjacent to joints, remove sealant smears or other soiling resulting from application of sealants. At metal surfaces, remove residue. Do not mar or damage finishes on materials adjacent to joints. Repair or replace marred or damaged materials.

.2 Leave Work area clean at end of each day.

.3 Clean adjacent surfaces immediately.

.4 Remove excess and droppings, using recommended cleaners as work progresses.

.5 Remove masking tape after initial set of sealant.

.6 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.8 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by joint sealants installation.

3.9 SCHEDULE OF LOCATIONS

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

.1 Concrete, masonry, wood and stone to metal. Wood to masonry, concrete and stone.

.2 Metal to metal.

.3 All dissimilar materials.

.4 Where ‘sealant’ or ‘caulking’ in indicated on drawings.

.2 Sealant Type A:

.1 Exterior joints between masonry and steel or aluminum.

.2 Exterior joints between masonry and shelf angle.

.3 Exterior joints between steel or aluminum and concrete or masonry. Interior and exterior control joints, except in floors.

.4 Interior and exterior control joints, except in floors

.5 Door frames, louvre frames, interior and exterior side.

.6 Protrusions through interior and exterior walls and floors, interior and exterior side, except where fire rated seals are required.

.7 Seal thresholds.

.3 Sealant Type B:

.1 Control joints in tiled areas.

.2 Between vanity and tiles

.3 Between mechanical fixtures/fittings.

.4 Between access panels and tile.

.5 Between tiles and adjacent materials

.4 Sealant Type C:

.1 Perimeter of interior windows.

.2 Perimeter of counters

.3 Junction between drywall and masonry.

.5 Sealant Type D:

.1 Exterior joints between roof and mechanical fixtures/fittings

.2 Perimeter of roof.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment, tools, and services necessary for the metal doors and frames work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or ZincIron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM A568/A568M, Specification for General Requirements for Steel, Carbon and High-Strength Low-Alloy, Hot-Rolled Sheet and Cold-Rolled Sheet.

.3 CAN4/ULC-S104M, Standard Method for Fire Test of Door Assemblies.

.4 CAN4/ULC-S105M, Standard Specification for Fire Door Frames, Meeting the Performance Required by CAN4/ULC-S104M.

.5 CAN/CGSB-1.198, Cementitious Primer, (for Galvanized Surfaces).

.6 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.

.7 CGSB 31-GP-105Ma Zinc Phosphate Conversion Coating for Paint Base

.8 CAN/CSA-G40.21-M92 Structural Quality Steels

.9 CSA W59-M89 Welded Steel Construction (Metal Arc Welding)

.10 NFPA 80 Fire Doors and Windows

.11 NFPA 252-95 Standard Methods of Fire Tests of Door Assemblies

1.3 **DESIGN REQUIREMENTS**

.1 Design exterior frame assemblies to accommodate expansion and contraction when subjected to minimum and maximum surface temperature of -35°C to 35°C.

1.4 **SUBMITTALS**

.1 Product data: Submit manufacturer's Product data in accordance with Section 01 33 00 indicating door and frame construction.

.2 Shop drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 for each type of door and frame indicating:

.1 Thickness and type of steel.

.2 Thickness and type of core.

.3 Thickness and type of steel stiffeners and location of them within the door.

.4 Thickness and type of metal facing on edges of door and method of fastening.

.5 Location of mortises, reinforcement, anchorages, joining, welding, sleeving, exposed fasteners, openings and arrangement for hardware.

.2 Include schedule identifying each unit with door marks and numbers relating to numbering on Contract Drawings and in door schedule

.3 Mill Certification: Submit mill certification on all materials used to fabricate items specified.

1.5 **QUALITY ASSURANCE**

.1 Perform work in accordance with requirements by a member of the Canadian Steel Door and Frame Manufacturers Association.

.2 Label and list fire rated doors and frames by an organization acceptable to authorities having jurisdiction and accredited by the Standards Council of Canada in conformance with CAN4/ULC-S104M and CAN4/ULC-S105M for ratings indicated, labelling shall be in accordance with NFPA 80.

2 Products

2.1 **ACCEPTABLE MANUFACTURERS**

.1 Apex Industries

.2 Daybar Industries Limited

.3 Fleming Doors Products.

.4 Steel-Craft Door Products Ltd

2.2 **MATERIALS**

.1 General:

.1 All materials under work of this Section, including but not limited to, primers are to have low VOC content limits.

.2 Materials used for the door & frame construction in this section to conform to: CAN/CSA-G40.21, Type 44W coating designation to ASTM A653.

.3 Galvanized Steel Sheets: (G90) Mill phosphatize in addition to coating specified at referenced HM standard. Provide at shower, washrooms doors and frames and other doors and frames where indicated as well as at exterior doors and frames.

.4 Supports and Anchors: Same material as frame including gage and galvanizing where indicated.

.5 Inserts, Bolts, and Fasteners: Manufacturer's standard units. Hot-dip galvanize in compliance with ASTM A 153, Class C or D as applicable at exterior walls and where opening is indicated to be galvanized.

.6 Provide shop primers for security hollow metal doors & frames were welded.

.2 Minimum base steel thickness:

.1	Frames	2.7 mm G90 Galvanized steel
.2	Typical doors	1.91 mm G90 Galvanized steel faces
.3	Lock/strike reinforcements	1.6 mm
.4	Hinge reinforcements	2.7 mm
.5	All other reinforcement	1.6 mm
.6	Top and bottom channels	1.2 mm
.7	Glazing stops	0.9 mm
.8	Guard boxes	0.9 mm

.9 Jamb spreaders 0.9 mm

.3 Top caps and thermal breaks: CGSB 41-GP-19Ma; Rigid PVC extrusions.

.4 Primer: CAN/CGSB 1.198.

.5 Door material:

.1 Interior and Exterior Doors: Provide minimum 1.91 mm (14 gauge) sheet G90 galvanized steel faces.

.2 Stiffeners: Provide 16ga A40 galvanneal stiffeners to extend full height top to bottom and maximum 75 mm(3") from door sides. Where stiffeners are not continuous between face sheets, weld internal joints 100 mm (4") o.c. max. Cope at hardware preparations only. Provide one of the following stiffener types:

.3 Edge Channels: Continuously weld to both face sheets.

.4 Flush Closing Channels: Continuously weld to both face sheets.

.5 Insulation: Core mineral fiber 48 kg/cubic meters density minimum.

.6 Hardware Reinforcements and Preparations: Comply with referenced HM standard and the following:

.1 Strike Plate: Do not cut edge channel to receive entire strike or keeper. Provide punched opening to engage bolt in edge channel matching cut-out in strike plate.

.2 Drilling and tapping for surface applied hardware may be done at project site.

.7 Exterior doors: Rigid poly/isocyanurate, closed cell insulation, 32 kg/m3, thermal value: RSI 1.9.

.8 Fire rated doors: Mineral fibre insulation to CAN/ULC S702, Type 1A; 24 kg/m3.

.6 Screws: Stainless steel screws with countersunk flat head.

.7 Door silencers: Type 6-180, black neoprene.

.8 Frame anchors:

.1 Frames in masonry: 1.2 mm minimum, adjustable T-strap jamb anchors.

.2 Frames in steel stud partitions: 0.9 mm minimum steel anchors of suitable design securely welded inside each jamb.

.3 Frames in precast: Countersunk galvanized expansion bolts complete with galvanized anchor, base anchors, and spacers behind hollow metal frame.

.4 Frames in existing masonry/concrete/precast walls: 0.9 mm minimum frame anchors to suit design.

.5 Labeled frames: In accordance with ULC requirements.

.9 Floor anchors: 1.6 mm minimum adjustable floor clip angles with 2 holes for anchorage to floor.

.10 Labels for fire doors and door frame: Brass plate, riveted to door and door frame.

.11 Grilles: Corrosion resistant steel with baked enamel finish. Model 61DG Series by Nailor Industries Inc or approved alternative by Hart and Cooley.

.12 Glass and glazing: In accordance with Section 08 80 00.

2.3 **FABRICATION**

.1 General

.1 Fabricate doors and frames in accordance with reviewed shop drawings.

.2 Welding: CSA W59-M to produce a finished unit with no visible seams or joints, square, true and free of distortion.

.3 Welding: Continuous unless specified otherwise. Execute welding by a firm fully acceptable to the Canadian Welding Bureau to requirements of CSA W47.1.

.4 Form profiles accurately to details shown on Contract Drawings.

.5 Ream and remove burrs from drilled and punched holes.

.6 Grind welded corners and joints to a flat plane and fill with metallic filler and sand to a uniform smooth finish. Apply one coat of primer.

.7 Provide weather strip for exterior doors in accordance with Section 08 70 00 and door manufacturer.

.2 Frames and screens:

.1 Fabricate frames of welded construction. Cut mitres and joints accurately and weld continuously on inside of frame profile. Exterior frames to be thermally broken.

.2 Construct large frame sections with provision for on Site assembly to suit Site conditions.

.3 Blank, reinforce, drill and tap frames for mortised, templated hardware. Protect mortised cut-outs with guard boxes.

.4 Reinforce frames where required for surface mounted hardware.

.5 Reinforce frames over 1200 mm wide with roll formed steel channels or hollow structural sections specified in Section 05 50 00 and as indicated on drawings.

.6 Furnish exterior door frames with a continuously welded integral steel weather drip at head of frame.

.7 Prepare each door opening for single stud rubber door silencers, 3 for single door openings located in strike jamb, and 2 for double door openings located in head.

.8 Install 2 channel or angle spreaders per frame, to ensure correct frame alignment. Install stiffener plates or spreaders between frame trim where required, to prevent bending of trim and to maintain alignment when setting in place.

.9 Form channel glazing stops minimum 16 mm height, accurately cut, mitred, fitted and fastened to frame sections with stainless steel counter-sunk, flat head screws spaced at maximum 450 mm throughout and 50 mm from each end.

.10 Frame Fill: Prepare heads, jambs, and sills abutting structure, walls, or floors for solid anchorage with full grout fill. Exclude grout from mullions except where otherwise indicated.

.1 Grout Guards: At frames to be grouted, tightly weld 0.45 mm(0.018”) minimum steel grout guards at screw holes, cut outs, and hardware preparations including those for removable glazing stops, locksets, pushbuttons, strike plates, hinges, etc. Additionally at hinge preparations Contractor to provide polyurethane or polystyrene foam fill or otherwise tightly seal grout guards to keep screw holes grout free.

.3 Anchorage:

.1 Anchor units to floor and wall construction. Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb, minimum number of anchors for each jamb:

.1 Frames up to 2285 mm 3 anchors.

.2 Frames from 2285 mm to 2440 mm 4 anchors.

.2 Where frames are to be set in masonry or concrete, supply adjustable anchors to trade installing frame.

.3 Fabricate frames for installation in steel stud partitions with steel anchors of suitable design, minimum number of anchors for each jamb:

.1 Frames up to 2285 mm height 4 anchors.

.2 Frames 2285 mm to 2440 mm 5 anchors.

.4 Frames in previously placed concrete, masonry, precast or structural steel:

.1 Anchors located at 150 mm maximum from top and bottom of each jamb, and intermediate anchors at maximum 660 mm o.c.

.4 General Door Requirements:

.1 Hollow steel construction, flush swing type, of sizes to conform to details, schedules and reviewed shop drawings with provisions for cut-outs for glass and grilles and reinforced to receive hardware fastenings.

.2 Blank, reinforce, drill and tap doors for mortised, templated hardware. Where required, reinforce doors for surface mounted hardware and door closers.

.3 Reinforce oversized doors with steel channels and plates specified in Section 05 50 00 and as indicated on drawings.

.4 Where openings are required, form integral cut-outs with framing, glass stop moldings and division bars.

.5 Install grilles to fit tight and secure into openings.

.6 Bevel both stiles of single doors 1 in 16.

.7 Reinforce doors with galvanized metal stiffeners at 150 mm o.c.

.5 Interior Doors:

.1 Supply and install inverted, recessed, mechanically interlocked with tack welded channels at top and bottom of doors.

.2 Fabricate doors with joints between front and back panels meeting on stile edges. Make joints mechanically interlocked and tack welded for entire height of door. After welding has been completed, grind joints smooth to match metal. Ensure that no filler is used in joints.

.3 Fill hollow space within door and vertical stiffeners from top to bottom with mineral fibre batt insulation.

.6 Exterior Doors:

.1 Supply and install inverted, recessed, mechanically interlocked with tack welded channels at top and bottom of doors. Supply and install PVC top caps.

.2 Fabricate doors with joints between front and back panels meeting on stile edges. Make joints mechanically interlocked and tack welded for entire height of door. After welding has been completed, grind joints smooth to match metal. Ensure that no filler is used in joints.

.3 Fill hollow space within door from top to bottom with rigid polyisocyanurate insulation.

.7 Fire Rated Doors:

.1 Supply and install inverted, recessed, spot welded channels at top and bottom of doors. Supply and install steel flush top caps on exterior doors.

.2 Fabricate doors with joints between front and back panels meeting on stile edges. Make joints continuously welded for entire height of door. After welding has been completed, grind joints smooth to match metal. Ensure that no filler is used in joints.

.3 Fabricate doors to achieve fire rating as indicated on drawings and in accordance with ULC. Provide ULC label plate on door at hinged edge midway between top hinge and head of door.

3 Execution

3.1 **EXAMINATION**

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

3.2 **HOLLOW METAL DOOR AND FRAME INSTALLATION**

.1 Install hollow metal doors and frames plumb, square, level, secure, and at correct elevation.

.2 Install doors clear of floor finishes, and with the correct rebate opening for the door installation. Install door silencers.

.3 Secure anchorages and connections to adjacent construction. Brace frames rigidly in position while building-in. Remove temporary steel shipping jamb spreaders. Install wood spreaders at third points of frame rebate height to maintain frame width. Supply and install vertical supports as indicated on drawings for openings over 1200 mm in width. Remove wood spreaders after frames have been built-in.

.4 Allow for structural deflection and prevent structural loads from being transmitted to hollow metal frames.

.5 Touch-up areas where galvanized coating has been removed or damaged with primer.

.6 Fire rated doors: Install fire rated doors and frames in accordance with requirements of NFPA 80.

3.3 **ADJUSTING AND CLEANING**

.1 Adjust doors for smooth and balanced door movement.

.2 Clean doors and frames.

END OF SECTION

1. General

1.1 **SECTION INCLUDES**

.1 Design, labour, Products, equipment and services necessary for electrically operated overhead coiling grill Work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM A653/A653M, Standard Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot Dip Process.

.2 ASTM D523, Test Method for Specular Gloss.

.3 ASTM D822, Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.

.4 CSA C22.1, Canadian Electrical Code, Part 1, Safety Standards for Electrical Installations.

.5 CAN/CSA-G40.20/G40.21-M, General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steels.

.6 CAN/CSA G164-M, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 **QUALITY ASSURANCE**

.1 Qualifications: Work under this section shall be executed by a Subcontractor with a minimum of 5 years of experience in the application of specified Products, systems, and assemblies, with documented approval and training by the respective Product manufacturers. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

.2 The Zero Carbon Building – Design Standard v4- Design Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

1.4 **SUBMITTALS**

.1 Product Data: Submit duplicate copies of manufacturer's Product data in accordance with Section 01 33 00, including:

.1 Performance criteria, compliance with applicable reference standards, characteristics, limitations, and troubleshooting protocols.

.2 Requirements for transportation, storage, handling, and installation.

.2 Shop Drawings: Submit shop drawings in accordance with Section 01 33 00, including:

.1 Elevations, sections, details, materials, operating components, dimensions, gauges, finishes, hardware arrangement, required clearances, and relationship to adjacent construction.

.2 Complete electrical wiring diagrams, including schematics and sequence of operation.

.3 Engineering design data confirming compliance with specified design criteria.

.3 **Closeout Submittals:**

.1 Provide the following for inclusion in Operations and Maintenance Manuals in accordance with Section 01 78 23:

.1 Identification: Manufacturer's name, type, year, and serial number.

.2 Performance criteria and maintenance data.

.3 Operating instructions and precautions.

.4 Safety precautions.

.5 Information on component parts availability, including names and addresses of spare part suppliers.

.6 Lubrication schedule detailing lubrication points and recommended types of lubricants.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Package or crate, and brace Products to prevent distortion during shipment and handling.

.2 Label packages and crates clearly. Protect finish surfaces with sturdy wrappings to avoid damage.

1.6 EXTENDED WARRANTY

.1 Submit an extended warranty for the Work of this Section in accordance with the General Conditions. The warranty period shall be extended to **3 years** from the date of Substantial Performance of the Work.

.2 Warranty Provisions:

.1 Design and Requirements: Warrant the Work against failure to meet design criteria and specified requirements.

.2 Coverage: Include complete replacement of defective components and any affected adjacent Work.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 Construction Waste Management and Disposal.

2. Products

2.1 ACCEPTABLE PRODUCTS AND MANUFACTURERS

.1 ROLLING ALUMINUM SLIMLINE SHUTTER

.1 Rolling aluminum door, manual operated, sizes as indicated.

.2 Acceptable manufacturers:

.1 Amstel.

.2 Cookson.

.3 Kinnear/Wayne Dalton.

.4 Overhead Door Corporation.

.3 Acceptable *Products*:

.1 Amstel Manufacturing “Rolling Aluminum Slimline Shutter” or approved alternative.

2.2 MATERIALS

.1 Curtain: Construct of interlocking extruded aluminum slat sections 0.050” thick, 3/8” deep and individually 1-1/4” high, with an overall width sized to suit door opening. Note: In general terms this model should not exceed 120” in width and/or 96” in height with a maximum area of 40 square feet. At maximum width of 120” door should not exceed 48” in height.

.2 Brackets: Steel brackets to support curtain, counterbalance and hood.

.3 Counterbalance: Helical torsion springs housed in a steel pipe barrel, supporting the curtain with deflection limited to 0.03"/ft of span. Counterbalance shall be adjustable by means of an adjusting tension wheel.

.4 Aluminum Bottom Bar: Members are to be horizontal bottom bars of tubular aluminum extrusion 1-1/4” in width and 2” in height. Manufacturer’s standard is slide-bolt lock at each end of bottom bar on coil side. Optional locking: master-keyed cylinder(s) on one or both sides or thumb-turn cylinder(s) on one side.

.5 Aluminum Guides: Members are to be 1-1/4” wide by 1-3/4” deep extruded aluminum guide sections with built-in upset shoulders to provide curtain retention. Each guide to be fabricated with a bell mouth to provide smooth curtain operation. Mount steel stoppers to guides to prevent roll over and travel above finished bulkhead/soffit. Guides shall be fitted with a wool pile wear strip on the outside face and a rigid P.V.C. stripping on the interior face to ensure smooth and quiet operation and reduce wear. Fasten guides to masonry or structural supports with concealed fasteners at max. 2’-0” O.C.

.6 Counterbalance: Construct of extruded aluminum involute tube to act as pipe barrel. This construction is generally unsuitable for spans exceeding 120”. Pipe barrel shall enclose oil tempered helical torsion springs of a design to ensure proper counterbalancing action with 25% overload factor. Spring tension adjustment shall be by means of an adjusting wheel and pin on the inside of the bracket plate.

.7 Bracket Plates: Construct of minimum 1/8” thick steel plate, primer painted “gray”.

.8 Aluminum Hood: Construct of 0.040” clear anodized aluminum sheet, press-bent to form suitable coil enclosure. Hoods and fascias will have maximum length of 120” per section. Steel channel fabricated hood supports will be provided for hoods and fascias that exceed 120” in width. In such cases the client is responsible for suitable support within the bulkhead. Hoods are not furnished for doors where coil is located above ceiling.

.9 Finish: Aluminum is to be 6063 aluminum alloy with T-5 temper. Standard factory finish to be 0.0004” (10 micron) clear anodizing. Optional finish: colour anodized or paint finish.

.10 Operation: Manufacturer’s standard is manual push-up operation. Optional hand-crank, chain-hoist or motor operation is available on most doors and for most mounting conditions. Depending on door model and size, manual push-up operation may be unsuitable and manufacturer will make recommendations. Door design is based on door specific conditions including but not limited to width, height and location. Motor operators will be sized based on the same conditions. Manufacturer provides tables for generalized sizing of components only.

.11 Locks: Keyed cylinder type.

3. Execution

3.1 **EXAMINATION**

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

3.2 **PREPARATION**

.1 Inspect all supports and site conditions to ensure suitability for the installation of closures.

.2 Coordinate with the responsible party to address and rectify any unsatisfactory conditions before proceeding with installation.

3.3 **INSTALLATION**

.1 Ensure materials are installed by the manufacturer or an authorized representative. Before beginning work, confirm that site conditions are suitable for proper installation.

.2 Assemble and install components plumb, true, square, straight, level, and accurate to the specified sizes and reviewed shop drawings.

.3 Ensure installation is free from distortion and defects that could negatively affect appearance or performance.

.4 Isolate metals to prevent corrosion caused by contact between dissimilar metals or between metals and masonry, concrete, or plaster. Use bituminous paint or butyl tape as necessary.

.5 Provide detailed instructions, templates, and supervision, as required, for the installation of fastenings or accessories that need to be integrated into the work of other sections.

3.4 ADJUSTMENT, CLEANING AND TESTING

.1 Upon completing the work of this section, thoroughly clean materials and ensure proper lubrication.

.2 Adjust all components to achieve optimum performance.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment, tools, and services necessary for the sectional steel overhead doors and frames work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM A36 /A36M, Standard Specification for Carbon Structural Steel

.2 ASTM A653 / A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.3 ASTM A780 / A780M, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings

.4 ASTM A123 / A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

.5 ASTM A229 / A229M, Standard Specification for Steel Wire, Oil-Tempered for Mechanical Springs.

.6 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials

.7 ASTM E283, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

.8 CSA Z462, Workplace Electrical Safety Standard

1.3 **SUBMITTALS**

.1 Product data: Submit manufacturer's Product data in accordance with Section 01 33 00 indicating door and frame construction.

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data

.2 Construction details, material descriptions, dimensions of individual components, profile door sections, and finishes.

.3 Rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

.3 Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

.1 Include plans, elevations, sections, details, and attachments to other work.

.2 Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

.3 Wiring Diagrams: For power, and control wiring, all interrelated components including, but not limited to remote actuation buttons.

.4 Samples for Initial Selection: Manufacturer's finish charts showing full range of colours and textures available for units and accessories with factory-applied finishes.

.5 Submit manufacturer's parts lists; include servicing frequencies, instructions for adjustment and operation applicable to each type of component or hardware, and name, address and telephone number of nearest authorized service representative.

1.4 **QUALITY ASSURANCE**

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Source Limitations: Obtain sectional doors, tracks and motors, operators, and controls from single source from single manufacturer.

.4 Electrical components, devices, and accessories: Listed and labeled as defined in CSA Z462 or NFPA 70, by a qualified testing agency, and marked for intended location and application.

.5 Manufacturer Qualifications: Provide each high speed rolling door as a complete unit produced by a single manufacturer, including frames, sections, brackets, guides, tracks, counterbalance mechanisms, hardware, operators, and installation accessories.

.6 Doors shall be installed by a company that is an approved installer of the manufacturer of the doors to be used and has been in the business of installing this type of doors for a minimum period of 5 years.

.7 Inserts and Anchorages: Furnish inserts and anchoring devices that must be set in concrete or built into masonry for unit installation. Provide setting drawings, templates, and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.

.8 Wind Loading: Design and reinforce sectional overhead doors to withstand windload pressures per the current edition of the Ontario Building Code.

.9 Specific door model used must have a proven track record of successful installations in similar applications

.10 Manufacturers’ Doors shall be produced by a manufacturer with at least 5 years of experience in fabricating and installing sectional doors. Manufacturers not explicitly named in these specifications must provide evidence of their ability to meet the specified performance and fabrication requirements. This submission shall include a list of five completed projects of similar design and complexity within the past 5 years. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

.11 Installers / Applicators / Erectors: Sectional door installation shall be carried out by the manufacturer's authorized representative.

.12 The Zero Carbon Building – Design Standard v4- Design Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

1.5 **DELIVERY, STORAGE AND HANDLING**

.1 Package or crate, and brace Products to prevent distortion in shipment and handling. Label packages and crates, and protect finish surfaces by sturdy wrappings.

1.6 **WARRANTY**

.1 Manufacturer's standard form in which manufacturer agrees to repair or replace components of sectional doors that fail in materials or workmanship within specified warranty period.

.2 Failures include, but are not limited to, the following:

.1 Structural failures including, but not limited to, excessive deflection.

.2 Faulty operation of hardware.

.3 Deterioration of metals, metal finishes, and other materials beyond normal weathering and use; rust through.

.4 Delamination of exterior or interior facing materials.

.5 Warranty period: Extend warranty period five years.

.3 Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.

.1 Warranty period: Extend warranty period ten years.

1.7 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 Construction Waste Management and Disposal.

2 Products

2.1 **PERFORMANCE REQUIREMENTS**

.1 General Performance: Sectional doors shall meet performance requirements specified without failure due to defective manufacture, fabrication, installation, or other defects in construction and without requiring temporary installation of reinforcing components.

.2 Structural Performance: Exterior sectional doors shall withstand the effects of gravity loads, and following loads and stresses within limits and under conditions indicated according to OBC.

.1 Wind Loads: In accordance with cladding design loads indicated on Structural drawings. Uniform pressure (velocity pressure) of 960 Pa, acting inward and outward.

.1 Basic wind speed: 26 m/s.

.3 Deflection Limits:

.1 Design exterior sectional doors to withstand design wind loads without evidencing permanent deformation or disengagement of door components.

.2 Deflection of interior and exterior doors in horizontal position (open): 1/120 of door width maximum.

.4 Air Infiltration: Maximum rate not more than indicated when tested according to ASTM E 283 or DASMA 105.

.1 Type 1: 1.64 m3/hr per sq. m at 24.1 km/h.

.2 Type 2: 2.74 m3/hr per sq. m at 24.1 km/h.

.5 Calculated Door Section Thermal Performance or [Tested Installed Door Thermal Performance]: Maximum U-factor for typical section

.1 Type 1: 0.22 W/m2K.

.2 Type 2: 0.443 W/m2K.

.6 Operation Cycles: Provide sectional door components and operators capable of operating for not less than 50 000 cycles. One operation cycle is complete when door is opened from closed position to fully open position and returned to closed position.

2.2 ACCEPTABLE MANUFACTURERS

.1 Solid Panel Rigid High-Speed Rigid Coiling Doors. Overhead rapid coiling door formed with panel of interlocking aluminum slats.

.2 Rytec Corporation "Spiral" is the standard high-speed overhead solid panel-slat coiling door. Or approved equivalent by Haas Door Company

2.3 MATERIALS AND CONSTRUCTION

.1 Single-Source Responsibility: Supply doors, tracks, motors, and accessories from a single manufacturer for each type of door. Ensure secondary components are sourced from a provider approved by the manufacturer of the primary components.

.2 Door Panel: aluminum slat frames with clear polycarbonate windows are 9” high. Thickness of slats ranges from 1.2” – 2.4”, depending on overall size of door. Integral rubber weatherseal between each slat. Door slats are connected by hinge system to provide additional rigidity and security to door panel. Door curtain does not require a tensioning system for additional wind/pressure resistance. Doors which require the use of a tensioning system for additional wind/pressure resistance will not be accepted.

.3 Side Frames: Galvanized steel side frames with full height weatherseal on both sides to seal against door panel. Dual thru-beam photo-eyes mounted within door jamb. Doors using an external coil cord will not be accepted.

.4 Bottom Bar: Extruded aluminum bottom bar with electric, reversing edge that reverses the door upon contacting an object.

.5 Counterbalance: Up to six extension springs in each side column, depending on the size of the door. Springs assist the motor in opening the door. Mechanical release lever on side column allows door to be easily opened in the event of a power failure. Doors using torsion springs for counterbalance or doors with springs located within a barrel will not be accepted.

.6 Drive system: Minimum 2 HP motor with variable speed AC drive which allows for soft acceleration and braking. Doors using a motor with a clutch or pump will not be accepted.

.7 Travel Speed: Opens at up to 100 inches per second and closes at lower speed.

.8 Electrical Controls:

.1 Rytec controller housed in a UL/cUL Listed NEMA 4X-rated enclosure with factory set parameters.

.2 Parameter changes and all door configurations can be made from the face of the control box, no exposure to high voltage. Control panels that require opening of the control box and reaching inside to make parameter changes will not be accepted.

.3 Controls include a variable speed AC drive system capable of infinitely variable speed control in both directions.

.4 Programmable inputs and outputs accommodate special control applications (traffic lights, horns, actuation devices, timing sequences, etc.) without the need for additional electrical components.

.5 Self-diagnostic scrolling two-line vacuum fluorescent display provides expanded informational messages for straightforward installation, control adjustments and error reporting.

.6 Complete history of door, at least two years, is logged and encrypted onto a USB flash drive. All errors have a time and date stamp for reference. Control panels not logging up to two years of door history will not be accepted.

.9 Door to use rotary encoder to regulate door travel limits. Limits to be self adjusting, without the use of tools, from floor level at the control panel. Doors using mechanical limits switches or doors that require tools to set the limits will not be accepted.

.10 Door Track: Spiral rollup design features not metal-to-metal contact which results in whisper-quiet, low maintenance operation and eliminates wear on panel slats. Doors that roll up on a barrel or whose track design allows metal-to-metal contact will not be accepted.

.11 Provide motion/presence sensor actuators each side of each door equal to BEA Falcon (two per door).

.12 All components factory finished.

3 Execution

3.1 INSTALLATION

.1 Doors shall be installed in strict accordance with the door manufacturer's instructions and approved shop drawings. The installation shall be complete and in perfect working condition. After door installation is complete, each door shall be inspected together by a representative of the General Contractor, Owner, or Owners representative and door installer prior to final acceptance.

.2 Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

.3 Fit and align assembly including hardware; level to plumb to provide smooth operation.

.4 Coordinate installation of electrical service. Complete wiring from disconnect to unit components.

.5 Ensure all work is carried out by qualified personnel approved by the door manufacturer.

.6 Securely attach guides to steel framing members, the header box to side guides, and the motor to the header box.

.7 Drill and tap door frames to accommodate hardware installation. Use machine bolts to fasten door tracks and stops to the door frame; welding is not permitted.

.8 Fit doors snugly to all edges of jambs and frame heads. Ensure smooth and free operation under all conditions. Doors must remain stationary in any position within the door opening without drifting upward or downward. Install and adjust weatherstripping to ensure proper sealing.

.9 Provide all necessary appurtenances required for door installation, including those related to door frames.

.10 After completing the installation of doors and operating equipment, lubricate all moving parts. Supply oil to gear reduction units and apply grease to sprockets, bearings, cables, link chains, and door guides before putting the system into operation.

.11 Ensure doors are installed to operate smoothly, close tightly, and provide a secure fit.

3.2 ADJUSTING AND CLEANING

.1 Adjust doors for smooth and balanced door movement.

.2 Clean doors and frames.

.3 Ensure doors and door frames are covered with protective materials after installation to safeguard factory-applied finishes from damage.

.4 Inspect and adjust all operating hardware, including weatherstripping, to ensure proper function and fit.

.5 At the completion of work under this section, thoroughly clean all materials, lubricate moving parts, and make necessary adjustments to achieve optimal operational performance.

3.3 **MAINTENANCE**

3.4 Maintenance instructions, parts list, including drawings showing all parts, etc., shall be furnished at the completion of the work.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services for washroom accessories work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-79.1, Insect Screens.
.2 Canadian Standards Association (CSA)
  .1 CSA-A440/A440.1, A440, Windows / Special Publication A440.1, User Selection Guide to CSA Standard A440, Windows.
  .2 AAMA /WDMA/CSA101/I.S.2/A440-08 & CSA A440S1-09 CAN SUPPLEMENT SECTION 5

1.3 **SUBMITTALS**

.1 Indicate materials and details in scale full size for head, jamb and sill, profiles of components, interior and exterior trim. Junction between combination units, elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes fasteners, and caulking. Indicate location of manufacturer’s nameplates.
.2 Shop drawings to include continuation of air barrier and vapour barrier between wall assembly and fiberglass window.
.3 Submit one complete full size window sample of each type window.
.4 Include frame, sash, sill, glazing and weatherproofing method, insect screens, surface finish and hardware. Show location of manufacturer's nameplates.
.5 Include 150 mm long samples of head, jamb, sill, meeting rail, mullions to indicate profile.

1.4 **TEST REPORTS**

.1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:
  .1 Windows classifications
  .2 Air tightness
  .3 Water tightness
  .4 Wind load resistance
  .5 Forced entry resistance
  .6 Insect screens
  .7 Glazing
  .8 Safety drop - vertical sliding windows only
  .9 Ease of operation - windows with operable lights
  .10 Sash pull-off - fiberglass windows

1.5 **WARRANTY**

.1 Provide a written warranty for work under this Section from Manufacturer for failure due to defective materials and from Contractor for failure due to defective installation, workmanship for ten (10) years respectively from the date of Substantial Completion.

1.6 **CLOSEOUT SUBMITTALS**

.1 Provide operation and maintenance data for windows for incorporation into manual specified in Section 01 33 00 –General Requirements.

2 Products

2.1 **MANUFACTURER**

.1 **W01 and W02 and W02A and W03F and W04**: 700 Series Fixed, Window Assemblies, as manufactured by INLINE FIBERGLASS Limited. Frames are 60mm (2-3/8”) or approved equivalent, refer to drawings for size

.2 **W03A and W03B and W03C and W03E**: 700 Series In-Swinging Hopper Window Assemblies, as manufactured by INLINE FIBERGLASS Limited. Frames are 60mm (2-3/8”) or approved equivalent, refer to drawings for size

2.2 **MATERIALS**

.1 Materials: to CSA-A440/A440.1 supplemented as follows:
.2 All fiberglass windows by same manufacturer.
.3 Sash: pultruded, fibreglass, nominal wall thickness 2.3 mm.
.4 Main frame: pultruded, fibreglass, nominal wall thickness 2.3 mm.
.5 Glass: See below.
.6 Weatherstripping: Foam filled seal and fin seal polypropylene pile.
.7 Screens: to CAN/CGSB-79.1.
  .1 Insect screening mesh: count 18 x 14
  .2 Fasteners: tamper proof
  .3 Screen frames: aluminum, colour to match window frames
  .4 Mount screen frames for exterior replacement.
  .5 Provide full insect screens to cover entire window
  .6 Full-height, roll-formed aluminum frame with friction fit corner keys. Screen mesh (Fiberglass or Aluminum) retained by vinyl spline.

2.3 **WINDOW TYPE AND CLASSIFICATION**

.1 Types:
  .1 In-Swinging Hopper Window with insulating glass.
  .2 Fixed: with insulating glass.
  .3 Screens: screens as indicated.

2.4 **FABRICATION**

.1 Fabricate in accordance with CSA-A440/A440.1 supplemented as follows:
.2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3.0 mm for units with a diagonal measurement over 1800 mm.
.3 Face dimensions detailed are maximum permissible sizes.
.4 Brace frames to maintain squareness and rigidity during shipment and installation.
.5 Frame and sash corners are connected with molded reinforced polymer components, and mechanically secured. Joints are factory sealed and neatly fitted together.

2.5 **FIBERGLASS FINISHES**

.1 All exposed surfaces are coated with polyurethane enamel top coat with a medium gloss of 17-35. In compliance with AAMA 623. Consultant to select from full range of standard colours.

2.6 **GLAZING**

.1 Glaze windows in accordance with CSA-A440/A440.1

.2 All windows are glazed with 22 mm (7/8”), insulating glass units. Glass thickness shall be in accordance with applicable Building Codes, but not less than 3mm (1/8”).

.3 Use of double-sealed insulating glass units certified by IGMAC or SIGMA. The glazing shall be: low-e, low conductivity spacers, low-inert gas fills.

2.7 **GLAZING METHOD**

.1 Laid-in glazing using polyethylene closed cell tape on the exterior and aluminum (7/8”), glass stop locked-in from the interior provides a secure and positive seal for the glass.

2.8 **HARDWARE**

.1 Hardware:

.1 Concealed Stainless Steel Hinges and metal-cam-locks with keepers. Hardware is installed through fiberglass substrate and into patented reinforcements. For windows greater than 1220mm (48”) in height, a compression interlock provides a positive seal.

2.9 **AIR BARRIER AND VAPOUR RETARDER**

.1 Provide low expanding, single component polyurethane foam sealant installed at head, jamb and sill perimeter of window for sealing to building air barrier, vapour retarder and window frame. Foam sealant width to be adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder foam interior.

3 Execution

3.1 **WINDOW INSTALLATION**

.1 Install in accordance with CSA-A440.

.2 Arrange components to prevent abrupt variation in colour.

.3 Install shims between windows and building frame at each installation screw location. Shim and fasten windows in accordance with manufacturer’s recommendations and CAN/CSA A440.4.

.4 Shall be performed by experienced installers in accordance with manufacturer’s instructions and CSA-A440.4. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation. Window shall be plumb and square after installation is complete and sealed to both interior and exterior walls with a high quality sealant around the perimeter of the frame. If perimeter cavity is to be foamed, additional anchorage may be required to prevent bowing. It shall be the responsibility of the installers to make all necessary final adjustments to ensure normal and smooth operation.

3.2 **CAULKING**

.1 Seal joints between windows and window sills with sealant. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.

.2 Apply sealant in accordance with Section 07 91 00 - Sealants. Conceal sealant within window units except where exposed use is permitted by Owner’s Representative.

3.3 **MAINTENANCE**

.1 To maintain performance and ease of operation, clean glass, frames and fly screen, vacuum

weather stripping and sill, lubricate hardware and weather-stripping with only silicone spray, a minimum of every six months.

END OF SECTION

PART 1 – GENERAL

1.1 WORK INCLUDED

.1 Furnish, deliver and install finish hardware.

.2 It is intended that the following list of hardware will cover finish hardware to complete the project. Bring to the Consultants attention any omissions, discrepancies that will affect work in this section during the bidding period.

1.2 RELATED SECTIONS

.1 General Requirements Division 1

.2 06 20 00 Finish Carpentry

.3 06 40 00 Architectural Woodwork

.4 08 10 00 Doors and Frames

.5 08 40 00 Entrances, Storefronts and Curtain Walls

.6 Division 26 Electrical

.7 Division 28 Electronic Safety and Security

1.3 PRODUCTS SUPPLIED BUT NOT INSTALLED IN THIS SECTION

.1 Power supplies, compressor/control boxes, junction boxes installed by Division 26.

1.4 REFERENCES

.1 Door and Hardware Institute - Recommended locations for Architectural Hardware for Standard Steel Doors and Frames

.2 Door and Hardware Institute - Recommended locations for Architectural Hardware for Flush Wood Doors

.3 NFPA 80-Standard for Fire Doors and Windows, 1999 Edition

.4 Door and Hardware Institute - Sequence Format for Hardware Schedule

.5 Door and Hardware Institute - Key Systems and Nomenclature

.6 Door and Hardware Institute - Abbreviations and Symbols used in Architectural Door and Hardware Schedules and Specifications

.7 Door and Hardware Institute – Installation Guide for Doors and Hardware

.8 Ontario Building Code 2012

1.5 SUBMITTALS

.1 Updated Finish Hardware Schedule:

Submit submittals in accordance with Section 01 33 00 Submittal Procedures. Prepare detailed hardware schedules in Door and Hardware (DHI) vertical format as detailed in Reference 1.4.4.

.2 Product Data:

Submit in a three-ring binder six (6) copies of product data sheets with the finish hardware schedule showing items of hardware to be used on the project.

.3 Samples:

When requested in writing, provide (to the Consultants Site Office) one sample of each hardware item complete with fasteners, within thirty (30) calendar days of award of a purchase order. Samples to be clearly labeled with their hardware schedule designation and manufacturers' name and model number. Samples will be incorporated into the work.

.5 Templates:

Submit templates within to related trades when requested.

.6 Keying Schedule:

After a keying meeting between representatives of the Owner, furnish a keying schedule listing the levels of keying as well as an explanation of the key system's function, the key symbols used, and the door numbers controlled. Utilize "Door and Hardware Institute - Key Systems and Nomenclature" as a guideline for nomenclature, definitions, and approach for selecting the optimal keying system. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.

.7 Wiring Diagrams

Co-ordinate with related trades, meet with the owner and security provider and submit a written description of the functional use (mode of operation) of electrical hardware products specified. Include operation for ingress, egress, fire alarm, and after hours use where applicable. Include door and frame elevations showing the location of each item of electrical hardware to be installed, mode of operation including a diagram showing number and size of conductors. Indicate on elevation drawing items provided by related trades, include for back boxes, and 120V power sources. Provide point to point drawings showing terminal connections necessary for a complete installation.

.8 Operations and Maintenance Data

Prior to Substantial Completion, furnish to the owner, three (3) copies of an owner's operation and maintenance manuals in a three-ring binder with the following information:

1. Name of hardware distributor, address and contact name
2. Copy of final "as-built" finish hardware schedule
3. As installed "wiring diagrams, elevations, risers, point to point"
4. Copy of final keying schedule
5. Copy of floor plans with keying nomenclature assigned to door numbers as per the approved keying schedule
6. Catalogue cut sheets and product specifications for each product
7. Parts list for each product
8. Installation instructions and templates for each product

1.7 QUALITY ASSURANCE

.1 Review installation procedures with the Contractor's Designated Installers. Hold instruction meetings with installers prior to installation and subsequent review meetings during the installation period. Submit minutes of meetings to the Consultant.

.2 Substitutions

Only approved products specified are accepted. Make substitution requests in accordance with Division 1. Include product data and indicate benefit to the project.

.3 Supplier Qualifications

Successful hardware distributor to have a minimum of five (5) years' experience in the door and hardware industry. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation. Distributor to have on staff an Architectural Hardware Consultant (A.H.C.) whose name will be listed on the hardware schedule title page submittal and will be responsible for scheduling, detailing, (see Reference 1.5.4) ordering and co-ordination of the finishing hardware for this project. If so, requested by the Consultant and or installer this individual will be required to visit the jobsite for any installation problems that may occur.

.4 Designated Installers

Hardware Installers must have a minimum of five (5) years' experience in installation of hardware. Provide verification of installer's qualification to Consultant for approval upon request. Proof of qualifications shall not be required for tender evaluation. Installers to attend review meetings with the Hardware Distributor.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Marking and Packaging

Mark cartons with heading number, door number, and key-set symbol where applicable in original packaging provided by the manufacturer. Pack packaged hardware in suitable wrappings and containers to protect it from damage during shipping and storage. Enclose accessories, fastening devices and other loose items with each applicable item of hardware.

.2 Delivery

Deliver hardware to related trades.

.3 Storage

Store in a clean, dry room with lockable man door and adequate shelving to permit organization so item numbers are readily visible.

1.9 WARRANTY

.1 Furnish warranties by the accepted manufacturers:

Hardware Item	**Length of Warranty**
Mortise Hinges	1year
Locks (Mortise)	3 years
Exit Devices	3 years
Door closer – 4040XP	30 years
Floor/Wall stops	1 year

1.10 MAINTENANCE

.1 Maintenance Service

After the building is occupied arrange an appointment with the maintenance staff from the City of Toronto for instruction of proper use, servicing, adjusting and lubrication of hardware furnished. Submit to the consultant a list of attendees and meeting date.

.2 Extra Materials

Furnish the following items in proper manufacturer's cartons once the job has been completed:

1. 5 of each installation tool used for locks/passage/privacy, type of door closers, and exit devices.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

Products listed in the hardware groups are from the manufacturers listed below:

ITEM	MANUFACTURER NAME
Full Mortise Hinges	Ives
Locksets, Latchsets/Deadbolts	Schlage
Cylinders	Schlage
Exit Devices	Von Duprin
Door Closers	LCN
Overhead Door Holders/Stops	Glynn Johnson
Wall/Floor Stops	Ives
Weather/Smoke/Sound Seals	Zero
Door Sweeps/Thresholds	Zero

2.1 MATERIALS

1. Screws and Fasteners:

Screws and fasteners to be matching finish to their product and to be manufacturer's standard. Door closers, door holders and exit devices installed on fire rated wood doors and hollow metal doors to be attached with fasteners to meet NFPA 80 requirements.

2. **Materials-Acceptable Manufacturers (Note: Supply products in a given category from the same manufacturer**):

.1 Mortise Hinges

Provide five knuckle bearing hinges with NRP option on reverse bevel doors with locking hardware. Hinge width to accommodate door closer projection, door trim and allow for 180-degree swing. Doors up to 2286mm (90") in height, supply 3 hinges, doors greater than 2286mm in height add one hinge for every additional 760mm of door height. Doors 915mm (36") wide and less furnish 114mm (4-1/2") high hinges, doors greater than 915mm (36") wide furnish 127mm (5") high hinges, heavy weight or standard weight as specified. Supply ferrous (steel), stainless steel material for all interior and/or fire-rated doors and stainless steel for exterior doors.

As Specified: Ives Hinges, 5BB1, 5BB1HW

.2 Locksets/Deadlocks/Privacy Sets:

Mortise:
Grade 1 Operational, Grade 1 Security, mortise lock for commercial and institutional buildings. Manufacture lock cases from fully wrapped, heavy 12 gage steel with a protected leading edge and screw configuration that limits access to operating parts. Lock components to be manufactured of zinc dichromate plated steel. Latch bolts to have a standard 70mm (2 ¾") backset with a full 19mm (¾") throw. Latchbolts to be non-handed, field reversible without opening the lock case. Latchbolts to be 2-piece anti-friction, manufactured from stainless steel. Solid latchbolts and/or plastic anti-friction devices are not acceptable. Deadbolts to be 45mm (1 ¾") total length have standard 25mm (1") throw with a minimum 19mm (¾") internal engagement when fully retracted. Deadbolts to be constructed of stainless steel, incorporating a security roller pin with a minimum Rc60 rating for surface hardness. Lever assembly (external) to be one-piece design attached by threaded bushing. Lever assembly (internal) to be attached by screw less shank. Lever attachments by common tools (allen nuts and/or set screws) are not acceptable. Thru bolt lever assemblies through the door for positive interlock. Levers to have independent rotation in both directions. Lever operation to be freewheeling (clutch) when in the locked mode. Spring cages are to be incorporated into the lever assemblies. Hub blocking plate to be solid, cast stainless steel. Manufacturers utilizing open hub designs are not acceptable. Spindles to be independent, designed to "break away" at a maximum of 75psi torque. Mounting tabs are to be automatic self-adjusting, vertically and horizontally for door bevel and strike alignment. Cylinders to be secured by a cast stainless steel, dual retainer. Manufacturers utilizing screws and/or stamped retainers are not acceptable.

Supply as Specified: Schlage "L" series

.3 Exit Devices/Device Trims/Mullions:

Heavy Duty
Exit device to be cUL listed for panic hardware and fire exit hardware. Supply panic hardware and fire exit devices featuring coil compression springs on device mechanism subassemblies and dead latching mechanisms for active latch bolts. Supply exit devices with smooth mechanism case and "the quiet one" fluid dampener to eliminate noise associated with exit device operations. Non-handed device with touchpad assemblies with no exposed fasteners and cast end caps, reinforced aluminum with stainless steel touchpad and raised edge to minimize pinching. Roller strikes to be standard on rim and surface vertical rod devices, mortise exit devices (626) complete with strikes that match the same finish as the device. Doors greater than 950mm (37-13/32") wide supply long bar exit devices, doors greater than 2134mm (84") high supply extension rods for surface vertical rod series. 1,000,000cycle testing independently certified by ETL.

Supply as Specified: Von Duprin 98 series

Exit Device Trim
Supply device trim featuring recessed cylinder mounting and coil compression spring design with shear pin protection for lever designs. Similar lever designs for exits as specified for locksets.

Supply as Specified Von Duprin 996 series

.4 Door Closers:

Door closers to have the following Fully hydraulic, rack and pinion action with high strength cast iron and one-piece forged steel pistons.
- Include high efficiency, low friction pinion bearings.
- Hydraulic fluid of a type requires no seasonal adjustments, ULTRA X TM fluid has constant temperature control from -35 degrees Celsius to +49 degrees Celsius.
- Hydraulic regulation controlled by tamper-proof, non-critical screw valves, adjustable with a hex wrench.
- Separate adjustments for backcheck, general speed and latch speed.
- Door closers with special template (ST-) numbers include required associated product, information sheets and instructions
- Size 1 manual door closers to provide less than 5 pounds opening force on a 900mm door leaf.
- Door closer with Pressure Relief Valves are not accepted.
- Door closer bodies, arms, covers to be powder coated
- Closers with powder coat finishes to exceed a minimum 100-hour salt spray test, as described in ANSI A156.18 and ASTM B117.
- Closers detailed with plated finishes to include plated covers (or finish plates), arms and visible fasteners.

Medium Duty Mechanical (Interior/Exterior):
Non-sized (1-6) and non-handed cylinder body to have 32mm (1 ¼") piston diameter with 16mm (5/8") single heat-treated shaft. Track closer cylinder body non-sized (2-4) or (1-2). Closers to have stamped main arm and forearm (forged steel main arm and forearm EDA and CUSH type arms). Optional arms to be interchangeable within the series of closers, except track arm type closers. Track arm type closers to have single lever arm with low friction track and roller assembly and provisions for an optional bumper to assist backcheck.

Supply as Specified: LCN1460 HD series

Heavy Duty Mechanical (Multiple Applications):
Non-sized (1-6) and non-handed cast iron cylinder body to have 38mm (1 1/2") diameter with 19mm (3/4") journal double heat-treated pinion shaft with 16mm (5/8") full complement bearings. XP closer hydraulic regulation controlled by tamper-proof, non- critical screw valves, abrasion resistant Vitron "O" ring, adjustable with a hex wrench. Closer to have "FAST" Power Adjust speed dial to show spring size power. Track closers non-sized 1-4. Closers to have forged steel main arm and forearm (forged steel main arm and forearm EDA and CUSH type arms). Optional arms to be interchangeable within the series of closers, except track arm type closers. Track arm type closers to have single lever forged arm with low friction track and roller assembly and provisions for an optional bumper to assist backcheck.

Supply as Specified: LCN 4040XP series

"NOTE: LOW ENERGY OPERATORS SUPPLIED AND INSTALLED BY THIS SECTION"

Heavy Duty Electric Operator
Provide low energy automatic operator units that are electro-mechanical design. Powered by DC motor working through reduction gears. Spring force closing. Motor is off when door is in closing mode. Door can be manually operated with power on or off without damage to operator. Provide variable adjustments, including opening and closing speed adjustment. Provide units with manual off/auto/hold-open switch, push and go function to activate power operator, vestibule interface delay, electric lock delay, hold-open delay adjustable from 2 to 30 seconds, and logic terminal to interface with accessories, mats, and sensors. Provide full length aluminum header, drop plates, angle brackets, or adapters for arms to suit details. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings, consult with owner.

Supply as Specified: LCN 9500

.5 Overhead Door Stops/Holders:

Heavy Duty Surface Mounted:
Surface overhead stops/holders to be stainless steel base, non-handed for single-acting doors with a heavy-duty channel/slide-arm design and offset jamb bracket to allow for simple field modifications of functions. Channel to be surface mounted to the door with thru bolts and the jamb bracket is surface mounted to the frame soffit.

Supply as Specified: Glynn-Johnson 90 series

Medium-Duty Surface Mounting:
Surface overhead stops/holders to be stainless steel base, non-handed for single-acting doors with a channel/slide-arm design and offset jamb bracket to allow for simple field modifications of functions. Channel to be surface mounted to the door with thru bolts and the jamb bracket is surface mounted to the jamb.

Supply as Specified: Glynn-Johnson 450 series

.6 Door Pulls/Flatware/Coat Hooks:

Ives 8400 B-NH-A, tape mounting for installation (Kickplates 40mm (1-5/8”) less door width single door and 25mm (1”) less door width double doors)

.7 Floor/Wall Stops:

Wall Stops (No Button on Locking Hardware):
Wall stops to be constructed of stainless-steel base with special retainer cup that makes the rubber stop tamper resistant. Convex design of rubber bumper.

Supply as Specified: Ives WS407CVX

.8 Weather/Smoke/Sound Seals:

Supply as Specified: Zero 429AA (head seal)

Note: Mount head seal prior to soffit mounted hardware.
Zero 328AA-S (jamb seal, head/jamb seal)
Zero 188SBK (head/jamb seal)
Zero 8192AA (door sweep)

.9 Thresholds/Weatherstrip/Door Sweeps:

Supply as Specified: Zero 625A(Threshold)

2.3 FINISHES

.1 Unless otherwise specified, finishes to be brushed chrome (BHMA 626/652).

Finishes are specified as follows:

ITEM	BHMA#	DESCRIPTION	BASE MATERIAL
Hinges	630	satin stainless steel	stainless steel
Hinges	652	satin chrome plated	steel
Pivots	689	powder coat aluminum	steel
Lock Trim	626	satin chrome plated	brass/bronze
Exit Devices	626	satin chrome plated	brass/bronze
Protective Plate	630	satin stainless steel	stainless steel
Door Stops/Holders			
Overhead	630	satin stainless steel	stainless steel
Wall/Floor	626	satin chrome plated	brass/bronze
Thresholds	628	anodized aluminum	aluminum
Weatherstrip	628	anodized aluminum	aluminum

2.4 [KEYING - STANDARD KEYING WITH EXTERIOR PRIMUS CYLINDERS]

CYLINDERS, KEYING SYSTEMS AND KEY CONTROL

.1 Meet with the Owner to finalize keying requirements and obtain keying instructions in writing as outlined in Division 1. Locks, cylinders and keys shall be furnished with Schlage patented full size key sections.

.2 Provide temporary construction keying system during construction period. Permanent keys will be furnished to the Owner's Representative prior to occupancy. The Owner or Owner's Security Agent will void the operation of the construction keys.

.3 Permanent cylinders to be keyed by factory, combinated in sets or subsets, master keyed or great grand master keyed, as directed by Owner. Permanent keys, keyblanks and cylinders shall be stamped with the applicable blind code for identification. These visual key control marks or codes will not include the actual key cuts. Stamp cylinders with concealed visual keying for added security. Permanent keys will also be stamped "Patented". Keys and cylinder identification stamping to be approved by the Consultant and Owner. Failure to properly comply with these requirements may be cause to require replacement of the cylinders and keys involved as deemed necessary at no additional cost to the Owner.

.4 Equip locks and cylinders with patent protected, full size cylinders with nickel silver

blocking pin to check for patented feature on keys. Provide a minimum of six pins with nickel silver bottom pins. Cylinders must allow for multiplex master keying, combinated to Owner's instructions.

.5 Provide complete cross-index system, place keys on markers and hooks in the cabinet as determined by the finial key schedule. Provide one each key cabinet, hinged panel type cabinet for wall mounting. See hardware groups for model number.

.6 Deliver permanent key blanks and other security keys direct to Owner's representative from factory by secure courier, return receipt requested. Failure to properly comply with these
requirements may be cause to require replacement of cylinders and keys involved as deemed necessary at no additional cost to the Owner.

Key Management Software

PART 3 – EXECUTION

3.1 EXAMINATION

.1 Ensure that doors and frames are prepared and reinforced to receive finish hardware prior to installation.

.2 Ensure that door frames and finished floor are plumb and level to permit proper engagement and operation of hardware.

.3 Verify power is run to door opening requiring electrified hardware.

.4 Submit in writing a list of deficiencies determined as part of inspection required in 3.1.1 and 3.1.2 to supervising consultant prior to installation of finished hardware. Correct door frame installation before proceeding with finish hardware installation.

3.2 INSTALLATION

.1 Hardware Installers must have a minimum of five (5) years' experience in installation of hardware.
Provide verification of installer's qualification to Consultant for approval. Installers to attend review meetings conducted by the hardware distributor.

.2 Install hardware at mounting heights as specified in the manufacturer's templates or specific references in approved hardware schedule or approved elevation drawings.

.3 Where mounting height is not otherwise specified, install hardware at mounting heights as indicated in 1.5.1, 1.5.2.

.4 Install hardware using only manufacturer supplied and approved fasteners in strict adherence with manufacturers published installation instructions.

.5 Ensure locksets / latchsets / deadlocks are of the correct hand before installation to ensure that the cylinder is in the correct position. **Handing is part of installation procedure.**

.6 Ensure that exit devices are of the correct hand and adjust device cam/drive screw for proper outside trim function prior to installation. Handing is part of installation procedure.

.7 Follow manufactures installation instructions. Adjustment of door closers is inclusive of spring power, closing speed, latching speed and back-check, valve screws to achieve backcheck (4040, 4040XP series) at the time of installation.

.8 Adjust delayed action door closers to forty (40) second delay for barrier free accessibility and movement of materials. Time period to be approved by Owner.

.9 Install head seal weatherstrip prior to installation of soffit mounted hardware. Trim cut and notch thresholds and saddles neatly to minimally fit the profile of the door frame. Install thresholds and saddles in a bed of caulking completely sealing the underside from water and air penetration.

.10 Counter sink through bolt of door pull under push plate during installation.

.11 Install blocking material in cavities of metal and wood stud walls and partitions. Located concave and convex type door bumpers at the appropriate height to properly contact protruding door trim.

3.3 FIELD QUALITY CONTROL

.1 Verify each door leaf opens closes and latches. Inspect fire rated openings to ensure they are installed in compliance with NFPA 80 requirements. Test access control system and electrified hardware devices for proper operation with owner to sign off on verification of operation. Verify electric door release hardware operates to close the door upon activation of the fire alarm system.

.2 Perform bi-monthly on-site inspections during hardware installation and provide inspection reports listing progress of work, unacceptable work and corrective measures. Repair or replace as directed by the Consultant.

.3 Before completion of the work but after the hardware has been installed, submit a certificate to the Consultant stating that final inspection has been made and that hardware has been checked for installation and operation by a technician from the manufacturer and hardware consultant

3.4 ADJUSTING AND CLEANING

.1 Check and make final adjustments to each operating item of hardware on each door to ensure proper operation and function.

.2 Adjust doors with self-closing devices or automatic closing devices for operation after the HVAC system is balanced and adjusted. Adjust spring power of non sized door closers to close and latch the door.

.3 Hardware to be left clean and free of disfigurements.

.4 Instruct owner personnel in the operation, adjustment and maintenance of hardware.

.5 Check locked doors against approved keying schedule.

3.5 PROTECTION

.1 Protect hardware from damage during construction. Wrap locks, panic hardware, and fire exit hardware, door pull trim with kraft paper or plastic bubble materials to protect finish

from damage until date of substantial completion. Remove and reinstall or where necessary, use temporary hardware to maintain finish in new condition and maintain manufacturer's warranty.

3.6 HARDWARE GROUPS

Blantyre Park Improvements

Door#	HwSet#
D001A	01
D001B↙	02
D002↙	03
D03A	04
D03B	04
D007	05
D009	06
D010A	06
D010B	09
D011A	07
D011B↙	08
D011C	04

Blantyre Park Improvements

Hardware Group No. 01

For use on Door #(s):
D001A
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
4	EA	HINGE	5BB1HW 127X114MM NRP		630	IVE
1	EA	CORRIDOR LOCK	L9456P6 06B 09-544		630	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH ST-1595 SPEC		689	LCN
1	EA	KICK PLATE	8400 10" B-CS X WIDTH TO SUIT		630	IVE
2	EA	JAMB SEAL	328AA (2 X H)		AA	ZER
1	EA	GASKETING	429AA (1 X W) HEAD		AA	ZER
1	EA	DOOR SWEEP	39A X DOOR WIDTH		A	ZER
1	EA	THRESHOLD	625A (1 X WIDTH)		A	ZER
1	EA	ASTRAGAL	WELDED FLAT ASTRAGAL BY DOOR SUPPLIER			

Hardware Group No. 02

For use on Door #(s):
D001B
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 127X114MM		630	IVE
1	EA	SGL CYL DEADBOLT	B660P6		626	SCH
1	EA	MONITOR STRIKE	LSM-1		630	SEC
1	SET	DOOR PULL	CBH 7238-1 #3 MTG.		630	CBH
1	EA	MOUNTING PLATE	9530-18		689	LCN
1	EA	SURF. AUTO OPERATOR	9531 AS REQ (120/240 VAC)		ANCLR	LCN
1	EA	KEYSWITCH	8310-806K		BLK	LCN
2	EA	ACTUATOR, TOUCH	8310-836T		630	LCN
1	EA	KICK PLATE	8400 10" B-CS X WIDTH TO SUIT		630	IVE
1	EA	FLOOR STOP	FS439		630	IVE

DESCRIPTION OF OPERATIONS:
-DOOR NORMALLY CLOSED
WHEN DEADBOLT IS LOCKED, IT MONITOR STRIKE WILL SHUNT POWER TO ACTUATORS
-WALL MOUNTED KEYSWITCH TO ENABLE/DISABLE INTERIOR AND EXTERIOR ACTUATORS
-FREE EGRESS AT ALL TIMES

Blantyre Park Improvements

Hardware Group No. 03

For use on Door #(s):
D002
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1HW 127X114MM			630	IVE
1	EA	STOREROOM LOCK	L9080P 06B			630	SCH
1	EA	INTERFACE BOX	JB7				VON
1	EA	ELECTRIC STRIKE	6211 FS CON 12/16/24/28 VAC/VDC			630	VON
1	EA	MOUNTING PLATE	9530-18			689	LCN
1	EA	SURF. AUTO OPERATOR	9531 AS REQ (120/240 VAC)			ANCL R	LCN
2	EA	ACTUATOR, TOUCH	8310-836T			630	LCN
1	EA	OCCUPANCY INDICATOR	CM-AF500			630	CAM
1	EA	PUSH TO LOCK/ANNUNCIATOR	CM-AF500R			630	CAM
1	EA	KICK PLATE	8400 10" B-CS X WIDTH TO SUIT			630	IVE
1	EA	FLOOR STOP	FS439			630	IVE
1	EA	ADVANCED LOGIC RELAY	CX-33				CAM
1	EA	EMERGENCY CALL KIT	CX-WEC10K2				CAM
1	EA	DOOR CONTACT	679-05HM			BLK	SCE

DESCRIPTION OF OPERATIONS:
-DOOR NORMALLY CLOSED AND UNLOCKED.
-OUTSIDE ACTUATOR ACTIVATES DOOR OPERATOR ALLOWING ASSISTED ACCESS, PUSHING DOOR ALLOWS MANUAL ACCESS.
-INSIDE PUSH-TO-LOCK BUTTON SECURES ELECTRIC STRIKE, AND CHANGES STATE OF OUTSIDE LED OCCUPANCY INDICATOR TO "OCCUPIED"
-FREE EGRESS BY INSIDE LEVER, OR INSIDE ACTUATOR ALLOWING ASSISTED EGRESS
-EXITING SPACE RESETS SYSTEM TO UNLOCKED AND UNOCCUPIED STATUS VIA DOOR CONTACT
-PUSHING INSIDE "PRESS FOR EMERGENCY ASSISTANCE" ACCUATOR ENGAGES EMERGENCY CALL SYSTEM
-IN THE EVENT OF AN EMERGENCY, HORN STROBE WILL ACTIVATE AND OPENING WILL RETURN TO UNLOCKED STATE ALLOWING ENTRY TO ASSIST

Hardware Group No. 04

For use on Door #(s):
D03A D03B D011C
Provide each RU door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	HARDWARE	ALL HARDWARE BY DOOR SUPPLIER		

Blantyre Park Improvements

Hardware Group No. 05

For use on Door #(s):
D007
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
4	EA	HINGE	5BB1HW 127X114MM NRP		630	IVE
1	EA	CLASSROOM DEADBOLT	B663P6		626	SCH
1	EA	CYLINDER PULL	CBH 350		630	CBH
1	EA	SURFACE CLOSER	4040XP SHCUSH ST-1595 SPEC		689	LCN
2	EA	JAMB SEAL	328AA (2 X H)		AA	ZER
1	EA	GASKETING	429AA (1 X W) HEAD		AA	ZER
1	EA	DOOR SWEEP	39A X DOOR WIDTH		A	ZER
1	EA	THRESHOLD	625A (1 X WIDTH)		A	ZER
1	EA	ASTRAGAL	WELDED FLAT ASTRAGAL BY DOOR SUPPLIER			

Hardware Group No. 06

For use on Door #(s):
D009 D010A
Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
8	EA	HINGE	5BB1HW 127X114MM NRP		630	IVE
2	EA	MANUAL FLUSH BOLT	FB458 650MM		626	IVE
1	EA	DUST PROOF STRIKE	DP2		626	IVE
1	EA	STOREROOM LOCK	L9080P 06B		630	SCH
2	EA	SURFACE CLOSER	4040XP SHCUSH SRI ST-1595 SPEC		689	LCN
2	EA	JAMB SEAL	328AA (2 X H)		AA	ZER
2	EA	MEETING STILE	328AA (2 X H)		AA	ZER
1	EA	GASKETING	429AA (1 X W) HEAD		AA	ZER
2	EA	DOOR SWEEP	39A X DOOR WIDTH		A	ZER
1	EA	THRESHOLD	625A (1 X WIDTH)		A	ZER
2	EA	ASTRAGAL	WELDED FLAT ASTRAGAL BY DOOR SUPPLIER			

Blantyre Park Improvements

Hardware Group No. 07

For use on Door #(s):
D011A
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 127X114MM NRP		630	IVE
1	EA	CORRIDOR LOCK	L9456P6 06B 09-544		630	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH ST-1595 SPEC		689	LCN
1	EA	KICK PLATE	8400 10" B-CS X WIDTH TO SUIT		630	IVE
2	EA	JAMB SEAL	328AA (2 X H)		AA	ZER
1	EA	GASKETING	429AA (1 X W) HEAD		AA	ZER
1	EA	DOOR SWEEP	39A X DOOR WIDTH		A	ZER
1	EA	THRESHOLD	625A (1 X WIDTH)		A	ZER
1	EA	ASTRAGAL	WELDED FLAT ASTRAGAL BY DOOR SUPPLIER			

Hardware Group No. 08

For use on Door #(s):
D011B
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 127X114MM		630	IVE
1	EA	LONG DOOR PULL	PR 9266 72 56 N		630	IVE
1	EA	SURF. AUTO OPERATOR	9542 MS AS REQ (120/240 VAC)	✓	ANCL R	LCN
2	EA	ACTUATOR, TOUCH	8310-836T	✓	630	LCN
1	EA	MOUNTING PLATE	9540-18 45 "		ANCL R	LCN
1	EA	KICK PLATE	8400 10" B-CS X WIDTH TO SUIT		630	IVE
1	EA	FLOOR STOP	FS439		630	IVE

Hardware Group No. 09

For use on Door #(s):
D010B
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
4	EA	HINGE	5BB1 127X114MM NRP		630	IVE
1	EA	STOREROOM LOCK	L9080P 06B		630	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH ST-1595 SPEC		689	LCN
1	EA	KICK PLATE	8400 10" B-CS X WIDTH TO SUIT		630	IVE

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for glass and glazing Work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ANSI Z97.1-2015 (R2020), Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test (includes errata).

.2 ASTM C1036-21, Standard Specification for Flat Glass.

.3 ASTM C1048-18, Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.

.4 ASTM C1503-18, Standard Specification for Silvered Flat Glass Mirror.

.5 ASTM D2240-15e1, Standard Test Method for Rubber Property—Durometer Hardness.

.6 ASTM E2190-19, Standard Specification for Insulating Glass Unit Performance and Evaluation.

.7 CAN/CGSB-12.1-2017, Safety Glazing.

.8 CAN/CGSB-12.3-2019, Flat, Clear Float Glass.

.9 CAN/CGSB-12.8-2017, Insulating Glass Units.

.10 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.

.11 CPSC 16 CFR 1201, Safety Standard for Architectural Glazing Materials.

.12 GANA Glazing Manual, International Year of Glass (IYOG) Edition (2022).

.13 GANA Engineering Standards Manual, Latest Edition.

.14 GANA Laminated Glazing Reference Manual, 2019 Edition.

.15 GANA Sealant Manual, Latest Edition.

1.3 **STRUCTURAL DESIGN**

.1 Specified glass thicknesses are the minimum acceptable and may need to be exceeded. Establish glass thicknesses for each application and loading condition in accordance with CAN/CGSB 12.20.

.2 Design loads shall comply with Ontario Building Code (OBC) requirements specific to the project's location, including:

.1 Design of exterior glazing to resist positive and negative wind pressures, seismic loads, and thermal conditions.

.2 Design of glazing assemblies in exterior walls or interior partitions extending below 1070 mm from floor level to resist the lateral design loads specified for guards and walls under OBC regulations.

.3 Ensure all structural designs are reviewed and approved by a licensed professional engineer before fabrication or installation.

1.4 **EXTENT OF WORK**

.1 Work Included:

.1 This Section governs glazing systems installed by all trades throughout the project. At Contractor's option, this Work may be delegated amongst a number of sub-trades closely associated in their Work with glazing Work, or the total project Work may be executed by a single, qualified glazing specialist. Where 2 separate trades furnish glass from separate glass manufacturers, adjacent panes of glass in finished work shall match in flatness, reflectivity and colour, as applicable.

.2 Related Work Specified Elsewhere:

.1 Steel Doors and Frames – under Section 08 11 13.

.2 Fibreglass Windows - under Section 08 54 13

1.5 **QUALITY ASSURANCE**

.1 Qualifications of Installers: Provide at least one trade specialist who is thoroughly trained and experienced in skills required, and who is completely familiar with referenced standards and requirements of this Work, and personally directs installation performed under this Section.

1.6 **JOB CONDITIONS**

.1 Environmental Requirements: No glazing done when temperature is less than 7°C or sash or frames are wet, damp or frosted.

.2 Protection:

.1 Protect Work of other trades from damage resulting from Work of this Section.

.2 Identify glazed openings immediately following glass installation. Use coloured tapes or flags suspended near, but not in contact with glass. Attach to frames or surround with suitable non-staining strippable adhesives or tapes.

1.7 **SUBMITTALS**

.1 Shop Drawings: Submit full-size details according to Section 01 33 00 showing each different glazing condition; show dimensions and all materials with complete notations. Submit glass design calculations when requested.

.2 Samples:

.1 Submit samples according to Section 01 33 00. Provide three 300 mm square glazing samples.

.2 Submit samples of all glazing materials.

.3 Data Manual: Provide maintenance and cleaning instructions for glass and glazing. Advise of proper materials and methods of cleaning glass.

1.8 **DESIGN**

.1 Design glass and glazing to meet CAN/CGSB-12.20-M89 and all Appendices. Glass thicknesses given in this Specification are minimum.

1.9 **WARRANTY**

.1 Contractor hereby warrants all glass materials and installations for a period of two (2) years.

1.10 **SUBMITTALS**

.1 Shop drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 for fabrication and erection of glazing elements, indicating materials, thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

.2 Show details of each type of glazing system in conjunction with the framing system indicating type of glass, sizes, shapes, glazing material, and quantity. Show details indicating glazing material, glazing thickness, bite on the glass, and glass edge clearance.

.3 For glass scheduled or indicated as engineered and glass to serve as guards in accordance with building code, shop drawings to be engineered shop drawings. Refer also to Section 08 88 00 for requirements of glass guards.

.4 Indicate analysis of glass including maximum deflection and allowable stresses from imposed dead/live loads and thermal loads.

.1 Samples:

.1 Submit the following samples in accordance with Section 01 33 00:

.2 One sample of each type of glass:

.1 305 x 305 mm of each type of insulating glass unit, complete with each different Low-E coating.

.2 305 x 305 mm of each colour of spandrel glass.

.3 305 x 305 mm of fire-rated wired glass.

.4 305 x 305 mm of mirror.

.5 305 x 305 mm of glass film.

.2 Certificates: Submit the manufacturer's certification that glass and glazing materials are compatible.

.3 IGMA Compliance Audit: Submit a written certification of successful completion of a

Compliance Audit within the last six months, in accordance with Section 01 33 00.

.4 Provide certificates of compliance from the glass and glazing materials manufacturers attesting that glass and glazing materials furnished for the project comply with requirements.

.5 Separate certification will not be required for glazing materials bearing a manufacturer's permanent label designating the type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to the authorities having jurisdiction.

.6 Obtain compatibility and adhesion test reports from the sealant manufacturer indicating that glazing materials were tested for compatibility and adhesion with the glazing sealant as well as other glazing materials, including insulating units.

.7 Submit glass fabricator’s product information and structural calculations indicating compliance with glazing standards established by the Glass Association of North America (GANA). Include thermal stress and structural load analysis of the proposed glass types, configurations, and sizes.

.8 Submit applicable supporting documentation for The Zero Carbon Building – Design Standard v4 requirements in accordance with the Canadian Green Building Council (CAGBC) guidelines.

.1 Ensure all submissions are complete and accurate, including calculations, and certifications required to demonstrate compliance with Zero Carbon Building Design standards.

1.5 **QUALITY ASSURANCE**

.1 Insulating Glass Unit Fabricators:

.1 Fabricators shall be certified members of the Insulating Glass Manufacturer’s Alliance (IGMA).

.2 IGMA members must participate in the certification program and have successfully passed a Compliance Audit within the last six months.

.3 Installer Qualifications: Work of this section shall be performed by a company with a minimum of five years proven experience in the installation of glazing units of a similar size and nature. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

.4 Manufacturers: Fabrication processes, including low emissivity and reflective coatings, insulating, laminated, silk-screening, and tempering shall be manufactured by a single manufacturer with a minimum of ten (10) years of fabrication experience and meet ANSI / ASQC 9002 1994. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

.5 Work of this section shall be executed by a specialist Subcontractor who shall be thoroughly trained and experienced in skills required, be completely familiar with referenced standards and requirements of the work of this section, and personally direct installation performed under this section. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

.1 Foreperson experience: Minimum 10 years experience as a glazing mechanic.

.2 Glazing mechanic experience: Minimum 3 years experience as glazers.

.3 Structural sealant glazing mechanic experience: Minimum 5 years relevant experience.

.4 Mirror installations: Installation only by an applicator trained and approved by the adhesive manufacturer for application of its products.

.6 Mock-ups:

.1 Provide a mock-up of mirror installation, including a minimum of 4 full-size mirrors. Locate the mirror mock-up where approved by the Consultant.

.2 Provide a mock-up of a full height - span curtain wall.

.2 The Zero Carbon Building – Design Standard v4- Design Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver materials to the specified destination in the manufacturer's or distributor's packaging, ensuring the packaging is undamaged, labels are intact, and installation instructions are included.

.2 Store materials off the ground, under cover, and protected from weather and construction activities to prevent damage or deterioration.

1.7 SITE CONDITIONS

.1 Glazing Temperature Conditions: Perform glazing with compounds, sealants, or tapes only when glazing surfaces are at temperatures over 5°C, and ensure no moisture from rain, mist, or condensation is accumulating on the surfaces.

.2 Glazing at Low Temperatures: When glazing surfaces are below 5°C, obtain Consultant approval for glazing methods and protective measures to be used during glazing operations.

1.8 EXTENDED WARRANTY

.1 For the work of this Section, the 2-year warranty period prescribed in the General Conditions of the Contract is extended to the following durations:

.1 Insulating glass units: 10 years

.2 Laminated glass: 5 Years

.3 Mirror glass: 10 years

.2 Extended warranty for insulating glass unit products:

.1 Warrant insulating glass units against defects and malfunction under normal usage, including failure of the seal of the enclosed air space and deposits on inner faces of the glass that are detrimental to vision.

.2 Failure of the seal resulting in material obstruction of vision due to dirt, moisture, or film formation on the interior glass surfaces caused by failure of the hermetic seal.

.3 Replacement of sealed insulating glass units.

.4 No dollar limit.

.5 Non-prorated.

.3 Extended warranty for laminated glass products:

.1 Provide a written 5-year warranty from the date of manufacture for laminated glass. The warranty shall cover deterioration due to normal conditions of use and not due to handling, installing, or cleaning practices contrary to the glass manufacturer's published instructions. The warranty shall be the manufacturer's standard form, in which the laminated-glass manufacturer agrees to replace laminated-glass units.

.4 Extended warranty for mirror glass products:

.1 Deterioration of the mirror silvering under normal conditions of use, excluding issues caused by improper handling, installation, protection, or maintenance practices contrary to the glass manufacturer's published instructions.

.2 Replacement of defective mirror glass units.

1.9 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 Construction Waste Management and Disposal.

2 Products

2.1 **ACCEPTABLE MANUFACTURERS**

.1 Glass manufacturers:

.1 Cardinal Glass Industries.

.2 PPG Industries Ltd.

2.2 **MATERIALS**

.1 Single source responsibility: Provide materials from a single manufacturer or fabricator for each kind and condition of glass indicated and composed of primary glass obtained from a single source and manufacturing plant for each type and class required. There shall be no voids or skips in the primary seal.

.2 Glass strength:

.1 Provide glass products in the thickness and strengths required to meet or exceed the following criteria based on project loads and in-service conditions:

.2 Analysis shall comply with CAN/CGSB 12.20-M89. .2 Minimum thickness of annealed or heat-treated glass products to be selected so the worst-case probability of failure does not exceed the following:

.1 8 breaks per 1000 for glass installed vertically less than 15 degrees from the vertical plane and under wind action.

.2 5 breaks per 1000 for heat-soaked tempered glass as a result of verifiable Nickel Sulfide (NiS) inclusion.

.3 1 break per 1000 for glass installed 15 degrees or more from the vertical plane and under the action of wind and/or snow.

.3 Maximum lateral deflection for insulating glass units:

.1 For insulating glass units supported on four edges, limit center-of-glass deflection at design wind pressure to not more than 1/175 times the long-side length or 19 mm maximum.

.2 For structural insulating glass units not supported on four edges, limit center-of-glass deflection at design wind pressure to not more than 1/240 times the long-side length or 19 mm maximum.

.4 Provide annealed, heat-strengthened, and tempered lights where required by the building code and for the various solar exposures on the building.

.5 Glass thicknesses and types specified, indicated, or scheduled in the Contract Documents are minimum requirements. The glass designer/engineer shall modify these as necessary to satisfy design, building code requirements, and the requirements of authorities having jurisdiction. Any such modifications shall be clearly indicated on shop drawings.

.6 Thermal and optical performance: Provide glass products with performance properties specified or published by the glass manufacturer where not specified. Performance properties shall be the manufacturer’s published data, determined according to the following procedures:

.1 Center-of-glass U-Value: National Fenestration Rating Council (NFRC) 100 methodology using LBNL WINDOW 5.2 computer program.

.2 Center-of-glass solar heat gain coefficient: NFRC 200 methodology using LBNL WINDOW 5.2 computer program.

.3 Visible light transmittance: NFRC 200 methodology.

.4 Solar optical properties: NFRC 300 or LBNL Optics.

.7 Glazing systems shall withstand normal thermal movements without failure, including loss due to defective manufacture, fabrication, and installation; deterioration of glazing materials; and other construction defects.

.8 Provide glass products with uniform appearance, reflectivity, hue, shade, visible light

transmittance, and color when viewed from a distance of 3 m to 30 m perpendicular to the glass or at a 45-degree angle.

.9 Protect laminated glass interlayer from damage or discoloration resulting from contact with incompatible sealants, substances, and materials. Follow the manufacturer's recommended installation instructions.

.10 Insulating glazing unit (**GL-1**):

.1 By SECTION 08 54 13

.11 Silvered Mirror Glass (**GL-2**):

.1 Fabricated to ASTM C1501-18 standards, 6 mm thick laminated safety mirror glass using polished plate or float glass. Mirror backing shall resist sulphur and hydrogen sulphide fumes. Corners must be polished and rounded.

.2 Mirror attachment accessories:

.1 Mirror adhesive: Chemically compatible with mirror coating and wall substrate.

.2 Mirror frames: Stainless steel.

.3 Stainless steel clips.

.12 Laminated Glass (**GL-3**):

.1 Compliance: CAN/CGSB 12.1-M2017.

.2 Construction: Laminate glass with polyvinyl butyral interlayer to comply with the interlayer manufacturer's written recommendations. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

.3 For exterior applications where edges are not protected, provide laminated glass with ionoplast interlayer, such as DuPont ‘SentryGlas’.

.4 Glass layers shall be a minimum of 19 mm thick unless otherwise indicated.

.5 Interlayer thickness: Provide thickness as needed to comply with requirements and not less than the following:

.6 Vertical glazing: Not less than 0.76 mm unless otherwise indicated.

.7 Interlayer color: Clear unless otherwise indicated.

.8 Glass type: Annealed, heat-strengthened, or tempered, as required to suit design requirements.

.9 Fabrication: Laminated glass products shall be fabricated free of foreign substances and air or glass pockets using an autoclave with heat and pressure.

.13 Glass Film (**FILM-1**): On all insulating glass units (**GL-1**) Design: Bird-friendly staggered dot coverage in a colour selected by the Consultant.

.1 Screen transferred to the glass surface and heat-cured.

.2 Acceptable Product: ‘Silk-Screen, Viraspan Design’ by Viracon or approved equivalent

.14 Glazing and Rebate Primers, Sealants, Sealers, and Cleaners: Must be compatible with each other and recommended by the glass manufacturer.

.15 Glazing Sealant: Silicone sealant recommended by the glazing manufacturer and compatible with the insulating glass unit's secondary sealant.

.16 Heel & Toe Bead: Silicone sealant recommended by the glazing manufacturer.

.17 Glazing Gasket: Visionstrip by Tremco Ltd., extruded composite glazing seal, size as recommended by the manufacturer.

.18 Glazing Tape: Preformed butyl tape, 10-15 durometer hardness, paper release, white color, thickness, and width as recommended by steel door and screen frame manufacturer.

.19 Glazing Splines: EPDM or neoprene, extruded shape to suit glazing channel retaining slot, color as selected.

.20 Setting Blocks (Regular): Neoprene, EPDM, or silicone Shore "A" durometer hardness 70-90, tested for compatibility with glazing compound, 100 mm long x 6 mm high x width to suit glass thickness.

.21 Edge Blocks: One-part neutral curing silicone, medium modulus sealant, Type S; Grade NS; Class 25 with additional movement capacity of 50% in both extension and compression (total 100%); Use (Exposure) NT; Uses (Substrates) G, A, and O as applicable.
Acceptable products:

.1 Dow Corning 795 by Dow Corning

.2 SilPruf SCS2000 by General Electric

.3 Spectrum 2 by Tremco

.22 Glass Presence Markers: Easily removable and non-residue depositing.

.23 Screws, Bolts, and Fasteners: Type 304 stainless steel.

.24 Primers, sealers, and cleaners: Type recommended by the manufacturer of glass and gaskets.

2.3 FABRICATION

.1 Verify glazing dimensions on-site.

.2 Clearly label each glass lite with the maker's name and glass type. Ensure labels are easily removable, non-residue depositing type. Do not remove labels until after work is accepted by the Consultant.

.3 Fabricate glazing not less than 3 mm smaller than the rebate size in either dimension; allow for edge spacers, shims, and setting blocks as necessary.

.4 Ensure work has smooth finished surfaces free from distortion and defects detrimental to appearance and performance.

.5 Carefully make and fit details, taking special care with exposed finished work to produce a neat and correct appearance to the Consultant's acceptance.

.6 Grind and polish a 1.5 mm arris to both edges of exposed glazing where the glazing is not encapsulated in framing and where edges are exposed to occupants.

.7 Fabricate argon-filled thermal units with an air space filled to a minimum of 90% with argon gas.

.8 Provide bird-warning glass in accordance with the City of Toronto Green Development Standard - Bird Friendly Development Guidelines. Style as selected by the Consultant.

3 Execution

3.1 **EXAMINATION**

.1 Verify condition and dimensions of previously installed work upon which this section depends. Report defects to Consultant. Commencement of work signifies acceptance of existing conditions.

.2 Verify that openings for glazing are correctly sized and within tolerance.

.3 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

.4 Ensure laminated glass edges are completely covered by tape to protect against sealants and water if required by the manufacturer.

3.2 **PREPARATION**

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with substrate-compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

3.3 **INSTALLATION**

.1 Provide glazing in accordance with IGMA recommendations. Ensure continuous contact between glazing tapes and gaskets with the glazing.

.2 Install glazing to the work of Sections 08 11 13 and 08 54 13.

.3 Provide neat, straight sight lines. Trim excess glazing material flush with the top of stops and the fixed leg of frames.

.4 Remove protective coatings, glazing stops, clean rebates, and glass contact surfaces with solvent, and wipe dry.

.5 Apply primer/sealer to contact surfaces before glazing.

.6 Apply glazing tape per manufacturer’s instructions, including recommended corner sealant.

.7 Use setting blocks at 1/4 points and spacers to center the glass unit in the frame.

.8 Install glazing in accordance with reviewed shop drawings and manufacturer's written instructions. Ensure full contact and adhesion at the perimeter, maintaining edge clearance recommended by the glass manufacturer.

.9 Apply a continuous heel bead of sealant around the perimeter of the inboard lite of the sealed unit and the metal framing.

.10 Re-install glazing stops ensuring continuous contact and rattle-free installation. Do not distort glass. Trim tape protruding more than 2 mm above the stop.

.11 Install glazing gasket in accordance with the manufacturer’s recommendations.

.12 Do not cut or abrade tempered, heat-treated, or coated glass.

.13 Install glass presence markers in two cross stripes extending from diagonal corners. Maintain markers until final clean-up.

.14 Remove, dispose of, and replace broken, cut, abraded, or defective glass including but not limited to production dimples, tiger-stripping, chips, or cracks.

.15 Exterior glass: Glaze units with gaskets on the exterior side and glazing tape on the interior side. Seal the gap between glazing and stop with sealant to a depth equal to the bite of the frame. Apply a cap head of sealant along the void between stop and glazing, flush with the sightline, and tool or wipe the sealant surface smooth.

.16 Interior glass: Glaze interior glass using glazing gasket and glazing tape.

3.4 EXTERIOR GLAZING IN FIBERGLASS WINDOWS FRAMING

.1 Installation: To be completed by the installer following the system manufacturer's recommendations.

.2 Reference Sections: Installation requirements and guidelines as specified in: Section 08 54 13 Fiberglass Windows

3.5 GLAZING OF HOLLOW METAL DOORS AND HOLLOW METAL FRAMES

.1 Use the dry method (tape/tape) for glazing installation.

.2 Cut glazing tape to the required length and install it against the permanent stop, ensuring it projects 1.5 mm above the sightline.

.3 Place glazing tape on the free perimeter of the glass in the same manner as described for the permanent stop.

.4 Secure glazing stops using screw fasteners, following the manufacturer's instructions for proper alignment and stability.

3.6 BIRD WARNING GLASS

.1 Install bird-warning glass in accordance with the City of Toronto Green Development Standard - Bird-Friendly Development Guidelines.

.2 Install glass film with adhesive applied in accordance with the film manufacturer's instructions.

.3 Place without air bubbles, creases, or visible distortion.

.4 Fit tight to the glass perimeter with a razor-cut edge.

3.7 **MIRRORS**

.1 Install mirrors in one single piece in sizes indicated without joints.

.2 Set mirrors with adhesive and clips applied in accordance with the manufacturer's instructions.

.3 Provide continuous metal trim along all mirror edges where indicated, with mitered corners and concealed fastenings.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Design, labour, Products, equipment and services necessary for the installation of all gypsum board walls, ceilings, and exterior gypsum board wall sheathing.

1.2 **REFERENCES**

.1 ASTM A653/A653M, Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM C475, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.3 ASTM C645, Specification for Nonstructural Steel Framing Members.

.4 ASTM C665, Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

.5 ASTM C754, Specification for Steel Framing Members to Receive Screw-Attached Gypsum Board.

.6 ASTM C834, Standard Specification for Latex Sealants.

.7 ASTM C840, Specification for Application and Finishing of Gypsum Board.

.8 ASTM C1002, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

.9 ASTM C1047, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

.10 ASTM C1178, Specification for Glass Mat Water-Resistant Gypsum Backing Board.

.11 ASTM C1278, Specification for Fiber-Reinforced Gypsum Panel.

.12 ASTM C1396, Specification for Gypsum Board.

.13 ASTM C1629, Standard Classification for Abuse-Resistant Non-Decorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.

.14 ASTM D5420, Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimens by Means of a Striker Impacted by a Falling Weight.

.15 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.

.16 ASTM E695, Standard Test Method of Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading.

1.3 **DESIGN REQUIREMENTS**

.1 Design ceiling suspension system in accordance with manufacturer's printed directions and ASTM C754.

.2 Design ceiling system for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority.

.3 Design hanger anchor and entire suspension system static loading not to exceed 25% of their ultimate capacity including lighting fixture dead loads.

.4 Design suspension system to support weight of mechanical and electrical items such as air handling boots and lighting fixtures, and with adequate support to allow rotation/relocation of light fixtures.

.5 Design subframing as necessary to accommodate, and to circumvent, conflicts and interferences where ducts or other equipment prevent the regular spacing of hangers.

.6 Design wall framing system and reinforce as necessary to accommodate and support items attached to and supported by wall framing system.

.7 Design wall framing system for wall assemblies with a height greater than 3000 mm and those assemblies incorporating non-standard gypsum board assemblies including, but not limited to, abuse resistant gypsum board, large format tile applications, etc.

1.4 **REGULATORY REQUIREMENTS**

.1 Provide fire separations and fire protection exactly as specified in test design specification that validates the specified rating. Verify that work specified in other Sections, as a part of the entire assembly, meets applicable validating test design specification.

1.5 **SUBMITTALS**

.1 Product data:

.1 Submit copies of manufacturer's Product data in accordance with Section 01 33 00 indicating:

.1 Performance criteria, compliance with appropriate reference standard, characteristics, and limitations.

.2 Product transportation, storage, handling and installation requirements.

.2 Shop Drawings:

.1 Submit Shop Drawings in accordance with Section 01 33 00 indicating:

.1 Wall assemblies, suspension systems, adjacent construction, elevations, sections and details, dimensions, thickness, finishes and relationship to adjacent construction.

.2 Framing and blocking for items being supported of wall systems.

.3 Certifications: Submit written certification stating that suspended ceiling system is designed for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority.

1.6 **QUALITY ASSURANCE**

.1 Qualifications: Execute the work of this Section by skilled, qualified, and experienced workers trained in the installation of the work of this Section.

.2 Retain a Professional Engineer, licensed in Province of Ontario, with experience in work of comparable complexity and scope, to perform following services as part of work of this Section:

.1 Design of wall systems with height greater than 3000 mm and at nonstandard gypsum board assemblies including, but not limited to, assemblies incorporating abuse resistant gypsum board, large format tile applications, etc.

.2 Design of suspended gypsum board assemblies.

.3 Review, stamp, and sign Shop Drawings and design calculations.

.4 Conduct shop and on-site inspections, prepare and submit written inspection reports verifying that this part of Work is in accordance with Contract Documents and reviewed Shop Drawings.

.3 The Zero Carbon Building – Design Standard v4- Design Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

1.7 **SITE CONDITIONS**

.1 Do not begin work of this Section until:

.1 Mechanical and electrical work above the ceiling is complete.

.2 Substrate and ambient temperature is above 15 degrees Celsius.

.3 Relative humidity is below 80%.

.4 Ventilation is adequate to remove excess moisture.

.2 Install temporary protection and facilities to maintain Product manufacturer's, and above specification, environmental requirements 24 hours before, during, and 24 hours after installation.

1.8 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 "Construction Waste Management and Disposal".

2 Products

2.1 **MATERIALS**

2.2 **GYPSUM BOARD PRODUCTS**

.1 Exterior Sheathing (**GB-1**):

.1 ASTM Standards: ASTM C1177/C1177M, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

.2 Composition:

.1 Silicone-treated core with fibreglass mat face and back.

.2 Face side surfaced with a heat-cured copolymer water- and vapour-resistant coating.

.3 Fibreglass mat faced on front, back, and long edges.

.4 Square ends and edges.

.3 Thickness: 16 mm unless otherwise indicated.

.4 Fire Rating: Use Firestop Type X fire-resistant board where indicated.

.5 Service Grade: Exterior grade.

.6 Acceptable Products:

.1 ‘GlasRoc Exterior Sheathing’ by CertainTeed

.2 ‘Securock Glass-Mat Sheathing’ by CGC

.3 ‘Dens-Glass Gold Fireguard Gypsum Sheathing’ by Georgia-Pacific

.2 Glass Faced Gypsum Tile Backer Board (**GB-2**):

.1 ASTM Standards:

.1 ASTM C1178/C1178M, Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel.

.2 Composition:

.1 Moisture-resistant gypsum core with glass mat embedded on front and back surfaces.

.2 Acrylic coating on the face for enhanced water resistance.

.3 Edges and Ends:

.1 Ends square cut.

.2 Edges tapered.

.4 Fire Rating: Provide ‘Type X’ core where required as part of a fire-rated assembly.

.5 Acceptable Products:

.1 ‘Dens-Shield’ and ‘Dens-Shield Fire-Guard,’ regular or Type X, by Georgia-Pacific.

.2 ‘DiamondBack Glasroc,’ regular or Type X, by CertainTeed.

.3 Abuse Resistant Panels (**GB-3**):

.1 ASTM Standards**:**

.1 ASTM C1629, Standard Classification for Abuse-Resistant Non-Decorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels, Level 3 (Surface Abrasion).

.2 ASTM D5420, Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimens by Means of a Striker Impacted by a Falling Weight, Level 1 (Surface Indentation).

.3 ASTM E695, Standard Test Method of Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading, Level 3 (Soft-Body Impact Penetration).

.4 ASTM C1629, Level 2 (Hard-Body Impact Penetration).

.2 Thickness: 15.9 mm (5/8") minimum unless indicated otherwise on drawings.

.3 Fire Rating: Type X where required for fire resistance rated assemblies

.4 Mold and Moisture Resistance: Mold-resistant core with moisture-resistant facing.

.5 Acceptable Products:

.1 'Air-Renew Extreme Impact Resistant Board' by CertainTeed Gypsum.

.2 'DensArmor Plus Impact-Resistant Panel' by Georgia-Pacific.

.3 'High-Impact XP' by National Gypsum.

.4 'Protecta HIR 300 Type X with Mold Defense' by Lafarge.

.5 'Sheetrock Brand Panels Mold Tough VHI Firecode X' by CGC Inc.

2.3 ATTACHMENT MATERIALS

.1 Fasteners for Gypsum Board: Use bugle head, fine thread, self-tapping screws such as Type W, S, or S-12, chosen to match the framing material and gauge, with a corrosion-resistant finish compliant with ASTM C1002-07/ASTM C954-11.

.2 screw sizes:

.1 #6 x 25 mm (1") for attaching a single layer of gypsum board.

.2 #6 x 32 mm (1-1/4") for securing a single layer of 15.9 mm (5/8") board.

.3 #7 x 41 mm (1-5/8") for fastening double layers of board.

.3 Fasteners for Exterior Sheathing: Follow the manufacturer's installation guidelines to ensure compliance with wind load requirements.

.4 Tying Wire: Utilize 1.6 mm (0.063") diameter galvanized wire, soft annealed for flexibility.

.5 Adhesive for Gypsum Panels:

.1 Use an adhesive recommended by the panel manufacturer and appropriate for the specific application.

.2 Ensure the adhesive has a VOC content not exceeding 50 g/L (1.8 oz/gal), determined according to 40 CFR 59, Subpart D (EPA Method 24).

2.4 JOINT TREATMENT MATERIALS

.1 General: Provide joint treatment materials complying with ASTM C475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.

.2 Joint tape:

.1 For gypsum board: Paper reinforcing tape as recommended by the gypsum board manufacturer.

.2 For cement board: Alkali-resistant glass fibre tape as recommended by the cement board manufacturer.

.3 Joint Compound for Gypsum Board: Factory-mixed, all-purpose compound formulated for both taping and topping compound.

2.5 ACCESSORIES

.1 General Accessories: Comply with ASTM C1047-14a unless specified otherwise. Provide maximum length pieces for each location. Ensure flanges are clean and free from dirt, grease, or other materials that may impair joint treatment or decoration adherence.

2.6 TRIM ACCESSORIES

.1 Accessories for Interior Installation: Cornerbead, edge trim, and control joints complying with ASTM C1047 and requirements indicated below:

.1 Shapes as required in accordance with ASTM C1047.

.2 Use preformed vent louvers made of corrosion-resistant metal with insect-proof design.

.3 Ventilation must comply with or exceed building code requirements, with a ratio not less than 1/300 (vent area to sheathing board cavity area).

.4 Z-Reveal Types (**T-2 Trim**): Fry Reglet DRMZ-625-100, DRMZ-625-50, or DRMZ-25-25, or equivalent by Gordon Interior Specialties.

.5 Control Joints:

.1 No. 093 Zinc Control Joint by CGC Inc. or equivalent, certified for fire-resistant assemblies.

.2 Fry Reglet DRM-50-25 2-PC, or equivalent by Gordon Interior Specialties.

.3 093V Expansion Bead by Trim-Tex Drywall Products Inc.

.6 Vinyl Casing Beads: Vinyl J-molds for gypsum board interface with aluminum-framed glazing.

.7 Aluminum Gypsum Board Trim: Extruded aluminum alloy 6063-T5 conforming to ANSI H35.1/H35.1M-2013, with fin, tapered, grooved profiles prepunched for screw attachment and bonding agent, as manufactured by Gordon Inc., Softforms, or Fry Reglet.

.8 Drywall Edge Trim: Gordon CA-4-DW Profile or equivalent by Fry Reglet.

2.7 MISCELLANEOUS MATERIALS

.1 General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.

.2 Laminating Adhesive: Special adhesive or joint compound Low VOC recommended for laminating gypsum panels.

.3 Spot Grout: ASTM C475, setting-type joint compound recommended for spot-grouting hollow metal door frames.

.4 Fastening Adhesive for Metal: Special adhesive Low VOC recommended for laminating gypsum panels tosteel framing.

.5 Fasteners: Steel drill screws complying with ASTM C954 for fastening gypsum board to steel members from 0.84 mm to 2.84 mm (21 ga to 12 ga) thick.

.6 Acoustic sealant: Refer to Section 07 92 00 "Joint Sealants".

2.8 **INSULATION – FIRE RATED AND ACOUSTIC WALL ASSEMBLY**

.1 Mineral fibre acoustic fire batt insulation. Mineral-fibre acoustic fire batts to comply with CAN/ULC S702-09, Type 1, fire-resistant, and non-combustible in accordance with CAN/ULC-S114-05, with high density for sag-free, tight-fitting installation.

.1 Acceptable Products:

.1 Johns Manville ‘MinWool Sound Attenuation Fire Batts’.

.2 Roxul 'AFB'.

.2 Acoustic sealant for concealed locations: Non-skinning butyl sealant, non-hardening, and remains soft and tacky, in compliance with CGSB 19.21-M87.

.3 Sealant shall not deteriorate, stain, or bleed into painted surfaces.

.4 Acceptable Products:

.1 DAP ‘Mono Acoustic Sealant’.

.2 Pecora ‘BA98’.

.3 Quiet Solution ‘QuietSeal’.

.4 Tremco ‘Acoustical Sealant’.

.2 Acoustic sealant for exposed locations: Interior paintable sealant, in accordance with Section 07 92 00.

.1 Acoustic sealant for plenum locations: Smoke-seal sealant with a flame-spread rating of not more than 25 and a smoke-developed classification of not more than

50, compliant with CAN/ULC-S102-10

.2 Mass-loaded acoustic partition closure:

.1 Acceptable Product: Emseal ‘QuietJoint-SHG’.

.2 Field measure for opening width and depth.

.3 Noise barrier sheeting: AcoustiGuard ‘Barymat 5 B-05’.

.4 Noise control board: 10mm thickness, Kinetics SPR Perimeter Isolation Board.

.5 Neoprene pads: Closed cell neoprene, in compliance with ASTM D1056-14.

3 Execution

3.1 **EXAMINATION**

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

3.2 **COORDINATION**

.1 Examine the mechanical and electrical drawings and coordinate with appropriate other trades to establish openings, additional support, furring out and other special provisions required for mechanical and electrical fixtures and fittings and access hatches built into the work of this Section.

.2 Examine the architectural drawings and coordinate with appropriate other trades to establish openings, additional support and other special provisions required for items built into or partially supported by the work of this Section.

.3 Prior to installation of gypsum board or cement board, coordinate with all other trades responsible for wall-mounted items and verify that the required back up blocking is in place and properly located and installed.

3.3 **SUSPENSION FRAMING**

.1 Install ceiling systems in accordance with reviewed Shop Drawings and manufacturer's written instructions.

.2 Install hanger wires plumb and securely anchored to the building structural framing, independent of walls, pipes, ducts, and metal deck; install additional framing and hangers to bridge interference items.

.3 Install hanger wires at 1200 mm maximum centres along carrying channels, not less than 25 mm, and not more than 150 mm from channel ends.

.4 Install additional hangers at lighting fixture and ductwork locations. Do not attach hanger wires to mechanical or electrical equipment. Do not support mechanical and electrical fixtures and fitting on ceiling without the ceiling manufacturer's written acceptance.

.5 Install main carrying channels transverse to structural framing members. Lap main carrying channels 200 mm minimum at splices and wire each end with two loops and prevent clustering or lining-up of splices.

.6 Install furring channels at 400 mm o.c., not less than 25 mm, and not more than 150 mm from perimeter walls, at openings, at interruptions in ceiling continuity, and at change in plane. Install furring channels to a tolerance of 3 mm maximum in 3600 mm.

.7 Install additional main carrying and furring channels to frame and to reinforce openings such as recessed lighting fixtures, access hatches, ceiling grilles, outlet boxes, ventilating outlets and similar items.

3.4 CEILING BULKHEADS

.1 Frame for gypsum board faced vertical bulkheads within and at termination of ceilings.

.2 Frame for complex bulkheads in accordance with the drawings.

.3 Frame above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

3.5 FIRE RATED ASSEMBLIES

.1 Install Products in fire rated assemblies in strict accordance with applicable ULC tested and approved designs.

.2 Stiffen fire rated walls over 3.66 m high, where linear length of wall is greater than 2.44 m between perpendicular wall supports, with diagonal bracing above the ceiling extending perpendicular to wall at a 45E angle to structure above. Locate diagonal bracing at maximum 2.44 m o.c.

.3 Where double layers of gypsum board are shown, and required for fire rating, screw first layer to studs and furring and laminate the second layer to the first using joint filler as an adhesive. Stagger joints between first and second layers.

3.6 ACOUSTICAL INSULATION

.1 Install acoustic insulation in partitions, between steel studs, and as indicated on Contract Drawings and in accordance with the manufacturer's instructions. Fill stud cavities to full height of partitions and carefully cut and fit acoustic insulation around services and protrusions.

3.7 ACOUSTICAL SEALANT

.1 Install acoustical sealant to acoustically insulated partitions in accordance with the manufacturer's instructions and Contract Drawings.

.2 Install acoustical sealant under floor runner track, at partition perimeter both sides and at openings, cut-outs, and penetrations, concealed from view in the final installation.

.3 Install firestop fill material behind fire rated acoustical sealant and provide firestop identification tag.

.4 Smooth acoustical sealant with trowel prior to skin forming.

3.8 BUILT-IN CORNER GUARDS

.1 Install built-in corner guards in accordance with manufacturer’s written instructions level, secure and rigid.

3.9 GYPSUM BOARD

.1 Comply with ASTM C840. Install gypsum board in accordance with reviewed Shop Drawings and manufacturer's written instructions.

.2 Install gypsum board vertically or horizontally, whichever results in fewer end joints. Locate end joints over supporting members.

.3 Install gypsum board in lightly butted contact at edges and ends and with 1.6 mm maximum open space between boards; do not force gypsum board into place. Do not install imperfect, damaged or damp boards.

.4 Install gypsum board butting paired tapered edge joints, and mill-cut or field-cut end joints; do not place tapered edges against cut edges or ends.

.5 Install vertical joints minimum 300 mm from the jamb lines of openings and stagger vertical joints over different studs on opposite sides of partitions.

.6 Do not locate joints within 200 mm of corners or openings, except where control joints occur at jamb lines or where openings occur adjacent to corners. Where necessary, place a single vertical joint over the centre of wide openings.

.7 Cut, drill and patch gypsum board as may be necessary to accommodate the work of other trades.

.8 Fire Separations:

.1 Construct gypsum board assemblies, where located, in accordance with tested assemblies to obtain required or indicated fire rated assemblies. As a minimum fire separations shall consist of metal framing covered on both sides by fire-rated gypsum board.

.2 Install assemblies tightly to enclosing constructions to maintain integrity of the separations. Install casing beads at all perimeter edges.

3.10 CORNER, CASING BEADS AND TRIM

.1 Corner reinforcing bead: Install along all external angles, erect plumb, level and with a minimum of joints. Secure with screws at 225 mm o.c. apply filler over flanges flush with nose of the bead and extending at least 75 mm onto surface of board each side of corner. When filler dries, apply a thin coat of topping cement and blend onto adjoining surfaces.

.2 Casing bead: Install where wallboard butts against a surface having no trim concealing the juncture and where shown on drawings. Erect casing beads plumb or level, with minimum joints, and secure with screws at 300 mm o.c. apply filler over flange flush with bead and extending at least 75 mm onto surface of board. When dry, apply a thin coat of topping cement and blend onto adjoining surfaces.

.3 Recess channels and trim: Install recess channels and special metal trim where shown. Secure to substrate. Provide casing beads full height on wallboard edges at recess channels and metal trim.

3.11 JOINT TAPING AND FINISHING

.1 Install reinforcing tape and a minimum of 3 coats of joint compound over gypsum board joints, metal trim and accessories, and screw fasteners in accordance with the gypsum board manufacturer's instructions.

.2 Fill gaps between, and any imperfections in, gypsum boards with joint compound, allow to dry, and sand smooth ready for painting.

.3 Install finished gypsum board work smooth, seamless, plumb, true, flush, and with square, plumb, and neat corners.

.4 Finish gypsum board in accordance with ASTM C840 to the following grades:

.1 Level 0: No taping, finishing, or accessories required. Use above suspended ceilings and within other concealed spaces, unless the assembly is fire rated, sound rated, sound or smoke controlled, or unless the space serves as an air plenum.

.2 Level 1: At joints and interior angles embed tape in joint compound. Leave surface free of excess joint compound. Tool marks and ridges are acceptable. Use above suspended ceilings and within other concealed spaces if the gypsum board assembly is fire rated, sound rated, sound or smoke controlled, or the space serves as an air plenum.

.3 Level 2: At joints and interior angles embed tape in joint compound with one separate coat of joint compound applied over joints, angles, fastener heads, and accessories. Use for water resistant gypsum board indicated for use as a substrate for ceramic tile.

.4 Level 3: At joints and interior angles embed tape in joint compound with two separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply joint compound smooth and free of tool marks and ridges. Use where heavy grade wall coverings are the final decoration.

.5 Level 4: At joints and interior angles embed tape in joint compound with three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply joint compound smooth and free of tool marks and ridges. Use for all locations except those indicated for other finish levels.

.6 Level 5: At joints and interior angles embed tape in joint compound with three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply a thin skim coat of joint compound, or a material manufactured especially for this purpose, to the entire surface. Leave surface smooth and free of tool marks and ridges. Use where semi-gloss or gloss finish coatings are the final decoration.

3.12 GLASS MAT GYPSUM TILE BACKER INSTALLATION

.1 Except in showers, install tile backer board in accordance with the manufacturer's recommendations and to the satisfaction of the ceramic tile installer.

.2 Place temporary 6 mm spacer strips around the lips of plumbing fixtures.

.3 Precut boards to required sizes and make necessary cutouts. Fit ends and edges closely but not tightly.

.4 Start by installing the boards adjacent to the spacer strips.

.5 Stagger end joints in successive courses.

.6 Fasten boards to steel studs and/or steel furring spaced at maximum 400 mm o.c. and to bottom plates with 32 mm steel screws at 200 mm o.c. with perimeter fasteners between 10 mm and 16 mm from the edges of the boards.

.7 Prefill panel joints, and joints where panels abut other surfaces such as gypsum board, with tile setting mortar or adhesive and then immediately embed joint tape and level the joints. Coordinate with the ceramic tile installer to ensure compatibility of joint treatment material.

.8 On portions of wall not to be tiled, apply tape over joints and angles and embed tape in joint compound. Trowel joint compound over the entire surface to produce a smooth surface.

3.13 EXTERIOR SHEATHING BOARD INSTALLATION

.1 Install glass mat gypsum sheathing where indicated, in accordance with the manufacturer's recommendations.

.2 Install yellow side facing out.

.3 Lay out boards so that joints are centered on framing or furring members. Stagger end joints.

.4 Cut boards to fit irregular shapes and to fit snugly around door and window openings. On curved surfaces, score boards if required to maintain curves.

.5 Ensure that all edges are supported continuously. Provide additional furring if necessary.

.6 Butt boards together in an easy fit.

.7 Fasten in accordance with the manufacturer's recommendations for the specific application. Maximum fastener spacing: 200 mm o.c.

.8 Locate fasteners no closer than 10 mm from the edges of the boards and drive firmly against and flush with the surface of the sheathing. Do not countersink.

.9 Install sheathing as per the manufacturer's guidelines and applicable standards, including GA-253, ASTM C1280-13, and ASTM C1397-13. Avoid bridging building expansion joints with the support system and frame both sides of joints using furring and other specified supports.

.10 Utilize the longest board lengths possible to minimize joints. Stagger joints by offsetting them by at least one framing member, maintaining a minimum offset of 150 mm (6") from the corners of openings.

.11 Position the exterior board side to face outward. Butt edges and ends lightly together, ensuring a maximum gap of 1.6 mm (1/16") without forcing boards into position.

.12 Drive fasteners tightly against and flush with the sheathing surface without countersinking them.

.13 Maintain a minimum distance of 10 mm (3/8") from edges and ends when positioning fasteners.

.14 Provide necessary clearances between sheathing and structural elements to avoid transferring structural loads, ensuring a minimum gap of 16 mm (5/8").

.15 Tolerances:

.1 Ensure the sheathing is flat to within 6 mm over 3050 mm (1/4" over 10') when acting as a substrate for direct-applied or insulated finishing systems, as specified in ASTM C1397-13.

.2 Maintain a maximum gap of 1.6 mm (1/16") at board joints.

.3 Replace any damaged or weathered sheathing boards to maintain quality and performance.

3.14 ACCESSORIES

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre

and fit corners accurately, free from rough edges. Secure at 150 mm o.c.

.2 Install casing beads around perimeter of suspended ceilings.

.3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.

3.15 **CONTROL JOINTS**

.1 Confirm locations of control joints with Consultant before installation.

.2 Construct control joints of preformed units except where otherwise shown. At junction of partitions with bulkheads, where indicated on the drawings, use two casing beads as indicated on the drawings.

.3 Set gypsum board facing in the preformed units or casing beads and support independently on both sides of joint.

.4 Provide continuous dust barrier behind and across control joints.

.5 Install control joints straight and true.

.6 Where not otherwise indicated, locate control joints at the following locations; verify exact locations with the Consultant before installation:

.1 Changes in substrate construction

.2 Maximum 5 m spacing on walls or partitions to receive ceramic, porcelain or thin brick cladding or similar.

.3 Maximum 9 m spacing, horizontally and vertically on walls or partitions

.4 Maximum 9 m spacing on ceilings without perimeter relief in both directions.

.5 Maximum 15 m spacing on ceilings with perimeter relief in both directions.

3.16 **FIRE SEPARATIONS**

.1 Install fire-rated assemblies in compliance with the assembly listing requirements to achieve the specified fire ratings and meet the requirements of authorities having jurisdiction.

.2 Construct vertical bulkheads in ceiling spaces above fire-rated partitions, doors, and similar elements with the same fire rating as the partition below. Bulkheads should be constructed using gypsum board unless otherwise indicated.

.3 Use fire-rated gypsum wallboard as specified in the project requirements.

.4 For recessed lighting fixtures, diffusers, or similar installations in fire-rated ceilings or bulkheads, provide enclosures to maintain the required fire rating. Include removable panels to allow access to fixture outlet boxes.

.5 When fire hose cabinets, fixtures, or equipment are recessed into fire-rated walls or partitions, provide gypsum board enclosures or backing to maintain the specified fire rating unless detailed otherwise.

3.17 ACCESS DOORS

.1 Install access doors, supplied as part of other parts of the work, in accordance with manufacturer's written instructions. Access Doors by SECTION 10 95 00.

3.18 SITE TOLERANCES

.1 Install metal support systems to ensure that, within a tolerance of +3 mm and -1.5 mm for plaster thickness, finish surfaces will be flat within 3 mm under a 3 m straightedge, and with no variation greater than 1.5 mm in any running 300 mm, and that surface planes shall be within 3 mm of dimensioned location.

3.19 WORK IN EXISTING AREAS

.1 In existing areas, where existing gypsum board work has been demolished and/or damaged and repair work is required, provide new gypsum board finish.

.2 Thoroughly prepare areas to be repaired. Provide neat, clean and straight cuts.

.3 Finish all repair work as specified for new work.

.4 In existing areas where existing openings are to be filled in with gypsum board, provide new gypsum board wall and ceiling construction. Ensure new board faces are flush with faces of abutting existing walls and ceilings.

3.20 REPAIR

.1 Make good cut-outs for services and other work, fill in defective joints, holes and other depressions with joint compound.

.2 Make good defective work, and ensure that surfaces are smooth, evenly textured and within specified tolerances to receive finish treatments.

3.21 CLEANING

.1 Upon completion of the work of this Section, remove from the premises all surplus material, dirt and debris caused by the work of this Section and leave the installation clean.

.2 Clean any drippage and spills of surplus setting compound from adjacent surfaces.

.3 Make good any damage caused by the work of this Section.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for tile work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ANSI A108/A118/A136.1, Installation of Ceramic Tile.

.2 ANSI A137.1, Specifications for Ceramic Tile.

.3 ASTM C144, Specification for Aggregate for Masonry Mortar.

.4 ASTM C920, Specification for Elastomeric Joint Sealants.

.5 CAN/CSA A3000, Cementitious Materials Compendium.

.6 CGSB 71-GP-22M, Organic Adhesive for Installation of Ceramic Wall Tile.

.7 ISO 23599, Assistive Products for Blind and Vision-Impaired Persons - Tactile Walking Surface Indicators.

.8 TTMAC Specification Guide 09300 Tile Installation Manual.

.9 TTMAC, Maintenance Guide.

1.3 **SUBMITTALS**

.1 Product data:

.1 Submit copies of manufacturer's Product data in accordance with Section 01 33 00 indicating:

.1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations and warranties.

.2 Product transportation, storage, handling and installation requirements.

.2 Shop drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 indicating:

.1 Tile layout, patterns, and colour arrangement.

.2 Perimeter conditions, junctions with dissimilar materials.

.3 Setting details

.3 Samples:

.1 Submit following sample panels in accordance with Section 01 33 00.

.1 Each colour, texture, size, and pattern of tile.

.2 Adhere tile samples to 400 x 400 x 12.5 mm thick cement board complete with selected grout colour in joints.

.4 Certificates: Submit manufacturer's certificates stating that materials supplied are in accordance with this specification.

.5 Closeout submittals: Submit recommended maintenance instructions and listing of recommended maintenance Products for incorporation into Operations and Maintenance Manuals in accordance with Section 01 33 00.

1.4 **QUALITY ASSURANCE**

.1 Perform work of this Section by a company with proven, acceptable experience on installations of similar complexity and scope.

1.5 **DELIVERY, STORAGE AND HANDLING**

.1 Deliver materials in adequate crates or containers with manufacturer's name and product description clearly marked.

.2 Handle and store tiles in a manner to avoid chipping, breakage or the instruction of foreign matter. Take precautions to protect the mortar and grout admixtures from freezing or from excessive heat.

1.6 **SITE CONDITIONS**

.1 Do not install work of this Section outside of the following environmental ranges without the Consultant's and Product manufacturer's written acceptance:

.1 Ambient air and surface temperature: 15 degree Celsius to 45 degree Celsius.

.2 Precipitation: None.

.2 Install temporary protection and facilities to maintain the Product manufacturer's, and specified, environmental requirements for 7 Days before, during, and 7 Days after installation.

1.7 **MAINTENANCE**

.1 Submit extra tile amounting to 3% of gross area covered, allowing proportionately for each pattern and type specified and which are part of the same Production run as installed Products. Store maintenance Products as directed by the Consultant.

2 Products

2.1 **MATERIALS**

.1 General: All materials under work of this Section, including but not limited to, sealants, adhesives, and sealers are to have low VOC content limits.

.2 Tile:

.1 To ANSI A137.1.

.2 Supply coves, caps, inside and outside corners and bullnose tile as required.

.3 Where unfinished tile edge is exposed, supply cap to Consultant's selection.

.4 Tile Types:

.1 Porcelain tile (POR-1): Porcelain floor tile, sized at 12" x 24". 'Chord' by Daltile or approved alternative from Stone Tile International or Centura. To be selected by the Consultant from the manufacturer's full colour range in all Price Groups.

.2 Porcelain tile (POR-2): Porcelain floor tile, sized at 1" x 1" mosaic tile. 'Keystones' by Daltile or approved alternative. To be selected by the Consultant from the manufacturer's full colour range in Price Groups 1, 2, 3 and 4.

.3 Ceramic tile (CT-1): 'Rainbow" ceramic tile size 4" x 16", by Centura or approved alternative from Stone Tile International or Daltile. To be selected by the Consultant from the manufacturer's full colour range in Glossy.

.4 Ceramic tile (CT-2): 'Rainbow" ceramic tile size 4" x 16", by Centura or approved alternative from Stone Tile International or Daltile. To be selected by the Consultant from the manufacturer's full colour range in Glossy.

.5 Ceramic tile (CT-3): ‘Rainbow” ceramic tile size 3” x 6”, by Centura or approved alternative from Stone Tile International or Daltie. To be selected by the Consultant from the manufacturer’s full colour range in Glossy.

.6 Custom Mosaic Tile Design (CT-4): Custom Pool Tile “Custom Mosaic” Sintered Glass Mosaic Tile size 9/16”, by Artaic or approved alternative. Custom mosaic image to be provided by the Consultant. Colour and Finish to be selected by the Consultant from the manufacturer’s full colour range in Opalescent.

.7 Porcelain Tile Base: Cove porcelain base tile to match floor porcelain tile.

.5 Floor / Wall transitions:

.1 Tile to adjacent floor finish with flush condition: Schluter ‘SCHIENE’, anodized aluminium finish.

.2 Tile to adjacent floor finish at lower elevation not exceeding 13 mm (1/2”): Schluter ‘RENO-U’, anodized aluminium finish.

.3 Tile to adjacent floor finish at lower elevation exceeding 13 mm (1/2”) or to finished concrete: Schluter ‘RENO-RAMP/-K’, anodized aluminium finish. Wall edge protection: Aluminium edge protection with trapezoid-perforated anchoring leg and an anodized finish, continuous at all exposed tile edges, depth as required to suit tile thickness. ‘Jolly’ by Schluter Systems or approved alternative.

.4 T-3 Trim: Schluter trim to suit

.5 T-5 Trim: Schluter trim to suit

.6 POR-1 Baseboard edge protection: Aluminium edge protection with trapezoid-perforated anchoring leg and an anodized finish, continuous at all exposed tile edges, depth as required to suit tile thickness. ‘Jolly’ by Schluter Systems or approved alternative.

2.2 **ACCESSORIES**

.1 Cement: CAN/CSA A3000, Type GU.

.2 Sand: ASTM C144.

.3 Water: Potable and free of minerals and other contaminants which are detrimental to mortar and grout mixes.T

.4 Polymer additive: Keralastic by Mapei Inc or approved alternative by Ardex, Flextile Ltd. or Laticrete International.

.5 Thin-set mortar: 2 component to ANSI A108/A118/A136.1:

.1 ‘Kerabond with Keralastic Latex Additive’ by Mapei Inc., ‘Ardex X77 Microtec' by Ardex, ‘56SR/51 w/44' by Flextile Ltd., or ‘254/255' by Laticrete International.

.2 White coloured mortar shall be provided at appropriate tile types including, but not limited to; glass tile, light coloured marble, green marble and light coloured granite.

.6 Medium bed mortar: to ANSI A118.4:

.1 ‘Ultraflex LFT’ by Mapei Inc., or approved alternative by Ardex, Flextile Ltd., or Laticrete International.

.2 White coloured mortar shall be provided at appropriate tile types including, but not limited to; glass tile, light coloured marble, green marble and light coloured granite

.7 Thick bed sloped topping: Factory mixed blend of portland cement and aggregates with latex admix. ‘Ardex X32 Microtec’ by Ardex, ‘226 thick bed mortar with 3701 admix’ by Laticrete, or ‘Topcem with Planicrete AC Admixture’ by Mapei Inc.

.8 Shower area system: Provide the following system for use at shower areas as manufactured by Laticrete or Mapei Inc.:

.1 Adhesive: Polymer fortified, thin-set mortar complete with antimicrobials. ‘254' by Laticrete or ‘Ultraflex LFT’ by Mapei.

.2 Mortar bed: Factory mixed blend of portland cement and aggregates with latex admixture ‘226 thick bed mortar with 3701 admixture’ by Laticrete or approved alternative by Mapei.

.3 Waterproofing: Single component, self curing liquid rubber polymer. ‘Hydro Ban’ by Laticrete or ‘Aquadefense’ by Mapei.

.4 Finish: As indicated on Interior Design Schedule.

.5 Epoxy grout: High performance sanded epoxy grout ‘SpectraLOCK Pro Grout’ by Laticrete or ‘Kerapoxy CQ’ by Mapei in colour as selected by Consultant.

.9 Primer: To meet specified requirements of adhesive manufacturer.

.10 Cleaner: In accordance with TTMAC’s requirements and as recommended by tile manufacturer.

.11 Organic adhesive (walls): CGSB 71-GP-22M, Type 1.

.12 Grout:

.1 Floors and bases (below 3 mm joint width): ‘Keracolor U’ by Mapei Inc. or approved alternative by Ardex, Flextile Ltd. or Laticrete International.

.2 Floors and bases (3 mm to 10 mm joint width): ‘UltraColor Plus’ by Mapei Inc. or approved alternative by Ardex, Flextile Ltd. or Laticrete International.

.3 Walls (1.5 mm to 3 mm joint width): ‘Keracolor U' by Mapei Inc. or approved alternative by Ardex, Flextile Ltd. or Laticrete International.

.4 Walls (over 3 mm joint width): ‘Ultracolour Plus’ by Mapei Inc. or approved alternative by Ardex, Flextile Ltd. or Laticrete International.

.5 Grout colour: To be selected by the Consultant from the manufacturer’s full colour range.

.13 Tile sealant: In accordance with Section 07 91 00.

2.3 MIXES

.1 Levelling bed mix:

.1 1 part Portland cement.

.2 4 parts sand.

.3 1 part water (including polymer additive), adjusted for water content of sand

.4 1/10 part polymer additive.

2.4 CUSTOM MOSAIC TILE ADHESIVE, MORTAR AND GROUT MATERIALS

.1 Acceptable manufacturers:

.1 Laticrete International Inc. or approved equivalent

.2 Refer to Adhesive, Mortar, and Grout Materials schedule for specific acceptable Products.

.2 Primer: Low VOC, low viscosity primer as recommended by manufacturer to suit substrate and site conditions.

.3 Fortified Mortar Bed and Levelling Coat:

Latex Portland Cement Mortar for thick beds, screeds, leveling beds and scratch/plaster coats to be weather, frost, shock resistant, UL GREENGUARD Gold certified, and meet the following physical requirements:

1. Compressive Strength (ANSI A118.4 Modified): >4,000 psi (27.6 MPa)
2. Water Absorption (ANSI A118.6): ≤ 5%
3. Flexural Strength (ANSI A118.7 3.5): 1,100 – 1,200 psi (7.5 – 8.3 MPa)
4. Service Rating (TCA/ASTM C627): Extra Heavy
5. Shrinkage (ASTM C157 - 7 Day Cure): 0.05%
6. VOC Content: 0.00 g/L
7. Total VOC Emissions: ≤0.22 mg/m^3
8. Before placing mortar bed on horizontal surfaces, apply a slurry bond coat made from 254 Platinum. While the slurry bond coat is wet, spread the mortar and compact well.

(Basis of Design: LATICRETE 3701 Fortified Mortar)**

.4 Wall tile systems

.5 Thin-set mortar

.1 Modified Dry-Set Cement Thin Bed Mortar for thin set and slurry bond coats to be weather, frost, shock resistant, non-flammable, UL GREENGUARD Gold certified, conform to ISO C2TES1P1, and meet the following physical requirements:

1. Bond strength (ANSI A118.4): >450 psi (3.1 MPa)
2. Smoke & Flame Contribution (ASTM E84 Modified): 0
3. VOC Content: 0.00 g/L
4. Total VOC Emissions: ≤0.22 mg/m^3

(Basis of Design: LATICRETE® 254 Platinum)**

.2 White coloured mortar shall be provided at appropriate tile types including, but not limited to; glass tile, light coloured marble, green marble and light coloured granite.

.6 Thick bed sloped topping: Factory mixed blend of portland cement and aggregates. 3701 Fortified Mortar Bed by Laticrete.

	Laticrete System
Slurry Bond Coat	Laticrete 254 Platinum
Thinset Mortar (Exterior Shower Partition at Custom Mosaic): Modified Portland Cement	Laticrete 254 Platinum
Grout: Epoxy	Laticrete SpectraLock PRO Grout

.7 Epoxy Grout: Epoxy Grout (Commercial/Residential) shall be non-toxic, non-flammable, non-hazardous during storage, mixing, application and when cured, UL GREENGUARD Gold certified, and shall meet the following physical requirements:

1. Compressive Strength (ANSI A118.3): 3,800 psi (26.2 MPa)
2. Shear Bond Strength (ANSI A118.3): 1,100 psi (7.6 MPa)
3. Tensile Strength (ANSI A118.3): 1,100 psi (7.6 MPa)
4. Thermal Shock (ANSI A118.3): >800 psi (5.5 MPa)
5. Water Absorption (ANSI A118.3): <0.05%
6. Vertical Joint Sag (ANSI A118.3): Pass
7. VOC Content: 0.031 g/L
8. Total VOC Emissions: ≤0.22 mg/m^3
9. Cured Epoxy Grout to be chemically and stain resistant to ketchup, mustard, tea, coffee, milk, soda, beer, wine, bleach (5% solution), ammonia, juices, vegetable oil, brine, sugar, cosmetics, and blood, as well as chemically resistant to dilute acids and dilute alkalis.

(Basis of Design: LATICRETE SPECTRALOCK® PRO Premium Grout)**

1. Grout colour: To be selected by the Consultant from the manufacturer's full colour range.
2. Grout sealer: as recommended by grout manufacturer.
3. Install in accordance with TTMAC Specification Guide 09 30 00 Tile Installation Manual

Location	**Waterproofing Membrane**	**Thick Bed Mortar Leveling Coat (over Slurry Bond Coat)**	**Thin-Set Mortar (Adhesive)**	**Grout**	**TTMAC Details**
Exterior Shower Partition at Custom Mosaic	Yes	As required for leveling purposes	Modified Portland Cement	Epoxy	317SP

.8 Accessories:

.1 Reinforcing fabric to be non-woven rot-proof specifically intended for waterproofing membrane as recommended by waterproofing manufacturer.

.2 Mortar bed: Factory mixed blend of portland cement and aggregates by Laticrete.

.9 Accessories and Related Materials

.1 Prefabricated movement and control joints: Schluter 'DILEX-BWS' or approved equivalent.

.1 Joint sealants: mildew resistant sealant in accordance with Section 07 92 00 or as recommended by waterproofing membrane and grout manufacturer. 8 ft to 10 ft in each direction and changes in plane.

.2 Expansion and Control Joint Sealant to be a one component, neutral cure, exterior grade silicone sealant and meet the following requirements:

1. Tensile Strength (ASTM C794):280 psi (1.9 MPa)
2. Hardness (ASTM D751; Shore A):25 (colored sealant) /15 (clear sealant)
3. Weather Resistance (QUV Weather-ometer):10,000 hours (no change)
4. VOC Emissions:≤0.5 mg/m^3
5. VOC Content:35 g/L (translucent) and 42 g/L (sanded)

(Basis of Design: LATICRETE LATASIL™ and LATICRETE LATASIL 9118 Primer)

.10 Cementitious Waterproofing Membrane:

.1 Applied waterproofing membrane, at outdoor shower custom mosaic partition: and then apply a skim coat of Laticrete 254 .

.2 A one component, polymer fortified, cement based waterproofing that mixes with water that passes ANSI A118.10. Fracture Fabric and can withstand 2 Bars (29 psi) of negative hydrostatic pressure.

1. 7 Day Hydrostatic Test (ANSI A118.10): Pass
2. 7 Day Breaking Strength (ANSI A118.10): 450 - 500 psi (3.1 – 3.45 MPa)
3. 7 Day Water Immersion (ANSI A118.10): 120 - 150 psi (0.83 – 1.03 MPa)
4. 7 Day Shear Bond Strength (ANSI A118.10):320 – 400 psi (2.21 – 2.76 MPa)
5. 28 Day Shear Strength (ANSI A118.10): 370 – 450 psi (2.55 – 3.10 MPa)
6. Water Vapor Transmission (ASTM E96 Procedure B): 1.6 – 1.7 grains/hr·ft (1.1 – 1g/hr·ft)
7. Water Vapor Permeance (ASTM E96 Procedure B): 3.9 – 4 perms (225 – 235 ng/Pa·s·m^2)
8. System Performance (ASTM C627 – TCNA Rating): Cycles 1 – 14 “Extra Heavy”
9. Tensile Strength for Elongation: 25%
10. Installed Thickness (Dried): 40 mil (1.02mm)

(Basis of Design: LATICRETE® HYDRO BAN® Cementitious Waterproofing)

.11 Mixes

.1 Mix premanufactured mortars and grouts in accordance with referenced standards, and mortar and grout manufacturer’s instructions.

3 Execution

3.1 **EXAMINATION**

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

3.2 **SURFACE PREPARATION**

.1 Clean and dry surfaces thoroughly. Remove oil, wax, grease, dust, dirt, paint, tar, primers, form release agents, curing compound, and other foreign material from substrate surfaces which may prevent or reduce adhesion.

.2 Neutralize any trace of strong acids or alkali from the substrate.

3.3 **CONTROL JOINTS**

.1 Provide control, expansion and isolation joints in accordance with TTMAC specification 301MJ and as indicated on drawings. Install in locations indicated on drawings and specified herein.

.2 Continue control, construction, and cold joints in the structural substrate up through the tile finish, and align with mortar joints where possible. Review joint locations on Site with the Consultant.

.3 Install joint widths to match grout joint widths, except where a minimum width is indicated.

.4 Install control joints in the following typical locations:

.1 Aligned over changes in type of substrate.

.2 At the restraining perimeters such as walls and columns.

.3 Interior areas (not subject to sunlight): 6 mm minimum width, at 7320 mm o.c. maximum.

.4 Interior areas (subject to sunlight): 6 mm minimum width, at 3660 mm o.c maximum.

.5 As indicated on the Contract Drawings.

.5 Seal control joints in accordance with Section 07 91 00.

3.4 LEVELLING BED

.1 Install a levelling bed on uneven substrate surfaces, level and plumb substrates in accordance with the following tolerances:

.1 Vertical surfaces: 3 mm in 2.4 m maximum.

.2 Horizontal surfaces: 6 mm in 3 m from finished levels of the surface, or better.

.2 Clean structural substrate control joints and blow-clean with compressed air. Grout fill control joints flush to slab with levelling bed.

3.5 SHOWER AREA SYSTEM

.1 Install mortar bed over thin set adhesive on uneven substrate surfaces, level and plumb substrates in accordance with manufacturer’s written instructions and having the following tolerances:

.1 Vertical surfaces: 3 mm in 2.4 m maximum.

.2 Horizontal surfaces: 6 mm in 3 m from finished levels of the surface, or better.

.2 Provide slopes to drains as indicated on drawings.

.3 Apply waterproofing with a spray applicator on prepared substrate to a total dry film thickness of 0.8 mm in accordance with manufacturer’s printed directions. Carry up walls to 50 mm high.

.4 Install finish materials after site inspection by manufacturer, ensuring that materials have been installed correctly and in accordance with manufacturers written instructions. Provide written inspection report verifying manufacturers warranty of system.

.5 Apply grout for shower area system in accordance with epoxy grout manufacturer's directions to produce watertight, filled joints without voids, cracks and excess grout. Thoroughly compact and tool grout. Finish grout flush to edge thickness of tile and remove excess grout with soft burlap or sponge moistened with clean water.

.6 Exterior Shower Partition surfaces:

.1 Rout out all construction joints and visible cracks exceeding 6.4 mmin size to minimum 19 mm. Remove all cement scum, dirt, duct and thoroughly rinse with water all concrete slab surfaces.

.2 Clean out all shrinkage cracks, tie holes, construction joints, and ‘bug’ holes and fill with an approved bonding compound.

.3 Prepare concrete with ultra high-pressure water blast between 30,000 to 40,000 psi to International Concrete Repair Institute (ICRI) designation Concrete Surface Preparation Part 3.

.4 Ensure all areas to be tiled and waterproofed have manufacturer's recommended moisture and alkalinity content prior to application. Record and document moisture alkalinity content and forward to Consultant.

.5 Ensure that surface areas shall have an open capillary system to assure permanent bonding of the application.

.6 Remove all form scale, oil, form release agents and any other foreign materials likely to affect bond, penetration and performance of the adhesive / waterproofing.

.7 Use waterproofing mortar mix to create coves where horizontal and vertical surfaces meeting and on inside corners and for grouting in inserts and other protrusions.

3.6 **GENERAL INSTALLATION REQUIREMENTS**

.1 Install tiles in accordance with manufacturer's instructions and TTMAC Specification Guide 093000 Tile Installation Manual. Manufacturer's installation instructions govern over TTMAC Installation Manual.

.2 Install in accordance with Installation of Ceramic Tile with. Dry-Set Portland Cement Mortar or Latex Portland. Cement Mortar ANSI A108.5 (ANSI A108/A118/A136.1-2020) and Installation of Grout in Tilework ANSI A108.10 (ANSI A108/A118/A136.1-2020).

.3 Lay out work to produce a symmetrical pattern with minimum amount of cutting. Ensure cut tile at room perimeter and at joints is not less than ½ full size.

.4 Install trim to be placed under tile in locations indicated on Drawings.

.5 Set tiles in place and rap or beat with a beating block as necessary to ensure a proper bond and to level surface. Align tile for uniform joints and allow to set until firm. Clean excess mortar from surface of tile with a wet cloth or sponge while mortar is fresh.

.6 Ensure following minimum mortar contact coverage to back of tiles. Contact must be evenly distributed to give full support of the tile.

.7 100% for tack and deck applications.

.8 Adjust joints between units uniform, plumb, straight, even, and true, with adjacent tile flush. Align grout joints in both directions unless indicated otherwise.

.9 Align floor, base and wall grout joints.

.10 Install tile accessory fittings for a complete and fully coordinated tile assembly.

.11 Install wall tile full height unless indicated otherwise.

.12 Do not place tile, trim, and accessories over control, expansion, or isolation joints. Stop materials in either side on joints and provide control, expansion and isolation joints as specified.

.13 Cut and fit tile neatly around piping, fittings, joints, projections and around recesses items e.g. washroom accessories. Where surface mounted equipment and accessories are installed on tile surfaces, extend tile over surfaces. Cut edges smooth, even, and free from chipping; chipped and broken edges are not acceptable.

.14 Do not proceed with grouting until minimum 48 hours after tile has set, to prevent displacement of tiles.

.15 Apply grout in accordance with grout manufacturer's directions to produce watertight, filled joints without voids, cracks and excess grout. Thoroughly compact and tool floor grout. Finish grout flush to edge thickness of tile and remove excess grout with soft burlap or sponge moistened with clean water.

.16 At floor deck drains, install slopes to drains as required by applicable codes and regulations, authorities having jurisdiction, and as indicated and water test before tile installation.

.17 Ponding of water on pool deck and in emptied pool basin is unacceptable. Areas where ponding occurs shall be removed and reinstalled.

.18 Provide edge protection at tile edges and corners, unless otherwise indicated, using maximum length pieces.

.19 Provide edge protection and transition strips at tile transitions, unless otherwise indicated, using maximum length pieces.

.20 Review locations of tile accessories with Consultant prior to setting tile and comply with directions of Consultant.

.21 Lap tile and seal with sealant at inside corners. Caulk around pipes and openings made in tile with sealant.

3.7 WATERPROOFING MEMBRANE INSTALLATION

.1 Install waterproof membrane to locations as indicated or scheduled to provide watertight performance.

.2 Install waterproofing to comply with ANSI A108.13 (ANSI A108/A118/A136.1-2020) and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.

.3 Work waterproofing membrane into adhesive with a flat trowel to achieve full contact and to remove air pockets.

.4 Install prefabricated corners at outside and inside corner conditions.

.5 Install prefabricated pipe collars at penetrations.

.6 Install waterproofing strips at corner conditions at change in substrate plane conditions and where required by manufacturer’s installation instructions.

.7 Provide strips of waterproofing where required to span expansion joints or terminate waterproofing into movement joint type tile setting accessories, in accordance with manufacturer's instructions.

.8 Seal waterproofing at penetrations and terminations in accordance with manufacturer’s installation instructions.

3.8 TILE SETTING

.1 Lay out tile work as indicated on drawings, and where lay-out is not indicated, lay-out tiles so tiles less than 1/2 the least dimension do not occur and with minimum amount of cutting.

.2 Using a damp towel, wipe off the back side of tile to remove any dust or other residue that may be left over from the manufacturing process.

.3 Place as much tile as possible in one operation before setting bed reaches initial set. Clean back and remove bed when it has set before tile is laid.

.4 Prime materials and by methods specified by manufacturer of bond coat.

.5 Line up joints between tile installed on stairs from tread to tread.

.6 Except where tiles have setting tabs, and except for expansion, control and isolation joints, maintain joint widths as selected by Consultant.

.7 Back up tile coves, curbs and other shaped pieces solid with mortar. Rigidly set, reinforce or otherwise make firm and secure such pieces.

.8 Beat tiles in thoroughly and sufficiently to cause mortar ribs or notches to come together into a continuous void free bed and allow the mortar to flow up partially into the joint space to maximum of 1/3 the thickness of the tile. Sound floor tiles by tapping and reset all tiles with voids in setting bed.

.9 Tile shall contact setting materials for minimum of 100% coverage unless otherwise indicated.

.10 Obtain 100% mortar coverage with applicable requirements for back buttering of tile in referenced TTMAC and ANSI A108/A118/A136.1-2020 series of tile installation standards.

.11 Remove any excess setting material from the joint area so that 2/3 of the depth of the tile is available for grouting.

.12 Remove smudges or smears of setting material from the tile surface with a damp sponge or cloth immediately after final adjustment and beat-in while the mortar is fresh.

.13 Do necessary cutting and drilling of fixtures, fittings, and built-in or penetrating units without marring the tile. Replace all cracked or damaged tile.

.14 Cut tiles to conform to irregularities in wall lines and vertical planes along outer edges. Smooth cut edges with carborundum block or by other means to provide clean straight edge.

.15 Install tiles to provide even distribution of shading, colour, and characteristics.

3.9 **MORTAR-BED TILING**

.1 Apply latex-Portland cement thin bed mortar with flat trowel as a slurry bond coat approximately 1.5 mm thick over clean concrete slab.

.2 Place latex-Portland cement thick bed mortar over slurry bond coat while bond coat is wet and tacky. Omit reinforcing wire fabric and fully compact bed by tamping.

.3 Spread latex-Portland cement thin bed mortar with flat trowel over surface of "green"/fresh mortar bed as a slurry bond coat approximately 1.5 mm (1/16”) thick.

.4 Apply latex-Portland cement thin bed mortar slurry bond coat to back of tile or threshold and place each piece/sheet while slurry bond coats are wet and tacky. Beat with a hardwood block or rubber mallet to level/imbed pieces before mortar bed takes initial set.

.5 Clean excess mortar from finished surfaces.

.6 For installation of tile over cured (pre-floated) latex-Portland cement thick bed mortar, follow Thin-Set Method.

3.10 **THIN-SET METHOD**

.1 Use the appropriate trowel notch size to ensure full bedding of the tile.

.2 Work the thin-set mortar into good contact with the substrate and comb with notched side of trowel.

.3 Beat each piece/sheet into the thin-set mortar with a beating block or rubber mallet to insure full bedding and flatness.

.4 Clean excess thin-set mortar from tile face and joints between pieces. Do not cover, bridge or fill tile joints located over expansion joints with adhesive.

3.11 **CONTROL JOINTS**

.1 Carry substrate control and movements joints through to tile work.

.2 Install control joints around the perimeter of tiled areas, around columns and where tile abuts other hard materials.

.3 Cut tiles on both sides along the edges of control or movement joints.

.4 Install control joints in the following typical locations:

.1 Aligned over changes in type of substrate.

.2 At the restraining perimeters such as walls and columns.

.3 Interior areas (not subject to sunlight): 6 mm minimum width, at 6000 mm o.c. maximum.

.4 Interior areas (subject to sunlight): 6 mm minimum width, at 3660 mm o.c maximum.

.5 Review locations with Consultant prior to setting tile and comply with instruction given by Consultant.

.6 Control joint width: 6.4 mm minimum, unless indicated otherwise.

3.12 TRIM ACCESSORIES INSTALLATION

.1 Coordinate transitions with work of other sections.

.2 Install trims in accordance with manufacturer’s installation instructions.

.3 Install in continuous lengths.

.4 Scribe and fit to obstructions.

.5 Cope mitre corners.

3.13 GROUTING OR POINTING

.1 Apply grout in accordance with manufacturer's printed instructions.

.2 The initial curing time for thin-set mortar prior to application of grout shall be 72 hours or more unless advised by manufacturer and approved by Consultant.

.3 The minimum cure time for epoxy grout and thin-set mortar shall be 21 days before immersion in water.

.4 ANSI A118.3 2000 Chemical Resistant, Water-Cleanable Tile Setting and Grouting Epoxy and Water-Cleanable Tile Setting Epoxy Adhesive.

.5 Allow tile installation to cure a minimum of 24 hours at ambient temperature of 21°C prior to grouting.

.6 Install chemical epoxy resistant grout in compliance with current revisions of Installation of Ceramic Tile Portland. Cement Mortar ANSI A108.1 (ANSI A108/A118/A136.1-2020) and Installation of Grout in Tile Work ANSI A108.10 (ANSI A108/A118/A136.1-2020).

.7 Verify grout joints are free of dirt, debris, water or tile spacers and face of tiles are clean.

.8 Apply grout release to face of absorptive, abrasive, non-slip or rough textured tile units that are not hot paraffin coated to facilitate cleaning.

.9 Spread using a sharp edged, hard rubber float and work grout into joints using diagonal strokes (45° angle).

.10 Pack joints full and free of voids/pits. Stroke diagonally to remove excess grout and to avoid pulling grout out of filled joints.

.11 Once excess grout is removed, begin cleaning grout haze approximately 20-30 minutes after grouting depending on temperature. Using a circular motion, lightly scrub grouted surfaces with the damp sponge to dissolve grout film/haze. Then drag sponge diagonally over the scrubbed surfaces to remove froth. Rinse sponge frequently and change cleaning solution at least every 5m2. Discard sponges as they become tacky texture with residue.

.12 Within 1 hour of finishing first cleaning, clean the same area again following the same procedure but utilizing a clean white scrub pad and fresh cleaning solution. Rinse scrub pad frequently. Drag a clean sponge diagonally over the scrubbed surfaces to remove froth. Use each side of sponge only once before rinsing and change cleaning solution at least every 5m2. Allow cleaned areas to dry and inspect tile surface. Rinse with clean water and allow surface to dry. Inspect grout joint for pinholes/voids and repair them with freshly mixed grout.

.13 Grout joint width to be 3.2 mm unless otherwise indicated.

.14 Do not cover, bridge or fill any expansion joints in tile with grout.

3.14 **TILE INSTALLATION TOLERANCES**

.1 Tile up to 152 mm x 152 mm in size: 1 mm: maximum lippage.

.2 Tile on outdoor shower with depth later than 1350 mm: no lippage.

.3 Finish planes shall be straight and plumb to within 6 mm in 3000 mm.

3.15 **CEMENTITIOUS WATERPROOFING MEMBRANE INSTALLATION CUSTOM MOSAIC TILE SHOWER PARTITION**

.1 Follow coating manufacturer's written instructions using compatible materials in quantities and techniques so recommended.

.2 Examine all construction substrates and conditions under which waterproofing materials are to be installed. Do not proceed with the waterproofing application until unsatisfactory conditions are corrected.

.3 Preparation:

.1 After acceptance of surfaces, prepare them as required to receive the work of this section. Remove projections and other conditions that may affect the installation of the waterproofing system.

.2 Substrate shall be sound, smooth and free from surface irregularities.

.3 Remove projections and other conditions which may affect installation of the waterproofing.

.4 Completely remove contaminants and deleterious substances and debris which may prevent, reduce, and affect adhesion or performance or may act as bond breaker.

.5 Prepare concrete surfaces by mechanical method approved by membrane manufacturer in accordance with International Concrete Repair Institute (ICRI) recommendations to achieve a Concrete Surface Profile classifications 3 light shorblast profile. Thoroughly clean upon completion of operation. Substrate to be approved in writing by manufacturer prior to application of waterproof membrane.

.6 Submit written report to Consultant following procedures for manufacturer’s field review in accordance with Section 01 33 00.

.7 Fill surface irregularities in substrates with appropriate repair materials and with methods as recommended by membrane manufacturer.

.8 Rinse surfaces to be waterproofed (excluding drywall or similar) with clean water to saturated surface dry (SSD) condition, with no standing water on horizontal surfaces.

.9 Perform adhesion tests for waterproofing to concrete substrate.

.4 Installation:

.1 Prime concrete substrates as recommended by membrane manufacturer on prepared substrates in accordance with manufacturer’s written instructions.

.2 Cavity fill, honeycombs & form tie holes: fill in accordance with membrane manufacturer's written instructions and recommendations.

.3 Tape construction joints and cracks in accordance with membrane manufacturer's written instructions and recommendations.

.4 Seal around penetrations in accordance with membrane manufacturer's written instructions and recommendations.

.5 Mix component waterproofing material in proportions recommended by manufacturer.

.6 Positive side waterproofing:

.1 Apply 2 coats of waterproofing material in quantities and number of coats in accordance with membrane manufacturer's instructions and recommendations:

.2 Finish 2 coats 40mil (1mm) Thick

.3 Surface finish: Overflow: Surface finish shall be "smooth" by applying a top coating of 10 mils - 20 mils special smooth powder mix of two-component waterproofing material.

3.16 CLEANING AND ADJUSTING

.1 Clean off excess grout with soft burlap or sponge moistened with clean water.

.2 Remove grout residue from tile after grouting has cured.

.3 Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning.

.4 Polish floor and wall tile after grout has cured in accordance with Tile, Marble, Terrazzo, Stone Specifications & Standards TTMAC recommendations in the Maintenance Guide; do not use acid for cleaning.

.1 Re-point joints after cleaning as required to eliminate imperfections, then re-clean as necessary. Avoid scratching tile surfaces.

.2 Flush surface with clean water before and after cleaning.

3.17 PROTECTION

.1 Prevent traffic over tiled areas, and protect tiled assemblies from weather, freezing, and water immersion, for 96 hours minimum, after final installation.

.2 Prevent direct impact, vibration and heavy hammering on adjacent and opposite walls for 96 hours minimum, after final installation.

.3 Cover work temporarily with building paper properly lapped and taped at joints until work has been approved by Consultant.

END OF SECTION

1. GENERAL

1.1 SECTION INCLUDES

.1 Labour, Products, equipment and services necessary for concrete floor sealer. Work in accordance with the Contract Drawings.

1.2 SUBMITTALS

.1 Product data: Submit manufacturer's Product data in accordance with Section 01 33 00 indicating:

.1 Two copies of manufacturer's Product data on characteristics, performance criteria, and limitations.

.2 Preparation, installation requirements and techniques, Product storage, and handling criteria.

.2 Samples: Submit samples in accordance with Section 01 33 00 indicating coating and final concrete finish.

.3 Reports: Submit manufacturer's acceptance of substrate prior to installation in writing. Submit verification of moisture content of floor prior to installation.

.4 Close-out submittals: Submit maintenance data for incorporation into Operations and Maintenance manuals.

1.3 QUALITY ASSURANCE

.1 Perform Work of this Section by a company that has a minimum of five years proven experience in installations of a similar size and nature and that is approved by manufacturer. Submit to Consultant, applicator’s current certificate of approval by the material manufacturer as proof of compliance.

.2 Mock-up:

.1 Construct one 15 m^2 mock-up of floor sealer in location acceptable to Consultant.

.2 Arrange for Consultant's review and acceptance, allow 48 hours after acceptance before proceeding with Work.

.3 Mock-up may remain as part of Work if accepted by Consultant. If sealer application is unacceptable to Consultant, rework sealer in accordance with manufacturer’s recommendations to provide a sealed concrete surface acceptable to Consultant.

.4 Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work of this Section.

.3 Pre-installation meetings: Arrange with manufacturer's representative and Consultant to inspect substrates, and to review Mock-up and installation procedures 48 hours in advance of installation.

1.4 SITE CONDITIONS

.1 Do not install the Work of this Section outside of environmental ranges as recommended by the manufacturer without Product manufacturer's written acceptance and as follows:

.1 Relative Humidity: In accordance with manufacturers' requirements.

.2 When no dust is being raised.

.3 In well-ventilated and broom clean areas.

.2 Install temporary protection and facilities to maintain the Product manufacturer's, and the above specification, environmental requirements for 24 hours before, during, and 24 h after installation.

.3 Post do not enter and appropriate warning signs at conspicuous locations.

1.5 **DELIVERY, STORAGE, AND HANDLING**

.1 Store materials at site in an area specifically set aside for purpose that is locked, ventilated, and maintained at a minimum temperature of 16℃.

.2 Ensure that health and fire regulations are complied with in storage area, and during handling and application.

2. Products

2.1 **MATERIALS**

.1 All materials under Work of this Section, including but not limited to, sealers and coatings are to have low VOC content limits.

.2 Each material used in the application of each flooring system shall be as recommended or manufactured by the supplier of the flooring system.

.3 Concrete floor sealer (CONC-1): Alkali-silicate, water-soluble, inorganic concrete hardener and dustproofer; ‘Kure-N-Harden’ by BASF Building Systems or approved alternative by Sika Canada Inc.

3. Execution

3.1 **EXAMINATION**

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

.2 Verify that concrete floor has cured 28 days minimum and that substrate is acceptable to sealer manufacturer.

.3 Test surfaces for moisture content to ensure that they are suitable for application.

3.2 **PREPARATION**

.1 Prepare substrate in accordance with manufacturer’s written instructions. Diamond grind and vacuum substrate free of debris and dust.

.2 Project adjacent surfaces from damage resulting from Work of this section. Mask and/or cover adjacent surfaces, fixtures, and equipment as necessary.

.3 Clean surfaces to be sealed as recommended by sealer manufacturer.

3.3 **APPLICATION**

.1 Apply concrete floor sealer in accordance with manufacturer’s written instructions. Sealer manufacturer shall supervise application.

.2 Spray apply concrete sealer to entire surface and keep from drying for 30 minutes as

recommended by manufacturer.

.3 Sprinkle surface with water as sealer begins to penetrate (after 30 minutes).

.4 Flush surface with water and drying begins to remove excess material. Allow to harden for 24 hours.

.5 Lightly buff floor with a commercial floor buffer and non-aggressive pad to bring up required sheen.

.6 Protect concrete floor sealer form freezing.

.7 In event of freeze/thaw, warm and restir to uniformity. If separation is persistent, discard concrete floor sealer DO NOT APPLY.

.8 Install joint sealants before application of concrete floor sealer; if not possible, test first for adhesion.

.9 Wash surfaces with water and detergent and allow to thoroughly dry. A test application is mandatory. For subsequent coating applications, perform proper surface preparation and consult the coatings manufacturer for more instructions. • Spray application will yield best results.

.10 Dry buffing 24 hours after application will improve sheen of finished floor.

3.4 **CLEANING**

.1 Remove promptly as work progresses spilled or spattered materials from surfaces of work performed under other Sections. Clean floors on completion of work. Do not mar surfaces while removing.

3.5 **PROTECTION**

.1 Erect barriers to prevent the entry and presence of personnel not performing work of this Section during application of floor sealer, and for 48 hours following completion of application.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for painting work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 CAN/CGSB 85.10, Protective Coatings for Metals.

.2 CAN/CGSB-85.100, Painting.

.3 Master Painters Institute (MPI), Painting Specification Manual.

.4 SSPC Steel Structures Painting Council, Standards.

.5 AMPP Association for Materials Protection & Performance, Standards.

1.3 **SUBMITTALS**

.1 Product data:

.1 Submit copies of manufacturer's Product data in accordance with Section 01 33 00 indicating:

.1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations.

.2 Product transportation, storage, handling and installation requirements.

.3 Product name, type and use.

.4 Manufacturer's product number.

.5 Colour numbers.

.6 MPI Environmentally Friendly classification system rating. Manufacturer's WHMIS Safety Data Sheets (SDS).

.2 Submit listing of manufacturer's Product types, Product codes, and Product names, number of coats, and dry film thicknesses, corresponding to each Painting Schedule code; submit listing minimum of 8 weeks before materials are required.

.2 Samples:

.1 Submit following samples in accordance with Section 01 33 00.

.1 Four 300 x 150 mm draw downs of each colour minimum 4 weeks before paints are required.

.2 Identify each sample with Contract number and title, colour reference, sheen, date, and name of applicator.

.3 Certificates:

.1 Submit certification from paint manufacturer, on company letterhead, indicating each product proposed for use is Manufacture's premium grade, first line Product.

.2 Submit certified documentation to confirm each airless spray painter has minimum of 5 years experience on applications of similar complexity and scope. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

.3 Submit certified documentation to confirm each worker has Provincial Tradesman Qualification certificate of proficiency. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

.4 Reports:

.1 Submit written field inspection and test report results after each inspection.

.2 Submit Field Quality Control test result reports for alkali content, substrate moisture, and dry film thickness.

.3 Submit electronic moisture meter manufacturer's specifications including tolerances. Submit record of latest meter calibration to meet manufacturer's recommendations.

1.4 QUALITY ASSURANCE

.1 Finishing work: Perform work to MPI requirements for premium grade.

.2 Supervision: Have work supervised by a full-time qualified foreperson who has 10 years minimum experience on Contracts of similar complexity and scope. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

.3 Mock-up:

.1 Construct three 5 square metre mock-ups of different Paint Schedule code systems, selected by Consultant, in locations acceptable to Consultant to demonstrate installation workmanship, colour, and hiding power of Products.

.2 Obtain Consultant's acceptance in writing before proceeding with the work of this Section.

.3 Mock-ups may remain as part of the Work if acceptable to Consultant and will serve as a standard for similar code systems.

.4 Repaint over mock-ups which do not form part of the Work.

1.5 EXTRA MATERIALS

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

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Install correct, safe temporary storage for paint, thinner, solvents, and other volatile, corrosive, hazardous, and explosive materials in accordance with requirements of authorities having jurisdiction.

.2 Post hazard warning signage in areas of storage and mixing. Install and maintain sufficient CO2 fire extinguishers of minimum 9 kg capacity, accessible in each storage mixing and storage areas.

.3 Maintain storage enclosures at minimum 10 degrees Celsius ambient temperature and to manufacturer's instructions.

.1 Labels shall clearly indicate:

.1 Manufacturer's name and address.

.2 Type of paint or coating.

.3 Compliance with applicable standard.

.4 Colour number in accordance with established colour schedule.

1.7 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:

.1 Ventilate enclosed spaces.

.2 Perform no painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10°C for 24 hours before, during and after paint application until paint has cured sufficiently.

.3 Where required, provide continuous ventilation for seven days after completion of application of paint.

.4 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities shall be provided by General Contractor.

.2 Apply coatings under the following conditions:

.1 Exterior coatings (except Latex): 5 degrees Celsius minimum.

.2 Exterior latex coatings: 10 degrees Celsius minimum.

.3 24 hours minimum after rain, frost, condensation, or dew.

.4 When no condensation is possible (unless specifically formulated against condensation).

.5 Interior coatings: 7 degrees Celsius minimum.

.6 Relative humidity: 85% maximum.

.7 Not in direct exposure to sun light.

.3 Maintain temperature conditions indicated above for 24 hours before, during and 24 hours after painting.

.4 Install clean plywood sheets to protect floors and walls in storage and mixing areas, from paint drips, spatters, and spills.

.5 Surface and Environmental Conditions:

.1 Apply paint finish only in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.

.2 Apply paint only to adequately prepared surfaces and to surfaces within moisture limits noted herein.

.3 Apply paint only when previous coat of paint is dry or adequately cured.

.4 Apply paint finishes only when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

.5 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of Owner such that painted surfaces will have dried and cured sufficiently before occupants are affected.

.6 Apply sufficient masking, clean drop cloths, and protective coverings for full protection of work not being painted including, but not limited to, the following:

.1 Light fixtures, fire and smoke detectors.

.2 Non-Prepainted diffusers and registers.

.3 Non-Prepainted equipment.

.4 Fire rating labels and equipment specification plates.

.5 Finished surfaces.

.6 Nameplates.

1.8 **ENVIRONMENTAL PERFORMANCE REQUIREMENTS**

.1 Provide paint products meeting MPI "Green Performance Standard GPS-1-05".

1.9 **WASTE MANAGEMENT AND DISPOSAL**

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Ensure emptied containers are sealed and stored safely.

.4 Unused paint, coating materials must be disposed of at official hazardous material collections site as approved by Owner.

.5 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal.

.6 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.7 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.8 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:

.1 Retain cleaning water for water-based materials to allow sediments to be filtered out.

.2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.

.3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.

.4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.

.5 Empty paint cans are to be dry prior to disposal or recycling (where available).

1.10 **MAINTENANCE**

.1 Deliver to Owner's place of storage on completion of work, sealed containers of each finish painting material applied, and in each colour. Label each container as for original, including mixing formula. Provide the following:

.1 1 L of extra materials when less than 50 L are used for Project;

.2 3.78 L of extra stock when 50 to 200 L are used;

.3 7.57 L of extra stock when over 200 L are used.

1.11 **SCHEDULE OF WORK**

.1 Submit work schedule for various phases of painting to Consultant for approval. Submit schedule minimum of 1 week in advance of proposed operations.

.2 Obtain written authorization from Consultant for any changes in work schedule.

.3 Schedule painting operations to prevent disruption of occupants in and about the building.

2 Products

2.1 **MATERIALS**

.1 Paint:

.1 All materials under work of this Section, including but not limited to, primers, stains, and paints are to have low VOC content limits.

.2 Products in accordance with the MPI Painting Specification Manual, and MPI Maintenance Repainting Manual, Exterior and Interior Systems;

.1 For each MPI paint code, manufacture's premium grade, first line Products is to be use.

.2 Uniform dispersion of pigment in a homogeneous mixture.

.3 Ready-mixed and tinted whenever possible.

.2 Products within each MPI paint system code: From single manufacturer.

.3 Acceptable manufacturers:

.1 Benjamin Moore.

.2 Dulux Paints/PPG.

.3 Sherwin Williams.

2.2 COLOUR SCHEDULE

.1 Consultant will select choice of colours and gloss when compiling a Colour Schedule after award of Contract; allow for colour selection beyond paint manufacturer's standard colour range.

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

.3 Refer to Colour Schedule for selected colour references. Allow for 12 different colours, an additional deep and ultra-deep colours; 4 coats may be required.

.4 Conform to gloss reflectance definitions listed in MPI Specification Manual.

2.3 PAINTING AND FINISHING SCHEDULE

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

Table 1: Exterior Painting and Finish Schedule				
EXTERIOR SUBSTRATES	Typical substrates (Including but not limited to)	MPI Manual Ref.	MPI Finish System Code	Topcoat
Galvanizes steel	HM doors & frames miscellaneous fabrications	REX 5.3	REX 5.3J	Spot Prime - PPG Pitt-Tech Plus EP Acrylic Primer 90-1912 Topcoat: PPG Pitt-Tech Plus EP DTM Acrylic Semi-Gloss 90-1610
Wood	Soffits, Glulam, Exterior Millwork - Cladding	156	EXT6.3C	Dulux PWF - CWF-UV5 Penetrating Wood Finish, 8590 Series **or** Sico Proluxe 1 Primar Coat RE Wood Finish, SIK41XXXC Series**,** Finish Coat**:** Apply a second coat of Dulux PWF - CWF-UV5 Penetrating Wood Finish, 8590 Series or Sico Proluxe 1 Primar Coat RE Wood Finish, SIK41XXXC Series, for a uniform finish and enhanced protection.

Table 2: Interior Painting and Finish Schedule				
TYPICAL INTERIOR SUBSTRATES	Typical substrates (Including but not limited to)	MPI Manual Ref.	MPI Finish System Code	Primer/Topcoat (PPG)
Concrete Masonry Units	Concrete walls – Wet Areas	RIN 4.2	RIN 4.2F	Spot Prime – PPG Aquapon WB EP Epoxy Semi-Gloss Topcoat- PPG Aquapon WB EP Epoxy Semi-Gloss
Concrete Masonry Units	Concrete walls – Wet Areas – Showers (non-tiled)	RIN 4.2	RIN 4.2D	Spot Prime – PPG Amerlock 600 Epoxy Topcoat – PPG Amerlock 600 Epoxy
Concrete Vertical Surfaces	Concrete walls & ceilings – Common Areas (Corridors, Offices)	RIN 3.1	RIN 3.1A	Spot Prime – Dulux Gripper Universal Acrylic Primer/ Sealer 60000A Topcoat- Dulux Ultra Interior Latex Semi-Gloss 948000
Concrete Vertical Surfaces	Concrete walls & ceilings – Wet Areas (Restrooms, Change rooms, Shower Rooms)	RIN 3.1	RIN 3.1F	Spot Prime – PPG Aquapon WB EP Epoxy Semi-Gloss Topcoat- PPG Aquapon WB EP Epoxy Semi-Gloss
Gypsum Board	Walls & ceilings –	RIN 9.2	RIN 9.2F	Spot Prime – Dulux Gripper Universal Acrylic Primer/ Sealer 60000A Topcoat- PPG Aquapon WB EP Epoxy Semi-Gloss
Wood	Soffits, Glulam	156	EXT6.3C	Dulux PWF - CWF-UV5 Penetrating Wood Finish, 8590 Series **or** Sico Proluxe 1 Primar Coat RE Wood Finish, SIK41XXXC Series**,** Finish Coat**:** Apply a second coat of Dulux PWF - CWF-UV5 Penetrating Wood Finish, 8590 Series or Sico Proluxe 1 Primar Coat RE Wood Finish, SIK41XXXC Series, for a uniform finish and enhanced protection.

Galvanized Metal	HM Doors & Frames,	RIN 5.3	RIN 5.3J	Spot Prime – PPG Pitt-Tech Plus EP Acrylic Primer 90-1912 Topcoat – PPG Pitt-Glaze WB1 Precatalyzed Acrylic Epoxy Semi-Gloss 16-1510
Galvanized Metal	Ducts, Pipes	RIN 5.3	RIN 5.3B	Spot Prime – PPG Pitt-Tech Plus EP Acrylic Primer 90-1912 Topcoat - PPG Pitt-Glaze WB1 Precatalyzed Acrylic Epoxy Semi-Gloss 16-1510
Structural Steel	Columns, beams, joists	RIN 5.1	RIN 5.3RR	Spot Prime – PPG Pitt-Tech Plus EP Acrylic Primer 90-1912 Topcoat – PPG Pitt-Glaze WB1 Precatalyzed Acrylic Epoxy Semi-Gloss 16-1510

3 Execution

3.1 **EXAMINATION**

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

3.2 **CONDITION OF SURFACES:**

.1 Prior to commencement of repainting work, thoroughly examine (and test as required) all interior conditions and surfaces scheduled to be repainted and report in writing to the Consultant any conditions or surfaces that will adversely affect work of this section.

.2 The degree of surface deterioration (DSD) shall be assessed using the assessment criteria indicated in the MPI Maintenance Repainting Manual. In general, the MPI DSD ratings and descriptions are as follows:

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

.3 Other than the repair of DSD-1 to DSD-3 defects included under this scope of work, structural and DSD-4 substrate defects discovered prior to and after surface preparation or after first coat of paint shall be made good and sanded by others ready for painting, unless otherwise agreed to by the Consultant and painter to be included in this Work.

.4 No repainting work shall commence until all such DSD-4 adverse conditions and defects have been corrected and surfaces and conditions are acceptable to the Painting Subcontractor. The Painting Subcontractor shall not be responsible for the condition of the substrate or for correcting defects and deficiencies in the substrate, which may adversely affect the painting work except for minimal work normally performed by the Painting Subcontractor and as, indicated herein. It shall always, however, be the responsibility of the Painting Subcontractor to see that surfaces are properly prepared before any paint or coating is applied. It shall also be the Painting Subcontractor's responsibility to paint the surface as specified providing that the Owner accepts responsibility for uncorrected DSD-4 substrate conditions.

3.3 PREPARATION

.1 General:

.1 Clean substrate surfaces free from, dust, grease, soiling, or extraneous matter, which are detrimental to finish.

.2 Patch, repair, and smoothen minor substrate defects and deficiencies e.g. machine, tool and sand paper marks, shallow gouges, marks, and nibs.

.3 Clean, sweep, and vacuum floors and surfaces to be painted, debris and dustfree prior to painting.

.4 Refer to MPI Painting Specification Manual for surface preparation requirements of substrates not listed here.

.2 Where finish hardware has been installed remove, store, re-install finish hardware, to accommodate painting. Do not clean hardware with solvent that will remove permanent lacquer finishes.

.3 Alkali Content tests and neutralization:

.1 Test for ph level using litmus paper on dampened substrate.

.2 Neutralize surfaces over 8.5 ph with 4% solution of Zinc Sulphate for solvent based systems and tetrapotassium pyrophosphate for latex based systems, to below 8.0 ph, and allow to dry.

.3 Brush-off any residual Zinc Sulphate crystals.

.4 Coordinate paint system primer / sealer to be alkali-resistant.

.4 Substrate moisture tests:

.1 Test for moisture content over entire surface to be painted, minimum one test/2 m2 in field areas and one test/600 mm along inside corners including at ceiling to wall juncture.

.2 If any test registers above 10% allow entire substrate surfaces, within the plane, to dry further before paint system application. Install temporary drying fans if necessary.

.3 Re-test employing same criteria.

.5 Mildew removal: Scrub with solution of trisodium phosphate and sodium hypochlorite (Javex) bleach, rinse with water, and allow to dry completely.

.6 Cementitious and masonry (existing): Clean existing surfaces by pressure washing where indicated on drawings with a TSP solution and pressure range of 1500 - 4000 PSI at 150 mm - 300 mm. Rinse areas with clean water and allow to throughly dry. Provide for collection and disposal of water.

.7 Cementitious and masonry (Concrete, block):

.1 Allow 28 days cure before painting.

.2 Coordinate repair of protrusion-chipping and grinding, and honeycomb filling with responsible trades.

.3 Remove dirt, loose mortar, scale, powder, efflorescence, and other foreign matter.

.4 Remove form oil and grease with trisodium phosphate, rinse, and allow to dry thoroughly.

.5 Prepare surfaces in accordance with CAN/CGSB-85.100.

.6 Remove rust stains with solution of sodium metasilicate after thorough wetting;

.1 allow to dry thoroughly.

.8 Metal Fabrications: Scrape and either hand or power wire brush surfaces to remove mill and scale.

.9 Galvanized steel sheet:

.1 Z275 (Satin & Spangled Sheet): SSPC SP7 brush blast.

.2 ZF075 (Wiped Coat): Remove contamination, wash with Xylene solvent.

.3 Touch-up damaged galvanized areas with organic zinc rich primer.

.10 Galvanized iron and steel: Prepare galvanized and ungalvanized metal surfaces as

.1 Z275 (Satin & Spangled Sheet): SSPC SP7 brush blast.

.2 ZF075 (Wiped Coat): Remove contamination, wash with Xylene solvent.

.3 Touch-up damaged galvanized areas with organic zinc rich primer.

.11 Galvanized iron and steel: Prepare galvanized and ungalvanized metal surfaces as follows:

.1 Unpassivated, unweathered and weathered: Remove contamination, wash with Xylene or Toluol solvent, allow to dry thoroughly. Make paint system primer/sealer an etching type primer.

.2 Manufacturer pre-treated (including passivated): SSPC SP7.

.3 Touch-up damaged galvanized areas with organic zinc rich primer.

.12 Structural steel and miscellaneous metal fabrications:

.1 Coordinate the following with the responsible trades:

.1 Rust, mars, mill scale, and weld-burn touch-ups.

.2 Oil, grease, weld flux and other residue removal.

.2 Prime paint items, not otherwise indicated to be primed as part of another Section.

.3 Touch-up damaged galvanized areas with organic zinc rich primer

.13 Factory primed surfaces:

.1 Touch up damaged areas.

.2 Clean as required for top coat.

.14 Gypsum board:

.1 Apply primer/sealer paint to reveal defects and deficiencies and to equalize absorption areas.

.2 Coordinate repairs and touch-ups with the responsible trade.

.3 Re-prime repairs.

.15 Coordinate with other trades to prevent:

.1 Damage, and inadvertent activation of fire and smoke detectors.

.2 Odour and dust distribution by permanent HVAC systems including fouling of ducts and filters.

.16 Field-mix Products in accordance with manufacturer's written instructions.

3.4 APPLICATION

.1 Apply painting systems in accordance with the MPI Painting Specification Manual. Apply each Product to manufacturer's recommended dry film thickness.

.2 Method of application to be as approved by Consultant. Apply paint by brush, roller, air sprayer, airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.

.3 Brush and Roller Application:

.1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.

.2 Work paint into cracks, crevices and corners.

.3 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple.

.4 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.

.5 Remove runs, sags and brush marks from finished work and repaint.

.4 Spray application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.

.3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.

.4 Brush out immediately all runs and sags.

.5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.

.5 Painting systems listed are required minima, apply additional coats if necessary to obtain substrate hiding acceptable to the Consultant.

.6 Tint intermediate coats lighter than final top coats for identification of each succeeding coat and to facilitate inspections. Include only manufacturer's recommended reducing and tinting accessories. Do not add adulterants.

.7 Primer to be specialized primer coating system as required by manufacturer for selected colour. Standard primer being tinted shall be tinted to a maximum of 1.5% by volume.

.8 Sand lightly between coats to achieve a tooth or anchor for subsequent coats.

.9 Apply paint uniformly in thickness, colour, texture, and gloss, as determined by the Consultant under adequate illumination and viewed at a distance of 1500 mm. Apply finishes free of defects in materials and application which, in the opinion of the Consultant, affect appearance and performance. Defects include, but are not limited to:

.1 Improper cleaning and preparation of surfaces.

.2 Entrapped dust, dirt, rust.

.3 Alligatoring, blisters, peeling.

.4 Scratches, blemishes.

.5 Uneven coverage, misses, drips, runs, and poor cutting in.

.10 Do not apply coatings on substrates which are not sufficiently dry. Unless indicated otherwise, allow each painting system coat to cure dry and hard before following coats are applied.

.11 Repaint entire areas of damaged or incompletely covered surfaces, to the nearest inside or outside corner; patching will not be permitted.

.12 Miscellaneous painting requirements:

.1 Paint projecting ledges, and tops, bottoms and sides of doors both above and below sight lines to match adjacent surfaces.

.2 Paint door frames, access doors and frames, door grilles, prime coated butts, and prime coated door closers to match surface in which they occur.

.3 Finish closets and alcoves as specified for adjoining rooms.

.4 Paint light coves white whether a light lense is installed or not, unless otherwise indicated.

.5 Paint interior columns to match walls of room.

.6 Allow for:

.1 2 wall colours per room, one ceiling colour per room.

.2 Different door colours in each functionally different area.

.3 Different colours on both sides of same door.

.13 Mechanical, electrical, and other painting coordination:

.1 Coordinate painting of pipes, ducts, and coverings with the work to precede pipe colour banding, flow arrows, and other pipe identification labeling installation.

.2 Paint exposed conduit, pipes, hangers, ductwork, grilles, gratings, louvres, access panels, fire hose cabinets, registers, convector and radiator covers, enclosures, and other mechanical and electrical equipment including services concealed inside cupboard and cabinet work; apply colour and sheen to match adjacent surfaces, except as noted otherwise.

.3 Paint portions of surfaces such as duct interiors, piping, ductwork, hangers, insulation, walls, and similar items, visible through grilles, louvres, convector covers etc., colour as noted on drawings.

.4 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.

.5 Remove the following to accommodate painting, carefully store, clean, then reinstall on completion of each area and when dry:

.1 Switch and receptacle plates, fittings and fastenings, grilles, gratings, louvres, access panels, convector covers, and enclosures.

.6 Unless otherwise specified, paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.

.7 Boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.

.8 Paint fire protection piping red.

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

.10 Paint natural gas piping yellow.

.11 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

3.5 FIELD QUALITY CONTROL

.1 Dry film thickness tests:

.1 Test for film thickness over entire surface to be painted, minimum one test 2m2 in field areas and one test/600 mm along inside corners including at ceiling to wall juncture.

.2 If any test registers below specified thickness, re-apply paint to entire surface to nearest inside and outside corners.

.3 If test registers more than 50% above specified thickness, consult with paint manufacturer, determine if problem exists, offer solutions to Consultant, and repair as directed.

.4 Re-test employing same criteria after repair.

3.6 RESTORATION

.1 Clean and re-install all door hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Consulant. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative.

3.7 CLEANING

.1 Remove spilled, splashed, and spattered paint promptly as work proceeds and on completion of work. Clean surfaces soiled by paint spillage and paint spatters. Repair or replace damaged work, as directed by Consultant.

3.8 **PROTECTION**

.1 Post Wet Paint signs during drying and restrict or prevent traffic where necessary.

.2 Post sign, after Consultant's inspection and acceptance of each room, reading: PAINTING COMPLETE - NO ADMITTANCE WITHOUT CONTRACTOR'S PERMISSION.

.3 After work of other trades is complete, touch up and restore damaged or defaced painted surfaces.

.4 Protect all installed products, materials, and components from damage throughout the construction process. Implement site-specific protective measures to prevent harm caused by construction activities, environmental conditions, or improper handling.

.5 Promptly repair any damage to adjacent materials or components caused during the installation of joint sealants or other construction activities. Repairs must restore affected areas to their original condition and be carried out at no additional cost to the Owner. Obtain the Consultant’s approval for repair methods prior to proceeding.

.6 Provide and maintain adequate protection measures to safeguard roof waterproofing materials from potential damage caused by construction equipment, ladders, or painting tools. Protection methods shall include, but are not limited to, non-slip protective mats, barriers, or coverings that are durable, secure, and acceptable to the Consultant. Inspect and adjust protection as necessary to ensure ongoing effectiveness.

.7 Supply and install sufficient drop cloths, tarps, and other protective coverings to fully shield glass walls, roof waterproofing, and surrounding surfaces from paint splatters and overspray. All protective materials must be securely fastened, resistant to wind and site conditions, and remain in place for the duration of painting activities. Remove protective coverings carefully upon completion to avoid damage.

.8 Regularly inspect all protective measures to ensure they remain effective and undamaged throughout the construction period. Replace or repair any compromised protective materials immediately. Document inspections and make reports available to the Consultant upon request.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services for washroom accessories work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 CAN/CSA B651-M, Barrier Free Design.

.2 ASTM A167, Specification for Stainless Steel and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

1.3 **SUBMITTALS**

.1 Shop drawings: Submit shop drawings in accordance with Section 01 33 00 indicating fabrication and erection details, plans, elevations, hardware, and installation details.

.2 Samples:

.1 Submit samples in accordance with Section 01 33 00.

.2 Submit 300 x 300 mm samples for each colour.

.3 Submit samples of each hardware item, including brackets, fastenings, and trim.

1.4 **MAINTENANCE DATA**

.1 Provide maintenance data for maintenance of finished work for incorporation into General Requirements specified in Section 01 33 00.

1.5 **PROTECTION**

.1 Cover finished surfaces with heavy Kraft paper or put in cartons during shipment. Protect installed surfaces by approved means. Do not remove until immediately prior to final inspection.

2 Products

2.1 **ACCEPTABLE MANUFACTURERS**

.1 Floor Mounted Overhead Braced Extended Privacy;

.1 Compact Grade Laminate (CGL) Extended Privacy Partitions by Bobrick

.2 Euro Style Partitions – Highrise Series by Bradley Corporation.

2.2 **MATERIALS**

.1 All materials under Work of this Section, including but not limited to, adhesives are to have low VOC content limits.

.2 Phenolic partitions: Stiles and doors are 3/4" (19mm) thick, panels are 1/2" (13mm) thick solidly fused plastic laminate with matte-finish melamine surfaces, colored face sheets, and black phenolic-resin core that are integrally bonded. Colour: to be selected from full range of standard colours by the Consultant.

.3 Hardware:

.1 Hinges: concealed, heavy duty stainless steel casting, self-lubricating inward swing, gapless privacy interlocking edges.

.2 Slide bolt and keeper: Stainless steel casting or extrusion, equipped for emergency access.

.3 Door stop: Stainless steel casting or extrusion with rubber insert.

.4 Connecting brackets: channel shaped, stainless steel extrusion or casting, continuous.

.5 Coat hook: combination hook and door bumper, stainless steel casting.

.4 Stainless steel sheet metal: ASTM A167, Type 304 with No. 4 satin finish.

.5 Fasteners: Stainless steel tamperproof type screws and bolts.

2.3 **FABRICATION**

.1 Toilet partitions shall be floor mounted, overhead braced with aluminum headrail.

.2 Fabricate stiles and doors of 19 mm thick solid plastic and feature Gapless Privacy interlocking edges.

.3 Fabricate and provide non-see-through style doors and pilasters by fabricating doors and pilasters with 45 deg. bevelled edges, with 6 mm gap between door and pilaster.

.4 Unless otherwise indicated or required, doors shall be nominal 610 mm wide, except doors to compartments for the handicapped shall be 810 mm wide.

.5 Fabricate headrail of brake formed anti-grip 1.5 mm thick clear anodized aluminum with satin finish.

.6 Fabricate pilaster boot assembly for bottom, of 1.5 mm thick die formed stainless steel. Fabricate assembly in size to suit pilaster.

3 Execution

3.1 **EXAMINATION**

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

3.2 **INSTALLATION**

.1 Install compartments and cubicles in accordance with manufacturer's details and reviewed shop drawings, for a secure, plumb, square, and rigid installation.

.2 Provide connecting brackets and secure to building structure and to pilasters. Insert edge of panels and closure pilasters into brackets and secure with through type sleeve bolt and nut.

.3 Install doors with 6 mm to 10 mm maximum space between door panel and pilasters.

.4 Install panels with 6 mm maximum space between panels and walls.

.5 Install hardware in accordance with manufacturers' instructions and CAN/CSA B651-M.

.6 Make compartments adjustable with screw jack through steel saddles made integral with pilaster. Conceal fixings with stainless steel shoes.

.7 Provide for adjustment of floor variations with screw jack through steel saddles made integral with pilaster. Conceal floor fixings with stainless steel boot assemblies.

.8 Install door tops edges aligned parallel with top edges of side partitions; determine alignment when doors are in closed position.

.9 Brace through top of pilasters with rectangular shaped anti-grip headrail and fasten with stainless steel sheet metal screws.

.10 Set panels, and doors level and in line, raised approximately 300 mm above finished floor.

.11 Hang doors to remain stationary at open position.

.12 Equip each door with hardware. Adjust and align hardware for easy, proper function.

.13 Provide closure pilasters, as required, at end units of compartment bank.

.14 Remove and replace damaged components not acceptable to Consultant.

3.3 **SCREEN ERECTION**

.1 Provide urinal stall screens consisting of panel and framing/supports as specified for toilet compartments.

.2 Anchor screen panels to walls with wall hung urinal screen brackets and vertical upright post complete with floor and ceiling boot assembly.

3.4 **ADJUSTING**

.1 Adjust operating hardware to work smoothly and without force. Adjust hinges of compartment doors so that all doors remain open to the same degree when unlatched, except doors at handicapped cubicles shall close automatically.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services for washroom accessories work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM A167, Specification for Stainless Steel and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM A312, Specification for Seamless and Welded Austenitic Stainless Steel Pipes.

.3 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.4 CAN/CSA B651-M, Barrier Free Design.

1.3 **SUBMITTALS**

.1 Product data: Submit Product data to requirements of Section 01 33 00 indicating each washroom accessory describing size, finish, details of function, attachment methods, hardware and locks, description of rough-in frame, and building-in details of anchors for grab bars.

.2 Closeout submittals:

.1 Submit for each Product operation and maintenance instructions for incorporating into the Operations and Maintenance Manuals in accordance with Section 01 33 00.

.1 Supply 2 keys for each lockable washroom accessory to Consultant.

.2 Master key washroom accessories which are keyed.

1.4 **DELIVERY, STORAGE AND HANDLING**

.1 Deliver materials in sealed cartons and containers with manufacturer’s name and product description clearly marked.

1.5 **EXTENDED WARRANTY**

.1 Submit an extended warranty for washroom accessories work in accordance with the General Conditions, except that the warranty period is extended to 10 years.

.1 Against cracked or scratched mirrors, spoiling or deterioration of silvering or backing, loosening of fastenings or adhesive

.2 Coverage: complete replacement including effected adjacent work.

1.6 **MAINTENANCE**

.1 Maintenance Tools: Provide special tools necessary for accessing, assembly/disassembly or removal of toilet, bath and cleaning accessories in accordance with Section 01 33 00.

2 Products

2.1 **MATERIALS**

.1 Stainless steel:

.1 Sheet metal: ASTM A167, Type 304.

.2 Tubing: ASTM A312, Type 304.

.2 Sheet steel: ASTM A653M, Z275; Cold rolled, commercial quality, surface preparation and pre-treatment as required for applied finish.

.3 Fasteners, screws and bolts: ASTM A167, Type 304 stainless steel, tamper-proof.

2.2 **ACCESSORIES**

.1 Refer to drawings for quantity and location of washroom accessories.

.2 Toilet tissue dispenser (TTD):

.1 #B-2888 by Bobrick or #0030 by ASI Group Canada; Surface mounted, multi roll dispenser, with second roll enclosed in cabinet above.

.2 Finish: Type 304 stainless steel with satin finish.

.3 Waste Receptacle (WR)

.1 #B-279 by Bobrick or approved alternative by ASI/Watrous or Bradley Corporation; Surface mounted 355 x 455 x 150mm receptacle.

.2 Finish: Type 304 stainless steel with satin finish.

.4 L-Shaped Grab bar (GBR-1):

.1 '3200 Series' by ASI/Watrous or approved alternative by Bobrick or Bradley Corporation; 760mm length, 38 mm diameter, 1.2 mm thick, concealed mounting with flange, L-shape as indicated on drawings.

.2 Finish: Type 304 stainless steel with a satin finish and peened grip.

.5 L-Shaped Grab bar (GBR-2):

.1 '3200 Series' by ASI/Watrous or approved alternative by Bobrick or Bradley Corporation; 1000mm length, 38 mm diameter, 1.2 mm thick, concealed mounting with flange, L-shape as indicated on drawings.

.2 Finish: Type 304 stainless steel with a satin finish and peened grip.

.6 Grab bar (GBR-3):

.1 '3200 Series' by ASI/Watrous or approved alternative; 600 mm length, 38 mm diameter, 1.2 mm thick, concealed mounting, complete with escutcheons as indicated on drawings.

.2 Finish: Type 304 stainless steel with a satin finish and peened grip.

.7 Grab bar (GBR-4):

.1 '3200 Series' by ASI/Watrous or approved alternative; 750 mm length, 38 mm diameter, 1.2 mm thick, concealed mounting, complete with escutcheons as indicated on drawings.

.2 Finish: Type 304 stainless steel with a satin finish and peened grip.

.8 Grab bar (GBR-5):

.1 '3200 Series' by ASI/Watrous or approved alternative; 1000 mm length, 38 mm diameter, 1.2 mm thick, concealed mounting, complete with escutcheons as indicated on drawings.

.2 Finish: Type 304 stainless steel with a satin finish and peened grip.

.9 Soap dispenser (SD):

.1 6A03-11 by Bradley Corporation or approved alternative; Vertical surface wall mounted dispenser, 100 mm from wall to automatic, 1.18 -litre capacity stainless steel container with tamper resistant sight gauge.

.2 Finish: Type 304 stainless steel with satin finish.

.10 Barrier-free mirror with shelf (MIRROR-1):

.1 #B-166 1830 by Bobrick or approved alternate; 6 mm thick, mirror quality float glass complete with stainless steel channel frame with galvanized steel back having integral horizontal hanging brackets, integral stainless steel shelf with return edge and galvanized steel concealed wall hanger.

.2 Frame finish: Type 304 stainless steel satin finish.

.3 Locations as indicated on the Contract Drawings.

.11 Mirror:

.1 Mirror (MIRROR-2) 6 mm thick, mirror quality float glass

.2 #B-166 2436 by Bobrick;, #20655-B series by ASI Group Canada or approved alternate; mitred corners welded, and polished smooth. 6 mm thick, mirror quality float glass complete with stainless steel channel frame with galvanized steel back having integral horizontal hanging brackets, integral stainless steel shelf with return edge and galvanized steel concealed wall hanger.

.1 Dimensions: 24”W x 36” H (61 x 91cm)

.2 Frame finish: Type 304 stainless steel satin finish.

.12 Full Length Mirror:

.1 Mirror (MIRROR-3) 6 mm thick, mirror quality float glass

.2 #0600 series by ASI Group Canada or approved equivalent; mitred corners welded, and polished smooth.

.1 Dimensions: 36”W x 72” H (914mm x 1829mm)

.2 Frame finish: Type 304 stainless steel satin finish.

.13 Coat hook (CH) :

.1 HDP005IP – Henkelhook Safety Release Coat Hook by Richelieu or approved alternative.

.2 Finish: Consultant to select from full arrange of standard colours.

.14 Baby changing station (CHTB):

.1 Horizontal baby changing station complete with liners.

.2 Model: Sturdy Station 2 by Rubbermaid or approved alternative.

.15 Backrest:

.1 Provide barrier-free backrests in all accessible washrooms where shown on Contract Drawings.

.2 Backrest to be fabricated from 32 mm o.d. stainless steel tubing having a satin finish, complete with concealed mounting and a 16 mm thick solid panel finished with white plastic laminate.

.3 Backrest, 'Model 1028' by Frost Products Ltd. or approved alternative.

.16 Sanitary napkin disposal (ND):

.1 #B-270 by Bobrick or approved alternative by ASI Group Canada; Surface mounted, top hung upper door with multi-staked piano hinge, surface mounted stainless steel wall box and waste receptacle, full length stainless steel hinge. Receptacle capacity: 3.8 L.

.2 Finish: All exposed edges Type 304 stainless steel with satin finish.

.17 Stainless Steel Shelf:

.1 #B-298 x 24 by Bobrick or approved alternative by ASI/Watrous or Bradley Corporation;; shelf fabricated from 1.2 mm thick stainless steel with 19 mm return edge and front edge hemmed for safety.

.2 Shelf complete with brackets fabricated from 1.6 mm thick stainless steel.

.3 Size: 200 mm wide x 600 mm length.

.4 Finish: Type 304 stainless steel, satin finish.

.18 Shower Seat (FSS):

.1 '#B-5191' Folding Shower Seat by Bobrick or approved alternative by ASI/Watrous or Bradley Corporation; 455 mm x 400mm seat.

.2 Finish: Solid Phenolic

3 Execution

3.1 **EXAMINATION**

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

3.2 **INSTALLATION**

.1 Verify and coordinate templates, inserts, and rough-in frames and verify exact location of washroom accessories for installation.

.2 Verify there is adequate supports and/or blocking in gypsum wall assemblies prior to installation of washroom accessories.

.3 Provide fastening and mounting kits for washroom accessories.

.4 Locate washroom accessories where indicated on Drawings and where directed by Consultant.

.5 Install washroom accessory fixtures, accessories, and items in accordance with manufacturer's instructions and CAN/CSA B651-M. Provide exposed tamper-proof screws of stainless steel to match units.

.6 Install washroom accessories plumb, level, and securely and rigidly anchored to substrate surfaces and framing. Adjust accessories for proper operation and verify mechanisms function smoothly.

.7 Install grab bars to withstand minimum 408 kg downward pull. Provide necessary reinforcements as required.

.8 Clean and polish exposed surfaces

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products equipment and services necessary for the miscellaneous specialities Work in accordance with the Contract Documents.

1.2 **SUBMITTALS**

.1 Product data:

.1 Submit manufacturer's Product data for each Product specified in accordance with Section 01 33 00 indicating:

.1 Performance criteria, compliance with appropriate reference standard(s),

.2 Product transportation, storage, handling and installation requirements.

.2 Shop drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 indicating elevations, sections, details, dimensions, materials, gauges, and finishes.

.3 Closeout submittals: Submit cleaning and maintenance instructions for miscellaneous specialties for incorporation into Operations and Maintenance Manuals in accordance with Section 01 33 00.

1.3 **DELIVERY, STORAGE, AND HANDLING**

.1 Package or crate, and brace products to prevent distortion in shipment and handling. Label packages and crates, and protect finish surfaces by sturdy wrappings.

2 Products

2.1 **MATERIALS**

.1 Access doors (non-fire rated walls and ceilings):

.1 Access door, “Bauco Plus II TX” by Access Panel Solutions or approved alternative.

.2 Seamless access penal for gypsum board with concealed aluminum frame with continuous factory installed perimeter EPDM gasket, galvanized steel hardware, pivoting hinge and steel safety cable with clip for ceiling operation.

.3 Provide concealed mechanical touch-latch for ceiling access doors and tamper-resistant torx head can latch lock for wall and ceiling applications.

.4 Door size as approved by the Consultant for intended applications.

.5 Finishing: In accordance with Section 09 91 00.

.2 Access doors (tiled insert – walls):

.1 Access door, “Bauco Plus II TX” by Access Panel Solutions or approved alternative.

.2 Seamless access penal for gypsum board with concealed aluminum frame with continuous factory installed perimeter EPDM gasket, galvanized steel hardware, pivoting hinge and steel safety cable with clip for ceiling operation.

.3 Provide concealed mechanical touch-latch for ceiling access doors and tamper-resistant torx head can latch lock for wall and ceiling applications.

.4 Door size as approved by the Consultant for intended applications.

.5 Finishing: In accordance with Section 09 30 00 and 09 91 00.

.6 Install bench brackets and supports supplied under work of Section 05 50 00.

3 Execution

3.1 **EXAMINATION**

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

3.2 **PREPARATION**

.1 Verify substrate surfaces are solid, free from surface water, dust, oil, grease, projections and other foreign matter detrimental to performance.

.2 Items to be built-in: Provide information and templates required for installation of work of this Section, and assist or supervise, or both, the setting of anchorage devices, and construction of other work incorporated with products specified in this Section in order that they function as intended.

.3 Verify there is adequate supports and / or blocking in gypsum wall assemblies prior to installation of miscellaneous speciality items as required.

3.3 **INSTALLATION**

.1 Install miscellaneous specialties level and securely and rigidly anchored to substrate in accordance with authorities having jurisdiction, reviewed shop drawings, and manufacturer's written instructions.

.2 After installation, adjust miscellaneous specialties in accordance with manufacturer’s written instructions.

3.4 **CLEANING**

.1 Clean and polish exposed surfaces prior to acceptance by Consultant.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products equipment and services necessary for the shower curtain Work in accordance with the Contract Documents.

1.2 **SUBMITTALS**

.1 Samples: Submit samples of the following in accordance with the requirements of Section 01 33 00:

.1 Submit manufacturer’s Product data sheets for Products proposed for use in the work of this section.

.2 Indicate curtain stack depth, stack size, and depth from wall obstruction.

.3 Submit 3 samples of each type and colour of curtain fabric specified, 300 mm x 300 mm (12” x 12”), for acceptance of colour and construction by Consultant. Obtain acceptance from Consultant prior to ordering material.

1.3 **QUALITY ASSURANCE**

.1 Installers / applicators / erectors: Work of this section, shall be executed by competent installers with minimum 5 years experience in application of Products specified and with approval and training of Product manufacturer. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

1.4 **DELIVERY, STORAGE, AND HANDLING**

.1 Product shall be delivered to the Place of the Work in manufacturer's original packaging.

.2 Product shall be handled and stored to prevent damage to materials, finishes and operating mechanisms.

2 Products

2.1 **MATERIALS**

.1 Track; manual/cord operated:

.1 Heavy duty aluminum cord operated track system with roller gliders on rim of front channel.

.2 Acceptable Product: Silent Gliss ‘6200’.

.3 Load: 70 kg maximum curtain weight.

.4 Mounting: ceiling.

.2 Fabric; fire retardant:

.1 Acceptable Product: Privacy Curtain – Flourish 2

.2 Width: 1680 mm (66").

.3 Colour: To be selected from full range of standard colours

.3 Fabrication:

.1 4 panels.

.2 Wave, 76 mm (3”) wide heading tape, plastic hooks. .3 Bottom hems: 152 mm (6”) with weight

.3 Side hems: 50 mm (2”).

.4 Fullness: 2.3.

.5 Wand: on both sides of panels.

.6 Length: custom, 1500 mm at finished floor.

3 Execution

3.1 **EXAMINATION**

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

3.2 **INSTALLATION**

.1 Install work to meet manufacturer’s recommended specifications, true, tightly fitted, and level or flush to adjacent surfaces, as suitable for installation.

.2 Include reinforcing, anchorage and mounting devices required for the installation of each product.

3.3 **DRAPERY TRACK INSTALLATION**

.1 Set assemblies plumb, square, and level.

.2 Install with securely anchored brackets at 600 mm (24") on centre.

.3 Fit track with end stops where applicable.

.4 Use only compatible, non-corrosive fasteners for installation, and conceal in final assembly unless otherwise specifically permitted by Consultant.

3.4 **INSTALLATION TOLERANCES**

.1 Install level, tight and secured.

.2 Comply with the following maximum tolerances:

.1 Level: 3 mm (1/8").

.2 Variation from indicated position: plus/minus 3 mm (1/8").

3.5 **ADJUSTING AND CLEANING**

.1 Verify under work of this section that installed products function properly, and adjust them accordingly to ensure satisfactory operation.

.2 Refinish damaged or defective work so that no variation in surface appearance is discernible.

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Division One, General Requirements is part of this Section and shall apply as if repeated here.

1.2. SUMMARY

1.2.1. Work Included:

1.2.1.1. Provide below-grade Concrete Swimming Pool, including but not limited to the following:

1.2.1.1.1. Cast-in-place pool structure and finishes.

1.2.1.1.2. Pool pumps, filter systems, inlets, outlets, Variable Frequency Drives (VFD's), Chemical Treatment Systems, pool piping and pool skimmer system.

1.2.1.1.3. Provide swimming pools and deck accessories, safety and maintenance equipment and signage.

1.2.1.1.4. Coordination of weeping tile system. (Connection to storm by Division 15).

1.2.1.1.5. All other Work as described herein and, on the drawings, and the supervision or approval of Work to be completed by related Contractors as referenced in this Section

1.2.1.2. All Division 13 specifications and Division 13 engineered plans are to be read in conjunction of one another for full project bid submission.

1.2.1.3. It is the intent of this Section to place the responsibility for the construction of the pool and pool-related equipment noted in these specifications and drawings under one vested POOL SUBCONTRACTOR. Subletting of the Work of this Section by the General Contractor to various sub-trades will not be permitted. The POOL SUBCONTRACTOR shall actually do at least the Work noted below and shall coordinate and verify all Work relating to the pools, pool equipment, controls and systems. Under this Section, the POOL SUBCONTRACTOR shall provide but is not necessarily limited to:

1.2.1.3.1. Layout the pool with General Contractor and provide all excavation for pool and all pool pipe trenches.

1.2.1.3.2. Backfill using free draining imported granular fill, compact fill around structures, piping trenches and excavations required by this Section, or as noted in the soil report. Remove and dispose of all excavated materials from site.

1.2.1.3.3. Construct the pool structure, including reinforcing steel, inserts, fittings and piping. Before commencing concrete pours, verify electrical bonding of swimming pool embedded items and reinforcing steel and verify that any required electrical, plumbing or building inspections have been performed. Provide any pool structure ground water drainage around the pools as shown on the Drawings.

1.2.1.3.4. POOL SUBCONTRACTOR shall provide all housekeeping pads, hangers, fire stops, pipe seals through sleeves, thrust blocks,

anchorage and supports for the pool piping and equipment. Furnish pipe sleeves for pool equipment installation by other Contractors at the proper locations. Division 13 to site coordinate pipe sleeves with other Contractors.

1.2.1.3.5. POOL SUBCONTRACTOR shall provide all scaffolding, rigging, hoisting and services necessary for erection and delivery into the premises and mechanical spaces of any equipment and apparatus furnished. Remove same from premises when no longer required.

1.2.1.3.6. Furnish and install a Skimmer recirculation system on the Pool.

1.2.1.3.7. Furnish and install a complete filtration system, including recirculation pump, recirculation piping, water treatment equipment, flow meters, gauges, and valves. Colour code all piping.

1.2.1.3.8. Furnish and install an automatic chemical feed system and related pumps for chlorine sanitation systems and pH adjustment systems.

1.2.1.3.9. Furnish, layout and install all anchors, sockets, inserts and stainless-steel rail good. Install and adjust all equipment.

1.2.1.3.10. Surface finishes shall be in accordance with ANSI 7 standards for slip resistance.

1.2.1.3.11. Furnish and install epoxy paint finishes within the pool tank. Protect all surfaces from concrete splash and other damage until handed over to the Owner.

1.2.1.3.12. Furnish and install chemical controller including sample stream piping and sensors.

1.2.1.3.13. Furnish and install tiled depth markings, contrasting bands, and stair and bench nosing and markings. POOL SUBCONTRACTOR to verify the depth of the pool prior to the depth marking installation. Tiled depth markers to be set flush within the concrete deck.

1.2.1.3.14. Furnish and install all pool equipment control systems and instrumentation not shown on the electrical drawings. POOL SUBCONTRACTOR to perform all wiring and connection related to the pool equipment.

1.2.1.3.15. Perform test for water tightness as directed in this Section.

1.2.1.3.16. Furnish and install heating units and pool water piping to and from the heating units, including thermometers, flow switches, thermowells, and valves.

1.2.1.3.17. Furnish and assemble all maintenance and safety equipment as listed in Section 13 40 00, including all required pool safety signage.

1.2.1.3.18. Furnish and install automatic fill systems and fill piping including static water level lines, sensor fittings, electronic controllers and sensors.

1.2.1.3.19. Start, test, calibrate and adjust all equipment, chemical feed equipment, and vacuum cleaning equipment and instruct Owner's representative in the operation and maintenance of the system.

1.2.1.3.20. Furnish and install all chemical-resistant sealant joints inside or within areas of the pools, including but not limited to backer rods, primers and required accessories. Pool sealants must be chlorine resistant and be compatible with all pool chemicals.

1.2.1.3.21. Owner will pay for all water for two (2) complete fillings. Any additional fillings will be paid by the POOL SUBCONTRACTOR.

1.2.1.3.22. Certify in writing that the manufacturers of filtration, recirculation and chemical control equipment furnished and installed under this Section of the Specifications have:

1.2.1.3.22.1. Examined the contract documents and agree that their equipment is compatible with the design of the pool tank, filter room, pool capacity and when properly installed will provide recirculation and filtration in accordance with standards noted.

1.2.1.3.22.2. Agreed with all fabrication work for filtration systems and water treatment systems, which will be installed by a manufacturer approved installer.

1.2.1.3.23. The POOL SUBCONTRACTOR shall make available on call the services of a competent and experienced pool equipment installer to inspect the completed installation, adjust the automatic controls for the proper set points, place the system in operation and give operation instructions for its care and use.

1.2.1.3.24. Obtain operating permits and final acceptance by all government authorities in a timely manner preventing delays. The permit submission and plan-checking fee for the swimming pool will be paid by the Owner.

1.2.1.3.25. The POOL SUBCONTRACTOR shall provide for the storage of equipment and materials in excess of those allowed on site by the Owner's representative.

1.2.1.3.26. The POOL SUBCONTRACTOR shall provide and maintain proper shoring and bracing for existing utilities, sewers and building foundations in relation to the pool Work.

1.2.1.3.27. The POOL SUBCONTRACTOR shall provide all pumping/dewatering necessary to keep pools excavations free from water.

1.2.1.3.28. The POOL SUBCONTRACTOR shall erect and maintain all necessary barricades and signs to protect the workmen and the public in relation to the pool Work.

1.2.1.3.29. The POOL SUBCONTRACTOR shall excavate for all under tank pool piping and encase in concrete.

1.2.1.3.30. The POOL SUBCONTRACTOR shall supply and install an emergency stop button, including audible/visual alarm in the pool area in accordance with local codes. The button itself shall be wired by the POOL SUBCONTRACTOR and shut down all pool related pumps when activated. Pumps to be reset manually form the pool mechanical space.

1.2.1.3.31. The POOL SUBCONTRACTOR shall provide all grounding of pool equipment as required by the Ontario Electrical Code. Main pool tank

and accessory grounding loop shall also be provided by the POOL SUBCONTRACTOR.

1.2.1.3.32. The POOL SUBCONTRACTOR shall provide electrical power wiring including pool pump motor starters, disconnects, panels, junction boxes and power wiring, chemical feeder receptacles (through the pool monitor-controller unit), pump interlocks.

1.2.1.3.33. Pool SUBCONTRACTOR to provide receptacles as needed for pool equipment within the pool mechanical and chemical rooms, and connect to power.

1.2.1.3.34. The POOL SUBCONTRACTOR shall provide all required Permits, inspections and approvals of all wiring in accordance with local codes and the Ontario Hydro Code.

1.2.1.3.35. The POOL SUBCONTRACTOR shall provide the Consultant with written and verified pressure test reports for every pool pipe installed that is not exposed. All pressure testing to be done with water.

1.2.1.3.36. Provide caulked joints on the pool deck at all construction and control joints. Pool Deck construction joints to be created using the Key-Loc Joint system.

1.2.1.3.37. The POOL SUBCONTRACTOR shall supply and install all pool safety signage as required by Ontario Building Code and Ontario Health Regulations.

1.2.1.3.38. All water fillings (during water tightness test, and once tile has been installed) shall be done at a rate of no more than 1" per hour (1' per day) to avoid damage to the concrete tank, as well as the concrete finishes.

1.3. QUALIFICATIONS

1.3.1. Execute Work of this Section using a company who has experience in application of Products, systems and assemblies specified, and illustrated. Perform Work using skilled mechanics trained and experienced in Work of this complexity.

1.3.2. POOL SUBCONTRACTOR to have completed a minimum of five (5) Class A commercial pools with similar scope of work within the past four (4) years, and shall be available upon request. Proof of qualifications shall not be required for tender evaluation.

1.3.3. POOL SUBCONTRACTOR to provide a list of referrals (projects) for similar projects, minimum five (5) projects, upon request. Proof of qualifications shall not be required for tender evaluation.

1.3.4. POOL SUBCONTRACTOR to include a letter from the POOL SUBCONTRACTOR'S bonding company confirming the surety's willingness to provide a 100% Performance Bond and a 50% Labour and Material Payment Bond for the General Contractor. Indicate the length of time spent with mentioned surety company and provide a named reference with the phone number. All documents to be included with bid submission.

1.3.5. POOL SUBCONTRACTOR to use local forces and/or services as required to facilitate requirements set out within this contract (i.e. pool tile). Local trades to have experience similar to the requirements of the POOL SUBCONTRACTOR, as stated within these Specifications. All sub-contracted Work must be overseen and deemed acceptable by the POOL SUBCONTRACTOR. The POOL SUBCONTRACTOR is responsible to fulfill the requirements of these Specifications and is responsible for all sublet Work.

1.3.6. POOL SUBCONTRACTOR to carry minimum $2 million insurance.

1.4. RELATED WORK PERFORMED BY GENERAL CONTRACTOR OR OTHER SUBCONTRACTORS AND NOT BY THE DIVISION 13 SUBCONTRACTOR

1.4.1. Concrete work for the pool deck including a granular base, broom finish, all conduits under deck slab, sleeves and KBE deck trench drain system. Connection of deck drains to sanitary by Division 15

1.4.2. Concrete work for pool equipment room and backwash sump pit, other than housekeeping pads.

1.4.3. Install any required sleeves furnished by POOL SUBCONTRACTOR.

1.4.3.1. General Contractor shall be responsible for the placement of sleeves for pool piping and other conduits at all construction areas through walls constructed by other than POOL SUBCONTRACTOR. POOL SUBCONTRACTOR shall furnish sleeves and provide placement coordination.

1.4.4. General Contractor shall provide adequate light, electric power, heat, ventilation and water for POOL SUBCONTRACTOR to install equipment.

1.4.5. General Contractor shall take every practical precaution to prevent concrete from spattering on the finishes with protective materials.

1.4.6. General Contractor shall not permit any heavy equipment activity over any area within 1524mm (5 feet) of any area under which pool piping is buried or within 1524mm (5 feet) of pool wall. There shall be no exceptions to this procedure.

1.4.7. General Contractor shall keep the pool excavation and pool structure free of construction residue and waste materials from his workmen or Subcontractors removing said material from the pool at the direction of the POOL SUBCONTRACTOR and POOL CONSULTANT.

1.4.8. General Contractor shall protect the pool from damage caused by his construction equipment and/or workmen and subcontractors. General Contractor shall provide an adequate storage area and protect materials and equipment stored on job site by the POOL SUBCONTRACTOR from damage, weather or theft.

1.4.9. General Contractor shall furnish and install all necessary foundations, pits and recesses in slabs, required for all pool equipment, pumps, tanks and for all other equipment furnished by the POOL SUBCONTRACTOR, within the scope of concrete Work associated with the building enclosure or perimeter base building construction surrounding the pool and deck areas, and shall submit drawings to the Consultant/Engineer for approval before purchase, fabrication or construction of same.

1.4.10. General Contractor shall have all soil excavations in the pool area tested by a firm with experience in SPDD (Standard Proctor Dry Density) testing to ensure all compaction meets the requirements of sub-surface packed aggregates. For example Soil Eng or EXP (Trow).

1.4.11. Pay for all concrete tests, tiles pull tests, soil compaction test and any other testing. All reports from such to be forwarded to Architect, Owner and Pool Consultant for verification.

1.5. RELATED WORK PERFORMED BY DIVISION 15 OR OTHER SUBCONTRACTORS AND NOT BY DIVISION 13 SUBCONTRACTOR:

1.5.1. Installation of sanitary and storm sewer systems including excavation and backfill.

1.5.2. Associated piping required for the pool deck drains system.

1.5.3. Furnish and install drains and drains piping from filter room and chemical room, including floor drains, weeping system sump pit, backwash pit system, sump pumps, and piping from these items.

1.5.4. Furnish and install water services, hose bibs including back flow preventor and pressure reducing valve.

1.5.5. Provide representation at all times of pool start-up to coordinate Work related to pool system.

1.5.6. Provide temporary water service during construction.

1.5.7. Provide vents for all pool chemical tanks to exterior. Vents to be vented to atmosphere separately using PVC pipe.

1.5.8. Provide hose bibs on pool deck spaced approximately 22,860mm (75 feet).

1.5.9. Provide eye wash station in pool mechanical room.

1.5.10. Provide CO_2 sensor in pool mechanical room c/w leak and alarm detection.

1.5.11. Provide adequate ventilation in pool mechanical room and pool chemical room (separately).

1.5.12. Coordinate all excavation for underground piping with Division 13 Subcontractor.

1.5.13. Do not use any pool-piping trench for installation of any gas, waste or water line.

1.6. RELATED WORK PERFORMED BY DIVISION 16 OR OTHER SUBCONTRACTORS AND NOT BY DIVISION 13 SUBCONTRACTOR:

1.6.1. Furnish temporary power as required by the POOL SUBCONTRACTOR.

1.6.2. The ELECTRICAL CONTRACTOR shall provide general lighting for the pool and mechanical room.

1.6.3. The ELECTRICAL CONTRACTOR shall install the emergency telephone for the pool area.

1.6.4. The ELECTRICAL CONTRACTOR shall provide power to the Division 16 pool electrical panel located in the pool equipment room for all required pool equipment.

1.7. WATER TIGHTNESS TEST PROCEDURE

1.7.1. All concrete pool tanks shall be tested for water tightness, after backfilling around pool is complete, using the following procedure.

1.7.1.1. Plug all pipe systems in the pool tank.

1.7.1.2. Fill pool tank, at a rate of no more than 1” of water per hour (1’ per day), to avoid damaging (shocking) the concrete tank. Quicker filling is possible if the temperature difference between the water and tank is 10C degrees or less.

1.7.1.3. Let water stand in pool for twenty-four (24) hours to allow for absorption by concrete. Top up the water level; fill a pail with water, to the top. Mark pool and pail. Let water stand in pool tank and pail for forty-eight (48) hours.

1.7.1.4. Every twelve (12) hours, check the water level in the pool tank and compare it with the water level in the pail. Document test every twelve (12) hours.

1.7.1.5. The POOL SUBCONTRACTOR shall not be responsible for securing the vicinity of the pools being tested, for the purpose of keeping unauthorized persons from exposing themselves to the danger of falling into the pool while it is filled with water.

1.7.1.6. Test for forty-eight (48) hours. Any loss more than 13mm (½") in a twenty-four (24) hour period will require repairs at the POOL SUBCONTRACTOR expense. Repeat the procedure until test is within tolerance.

1.7.1.7. The General Contractor to verify test results.

1.7.1.8. In the event of water tightness failure, the CONTRACTOR responsible for the concrete pool tank shall provide all remedial and repair work necessary at no additional cost to ensure concrete pool tank are watertight. Additional water tightness testing to be repeated at no additional cost to the Owner until the above criteria is achieved.

1.8. WARRANTY

1.8.1. The POOL SUBCONTRACTOR warrants to the Owner that all materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The POOL SUBCONTRACTOR warranty excludes remedy for damage or defect caused by abuse, improper or insufficient maintenance, improper operations, modifications not executed by the POOL SUBCONTRACTOR or improper wear and tear under normal use and acts of god. The chemical balance of the pool water must conform to standard swimming pool guidelines and must be maintained as recommended in the manuals to prevent damage.

1.8.2. All warranties shall be for a period of one (1) year from the date of substantial performance of the Work, subject to the manufacturer's warranty, unless otherwise specified below:

1.8.2.1. Defects in material or workmanship of the pool structure causing a loss of water for a period of ten (10) years.

1.8.2.2. Tile grout and adhesive manufacturer's labour and materials warranty for a period of five (25) years.

1.8.2.3. Defects in material or workmanship of the pool underground piping systems for a period of two (2) years.

1.8.3. The POOL SUBCONTRACTOR shall agree to repair or replace any Work at no cost to the Owner upon written notification from the Owner within the warranty period.

1.9. COMMISSIONING AND SYSTEM TRAINING

1.9.1. Qualified representative of the Installer performing Work under this Section shall put the equipment into operation and instruct the Owner's representatives in the operation of this equipment to the Owner's satisfaction immediately after project substantial performance of the Work.

1.9.2. Training period shall be twenty-four (24) hours on-site. Training scheduled as follows:

1.9.2.1. Eight (8) hours initial training.

1.9.2.2. Eight (8) hours after Owner's staff has had two (2) weeks experience operating the system.

1.9.2.3. Eight (8) hours, four (4) weeks after the 2nd training session.

1.9.2.4. POOL SUBCONTRACTOR to video the training session and/or arrange video sessions with major suppliers such as filtration system, chemical feeders and water

level controller. Staff to be trained in general maintenance and operation procedures. Provide the Owner with a digital copy.

1.9.2.5. For outdoor installations, POOL SUBCONTRACTOR is responsible for first winterization and first spring opening (not including original opening) of pool. Any repairs due to improper winterization for first closure shall be at the cost of the POOL SUBCONTRACTOR.

1.10. POOL FILL WATER QUALITY

1.10.1. The Owner shall bear the cost of the water required for three (3) complete fillings of the pool (the initial leak test and the final filling). Any subsequent fillings shall be borne by the POOL SUBCONTRACTOR.

1.10.2. POOL SUBCONTRACTOR shall monitor and verify fill water is balanced with a saturation index between –0.3 and +0.3.

1.10.3. Temperature of fill water will be within plus or minus 5.56 degrees Celsius (10 degrees Fahrenheit) of the ambient air temperature and/or the pool structure at the time of any filling.

1.10.4. POOL SUBCONTRACTOR to provide the necessary chemicals to adjust and balance the water chemistry in the pools to the following levels:

Free Available Chlorine:	2.0 to 4.0 ppm
Total Chlorine:	1.0 to 4.0 ppm
Combined Chlorine:	0.0 to 0.2 ppm
pH:	7.4 to 7.6
Calcium Hardness:	200 to 400 ppm
Total Alkalinity:	80 to 120 ppm
Langelier saturation index between:	–0.3 and +0.3
Cyanuric Acid	30 to 150 ppm

1.11. COORDINATION AND CLARIFICATION

1.11.1. Coordinate with other trades affecting and affected by Work of this Section.

1.11.2. The General Contractor must establish with the selected POOL SUBCONTRACTOR and with the other trades having related Work in this Section that all work necessary to complete the pool(s) as shown on the plans and in the Specifications is included in his base bid to the Owner. Further, the POOL SUBCONTRACTOR in his bid to the General Contractor will list specifically those items of related Work to include in his proposal.

1.11.3. When in doubt regarding the responsibility for Work covered in this Section and/or discovery of errors or omissions in the bidding documents, the POOL SUBCONTRACTOR shall notify the Consultant/Engineer and request a clarification prior to the bid date. The POOL SUBCONTRACTOR's base bid shall be complete and include anything required to make the system operate to the Owner's and Consultant's satisfaction and in compliance with all codes having jurisdiction over this project.

1.12. ALTERNATES

1.12.1. POOL SUBCONTRACTOR to submit his bid based on materials, equipment and methods as specified in this Section. No substitution of materials will be allowed.

1.12.2. It is the intent of the Contract Documents to encourage competition. The base proposal must be based on furnishing the construction methods and equipment as specified and detailed. Any proposed system substitution must have prior approval of the Local Building Department and Consultant minimum five (5) business days prior to the closing date.

1.12.3. All proposed substitutions of specified construction methods and equipment shall include a complete submittal as required by these Specifications and Drawings of appropriate scale incorporating all required changes. All submissions shall be stamped by a registered Professional Engineer (P. Eng.). The POOL SUBCONTRACTOR shall provide a list of at least ten (10) satisfactory installations comparable to this project that have been manufactured and installed under the contractor's current legal name. Submit a list of such projects with the name, address and current telephone number of the Owner/Operator and Architect of Record to the Architect at least ten (10) days prior to the bid date.

1.12.4. The Architect will issue an addendum if the substitutions are approved.

1.12.5. Any changes or modifications to the Contract Documents shall be the sole responsibility of the POOL SUBCONTRACTOR.

1.12.6. Bidders shall provide with their bid any approved alternate proposals and amount of savings.

1.13. SUBMITTALS

1.13.1. All submittals shall be made in accordance with the requirements of Division 1 – General Requirements and in strict compliance with the following procedures and guidelines.

1.13.2. Shop Drawings and engineering data shall be in accordance with requirements of Division 1.

1.13.3. Permits, Receipts and Test Reports:

1.13.3.1. Submit a sample format for each pressure test report form intended for use.

1.13.3.2. Submit pipe pressure test reports required herein only on pre-approved forms.

1.14. MAINTENANCE MANUALS AND CLOSE-OUT SUBMITTALS

1.14.1. Detailed operation and maintenance information shall be supplied for all equipment requiring maintenance or other attention. The equipment supplier shall prepare an operation and maintenance manual for all equipment. Parts lists and operating and maintenance instructions shall be furnished.

1.14.2. Operation and maintenance manuals shall include the following:

1.14.2.1. Equipment function, normal operating characteristics, and limiting conditions.

1.14.2.2. Assembly, installation, alignment, adjustment and checking instructions.

1.14.2.3. Operating instructions for startup, routing and normal operation, regulation and control, shutdown and emergency conditions.

1.14.2.4. Operating cycles shall be specifically described in outline format and in referenced detail. A legible wall-mounted colour-coded piping flow diagram shall be provided in equipment room.

1.14.2.5. Include manufacturer recommended maintenance schedule, parts lists, piping diagram (to agree with wall mounted diagram) and trouble shooting information for all pool mechanical equipment. Provide motor warranty depot for each and every motor manufacturer.

1.14.2.6. Using reference to keyed valves and wall diagram, include specific written instructions for procedures to be followed for:

1.14.2.6.1. Emptying and refilling the pools including de-watering during the period that the pool will be empty;

1.14.2.6.2. Filter operation and backwashing;

1.14.2.6.3. Super chlorination;

1.14.2.6.4. Water level control and adjustment and

1.14.2.6.5. Chemical controllers

1.14.2.7. Lubrication and maintenance instructions.

1.14.2.8. Guide to “troubleshooting”.

1.14.2.9. Parts list and predicted life of parts subject to wear.

1.14.2.10. Test all motors and provide written confirmation. Electrical Consultant will provide the necessary forms.

1.14.2.11. Specific written instructions for procedure for emptying and refilling the pools including de-watering during any period that the pool will be empty. Provide a red sign with minimum 1” letters in the equipment room (1/8” thick Plexiglas):

WARNING
DO NOT DRAIN POOL WITHOUT
FOLLOWING THE PROCEDURES IN
THE POOL OPERATION MANUAL

1.14.2.12. Provide 216mm x 279mm (8 ½” x 11”) laminated pump curve for each and every pump, posted next to the specific pump.

1.14.3. The operation and maintenance manuals shall be in addition to any instructions or parts lists packed with or attached to the equipment when delivered, or which may be required by the POOL SUBCONTRACTOR.

1.14.4. Manuals and other data shall be printed on heavy, first quality paper, 216mm x 279mm (8 ½” x 11”) size with standard 3-hole punching. Drawings and diagrams shall be reduced to 216mm x 279mm (8 ½” x 11”) or 279mm x 432mm (11” x 17”). Where reduction is not practicable, larger drawings shall be folded separately and placed in envelopes, which are bound into the manuals. Each envelope shall bear suitable identification on the outside.

1.14.5. One (1) bound volumes and 1 digital volume of each manual shall be submitted (or as required). All parts lists and information shall be assembled in substantial manuals and permanent, three-ring or three-post binders. Material shall be assembled and bound in the same order as specified, and each volume shall have a table of contents and suitable index tabs.

1.14.6. All material shall be marked with Project identification and inapplicable information shall be marked out or deleted.

1.14.7. Shipment of equipment will not be considered complete until all required manuals and data have been received.

1.15. PRODUCT DELIVERY, STORAGE AND HANDLING

1.15.1. Deliver materials in manufacturer's original, unopened containers and crates with all labels intact and legible.

1.15.2. Deliver materials in sufficient time and quantity to allow continuity of work and compliance with approved construction schedule.

1.15.3. Handle materials in a manner to prevent damage.

1.15.4. Store all materials on clean raised platforms with weather protective covering when stored outdoors. Provide continuous protection of materials against damage or deterioration.

1.15.5. Remove damaged materials from site.

1.16. START-UP CHEMICALS

1.16.1. POOL SUBCONTRACTOR shall maintain the chemical balance of the pool water (including the cost of all chemicals required) until the pool and mechanical system is fully operational and accepted by the Consultant/Engineer and the Owner.

1.16.2. Provide to the Owner sufficient quantities of the necessary chemicals to maintain the pools operation for a minimum of thirty (30) days from the date of substantial performance of the work.

1.16.3. Provide the Owner with a list of necessary chemicals sixty (60) days prior to filling of the pool complete with estimated monthly quantities.

1.17. RECORD DRAWINGS

1.17.1. Provide a complete set of record Drawings of the entire pool system and underground piping. All record Drawings shall be furnished electronically on a DVD in AutoCAD software and 3 printed copies.

1.17.2. POOL SUBCONTRACTOR to update a set of "as built" Drawing daily showing locations and elevations of all underground piping of the pools.

1.17.3. Provide record Drawings promptly upon completion of all underground piping.

1.17.4. All underground piping Drawings of the pools shall show the location of all piping and the depth of all piping.

1.18. SPECIFICATION ISSUES LOG

REV NO.	ISSUE	DATE
A	Issued for Tender	09-18-24

END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Division One, General Requirements is part of this Section and shall apply as if repeated here.

1.2. DESCRIPTION

1.2.1. Supply labour, materials, plant, tools and equipment to complete the Work as shown on the Drawings and as specified herein including, but not limited to the following:

1.2.1.1. Reinforced concrete for pool structure.

1.3. STANDARDS, CODES AND ACTS

1.3.1. Conform with the Ontario Building Code 2006 under Ontario Regulation 350/06, and amendments O.Reg. 22, 102 and 122/98, O.Reg. 152, 278, 593 and 597/99, O. Reg. 205/00, O.Reg. 283/01, O. Reg. 220/02, O. Reg. 304 and 305/03, O. Reg. 23 and 245/04 and O. Reg. 145, 146, 236 and 389/05 and all other applicable acts of any authority having jurisdiction and the following:

1.3.1.1. CAN/CSA-A23.1-04, Concrete Materials and Methods of Concrete Construction, Canadian Standards Association.

1.3.1.2. CAN/CSA-A23.3-04, Design of Concrete Structures for Buildings, Canadian Standards Associations.

1.3.1.3. CAN/CSA-A3000-08, Cementitious Materials Compendium, Canadian Standards Association.

1.3.1.4. CAN/CSA-A3001-08, Cementitious Materials for Use in Concrete, Canadian Standards Association.

1.3.1.5. ASTM C260-01, Standard Specification for Air-Entraining Admixtures for Concrete, Canadian Standards Association.

1.3.1.6. CAN/CSA-S269.3-M92 (R2008) – Concrete Formwork, Canadian Standards Association.

1.3.2. Where there are differences between the specifications, drawings, codes, standards or act, the most stringent shall govern.

PART 2 - PRODUCTS

2.1. FORMWORK

2.1.1. For exposed concrete, new exterior grade plywood, smooth and free of defects in as large sections as possible or of new metal forms free of dents or distortion.

2.1.2. For unexposed concrete, new or used plywood, sound plank material, new or used metal forms free of distortion.

2.1.3. Snap-off metal ties with [plastic cones so arranged that no metal will be within 20mm of the concrete surfaces.

2.1.4. Form Coating: If used, compatible with finishes which are specified for application to concrete.

2.1.5. Water: Potable.

2.2. CONCRETE REINFORCEMENT

2.2.1. Reinforcing Steel: To meet specified requirements of CSA G30 series M92: billet steel, grade 400 deformed bars unless otherwise indicated.

2.2.2. Chairs, bolsters, bar supports, spacers: Adequate for strength and support of reinforcing concrete conditions. Plastic or concrete construction.

2.2.3. Pool deck and pool tank, reinforcement as per details and drawings from Division 3 & Division 13.

2.3. CONCRETE

2.3.1. Concrete design mix shall be transit-mixed from a ready-mix plant with materials and mixing procedures to meet specified requirements of CSA Specification A23.1-04. The concrete shall be mixed so that it is homogenous, uniformly workable and readily placeable into corners and angles of forms and around reinforcement by the methods of placing and consolidation employed on the work, but without permitting materials to segregate or excessive free water to collect on the surface. The concrete for the pool, deck, and surge tanks shell shall be normal density concrete with 28-day compressive strength of 30 MPa, Type F-1, and 75 mm slump. Concrete to have a 0.50 water/cement ratio.

2.3.2. Cement: Type GU - General use (Type 10) to meet specified requirements of CAN/CSA-A5-M93.

2.3.3. Plasticizing Admixture: To meet specified requirements of CAN 3-A266.2-M78, Type WN: Conchem SPN or approved equal.

2.3.4. Waterstop: Polyvinyl Chloride, size as indicated; butt welded and fused. Lap joints not acceptable.

2.3.5. All concrete to be water cured for fourteen (14) days.

2.3.6. No water shall be added on site.

2.3.7. Waterproofing admixture to be included as per Section 13 15 01.

2.3.8. Fibremax F1 admixture (or approved similar) shall be added to the concrete mix design.

PART 3 - EXECUTION

3.1. INSTALLATION

3.1.1. Comply with requirements of Section 03100: Concrete Formwork, Section 03200: Concrete Reinforcement and Section 03300: Cast-In-Place Concrete where applicable unless otherwise indicated in this Section.

3.1.2. Pool tank and pool deck shall be cast-in-place reinforced concrete.

3.1.3. Add a plasticized admixture to concrete in accordance with manufacturer's Specifications. Use admixture only as plasticizing agent and incorporate as a liquid by automatic mechanical dispenser. Reduce mix water but do not change cement content from that required in plain mix design. Submit mix design to consultant for approval. Water shall not be added to the mix at site.

3.1.4. Incorporate air entrainment in accordance with the standards having jurisdiction.

3.1.5. Locate waterstops at floor/wall intersections and at construction joints, if any, and as indicated on Drawings. Build waterstops into forms and support against displacement during pouring of concrete. Use preformed waterstop corners and intersections where available. Use butted and welded connections in accordance with manufacturer's recommendation.

3.1.6. Moist cure concrete in accordance with the applicable requirements for a curing period of fourteen (14) days.

3.1.7. Observe cold weather requirements, when appropriate, in accordance with CAN/CSA-A23.1-04. Contractor shall observe proper procedures and precautions. Contractor will be solely responsible for installations, curing and protection method.

3.1.8. Prior to placing of concrete, obtain Consultant's approval of proposed method for protection of concrete during placing and curing in adverse weather.

3.1.9. Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

3.1.10. Finish concrete in accordance with CAN/CSA-A23.1-04.

3.1.11. Provide sawcut and construction control joints as shown and/or noted on Drawings. Sawcuts to be provided within 24 hours after placement.

3.2. SURVEYING

3.2.1. Measure location of the pool tank and bottom slopes of each tank bottom.

3.2.2. Measure location of the pool tank to confirm location relative to other elements on site.

3.2.3. Measure the length, width and depth of pools. Pool length, width and depth must be in compliance with all pool plans. Any portion of the pools that does not meet what is shown on the pool drawings will need to be repaired at the POOL SUBCONTRACTOR's expense.

3.2.4. Measurements to be performed by a Registered Land Surveyor and shown on an as-built condition drawing(s) Drawing(s) must be stamped by a Professional Engineer.

3.3. PROTECTION

3.3.1. General:

3.3.1.1. Conform to the requirements of CAN/CSA – A.23.1-04 and the following to protect freshly deposited concrete from freezing, premature drying and extremes of temperature. Maintain concrete with minimal moisture loss at a relatively constant temperature for the period of time necessary for the hydration of the cement and to achieve the specified strength of the concrete.

3.3.2. Cold Weather Concrete Planning:

3.3.2.1. Submit for review, a plan for cold weather concreting. Include as a minimum:

3.3.2.1.1. Slag replacement level to be used in the mix design.

3.3.2.1.2. Curing period for concrete selected if accelerators are to be used to reduce the length of time winter heat is required.

3.3.2.1.3. Method of application of winter heat to the concrete and soil for the initial curing period, be it through construction or a heated enclosure or application of radiant, hydronic heaters.

3.3.2.1.4. Method of protection of the concrete and soil for the balance of the curing period, be it through the use of insulating blankets, straw, fill or other methods.

3.3.2.1.5. Method of pre-heating of embedded elements such as reinforcing steel etc.

3.3.3. Cold Weather Concreting:

3.3.3.1. Between October 15th and April 15th of the following year, provide on hand and ready for use all equipment necessary for adequate cold weather protection and curing before concrete placement (example, heating blankets, heaters, etc.)

3.3.3.2. When new concrete is to be poured against existing concrete, prevent the loss of heat by extending the protection for the new concrete at least a minimum of 600 mm over the existing concrete.

3.3.3.3. Insulate or construct enclosure around all form work especially around any items that may protrude beyond the area being cast.

3.3.3.4. Construct enclosures tight and safe from wind and snow loads.

3.3.3.5. Maintain enclosures and supplementary heat in place for entire period.

3.3.3.6. Dispose heating units to avoid heating concrete locally or drying excessively. Avoid high temperature and dry heating within the enclosures.

3.4. SPECIFICATION ISSUES LOG

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END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Division One, General Requirements is part of this Section and shall apply as if repeated here.

1.2. SECTION INCLUDES

1.2.1. Furnish all labour, materials, plant, tools and equipment as necessary to perform incorporation of Liquid Crystalline Waterproofing Admixture for concrete mix. Admixture shall be added to the wet concrete mix at the batching plant or to the ready-mix-truck at job site as per manufacturer's instructions.

1.2.2. Related Sections:

1.2.2.1. Division 13, Section 13 01 00 – Below Grade Swimming Pool

1. WARRANTY
2. SUBMITTALS
3. DELIVERY, STORAGE AND HANDLING

1.3. SCOPE OF WORK

1.3.1. To provide Crystalline Waterproofing to the following:

1.3.1.1. Pool tank.

1.4. SUBMITTALS

1.4.1. General:

1.4.1.1. Submit manufacturer's certification that proposed materials, details and systems as indicated and specified fully comply with manufacturer's details and Specifications. If any portion of Contract Documents do not conform to manufacturer's standard recommendations, submit notification of portions of design that are at variance with manufacturer's Specifications

1.4.2. Compatibility:

1.4.2.1. Submit manufacturer's certification that proposed material is compatible with concrete mix design.

1.4.3. Product Data:

1.4.3.1. Submit manufacturer's product data, installation instructions and MSDS for product.

1.5. QUALITY ASSURANCE

1.5.1. Manufacturer Qualifications:

1.5.1.1. Work under this Section shall be performed by qualified personnel with a minimum of five (5) years of experience applying/installing the specified products, systems, and assemblies, and who have approval from the respective product manufacturers. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

1.6. DELIVERY, STORAGE AND HANDLING

1.6.1. Deliver and store materials in a dry area at minimum 68°F (20°C). Handle and protect from freezing and contamination in accordance with manufacturer's instructions.

1.6.2. Deliver materials in manufacturer's unopened containers, fully identified with brand, type, grade, class and all other qualifying information. Provide Material Safety Data Sheet.

1.7. SYSTEM REQUIREMENTS

1.7.1. Provide materials and accessories in timely manner so as not to delay Work.

1.8. PRE-INSTALLATION CONFERENCE AND TRIAL MIXES

1.8.1. Convene pre-installation conference at the Contractor's direction prior to commencing Work to review methods and sequence of installation. The meeting shall include the Engineer, Contractor and/or Subcontractor, Manufacturer's Representative, and any related concrete supplier. Requirement for manufacturer's representative may be waived if Contractor provides sufficient evidence that Producer and Finisher have adequate experience with admixture required.

1.8.2. Trial mixes shall be carried out with proposed mix design to ensure that mix meets all requirements set forth in the Specification, prior to actual installation of concrete.

PART 2 - PRODUCTS

2.1. ***MANUFACTURERS'***

2.1.1. Approved Manufacturers: AQUAFIN, Inc. 505 Blue Ball Rd., #160, Elkton, MD, 21921 Phone (800) 394-1410 or (410) 392-2300, Fax (410) 392-2324; e-mail info@aquafin.net.

2.1.2. Requests for substitutions will be considered only if submitted to the Architect/Engineer in writing five (5) days prior to bid date and must include substantiation of product performance.

2.2. MATERIALS

2.2.1. Crystalline Waterproofing Admixture: Liquid waterproofing admixture with the following characteristics:

1.	Product:	Aquafin®-IC ADMIX
2.	Aggregate state:	Liquid - non flammable - non corrosive
3.	Water/cement ratio (w/c)	0.55 maximum of concrete mix
4.	Compressive Strength: (ASTM C-39)	Up to 25% increase over untreated concrete
5.	Flexural Strength: (ASTM C-293)	Does not detrimentally alter concrete mix
6.	Permeability: (COE CRD-C 48)	No measurable leakage through waterproofed concrete when tested at 140 meters (460 feet) water head, or 200 psi (14 bar) water pressure

PART 3 - EXECUTION

3.1. ***MANUFACTURERS' INSTRUCTIONS***

3.1.1. Assure that concrete mix design and proposed material are in compliance with manufacturer's recommendations.

3.1.2. Assure that test batching and material testing if recommended by manufacturer has been carried out prior to starting concrete Work.

3.1.3. Comply with manufacturer's product data and installation instructions.

3.2. INSTALLATION

3.2.1. Stir liquid crystalline waterproofing admixture in container provided prior to use, to assure that the mixture is homogeneous.

3.2.2. Assure that the water/cement ratio (w/c) is 0.55 before liquid crystalline waterproofing admixture is added.

3.2.3. At batching plant, if transportation of concrete mix to place of usage is no longer than forty five (45) minutes.

3.2.3.1. Mix concrete mix in batch mixer and add specified dosage of liquid crystalline waterproofing admixture to the batching water, or add last to the wet mix.

3.2.4. Ready-mix truck at job site:

3.2.4.1. Deliver mix with specified water content.

3.2.4.2. Add specified dosage of liquid crystalline waterproofing admixture.

3.2.4.3. Mix for 3-5 minutes.

3.2.5. Install concrete as per project Specifications, Division 03 Sections for concrete installation.

3.3. SPECIFICATION ISSUES LOG

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END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Division One, General Requirements is part of this Section and shall apply as if repeated here.

1.2. REFERENCES

1.2.1. This Section contains references to the governing standards and documents listed below. They are a part of this Section as specified and modified; the current version shall apply unless otherwise noted. In case of conflict between the requirements of this section and those of the listed documents, the more stringent of the requirements shall prevail.

1.2.1.1. ASTM International (ASTM):

1.2.1.1.1. ASTM D 16 - Terminology Relating to Paint, Varnish, Lacquer, and Related Products.

1.2.1.1.2. ASTM D 4263 - Indicating Moisture in Concrete by the Plastic Sheet Method.

1.2.1.1.3. ASTM F 1869 - Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

1.2.1.2. NACE International (NACE):

1.2.1.2.1. NACE 3 - Commercial Blast Cleaning.

1.2.1.2.2. NACE 6 - Surface Preparation of Concrete.

1.2.1.3. SSPC: The Society of Protective Coatings (SSPC):

1.2.1.3.1. SSPC-SP 1 - Solvent Cleaning.

1.2.1.3.2. SSPC-SP 6 - Commercial Blast Cleaning.

1.2.1.3.3. SSPC-SP 13 - Surface Preparation of Concrete.

1.2.1.4. International Concrete Repair Institute (ICRI):

1.2.1.4.1. International Concrete Repair Institute (ICRI) Guideline No. 03732 - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.

1.2.1.5. Unless otherwise specified, references to documents shall mean the documents in effect at the time of receipt of Bids. If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents, the last version of the document before it was discontinued.

1.3. SECTION INCLUDES

1.3.1. Furnish all labour, materials, tools and equipment as necessary to perform incorporation of Series 69 Hi-Build Epoxoline II. Series 69 Hi-Build Epoxoline II Swimming Pool Coating System shall be applied, but not limited to the following:

1.3.1.1. Lap Pool tank including floor and walls.

1.4. DEFINITIONS

1.4.1. Definitions of Painting Terms: ASTM D 16, unless otherwise specified.

1.4.2. Dry Film Thickness (DFT): Thickness of a coat of paint in fully cured state measured in mils (1/1000 inch).

1.5. PROJECT CONDITIONS

1.5.1. Maintain environmental conditions (temperature, humidity, moisture, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.5.1.1. Weather:

1.5.1.1.1. Air and surface temperatures: Prepare surfaces and apply and cure coatings within air and surface temperature range in accordance with manufacturer's instructions.

1.5.1.1.2. Surface Temperature: Minimum of 5 degrees F (3 degrees C) above the dew point.

1.5.1.1.3. Relative Humidity: Prepare surfaces and apply and cure coatings within relative humidity range in accordance with manufacturer's instructions.

1.5.1.1.4. Precipitation: Do not prepare surfaces or apply coatings in rain, snow, fog, or mist.

1.5.1.1.5. Wind: Do not spray coatings if wind velocity is above manufacturer's recommended limit.

1.5.1.2. Ventilation: Provide ventilation during coating evaporation stage in confined or enclosed areas in accordance with manufacturer's instructions.

1.5.1.3. Dust and Contaminants:

1.5.1.3.1.1. Schedule coating work to avoid excessive dust and airborne contaminants.

1.5.2. Protect work areas from excessive dust and airborne contaminants during coating application and curing.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

2.1.1. Approved Manufacturers: TNEMEC Co, Inc. 6800 Corporate Drive Kansas City, MO 64120 Phone 1-800-863-6321, E-mail: marketing@tnemec.com.

2.2. MATERIALS

2.2.1. Tnemec Series N69 Hi-Build Epoxoline: Swimming Pool Coating System with the following characteristics:

1.	Product:	Tnemec Series N69 Hi-Build Epoxoline II
2.	Volume Solids:	67.0 ± 2.0% (mixed)

3.	Curing Time:	At 70°F for 7 hours to handle, 10 hours to recoat and 7 days for immersion.
4.	Theoretical Coverage:	1,704 mil sq.ft/gal. (26.4 m²/L at 25 microns)

PART 3 - EXECUTION

3.1. GENERAL

3.1.1. Assure that concrete mix design and proposed material are in compliance with manufacturer's recommendations.

3.1.2. Assure that test batching and material testing if recommended by manufacturer, has been carried out prior to starting concrete work.

3.1.3. Comply with manufacturer's product data and installation instructions.

3.2. EXAMINATION

3.2.1. Examine areas and conditions under which coating systems are to be applied.

3.2.2. Notify Architect of areas or conditions not acceptable.

3.2.3. Do not begin surface preparation or application until unacceptable areas or conditions have been corrected.

3.2.4. Do not begin installation until substrates have been properly prepared.

3.3. SURFACE PREPERATION

3.3.1. Protection of Surfaces Not Scheduled to be Coated:

3.3.1.1. Protect surrounding areas and surfaces not scheduled to be coated from damage during surface preparation and application of coatings.

3.3.1.2. Immediately remove coatings that fall on surrounding areas and surfaces not scheduled to be coated.

3.3.2. Surface Preparation:

3.3.2.1. SSPC-SP13 in accordance with a minimum of CSP-3.

3.3.2.2. All surfaces must be clean, dry and free from contaminants.

3.3.3. Remove chalk, dirt, grease and oil by washing and scrubbing surfaces with a solution made up of three (3) ounces of detergent or trisodium phosphate to each gallon of water. Flush away all cleaning solution and dirt with clean water.

3.3.4. Completely remove old coatings by abrasive blast cleaning.

3.3.5. Rout out cracks. avoid exposing underlying aggregate.

3.3.6. Remove blast abrasive by sweeping. All residual abrasive, dust and loose material must be removed by vacuuming.

PART 4 - REPAIR OF SURFACE VOIDS, HOLES AND CRACKS:

4.1.1. Voids, holes, cracks and surfaces must be dry.

4.1.2. Prime voids, holes and routed out cracks with a thin coat of Series N69 Hi-Build Epoxoline. Work material well into the openings with a small brush. Allow to cure twenty-four (24) hours and 75°F (24°C).

4.1.3. Fill voids, holes and cracks flush with the surface using Series 218 Mortarclad. Mix and apply Series 218 according to label directions.

4.1.4. Allow Series 218 to cure for sixteen (16) hours at 75°F (24°C) before applying coating system.

4.2. APPLICATION

4.2.1. Surfaces must be dry and clean.

4.2.2. Observe surface preparation and spreading rate recommendations only as contained in this Series N69 Hi-Build Epoxoline Swimming Pool Coating System supplement. Refer to product data sheet or can label for additional mixing and application instructions, in particular temperature, pot life and dry-to-recoat time.

4.2.3. Allow the final coat to cure for seven (7) days at 75°F (24°C) or above, before filling pool with water.

4.3. ABBRASIVE NON-SLIP FINISH

4.3.1. For areas requiring an abrasive non-slip finish (ramp, beach entry, and steps), the following application procedures are to be followed:

4.3.1.1. Apply 6 to 8 mils of Series N69 by roller.

4.3.1.2. Broadcast an adequate amount of 50 White Mesh Ottawa Silica Sand into N69.

4.3.1.3. Let fully cure.

4.3.1.4. Sweep off any loose sand.

4.3.1.5. Apply the second coat of Series N69 at 6-9 mils.

4.3.2. Always ensure the Silica Sand being used is dry and clean.

4.4. REPAIRS

4.4.1. Materials and Surfaces Not Scheduled to be Coated: Repair or replace damaged materials and surfaces not scheduled to be coated.

4.4.2. Damaged Coatings: Touch-up or repair of damaged coatings. Touch-up of minor damage shall be acceptable where the result is not visibly different from adjacent surfaces. Recoat the entire surface where touch-up result is visibly different, either in sheen, texture, or color.

4.4.3. Coating Defects: Repair in accordance with manufacturer's instructions coatings that exhibit film characteristics or defects that would adversely affect performance or appearance of coating systems.

4.5. FIELD QUALITY CONTROL

4.5.1. Inspector's Services:

4.5.1.1. Verify coatings and other materials are as specified.

4.5.1.2. Verify surface preparation and application is as specified.

4.5.1.3. Verify DFT of each coat and total DFT of each coating system specified using wet film and dry film gauges.

4.5.1.4. Coating Defects: Check coatings for film characteristics or defects that would adversely affect performance or appearance of coating systems.

4.5.1.5. Report:

4.5.1.5.1. Submit written reports describing inspections made and actions taken to correct non-conforming work.

4.5.1.5.2. Report non-conforming work not corrected.

4.5.1.5.3. Submit copies of report to Architect and Contractor.

4.5.1.6. Manufacturer's Technical Services: Coordinate with coating manufacturer's technical service department or independent sales representative for current technical data and instructions.

4.5.1.7. One-Year Inspection:

4.5.1.7.1. Owner will set date for one-year inspection of coating systems.

4.5.1.7.2. Inspection shall be attended by Owner, Contractor, Architect, and manufacturer's representative.

4.5.1.7.3. Repair deficiencies in coating systems as determined by Architect in accordance with manufacturer's instructions.

4.6. CLEANING

4.6.1. Remove temporary coverings and protection of surrounding areas and surfaces.

4.7. PROTECTION OF COATING SYSTEMS

4.7.1. Protect surfaces of coating systems from damage during construction.

4.7.2. Touch-up, or repair damaged products before substantial completion.

4.8. COATING SCHEDULE FOR SWIMMING POOLS

4.8.1. Swimming Pools Walls and Floors:

4.8.1.1. System Type: Epoxy.

4.8.1.2. Surface Preparation: SSPC-SP13 in accordance with a minimum of CSP-3.

4.8.1.2.1. Note: Test area is required and approved by owner and coating manufacturer's representative before work is performed.

4.8.1.3. Filler and Surfacer (Optional): Series 215 Surfacing Epoxy, as required.

4.8.1.4. Primer: Series N69, applied as per the manufacturer.

4.8.1.4.1. Primer Color: Options available at Tnemec.com

4.8.1.5. Finish: Series N69 Hi-Build Epoxoline II, applied as per the manufacturer.

4.8.1.5.1. Finish Color: Options available at Tnemec.com (ramp to be one shade darker than basin colour – still considered light in colour)

4.8.1.6. System Note:

4.8.1.6.1. Add 50 mesh white Ottawa silica sand to designated areas (sloped ramp surface and teaching steps) for both the intermediate coat and finish coat for required slip resistance.

4.8.2. Lane Markers and Targets:

4.8.2.1. System Type: Epoxy.

4.8.2.2. Surface Preparation: SSPC-SP13 in accordance with a minimum of CSP-3.

4.8.2.3. Primer: Series N69 Hi-Build Epoxoline II as per manufacturer

4.8.2.3.1. Primer Color: 35GR Black

4.8.2.4. Finish: Series N69, as per manufacturer

4.8.2.4.1. Finish Color: 35GR Black

4.9. SPECIFICATION ISSUES LOG

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END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to The General Conditions of the Contract, Supplementary Conditions and Division 01 requirements and documents referred to herein.

1.2. SUMMARY

1.2.1. Work Included: Provide pool accessories including but not limited to the following:

1.2.1.1. Stainless Steel Railings

1.2.1.2. Stainless Steel Grab rails c/w recessed steps and escutcheons.

1.2.1.3. Cup anchors.

1.2.1.4. Wedge anchors.

1.2.1.5. Safety Signage.

1.2.1.6. Safety equipment.

1.2.1.7. Maintenance equipment.

1.2.1.8. Guard Chairs c/w umbrellas/shade

1.3. DELIVERY, STORAGE AND HANDLING

1.3.1. Package or crate, and brace products to prevent damage or distortion of equipment in shipment and handling. Label packages and crates and protect finished surfaces by sturdy wrappings or equivalent protection. Utilize temporary skids under large or heavy units.

1.3.2. Deliver equipment to location at building site designated by the General Contractor.

1.3.3. Do not deliver products to site until conditions are such that no damage will occur to them while in storage.

1.3.4. Store equipment at site in a manner to prevent damage to it.

1.3.5. Uncrate equipment only before installation.

1.3.6. The POOL SUBCONTRACTOR shall be responsible for the care and protection of all materials and equipment specified in this Section of the Work.

1.3.7. Site Conditions:

1.3.7.1. Delivery equipment or its parts ready for installation in accordance with construction schedule. Verify required delivery date sufficiently before delivery to ensure that construction is not delayed.

1.4. WARRANTY

1.4.1. Refer to item **"WARRANTY"** in Specification Section 13 01 00.

PART 2 - PRODUCTS

2.1. SWIMMING POOL ACCESSORIES, SAFETY AND MAINTENANCE EQUIPMENT

2.1.1. Supply and install equipment as shown in the following list or as shown on the Swimming Pool Drawings as part of this Section. Equipment list may not show all equipment to be provided. If an item of equipment is required for operation of the pools, that item shall be deemed to be included.

2.1.2. Provide pool and spa safety signage as required by the Ontario Building Code and by the Ontario Health Regulations. The POOL SUBCONTRACTOR to select appropriate signage and submit to the POOL CONSULTANT for approval.

2.1.3. Accessories, Safety and Maintenance Equipment List:

PART 3 - EXECUTION

3.1. EXAMINATION

3.1.1. Ensure that mounting devices, anchorages, members and surfaces are satisfactory and adequate for securing of Work and report any defects to the Consultant.

3.2. INSTALLATION

3.2.1. Provide all anchorage information, templates, mounting jigs, anchor bolts, lag screws, expansion shield, and any other items required for complete installation. Supervise and assist with the setting of anchorage devices incorporated in other Work necessary for the Work of this Section.

3.2.2. Install Work plumb, true, square, straight and level. Anchor securely in place.

3.2.3. Provide all mounted stainless-steel hooks for storage of vacuum equipment, maintenance equipment and safety equipment. Co-ordinate final location on site with Owner's staff.

3.2.4. Provide grounding lugs on all metal pool fittings for connection to ground loop.

3.2.5. All stainless-steel rails and posts to be powder coated.

3.3. SPECIFICATION ISSUES LOG

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END OF SECTION

PART 1 - GENERAL

1.1. GENERAL INSTRUCTIONS

1.1.1. Read and conform to The General Conditions of the Contract, Supplementary Conditions and Division 01 requirements and documents referred to herein.

1.2. DESCRIPTION

1.2.1. Supply labour, materials, plant, tools and equipment to complete the Work as shown on the Drawings and as specified herein including, but not limited to the following:

1.2.1.1. Filtration and recirculation system including pumps, Variable frequency Drive (VFD), piping, pool fittings, valves and accessories for all pools.

1.2.1.2. All Chemical Supplies and Chemical feed systems including piping, feeders and accessories.

1.3. RELATED WORK PROVIDED BY OTHERS, SPECIFIED ELSEWHERE AND NOT THE RESPONSIBILITY OF DIVISION 13 SUBCONTRACTOR:

1.3.1.1. Refer to section 13 01 00 BELOW GRADE SWIMMING POOLS

1.4. WARRANTY

1.4.1. Refer to item **"WARRANTY"** in specification section 13 01 00 BELOW GRADE SWIMMING POOLS

PART 2 - PRODUCTS

2.1. MATERIAL

2.1.1. PVC Pipe and Fittings:

2.1.1.1. Polyvinyl chloride (PVC) pipe to meet specified requirements of CSA Standard B 137.3M: Schedule 40 (buried/unexposed) and Schedule 80 (exposed) as manufactured by Ipex or approved equal. Chlorinated polyvinyl chloride (CPVC) pipe to meet specified requirements of ASTM F441.

2.1.1.2. Fittings: Moulded or fabricated from PVC or CPVC, compatible with pipe material. Socketed type manufactured in accordance with ASTM D2467 for PVC fittings, F439 or F437 for CPVC fittings. Fabricated fittings shall be reinforced with Fibreglass Reinforced Plastics (FRP) to achieve equivalent strength rating of the pipe.

2.1.1.3. Solvent Cements and Primer: Manufactured in accordance with ASTM D2564 for PVC pipe and fittings and with ASTM F493 for CPVC pipe and fittings.

2.1.2. Valves

2.1.2.1. PVC Butterfly Valves: Wafer Style, 1034 KPA pressure rating, PVC body, PVC or polypropylene disc, EPDM seat, stainless steel shaft, lever or gear operator: PVC butterfly valves as manufactured by Chemline, Hayward, Chemtrol, Cepex or approved equal.

2.1.2.2. Check Valves: Wafer type, 1388 KA pressure rating, cast or ductile iron body, EPDM seat, stainless steel trim; wafer check valves as manufactured by Praher or approved equal.

2.1.2.3. Expansion Joints: Spherical bellows type, single arch, nylon reinforced neoprene bellows, flanged ends: Vibra-Sphere as distributed by Piping Accessories of Canada Limited, or approved equal.

2.1.2.4. PVC Ball Valves and Ball Check Valves: True union, socket ends, TFE seats, EPDM or Viton seals: PVC or CPVC ball valves as manufactured by Hayward, Chemline, Chemtrol, Astral or approved equal.

2.1.2.5. Gate Valves: 200 lb. WOG, bronze body, rising stem, wedge disc type, solder Gate valves as manufactured by Jenkins, Crane, McAvity or approved equal.

2.1.3. Pumps:

2.1.3.1. Pump Schedule specifies pumps as manufactured by Pentair. Equivalent models as manufactured by ITT Bell & Gossett, Griswold, Hayward, Herborner, Spek, and S.A. Armstrong are acceptable alternatives.

2.1.3.2. Motors greater than ½ hp: All pump motors shall be high efficiency, 575V, 3 Phase, 60 Hz, comply with UL and/or Nema Requirements. All pumps TEFC, HighE.

2.1.3.3. Provide pressure and compound gauges complete with gauge cock on each pump.

2.2. MECHANICAL EQUIPMENT

2.2.1. Supply and install equipment as shown in Section 2.2 (4) or as shown on the Swimming Pool Drawings as part of this Section.

2.2.2. Base tender upon materials and equipment specified. Where appropriate, more than one equipment manufacturer has been specified. It is not the intent to limit competition. Proposals for alternative equipment may be submitted in accordance with procedures as listed in the General Requirements.

2.2.3. Section 2.2 (4) indicates items of equipment to be provided. Any additional items not listed or necessary for the operation of a piece of equipment and which is not indicated in the Drawings and/or Specifications shall be reported to the Consultant in writing during the tender period. Otherwise, the additional items shall be deemed to be included.

2.2.4. Equipment List:

POOL CONCRETE SHELL			
QTY	**MANUF.**	**DESCRIPTION**	**MODEL**
LOT	Custom	Pool Concrete: F-1 Concrete Mix Design, 0.50 water/cement ration, 5-8% air entrainment, 30 MPa	Pool Concrete (F-1)
LOT	See Structural Drawings	Reinforcing Rod - 15M (Canada)	ASTMA615 Grade 60-15M
LOT	See Structural Drawings	Reinforcing Rod -10M (Canada)	ASTMA615 Grade 60-10M
LOT	Aquafin	Aquafin IC Admix- Liquid Crystalline Waterproofing Additive for Concrete - 6 Gallon Pails (ANSI/NSF Standard 61)	4ICA-124T
LOT	CBM	FiberMAX F1 Reinforcing Admixture	F1 Admix
LOT	SIKA	Sikadur 32 Crack Repair - 2 Part, 10L Unit	Sikadur32
LOT	W.R. Meadows	4” Waterstop for Floor/Wall Joints (50' Rolls)	Type 3

LOT	W.R. Meadows	6” Waterstop for Wall Joints (50' Rolls)	Type 4
LOT	W.R. Meadows	9” Waterstop for Floor Joints (50' Rolls) NOT FOR WALLS	Type 61
LOT	Big “O”	4” Weeping Tile c/w Sock (250' Rolls)	BIG-O
LOT	Big “O”	4" Tees for Weeping Tile	BIG-O-T-4
LOT	Dow Chemical	1" Thick Insulation - 2' x 8' Sheets (2 layers under pool, 1 layer under deck)_	SM

POOL FINISHES

QTY	MANUF.	DESCRIPTION	MODEL
LOT	Tnemec	Series N69 - Hi-Build Epoxoline - Epoxy Pool Coating, Satin Finish Part A Paint - Colour Selected By Architect (White or Light - Field Colour)	Series N69 - Field
LOT	Tnemec	Series N69 - Hi-Build Epoxoline - Epoxy Pool Coating, Satin Finish Part A Paint - Colour - Black (Accent Colour)	Series N69 - Accent
LOT	Tnemec	Series N69 - Hi-Build Epoxoline - Epoxy Pool Coating, Satin Finish Part A Paint - Colour Se lected By Architect (White or Light - Different Shade than Field Colour)	Series N69 - Ramp
LOT	Tnemec	Series 241 Ultra Tread moisture barrier	Series 241 Ultra tread
LOT	Inlays	6"x6" Depth Markers (4" Letters) - CONFIRM Quantity and Layout (SR=Skid Resistant)	DEPTH 6x6
LOT	Elan Tile	Tactile Attention Markers (Domed) - Elan Tile (Confirm Colour)	ELAN-D-1212
LOT	Elan Tile	Tactile Direction Markers (Wayfinding) - Elan Tile (Confirm Colour)	ELAN-B-1212
LOT	Federal Stone	Federal Stone - White - SBN Series - 12" Pool Coping	SBN Series
LOT	Federal Stone	Federal Stone - White - 12" DBN Series - Pool Double Bullnose Coping	DBN Series
LOT	LATICRETE International	LATAPOXY 300 Adhesive - For Coping Setting	LATAPOXY 300
LOT	KBE	3" Shallow KBE Trench Drain and required accessories	KBE North America

POOL PIPING AND VALVES

QTY	MANUF.	DESCRIPTION	MODEL
LOT	Synko-Flex	Pipe Waterstop (105' box)	SYNKOFLEX
LOT	Custom	PVC plaster stops 3" (3/8") SCH40 White	7003
LOT	IPEX	Piping - Buried	Sch 40
LOT	IPEX	Piping - Exposed	Sch 80
LOT	Cepex	PVC Ball Valves - Various Sizes	Ball Valves
LOT	Cepex	PVC Lever Butterfly Valves c/w Flanges & Bolts - 3" to 6" size	Butterfly Valves - Lever
LOT	Cepex	PVC Gear Operated Butterfly Valves - 8" or Larger	Butterfly Valves - Gear
LOT	Cepex	PVC Check Valves - Various Sizes	Check Valves

LOT	Unistrut	Hot Dipped Galvanized Pipe Hangers in Mechanical Room	Unistrut
LOT	Unistrut	Support Hardware, Brackets, Fasteners, Hangers in Surge Tank - All Stainless Steel	Unistrut SS
1	Custom	4" Sight Glass	SG-040

POOL RECIRCULATION AND MECHANCIAL EQUIPMENT

QTY	MANUF.	DESCRIPTION	MODEL
2	Grate Technologies	18"X18" PVC Super Sump c/w White Domed Frame & Grates, 1-8" Side Connections Each & 2-2" Bottom Connections Each. (184 Sq In Open Area Each) VGB Compliant	MLD-SG-1818-WT (VGB)
2	Hayward	1-1/2-2" MIP Hydrostatic Relief Valve - Spring Loaded	SP-1056
2	Hayward	1-1/2"-2" FIP Collector Tube, 12" Long-Slotted	SP-1055
10	Sta-Rite	U3 Skimmer for Concrete Pools w/White Lid & Frame, 2" NPT w/1-1/2" NPT Reducers; Incl. Float & Check Valve & Basket (NO EQUALIZERS) NSF Listed	08650-1403
10	Water and Ice	Custom 6"x12" PVC Skimmer Grille	03-1906X
1	Neptune Benson	Guardian Fibergalss Hair & Lint Strainer - 6"x6" Straight Strainer c/w Strainer Basket	1000-6269
1	Neptune Benson	Spare Strainer Basket	1000-8397
2	Pentair	EQK1000 Filtration Pump (no strainer), Horizontally Mounted, End Suction, Self-Priming, Closed Coupled, ODP, 575V, 3 Phase, 10HP, 425 USGPM @ 70' TDH, NEMA Motor - NSF Listed.	EQK1000
2	Custom	Pump Anchorage Kit	PUMP-KIT
1	Davis-Controls	NEMA 1 - 208VAC, 3 PHASE, 10HP VFD - c/w Bypass	VFD-10-208-N1
2	Winters	Dry Compound Gauge. 2-1/2" dial, ss case. Range: 0-60psi/kpa c/w Petcock & Snubber	C25PCS-D
2	Winters	Dry Pressure Gauge. 2-1/2" dial, ss case. Range: 0-60psi/kpa c/w Petcock & Snubber	P25PCS-D
1	Neptune Benson	Defender Fully Automatic Regenerative Media Filter c/w All Ancillary Components. 381 Sq.Ft. - Reduced Height	SP-27-48-487 - REDUCED
LOT	Tech-Flo Inc.	Perlite - 25lb Bags	Tech-Flo 2000-X
1	Weiss	Thermometers (range 0-160 Degrees F) c/w 3 1/2" Wells	9VS35-160
1	H2Flow	FlowVIS 6" Flow Meter	FV-6
1	H2Flow	FlowVIS Digital Readout - 4-20ma Connection to Pumps	FV-D
23	Sta-Rite	Adjustable Wall Inlets, 1-1/2 in Slip, 3/16 in, 1/2 in, 3/4 in 90 Degree Nozzle - WHITE	08429-0000
1	Coates	Coates 240V Electric Pool Heater c/w Flow Switch - 3 Phase, 600V	PHS-20
1	Levelor	Water Level Controller c/w 1.5", 24 Volt Solenoid Valve Kit	K-1100-1.5

1	Pentair	Flat Face Equalizer/Suction Fitting, 2" Slip, White ABS w/1.5" Reducer, VGBA Compliant	500300

POOL CHEMICAL EQUIPMENT

QTY	MANUF.	DESCRIPTION	MODEL
1	Neptune Benson	Blu-Sentinel Chemical Controller: PH, ORP, Free Chlorine & Temperature	Blu-Sentinel SE
2	Stenner	45 GPD, Adjustable Metering Pump c/w Wall Bracket, 120V	45MJL5A3S
1	Chemtainer	52" x 56" - 350 Gallon, Closed Non-Vented Top, Double Wall Containment Tank (Acid) c/w 2" Bulk head fitting for vent	TC5256DC
1	Chemtainer	200 Gallon Closed Non-Vented Top, Double Wall Containment Tank c/w 2" Bulk head fitting for vent	TC4152DC
1	Custom	1-Pool Sample Line Kit	SL1-KIT

POOL INSERTS AND ANCHORS

QTY	MANUF.	DESCRIPTION	MODEL
3	Northern Stainless	On Deck Stainless Steel Guard Rails 1.50" O.D. x .065 " Wall, Type 304 SS (CONTRACTOR TO MEASURE ON SITE)	Hand Rail (Guard Rails)
2	Northern Stainless	Stainless Steel Stair Hand Rail, 1.50" O.D. x .065 " Wall, Type 304 SS (CONTRACTOR TO MEASURE ON SITE)	Hand Rail (Stairs)
2	Northern Stainless	Ramp Stainless Steel Hand Rail, 1.50" O.D. x .065 " Wall, Type 304 SS (CONTRACTOR TO MEASURE ON SITE)	Hand Rail (Ramp)
8	Perma-Cast	Round Escutcheon Plates for 1.5" OD Rails	PE-0015S
2	Northern Stainless	Stainless Steel Figure Four Rails 1.50” O.D. x .065” Wall, Type 304 SS (TO FOLLOW SITE MEASURE/CONCRETE POUR)	Figure Four Rail
6	SR Smith	Baja Recess Step White-Frost proof/Heavey Duty	62-209-4001
20	Pentair	Rope Anchor With Stainless Steel Bar (white)	54-2044
1	Monarch-McLaren	3/4" Blue and White Rope 11M (Slope Break Rope) SITE CONFIRM	PR75-3
4	Monarch-McLaren	3/4" Blue and White Rope 25M (Lane Ropes) - SITE CONFIRM	PR75-3
10	Perma-Cast	3/4" Rope Hooks	PH-53
LOT	Rainbow	5”x9” Alternating Blue and White Floats at 5' +/- on center	R181086

POOL DECK MAINTENANCE, SAFETY EQUIPMENT AND ACCESSORIES

QTY	MANUF.	DESCRIPTION	MODEL
1	Rainbow	Life Hook (#153)	r221026
1	Rainbow	12' Fiberglass Safety Pole Model 818-12	r191095
1	Rainbow	Professional Grade Heavy Duty Skimmer, 3/8" Solid Aluminum Rod, Deep Net Molded into Abs Snap-On Replacement Frame	r121196
1	Rainbow	18" Wall Brush (#902)	r111316
2	Rainbow	8' - 16' Telescopic Anodized Aluminum Pole for Wall Brush and Leaf Net (#806-16)	r191306

2	Cal June	USCG Approved Life Rings 20" Orange Soft Shell	GO-20
2	Monarch-McLaren	Yellow Throw Ropes - ¼" Thick	YR25-1
1	Marine Rescue	Rescue Board c/w Head Immobilizer and (3) Straps	combo
1	Rainbow	19" Flexible Vacuum Head (#250)	R201126
1	Plastiflex	50' x 1 1/2" Vacuum Hose	HD-150-50
1	Taylor	Taylor Test Kit	2005
LOT	Custom	Safety Signage (PER OBC - BY POOL CONTRACTOR)	SAFETY SIGNS
1	IDT Systems Inc.	24VAC Audible/Visual Alarm w/ Emergency Stop Button, Enclosure, Face Plate, Surface Mount, Nema 4X Rated	AP-SA10
1	Custom	Vacuum Cart c/w 1HP, 115/230 Volt, 1 Phase Motor c/w Filter	03-1515A
2	Custom	Paraflyte OSHA Club Fixed Lifeguard Chair c/w Single Post & Anchor - Type 304SS - C/W Umbrella shade and post	20004

PART 3 - EXECUTION

3.1. GENERAL

3.1.1. Comply with requirements of Division 15 Mechanical where applicable unless otherwise indicated in this Section or on the Pool Drawings.

3.1.2. Drawings do not show all structural and building details. Refer to Architectural and Structural Drawings for necessary details.

3.1.3. Contractor is responsible for co-ordinating Work of this Section with Other Trades. Relocate piping, controls or equipment as required or directed by the Consultant without additional charge.

3.2. PVC PIPING

3.2.1. All above ground piping shall be substantially supported with necessary hangers, structural supports and/or brackets as required to prevent sagging, warping and excessive movement as recommended by the piping manufacturer. Place additional supports close to fittings, valves or other heavy parts. All hangers, supports and brackets shall be galvanized. All supports and hangers as manufactured by Unistrut, Hilti or approved equal.

3.2.2. Provide unions or flanges at any item of equipment which may have to be removed for servicing or maintenance.

3.2.3. All buried piping shall be PVC Schedule 40.

3.2.4. Piping under pool slab shall be PVC Schedule 40 encased in concrete.

3.2.5. All exposed pool recirculation piping shall be PVC Schedule 80.

3.2.6. Influent and effluent heater piping within 3048mm (10 feet) of pool heater, heat recovery unit and heat exchangers shall be CPVC Schedule 80.

3.2.7. All joints shall be solvent welded or flanged. Threaded joints shall be permitted only for connection to threaded equipment.

3.2.8. All valve and flange fasteners shall be stainless steel.

3.2.9. Prior to pouring of any concrete which encases pool piping or backfilling of buried piping, perform water pressure test to all pool piping in the presence of the Consultant. Piping shall maintain a minimum pressure of 35psi for a two (2) hour period with no pressure drop. Leakage at solvent welded joints shall be corrected by replacing the defective section. Maintain pressure test during concrete pours and backfilling operations.

3.2.10. Provide an additional pressure test of all pool piping in the presence of the Consultant prior to commencement of pool finishes.

3.2.11. Provide sleeves as required for PVC piping passing through structural elements for installation by Division 3.

3.2.12. All butterfly valves shall be PVC Valves 200mm (8 inches) and larger shall have gear operators. Valves 152mm (6 inches) and smaller shall have lever operators.

3.2.13. Provide flanged connections on heat exchangers for connection to CPVC piping. All connections of dissimilar materials shall have flanged connections.

3.2.14. Support for the PVC Piping System shall conform to the following:

3.2.14.1. Concentrated loads (i.e. valves, flanges, etc....) shall be supported directly or immediately adjacent to the load.

3.2.14.2. All elbows and tees shall be supported as close as practical to the fitting to eliminate torsional stress.

3.2.14.3. Sharp support or sharp edges shall not be used with PVC pipe.

3.2.14.4. All valves shall be braced against operating torque.

3.2.14.5. Maximum support spacing for each normal pipe size used shall be as follows:

½"	(12mm)	=	3½ ft. (1.06m)
¾"	(18mm)	=	3¾ ft. (1.13m)
1"	(25mm)	=	4¼ ft. (1.28m)
1¼"	(32mm)	=	4¾ ft. (1.43m)
1½"	(40mm)	=	5¼ ft. (1.59m)
2"	(50mm)	=	5¾ ft. (1.74m)
3"	(75mm)	=	7¼ ft. (2.19m)
4"	(100mm)	=	8½ ft. (2.5m)
6"	(150mm)	=	10¼ ft. (3.1m)
8"	(200mm)	=	11¾ ft. (3.5m)
10"	(250mm)	=	13¼ ft. (4m)
12"	(300mm)	=	14½ ft. (4.4m)

3.2.14.6. All supports and hangers as manufactured by Unistrut, Hilti or approved equal.

3.3. IDENTIFICATION

3.3.1. Colour code potable water and chlorine piping according to Ministry of Health and Building Code requirements.

3.3.2. Provide 25mm (1 inch) diameter numbered lamacoid tag for each valve to correspond to valve list and piping schematic.

3.3.3. Provide 25mm (1 inch) high lamacoid type name plates for all equipment in the pool equipment room.

3.3.4. Label all pool piping with pre-printed labels with lettering 50mm (2 inches) high to indicate service and direction of water flow.

3.3.5. Colour code valve operators green for normally open valves and red for normally closed valves.

3.3.6. Label chlorine and acid storage tanks with pre-printed labels with 50mm (2 inches) high lettering.

3.4. ELECTRICAL WORK

3.4.1. General

3.4.1.1. Conform to requirements of Division 16 Electrical for all electrical work where applicable unless otherwise noted in this Section or on the Pool Drawings.

3.4.1.2. Provide stamped wiring diagrams as required by General Conditions of Division 16.

3.4.1.3. Do complete installation in accordance with C.S.A. C22.1-1982 except where specified otherwise.

3.4.1.4. Comply with C.S.A. Electrical Bulletins in force at time of Tender submission, while not identified and specified by number in this Division, are to be considered as forming part of related C.S.A. Part II standard.

3.4.1.5. Do overhead and underground systems in accordance with C.S.A. C22.3 No. 1 except where specified otherwise.

3.4.1.6. Comply with the following codes:

3.4.1.6.1. Ontario Electrical Safety Code – 1990

3.4.1.6.2. Ontario Health Regulations for Pools & Spas

3.4.1.6.3. Ontario Building Code

3.4.1.6.4. Ontario Fire Marshal Requirements

3.4.1.6.5. Local Fire Code Requirements

3.4.1.6.6. Local Hydro Utility Requirements

3.4.1.6.7. Local By-law's and Regulations

3.4.2. Permits and Fees

3.4.2.1. Submit to Electrical Inspection Department and Supply Authority necessary number of drawings and specifications for examination and approval prior to commencement of Work.

3.4.2.2. Obtain and pay for all permits and inspections as required by authorities having jurisdiction.

3.4.3. Power Wiring:

3.4.3.1. Power wiring supply and all electrical hook-ups 110 volts and higher shall be provided by Division 16.

3.4.3.2. All low voltage control wiring less than 110 volts shall be by the Division 13 POOL SUBCONTRACTOR.

3.4.3.3. Starters for all pool pump to be provided via the VFD system.

3.4.3.4. Pool Contractor to provide receptacles as needed for pool equipment within the pool mechanical and chemical rooms, and connect to power.

3.4.4. Control and Interlock Wiring:

3.4.4.1. Provide all control and interlock wiring including conduits required for proper operation of the system including wiring of remote start/stop stations. Remote stop/start stations shall be 110 volt.

3.4.4.2. Provide wiring diagrams for all control and interlocking wiring.

3.4.4.3. Provide master emergency shut off complete with visual and audible alarm for all pool pumps on deck as shown on Drawing PL 1.0. S-stop system to also shut does air blower system.

3.4.4.4. All remote control devices shall be contained in flush mounted receptacle bases. All conduits shall be concealed in floor slabs, walls, or columns.

3.5. VARIABLE FREQUENCY DRIVES (VFD'S)

3.5.1. A Variable Frequency Drive (VFD) shall be provided with each filter pump for control of the filter pump motor.

3.5.2. The Variable frequency Drive (VFDs) shall be solid state, with a Pulse Width Modulated (PWM) output. The VFD package as specified herein shall be enclosed in a NEMA 1 enclosure, completely assembled, programmed and tested by the manufacturer. The VFD shall employ a full wave rectifier (to prevent input line notching), capacitors, and Insulated Gate Bipolar Transistors (IGBT's) as the output-switching device. The drive efficiency shall be 96% or better at full speed and full load. Displacement power factor shall be no less than 0.98 at all speeds and loads.

3.5.3. All VFD models shall be factory programmed per the unique requirements of each job. Programming shall include but shall not be limited to filter pump motor specifications, remote start/stop requirements, run confirm requirements and PID loop requirements.

3.5.4. VFDs and options shall be UL/CSA and CUL listed as a complete assembly. VFDs and options shall be CE labelled as a component.

3.5.5. Harmonic Distortion Control:

3.5.5.1. The VFD design shall incorporate mechanisms that lower the harmonic currents caused by the drive as compared to standard six-pulse drives onto the AC power line. This design shall be HVAC specific low DC link capacitance. Harmonic distortion at the drive is not to exceed 29% without the use of additional components such as line reactors or DC link chokes. Harmonic calculations shall be supplied upon request based on a single line diagram of the electrical system. This diagram shall include transformer(s) KV, kVA and impedance percentage to accurately predict the harmonic levels at the PCC (Point of Common Coupling), as specified by IEEE519-1992. The calculations shall be made with the point of the common coupling being the utility feeder.

3.5.6. Specifications

3.5.6.1. Input voltage 575-600 VAC +/- 10%, 3 phase, 48-63 Hz.

3.5.6.2. Voltage tolerance + or – 10% of specified line voltage.

3.5.6.3. Output frequency 0 to 150 Hz. Operation above 60 Hz shall require programming changes to prevent inadvertent high-speed operation.

3.5.6.4. Environmental operating conditions: 0 to 40ºC, 0 to 100 meters above sea level, less than 95% humidity, non-condensing.

3.5.6.5. Enclosure shall be rated NEMA 1 or as specifically mentioned elsewhere.

3.5.7. The VFD shall be wired into the RMF controller for on/off and run confirm functions. Wiring shall be by electrical contractor.

3.5.8. The VFD shall be Danfoss or Siemens equal.

3.5.9. The VFD shall be equipped with a bypass. SED2 bypass options shall send the motor to bypass mode based on an easily accessible door-mounted selector or based on the drive's programmable relay. A bypass pilot light shall provide indication of the bypass mode. The bypass mode shall provide overload protection. Contactors shall be electrically and mechanically interlocked. An essential services mode shall send the motor to bypass regardless of the selected mode.

3.6. FLOW METER

3.6.1. A digital flow meter shall be included with a 4-20mA 0-10 VDC analog output.

3.6.2. The flow meter shall be wired into the VFD to provide automatic speed control of the filter pump motor.

3.6.3. The VFD shall compensate for varying filter head losses by maintaining the specified flow rate with the 4-20mA output signal of the flow meter.

3.7. START-UP AND INSTRUCTION

3.7.1. Initial Fill:

3.7.1.1. The POOL SUBCONTRACTOR shall provide a water test of the source water to the Consultant with recommendations prior to filling of the pool.

3.7.1.2. The POOL SUBCONTRACTOR shall be responsible for the initial filling of the pools and start-up of the associated systems.

3.7.1.3. Utilize the pool filtration and heating system to provide tempered water for filling the pools. Fill pools with water matching the temperature of the pool tank in order to prevent thermal shock to the pool tank and interior finishes. In the event that the heating systems are not available for use fill the pool no more than 610mm (2'0") in a twenty four (24) hour period.

3.7.1.4. Add chemicals during the filling process to achieve the following chemical levels:

Free Available Chlorine:	2.0 to 4.0 ppm
Total Chlorine:	1.0 to 4.0 ppm
Combined Chlorine:	0.0 to 0.2 ppm
pH:	7.4 to 7.6

Calcium Hardness:	200 to 400 ppm
Total Alkalinity:	80 to 120 ppm
Langelier saturation index between:	−0.3 and +0.3
Cyanuric Acid	30 to 150 ppm

3.7.1.5. Monitor and maintain required chemical or other pool parameters until taken over by the Owner. Provide a sequestering agent when filling the pool in accordance with the manufacturers' recommendations. "Blue Metal Solution" by Jack's Magic or approved equal.

3.7.1.6. After the pool is filled, raise the temperature of the pool water at a rate of 0.3° per hour

3.7.2. Commissioning and System Training:

3.7.2.1. Refer to Specification Section 13010 for details.

3.7.3. Manuals:

3.7.3.1. Provide operating and maintenance manuals for the pool systems as called for in the General Requirements of the Specification.

3.7.3.2. Manuals shall thoroughly explain all aspects of filter system normal operation, backwashing, pool water chemical treatment and maintenance procedures.

3.7.3.3. Provide minimum 610mm x 915mm (24" x 36") schematic flow diagram for each pool filter system showing all valves and the sequence of operation of the filter systems, mounted and laminated with plastic, suitable for wall display. A copy of this schematic shall be included in the maintenance manuals.

3.8. SPECIFICATION ISSUES LOG

REV NO.	ISSUE	DATE
A	Issued for Tender	09-18-24

END OF SECTION

Contents

Section 22 01 10.51
Plumbing Piping Cleaning

Part 1 General

1.1 Section includes

1. Disinfection of potable water distribution and transmission piping.
2. Testing and reporting results.

1.2 Related requirements

1. Section 33 14 16 - Site Water Utility Distribution Piping.
2. Section 22 10 00 - Plumbing Piping: Disinfection of building domestic water piping system.

1.3 Reference standards

1. AWWA B300-18 Hypochlorites
2. AWWA B301-18 Liquid chlorine
3. AWWA B302-23 Ammonium sulfate
4. AWWA B303-18 Sodium chlorite
5. AWWA C651-14 Disinfecting water mains

1.4 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Test Reports: Indicate results comparative to specified requirements.
3. Certificate: Certify that cleanliness of water distribution system meets or exceeds specified requirements.

1.5 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Record Documentation:
    2.1. Disinfection report:
        2.1.1. Type and form of disinfectant used.
        2.1.2. Date and time of disinfectant injection start and time of completion.
        2.1.3. Test locations.
        2.1.4. Initial and 24 hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
        2.1.5. Date and time of flushing start and completion.
        2.1.6. Disinfectant residual after flushing in ppm for each outlet tested.
    2.2. Bacteriological report:
        2.2.1. Date issued, project name, and testing laboratory name, address, and telephone number.
        2.2.2. Time and date of water sample collection.

2.2.3. Name of person collecting samples.

2.2.4. Test locations.

2.2.5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.

2.2.6. Coliform bacteria test results for each outlet tested.

2.2.7. Certification that water conforms, or fails to conform, to bacterial standards of authority having jurisdiction.

1.6 Quality assurance

1. Products of This Section: Manufactured to ISO 14000 certification requirements.
2. Perform Work in accordance with AWWA C651.
3. Water Treatment Firm: Company specializing in disinfecting potable water systems specified in this Section with minimum three (3) years documented experience.
4. Testing Firm: Company specializing in testing potable water systems, certified by the Province of Ontario. Submit proof upon request.
5. Submit bacteriologist's signature and authority associated with testing.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
   1.1. Conform to applicable code or regulation for performing the work of this Section.
   1.2. Provide certificate of compliance from authority having jurisdiction indicating approval of water system.

Part 3 Execution

3.1 Examination

1. Section 01 71 00: Verify existing conditions before starting work.
2. Verify that piping system has been cleaned, inspected and pressure tested.
3. Perform scheduling and disinfecting activity with start-up, testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

3.2 Execution

1. Provide and attach required equipment to perform the work of this Section.
2. Inject treatment disinfectant into piping system.
3. Maintain disinfectant in system for twenty-four (24) hours.
4. Flush, circulate, and clean until required cleanliness is achieved; use municipal domestic water.
5. Replace permanent system devices removed for disinfection.

3.3 Field quality control

1. Inspection and Testing:
   1.1. Test samples in accordance with AWWA C651.

End of Section

Section 22 05 00
Common Work Results for Mechanical

Part 1 General

1.1 Action and informational submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. Product Data:
   2.1. Submit manufacturer's instructions, printed product literature and data sheets for equipment, components and include product characteristics, performance criteria, physical size, finish and limitations.
3. Shop Drawings:
   3.1. Indicate on drawings:
      3.1.1. Mounting arrangements.
      3.1.2. Operating and maintenance clearances.
   3.2. Shop drawings and product data accompanied by:
      3.2.1. Detailed drawings of bases, supports, and anchor bolts.
      3.2.2. Acoustical sound power data, where applicable.
      3.2.3. Points of operation on performance curves.
      3.2.4. Manufacturer to certify current model production.
      3.2.5. Certification of compliance to applicable codes.
   3.3. In addition to transmittal letter referred to in Section 01 33 00 - Submittal Procedures: use MCAC "Shop Drawing Submittal Title Sheet". Identify section and paragraph number.

1.2 Closeout submittals

1. Submit in accordance with Section 01 78 00 - Closeout Submittals.
2. Operation and Maintenance Data: submit operation and maintenance data sheets for incorporation into manual.
   2.1. Operation data to include:
      2.1.1. Control schematics for systems including environmental controls.
      2.1.2. Description of systems and their controls.
      2.1.3. Description of operation of systems at various loads together with reset schedules and seasonal variances.
      2.1.4. Operation instruction for systems and component.
      2.1.5. Description of actions to be taken in event of equipment failure.
      2.1.6. Valves schedule and flow diagram.
      2.1.7. Colour coding chart.
   2.2. Maintenance data to include:
      2.2.1. Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.

2.2.2. Data to include schedules of tasks, frequency, tools required and task time.

2.3. Performance data to include:

2.3.1. Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.

2.3.2. Equipment performance verification test results.

2.3.3. Special performance data as specified.

2.3.4. Testing, adjusting and balancing reports as specified in Section 23 05 93 - Testing, Adjusting and Balancing for HVAC.

2.4. Additional data:

2.4.1. Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.

2.5. Site records:

2.5.1. Consultant will provide 1 set of reproducible mechanical drawings. Provide sets of white prints as required for each phase of work. Mark changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems and low voltage control wiring.

2.5.2. Transfer information weekly to reproducibles, revising reproducibles to show work as actually installed.

2.5.3. Use different colour waterproof ink for each service.

2.5.4. Make available for reference purposes and inspection.

2.6. As-built drawings:

2.6.1. Prior to start of Testing, Adjusting and Balancing for HVAC, finalize production of as-built drawings.

2.6.2. Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).

2.6.3. Submit to Consultant for approval and make corrections as directed.

2.6.4. Perform testing, adjusting and balancing for HVAC using as-built drawings.

2.6.5. Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.

2.7. Submit copies of as-built drawings for inclusion in final TAB report.

Part 2 Products

2.1 Not used

1. Not used.

Part 3 Execution

3.1 Examination

1. Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for mechanical installation in accordance with manufacturer's written instructions.

1.1. Visually inspect substrate in presence of Consultant.

1.2. Inform Consultant of unacceptable conditions immediately upon discovery.

1.3. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 Painting repairs and restoration

1. Do painting in accordance with Section 09 91 23 - Interior Painting.
2. Prime and touch up marred finished paintwork to match original.
3. Restore to new condition, finishes which have been damaged.

3.3 System cleaning

1. Clean interior and exterior of all systems including strainers. Vacuum interior of ductwork and air handling units.

3.4 Field quality control

1. Manufacturer's Field Services:
   1.1. Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
   1.2. Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.5 Demonstration

1. Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.
2. Use operation and maintenance manual, as-built drawings, and audio visual aids as part of instruction materials.
3. Instruction duration time requirements as specified in appropriate sections.

3.6 Cleaning

1. Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
   1.1. Leave Work area clean at end of each day.
2. Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

3.7 Protection

1. Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

3.8 Mounting

1. For all wall or ceiling mounted equipment or components weighting more than 30 kg, provide mounting design from professional engineer licensed to practice in Ontario. Submit sealed design documents prior to commencing installation.

End of Section

Section 22 10 00
Plumbing Piping

Part 1 General

1.1 Section includes

1. Pipe, pipe fittings, valves, and connections for piping systems sanitary sewer, domestic water..

1.2 Related requirements

1. Section 08 31 13 - Access Doors and Frames.
2. Section 09 91 00 - Painting.
3. Section 23 05 48 - Vibration Isolation.
4. Section 23 05 53 - Mechanical Identification.
5. Section 23 07 19 - Piping Insulation.
6. Section 26 05 83 - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 Reference standards

1. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
2. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
3. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV.
4. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes.
5. ASME B16.29 - Wrought Copper And Wrought Copper Alloy Solder Joint Drainage Fittings - DWV.
6. ASME B16.50 - Wrought Copper and Copper Alloy Braze-Joint Pressure Fittings.
7. ASME B31.1/B31.3 - Power Piping and Process Piping (Set).
8. ASME B31.2 - Fuel Gas Piping.
9. ASME B31.9 - Building Services Piping.
10. ASME Boiler and Pressure Vessels Code, Section I - Rules for Construction of Power Boilers.
11. ASME Boiler and Pressure Vessels Code, Section IV - Rules for Construction of Heating Boilers.
12. ASME Boiler and Pressure Vessel Code, Section IX - Welding and Brazing Qualifications.
13. ASTM A53/A53M-22 Standard specification for pipe, steel, black and hot-dipped, zinc-coated, welded and seamless
14. ASTM A74-21 Standard specification for cast iron soil pipe and fittings
15. ASTM A234/A234M-23a Standard specification for piping fittings of wrought carbon steel and alloy steel for moderate and high temperature service
16. ASTM A312/A312M-22a Standard specification for seamless, welded, and heavily cold worked austenitic stainless steel pipes
17. ASTM A774/A774M-14(2019) Standard specification for as-welded wrought austenitic stainless steel fittings for general corrosive service at low and moderate temperatures
18. ASTM B32-20 Standard specification for solder metal

19. ASTM B75/B75M-20 Standard specification for seamless copper tube
20. ASTM B88M-20 Standard specification for seamless copper water tube (metric)
21. ASTM B88-22 Standard specification for seamless copper water tube
22. ASTM B280-23 Standard specification for seamless copper tube for air conditioning and refrigeration field service
23. ASTM B306-20 Standard specification for copper drainage tube (DWV)
24. ASTM B837-19 Standard specification for seamless copper tube for natural gas and liquified petroleum (LP) gas fuel distribution systems
25. ASTM C14M-20 Standard specification for nonreinforced concrete sewer, storm drain, and culvert pipe (metric)
26. ASTM C14-20 Standard specification for nonreinforced concrete sewer, storm drain, and culvert pipe
27. ASTM C443M-21 Standard specification for joints for concrete pipe and manholes, using rubber gaskets (metric)
28. ASTM C443-21 Standard specification for joints for concrete pipe and manholes, using rubber gaskets
29. ASTM C564-20a Standard specification for rubber gaskets for cast iron soil pipe and fittings
30. ASTM C1053-00(2015) Standard specification for borosilicate glass pipe and fittings for drain, waste, and vent (DWV) applications (Withdrawn 2019)
31. ASTM D2235-22 Standard specification for solvent cement for acrylonitrile-butadiene-styrene (ABS) plastic pipe and fittings
32. ASTM D2241-20 Standard specification for poly(vinyl chloride) (PVC) pressure-rated pipe (SDR series)
33. ASTM D2464-23 Standard specification for threaded poly(vinyl chloride) (PVC) plastic pipe fittings, Schedule 80
34. ASTM D2513-20 Standard specification for polyethylene (PE) gas pressure pipe, tubing, and fittings
35. ASTM D2564-20 Standard specification for solvent cements for poly(vinyl chloride) (PVC) plastic piping systems
36. ASTM D2683-20 Standard specification for socket-type polyethylene fittings for outside diameter-controlled polyethylene pipe and tubing
37. ASTM D3138-21 Standard specification for solvent cements for transition joints between acrylonitrile-butadiene-styrene (ABS) and poly(vinyl chloride) (PVC) non-pressure piping components
38. ASTM E814-23a Standard test method for fire tests of penetration firestop systems
39. ASTM F708-92(2018)e1 Standard practice for design and installation of rigid pipe hangers
40. ASTM F1281-23a Standard specification for crosslinked polyethylene/aluminum/crosslinked polyethylene (PEX-AL-PEX) pressure pipe
41. ASTM G17-07(2020) Standard test method for penetration resistance of pipeline coatings (blunt rod)
42. Specification A5.8M/A5.8:2019 Specification for filler metals for brazing and braze welding
43. AWWA C105/A21.5-18 Polyethylene encasement for ductile-iron pipe systems
44. AWWA C651-14 Disinfecting water mains
45. CSA B70:19 Cast iron soil pipe, fittings, and means of joining
46. CSA B1800:21 Thermoplastic nonpressure piping compendium
47. CAN/ULC-S102.2 - Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.
48. ANSI Z21.22-2015/CSA 4.4:R2020 Relief valves for hot water supply systems
49. STD SP-110-2010 Ball valves threaded, socket-welding, solder joint, grooved and flared ends

50. STD SP-58-2018 Pipe hangers and supports - materials, design, manufacture, selection, application, and installation
51. STD SP-67-2022 Butterfly valves
52. STD SP-70-2011 Gray iron gate valves, flanged and threaded ends
53. STD SP-71-2018 Gray iron swing check valves, flanged and threaded ends
54. STD SP-78-2011 Gray iron plug valves, flanged and threaded ends
55. STD SP-80-2019 Bronze gate, globe, angle, and check valves
56. STD SP-85-2011 Gray iron globe and angle valves, flanged and threaded ends
57. NFPA 54/ANSI Z223.1 - National Fuel Gas Code.
58. NFPA 58 - Liquefied Petroleum Gas Code.
59. UL 1479 - Standard for Fire Tests of Through-Penetration Firestops.

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalogue information. Indicate valve data and ratings.

1.5 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Record Documentation: Record actual locations of valves.

1.6 Quality assurance

1. Products of This Section: Manufactured to ISO 9000 certification requirements.
2. Valves: Manufacturer's name and pressure rating marked on valve body.
3. Welding Materials and Procedures: Conform to ASME BPVC.IX.
4. Welder's Certification: To ASME BPVC.IX.

1.7 Delivery, storage, and handling

1. Section 01 61 00: Transport, handle, store, and protect products.
2. Accept valves on site in shipping containers with labelling in place. Inspect for damage.
3. Provide temporary protective coating on cast iron and steel valves.
4. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
5. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.8 Site conditions

1. Ambient Conditions: Do not install underground piping when bedding is wet or frozen.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
   1.1. Perform Work to applicable plumbing code.
   1.2. Conform to applicable code for installation of backflow prevention devices.
   1.3. Provide certificate of compliance from authority having jurisdiction indicating approval of installation of backflow prevention devices.

2.2 Sanitary sewer piping, buried, inside building

1. Cast Iron Pipe: CAN/CSA-B70.
   1.1. Fittings: Cast iron, FSWW-P-401, hubless cast iron pipe fittings.
   1.2. Joints: ASTM C564, rubber or compression gaskets.
2. ABS Pipe: CAN/CSA-B1800, Type DWV.
   2.1. Fittings: ASTM D2468, ABS socket type, Schedule 40.
   2.2. Joints: ASTM D2235, solvent cement and primer for fittings; ASTM D3138, solvent cement and primer for transition joints.
3. PVC Pipe: CAN/CSA-B1800, SDR 35 pipe.
   3.1. Fittings: ASTM D2468, ABS socket type, Schedule 40.
   3.2. Joints: ASTM D2564 solvent cement and primer.
4. Copper Tube: ASTM B306, DWV.
   4.1. Fittings: ASME B16.23, cast bronze.
   4.2. Joints: ASTM B32, soldered.

2.3 Sanitary sewer piping, above ground

1. Cast Iron Pipe: CAN/CSA-B70.
   1.1. Fittings: Hubless Cast Iron Pipe Fittings: FSWW-P-401.
   1.2. Joints: ASTM C564, rubber or compression gaskets.
2. Copper Tube: ASTM B306, DWV.
   2.1. Fittings: ASME B16.23 cast bronze.
   2.2. Joints: Joints: ASTM B32, soldered.
3. PVC Pipe: CAN/CSA-B1800, and CAN/ULC-S102.2 flame spread rating 15.
   3.1. Fittings: CAN/CSA-B1800, socket type, and CAN/ULC-S102.2 flame spread rating 15.
   3.2. Joints: ASTM D2564 solvent cement and primer.

2.4 Domestic water piping, above ground

1. Copper Tubing: ASTM B88M, Type L, H (drawn) temper.
   1.1. Fittings: ASME B16.18 cast copper alloy.
   1.2. Joints: ASTM B32, soldered.

2.5 Flanges, unions, and couplings

1. Ferrous Pipe Size 75 mm and Under: Class 150 malleable iron threaded unions.
2. Copper Tube and Pipe Size 75 mm and Under: Class 150 bronze unions with soldered joints.
3. Ferrous Pipe Size Over 25 mm: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
4. Copper Tube and Pipe Size Over 25 mm: Class 150 slip-on bronze flanges; preformed neoprene gaskets.
5. Grooved and Shouldered Pipe End Couplings:
    5.1. Housing: Malleable iron clamps to engage and lock, designed to permit some angular deflection, contraction, and expansion; steel bolts, nuts, and washers; galvanized for galvanized pipe.
    5.2. Sealing gasket: C-shape composition sealing gasket.
6. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.6 Pipe hangers and supports

1. Plumbing Piping - Drain, Waste, and Vent:
    1.1. Conform to ASME B31.9.
    1.2. Hangers for Pipe Sizes 13 to 38 mm: Malleable iron, adjustable swivel, split ring.
    1.3. Hangers for Pipe Sizes 50 mm and Over: Carbon steel, adjustable, clevis.
    1.4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
    1.5. Wall Support for Pipe Sizes to 75 mm: Cast iron hook.
    1.6. Wall Support for Pipe Sizes 100 mm and Over: Welded steel bracket and wrought steel clamp.
    1.7. Vertical Support: Steel riser clamp.
    1.8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
    1.9. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
2. Plumbing Piping - Water:
    2.1. Conform to ASME B31.9.
    2.2. Hangers for Pipe Sizes 13 to 38 mm: Carbon steel, adjustable swivel, split ring.
    2.3. Hangers for Cold Pipe Sizes 50 mm and Over: Carbon steel, adjustable, clevis.
    2.4. Hangers for Hot Pipe Sizes 50 to 100 mm: Carbon steel, adjustable, clevis.
    2.5. Hangers for Hot Pipe Sizes 150 mm and Over: Adjustable steel yoke, cast iron pipe roll, double hanger.
    2.6. Multiple or Trapeze Hangers: Steel channels with welded supports or spacers and hanger rods.
    2.7. Multiple or Trapeze Hangers for Hot Pipe Sizes 150 mm and Over: Steel channels with welded supports or spacers and hanger rods, cast iron roll.
    2.8. Wall Support for Pipe Sizes to 75 mm: Cast iron hook.
    2.9. Wall Support for Pipe Sizes 100 mm and Over: Welded steel bracket and wrought steel clamp.
    2.10. Wall Support for Hot Pipe Sizes 150 mm and Over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron pipe roll.

2.11. Vertical Support: Steel riser clamp.

2.12. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

2.13. Floor Support for Hot Pipe Sizes to 100 mm: Cast iron adjustable pipe saddle, locknut, nipple, floor flange, and concrete pier or steel support.

2.14. Floor Support for Hot Pipe Sizes 150 mm and Over: Adjustable cast iron pipe roll and stand, steel screws, and concrete pier or steel support.

2.15. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.7 Ball valves

1. Ball Valves 100 mm and Smaller: MSS SP-110, Class 150, 2760 kPa CWP, bronze, two-piece body, chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder ends with union, lead free.

   1.1. Product: 858/859 Series, manufactured by KITZ.

2.8 Swing check valves

1. Swing Check Valves Up To and Including 50 mm: MSS SP-80, Class 125, bronze body and cap, bronze swing disc with rubber seat, solder ends.

   1.1. Product: LFCV, manufactured by WATTS.

2. Swing Check Valves 50 mm and Larger: MSS SP-71, Class 125, iron body, bronze swing disc, renewable disc seal and seat, flanged ends.

   2.1. Product: 411, manufactured by WATTS.

2.9 Water pressure reducing valves

1. Water Pressure Reducing Valves Up to 50 mm: MSS SP-80, bronze body, stainless steel and thermoplastic internal parts, fabric reinforced diaphragm, strainer, threaded ends.

   1.1. Product: LF123LP, manufactured by WATTS.

2. Water Pressure Reducing Valves Over 50 mm: MSS SP-85, cast iron body, bronze fitted, elastomeric diaphragm and seat disc, flanged.

   2.1. Product: LFN223F, manufactured by WATTS.

2.10 Relief valves

1. Pressure Relief Valves: ANSI Z21.22/CSA 4.4, certified, bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated.

   1.1. Product: LF3L, manufactured by WATTS.

2. Temperature and Pressure Relief Valves: ANSI Z21.22/CSA 4.4 certified, bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, temperature relief maximum 98.9 degrees C, capacity ASME BPVC.IV certified and labelled.

   2.1. Product: LF100XL, manufactured by WATTS.

2.11 Strainers

1. Strainers 50 mm and Under: Class 150 threaded brass body for 1200 kPa CWP, Y pattern with 0.8 mm stainless steel perforated screen.
   1.1. Product: LF777, manufactured by WATTS.
2. Strainers 38 mm to 100 mm: Class 125, flanged iron body, Y pattern with 1.6 mm stainless steel perforated screen.
   2.1. Product: 77F-DI 125, manufactured by WATTS.
3. Strainers 125 mm and Larger: Class 125, flanged iron body, basket pattern with 3.2 mm stainless steel perforated screen.
   3.1. Product: 97FB-CI, manufactured by WATTS.

2.12 Fire stop systems

1. General Purpose Fire Stopping Sealant: Water based, nonslumping, premixed sealant with intumescent properties, rated for 3 hours to ASTM E814.
2. General Purpose Vibration Resistant Fire Stopping Sealant: Silicone based, nonslumping, premixed sealant with intumescent properties, vibration and moisture resistant, rated for three (3) hours per ASTM E814.
3. DWV Plastic Pipe Systems Fire Stopping Sealant: Silicone based, premixed sealant with intumescent properties, vibration and moisture resistant, rated for three (3) hours per ASTM E814 with metal collars.

Part 3 Execution

3.1 Examination

1. Section : Verify existing conditions before starting work.
2. Verify that excavations are to required grade, dry, and not over-excavated.

3.2 Preparation

1. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
2. Remove scale and dirt, on inside and outside, before assembly.
3. Prepare piping connections to equipment with flanges or unions.

3.3 Installation

1. Install to manufacturer's written instructions.
2. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
3. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
4. Install piping to maintain headroom, conserve space, and not interfere with use of space.
5. Group piping whenever practical at common elevations.
6. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 23 05 16.
7. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 23 07 19.

8. Provide access where valves and fittings are not exposed. Coordinate size and location of access doors with Section 08 31 13.
9. Install vent piping penetrating roofed areas to maintain integrity of roof assembly.
10. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
11. Provide support for utility meters to requirements of utility companies.
12. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Section 09 91 00.
13. Install bell and spigot pipe with bell end upstream.
14. Install valves with stems upright or horizontal, not inverted.
15. Pipe vents from gas pressure reducing valves to outdoors and terminate in weather proof hood.
16. Install water piping to ASME B31.9.
17. Sleeve pipes passing through partitions, walls and floors.
18. Inserts:
    - 18.1. Provide inserts for placement in concrete formwork.
    - 18.2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
    - 18.3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 100 mm.
    - 18.4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
    - 18.5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut flush with top of slab.
19. Pipe Hangers and Supports:
    - 19.1. Install to ASME B31.9.
    - 19.2. Support horizontal piping as scheduled.
    - 19.3. Install hangers to provide minimum 15 mm space between finished covering and adjacent work.
    - 19.4. Place hangers within 300 mm of each horizontal elbow.
    - 19.5. Use hangers with 40 mm minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
    - 19.6. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
    - 19.7. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
    - 19.8. Provide copper plated hangers and supports for copper piping.
    - 19.9. Prime coat exposed steel hangers and supports. Refer to Section 09 91 00. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
    - 19.10. Provide hangers adjacent to motor driven equipment with vibration isolation; refer to Section 23 05 48.
    - 19.11. Support cast iron drainage piping at every joint.

3.4 Application

1. Use grooved mechanical couplings and fasteners only in accessible locations.
2. Install unions downstream of valves and at equipment or apparatus connections.
3. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
4. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
5. Install globe valves for throttling, bypass, or manual flow control services.
6. Provide lug end butterfly valves adjacent to equipment when provided to isolate equipment.
7. Provide spring loaded check valves on discharge of water pumps.
8. Provide plug valves in natural gas systems for shut-off service.
9. Provide flow controls in water recirculating systems where indicated.

3.5 Erection tolerances

1. Section 01 73 00: Tolerances.
2. Establish invert elevations, slopes for drainage to 1% minimum. Maintain gradients.
3. Slope water piping minimum 0.25% and arrange to drain at low points.

3.6 Disinfection of domestic water piping system

1. Disinfect water distribution system to Section 22 01 10.51.
2. Prior to starting work, verify system is complete, flushed and clean.
3. Ensure Ph of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
4. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80 mg/L residual.
5. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15% of outlets.
6. Maintain disinfectant in system for twenty-four (24) hours.
7. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
8. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
9. Take samples no sooner than twenty-four (24) hours after flushing, from 2% of outlets and from water entry, and analyze to AWWA C651.

3.7 Service connections

1. Provide new sanitary sewer services. Before commencing work check invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover to avoid freezing.
2. Provide water service complete with approved backflow preventers and pressure reducing valve with bypass.
    2.1. Provide sleeve in wall for service main and support at wall with reinforced concrete bridge. Caulk enlarged sleeve and make watertight with pliable material. Anchor service main inside to concrete wall.
    2.2. Provide 1.2 mm galvanized sheet metal sleeve around service main to 150 mm above floor and 1800 mm minimum below grade. Size for minimum of 50 mm of loose batt insulation stuffing.

End of Section

Section 22 11 19
Domestic Water Piping Specialties

Part 1 General

1.1 Section includes

1. Roof and floor drains.
2. Cleanouts.
3. Backflow preventers.
4. Thermostatic mixing valves.

1.2 Related requirements

1. Section 22 10 00 - Plumbing Piping.
2. Section 22 42 00 - Plumbing Fixtures.
3. Section 22 47 00 - Plumbing Equipment.
4. Section 26 05 83 - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 Reference standards

1. ASTM C478/C478M-22 Standard specification for circular precast reinforced concrete manhole sections
2. AWWA C510-17 Double check-valve backflow prevention assembly
3. AWWA C511-17 Reduced-pressure principle backflow prevention assembly
4. ASSE 1011:2023 Performance requirements for hose connection vacuum breakers
5. ASSE 1012:2021 Backflow preventers with an intermediate atmospheric vent
6. ASSE 1013:2021 Performance requirements for backflow preventer with intermediate atmospheric vent
7. ASSE 1019:2011 Performance requirements for wall hydrant with backflow protection and freeze resistance
8. PDI Standard G101-2017 Testing and rating procedure for hydro mechanical grease interceptors with appendix of installation and maintenance
9. PDI Standard WH201-2017 Water hammer arresters

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
3. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Certificates: Certify that grease interceptors meet or exceed specified requirements.
3. Installation Data: Manufacturer's special installation requirements including assembly and support requirements.

1.6 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Operation Data: Indicate frequency of treatment required for interceptors.
3. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.

1.7 Quality assurance

1. Products of This Section: Manufactured to ISO 14000 certification requirements.
2. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience. Submit proof upon request.

1.8 Delivery, storage, and handling

1. Section 01 61 00: Transport, handle, store, and protect products.
2. Accept specialties on site in original factory packaging. Inspect for damage.

Part 2 Products

2.1 Backflow preventers

1. Reduced Pressure Backflow Preventers: ASSE 1013, bronze body with bronze internal parts and stainless steel springs, two (2) independently operating, spring loaded check valves and diaphragm type differential pressure relief valve located between check valves; third check valve that opens under back pressure in case of diaphragm failure.
   1.1. Non-threaded vent outlet.
   1.2. Assembled with two (2) gate valves, strainer, and four test cocks.
   1.3. 50mm and smaller: Series 009, manufactured by WATTS.
   1.4. Above 50mm: Series LF909, manufactured by WATTS.

2.2 Thermostatic mixing valves

1. Chrome plated cast brass body, stainless steel or copper alloy bellows, integral temperature adjustment, check valve on inlets, volume control shut-off valve on outlet, stem thermometer on outlet and strainer stop checks on inlets.
   1.1. Cabinet: 1.5 mm, prime coated, for recessed mounting with keyed lock.

Part 3 Execution

3.1 Installation

1. Install to manufacturer's written instructions.
2. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
3. Encase exterior cleanouts in concrete flush with grade.
4. Install floor cleanouts at elevation to accommodate finished floor.
5. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibs.

6. Pipe relief from backflow preventer to nearest drain.
7. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to sinks, washing machine outlets.
8. Install air chambers on hot and cold water supply piping to each fixture or group of fixtures (each washroom). Fabricate same size as supply pipe or 20 mm minimum, and minimum 450 mm long.

End of Section

Section 22 42 00
Commercial Plumbing Fixtures

Part 1 General

1.1 Section includes

1. Water closets.
2. Lavatories.
3. Sinks.
4. Service sinks.
5. Eye wash fountains.
6. Emergency showers.

1.2 Related requirements

1. Section 07 92 00 - Joint Sealants: Seal fixtures to walls and floors.
2. Section 23 05 29 - Supports And Anchors.
3. Section 22 10 00 - Plumbing Piping.
4. Section 22 11 19 - Plumbing Specialties.
5. Section 22 47 00 - Plumbing Equipment.
6. Section 26 05 83 - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 Reference standards

1. ASME A112.6.1M - Floor Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use.
2. ASME A112.18.1-2012/CSA-B125.1-12 - Plumbing Supply Fittings.
3. ASME A112.19.1/CSA B45.2 - Enamelled Cast Iron and Enamelled Steel Plumbing Fixtures.
4. ASME A112.19.2/CSA-B45.1 - Ceramic Plumbing Fixtures. Includes Errata 10/2018.
5. ASME A112.19.3/CSA-B45.4 - Stainless Steel Plumbing Fixtures.
6. ASME A112.19.5-2017/CSA-B45.15-2017 - Flush Valves and Spuds for Water Closets, Urinals, and Tanks.
7. STD Z124-2022 Plastic plumbing fixtures
8. ANSI/ISEA Z358.1-2014 American national standard for emergency eyewash and shower equipment
9. NFPA 70 - National Electrical Code (NEC).
10. CSA (Canadian Standards Association).
11. UL (Underwriters Laboratories Inc.).

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide catalogue illustrations of fixtures, sizes, rough-in dimensions, trim, utility sizes, finishes.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Manufacturer's Instructions: Indicate installation methods and procedures.

1.6 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
3. Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.7 Delivery, storage, and handling

1. Section 01 61 00: Transport, handle, store, and protect products.
2. Accept fixtures on site in factory packaging. Inspect for damage.
3. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
    1.1. Products Requiring Electrical Connection: Listed and classified by CSA as suitable for the purpose specified and indicated.

Part 3 Execution

3.1 Examination

1. Section 01 71 00: Verify existing conditions before starting work.
2. Verify that walls and floor finishes are prepared and ready for installation of fixtures.
3. Verify that electric power is available and of the correct characteristics.
4. Confirm that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

3.2 Preparation

1. Rough-in fixture piping connections to minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.3 Installation

1. Install to manufacturer's written instructions.
2. Install each fixture with trap, easily removable for servicing and cleaning.
3. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.
4. Install components level and plumb.
5. Install and secure fixtures in place with wall supports and bolt, washer, nut fasteners.

6. Seal fixtures to wall and floor surfaces with sealant as specified in Section 07 92 00, colour to match fixture.
7. Solidly attach water closets to floor with lag screws. Lead flashing is not intended hold fixture in place.

3.4 Interface with other products

1. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.5 Adjusting

1. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.6 Cleaning

1. Section 01 74 10: Cleaning installed work.
2. Clean plumbing fixtures and equipment.

3.7 Protection

1. Section 01 78 23: Protecting installed work.
2. Do not permit use of fixtures.

End of Section

Section 22 47 00
Domestic water heating systems

Part 1 General

1.1 Section includes

1. Water heaters.
2. Packaged water heating systems.
3. Domestic water heat exchangers.
4. Water storage tanks.
5. Pumps.

1.2 Related requirements

1. Section 26 05 83 - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 Reference standards

1. ASME Boiler and Pressure Vessels Code, Section VIII, Division 1 - Rules for Construction of Pressure Vessels.
2. CSA B51:19 Boiler, pressure vessel, and pressure piping code
3. NEMA 250-2020 Enclosures for electrical equipment (1,000 Volts maximum)
4. NFPA 30 - Flammable and Combustible Liquids Code.
5. NFPA 31 - Standard for the Installation of Oil-Burning Equipment. Superseded by ASHRAE 62.1 Ventilation for Acceptable Indoor Air Quality.
6. NFPA 54/ANSI Z223.1 - National Fuel Gas Code.
7. NFPA 58 - Liquefied Petroleum Gas Code.
8. UL 1453 - Standard for Electric Booster and Commercial Storage Tank Water Heaters.
9. UL 174 - Standard for Household Electric Storage Tank Water Heaters.
10. CSA (Canadian Standards Association).
11. UL (Underwriters Laboratories Inc.).

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data:
    2.1. Provide dimension drawings of water heaters indicating components and connections to other equipment and piping.
    2.2. Indicate pump type, capacity, power requirements.
    2.3. Provide certified pump curves showing pump performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable.
    2.4. Provide electrical characteristics and connection requirements.

3. Shop Drawings:
   3.1. Indicate heat exchanger dimensions, size of tappings, and performance data.
   3.2. Indicate dimensions of tanks, tank lining methods, anchors, attachments, lifting points, tappings, and drains.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.

1.6 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Record Documentation: Record actual locations of components.
3. Operation and Maintenance Data: Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.
4. Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.7 Maintenance material submittals

1. Section 01 78 23: Maintenance and extra material requirements.

1.8 Quality assurance

1. Products of This Section: Manufactured to ISO 9000 certification requirements.
2. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience. Submit proof upon request.
3. Provide pumps with manufacturer's name, model number, and rating/capacity identified.
4. Ensure products and installation of specified products are to recommendations and requirements of the following organizations:
   4.1. American Gas Association (AGA).
   4.2. National Sanitation Foundation (NSF).
   4.3. American Society of Mechanical Engineers (ASME).
   4.4. National Board of Boiler and Pressure Vessel Inspectors (NBBPVI).
   4.5. National Electrical Manufacturers' Association (NEMA).
   4.6. Underwriters Laboratories (UL).
5. Ensure pumps operate at specified system fluid temperatures without vapour binding and cavitation, are non-overloading in parallel or individual operation, operate within 25% of midpoint of published maximum efficiency curve.

1.9 Delivery, storage, and handling

1. Section 01 61 00: Transport, handle, store, and protect products.
2. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
   1.1. Conform to ASME BPVC.VIII.1 for manufacture of pressure vessels for heat exchangers.
   1.2. Conform to ASME BPVC.VIII.1 for tanks.
   1.3. Products Requiring Electrical Connection: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 Commercial electric water heaters

1. Water Heater: Factory-assembled and wired, electric, vertical storage, with glass lined welded steel tank, 100 mm diameter inspection port, thermally insulated with minimum 50 mm, glass fibre insulation encased in corrosion-resistant steel jacket; baked-on enamel finish.
2. Controls: Automatic immersion water thermostat with externally adjustable temperature range from 16 to 82 degrees C, flanged or screw-in nichrome elements and high temperature limit thermostat.
3. Accessories:
   3.1. Brass water connections and dip tube.
   3.2. Magnesium anode protection.
   3.3. Drain valve.
   3.4. ASME rated temperature and pressure relief valve.
4. Tank: ASME labelled pressure vessel, glass welded steel lining, mounted on steel channel base with lifting lugs, thermally insulated with minimum 50 mm, glass fibre insulation encased in corrosion-resistant steel jacket; baked-on enamel finish..
5. Controls: Ventilated control cabinet, factory-wired with solid state progressive sequencing step controller, fuses, magnetic contactors, control transformer.
   5.1. Pilot lights indicating main power and heating steps.
   5.2. Control circuit toggle switch.
   5.3. Electronic low-water (probe-type) cut-off.
   5.4. High temperature limit thermostat.
   5.5. Flush-mounted temperature and pressure gauges.
6. Heating Elements: Flange-mounted immersion elements with individual elements sheathed with Incoloy corrosion-resistant metal alloy.
   6.1. Rated less than 480 W/sq cm.

Part 3 Execution

3.1 Installation

1. Install water heaters to manufacturer's instructions and to AGA requirements.
2. Domestic Hot Water Storage Tanks:
   2.1. Provide steel pipe support, independent of building structural framing members.

2.2. Clean and flush prior to delivery to site. Seal until pipe connections are made.

3. Pumps:

3.1. Provide air cock and drain connection on horizontal pump casings.

3.2. Provide line sized isolating valve and strainer on suction and line sized soft seated check valve and balancing valve on discharge.

3.3. Decrease from line size with long radius reducing elbows or reducers.

3.4. Support piping adjacent to pump such that no weight is carried on pump casings.

3.5. Provide supports under elbows on pump suction and discharge line sizes 100 mm and over.

3.6. Ensure pumps operate at specified system fluid temperatures without vapour binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25% of midpoint of published maximum efficiency curve.

3.7. Align and verify alignment of base mounted pumps prior to start-up.

End of Section

Section 23 05 13
Common Motor Requirements for HVAC Equipment

Part 1 General

1.1 Section includes

1. Single phase electric motors.
2. Three-phase electric motors.

1.2 Related requirements

1. Section 26 05 83 - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 Reference standards

1. STD 9:2015 Load ratings and fatigue life for ball bearings
2. STD 11:2014 Load ratings and fatigue life for roller bearings
3. STD C22.2 NO. 100-14 Motors and generators
4. STD 112-2017 IEEE Standard test procedure for polyphase induction motors and generators
5. NEMA MG 1-2016 Motors and generators

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide wiring diagrams with electrical characteristics and connection requirements.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Test Reports: Indicate test results verifying nominal efficiency and power factor for three-phase motors larger than 0.38 kW.
3. Certificate: Provide certificate of compliance from authority having jurisdiction indicating approval of high efficiency motors.
4. Installation Data: Indicate setting, mechanical connections, lubrication, and wiring instructions.

1.6 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Operation Data: Include instructions for safe operating procedures.
3. Maintenance Data: Include assembly drawings, bearing data including replacement sizes, and lubrication instructions.

1.7 Quality assurance

1. Products of This Section: Manufactured to ISO 9000 certification requirements.

2. Manufacturer: Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented product development, testing, and manufacturing experience. Submit proof upon request.

1.8 Delivery, storage, and handling

1. Section 01 61 00: Transport, handle, store, and protect products.
2. Protect motors stored on site from weather and moisture by maintaining factory covers and suitable weather-proof covering. For extended outdoor storage, remove motors from equipment and store separately.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
   1.1. Conform to applicable code for energy efficiency.
   1.2. Products Requiring Electrical Connection: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 General construction and requirements

1. Motors Less Than 250 Watts, for Intermittent Service: Equipment manufacturer's standard and need not conform to these specifications.
2. Electrical Service:
   2.1. Refer to Section 26 05 83 for required electrical characteristics.
3. Motor Type:
   3.1. Open drip-proof except where specifically noted otherwise.
   3.2. Design motors for continuous operation in 40 degrees C environment.
   3.3. Design for temperature rise to CSA-C22.2 No. 100 limits for insulation class, service factor, and motor enclosure type.
   3.4. Motors with frame sizes 254T and larger: Energy Efficient Type.
4. Explosion-Proof Motors: CSA approved and labelled for hazard classification, with over temperature protection.
5. Visible Nameplate: Indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, service factor, power factor, efficiency.
6. Wiring Terminations:
   6.1. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to code, threaded for conduit.
   6.2. For fractional horsepower motors where connection is made directly, provide threaded conduit connection in end frame.

Part 3 Execution

3.1 Installation

1. Install to manufacturer's written instructions.

2. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.
3. Check line voltage and phase and ensure agreement with nameplate.

End of Section

Section 23 05 53
Identification for HVAC Piping and Equipment

Part 1 General

1.1 Section includes

1. Nameplates.
2. Tags.
3. Pipe Markers.

1.2 Reference standards

1. ASME A13.1-2020 - Scheme for the Identification of Piping Systems.

1.3 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide manufacturers catalogue literature for each product required.
3. Identification Information:
   3.1. Submit list of wording, symbols, letter size, and colour coding for mechanical identification.
   3.2. Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

1.4 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Indicate special procedures, and installation.

1.5 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Record Documentation: Record actual locations of tagged valves.

Part 2 Products

2.1 Nameplates

1. Description: Laminated three-layer plastic with engraved black letters on light contrasting background colour.

2.2 Tags

1. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background colour. Square tags, minimum size 10 mm.
2. Chart: Typewritten letter size list in anodized aluminum frame.

2.3 Pipe markers

1. Colour: Conform to ASME A13.1.
2. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
3. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.
4. Underground Plastic Pipe Markers: Bright coloured continuously printed plastic ribbon tape, minimum 150 mm wide by 0.10 mm thick, manufactured for direct burial service.

Part 3 Execution

3.1 Preparation

1. Degrease and clean surfaces to receive adhesive for identification materials.

3.2 Installation

1. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
2. Install tags with corrosion resistant chain.
3. Install plastic pipe markers to manufacturer's written instructions.
4. Install plastic tape pipe markers complete around pipe to manufacturer's written instructions.
5. Install underground plastic pipe markers 150 to 200 mm below finished grade, directly above buried pipe.
6. Identify air handling units, pumps, heat transfer equipment, tanks, and water treatment devices with plastic nameplates. Small devices, such as in-line pumps, may be identified with tags.
7. Identify control panels and major control components outside panels with plastic nameplates.
8. Identify thermostats relating to terminal boxes or valves with nameplates.
9. Identify valves in main and branch piping with tags.
10. Identify air terminal units and radiator valves with numbered tags.
11. Tag automatic controls, instruments, and relays. Key to control schematic.
12. Identify piping, concealed or exposed, with plastic tape pipe markers. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 ft on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
    12.1. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping.
    12.2. Locate identification not to exceed 6 m on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
13. Identify ductwork with stencilled painting. Identify with air handling unit identification number and area served. Locate identification at air handling unit, at each side of penetration of structure or enclosure, and at each obstruction.
14. Provide ceiling tacks to locate valves or dampers above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

End of Section

Section 23 05 93
Testing, Adjusting, and Balancing for HVAC

Part 1 General

1.1 Section includes

1. Testing, adjustment, and balancing of air systems.
2. Measurement of final operating condition of HVAC systems.

1.2 Related requirements

1. Section 01 78 00 - Closeout Submittals:
   1.1. Starting of Systems.
   1.2. Testing, Adjusting, and Balancing of Systems.

1.3 Reference standards

1. National standards for total system balance
2. ADC 1062: GRD-84 - Test Code for Grilles, Registers and Diffusers.
3. STD 111:2008 Testing, adjusting, and balancing of building HVAC systems (ANSI approved)
4. Procedural standard for testing adjusting and balancing of environmental systems

1.4 Administrative requirements

1. Section 01 31 00: Project management and coordination procedures.
2. Pre-installation Meetings: Convene one (1) week before starting work of this section.
3. Sequencing: Sequence work to commence after completion of systems and schedule completion of work before Substantial Completion of Project.
4. Scheduling: Schedule and provide assistance in final adjustment and test of life safety system with Fire Authority.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Submit name of adjusting and balancing agency for approval within thirty (30) days after award of Contract.
3. Field Reports: Submit procedures for submitting Field Reports.
   3.1. Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
   3.2. Prior to commencing work, submit report forms or outlines indicating adjusting, balancing, and equipment data required.
   3.3. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Consultant and for inclusion in operating and maintenance manuals.

3.4. Provide reports in soft cover, letter size, 3-ring binder manuals, complete with index page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.

3.5. Include detailed procedures, agenda, sample report forms and copy of AABC National Project Performance Guaranty prior to commencing system balance.

4. Test Reports: Indicate data on AABC National Standards for Total System Balance forms. Submit data in SI (metric) units.

1.6 Quality assurance

1. Perform total system balance to AABC National Standards for Field Measurement and Instrumentation, Total System Balance.
2. Agency Qualifications: Company specializing in the testing, adjusting, and balancing of systems specified in this Section with minimum three (3) years documented experience certified by AABC. Submit proof upon request.
3. Perform Work under supervision of AABC Certified Test and Balance Engineer.

Part 2 Products - Not Used

Part 3 Execution

3.1 Examination

1. Section 01 71 00: Verify existing conditions before starting work.
2. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
   2.1. Systems are started and operating in a safe and normal condition.
   2.2. Temperature control systems are installed complete and operable.
   2.3. Proper thermal overload protection is in place for electrical equipment.
   2.4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
   2.5. Duct systems are clean of debris.
   2.6. Fans are rotating correctly.
   2.7. Fire and volume dampers are in place and open.
   2.8. Air coil fins are cleaned and combed.
   2.9. Access doors are closed and duct end caps are in place.
   2.10. Air outlets are installed and connected.
   2.11. Duct system leakage is minimized.
   2.12. Hydronic systems are flushed, filled, and vented.
   2.13. Pumps are rotating correctly.
   2.14. Proper strainer baskets are clean and in place.
   2.15. Service and balance valves are open.
3. Submit field reports. Report defects and deficiencies noted during performance of services which prevent system balance.
4. Beginning of work means acceptance of existing conditions.

3.2 Preparation

1. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Consultant to facilitate spot checks during testing.
2. Provide additional balancing devices as required.

3.3 Installation tolerances

1. Air Handling Systems: Adjust to within plus or minus 5% of design for supply systems and plus or minus 10% of design for return and exhaust systems.
2. Air Outlets and Inlets: Adjust total to within plus 10% and minus 5% of design to space. Adjust outlets and inlets in space to within plus or minus 10% of design.

3.4 Adjusting

1. Ensure recorded data represents actual measured or observed conditions.
2. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
3. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
4. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
5. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Owner.
6. Check and adjust systems approximately six months after final acceptance and submit report.

3.5 Air system procedure

1. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
2. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
3. Measure air quantities at air inlets and outlets.
4. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
5. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
6. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
7. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
8. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50% loading of filters.
9. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
10. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
11. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.

End of Section

Section 23 07 13
Duct Insulation

Part 1 General

1.1 Section includes

1. Duct work insulation.
2. Insulation jackets.

1.2 Related requirements

1. Section 23 05 53 - Mechanical Identification.
2. Section 23 31 00 - Duct Work: Duct liner.

1.3 Reference standards

1. ASTM B209/B209M-21a Standard specification for aluminum and aluminum-alloy sheet and plate
2. ASTM B210/B210M-19a Standard specification for aluminum and aluminum-alloy drawn seamless tubes
3. ASTM C1071-19 Standard specification for fibrous glass duct lining insulation (thermal and sound absorbing material)
4. ASTM C518-21 Standard test method for steady-state thermal transmission properties by means of the heat flow meter apparatus
5. ASTM C553-13(2019) Standard specification for mineral fiber blanket thermal insulation for commercial and industrial applications
6. ASTM C612-14(2019) Standard specification for mineral fiber block and board thermal insulation
7. ASTM C921-10(2015) Standard practice for determining the properties of jacketing materials for thermal insulation. (Withdrawn 2021)
8. ASTM E162-21 Standard test method for surface flammability of materials using a radiant heat energy source
9. ASTM E84-21a Standard test method for surface burning characteristics of building materials
10. ASTM E96/E96M-16 Standard test methods for water vapor transmission of materials
11. ASTM G21-15(2021)e1 Standard practice for determining resistance of synthetic polymeric materials to fungi
12. NAIMA - National Insulation Standards.
13. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials, 2006 Edition.
14. HVAC duct construction standards - metal and flexible
15. UL 723-2018 - Tests for Surface Burning Characteristics of Building Materials (11th Edition).

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Indicate installation procedures which ensure acceptable workmanship and installation standards will be achieved.

1.6 Quality assurance

1. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience. Submit proof upon request.
2. Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer. Submit proof upon request.

1.7 Delivery, storage, and handling

1. Section 01 61 00: Transport, handle, store, and protect products.
2. Accept materials on site in original factory packaging, labelled with manufacturer's identification, including product density and thickness.
3. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.8 Site conditions

1. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
2. Maintain temperature during and after installation for minimum period of twenty-four (24) hours.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
    1.1. Materials: Flame spread/smoke developed rating of 25/50 to ASTM E84.

2.2 Glass fibre, flexible

1. Insulation: ASTM C553; flexible, noncombustible blanket.
    1.1. Thermal Conductivity: ASTM C518, 0.045W/m.K at 24 degrees C.
    1.2. Maximum service temperature: 175 degrees C.
    1.3. Maximum moisture absorption: 0.50% by volume.
2. Vapour Barrier Jacket: Kraft paper with glass fibre yarn and bonded to aluminized film.
    2.1. Moisture vapour transmission: ASTM E96/E96M; 0.02 perm.
    2.2. Secure with pressure sensitive tape.
3. Vapour Barrier Tape:
    3.1. Kraft paper reinforced with glass fibre yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
4. Outdoor Vapour Barrier Mastic:

4.1. Vinyl emulsion type acrylic or mastic, compatible with insulation, black colour.

5. Tie Wire: Annealed steel, 1.5 mm.

2.3 Glass fibre, rigid

1. Insulation: ASTM C612; rigid, noncombustible blanket.
   1.1. Thermal Conductivity: ASTM C518, 0.036W/m.K at 24 degrees C.
   1.2. Maximum service temperature: 176 degrees C.
   1.3. Maximum moisture absorption: 0.20% by volume.
   1.4. Density: 72 kg/cu m.
2. Vapour Barrier Jacket: Kraft paper with glass fibre yarn and bonded to aluminized film.
   2.1. Moisture vapour transmission: ASTM E96/E96M; 0.04 perm.
   2.2. Secure with pressure sensitive tape.
3. Vapour Barrier Tape:
   3.1. Kraft paper reinforced with glass fibre yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
4. Indoor Vapour Barrier Finish:
   4.1. Vinyl emulsion type acrylic, compatible with insulation, white colour.

2.4 Jackets

1. Aluminum Jacket: ASTM B209M.
   1.1. Thickness: 0.40 mm sheet.
   1.2. Finish: Smooth.
   1.3. Joining: Longitudinal slip joints and 2 inch laps.
   1.4. Fittings: 0.40 mm thick die shaped fitting covers with factory attached protective liner.
   1.5. Metal Jacket Bands: 3/8 inch wide; 0.015 thick stainless steel.
2. All Service Jacket - White

Part 3 Execution

3.1 Examination

1. Section 01 71 00: Verify existing conditions before starting work.
2. Verify that duct work has been tested before applying insulation materials.
3. Verify that surfaces are clean, foreign material removed, and dry.

3.2 Installation

1. Install to NAIMA.
2. Insulated duct work conveying air below ambient temperature:
   2.1. Provide insulation with vapour barrier jackets.
   2.2. Finish with tape and vapour barrier jacket.

2.3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.

2.4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.

3. Insulated duct work conveying air above ambient temperature:

3.1. Provide with or without standard vapour barrier jacket.

3.2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.

4. Duct Work Exposed in Mechanical Equipment Rooms or Finished Spaces below roof deck above finished floor: Finish with all service jacket.

5. Exterior Applications: Provide insulation with vapour barrier jacket. Cover with with caulked aluminum jacket with seams located on bottom side of horizontal duct section.

6. External Duct Insulation Application:

6.1. Secure insulation with vapour barrier with wires and seal jacket joints with vapour barrier adhesive or tape to match jacket.

6.2. Install without sag on underside of duct work. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift duct work off trapeze hangers and insert spacers.

6.3. Seal vapour barrier penetrations by mechanical fasteners with vapour barrier adhesive.

6.4. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

End of Section

Section 23 31 00
HVAC Ducts and Casings

Part 1 General

1.1 Section includes

1. Metal duct work.

1.2 Related requirements

1. Section 09 91 00 - Painting: Weld priming, weather resistant, paint or coating.
2. Section 11 40 00 - Food Service Equipment: Supply of kitchen range hoods for placement by this Section.
3. Section 23 07 13 - Duct Insulation: External insulation and duct liner.
4. Section 23 33 00 - Duct Work Accessories.
5. Section 23 36 00 - Air Terminal Units.
6. Section 23 37 00 - Air Outlets And Inlets.
7. Section 23 05 93 - Testing, Adjusting, And Balancing.

1.3 Reference standards

1. ASTM A90/A90M-21 Standard test method for weight [mass] of coating on iron and steel articles with zinc or zinc-alloy coatings
2. ASTM A167-99(2004) Standard specification for stainless and heat-resisting chromium-nickel steel plate, sheet, and strip. (Withdrawn 2014)
3. ASTM A568/A568M-19a Standard specification for steel, sheet, carbon, structural, and high-strength, low-alloy, hot-rolled and cold-rolled, general requirements for
4. ASTM A653/A653M-20 Standard specification for steel sheet, zinc-coated (galvanized) or zinc-iron alloy-coated (galvannealed) by the hot-dip process
5. ASTM A1018/A1018M-18 Standard specification for steel, sheet and strip, heavy-thickness coils, hot-rolled, carbon, commercial, drawing, structural, high-strength low-alloy, high-strength low-alloy with improved formability, and ultra-high strength
6. ASTM A1011/A1011M-18a Standard specification for steel, sheet and strip, hot-rolled, carbon, structural, high-strength low-alloy, high-strength low-alloy with improved formability, and ultra-high strength
7. ASTM B209/B209M-21a Standard specification for aluminum and aluminum-alloy sheet and plate
8. ASTM C14M-20 Standard specification for nonreinforced concrete sewer, storm drain, and culvert pipe (metric)
9. ASTM C14-20 Standard specification for nonreinforced concrete sewer, storm drain, and culvert pipe
10. ASTM C443M-21 Standard specification for joints for concrete pipe and manholes, using rubber gaskets (metric)
11. ASTM C443-21 Standard specification for joints for concrete pipe and manholes, using rubber gaskets
12. NFPA 90A -Standard for Installation of Air Conditioning and Ventilating Systems, 2021 Edition.
13. NFPA 90B - Standard Installation of Warm Air Heating and Air-Conditioning Systems, 2021 Edition.
14. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, 2021 Edition.

15. SMACNA 1884-2003 - Fibrous Glass Duct Construction Standards, 7th Edition.
16. SMACNA 016-2012 - HVAC Air Duct Leakage Test Manual, 2nd Edition.
17. HVAC duct construction standards - metal and flexible
18. UL 181-2013 - Standard for Factory-Made Air Ducts and Air Connectors (11th Edition).

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Shop Drawings: Indicate duct fittings, particulars such as gauges, sizes, welds, and configuration prior to start of work for the following systems.
    2.1. Kitchen hood exhaust.
    2.2. 1000 kPa pressure class and higher.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA 1966.
3. Installation Data: Manufacturer's special installation requirements including special procedures for glass fibre ducts.

1.6 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Record Documentation: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.7 Quality assurance

1. Perform Work to - HVAC Duct Construction Standards - Metal and Flexible.
2. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience. Submit proof upon request.
3. Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience. Submit proof upon request.

1.8 Site conditions

1. Ambient Conditions:
    1.1. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.
    1.2. Maintain temperatures during and after installation of duct sealants.

Part 2 Products

2.1 Performance / design criteria

1. No variation of duct configuration or sizes permitted except by written permission. Size round ducts installed in place of rectangular ducts to ASHRAE table of equivalent rectangular and round ducts.

2.2 Materials

1. Galvanized Steel Ducts: ASTM A653/A653M galvanized steel sheet, lock-forming quality, having G90 zinc coating tested to ASTM A90/A90M.
2. Fasteners: Rivets, bolts, or sheet metal screws.
3. Sealant:
   3.1. Non-hardening, water resistant, fire resistive, compatible with mating materials; liquid used alone or with tape, or heavy mastic.
4. Hanger Rod: ASTM A36/A36M, steel galvanized; threaded both ends, threaded one end, or continuously threaded.

2.3 Duct work fabrication

1. Fabricate and support to SMACNA 1966, and as indicated. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.
2. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centreline. Where not possible and where rectangular elbows are used, provide air foil turning vanes. Where acoustical lining is indicated, provide turning vanes of perforated metal with glass fibre insulation.
3. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
4. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90 degree conical tee connections may be used.

Part 3 Execution

3.1 Installation

1. Install to manufacturer's written instructions.
2. Install and seal ducts to SMACNA 1966.
3. Duct Sizes are inside clear dimensions. For lined ducts, maintain sizes inside lining.
4. Provide openings in duct work where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated duct work, install insulation material inside a metal ring.
5. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
6. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with crimp in direction of air flow.
7. Use double nuts and lock washers on threaded rod supports.
8. Connect terminal units to supply ducts directly or with 300 mm maximum length of flexible duct. Do not use flexible duct to change direction.
9. Connect diffusers or light troffer boots to low pressure ducts directly or with 1.5 m maximum length of flexible duct held in place with strap or clamp.
10. Connect flexible ducts to metal ducts with adhesive plus sheet metal screws.
11. Set plenum doors 150 to 300 mm above floor. Arrange door swings so that fan static pressure holds door in closed position.

12. Provide residue traps in kitchen hood exhaust ducts at base of vertical risers with provisions for clean out. Use stainless steel for duct work exposed to view and stainless steel or carbon steel for ducts where concealed.
13. During construction provide temporary closures of metal or taped polyethylene on open duct work to prevent construction dust from entering duct work system.

3.2 Cleaning

1. Section 01 74 10: Cleaning installed work.
2. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment which may be harmed by excessive dirt with temporary filters, or bypass during cleaning.
3. Clean duct systems with high power vacuum machines. Protect equipment which may be harmed by excessive dirt with filters, or bypass during cleaning. Provide adequate access into duct work for cleaning purposes.

End of Section

Section 23 33 00
Air Duct Accessories

Part 1 General

1.1 Section includes

1. Duct access doors.
2. Duct test holes.
3. Fire dampers.
4. Flexible duct connections.

1.2 Related requirements

1. Section 23 05 48 - Vibration Isolation.
2. Section 23 31 00 - Duct Work.
3. Section 23 36 00 - Air Terminal Units: Pressure regulating damper assemblies.
4. Section 26 05 83 - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 Reference standards

1. NFPA 90A -Standard for Installation of Air Conditioning and Ventilating Systems, 2021 Edition.
2. NFPA 92 - Standard for Smoke Control Systems, 2021 Edition.
3. HVAC duct construction standards - metal and flexible
4. UL 33-2021 - Standard for Heat Responsive Links for Fire-Protection Service (9th Edition).
5. UL 555-2010 - Standard for Fire Dampers (7th Edition).
6. UL 555S-2014 - Standard for Smoke Dampers (5th Edition).
7. CSA (Canadian Standards Association).
8. UL (Underwriters Laboratories Inc.).

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide for shop fabricated assemblies including duct test holes, duct access doors, duct test holes, hardware used. Include electrical characteristics and connection requirements.
3. Shop Drawings: Indicate for shop fabricated assemblies including volume control dampers, duct access doors, duct test holes.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Manufacturer's special installation requirements including fire dampers, combination fire and smoke dampers.

1.6 Closeout submittals

1. Record Documentation: Record actual locations of access doors.

1.7 Quality assurance

1. Products of This Section: Manufactured to ISO 14000 certification requirements.
2. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience. Submit proof upon request.

1.8 Delivery, storage, and handling

1. Section 01 61 00: Transport, handle, store, and protect products.
2. Protect dampers from damage to operating linkages and blades.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
    1.1. Products Requiring Electrical Connection: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 Air turning devices/extractors

1. Multi-blade device with blades aligned in short dimension; steel construction; with individually adjustable blades, mounting straps.
2. Multi-blade device with radius blades attached to pivoting frame and bracket, steel construction, with the following:
    2.1. Push-pull operator strap.
    2.2. Ceiling mounted rotary operator knob.
    2.3. Worm drive mechanism with 450 mm long removable key operator.

2.3 Duct access doors

1. Fabricate to SMACNA 1966, and as indicated.
2. Fabrication: Rigid and close-fitting of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated duct work, install minimum one inch thick insulation with sheet metal cover.
    2.1. Less Than 300 mm Square: Secure with sash locks.
    2.2. Up to 450 mm Square: Provide two (2) hinges and two (2) sash locks.
    2.3. Up to 600 x 1200 mm: Three (3) hinges and two (2) compression latches with outside and inside handles.
3. Access doors with sheet metal screw fasteners are not acceptable.

2.4 Duct test holes

1. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

2.5 Fire dampers

1. Fabricate to UL 555, and as indicated.
2. Horizontal Dampers: Galvanized steel, 0.76 mm frame, stainless steel closure spring, and lightweight, heat retardant non-asbestos fabric blanket.
3. Curtain Type Dampers: Galvanized steel with interlocking blades. Provide stainless steel closure springs and latches for closure under air flow conditions. Configure with blades out of air stream except for 250 Pa pressure class ducts up to 300 mm in height.
4. Fusible Links: UL 33, separate at 71 degrees C with adjustable link straps for combination fire/balancing dampers.

2.6 Flexible duct connections

1. Fabricate to SMACNA 1966, and as indicated.
2. Connector: Fabric crimped into metal edging strip.
   2.1. Fabric: UL listed fire-retardant neoprene coated woven glass fibre fabric to NFPA 90A, minimum density 1.0 kg/sq m.
   2.2. Net Fabric Width: Approximately 50 mm wide.
   2.3. Metal: 75 mm wide, galvanized steel.

Part 3 Execution

3.1 Preparation

1. Verify that electric power is available and of the correct characteristics.

3.2 Installation

1. Install accessories to manufacturer's written instructions, NFPA 90A, and follow SMACNA 1966. Refer to Section 23 31 00 for duct construction and pressure class.
2. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.
3. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, combination fire and smoke dampers, and elsewhere as indicated. Provide for cleaning kitchen exhaust duct work to NFPA 96. Provide minimum 200 x 200 mm size for hand access, 450 x 450 mm size for shoulder access, and as indicated. Provide 100 x 100 mm for balancing dampers only. Review locations prior to fabrication.
4. Provide duct test holes where indicated and required for testing and balancing purposes.
5. Provide fire dampers combination fire and smoke dampers at locations indicated, where ducts and outlets pass through fire rated components and where required by authorities having jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
6. Demonstrate re-setting of fire dampers to Owner's representative.
7. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment and supported by vibration isolators. Refer to Section 23 05 48. For fans developing static pressures of 1250 Pa and over, cover connections with leaded vinyl sheet, held in place with metal straps
8. Provide balancing dampers on high velocity systems where indicated. Refer to Section 23 36 00.
9. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

End of Section

Section 23 34 23
HVAC Fans

Part 1 General

1.1 Section includes

1. Energy Recovery Ventilators

1.2 Related requirements

1. Section 23 31 00 - Duct Work.
2. Section 26 05 83 - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 Reference standards

1. STD 210-16 ANSI/AMCA 210-16 / ASHRAE Standard 51-16 Laboratory methods of testing fans for aerodynamic performance rating
2. STD 300-14 ANSI/AMCA Standard 300-14 Reverberant room method for sound testing of fans
3. STD 301-14 ANSI/AMCA Standard 301-14 Methods for calculating fan sound ratings from laboratory test data
4. STD 99-16 ANSI/AMCA Standard 99-16 Standards handbook
5. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, 2017 Edition.
6. UL 705-2017 - Standard for Power Ventilators (7th Edition).

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide data on fans and accessories including fan curves with specified operating point clearly plotted, sound power levels at rated capacity, and electrical characteristics and connection requirements.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Manufacturer's special installation requirements.

1.6 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Maintenance Data: Include instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

Part 2 Products - Not Used

Part 3 Execution

3.1 Installation

1. Install to manufacturer's written instructions.
2. Install flexible connections specified in Section 23 33 00 between fan inlet and ductwork. Ensure metal bands of connectors are parallel with minimum 25 mm flex between ductwork and fan while running.
3. Provide sheaves required for final air balance.
4. Do not operate fans for any purpose until ductwork is clean, filters in place, bearings lubricated, and fan has been test run under observation.

End of Section

Section 23 37 00
Air Outlets and Inlets

Part 1 General

1.1 Section includes

1. Registers/grilles.

1.2 Reference standards

1. ADC 1062: GRD-84 - Test Code for Grilles, Registers and Diffusers.
2. STD 500-L-12 ANSI/AMCA Standard 500-L-12 Laboratory methods of testing louvers for rating
3. STD 500-D-18 ANSI/AMCA Standard 500-D-18 Laboratory methods of testing dampers for rating
4. STD 70:2006 Method of testing the performance of air outlets and air inlets (ANSI approved)
5. NFPA 90A -Standard for Installation of Air Conditioning and Ventilating Systems, 2018 Edition.
6. HVAC duct construction standards - metal and flexible

1.3 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

1.4 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Manufacturer's special installation requirements.

1.5 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Record Documentation: Record actual locations of air outlets and inlets.

1.6 Quality assurance

1. Test and rate air outlet and inlet performance to ASHRAE 70.
2. Test and rate louvre performance to AMCA 500-L.

Part 2 Products - Not Used

Part 3 Execution

3.1 Installation

1. Install to manufacturer's written instructions.

2. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.
3. Install diffusers to duct work with air tight connection.
4. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.
5. Paint ductwork visible behind air outlets and inlets matte black. Refer to Section 09 91 00.

End of Section

Section 26 05 00
Common Work Results for Electrical

Part 1 General

1.1 Definitions

1. Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined byIEEE SP1122.

1.2 Reference standards

1. CSA Group
   1.1. CSA C22.1-12, Canadian Electrical Code, Part 1 (22nd Edition), Safety Standard for Electrical Installations, as amended and superseded by Ontario Electrical Safety Code (28th Edition).
   1.2. CAN/CSA-C22.3 No.1-10, Overhead Systems.
   1.3. CAN3-C235-83(R2010), Preferred Voltage Levels for AC Systems, 0 to 50,000 V.
2. Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)
   2.1. IEEE SP1122-2000, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.
3. OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021

1.3 Action and informational submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. Product Data:
   2.1. Submit manufacturer's instructions, printed product literature and data sheets for equipment and include product characteristics, performance criteria, physical size, finish and limitations.
3. Submit for review single line electrical diagrams under plexiglass and locate as indicated.
   3.1. Electrical distribution system in main electrical room.
4. Submit for review fire alarm riser diagram, plan and zoning of building under plexiglass at fire alarm control panel and annunciator.
5. Shop drawings:
   5.1. Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure co-ordinated installation.
   5.2. Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.
   5.3. Indicate of drawings clearances for operation, maintenance, and replacement of operating equipment devices.
6. Certificates:
   6.1. Provide CSA certified equipment and material.
   6.2. Where CSA certified equipment and material is not available, submit such equipment and material to authority having jurisdiction for special approval before delivery to site.

6.3. Submit test results of installed electrical systems and instrumentation.

6.4. Permits and fees: in accordance with General Conditions of contract.

6.5. Submit, upon completion of Work, load balance report as described in PART 3 - LOAD BALANCE.

6.6. Submit certificate of acceptance from authority having jurisdiction upon completion of Work to Consultant.

7. Manufacturer's Field Reports: submit to Consultant manufacturer's written report, within 3 days of review, verifying compliance of Work and electrical system and instrumentation testing, as described in PART 3 - FIELD QUALITY CONTROL.

1.4 Closeout submittals

1. Submit in accordance with Section 01 78 00 - Closeout Submittals.
2. Operation and Maintenance Data: submit operation and maintenance data for equipment for incorporation into manual.
   2.1. Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.
   2.2. Operating instructions to include following:
      2.2.1. Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
      2.2.2. Start up, proper adjustment, operating, lubrication, and shutdown procedures.
      2.2.3. Safety precautions.
      2.2.4. Procedures to be followed in event of equipment failure.
      2.2.5. Other items of instruction as recommended by manufacturer of each system or item of equipment.
   2.3. Print or engrave operating instructions and frame under glass or in approved laminated plastic.
   2.4. Post instructions where directed.
   2.5. For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.
   2.6. Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

Part 2 Products

2.1 Design requirements

1. Operating voltages: to CAN3-C235
2. Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
   2.1. Equipment to operate in extreme operating conditions established in above standard without damage to equipment.
3. Language operating requirements: provide identification nameplates and for control items in English.

2.2 Materials and equipment

1. Provide material and equipment in accordance with Section 01 61 00 - Common Product Requirements.

2. Material and equipment to be CSA certified. Where CSA certified material and equipment is not available, obtain special approval from authority having jurisdiction before delivery to site and submit such approval as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
3. Factory assemble control panels and component assemblies.

2.3 Electric motors, equipment and controls

1. Verify installation and co-ordination responsibilities related to motors, equipment and controls, as indicated.
2. Control wiring and conduit: in accordance with Section 26 except for conduit, wiring and connections below 50 V which are related to control systems specified in mechanical sections.

2.4 Warning signs

1. Warning Signs: in accordance with requirements of authority having jurisdiction.
2. Decal signs, minimum size 175 x 250 mm.

2.5 Wiring terminations

1. Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

2.6 Finishes

1. Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.

Part 3 Execution

3.1 Examination

1. Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for the installation in accordance with manufacturer's written instructions.
   1.1. Visually inspect substrate in presence of Consultant.
   1.2. Inform Consultant of unacceptable conditions immediately upon discovery.
   1.3. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 Installation

1. Do complete installation in accordance with OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021 except where specified otherwise
2. Do overhead and underground systems in accordance with CAN/CSA-C22.3 No.1 except where specified otherwise
3. For all wall or ceiling mounted equipment or components weighting more than 30 kg, provide mounting design from professional engineer licensed to practice in Ontario. Submit sealed design documents prior to commencing installation.
4. Provide 75mm thick concrete housekeeping pad for floor mounted equipment. Pad to include the following:
   4.1. Steel mesh reinforcement.

4.2. Steel dowel connection to existing concrete floor.

4.3. 12mm chamfered edges.

4.4. Pad size minimum 50mm beyond transformer footprint in all directions.

3.3 Nameplates and labels

1. Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed

3.4 Conduit and cable installation

1. Install conduit and sleeves prior to pouring of concrete.
   1.1. Sleeves through concrete: schedule 40 steel pipe, sized for free passage of conduit, and protruding 50 mm.
2. If plastic sleeves are used in fire rated walls or floors, remove before conduit installation.
3. Install cables, conduits and fittings embedded or plastered over, close to building structure so furring can be kept to minimum.

3.5 Location of outlets

1. Do not install outlets back-to-back in wall; allow minimum 150 mm horizontal clearance between boxes.
2. Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm, and information is given before installation.
3. Locate light switches on latch side of doors.
   3.1. Locate disconnect devices in mechanical and elevator machine rooms on latch side of floor.

3.6 Mounting heights

1. Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.
2. If mounting height of equipment is not specified or indicated, verify before proceeding with installation.

3.7 Co-ordination of protective devices

1. Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.

3.8 Field quality control

1. Load Balance:
   1.1. Measure phase current to panelboards with normal loads (lighting) operating at time of acceptance; adjust branch circuit connections as required to obtain best balance of current between phases and record changes.
   1.2. Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment.
   1.3. Provide upon completion of work, load balance report as directed in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS, phase and neutral currents on panelboards, dry-core transformers and motor control centres, operating under normal load, as well as hour and date on which each load was measured, and voltage at time of test.
2. Conduct following tests:

2.1. Power distribution system including phasing, voltage, grounding and load balancing.

2.2. Circuits originating from branch distribution panels.

2.3. Lighting and its control.

2.4. Motors, heaters and associated control equipment including sequenced operation of systems where applicable.

3. Carry out tests in presence of Departmental Representative.
4. Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
5. Manufacturer's Field Services:

5.1. Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

5.2. Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.9 System startup

1. Instruct operating personnel in operation, care and maintenance of systems, system equipment and components.
2. Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.
3. Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with aspects of its care and operation.

3.10 Cleaning

1. Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.

1.1. Leave Work area clean at end of each day.

2. Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

3.11 Integrated Life Safety Systems Testing

1. In accordance with the Ontario Building Code and CAN/ULC-S1001, provide the following, reviewed and approved by a professional engineer licensed to practice in Ontario, at the beginning of the project:

1.1. Integrated Testing Plan describing necessary tests and required test results for successful demonstration of integrated fire protection and life safety systems.

1.2. Integrated Testing Report describing how the Integrated Testing Plan will be implemented.

2. The following systems are to be incorporated in the Integrated Testing Plan and Integrated Testing Report:

2.1. Fire Alarm Systems

2.2. Mass Notification Systems

2.3. Elevators

2.4. Standby and Emergency Generators

2.5. Audio/Visual Systems

2.6. Lighting Control Systems

2.7. Notification Systems

2.8. Fire Protection Systems

2.9. Freeze Protection Systems

2.10. Fire Suppression Systems

2.11. Hazardous Environment Monitoring

2.12. Nurse Call System

2.13. Other Systems (as applicable)

End of Section

Section 26 05 19
Low-Voltage Electrical Power Conductors and Cables

Part 1 General

1.1 Section includes

1. Building wire and cable.
2. Service entrance cable.
3. Wiring connectors and connections.

1.2 Related requirements

1. Section 26 05 53 - Electrical Identification.

1.3 Reference standards

1. CSA C22.1:24 Canadian electrical code, Part I (26th edition), safety standard for electrical installations
2. STD C22.2 NO. 0.3-09 Test methods for electrical wires and cables
3. CSA C22.2 NO. 48:15 Nonmetallic sheathed cable
4. CSA C22.2 NO. 51:20 Armoured cables
5. CSA C22.2 NO. 52-17 Underground secondary and service-entrance cables
6. CAN/CSA C22.2 NO. 65-18 Wire connectors (Tri-national standard, with UL 486A-486B and NMX-J-543-ANCE)
7. CSA C22.2 NO. 75-17 Thermoplastic insulated wires and cables (Trinational standard with UL 83 and NMX-J-010-ANCE-2017)
8. CSA C22.2 NO. 123:16 Metal sheathed cables
9. STD C22.2 NO. 131-17 Type TECK 90 cable
10. CSA C22.2 NO. 208-18 Fire alarm and signal cable
11. ANSI/NETA ATS-2021 Standard for acceptance testing specifications for electrical power equipment and systems
12. CSA (Canadian Standards Association).
13. UL (Underwriters Laboratories Inc.).
14. OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021

1.4 Administrative requirements

1. Section 01 31 00: Project management and coordination procedures.
2. Coordination:
    2.1. Coordinate with other work having a direct bearing on work of this section.
    2.2. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.

1.5 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide for each cable assembly type.

1.6 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Test Reports: Indicate procedures and values obtained.
3. Installation Data: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

1.7 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Record Documentation: Record actual locations of components and circuits.

1.8 Quality assurance

1. Products of This Section: Manufactured to ISO 9000 certification requirements.

1.9 Site conditions

1. Conductor sizes are based on copper unless indicated as aluminum or "AL".

1.10 Scope Delineation

1. Except only as expressly indicated herein, provide all required electrical products and services for the project including but not limited to those designated as the responsibility of the "Customer".
   Toronto Hydro shall provide only those products and services specifically identified in the Offer to Connect as being provided by Toronto Hydro. For additional clarity, and without limiting the generality of the foregoing, contractor's scope of work under this project includes but is not limited to the following:
   1.1. Supply and install 2W2H concrete encased primary duct bank from properly line on Fallingbrook Road to new transformer base. Adjust depth of duct bank as required to provide required clearances to other services. Coordinate with landscape architect.
   1.2. Supply and install pre-cast concrete transformer base complete with grounding grid.
   1.3. Supply and install underground secondary conductors and conduit from transformer to main disconnect inside building.
   1.4. Supply and install metering components including meter cabinet, meter base, etc.
   1.5. Coordination and cooperation with Toronto Hydro.
   1.6. All other electrical scope items indicated in contract documents except only those scope items explicitly identified as being the responsibility of Toronto Hydro.
   1.7. Pay "Connection Charges" as required by Toronto Hydro (refer to cash allowance).

Part 2 Products

2.1 Description

1. Regulatory Requirements:
   1.1. Conform to OESC-2021.
   1.2. Most authorities having jurisdiction with respect to electrical code enforcement accept listing and classification as evidence that a product meets adequate safety standards and, in the case of classification, is suitable for the classified environment or application.
   1.3. Provide products listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 Building wire

1. Applicability: All conductors in any system above 50 volts to ground unless otherwise indicated.
2. Description: Single conductor insulated wire, unless otherwise indicated.
3. Conductor: Copper.
4. Insulation Voltage Rating: 600 volts.
5. Conductor Type
   5.1. RW90 or RWU90 for runs entirely indoors.
   5.2. RWU90 for runs with any portion outdoors or underground.
6. Insulation: Thermoplastic material rated 90 degrees C, notwithstanding sizing methodology.
7. Conductor sizing as indicated, but in no case less than 12 AWG unless explicitly indicated. Allow for increase of one conductor size without impact on price or schedule.

2.3 Armoured cable

1. Description: Type AC.

Part 3 Execution

3.1 Examination

1. Section 01 71 00: Verify existing conditions before starting work.
2. Verify that field measurements are as indicated.
3. Verify that interior of building has been protected from weather.
4. Verify that mechanical work likely to damage wire and cable has been completed.
5. Verify that raceway installation is complete and supported.

3.2 Preparation

1. Completely and thoroughly swab raceway before installing wire.

3.3 Wiring methods

1. Use wiring methods indicated. Where not indicated, as required by OESC-2021.

3.4 Installation

1. Install wire and cable to manufacturer's written instructions.
2. Route wire and cable as required to meet project conditions.
3. Install cable to the OESC-2021.
4. Use stranded conductor for feeders and branch circuits 10 AWG and larger.
5. Use stranded conductors for control circuits.
6. Sizing: As indicated, and where not indicated, one size larger than required by OESC-2021.
7. Use conductor not smaller than 12 AWG for power and lighting circuits.
8. Use conductor not smaller than 16 AWG for control circuits.
9. Pull all conductors into raceway at same time.
10. Use suitable wire pulling lubricant for building wire 4 AWG and larger.
11. Protect exposed cable from damage.
12. Use suitable cable fittings and connectors.
13. Neatly train and lace wiring inside boxes, equipment, and panelboards.
14. Clean conductor surfaces before installing lugs and connectors.
15. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
16. Terminate aluminum conductors with tin-plated aluminum- bodied compression connectors only. Fill with anti-oxidant compound before installing conductor.
17. Use suitable reducing connectors or mechanical connector adaptors for connecting aluminum conductors to copper conductors.
18. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
19. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
20. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
21. Trench and backfill for direct burial cable installation as specified in Section 32 23 18 and Section 32 23 23. Install warning tape along entire length of direct burial cable as required by OESC-2021.
22. Identify and colour code wire and cable to Section 26 05 53. Identify each conductor with its circuit number or other designation indicated.
23. Ensure all work is performed in accordance with requirements of OESC-2021 and Toronto Hydro, including but not limited to the Toronto Hydro documents attached as part of the bid documents, along with any other applicable requirements of ESA and/or Toronto Hydro, including but not limited to Toronto Hydro's Conditions of Service. Contractor shall fulfill all obligations of the Customer pursuant to the Conditions of Service.

3.5 Field quality control

1. Inspection and Testing:
   1.1. Perform inspections and tests listed in NETA ATS, Section 7.3.1.

End of Section

Section 26 05 26
Grounding and Bonding for Electrical Systems

Part 1 General

1.1 Section includes

1. Grounding electrodes and conductors.
2. Equipment grounding conductors.
3. Bonding.

1.2 Related requirements

1. Section 03 20 00 - Concrete Reinforcing.
2. Section 03 30 00 - Cast-in-place Concrete.
3. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables

1.3 Reference standards

1. CSA C22.1:24 Canadian electrical code, Part I (26th edition), safety standard for electrical installations
2. ANSI/NETA ATS-2021 Standard for acceptance testing specifications for electrical power equipment and systems
3. NFPA 70 - National Electrical Code (NEC).
4. NFPA 99 - Health Care Facilities.
5. CSA (Canadian Standards Association).
6. UL (Underwriters Laboratories Inc.).
7. OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021
8. CSA Z32:21 Electrical safety and essential electrical systems in health care facilities

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide for grounding electrodes and connections.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Test Reports: Indicate overall resistance to ground and resistance of each electrode.
3. Installation Data: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.6 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Record Documentation: Record actual locations of components and grounding electrodes.

3. Certificate of Compliance: Indicate approval of installation by authority having jurisdiction.

1.7 Quality assurance

1. Products of This Section: Manufactured to ISO 9000 certification requirements.

Part 2 Products

2.1 Description

1. System Description:
    1.1. Metal underground water pipe.
    1.2. Metal frame of the building.
    1.3. Concrete-encased electrode.
    1.4. Metal underground gas piping system.
    1.5. Rod electrode.
    1.6. Plate electrode.
    1.7. Active electrode.
2. Regulatory Requirements:
    2.1. Products: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 Performance / design criteria

1. Grounding System Resistance: 5 ohms.

2.3 Rod electrodes

1. Material: Copper.
2. Diameter and Length: To OESC 2021

2.4 Wire

1. Material: Stranded copper.
2. Foundation Electrodes: 2/0 AWG.
3. Grounding Electrode and Bonding Conductors: Size as indicated or to otherwise meet OESC-2021 requirements.

Part 3 Execution

3.1 Examination

1. Section 01 71 00: Verify existing conditions before starting work.
2. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.2 Installation

1. Install to manufacturer's written instructions.
2. Install rod electrodes at locations indicated. Install additional rod electrodes as required to achieve specified resistance to ground.

3. Install 4 AWG bare copper wire in foundation footing where indicated.
4. Provide grounding electrode conductor and connect to reinforcing steel in foundation footing where indicated. Bond steel together.
5. Provide bonding to meet Regulatory Requirements.
6. Bond together metal siding not attached to grounded structure; bond to ground.
7. Provide grounding and bonding in patient care areas to meet requirements of CSA Z32.
8. Equipment Grounding Conductor: Provide separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
9. Interface with site grounding system.
10. Interface with lightning protection system.

3.3 Field quality control

1. Inspection and Testing:
   1.1. Perform inspections and tests listed in NETA ATS.

End of Section

Section 26 05 29
Hangers and Supports for Electrical Systems

Part 1 General

1.1 Section includes

1. Conduit and equipment supports.
2. Anchors and fasteners.

1.2 Reference standards

1. CSA C22.1:24 Canadian electrical code, Part I (26th edition), safety standard for electrical installations
2. CECA (Canadian Electrical Contractors Association).
3. CSA (Canadian Standards Association).
4. UL (Underwriters Laboratories Inc.).
5. OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021

1.3 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide manufacturer's catalogue data for fastening systems.

1.4 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
   1.1. Provide products listed and classified by CSA as suitable for purpose specified and shown.

2.2 Product requirements

1. Materials and Finishes: Provide adequate corrosion resistance.
2. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.

2.3 Steel channel

1. Description: Galvanized steel.

Part 3 Execution

3.1 Installation

1. Install products to manufacturer's written instructions.
2. Provide anchors, fasteners, and supports to OESC-2021.
3. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.
4. Obtain permission from Consultant before using powder-actuated anchors.
5. Do not drill or cut structural members.
6. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
7. Install surface-mounted cabinets and panelboards with minimum of four anchors.
8. In wet and damp locations use steel channel supports to stand cabinets and panelboards 1 inch off wall.
9. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

End of Section

Section 26 05 33.13
Conduit for Electrical Systems

Part 1 General

1.1 Section includes

1. Metal conduit.
2. PVC coated metal conduit.
3. Flexible metal conduit.
4. Liquid tight flexible metal conduit.
5. Electrical metallic tubing.
6. Nonmetal conduit.
7. Electrical nonmetallic tubing.

1.2 Related requirements

1. Section 07 84 00 - Firestopping.
2. Section 26 05 33.16 - Boxes.
3. Section 26 05 43 - Duct Bank.
4. Section 26 05 26 - Grounding And Bonding.
5. Section 26 05 29 - Electrical Supporting Devices.
6. Section 26 05 53 - Electrical Identification.

1.3 Reference standards

1. CSA C22.1:24 Canadian electrical code, Part I (26th edition), safety standard for electrical installations
2. STD C22.2 NO. 45.1-07 Electrical rigid metal conduit - steel (Tri-National standard, with UL 6 and NMX-J-534-ANCE-2007)
3. CSA C22.2 NO. 45.2:08 Electrical rigid metal conduit - aluminum, red brass, and stainless steel (Tri-national standard, with NMX-J-576-ANCE and UL 6A)
4. STD C22.2 NO. 56-17 Flexible metal conduit and liquid-tight flexible metal conduit
5. STD C22.2 NO. 83.1-07 Electrical metallic tubing - steel (Tri-National Standard, with UL 797 and NMX-J-536-ANCE-2007)
6. STD C22.2 NO. 211.1-06 Rigid types EB1 and DB2/ES2 PVC conduit
7. STD C22.2 NO. 211.2-06 Rigid PVC (unplasticized) conduit
8. CSA C22.2 NO. 227.1:19 Electrical nonmetallic tubing (Binational standard with UL 1653)
9. NFPA 70 - National Electrical Code (NEC).
10. CSA (Canadian Standards Association).
11. UL (Underwriters Laboratories Inc.).
12. OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021

1.4 Administrative requirements

1. Section 01 31 00: Project management and coordination procedures.
2. Coordination:
   2.1. Coordinate with other work having a direct bearing on work of this section.

1.5 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Record Documentation: Accurately record actual routing of conduits larger than 2 inches.

1.6 Quality assurance

1. Products of This Section: Manufactured to ISO 9000 certification requirements.

1.7 Delivery, storage, and handling

1. Section 01 61 00: Transport, handle, store, and protect products.
2. Accept conduit on site. Inspect for damage.
3. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
4. Protect PVC conduit from sunlight.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
   1.1. Design conduit size as indicated or as otherwise required by OESC-21.
   1.2. Provide products listed and classified by CSA as suitable for purpose specified and shown.

2.2 Conduit requirements

1. Minimum Size: 19 mm unless otherwise specified.
2. Underground Installations:
   2.1. More than 1525 mm from Foundation Wall: Use thick wall non-metallic conduit.
   2.2. In or Under Slab on Grade: Use thick wall non-metallic conduit.
3. Outdoor Locations, Above Grade: Use rigid aluminum conduit.
4. In Slab Above Grade:
   4.1. Use ENT suitable for direct concrete encasement
   4.2. Maximum Size Conduit in Slab: 19 mm; 13 mm for conduits crossing each other.
5. Wet and Damp Locations: Use rigid steel conduit.
6. Dry Locations:
   6.1. Concealed: Use electrical metallic tubing.
   6.2. Exposed: Use electrical metallic tubing.

2.3 Metal conduit

1. Rigid Steel Conduit: CSA-C22.2 No. 45.1.
2. Rigid Aluminum Conduit: CSA-C22.2 No. 45.2.
3. Intermediate Metal Conduit (IMC): Rigid steel.
4. Fittings and Conduit Bodies: Aluminum fittings may be used with steel conduit.

2.4 Pvc coated metal conduit

1. Description: CSA-C22.2 No. 45.1; rigid steel conduit with external PVC coating, 40 mil 0.1 mm thick.
2. Fittings and Conduit Bodies: Steel fittings with external PVC coating to match conduit.

2.5 Flexible metal conduit

1. Description: Interlocked aluminum construction.
2. Fittings: CSA-C22.2 No. 56.

2.6 Liquid tight flexible metal conduit

1. Description: Interlocked steel construction with PVC jacket.
2. Fittings: CSA-C22.2 No. 56.

2.7 Electrical metallic tubing (emt)

1. Description: CSA-C22.2 No. 83.1; galvanized tubing.

2.8 Non-metallic conduit

1. Description: CSA-C22.2 No. 211.1; Schedule 40 PVC.
2. Fittings and Conduit Bodies: CSA-C22.2 No. 211.1.

2.9 Electrical non-metallic tubing

1. Description: CSA-C22.2 No. 227.1.
2. Fittings and Conduit Bodies: CSA-C22.2 No. 227.1.

Part 3 Execution

3.1 Examination

1. Section 01 71 00: Verify existing conditions before starting work.
2. Verify that field measurements are as shown on Drawings.
3. Verify routing and termination locations of conduit prior to rough-in.
4. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

3.2 Installation

1. Install conduit to OESC-21.

2. Install non-metallic conduit to manufacturer's written instructions.
3. Arrange supports to prevent misalignment during wiring installation.
4. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
5. Group related conduits; support using conduit rack.
6. Construct rack using steel channel provide space on each for 25% additional conduits.
7. Fasten conduit supports to building structure and surfaces to Section 26 05 29.
8. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
9. Do not attach conduit to ceiling support wires.
10. Arrange conduit to maintain headroom and present neat appearance.
11. Route exposed conduit parallel and perpendicular to walls.
12. Route conduit installed above accessible ceilings parallel and perpendicular to walls.
13. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket.
14. Route conduit in and under slab from point-to-point.
15. Do not cross conduits in slab.
16. Maintain adequate clearance between conduit and piping.
17. Maintain 6 inch clearance between conduit and surfaces with temperatures exceeding 40 degrees C.
18. Cut conduit square using saw or pipe cutter; de-burr cut ends.
19. Bring conduit to shoulder of fittings; fasten securely.
20. Join non-metallic conduit using cement as recommended by manufacturer.
    - 20.1. Wipe non-metallic conduit dry and clean before joining.
    - 20.2. Apply full even coat of cement to entire area inserted in fitting.
    - 20.3. Allow joint to cure for 20 minutes, minimum.
21. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations.
22. Install no more than equivalent of three 90-degree bends between boxes.
    - 22.1. Use conduit bodies to make sharp changes in direction, as around beams.
    - 22.2. Use hydraulic one-shot bender to fabricate bends in metal conduit larger than 2 inch size.
23. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
24. Provide suitable fittings to accommodate expansion and deflection where conduit crosses expansion joints.
25. Provide suitable pull string in each empty conduit except sleeves and nipples.
26. Use suitable caps to protect installed conduit against entrance of dirt and moisture.
27. Ground and bond conduit to Section 26 05 26.
28. Identify conduit to Section 26 05 53.

End of Section

Section 26 05 33.16
Boxes for Electrical Systems

Part 1 General

1.1 Section includes

1. Wall and ceiling outlet boxes.
2. Pull and junction boxes.

1.2 Related requirements

1. Section 07 84 00 - Firestopping.
2. Section 08 31 13 - Access Doors And Frames.
3. Section 26 27 26 - Wiring Devices: Wall plates in finished areas floor box service fittings.

1.3 Reference standards

1. CSA C22.1:24 Canadian electrical code, Part I (26th edition), safety standard for electrical installations
2. STD C22.2 NO. 18.1-13 Metallic outlet boxes (Tri-national standard, with UL 514A and ANCE NMX- J-023/1)
3. CSA C22.2 NO. 85:14 Rigid PVC boxes and fittings
4. CSA (Canadian Standards Association).
5. UL (Underwriters Laboratories Inc.).
6. OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021

1.4 Administrative requirements

1. Section 01 31 00: Project management and coordination procedures.
2. Coordination:
    2.1. Coordinate with other work having a direct bearing on work of this section.
    2.2. Coordinate installation of outlet box for equipment connected under Section 26 05 83.

1.5 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Record Documentation: Record actual locations and mounting heights of outlet, pull, and junction boxes on project record documents.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
    1.1. Provide products listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 Outlet boxes

1. Sheet Metal Outlet Boxes: CSA-C22.2 No. 18.1, galvanized steel.
    1.1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2 inch male fixture studs where required.
    1.2. Concrete Ceiling Boxes: Concrete type.
2. Non-metallic Outlet Boxes: CSA-C22.2 No. 85 .
3. Cast Boxes: CSA-C22.2 No. 18.1, Type FD, aluminum. Provide gasketed cover by box manufacturer. Provide threaded hubs.
4. Wall Plates for Finished Areas: As specified in Section 26 27 26.

2.3 Pull and junction boxes

1. Sheet Metal Boxes: CSA-C22.2 No. 18.1, galvanized steel.
2. Hinged Enclosures: As specified in Section 26 27 16.

Part 3 Execution

3.1 Examination

1. Section 01 71 00: Verify existing conditions before starting work.

3.2 Installation

1. Install boxes to OESC-21.
2. Install in locations as shown on drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
3. Set wall mounted boxes at elevations to accommodate mounting heights indicated.
4. Electrical boxes are shown on drawings in approximate locations unless dimensioned. Adjust box location up to 3 m if required to accommodate intended purpose.
5. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26.
6. Maintain headroom and present neat mechanical appearance.
7. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
8. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
9. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.
10. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.
11. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.
12. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.
13. Use flush mounting outlet box in finished areas.
14. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

15. Do not install flush mounting box back-to-back in walls; provide minimum 6 inches separation. Provide minimum 24 inches separation in acoustic rated walls.
16. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
17. Use stamped steel bridges to fasten flush mounting outlet box between studs.
18. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
19. Use adjustable steel channel fasteners for hung ceiling outlet box.
20. Do not fasten boxes to ceiling support wires.
21. Support boxes independently of conduit.
22. Use gang box where more than one device is mounted together. Do not use sectional box.
23. Use gang box with plaster ring for single device outlets.
24. Use cast outlet box in exterior locations exposed to the weather and wet locations.
25. Set floor boxes level.
26. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.

3.3 Adjusting

1. Adjust floor box flush with finish flooring material.
2. Adjust flush-mounting outlets to make front flush with finished wall material.
3. Install knockout closures in unused box openings.

3.4 Cleaning

1. Section 01 74 10: Cleaning installed work.
2. Clean interior of boxes to remove dust, debris, and other material.
3. Clean exposed surfaces and restore finish.

End of Section

Section 26 05 53
Identification for Electrical Systems

Part 1 General

1.1 Section includes

1. Nameplates and labels.
2. Wire markers.
3. Conduit markers.
4. Underground warning tape.

1.2 Related requirements

1. Section 09 91 00 - Painting.

1.3 Reference standards

1. CSA (Canadian Standards Association).
2. UL (Underwriters Laboratories Inc.).

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide catalogue data for nameplates, labels, and markers.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Indicate application conditions and limitations of use stipulated by Product testing agency specified under regulatory requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

1.6 Maintenance material submittals

1. Section 01 78 23: Maintenance and extra material requirements.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
    1.1. Provide products listed and classified by CSA as suitable for purpose specified and shown.

2.2 Nameplates and labels

1. Nameplates: Engraved three-layer laminated plastic, black letters on white background.
    1.1. Letter Size: Minimum 1/2 inch

2. Locations:
   2.1. Each electrical distribution and control equipment enclosure.
   2.2. Communication cabinets.
3. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background. Use only for identification of individual wall switches and receptacles, control device stations.

2.3 Wire markers

1. Description: Tape type wire markers.
2. Locations: Each conductor at panelboard gutters each load connection.
3. Legend:
   3.1. Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings.
   3.2. Control Circuits: Control wire number indicated on Shop Drawings.

2.4 Conduit markers

1. Location: Provide markers for each conduit longer than 6 ft.
2. Spacing: 20 ft on centre.
3. Colour:
   3.1. 600 Volt System: Dark Blue.
   3.2. 208 Volt System: Light Blue.
   3.3. Fire Alarm System: Red.
   3.4. Telephone System: Green.

Part 3 Execution

3.1 Preparation

1. Degrease and clean surfaces to receive nameplates and labels.

3.2 Application

1. Install nameplate and label parallel to equipment lines.
2. Secure nameplate to equipment front using adhesive.
3. Secure nameplate to inside surface of door on panelboard that is recessed in finished locations.
4. Identify conduit using field painting to Section 09 91 00.
5. Paint coloured band on each conduit longer than 6 ft.
6. Paint bands 20 ft on centre.
7. Colour:
   7.1. Fire Alarm System: Red.
8. Identify underground conduits using underground warning tape. Install one tape per trench at 75 mm below finished grade.

End of Section

Section 26 05 83
Wiring Connections

Part 1 General

1.1 Section includes

1. Electrical connections to equipment specified under other sections.

1.2 Related requirements

1. Section 01 11 00 - Summary of Work: Owner-provided equipment.
2. Section 08 33 23 - Overhead Coiling Doors.
3. Section 11 40 00 - Food Service Equipment.
4. Section 11 53 00 - Laboratory Equipment.
5. Section 14 21 23 - Electric Traction Passenger Elevators.
6. Section 22 47 00 - Plumbing Equipment.
7. Section 26 05 33.13 - Conduit.
8. Section 26 05 19 - Building Wire And Cable.
9. Section 26 05 33.16 - Boxes.

1.3 Reference standards

1. CSA C22.1:24 Canadian electrical code, Part I (26th edition), safety standard for electrical installations
2. ANSI/NEMA WD 6-2021 Wiring devices - dimensional specifications
3. NEMA WD 1-1999 General color requirements for wiring devices
4. NFPA 70 - National Electrical Code (NEC).
5. CSA (Canadian Standards Association).
6. UL (Underwriters Laboratories Inc.).
7. OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021

1.4 Administrative requirements

1. Section 01 31 00: Project management and coordination procedures.
2. Coordination:
    2.1. Coordinate with other work having a direct bearing on work of this section.
    2.2. Obtain and review shop drawings, product data, and manufacturer's instructions for equipment provided under other sections.
    2.3. Determine connection locations and requirements.
3. Sequencing:
    3.1. Sequence rough-in of electrical connections to coordinate with installation schedule for equipment.
    3.2. Sequence electrical connections to coordinate with start-up schedule for equipment.

1.5 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide wiring device manufacturer's catalogue information showing dimensions, configurations, and construction.

1.6 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
   1.1. Provide products listed and classified by CSA as suitable for purpose specified and shown.

2.2 Cords and caps

1. Attachment Plug Construction: Conform to NEMA WD 1.
2. Configuration: NEMA WD 6; match receptacle configuration at outlet provided for equipment.
3. Specify Type SJO (hard usage), Type SO (extra hard usage), or other special cord type as required.
4. Cord Construction: CSA-C22.1, Type SO multi-conductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
5. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit over-current protection.

Part 3 Execution

3.1 Examination

1. Section 01 71 00: Verify existing conditions before starting work.
2. Verify that equipment is ready for electrical connection, wiring, and energization.

3.2 Electrical connections

1. Make electrical connections to equipment manufacturer's written instructions.
2. Make conduit connections to equipment using flexible conduit. Use liquid-tight flexible conduit with watertight connectors in damp or wet locations.
3. Make wiring connections using wire and cable with insulation suitable for temperatures encountered in heat producing equipment.
4. Provide receptacle outlet where connection with attachment plug is indicated. Provide cord and cap where field-supplied attachment plug is indicated.
5. Provide suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

6. Install disconnect switches, controllers, control stations, and control devices as indicated.
7. Modify equipment control wiring with terminal block jumpers as indicated.
8. Provide interconnecting conduit and wiring between devices and equipment where indicated.
9. Coolers and Freezers: Cut and seal conduit openings in freezer and cooler walls, floor, and ceilings.

End of Section

Section 26 12 16.01
Dry Type Transformers Up to 600 V Primary

Part 1 General

1.1 Related requirements

1. Section 26 05 00 - Common Work Results for Electrical

1.2 Reference standards

1. Canada Green Building Council (CaGBC)
   1.1. LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for New Construction and Major Renovations (including Addendum 2007).
   1.2. LEED Canada-NC-2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating Systemfor New Construction and Major Renovations 2009.
   1.3. LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for Commercial Interiors.
   1.4. LEED Canada-EB: O&M-2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for Existing Buildings: Operations and Maintenance 2009.
2. CSA Group (CSA)
   2.1. CAN/CSA-C22.2 No.47-M90(R2007), Air-Cooled Transformers (Dry Type).
   2.2. CSA C9-02(R2007), Dry-Type Transformers.
   2.3. CAN/CSA-C802.2-06, Minimum Efficiency Values for Dry Type Transformers.
   2.4. OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021

1.3 Action and informational submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. Product Data:
   2.1. Submit manufacturer's instructions, printed product literature and data sheets for dry type transformers and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 Closeout submittals

1. Submit in accordance with Section 01 78 00 - Closeout Submittals.
2. Operation and Maintenance Data: submit operation and maintenance data for dry type transformers for incorporation into manual.

1.5 Delivery, storage and handling

1. Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
2. Storage and Handling Requirements:

2.1. Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

2.2. Store and protect dry type transformers from nicks, scratches, and blemishes.

2.3. Replace defective or damaged materials with new.

Part 2 Products

2.1 Design description

1. Design 1.
   1.1. Type: ANN.
   1.2. Voltage taps: standard.
   1.3. Insulation: Class H, 180 degrees C temperature rise.
   1.4. Basic Impulse Level (BIL): standard.
   1.5. Hipot: standard.
   1.6. Average sound level: standard
   1.7. Impedance at 17 degrees C: standard
   1.8. Enclosure: NEMA 3R, removable metal front panel.
   1.9. Finish: 26 05 00 - Common Work Results for Electrical.
   1.10. Copper windings.
   1.11. Winding configuration to be as noted on drawings.
   1.12. Voltage Regulation to be 4% or better.

Part 3 Execution

3.1 Examination

1. Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for dry type transformers installation in accordance with manufacturer's written instructions.
   1.1. Inform Consultant of unacceptable conditions immediately upon discovery.
   1.2. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 Installation

1. Mount dry type transformers up to 75 kVA as indicated. Mount transformers of larger size on floor unless otherwise indicated.
2. Ensure adequate clearance around transformer for ventilation.
3. Install transformers in level upright position.
4. Remove shipping supports only after transformer is installed and just before putting into service.
5. Loosen isolation pad bolts until no compression is visible.
6. Make primary and secondary connections in accordance with wiring diagram.
7. Energize transformers after installation is complete.

8. Make conduit entry into bottom 1/3 of transformer enclosure.
9. Provide 75mm thick concrete housekeeping pad for floor mounted transformers. Pad to include the following:
    9.1. Steel mesh reinforcement.
    9.2. Steel dowel connection to existing concrete floor.
    9.3. 12mm chamfered edges.
    9.4. Pad size minimum 50mm beyond transformer footprint in all directions.

3.3 Protection

1. Protect installed products and components from damage during construction.
2. Repair damage to adjacent materials caused by dry type transformers installation.

End of Section

Section 26 24 16
Panelboards

Part 1 General

1.1 Section includes

1. Distribution panelboards.
2. Branch circuit panelboards.
3. Load centres.

1.2 Related requirements

1. Section 26 05 26 - Grounding and Bonding.
2. Section 26 05 53 - Electrical Identification.

1.3 Reference standards

1. CSA C22.1:24 Canadian electrical code, Part I (26th edition), safety standard for electrical installations
2. CSA C22.2 NO. 5:16 Molded-case circuit breakers, molded-case switches and circuit-breaker enclosures (Trinational standard with UL 489 and NMX-J-266-ANCE-2016)
3. STD C22.2 NO. 29-15 Panelboards and enclosed panelboards
4. NEMA ICS 2-2000 Industrial control and systems - controllers, contactors and overload relays rated 600 V
5. NEMA KS 1-2013 Heavy duty enclosed and dead-front switches (600 Volts maximum)
6. ANSI/NETA ATS-2021 Standard for acceptance testing specifications for electrical power equipment and systems
7. CSA (Canadian Standards Association).
8. UL (Underwriters Laboratories Inc.).
9. OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.6 Closeout submittals

1. Section 01 78 00: Submission procedures.

2. Maintenance Data: Include spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.
3. Record Documentation: Record actual locations of panelboards and record actual circuiting arrangements in project record documents.

1.7 Maintenance material submittals

1. Section 01 78 23: Maintenance and extra material requirements.
2. Extra Stock Materials: Provide two (2) of each panelboard key.

1.8 Quality assurance

1. Products of This Section: Manufactured to ISO 9000 certification requirements.
2. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience. Submit proof upon request.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
    1.1. Products: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 Distribution panelboards

1. Manufacturers:
    1.1. Siemens
    1.2. Eaton
    1.3. Schneider
2. Description: CSA-C22.2 No. 29, circuit breaker type.
3. Panelboard Bus: Copper ratings as indicated. Provide copper ground bus in each panelboard.
4. Minimum integrated short circuit rating: as indicated.
5. Fusible Switch Assemblies: NEMA KS 1, quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle. Provide interlock to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse clips: Designed to accommodate Class J fuses.
6. Moulded Case Circuit Breakers: CSA-C22.2 No. 5, circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Provide circuit breakers listed as Type HACR for air conditioning equipment branch circuits.
7. Moulded Case Circuit Breakers with Current Limiters: CSA-C22.2 No. 5, circuit breakers with replaceable current limiting elements, in addition to integral thermal and instantaneous magnetic trip in each pole.
8. Current Limiting Moulded Case Circuit Breakers: CSA-C22.2 No. 5, circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.
9. Controllers: NEMA ICS 2, AC general-purpose Class A magnetic controller for induction motors rated in horsepower, with bimetal overload relay. Coil operating voltage: 120 volts, 60 Hz. Size as shown on Drawings.

Provide unit mounted control power transformer, HAND-OFF-AUTO selector switch, GREEN indicating light in front cover.

10. Circuit Breaker Accessories: Trip units and auxiliary switches as indicated.
11. Enclosure: NEMA Type 1 sprinkler proof unless otherwise indicated.
12. Cabinet Front: Surface type, fastened with screws, hinged door with flush lock finished in manufacturer's standard gray enamel.

2.3 Branch circuit panelboards

1. Manufacturers:

   1.1. Same as distribution panelboards.

2. Description: CSA-C22.2 No. 29, circuit breaker type, lighting and appliance branch circuit panelboard.
3. Panelboard Bus: Copper ratings as indicated. Provide copper ground bus in each panelboard; provide insulated ground bus where scheduled.
4. Minimum Integrated Short Circuit Rating: as indicated.
5. Moulded Case Circuit Breakers: CSA-C22.2 No. 5, plug-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers where scheduled. Do not use tandem circuit breakers.
6. Current Limiting Moulded Case Circuit Breakers: CSA-C22.2 No. 5, circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.
7. Enclosure: NEMA 3R.
8. Cabinet Front: Flush cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.

Part 3 Execution

3.1 Installation

1. Install panelboards as indicated, to manufacturer's instructions, and OESC-21.
2. Install panelboards plumb. Install recessed panelboards flush with wall finishes.
3. Height: 6 ft to top of panelboard; install panelboards taller than 6 ft with bottom no more than 4 inches above floor.
4. Provide filler plates for unused spaces in panelboards.
5. Provide typed or neatly handwritten circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.
6. Provide engraved plastic nameplates under the provisions of Section 26 05 53.
7. Provide spare conduits out of each recessed panelboard to an accessible location above ceiling. Minimum spare conduits: five (5) empty 1 inch. Identify each as SPARE.
8. Ground and bond panelboard enclosure according to Section 26 05 26.

3.2 Field quality control

1. Inspection and Testing:
   1.1. Perform inspections and tests listed in NETA ATS for switches and circuit breakers.

3.3 Adjusting

1. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads to within 20% of each other.
2. Maintain proper phasing for multi-wire branch circuits.

End of Section

Section 26 27 16
Electrical Cabinets and Enclosures

Part 1 General

1.1 Section includes

1. Hinged cover enclosures.
2. Cabinets.
3. Terminal blocks.
4. Accessories.

1.2 Related requirements

1. Section 26 05 29 - Electrical Supporting Devices.

1.3 Reference standards

1. CSA C22.1:24 Canadian electrical code, Part I (26th edition), safety standard for electrical installations
2. CAN/CSA C22.2 NO. 94-M91 Special purpose enclosures. (Withdrawn)
3. CSA C22.2 NO. 158:23 Terminal blocks
4. CSA (Canadian Standards Association).
5. UL (Underwriters Laboratories Inc.).
6. OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide manufacturer's standard data for enclosures and cabinets.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.6 Maintenance material submittals

1. Section 01 78 23: Maintenance and extra material requirements.
2. Extra Stock Materials: Provide two (2) of each key.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
   1.1. Conform to requirements of CSA-C22.1.
   1.2. Products: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 Hinged cover enclosures

1. Construction: CAN/CSA-C22.2 No. 94.
   1.1. Indoor: grey enameled galvanized steel, NEMA 3R enclosure.
   1.2. Outdoor: grey enameled painted galvanized steel, Type 4X enclosure.
2. Covers: Continuous hinge, held closed by flush latch operable by screwdriver.
3. Provide interior plywood panel for mounting terminal blocks and electrical components; finish with white enamel.
4. Enclosure Finish: Manufacturer's standard enamel.

2.3 Cabinets

1. Boxes: Galvanized steel with removable end walls.
2. Backboard: Provide 19 mm thick plywood backboard for mounting terminal blocks. Paint matte white.
3. Fronts: Steel, flush type with concealed trim clamps door with concealed hinge, and flush lock keyed to match branch circuit panelboard. Finish with gray baked enamel.
4. Provide metal barriers to form separate compartments wiring of different systems and voltages.
5. Provide accessory feet for free-standing equipment.

2.4 Accessories

1. Description: Plastic channel with hinged or snap-on cover.

Part 3 Execution

3.1 Installation

1. Install components to OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021 .
2. Install enclosures and boxes plumb. Anchor securely to wall and structural supports at each corner to Section 26 05 29.
3. Install cabinet fronts plumb.

3.2 Cleaning

1. Section 01 74 10: Cleaning installed work.
2. Clean electrical parts to remove conductive and harmful materials.
3. Remove dirt and debris from enclosure.
4. Clean finishes and touch up damage.

End of Section

Section 26 27 26
Wiring Devices

Part 1 General

1.1 Section includes

1. Wall switches.
2. Wall dimmers.
3. Receptacles.
4. Device plates and decorative box covers.
5. Floor box service fittings.
6. Poke-through service fittings.

1.2 Related requirements

1. Section 26 05 33.16 - Boxes.

1.3 Reference standards

1. CSA C22.1:24 Canadian electrical code, Part I (26th edition), safety standard for electrical installations
2. CSA C22.2 NO. 42:10 General use receptacles, attachment plugs, and similar wiring devices
3. CSA C22.2 NO. 42.1:13 Cover plates for flush-mounted wiring devices (Bi-national standard, with UL 514D)
4. CSA C22.2 NO. 55:15 Special use switches
5. CAN/CSA C22.2 NO. 111-18 General-use snap switches (Trinational standard with UL 20 and NMX-J-005-ANCE)
6. CSA C22.2 NO. 184.1:15 Solid-state dimming controls (Bi-national standard with UL 1472)
7. CSA (Canadian Standards Association).
8. UL (Underwriters Laboratories Inc.).
9. OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021

1.4 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide manufacturer's catalogue information showing dimensions, colours, and configurations.

1.5 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Submit manufacturer's installation instructions.

1.6 Maintenance material submittals

1. Section 01 78 23: Maintenance and extra material requirements.

1.7 Quality assurance

1. Products of This Section: Manufactured to ISO 9000 certification requirements.
2. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience. Submit proof upon request.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
    1.1. Provide products listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 Wall switches

1. Manufacturers:
    1.1. Hubbell
    1.2. Leviton
    1.3. Legrand
2. Description: CSA-C22.2 No. 111, Heavy-Duty, AC only general-use snap switch.
3. Body and Handle: while plastic with rocker handle.
4. Ratings: Match branch circuit and load characteristics.

2.3 Wall dimmers

1. Manufacturers:
    1.1. Hubbell
    1.2. Leviton
    1.3. Legrand
2. Description: CSA-C22.2 No. 184.1; Semiconductor dimmer for incandescent lamps, type as indicated on Drawings.
3. Body and Handle: white plastic with linear slide.
4. Voltage: 120 volts.
5. Power Rating: Match load shown on Drawings; 600 watts minimum.
6. Accessory Wall Switch: Match dimmer appearance.

2.4 Receptacles

1. Manufacturers:
    1.1. Hubbell
    1.2. Leviton
    1.3. Legrand
2. Description: CSA-C22.2 No. 42, Heavy-Duty general use receptacle.
3. Device Body: white plastic, unless otherwise indicated.
4. Configuration: Type as specified and indicated.

5. Convenience Receptacle: Type 5-20.
6. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.

2.5 Wall plates

1. As indicated. Where not indicated, brushed stainless steel.

Part 3 Execution

3.1 Examination

1. Section 01 71 00: Verify existing conditions before starting work.
2. Verify that outlet boxes are installed at proper height.
3. Verify that wall openings are neatly cut and will be completely covered by wall plates.
4. Verify that floor boxes are adjusted properly.
5. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
6. Verify that openings in access floor are in proper locations.

3.2 Preparation

1. Provide extension rings to bring outlet boxes flush with finished surface.
2. Clean debris from outlet boxes.

3.3 Installation

1. Install to OESC-21.
2. Install devices plumb and level.
3. Install switches with OFF position down.
4. Install wall dimmers to achieve full rating specified and indicated after de-rating for ganging as instructed by manufacturer.
5. Do not share neutral conductor on load side of dimmers.
6. Install receptacles with grounding pole on bottom.
7. Connect wiring device grounding terminal to device box and branch circuit bonding conductor.
8. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
9. Connect wiring devices by wrapping conductor around screw terminal.
10. Use jumbo size plates for outlets installed in masonry walls.
11. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
12. Install protective rings on active flush cover service fittings.

3.4 Field quality control

1. Inspection and Testing:
    1.1. Inspect each wiring device for defects.

1.2. Operate each wall switch with circuit energized and verify proper operation.

1.3. Verify that each receptacle device is energized.

1.4. Test each receptacle device for proper polarity.

1.5. Test each GFCI receptacle device for proper operation.

3.5 Adjusting

1. Adjust devices and wall plates to be flush and level.

3.6 Cleaning

1. Section 01 74 10: Cleaning installed work.
2. Clean exposed surfaces to remove splatters and restore finish.

End of Section

Section 26 28 23
Disconnect Switches - Fused and Non-Fused

Part 1 General

1.1 Reference standards

1. CSA Group
   1.1. CAN/CSA-C22.2 No.4-04(R2009), Enclosed and Dead-Front Switches (Tri-National Standard, with ANCE NMX-J-162-2004 and UL 98).
   1.2. CSA C22.2 No.39-13, Fuseholder Assemblies.

1.2 Action and informational submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. Product Data:
   2.1. Submit manufacturer's instructions, printed product literature and data sheets for disconnect switches - fused and non-fused and include product characteristics, performance criteria, physical size, finish and limitations.

Part 2 Products

2.1 Disconnect switches

1. Fusible, Non-fusible, Horsepower rated disconnect switch in CSA enclosure to, CAN/CSA-C22.2 No.4 size as indicated.
2. Provision for padlocking in on-off switch position by 3 locks.
3. Mechanically interlocked door to prevent opening when handle in ON position.
4. Fuses: size as indicated.
5. Fuseholders: CSA C22.2 No.39 suitable without adaptors, for type and size of fuse indicated.
6. Quick-make, quick-break action.
7. ON-OFF switch position indication on switch enclosure cover.

2.2 Equipment identification

1. Indicate name of load controlled on size 4 nameplate.

Part 3 Execution

3.1 Installation

1. Install disconnect switches complete with fuses if applicable.

End of Section

Section 26 51 13
Interior Lighting

Part 1 General

1.1 Section includes

1. Interior luminaires and accessories.
2. Lighting controls.

1.2 Reference standards

1. CSA C22.1:21 Canadian electrical code, Part I (25th edition), safety standard for electrical installations
2. STD C22.2 NO. 9.0-96 General requirements for luminaires
3. CSA C22.2 NO. 141:15 Emergency lighting equipment
4. CSA C22.2 NO. 250.0:21 Luminaires (Trinational standard with UL 1598 and NMX-J-307/1-ANCE)
5. CAN/CSA E920-98 Ballasts for tubular fluorescent lamps - general and safety requirements (Adopted IEC 920:1990, first edition, including Amendment 1:1993 and Amendment 2:1995, with Canadian deviations)
6. CAN/CSA E61347-2-3A-03 Amendment 1:2005 to CAN/CSA-E61347-2-3-03, lamp controlgear - Particular requirements for A.C. applied electronic ballasts for fluorescent lamps (adopted amendment 1:2004 to CEI/IEC 61347-2-3:2000)
7. NEMA WD 6-2016 Wiring devices - dimensional specifications
8. STD C78.379:2006 Electric lamps - classification of the beam patterns of reflector lamps
9. CSA (Canadian Standards Association).
10. OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021

1.3 Action submittals

1. Section 01 33 00: Submission procedures.
2. Shop Drawings: Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
3. Product Data: Provide dimensions, ratings, and performance data.

1.4 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Submit data indicating application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.5 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Operation and Maintenance Data: Submit manufacturer's operation and maintenance instructions for each product.

1.6 Maintenance material submittals

1. Section 01 78 23: Maintenance and extra material requirements.
2. Extra Stock Materials:
   2.1. Provide two (2) of each plastic lens type.
   2.2. Provide one (2) replacement lamps for each lamp type.
   2.3. Provide two (2) of each ballast type.

1.7 Quality assurance

1. Products of This Section: Manufactured to ISO 9000 certification requirements.
2. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience. Submit proof upon request.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
   1.1. Conform to requirements of CSA-C22.1.
   1.2. Products: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 Luminaires

1. As indicated.

Part 3 Execution

3.1 Installation

1. Install suspended luminaires using pendants supported from swivel hangers. Provide pendant length required to suspend luminaire at indicated height.
2. Support luminaires larger than 24 x 48 inch size independent of ceiling framing.
3. Locate recessed ceiling luminaires as indicated on reflected ceiling plan.
4. Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with each other. Secure to prevent movement.
5. Exposed Grid Ceilings: Support surface mounted luminaires on grid ceiling directly from building structure.
6. Install recessed luminaires to permit removal from below.
7. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.
8. Install clips to secure recessed grid-supported luminaires in place.
9. Install accessories provided with each luminaire.
10. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.
11. Bond products and metal accessories to branch circuit equipment grounding conductor.

12. Install specified lamps in each luminaire.

3.2 Interface with other products

1. Interface with air handling accessories provided and installed under Section 23 36 00.

3.3 Field quality control

1. Inspection and Testing:
   1.1. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.4 Adjusting

1. Aim and adjust luminaires as directed.
2. Position exit sign directional arrows as indicated.

3.5 Cleaning

1. Section 01 74 10: Cleaning installed work.
2. Clean electrical parts to remove conductive and deleterious materials.
3. Remove dirt and debris from enclosures.
4. Clean photometric control surfaces as recommended by manufacturer.
5. Clean finishes and touch up damage.

3.6 Closeout activities

1. Demonstration: Demonstrate luminaire operation for minimum two (2) hours.

3.7 Protection

1. Section 01 78 23: Protecting installed work.
2. Re-lamp luminaires that have failed lamps and at Substantial Completion.

End of Section

Section 26 56 00
Exterior Lighting

Part 1 General

1.1 Section includes

1. Luminaires and accessories.
2. Lamps.
3. Poles.

1.2 Related requirements

1. Section 03 30 00 - Cast-in-place Concrete: Foundations for poles.

1.3 Reference standards

1. CAN/CSA A14-07 Concrete poles
2. CAN/CSA C239-02 Performance standard for dusk-to-dawn luminaires
3. STD C22.2 NO. 9.0-96 General requirements for luminaires
4. CAN/CSA E61347-2-3A-03 Amendment 1:2005 to CAN/CSA-E61347-2-3-03, lamp controlgear - Particular requirements for A.C. applied electronic ballasts for fluorescent lamps (adopted amendment 1:2004 to CEI/IEC 61347-2-3:2000)
5. CAN/CSA E922-98 Ballasts for discharge lamps (excluding tubular fluorescent lamps) - general safety requirements (Adopted CEI/IEC 922:1989, first edition, including Amendment 1:1990 and Amendment 2:1992, with Canadian deviations)
6. STD C22.2 NO. 206-17 Lighting poles
7. STD C78.379:2006 Electric lamps - classification of the beam patterns of reflector lamps
8. Recommended Practice RP-8-18 Recommended practice for design and maintenance of roadway and parking facility lighting
9. CSA (Canadian Standards Association).
10. UL (Underwriters Laboratories Inc.).
11. OESC-2021 - Ontario Electrical Safety Code, 28th Edition - 2021

1.4 Administrative requirements

1. Section 01 31 00: Project management and coordination procedures.
2. Coordination:
    2.1. Coordinate with other work having a direct bearing on work of this section.
    2.2. Provide bolt templates and pole mounting accessories to installer of pole foundations.

1.5 Action submittals

1. Section 01 33 00: Submission procedures.

2. Product Data: Provide dimensions, ratings, and performance data.
3. Shop Drawings: Indicate dimensions and components for each luminaire which is not a standard Product of the manufacturer.

1.6 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Test Reports: Indicate measured illumination levels.
3. Installation Data: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

1.7 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Maintenance Data: Submit maintenance data for each luminaire.

1.8 Maintenance material submittals

1. Section 01 78 23: Maintenance and extra material requirements.
2. Extra Stock Materials:
   2.1. Provide two (2) of each type and wattage lamp installed.
   2.2. Provide two (2) litres of touch-up paint.

1.9 Quality assurance

1. Products of This Section: Manufactured to ISO 9000 certification requirements.
2. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience. Submit proof upon request.

1.10 Delivery, storage, and handling

1. Section 01 61 00: Transport, handle, store, and protect products.
2. Store and handle lighting poles to CSA-C22.2 No. 206.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
   1.1. Products: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 Luminaires and accessories

1. As indicated.

Part 3 Execution

3.1 Installation

1. Provide concrete bases for lighting poles at locations indicated, to Section 03 30 00.
2. Install poles plumb. Provide double nuts to adjust plumb. Grout around each base.
3. Install lamps in each luminaire.
4. Bond metal poles to branch circuit equipment grounding conductor.

3.2 Field quality control

1. Inspection and Testing:
   1.1. Operate each luminaire after installation and connection. Inspect for improper connections and operation.
   1.2. Measure illumination levels to verify conformance with performance requirements.
   1.3. Take measurements during night sky, without moon or with heavy overcast clouds effectively obscuring moon.

3.3 Adjusting

1. Aim and adjust luminaires to provide illumination levels and distribution as directed.

3.4 Cleaning

1. Section 01 74 10: Cleaning installed work.
2. Clean electrical parts to remove conductive and deleterious materials.
3. Remove dirt and debris from enclosure.
4. Clean photometric control surfaces as recommended by manufacturer.
5. Clean finishes and touch up damage.

3.5 Protection

1. Section 01 78 23: Protecting installed work.
2. Re-lamp luminaires which have failed lamps at Substantial Completion.

End of Section

Section 27 05 28
Pathways for Communications Systems

Part 1 General

1.1 Section includes

1. Equipment and terminal backboards.
2. Premises wiring.

1.2 Related requirements

1. Section 26 05 33.13 Conduit.
2. Section 26 05 43 Duct Bank.
3. Section 26 27 26 Wiring Devices: Telephone outlet jacks.

1.3 Reference standards

1. TIA 568-2020 Commercial building telecommunications cabling standard set
2. TIA 569:2019 Telecommunications pathways and spaces

1.4 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Manufacturer's special installation requirements.

1.5 Closeout submittals

1. Section 01 78 00: Submission procedures.
2. Maintenance Contracts: Provide service and maintenance of premises wiring for one year from Date of Substantial Completion.
3. Record Documentation: Record actual locations and sizes of pathways and outlets.

1.6 Maintenance material submittals

1. Section 01 78 23: Maintenance and extra material requirements.
2. Extra Stock Materials: Provide two (2) telephone outlet jacks.

1.7 Quality assurance

1. Products of This Section: Manufactured to ISO 9000 certification requirements.
2. Perform Work to telephone utility's rules and regulations.
3. Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer. Submit proof upon request.

Part 2 Products

2.1 Description

1. Regulatory Requirements:
   1.1. Products Requiring Electrical Connection: Listed and classified by CSA as suitable for the purpose specified and indicated.

2.2 Backing boards

1. Material: Softwood plywood.
2. Size: 1.2 x 2.4 m, 19 mm thick.

2.3 J Hooks

1. Manufacturer: CADDY CAT HP
   Size: As indicated.
   KEY FEATURES AND BENEFITS
   Provides optimal support for high-performance data cable, up to and including Cat 5e, Cat 6, Cat 6A, Cat 7 and fibre optic.
   Rounded edges on J-Hooks provide proper bend radius support for high performance data cables
   Multiple color options aid in the identification and organization of the pathway application
   Provides superior fill capacity and load rating over most other non-continuous cable support alternatives
   Compliant with UL® 2043 and suitable for use in air handling (plenum) spaces
   Tested according to DIN 4102-12• Complies with EN 50174-2
   Meets ISO®/IEC 14763-2, ANSI®/TIA 568 and ANSI®/TIA 569

Part 3 Execution

3.1 Installation

1. Install wire and cable to manufacturer's instructions and to EIA/TIA 568.
2. Finish paint termination backboards with durable white enamel under the provisions of Section 09 91 00 prior to installation of telephone equipment.
3. Support raceways, backboards, and cabinets under the provisions of Section 26 05 29.
4. Install termination cabinets plumb, and attach securely to building wall at each corner. Install cabinet trim plumb.
5. Install recessed cabinets flush with wall finishes, and stub five (5) empty 1 inch conduits to accessible location above ceiling at each location.
6. Install polyethylene pulling string in each empty telephone conduit over 10 ft in length or containing a bend.
7. Mark all backboards and cabinets with the legend TELEPHONE to Section 26 05 53.

End of Section

1 General

1.1 **SECTION INCLUDES**

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

1.2 **REFERENCES**

.1 ASTM ASTM C117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM C136-96a, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

.4 ASTM D422-632002, Standard Test Method for Particle-Size Analysis of Soils.

.5 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m).

.6 ASTM D1557-00, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft3) (2,700kN-m/m3).

.7 ASTM D1883-99, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

.8 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.9 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.10 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.11 Canadian Green Building Council (CaGBC)

.12 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.13 CAN/CSA-A3001-03, Cementitious Materials for Use in Concrete.

.14 CAN/CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.15 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

.16 OPSS 206, Nov 2014, Construction Specification for Grading.

.17 OPSS 410, Apr 2015, Construction Specification for Pipe Sewer Construction by Open Cut.

.18 OPSS 501, Nov 2014, Construction Specification for Compacting.

.19 OPSS 514, Apr 2009 Construction Specification for Trenching, Backfilling and Compacting.

.20 OPSS 1359, Nov. 2016 - Material Specification For Unshrinkable Fill.

1.3 **DEFINITION**

.1 Refer to definitions as outlined in the following Ontario Provincial Standards Specifications (OPSS):

.1 OPSS 206, November 2014

.2 OPSS 410, April 2015

.3 OPSS 501, November 2014

.4 OPSS 514, April 2009

1.4 **SUBMITTALS**

.1 Shop drawings:

.1 Submit shop drawings in accordance with Section 01 33 00.

.2 Submit records of underground utility locates, including:

.1 Location plan of existing utilities as found in the field.

.2 Clearance record from utility authority.

.3 Location plan of relocated and abandoned services, as required.

.2 Samples:

.1 Submit samples as per Section 01 33 00.

.2 Notify the Consultant at least two weeks prior to commencing work of the proposed source of fill materials and provide access for sampling.

.3 Submit 70 kg samples of each type of fill specified, including representative samples of excavated material.

.4 Ship samples prepaid to the Consultant in tightly sealed containers to prevent contamination and exposure to the elements.

1.5 **QUALITY ASSURANCE**

.1 Submit design and supporting data at least two weeks prior to starting the work.

.2 Design and supporting data must bear the stamp and signature of a qualified professional engineer registered or licensed in the Province of Ontario, Canada.

.3 Maintain copies of the design and supporting data on-site during the course of the work.

.4 Engage a qualified professional engineer as directed by the Consultant, registered or licensed in the Province of Ontario, Canada, to design and inspect cofferdams, shoring, bracing, and underpinning necessary for the work.

.5 Do not utilize soil material until the written report of soil test results has been reviewed and approved by the Consultant.

.6 Perform all construction activities in compliance with applicable occupational health and safety regulations.

.7 The Zero Carbon Building – Design Standard v4- Design Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

1.6 **MEASUREMENT PROCEDURES**

.1 Excavated materials will be measured in cubic metres in their original location.

.2 Excavation quantities measured will be the actual volume removed within the following limits:

.1 Width for trench excavation as indicated.

.2 Width for excavation for structures as indicated.

.3 Rock quantities measured will be the actual volume removed within the following limits:

.1 Width for trench excavation as indicated.

.2 Width for excavation for structures bounded by vertical planes up to 500 mm outside of and parallel to the neat lines of footings as indicated.

.3 Depth from rock surface elevations immediately prior to excavation to the elevation as indicated.

.4 Where the design elevation is less than 300 mm below the original rock surface, the depth will be considered to be 300 mm below the original rock surface.

.5 Volume of individual boulders and rock fragments will be determined by measuring three maximum mutually perpendicular dimensions.

1.7 **EXISTING CONDITIONS**

.1 Examine the soil report before commencing work.

.2 Buried Services:

.1 Verify the location of buried services on and adjacent to the site prior to beginning work.

.2 Arrange with the appropriate authority to relocate buried services that interfere with the execution of work.

.3 Remove obsolete buried services within 2 m of foundations and cap cut-offs.

.4 The size, depth, and location of existing utilities and structures, as indicated, are for guidance only and are not guaranteed for completeness or accuracy.

.5 Notify applicable authorities having jurisdiction before starting excavation work to establish the location and state of use of buried utilities and structures. Ensure these locations are clearly marked to prevent disturbance.

.6 Confirm the locations of buried utilities by conducting careful test excavations.

.7 Maintain and protect from damage all water, sewer, gas, electric, telephone, and other utilities and structures encountered during work.

.8 Obtain direction from the Consultant before removing utility lines or structures within the excavation area.

.9 Record the locations of maintained, re-routed, and abandoned underground lines.

.10 Confirm the locations of recent excavations adjacent to the work area.

.3 Existing Buildings and Surface Features:

.1 Conduct a condition survey with the Consultant of existing buildings, trees, plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey benchmarks, and monuments that may be affected by the work.

.2 Protect existing buildings and surface features from damage during the work. In the event of damage, immediately make repairs as directed by the Consultant.

2 Products

2.1 **MATERIALS**

.1 Granular aggregate requirements:

.1 Granular A fill: OPSS 1010 - 2013, Granular A.

.2 Granular B fill: OPSS 1010 - 2013, Granular B Type II.

.3 Clear stone: OPSS 1004 - 2012, Clear Stone, 19 mm Type 1.

.2 Unshrinkable fill: Provide unshrinkable fill in accordance with OPSS 1359, 2016**.**

.3 Ensure moisture content of fill is within 2% of the optimum moisture density as determined by ASTM D698-12e2.

.4 Obtain fill materials only from sources approved by the geotechnical engineer.

.5 Submit reports, including laboratory test results for fill material properties, for acceptance by the geotechnical engineer prior to importing fill to the site.

.6 Do not proceed with fill placement until approval of fill material and moisture content is obtained.

3 Execution

3.1 DEWATERING

.1 Bail, pump out, or divert water from excavations, regardless of the source, as it accumulates.

.2 Continue water management until permanent drainage systems are operational and foundations are in place.

.3 Ensure water removal methods do not cause damage to excavations, adjacent structures, or other work.

.4 Dispose of water in compliance with Section 01 35 43 - Environmental Procedures and any applicable regulations.

.5 Keep excavations free of water while Work is in progress.

.6 Provide details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs, for the Consultant's review.

.7 Avoid excavation below the groundwater table if quick conditions or heave are likely to occur.

.1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other suitable methods.

.8 Protect open excavations against flooding and damage due to surface run-off.

.9 Dispose of water in accordance with Section 01 35 43 – Environmental Procedures and in a manner not detrimental to public and private property or portions of Work completed or under construction.

.1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

.10 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses, or drainage areas.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and the discharge of soil-bearing water runoff or airborne dust onto adjacent properties, splash pads, and walkways, in accordance with the site-specific sediment and erosion control plan.

.2 Inspect, repair, and maintain erosion and sedimentation control measures throughout construction until permanent vegetation or stabilization has been established.

.3 Remove erosion and sedimentation controls upon completion of work and restore and stabilize areas disturbed during removal to prevent future erosion.

3.3 SITE PREPARATION

.1 Remove obstructions, ice, and snow from surfaces within the excavation limits as indicated.

.2 Cut pavement and sidewalk cleanly and neatly along the limits of proposed excavation to

ensure that the surface breaks evenly and cleanly.

3.4 PREPARATION / PROTECTION

.1 Protect existing features applicable to local regulations.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Consultant's approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

3.5 STRIPPING OF TOPSOIL

.1 Begin topsoil stripping of areas as indicated after the area has been cleared of brush, weeds, and grasses and removed from the site.

.2 Strip topsoil to depths as directed by the Consultant or Geotechnical Consultant.

.1 Do not mix topsoil with subsoil.

.2 Stockpile in locations as directed by the Consultant.

.3 Stockpile height not to exceed 2 m and should be protected from erosion.

.4 Dispose of unused topsoil off-site, or as directed by the Consultant.

3.6 STOCKPILING

.1 Stockpile fill materials in areas designated by the Consultant.

.2 Stockpile granular materials in a manner to prevent segregation.

.3 Protect fill materials from contamination.

.4 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

.5 Stockpile materials more than 10 m from water bodies and catch basins, unless otherwise instructed by the Consultant.

.6 Stockpile surplus materials or materials not suitable for reuse on site in separate stockpiles based on similar soil quality constituents. Allow up to 3 weeks for sampling and testing to classify material before removal of material off-site.

3.7 EXCAVATION

.1 Allow for delays and adjustments to the work schedule due to coordination for soil classification monitoring by the Consultant.

.2 Excavate to lines, grades, elevations, and dimensions as indicated.

.3 Remove concrete, masonry, paving, walks, demolished foundations, rubble, and other obstructions encountered during excavation.

.4 Ensure excavation does not interfere with the bearing capacity of adjacent foundations.

.5 Removal and disposal of existing boulders or concrete elements up to a size of 1 m^3 (1.3 yd^3), encountered below existing grade during excavation, are included as part of the Work.

.6 Notify the Consultant each time existing boulders or concrete elements larger than 1 m^3 are encountered below grade. Provide a detailed written record of each occurrence. Claims for extras will only be considered if this record is reviewed and approved by the Consultant.

.7 Remove non-registerable waste, as identified by the geotechnical engineer, to a private landfill that aligns with the landfill license. Registerable waste, if encountered, must be disposed of at a licensed landfill site under the direction of the geotechnical engineer. The removal of registerable waste not previously known or reasonably inferable will be treated as a change in the Work.

.8 Avoid disturbing soil within the branch spread of trees or shrubs that are to remain.

.1 If excavating through roots, perform excavation by hand and cut roots cleanly with a sharp axe or saw.

.9 For trench excavation, unless otherwise authorized in writing by the Consultant:

.10 Do not excavate more than 30 m of trench in advance of installation operations.

.11 Do not leave more than 3 m of trench open at the end of each day's operation.

.12 Maintain vertical trench walls and use the minimum trench width necessary for operations.

.13 Keep excavated and stockpiled materials at a safe distance from the edge of the trench.

.14 Restrict vehicle operations directly adjacent to open trenches to prevent collapse.

.15 Dispose of surplus and unsuitable excavated material off-site.

.16 Do not obstruct the flow of surface drainage or natural watercourses.

.17 Ensure earth bottoms of excavations are undisturbed soil, level, and free from loose, soft, or organic matter.

.18 If existing conditions deviate from those specified after reaching the required excavation depths, adjust excavation limits only with prior written authorization from the Consultant.

.19 Remove water, disturbed soil, or foreign matter from footing excavations prior to placing reinforcement or concrete.

.20 Prevent adjacent or underlying soil from freezing during cold weather conditions if it will be in contact with concrete.

.21 Excavation is not considered complete until the soil at the founding elevation has been

inspected and approved by the geotechnical engineer.

.22 Notify the Consultant when the bottom of the excavation is reached.

.23 Obtain the Consultant's approval for the completed excavation before proceeding.

.24 Remove unsuitable material from trench bottoms, including material extending below required elevations, to the extent and depth directed by the Consultant.

.25 Correct unauthorized over-excavation as follows:

.1 Fill under other areas with granular fill compacted to at least 98% of Standard Proctor maximum dry density.

.2 Note that no payment will be made for unauthorized over-excavation works.

.26 Hand trim, firm, and remove loose material and debris from excavations.

.1 Where material at the bottom of the excavation is disturbed, compact foundation soil to a density at least equal to the undisturbed soil.

.2 Clean out rock seams and fill with concrete mortar or grout to the approval of the Consultant.

3.8 FILL TYPES AND COMPACTION

.1 Use fill materials as specified in the contract documents and drawings. Ensure material type and quality meet the requirements indicated and approved by the Consultant.

.2 Dimensions specified in the following paragraphs are the minimum dimensions of fill required after compaction.

.3 Compaction shall meet the applicable Standard Proctor Maximum Dry Density (SPMDD).

.4 Concrete Floor Slab Base Course:

.1 Provide a minimum 200 mm (8") base course of 19 mm (3/4") clear stone fill beneath the slab. Vibrate the stone into place to achieve uniform support for the concrete slab, allowing a maximum concrete floor slab thickness tolerance of ± 10 mm (3/8") in accordance with CSA-A23.1-09.

.2 Compact disturbed subgrade to at least 98% of its SPMDD.

.5 Under Planted Landscaped Areas:

.1 Use clean, compacted excavated material selected and approved by the geotechnical engineer, placed to the underside of the topsoil.

.2 Compact material to at least 90% SPMDD.

.6 Backfill Against Foundation Walls:

.1 Provide fill material compacted to at least 98% SPMDD.

.2 Unless otherwise specified in the drawings, structural fill materials shall consist of the following:

.7 Beneath Planted Landscaping:

.1 From the face of the foundation enclosing interior space to a distance of 900 mm (36") from the foundation: Use Granular B Type II fill.

.2 Fill the remainder with approved fill material.

.8 Beneath Hard Finish Landscaping: Use Granular B Type II.

.9 Proof Rolling:

.1 Use a standard roller with a gross mass of 45,400 kg, four pneumatic tires each carrying 11,350 kg, inflated to 620 kPa, and arranged abreast with a center-to-center spacing of 730 mm.

.2 Obtain approval from the Consultant for the use of non-standard proof-rolling equipment.

.3 Proof roll granular base at the level indicated. For non-standard equipment, the Consultant will determine the proof rolling level.

.4 Subject every point on the surface to three separate passes of the loaded tire during proof rolling.

.5 If proof rolling reveals defective subgrade:

.6 Remove base, sub-base, and subgrade materials to the depth and extent directed by the Consultant.

.7 Replace base material and compact per this Section.

.8 If defective base or sub-base is identified during proof rolling, remove defective materials to the depth and extent directed by the Consultant and replace with new materials at no extra cost.

3.9 BEDDING AND SURROUND OF UNDERGROUND SERVICES

.1 Place and compact granular material for bedding and surround of underground services as specified in the contract documents and as approved by the Consultant.

.2 Ensure all bedding and surround materials are placed in an unfrozen condition to maintain the integrity and performance of the installation.

3.10 BACKFILLING

.1 Do not proceed with backfilling operations until the following are completed and approved:

.1 Installations inspected and approved by the Contract Administrator.

.2 Construction below finish grade inspected and approved by the Contract Administrator.

.3 Underground utilities inspected, tested, approved, and recorded.

.4 Removal of concrete formwork.

.5 Removal of shoring and bracing, and voids backfilled with satisfactory soil material.

.2 Ensure areas to be backfilled are free from debris, snow, ice, water, and frozen ground.

.3 Do not use backfill material that is frozen or contains ice, snow, or debris.

.4 Before placing fill under concrete slabs, proofroll the subgrade as directed by the geotechnical engineer. Remove any soft, wet, or deleterious material and replace it with approved fill compacted to 98% of its Standard Proctor Maximum Dry Density. Alternatively, import granular fill to stabilize the subgrade and create a working mat, all under the supervision of the geotechnical engineer.

.5 Backfill walls and other structures simultaneously on each side to equalize soil pressures.

.6 Obtain acceptance from the Consultant before placing backfill against foundation walls enclosing interior spaces.

.7 Request inspections by the Consultant and geotechnical engineer of the excavation prior to commencing backfilling activities.

.8 Where temporary unbalanced earth pressures may develop on walls or other structures, install bracing or shoring to counteract the unbalance. Keep bracing or shoring in place until its removal is approved by the Consultant.

.9 Place and compact fill materials in continuous horizontal layers, with a loose depth not exceeding 200 mm (8").

.10 Use backfilling methods that avoid disturbing or damaging buried services and site improvements.

.11 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing the next.

.12 Backfilling around installations:

.1 Place bedding and surround material as specified in relevant sections.

.2 Do not backfill around or over cast-in-place concrete within 24 hours after concrete placement.

.3 Place layers simultaneously on both sides of installed work to equalize loading.

.4 Where temporary unbalanced earth pressures may develop:

.1 Allow concrete to cure for a minimum of 14 days or until it has adequate strength to withstand earth and compaction pressure, and approval is obtained from the Consultant.

.2 If approved by the Consultant, install bracing or shoring to counteract unbalance, leaving it in place until removal is approved by the Consultant.

.13 Place unshrinkable fill in designated areas as indicated.

.14 Consolidate and level unshrinkable fill using internal vibrators.

.15 Install drainage filter system in backfill as indicated in the contract documents.

3.11 RESTORATION AND PROTECTION

.1 Remove all waste materials and debris upon completion of the work.

.2 Replace topsoil as specified or indicated in the contract documents.

.3 Restore lawns to their original elevation or as indicated prior to excavation.

.4 Reinstate pavements and sidewalks disturbed by excavation to match the original thickness, structure, and elevation that existed before excavation.

.5 Clean and restore all areas affected by the work as directed by the Consultant.

.6 Utilize temporary plating to support traffic loads over unshrinkable fill for the initial 24 hours post-installation.

.7 Protect newly graded areas from traffic and erosion. Maintain these areas free of trash, debris, and potential disturbances.

.8 Protect excavated areas from exposure to sun and rain that could cause cave-ins or softening of beds supporting foundations and drains. Prevent the flow of water and earth fines into excavated pits and trenches. Seal or divert flow from springs filling excavations.

.9 Protect the bottoms of excavations from softening. If softening occurs, remove softened soil and replace it with approved material.

.10 Protect the bottoms of excavations from freezing.

.11 Implement measures to minimize dust resulting from the Work.

3.12 FIELD QUALITY CONTROL

.1 Conduct quality control in accordance with Section 01 45 00.

.2 Field Tests and Inspections: Allow the inspection and testing services agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

.3 Inspections:

.1 Ensure that prior to the placement of fill, the site has been prepared in compliance with requirements.

.2 Verify that fill material and maximum lift thickness comply with requirements.

.3 Confirm, at the required frequency, that the in-place density of compacted fill complies with requirements.

.4 Testing:
.1 Testing agency will test compaction of soils in place according to requirements of the Contract Documents. Tests will be performed at the following locations and frequencies:

.5 Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 200 sq. m (2152 sq. ft.) or less, but no fewer than three tests.

.6 Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 30 m (100 ft) or less of wall length, but no fewer than two tests.

.7 Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 50 m (164 ft) or less of trench length, but no fewer than two tests.

END OF SECTION

3.6 SHORING

.1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with the Ontario Occupational Health and Safety Act.

.2 Where measures such as shoring, bracing or the like may be required, inform the Owner and Consultant prior to commencing the work.

.3 Where conditions are or become unstable, the Contractor shall take such measures as are necessary to protect safety of employees and the public and shall inform the Owner and Consultant immediately.

3.7 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations free of water while Work is in progress.

.2 Where required, provide for details of proposed dewatering or heave prevention methods, for Owner and Consultant's review.

.3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.

.1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

.4 Protect open excavations against flooding and damage due to surface run-off.

.5 Dispose of water in to approved areas only and in manner not detrimental to public and private property, or portion of Work completed or under construction.

.1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits within work area.

.6 Provide treatment to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas.

3.8 EXCAVATION

.1 Excavate to lines, grades, elevations and dimensions as indicated on the drawings.

.2 Do not disturb soil within designated tree protection areas.

.1 Where permitted, roots or branches may be cut only by a qualified tree care professional, and in full compliance with the City Policy.

.3 For trench excavation, unless otherwise authorized by Consultant or Owner in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave trench open at end of day's operation.

.4 Keep excavated and stockpiled materials safe distance away from edge of trench.

.5 Restrict vehicle operations directly adjacent to open trenches.

.6 Dispose of surplus and unsuitable excavated legally off-site.

.7 Do not obstruct flow of surface drainage or natural watercourses.

.8 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.9 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Owner and Consultant.

.10 Correct unauthorized over-excavation as follows:

.1 Fill under bearing surfaces and footings with concrete specified for footings.

.2 Fill under other areas with Granular 'B' Type II fill compacted to not less than 98% of corrected Standard Proctor maximum dry density.

.11 Hand trim, make firm and remove loose material and debris from excavations.

.1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

.12 Install geotextiles, if required, in accordance with Section 31 32 19.16 - Geotextile soil stabilization.

3.9 FILL TYPES AND COMPACTION

.1 Use types of fill as indicated or specified below.

.1 Within landscape areas, use of excavated soil materials or imported, clean soil materials is permitted for backfilling as indicated on the drawings, subject to Owner and Consultant Review.

.1 Do not use unsuitable materials as defined above.

.2 Within 2 metres of any area where backfill may support structures or pavements, use Granular 'B' Type II fill compacted to not less than 98% of corrected Standard Proctor maximum dry density.

.3 Place unshrinkable fill in areas as indicated.

3.10 BEDDING AND SURROUND OF UNDERGROUND SERVICES

.1 Place and compact granular material for bedding and surround of underground services as indicated on drawings or as directed by the utility owner.

.2 Place bedding and surround material in unfrozen condition.

3.11 BACKFILLING

.1 Do not proceed with backfilling operations until completion of following as applicable:

.1 Completion of any third-party inspections or sampling.

.2 Review of completed work by Owner and Consultant.

.3 Inspection, testing, approval, and recording location of underground utilities.

.4 Removal of concrete formwork.

.5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.

.2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

.5 Backfilling around installations:

.1 Place bedding and surround material as specified elsewhere.

.2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.

.3 Place layers simultaneously on both sides of installed Work to equalize loading.

.4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:

.1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure or:

.2 Erect bracing or shoring to counteract unbalance and leave in place until earth pressures are balanced.

.6 Place unshrinkable fill in areas as indicated.

.1 Consolidate and level unshrinkable fill with internal vibrators.

.7 Install drainage system in backfill as indicated.

3.12 RESTORATION

.1 Upon completion of Work, remove waste materials and debris in accordance with Work Assignment Terms and Conditions, to Owner's satisfaction.

.2 Replace topsoil as indicated.

.3 Reinstate lawns to elevation which existed before excavation.

.4 Reinstate pavements disturbed by excavation to thickness, structure and elevation which existed before excavation.

.5 Clean and reinstate areas affected by Work as directed by Owner and Consultant.

.6 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION 31 23 33.01

GENERAL

1.1 SUMMARY

.1 This Section includes requirements for utilization of geotextiles and geogrids to reinforce or stabilize soil, sub-base and base.

1.2 RELATED REQUIREMENTS

.1 Section 31 22 13 Rough Grading.

.2 Section 31 23 33.01 Excavating, Trenching and Backfilling

.3 Section 32 11 23 Aggregate Base Courses

1.3 MEASUREMENT AND PAYMENT

.1 Measure geotextiles in square metres of surface covered by material. No allowance will be made for seams and overlaps.

1.4 REFERENCE STANDARDS

.1 Reference to the listed standards shall be considered to include related standards and documents or standards referenced within the listed documents.

.2 ASTM International (ASTM)

.1 ASTM D4218 Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds By the Muffle-Furnace Technique.

.2 ASTM D4355/D4355M Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus

.3 ASTM D4491/D4491M Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

.4 ASTM D4533/D4533M Standard Test Method for Trapezoid Tearing Strength of Geotextiles.

.5 ASTM D4632/D4632M Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

.6 ASTM D4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile.

.7 ASTM D5617 Standard Test Method for Multi-Axial Tension Test for Geosynthetics.

.8 ASTM D6241 Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.

.9 ASTM D6637 Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method.

.10 ASTM D7737/D7737M Standard Test Method for Individual Geogrid Junction Strength.

.11 ASTM D7748/D7748M Standard Test Method for Flexural Rigidity of Geogrids, Geotextiles, and Related Products.

.3 Ontario Provincial Standard Specifications (OPSS):

.1 OPSS MUNI 1860 Geotextiles

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's instructions, printed product literature and data sheets for geotextiles and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Test and Evaluation Reports:

.1 Submit copies of mill test data and certificate, if requested, at least 4 weeks prior to start of Work.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Work Assignment Terms and Conditions and with manufacturer's written instructions

.2 Storage and Handling Requirements:

.1 Store materials in off-ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect geotextiles from direct sunlight and UV rays.

.3 Replace defective or damaged materials with new.

PART - 2 PRODUCTS

2.1 MATERIALS

.1 Geotextile: Terrafix 270R or equal.

.1 Needle-punched, non-woven synthetic fibre fabric, supplied in rolls.

.2 Size shall be the largest roll practical for the area to be covered.

.3 Composed of: 100% virgin polypropylene fibres.

.4 Physical properties:

.1 Grab Tensile Strength: 445 N per ASTM D4632

.2 Grab Elongation: 50% per ASTM D4632

.3 Tear Resistance: 200 N per ASTM D 4533

.4 Puncture CBR 1320 N per ASTM D 6241

.5 U.V. Stability: 70% @ 500 hours per ASTM D 4355

.5 Hydraulic properties:

.1 Apparent Opening Size: 0.300 mm per ASTM D 4751

.2 Water Flow: 6095 l/min/m2 per ASTM D 4491

.3 Permittivity: 2.00 sec-1 per ASTM D 4491

.2 Geogrid: Terrafix BX2500 biaxial geo-grid or equal.

.1 Single layer, extruded biaxial geogrid, supplied in rolls.

.1 Geogrid shall be free of striations, roughness, pinholes, blisters, undispersed raw materials or any sign of contamination by foreign matter.

.2 Size shall be the largest roll practical for the area to be covered.

.3 Composed of: 100% virgin polypropylene.

.4 Physical properties:

.1 Ultimate tensile strength: 25 kN/m per ASTM D6637 (both directions)

.2 Junction strength: 22.5 kN/M (machine direction) / 23.4 kM/m (cross machine direction) per ASTM D7737

.3 Junction efficiency: 90% (machine direction) / 94% (cross machine direction) per ASTM D7737

.4 Tensile strength @ 2% strain: 9.5 kN/M (machine direction) / 10.5 kM/m (cross machine direction) per ASTM D6637

.5 Tensile strength @ 5% strain: 18.0 kN/M (machine direction) / 20.0 kM/m (cross machine direction) per ASTM D6637

.6 Flexural stiffness/rigidity: 1312 g-cm (machine direction) / 875 g-cm (cross machine direction) per ASTM D7748

.7 Aperture stability: 4.5 kg-cm/deg. @ 20 kg-cm torque

.8 Radial stiffness at loe strain: 329.9 kN/m @ 0.5% strain

.9 Multi-axial tension test (ASTM D 5617)

- Vessel pressure at rupture: 13.2 psi
- Axisymmetric break resistance strain: 8.2%
- Average deflection at rupture: 107 mm

.10 Minimum carbon black content: 2% per ASTM D4218

.11 U.V. Stability: 100% per ASTM D 4355

.3 Securing pins and washers: to CSA G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m2to ASTM A123/A123M.

.4 Factory seams: sewn in accordance with manufacturer's recommendations.

.5 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.

PART - 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for geotextile material installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written notice to proceed from Consultant and Owner.

3.2 INSTALLATION

.1 Place material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with temporary weights as required.

.2 Place material smooth and free of tension stress, folds, wrinkles and creases.

.3 Place material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.

.4 Overlap each successive strip of unrolled material 600 mm over previously laid strip.

.5 Join successive strips of unrolled material by pinning.

.6 Pin successive strips with securing pins at 300 mm interval at mid point of lap.

.7 Protect installed material from displacement, damage or deterioration before, during and after placement of material layers.

.8 After installation, cover with overlying layer within 4 hours of placement.

.9 Replace damaged or deteriorated geotextile to Owner and Consultant's satisfaction.

.10 Place and compact soil or aggregate layers in accordance with Sections 31 22 13, 31 23 33.01 and/or 32 11 23.

3.3 PROTECTION

.1 Vehicular traffic not permitted directly on geotextile.

.2 Do not overload soil or aggregate covering on geotextile.

END OF SECTION 31 32 19

PART - 1 GENERAL

1.1 SUMMARY

.1 Specifies requirements for supplying and placing crushed gravel or quarried stone as a granular base to lines, grades and typical cross sections indicated.

1.2 RELATED REQUIREMENTS

.1 Section 31 22 13 Rough Grading

.2 Section 31 23 33.01 Excavating, Trenching and Backfilling

.3 Section 31 32 19 Geosynthetics

1.3 REFERENCE STANDARDS

.1 Reference to the listed standards shall be considered to include related standards and documents or standards referenced within the listed documents.

.2 City of Toronto Engineering and Technical Services (ECS) Standard Specifications (TS):

.1 TS 1010 Amendment to Aggregates – Base, Subbase, Select Subgrade, and Backfill Material

.3 Ontario Provincial Standard Specifications (OPSS):

.1 OPSS MUNI 1001, Material Specification for Aggregates, General.

.2 OPSS MUNI 1004, Material Specification for Aggregates – Miscellaneous.

.3 OPSS MUNI 1010, Material Specification for Aggregates, Base, Subbase, Select Subgrade, and Backfill Material.

.4 OPSS MUNI 1359, Material Specification for Unshrinkable Backfill.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Quality Control: in accordance with Section 01 45 00 - Quality Control:

.1 Inform Owner and Consultant at least 4 weeks prior to beginning Work, of proposed source(s) of fill, aggregates and any other materials to be used for the work.

.1 Provide source documentation of materials to be supplied including standard testing showing compliance with relevant OPSS requirements. Testing to have been completed within 1 calendar year of date of submittal.

.2 Where documentation is not available for any reason, Contractor shall arrange and pay for testing to be carried out by the same third-party contracted by the Owner or Consultant for Quality Assurance.

.2 Other submittals may be required due to unexpected conditions or as a result of the Contractors chose work method (i.e. dewatering or heave prevention methods).

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Work Assignment Terms and Conditions and with manufacturer's written instructions

.2 Storage and Handling Requirements:

.1 Store materials in off-ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

PART - 2 PRODUCTS

2.1 MATERIALS

.1 General:

.1 Materials shall conform to OPSS and standards referenced therein.

.2 Aggregates:

.1 All aggregates used for the work shall confirm to TS 1010 / OPSS 1010, except as noted.

.2 Where not specified, any reference to Granular 'B' shall be read as a reference to Granular 'B' Type II only.

.3 Re-claimed Concrete Material (RCM), re-claimed asphalt, and slag of any type SHALL NOT BE USED without express written authorization by the Owner or Consultant.

.3 Other materials as may be required for a complete installation shall be selected by the Contractor and subject to review by Consultant and Owner.

PART - 3 EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until removal.

.3 Remove erosion and sedimentation controls only when directed to do so by Owner or Consultant.

.1 Restore and stabilize areas disturbed during removal.

3.2 PROOF ROLLING

.1 Where proof-rolling is indicated, use standard roller or alternate equipment accepted by Consultant.

.1 Contractor to arrange attendance by representative of designated testing and inspection company.

.2 Proof roll at sub-grade level unless otherwise directed.

.3 Make sufficient passes with proof roller to subject every point on surface to three separate passes of loaded tire.

.4 Where proof rolling reveals areas of defective subgrade:

.1 Remove subgrade material to depth and extent as directed by Consultant.

.2 Backfill excavated subgrade with material indicated by Consultant in maximum 150 mm lifts and compact to 98% maximum dry density.

.5 Where proof rolling reveals defective base or sub-base, remove defective materials to depth and extent as directed by Consultant and replace with new materials in accordance with this section at no extra cost.

3.3 PLACEMENT AND INSTALLATION

.1 Place granular base after sub-base or subgrade surface has been accepted by the Consultant.

.2 Placing:

.1 Construct granular base to depth and grade in areas indicated.

.2 Ensure no frozen material is placed.

.3 Place material only on surface that is not saturated, is free of standing water and is capable of supporting construction equipment without rutting or deflecting.

.4 Place material only on clean unfrozen surface, free from snow and ice.

.5 Begin spreading base material on crown line or on high side of one-way slope.

.6 Place material using methods which do not lead to segregation or degradation of aggregate.

.7 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.

.8 Place material to full width in uniform layers not exceeding 150 mm compacted thickness.

.9 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.10 Remove and replace that portion of layer in which material becomes segregated during spreading.

.3 Compaction Equipment:

.1 Ensure compaction equipment is capable of obtaining required material densities.

.4 Compacting:

.1 Compact to density not less than 100% maximum dry density.

.2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.

.3 Apply water as necessary during compacting to obtain specified density.

.4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers.

.5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.4 TOLERANCES

.1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.5 PROTECTION

.1 Maintain finished base in condition conforming to this Section until succeeding material is applied.

END OF SECTION 32 11 23

PART - 1 GENERAL

1.1 SUMMARY

.1 This Section specifies asphalt concrete pavements.

1.2 RELATED REQUIREMENTS

.1 Section 32 11 23 Aggregate Base Courses

1.3 REFERENCE STANDARDS

.1 American Association of State Highway and Transportation Officials (AASHTO)

.1 AASHTO M320, Standard Specification for Performance Graded Asphalt Binder.

.2 AASHTO R29, Standard Specification for Grading or Verifying the Performance Graded of an Asphalt Binder.

.3 AASHTO T245, Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.

.2 Asphalt Institute (AI)

.1 AI MS-2, Mix Design Methods for Asphalt Concrete and Other Hot-Mixes.

.3 ASTM International

.1 ASTM C88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.

.2 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m)).

.4 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS MUNI 302, Construction Specification for Priming Granular Base.

.2 OPSS MUNI 310, Construction Specification for Hot Mix Asphalt.

.3 OPSS MUNI 314, Construction Specification for Untreated Subbase, Base, Surface, Shoulder, Selected Subgrade, and Stockpiling.

.4 OPSS MUNI 1010, Material Specification for Aggregates, Base, Subbase, Select Subgrade, and Backfill Material.

.5 OPSS MUNI 1103, Material Specification for Emulsified Asphalt.

.6 OPSS MUNI 1150, Material Specification for Hot Mix Asphalt (HMA).

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's instructions, printed product literature and data sheets for furnishings and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit asphalt concrete mix design and trial mix test results to Consultant and Owner at least 4 weeks prior to beginning Work.

.1 Do not change job-mix without prior written acceptance from Owner or Consultant. When change in material source proposed, new job-mix formula shall be submitted for review.

.3 Close-out Submittals:

1.5 CLOSEOUT SUBMITTALS

.1 Submit electronic copies of freight and waybills for asphalt cement at completion of work.

PART - 2 PRODUCTS

2.1 MATERIALS

.1 Aggregates to: OPSS MUNI 1010.
- .1 Granular A.
- .2 Granular B Type II (type I shall not be used).
- .3 Select subgrade.

.2 Prime coat: RC-30 or SS-1 to OPSS MUNI 1103.

.3 Tack coat: SS-1 to OPSS MUNI 1103.

.4 Asphalt concrete: to OPSS MUNI 1150.

PART - 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: continuously verify that existing conditions or conditions of substrate previously installed under other Sections or Contracts are acceptable for pavement installation.
- .1 Inform of unacceptable conditions immediately upon discovery.
- .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written notice to proceed from Consultant and Owner.

3.2 INSTALLATION - GENERAL

.1 Prior to installing aggregate bases and/or asphalt mixes, clean surfaces of loose and foreign material.

.2 Obtain inspections and/or acceptance of conditions prior to proceeding. Do not proceed with installation of any course until preceding course has been inspected and accepted.
- .1 Scheduling of works shall allow time to re-work or improve base following a failed inspection. The Owner shall not bear any costs for failure to obtain successful inspections prior to delivery of paving materials.
- .2 Installation of aggregate bases and pavement mixes shall not be scheduled more than three calendar days following successful inspection.

3.3 PREPARATION

.1 Full-depth pavements (new pavement over existing sub-soil or newly installed fill)
- .1 Sub-grade for asphalt pavement shall be compactible, non-expansive soils, free of debris or organic materials.
  - .1 Where materials appear to be unsuitable for paving, the Contractor shall notify the Consultant and Owner immediately upon exposing such conditions. Do not proceed until direction is provided in writing.
- .2 Sub-grade materials shall be compacted and inspected as indicated.

.2 Partial-depth pavements (new pavement over existing pavement bases)
- .1 Upon removal of pre-existing pavements, all loose pavement material, debris, and organic materials shall be removed from the surface.
  - .1 Areas of unsuitable material (inclusions of debris, footings, organic material or other unsuitable materials) shall be identified in the field. Contractor shall not proceed with work over such conditions until accepted by Owner and/or Consultant.
- .2 Re-used pavement base materials shall be compacted and inspected as indicated.

.3 Partial-depth pavements / Resurfacing (new pavement over existing pavements, with or without leveling course)

.1 Clean pavement surface in accordance with Section 32 01 11.01 - Pavement Cleaning and Marking Removal.

.2 When levelling course is not required, patch and correct depressions and other irregularities to approval of Owner and Consultant before beginning paving operations.

.4 Pavements in tree root protection zones

.1 Carefully remove duff and loose upper soil by hand.

.2 Do not compact.

3.4 PAVEMENT CROSS-SECTIONS

.1 Coordinate the following with the drawings and geotechnical report where applicable.

.1 Communicate discrepancies in the documents to the Owner and Consultant. Do not proceed until discrepancy is resolved in writing.

.2 MEDIUM-DUTY ASPHALT PATHWAY PAVEMENT:

.1 Wear Course: 40 mm HL3 asphalt

.2 Base Course: 50 mm HL8 asphalt

.3 Aggregate Base: 250 mm min. compacted thickness of granular A

.3 LIGHT-DUTY ASPHALT PAVEMENT (AT NEW PICKLEBALL COURT):

.1 Wear Course: 35 mm HL3A asphalt

.2 Base Course: 50 mm HL8 asphalt

.3 Aggregate Base: 200 mm min. compacted thickness of granular A

.2 Where environmental conditions are less favourable for asphalt pavement installation, the Contractor and Consultant may agree to substitute HL3F in lieu of HL3 on short notice at no additional cost to the Owner.

3.5 AGGREGATE BASES

.1 Refer to Section 32 11 23 Aggregate Base Courses

.1 Compaction: compact each lift of granular material to 100% maximum density to ASTM D698 or as indicated.

.2 Maximum lift thickness: 150 mm.

.2 Aggregate bases shall extend at full depth to a minimum of 200 mm beyond the indicated edge of finished pavement.

3.6 TRANSPORTATION OF ASPHALT CONCRETE MIX

.1 Schedule delivery of material for placing in daylight.

.2 Deliver loads continuously in covered vehicles and immediately spread and compact.

.3 Deliver and place mixes at temperature not less than 135 degrees C.

3.7 EQUIPMENT

.1 Pavers: mechanical grade controlled self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.

.2 Rollers: sufficient number of type and weight to obtain specified density of compacted mix.

.3 Vibratory rollers:

.1 Drum diameter: 1200 mm minimum.

.2 Amplitude of vibration (machine setting): 0.5 mm maximum for lifts less than 40 mm thick.

.4 Hand tools:

.1 Lutes or rakes with covered teeth for spreading and finishing operations.

.2 Tamping irons having mass 12 kg minimum and bearing area not exceeding 310 cm2 for compacting material along curbs, gutters and other structures inaccessible to roller.

.3 Straight edges, 4.5 m in length, to test finished surface.

3.8 INSTALLATION OF ASPHALT CONCRETE

.1 Placing conditions:

.1 Place asphalt mixtures only when air temperature is [5] degrees C minimum.

.2 When temperature of surface on which material is to be placed falls below 10 degrees C, provide extra rollers as necessary to obtain required compaction before cooling.

.3 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.

.2 Place asphalt concrete to compacted thicknesses, grades and lines as indicated.

.3 Commence spreading at high side of pavement or at crown and span crowned centerlines with initial strip.

.4 Roll asphalt continuously to density not less than 98% of Marshall density as indicated.

.1 Use static compaction for levelling course less than 25 mm thick.

.2 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 25 impacts per metre of travel. For lifts less than 50 mm thick, impact spacing not to exceed compacted lift thickness.

.3 Where rolling causes displacement of material, loosen affected areas at once with lutes or shovels and restore to original grade of loose material before re-rolling.

.5 Where required, tapering and levelling and shaping of formed edges shall be completed in lower lifts.

.6 When hand spreading is used:

.1 Use approved wood or steel forms, rigidly supported to assure correct grade and cross section.

.1 Use measuring blocks and intermediate strips to aid in obtaining required cross-section.

.2 Distribute material uniformly without broad casting material.

.3 During spreading operation, thoroughly loosen and uniformly distribute material by lutes or covered rakes.

.1 Reject material that has formed into lumps and does not break down readily.

.4 After placing and before rolling, check surface with templates and straightedges and correct irregularities.

.5 Provide heating equipment to keep hand tools free from asphalt.

.1 Control temperature to avoid burning material.

.2 Do not use tools at higher temperature than temperature of mix being placed.

3.9 JOINTS

.1 Overlap joints by not less than 300 mm.

.2 Remove surplus material from surface of previously laid strip.

.1 Do not deposit on surface of freshly laid strip.

.3 Construct joints between asphalt concrete pavement and concrete pavement as indicated.

.4 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.

3.10 FINISH TOLERANCES

.1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.

.2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with 4.5 m straight edge placed in any direction.

3.11 DEFECTIVE WORK

.1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required.

.1 If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form true and even surface and compact immediately to specified density.

.2 Repair areas showing checking, rippling, or segregation.

.3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

3.12 PROTECTION

.1 Protect installed pavements from damage during construction.

.1 Where protection fences and barriers are places on new pavement, they shall be provided with spread bases at every foot or post.

.2 Protect to adjacent materials during pavement operations. Correct damages immediately to Owner and/or Consultant's satisfaction.

END OF SECTION 32 12 16.01

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for tactile warning surfacing Work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM C 1028 Tile Testing – Certified Slip Resistance Test

.2 ASTM A 327 Standard Test Methods for Impact Testing of Cast Irons

.3 ASTM A 48 Standard Specification for Gray Iron Castings

.4 ASTM E8/E8M-13a Standard Test Methods for Tension of Metallic Materials

.5 ASTM C 501 Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tiles by the Taber Abraser

.6 AASHTO HS20-44 Standard Specifications for Highway Bridges

.7 ASTM D695 – Standard Test Method for Compressive Properties of Rigid Plastics

.8 ASTM D638 – Standard Test Method for Tensile Properties of Plastics

.9 ASTM D696 – Standard Test Method for Coefficient of Linear Thermal Expansion (CLTE) of Plastics

.10 ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials

.11 ASTM D570 – Standard Test Method for Water Absorption of Plastics

.12 ASTM G155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

.13 ASTM C1026 – Standard Test Method for Resistance of Ceramic Materials to Frost

.14 ASTM B117 – Standard Practice for Operating Salt Spray (Fog) Apparatus

.15 ASTM D1037 – Standard Test Methods for Evaluating the Properties of Wood and Wood-Base Materials

.16 ASTM D543 – Standard Test Method for Resistance of Plastics to Chemical Reagents

1.3 **SUBMITTALS**

.1 Product data: Submit copies of manufacturer's Product data in accordance with Section 01 33 00 indicating:

.1 Submit manufacturer’s Product data sheets for Products proposed for use in the work of this section.

.2 Product data sheets shall include material test reports from qualified independent testing laboratories, current within a 24 month period preceding date of installation, indicating that materials proposed for use in the Work are in compliance with the requirements of the Contract Documents, and meet the properties specified or indicated.

.2 Shop drawings: Submit shop drawings indicating seam layout and welding procedures in accordance with Section 01 33 00.

.3 Samples:

.1 Submit full size sample of each type and colour of tactile warning surfacing specified or required for the Work.

.4 Closeout submittals: Submit maintenance and cleaning data for incorporating into Operations and Maintenance Manuals in accordance with Section 01 33 00.

1.4 **QUALITY ASSURANCE**

.1 Installers / applicators / erectors: Provide work of this section, executed by competent installers with minimum 3 years experience in application of Products, systems and assemblies specified, and with approval and training of Product manufacturers.

1.5 **SITE CONDITIONS**

.1 Ambient conditions: Maintain minimum temperature of 5°C in spaces to receive tactile warning surfaces for at least 24 hours prior to installation, during installation, and for not less than 24 hours after installation.

2 Products

2.1 **MATERIALS**

.1 Acceptable Product: Kinesik ‘Access Tile – Cast in Place’ or approved alternative.

.2 Tactile warning surfacing plates, exterior:

.1 Truncated domes shall have a base diameter of 23 mm (0.9”) minimum and 36 mm (1.4”) maximum, a top diameter of 50% of the base diameter minimum, to 65% of the base diameter maximum, and a height of 5.0 mm (0.2”).

.2 Truncated domes shall have a centre-to-centre spacing of 41 mm (1.6”) minimum and 61 mm (2.4”) maximum, and a base-to-base spacing of 17 mm (0.65”) minimum, measured between the most adjacent domes on a square grid.

.3 Colour: Onyx Black.

.3 Anchors: Colour matched to tiles with which they are being used, flat head, drive anchors, 1/4” diameter x 1-1/2” long, as recommended and supplied by tactile warning surfacing tile manufacturer for use with tiles being installed.

.4 Adhesive: as recommended and supplied by tactile warning surfacing tile manufacturer for use with tiles being installed.

.5 Perimeter sealant: as recommended and supplied by tactile warning surfacing tile manufacturer for use with tiles being installed.

3 Execution

3.1 **EXAMINATION**

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

3.2 INSTALLATION

.1 Install tactile warning surfacing in accordance with tactile warning surfacing manufacturer's instructions and recommendations, to locations indicated, scheduled, or required by authorities having jurisdiction.

3.3 ADJUSTING AND CLEANING

.1 Clean tiles by method recommended by tile manufacturer not less than 4 days prior to inspection for Substantial Performance of the Work.

3.4 PROTECTION

.1 Protect tiles and installation against damage during construction period in accordance with the tile manufacturer's instructions and recommendations.

.2 Protect tiles against damage from rolling loads following installation by covering with plywood or hardwood in accordance with tile manufacturer's instructions and recommendations.

END OF SECTION

PART - 1 GENERAL

1.1 SUMMARY

.1 Section includes requirements for CSA compliant playground safety surface composed of cedar wood fibres.

.1 For this specification, "loose fill," "organic loose fill surfacing," "ECWF," "cedar-based engineered wood fibre," or "CEWF" shall be synonymous with Engineered Cedar Wood Fibre Playground Safety Surface and each of these terms shall refer to the complete surface system.

.2 Products identified as "wood chips," "double-shredded bark mulch," "mulch," or the like, are prohibited.

1.2 RELATED REQUIREMENTS

.1 Section 31 23 33.01 Excavating, Trenching and Backfilling

.2 Section 31 32 19 Geosynthetics

.3 Section 32 11 23 Aggregate Base Courses

.4 Section 33 41 16 Subdrainage Piping

1.3 DEFINITIONS

.1 Definitions in CAN/CSA Z614 and ASTM F 2223 shall both apply to Work of this Section.

.2 Critical Height: Standard measure of shock attenuation according to ASTM F 2223; same as "critical fall height" in ASTM F 1292. According to ASTM F 1292, this approximates "the maximum fall height from which a life-threatening head injury would not be expected to occur."

1.4 ACTION SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data: for each type of product.

1.5 INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Qualification Data: For Installer and testing agency, if requested.

.3 Material Certificates for each type of material confirming compliance with:

.1 The Material Safety Requirements outlined in this specification.

.2 CAN/CSA Z614 Children's Playspaces and Equipment

.3 ASTM F 963 Consumer Safety Specification for Toy Safety

.4 ASTM F 1292 Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment

.5 ASTM F 1951 Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment

.6 ASTM F 2075 Specification for Engineered Wood Fiber for Use as a Playground Safety Surface Under and Around Playground Equipment

.4 Field quality-control reports.

.5 Sample Warranty: For manufacturer's special warranty.

1.6 CLOSEOUT SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Maintenance Data: For playground safety surfacing to include in maintenance manuals.

1.7 QUALITY ASSURANCE

.1 Installer Qualifications: An entity that can demonstrate at least five years experience in performing similar work to that specified here and employs installers and supervisors who are trained and experienced with engineering wood fibre playground safety surfacing. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

1.8 WARRANTY

.1 Special Warranty: Manufacturer and Installer agree to repair or replace components of safety surfacing that fail in materials or workmanship within specified warranty period.

.1 Failures include, but are not limited to, the following:

.1 Reduction in impact attenuation as measured by reduction of critical fall height.

.2 Deterioration of safety surfacing and other materials beyond normal weathering.

.2 Warranty Period: one year from date of Substantial Completion.

PART - 2 PRODUCTS

2.1 SURFACING MATERIALS

.1 Engineered Wood Fiber: ASTM F 2075; containing no bark, leaves, twigs, or foreign or toxic materials; tested for accessibility according to ASTM F 1951.

.1 Critical Height: to be determined according to ASTM F 1292 and F 2223 for the playground equipment present or specified.

.2 Uncompressed Material Depth: not less than the depth required to provide shock attenuation as required by CAN/CSA Z614 and ASTM F 2223.

.2 Safety surface sources:

.1 Source limitations: Obtain safety surfacing materials from single source from single manufacturer.

.1 Provide geosynthetics and other accessories of each type from source recommended by manufacturer of safety surfacing materials, unless specified otherwise.

.2 Preferred manufacturers:

.1 Playground Planners (product trade name is "Cedarweave").

.2 Playcare & Design Inc. / Fibretop (product trade name is "Fibre Weave Cedar EWF").

.3 Gro-Bark (product trade name is "Fiber Weave").

.4 Submissions for approved equal will be reviewed after award and must be submitted within 10 business days of purchase order issuance. Submissions must include complete manufacturer documentation to allow for comparison with the specified product. In the event of rejection of submission, Contractor will be responsible to provide the specified product. The Owner will not accept any cost or delay due to rejection of submission.

.3 Safety surface material safety requirements

.1 All materials used in the playground safety surfacing system must be tested for potentially harmful substances and certified to not exceed the maximum ratio indicated for each of the potential contaminants listed in this section.

.1 Provide test results and certification from a facility accredited by the Canadian Association for Laboratory Accreditation (CALA).

.2 Certification of testing shall include declaration that the testing facility is capable of achieving detection limits that are lower than the referenced standards.

.2 Required testing methods and limits:

.1 Methods as specified by EN-71-3: Safety of Toys (source of limits: European Union Toy Standard EN 71-3/Category I)

Elements	Maximum	Unit
Aluminum	5,625	mg/kg
Antimony	45	mg/kg
Arsenic	3.8	mg/kg
Barium	1,500	mg/kg
Boron	1,200	mg/kg
Cadmium	1.3	mg/kg
Chromium (III)	37.5	mg/kg
Chromium (VI)	0.02	mg/kg
Cobalt	10.5	mg/kg
Copper	622.5	mg/kg
Lead	13.5	mg/kg
Manganese	1,200	mg/kg
Mercury	7.5	mg/kg
Nickel	75	mg/kg
Selenium	37.5	mg/kg
Strontium	4,500	mg/kg
Tin	15,000	mg/kg
Organic Tin	0.9	mg/kg
Zinc	3,750	mg/kg

.2 US EPA Method 8061A – Phthalate Esters by Gas Chromatography with Electron Capture Detection (GC/ECD) (source of limits: Canada Phthalates Regulations SOR/2010-298)

Phthalates	Maximum	Unit
di(2-ethylhexyl) phthalate (DEHP)	1,000	mg/kg
dibutyl phthalate (DBP)	1,000	mg/kg
benzyl butyl phthalate (BBP)	1,000	mg/kg
diisononyl phthalate (DINP)	1,000	mg/kg
diisodecyl phthalate (DIDP)	1,000	mg/kg
di-n-octyl phthalate (DNOP)	1,000	mg/kg

.3 Methods specified in "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act," Ontario Ministry of the Environment and Climate Change (MOECC), 2011 (source of limits: MOECC (2011) Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 1, Parkland)

Polycyclic aromatic hydrocarbons (PAH)	Maximum	Unit
Acenaphthene	0.072	µg/g
Acenaphthylene	0.093	µg/g

Anthracene	0.16	µg/g
Benz[a]anthracene	0.36	µg/g
Benzo[a]pyrene	0.3	µg/g
Benzo[b]fluoranthene	0.47	µg/g
Benzo[ghi]perylene	0.68	µg/g
Benzo[k]fluoranthene	0.48	µg/g
Chrysene	2.8	µg/g
Dibenz[a h]anthracene	0.1	µg/g
Fluoranthene	0.56	µg/g
Fluorene	0.12	µg/g
Indeno[1 2 3-cd]pyrene	0.23	µg/g
Methlynaphthalene, 2-(1-)	0.05	µg/g
Naphthalene	0.09	µg/g
Phenanthrene	0.69	µg/g
Pyrene	1	µg/g

.4 Test methods as specified in ANSI/BIFMA M7.1-2011: Standard Test Method for Determining VOC Emissions from Office Furniture Systems, Components and Seating (source of limits: ANSI/BIFMAM7.1-2011, Table A1.1 "Limits of Indoor Air Concentrations Due to Emissions from Systems Furniture and Seating at 168 Hours")

Volatile organic compounds (VOC)*	**Maximum**	**Unit**
TVOC toluene	0.5	mg/m^3
Formaldehyde	50	ppb
Total Aldehydes	100	ppb
4-Phenylcyclohexene	0.0065	mg/m^3

* Testing for VOCs shall be required for indoor installations only

.4 Safety surface Performance requirements

.1 Impact Attenuation: Critical fall height tested according to ASTM F 1292.

.1 No greater than 200 G(max) and 1000 HIC at time of installation according to ASTM F 355.

.2 Accessibility Standard: Minimum surfacing performance according to ASTM F 1951.

2.2 ACCESSORIES

.1 Stabilizing Mats: (if required)

.1 Water-permeable PVC or rubber mats tested for impact attenuation according to ASTM F 1292, with anchoring system designed to anchor mat securely to subgrade through loose fill, and rated for use in the following locations:

.1 Mat shall be rated for maximum fall height of playground in combination with the depth of loose fill material as adjusted to accommodate mat installation.

.2 Mats shall be Ipema certified.

.2 Preferred product: "TuffMat" Resilient Mats by Zeager Bros. Inc. or equal.

.1 Use sizes indicated or as recommended for the use intended.

.2 Use mats with beveled edges.

.3 Color: black.

.3 Warranty: product to be supplied with 5-year manufacturer's warranty.

.4 Size: as indicated.

.5 Locations: as indicated.

.6 Submissions for approved equal will be reviewed after award and must be submitted within 10 business days of purchase order issuance. Submissions must include complete manufacturer documentation to allow for comparison with the specified product. In the event of rejection of submission, Contractor will be responsible to provide the specified product. The Owner will not accept any cost or delay due to rejection of submission.

2.3 GEOSYNTHETICS

.1 Provide geosynthetic materials according to section 31 32 19

2.4 DRAINAGE

.1 Provide drainage stone layer and conveyance piping as indicated.

.1 Drainage stone layer to be 20 mm size clear stone according to Section 31 23 33.01 to depth indicated.

.2 Drainage conveyance piping to be as indicated and according to Sections 31 23 33.01 and 33 41 16.

PART - 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for exterior site furnishing installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written notice to proceed from Consultant and Owner.

3.2 PREPARATION

.1 Prepare substrates to receive surfacing products according to surfacing manufacturer's written instructions.

3.3 INSTALLATION OF DRAINAGE

.1 Install drainage as indicated and according to Sections 31 23 33.01 and 33 41 16.

.1 Coordinate with edging installation and surrounding works.

.2 If requested, test drainage system to ensure proper function prior to covering.

3.4 INSTALLATION OF GEOSYNTHETICS

.1 Install geosynthetics according to playground surface system manufacturer's and geosynthetic manufacturer's written instructions and in a manner that cannot become a tripping hazard.

.1 Drainage/Separation Geotextile: Completely cover area beneath safety surfacing, overlapping geotextile sides and edges a minimum of 200 mm with overlapping loosely laid seams.

3.5 INSTALLATION OF LOOSE-FILL SURFACING

.1 Apply loose-fill surfacing according to manufacturer's written instructions to produce a uniform surface.

.1 Place loose-fill materials to after installation of playground equipment support posts and foundations

.2 Install in maximum 150 mm depth lifts, compacting between each lift until the required depth is reached at the required finished elevation.

.1 The Contractor may increase the depth of material to reach the required elevation.

.2 The Contractor is not permitted to provide less than the required depth or to install the surface to a finished grade higher than the specified elevation.

.3 After the required depth and elevation have been reached, install and compact an additional 50 mm of material (to address expected settlement).

.1 The additional material requirement does not relieve or modify the Contractor's responsibility to provide a minimum depth of surfacing at no higher than the indicated elevation.

.2 Grading: Uniformly grade loose fill to an even surface free from irregularities.

.3 Compaction:

.1 After initial grading, compact loose fill according to manufacturer's instructions.

.1 Wet the material and compact mechanically.

.4 Finish Grading: Hand rake to a uniformly smooth finished surface and to required elevations.

3.6 ACCESSORIES

.1 Edging: Place and permanently secure edging in place and attach units to each other al in accordance with manufacturer's instructions.

.2 Stabilizing Mats: Coordinate installation of mats and mat anchoring system with placing and compacting of loose fill.

.1 Install mats at finished grade of safety surfacing unless otherwise indicated.

3.7 FIELD QUALITY CONTROL

.1 Testing Agency:

.1 Consultant and/or Owner shall arrange for a qualified testing agency to perform tests.

.2 Testing:

.1 Perform "Installed Surface Performance Test" according to ASTM F 1292 for each safety surfacing type and thickness in each playground area.

.2 Perform installed-surface-performance tests at no less than one series of tests for each 100 sq. m of each type and thickness of in-place safety surfacing or part thereof.

.3 Playground safety surfacing will be considered defective if it does not pass tests.

.4 Prepare test reports.

.1 Provide G(max) and HIC figures for each tested area and averages for the overall surfacing area.

3.8 PROTECTION

.1 Prevent traffic over surfacing until all testing and inspections are passed (for surfacing and equipment) and Owner has provided written acceptance of the Work.

END OF SECTION 32 18 16.13A

PART - 1 GENERAL

1.1 SUMMARY

.1 Section includes requirements for CSA compliant playground safety surface composed of rubber particles bound in a flexible polyurethane matrix.

1.2 RELATED REQUIREMENTS

.1 Section 31 23 33.01 Excavating, Trenching and Backfilling

.2 Section 31 32 19 Geosynthetics

.3 Section 32 11 23 Aggregate Base Courses

.4 Section 33 41 16 Subdrainage Piping

1.3 DEFINITIONS

.1 Definitions in CAN/CSA Z614 and ASTM F 2223 shall both apply to Work of this Section.

.2 Critical Height: Standard measure of shock attenuation according to ASTM F 2223; same as "critical fall height" in ASTM F 1292. According to ASTM F 1292, this approximates "the maximum fall height from which a life-threatening head injury would not be expected to occur."

.3 SBR: Styrene-butadiene rubber.

.4 Unitary Surfacing: A protective surfacing of one or more material components bound together to form a continuous surface; same as "unitary system" in ASTM F 2223.

1.4 ACTION SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data: for each type of product.

.3 Shop Drawings: For each type of surfacing.

.1 Include plans, sections, placement details, and attachment to substrates.

.2 Include accessories and edge terminations.

.3 Include patterns made by varying colors of surfacing and/or details of graphics.

.4 Include plans of fall heights and use zones for equipment and structures coordinated with the critical heights for safety surfacing, where applicable.

.1 Provide surfacing throughout the indicated area meeting the requirement for the highest fall height associated with the surfacing area.

.5 The Contractor shall be responsible to provide complete documentation for review and verification to installer of surfacing and installer of playground equipment.

.4 Samples for Verification: For each type of surfacing and exposed finish.

.1 Unitary, Seamless Surfacing: Minimum 150 by 150 mm.

1.5 INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Qualification Data: For Installer and testing agency, if requested.

.3 Material Certificates for each type of material confirming compliance with:

.1 The Material Safety Requirements outlined in this specification.

.2 CAN/CSA Z614 Children's Playspaces and Equipment

.3 ASTM F 963 Consumer Safety Specification for Toy Safety

.4 ASTM F 1292 Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment

.5 ASTM F 1951 Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment

.6 ASTM F 2479 Guide for Specification, Purchase, Installation and Maintenance of Poured-In-Place Playground Surfacing

.4 Field quality-control reports.

.5 Sample Warranty: For manufacturer's special warranty.

1.6 CLOSEOUT SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Maintenance Data: For playground safety surfacing to include in maintenance manuals.

1.7 QUALITY ASSURANCE

.1 Installer Qualifications: An entity that can demonstrate at least five years experience in performing similar work to that specified here and employs installers and supervisors who are trained and experienced with installation of seamless rubber playground safety surfacing. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

1.8 WARRANTY

.1 Special Warranty: Manufacturer and Installer agree to repair or replace components of safety surfacing that fail in materials or workmanship within specified warranty period.

.1 Failures include, but are not limited to, the following:

.1 Reduction in impact attenuation as measured by reduction of critical fall height.

.2 Deterioration of safety surfacing and other materials beyond normal weathering.

.2 Warranty Period: one year from date of Substantial Completion.

PART - 2 PRODUCTS

2.1 SURFACING MATERIALS

.1 Unitary, Dual-Density, Seamless Surfacing

.1 Description: Manufacturer's standard, site-mixed and applied, two-layer material with wearing layer over cushioning layer, with combined, overall thickness as required, tested for impact attenuation according to ASTM F 1292 and for accessibility according to ASTM F 1951.

.1 Wearing Layer: Formulation of EPDM rubber particles or polyurethane granules, binder, and other organic and inorganic components.

.2 Cushioning Layer: Formulation of SBR particles and binder.

.3 Binder: Weather-resistant, UV-stabilized, flexible, nonhardening, 100 percent solids polyurethane.

.4 Lacquer Topcoat (if required): Manufacturer's standard polyurethane-based formulation.

.5 Critical Height: to be determined according to ASTM F 1292 and F 2223 for the playground equipment present or specified.

.6 Overall Thickness: Not less than as required for critical height indicated.

.7 Primer/Adhesive: Manufacturer's standard primer and weather-resistant, moisture-cured polyurethane adhesive suitable for unit, substrate, and location.

.8 Wearing layer color(s): As selected by Consultant and Owner from manufacturer's full range, with reference to the drawings **(refer to Detail 10/L-10 for specified colour blend). *Contractor to provide sample for Consultant's review.**

.2 Leveling and Patching Material: shall be as supplied or recommended by surfacing manufacturer and suitable for exterior use.

.3 Rubber materials manufactured from recycled tires shall not be used in any part of the surfacing system.

.2 Safety surface sources:

.1 Source limitations: Obtain surfacing materials from single source from single manufacturer.

.1 Provide geosynthetics and other accessories of each type from source recommended by manufacturer of safety surfacing materials, unless specified otherwise.

.2 Subject to compliance with requirements, only manufacturers providing a complete surfacing system and demonstrating a track record of 5 years of continuous production with extensive successful installations of their product will be considered.

.2 Preferred manufacturer:

.1 Everplay (product trade name is "in situ") or equal.

.2 Submissions for approved equal will be reviewed after award and must be submitted within 10 business days of purchase order issuance. Submissions must include complete manufacturer documentation to allow for comparison with the specified product. In the event of rejection of submission, Contractor will be responsible to provide the specified product. The Owner will not accept any cost or delay due to rejection of submission.

.3 Safety surface material safety requirements

.1 All materials used in the playground safety surfacing system must be tested for potentially harmful substances and certified to not exceed the maximum ratio indicated for each of the potential contaminants listed in this section.

.1 Provide test results and certification from a facility accredited by the Canadian Association for Laboratory Accreditation (CALA).

.2 Certification of testing shall include declaration that the testing facility is capable of achieving detection limits that are lower than the referenced standards.

.2 Required testing methods and limits:

.1 Methods as specified by EN-71-3: Safety of Toys (source of limits: European Union Toy Standard EN 71-3/Category I)

Elements	Maximum	Unit
Aluminum	5,625	mg/kg
Antimony	45	mg/kg
Arsenic	3.8	mg/kg
Barium	1,500	mg/kg
Boron	1,200	mg/kg
Cadmium	1.3	mg/kg
Chromium (III)	37.5	mg/kg
Chromium (VI)	0.02	mg/kg
Cobalt	10.5	mg/kg
Copper	622.5	mg/kg
Lead	13.5	mg/kg

Manganese	1,200	mg/kg
Mercury	7.5	mg/kg
Nickel	75	mg/kg
Selenium	37.5	mg/kg
Strontium	4,500	mg/kg
Tin	15,000	mg/kg
Organic Tin	0.9	mg/kg
Zinc	3,750	mg/kg

.2 US EPA Method 8061A – Phthalate Esters by Gas Chromatography with Electron Capture Detection (GC/ECD) (source of limits: Canada Phthalates Regulations SOR/2010-298)

Phthalates	**Maximum**	**Unit**
di(2-ethylhexyl) phthalate (DEHP)	1,000	mg/kg
dibutyl phthalate (DBP)	1,000	mg/kg
benzyl butyl phthalate (BBP)	1,000	mg/kg
diisononyl phthalate (DINP)	1,000	mg/kg
diisodecyl phthalate (DIDP)	1,000	mg/kg
di-n-octyl phthalate (DNOP)	1,000	mg/kg

.3 Methods specified in "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act," Ontario Ministry of the Environment and Climate Change (MOECC), 2011 (source of limits: MOECC (2011) Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 1, Parkland)

Polycyclic aromatic hydrocarbons (PAH)	**Maximum**	**Unit**
Acenaphthene	0.072	µg/g
Acenaphthylene	0.093	µg/g
Anthracene	0.16	µg/g
Benz[a]anthracene	0.36	µg/g
Benzo[a]pyrene	0.3	µg/g
Benzo[b]fluoranthene	0.47	µg/g
Benzo[ghi]perylene	0.68	µg/g
Benzo[k]fluoranthene	0.48	µg/g
Chrysene	2.8	µg/g
Dibenz[a h]anthracene	0.1	µg/g
Fluoranthene	0.56	µg/g
Fluorene	0.12	µg/g
Indeno[1 2 3-cd]pyrene	0.23	µg/g
Methlynaphthalene, 2-(1-)	0.05	µg/g
Naphthalene	0.09	µg/g
Phenanthrene	0.69	µg/g
Pyrene	1	µg/g

.4 Test methods as specified in ANSI/BIFMA M7.1-2011: Standard Test Method for Determining VOC Emissions from Office Furniture Systems, Components and Seating (source of limits: ANSI/BIFMAM7.1-2011, Table A1.1 "Limits of Indoor Air Concentrations Due to Emissions from Systems Furniture and Seating at 168 Hours)

Volatile organic compounds (VOC)*	**Maximum**	**Unit**
TVOC toluene	0.5	mg/m^3

Formaldehyde	50	ppb
Total Aldehydes	100	ppb
4-Phenylcyclohexene	0.0065	mg/m^3

* Testing for VOCs shall be required for indoor installations only

.4 Safety surface Performance requirements

.1 Impact Attenuation: Critical fall height tested according to ASTM F 1292.

.1 No greater than 200 G(max) and 1000 HIC at time of installation according to ASTM F 355.

.2 Accessibility Standard: Minimum surfacing performance according to ASTM F 1951.

2.2 GEOSYNTHETICS

.1 Provide geosynthetic materials according to section 31 32 19

2.3 AGGREGATE BASE AND DRAINAGE

.1 Provide aggregate base course and drainage stone and piping as indicated.

.1 Aggregate base course to be as indicated and according to section 32 11 23.

.2 Drainage stone to be 20 mm size clear stone according to Section 31 23 33.01 to depth indicated.

.3 Drainage conveyance piping to be as indicated and according to Sections 31 23 33.01 and 33 41 16.

PART - 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for exterior site furnishing installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.1 Concrete Substrates: Verify that substrates are dry and free from surface defects, laitance, glaze, efflorescence, curing compounds, form-release agents, hardeners, dust, dirt, loose particles, grease, oil, and other contaminants incompatible with safety surfacing or that may interfere with adhesive bond. Determine adhesion, dryness, and acidity characteristics by performing procedures recommended in writing by safety surfacing manufacturer.

.2 Inform of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written notice to proceed from Consultant and Owner.

3.2 PREPARATION

.1 Prepare substrates to receive surfacing products according to safety surfacing manufacturer's written instructions.

.2 Hard-Surface Substrates: Clean surface free of laitance, efflorescence, curing compounds, and other contaminants incompatible with safety surfacing.

.1 Repair: Fill holes and depressions in unsatisfactory surfaces with leveling and patching material.

.2 Treatment: Mechanically abrade or otherwise prepare concrete substrates according to safety surfacing manufacturer's written instructions to achieve adequate roughness.

.3 Terminal Edges: Saw cut substrate for terminal edges of safety surfacing.

.4 Treat control joints and other non-moving substrate cracks to prevent telegraphing through safety surfacing.

3.3 INSTALLATION OF AGGREGATE BASE COURSES AND DRAINAGE

.1 Install aggregate base courses according to section 32 11 23.

.1 Ensure successful compaction testing completed prior to proceeding with subsequent works.

.2 Install drainage as indicated and according to Sections 31 23 33.01 and 33 41 16.

.1 Coordinate with edging installation and surrounding works.

.3 If requested, test drainage system to ensure proper function prior to covering.

3.4 INSTALLATION OF GEOSYNTHETICS

.1 Install geosynthetics according to playground surface system manufacturer's and geosynthetic manufacturer's written instructions and in a manner that cannot become a tripping hazard.

.1 Drainage/Separation Geotextile: Completely cover area beneath safety surfacing, overlapping geotextile sides and edges a minimum of 200 mm with overlapping loosely laid seams.

3.5 INSTALLATION OF SEAMLESS SURFACING

.1 Mix and apply components of seamless surfacing according to manufacturer's written instructions to produce uniform, monolithic, and impact-attenuating protective surfacing of required overall thickness.

.1 Substrate Primer: Apply over prepared substrate at manufacturer's standard spreading rate for type of substrate.

.2 Poured Cushioning Layer: Spread evenly over primed substrate to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation, with a minimum of cold joints.

.3 Intercoat Primer: Over cured cushioning layer, apply primer at manufacturer's standard spreading rate.

.4 Wearing Layer: Spread over primed base course to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation and, except where color changes, with no cold joints. Finish surface to produce manufacturer's standard wearing-surface texture.

.5 Design: Where colored pattern and/or graphic design is required, place colored, design material as soon as previously placed material is sufficiently cured, using primer or adhesive if required by manufacturer's written instructions.

.6 Lacquer Topcoat (if required): Spray or roller applied at manufacturer's standard coating rate in one continuous operation.

.7 Edge Treatment: As detailed. Fully adhere edges to substrate with full coverage of substrate. Maintain fully cushioned thickness required to comply with performance requirements.

3.6 FIELD QUALITY CONTROL

.1 Testing Agency:

.1 Consultant and/or Owner shall arrange for a qualified testing agency to perform tests.

.2 Testing:

.1 Perform "Installed Surface Performance Test" according to ASTM F 1292 for each safety surfacing type and thickness in each playground area.

.2 Perform installed-surface-performance tests at no less than one series of tests for each 100 sq. m of each type and thickness of in-place safety surfacing or part thereof.

.3 Playground safety surfacing will be considered defective if it does not pass tests.

.4 Prepare test reports.

.1 Provide G(max) and HIC figures for each tested area and averages for the overall surfacing area.

3.7 PROTECTION

.1 Prevent traffic over surfacing until all testing and inspections are passed (for surfacing and equipment) and Owner has provided written acceptance of the Work.

END OF SECTION 32 18 16.13B

PART - 1 GENERAL

1.1 SUMMARY

.1 This section includes materials and installation of chain link fences and gates.

1.2 RELATED REQUIREMENTS

.1 Section 03 30 00.09 Cast-in-Place Concrete – Short Form

1.3 REFERENCE STANDARDS

.1 ASTM International

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

.2 ASTM A90/A90M, Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.

.3 ASTM A121, Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.

.4 A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.5 ASTM C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

.6 ASTM F1664, Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.

.7 ASTM A123/A123M, Standard Specification for Zinc (Hot Dip Galvanized) coatings on Iron and Steel Products.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-138.1, Fabric for Chain Link Fence.

.2 CAN/CGSB-138.2, Steel Framework for Chain Link Fence.

.3 CAN/CGSB-138.3, Installation of Chain Link Fence.

.4 CAN/CGSB-138.4, Gates for Chain Link Fence.

.5 CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating.

.3 CSA Group (CSA)

.1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A3000, Cementitious Materials Compendium.

.4 Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - current edition.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for concrete mixes, fences, posts and gates and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 If indicated, submit shop drawings indicating components, dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.

PART - 2 PRODUCTS

2.1 MATERIALS

.1 Concrete mixes and materials: in accordance with 03 30 00.09 Cast-in-Place Concrete – Short Form.

.2 Concrete mixes and materials: in accordance with CSA A23.1.

.1 Compressive strength: 20 MPa minimum at 28 days.

.3 Chain-link fence fabric: to CAN/CGSB-138.1.

.1 6-gauge galvanized (GAW) wire mesh, 50 mm X 50 mm wire spacing with knuckled selvedge top and bottom.

.2 Heavy duty, 6-gauge, galvanized (GAW) wire mesh, 50 mm X 50 mm wire spacing.

.3 Standard duty, 9-gauge, galvanized (GAW) wire mesh, 50 mm X 50 mm wire spacing.

.4 Height of fabric: as indicated.

.4 Posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe; Dimensions as indicated.

.5 Tension wire: to CAN/CGSB-138.2, single strand steel wire.

.1 Tie wire fasteners: aluminum or aluminum alloy wire.

.6 Tension bar: to ASTM A653/A653M, 5 x 20 mm minimum galvanized steel.

.7 Gates: to CAN/CGSB-138.4.

.8 Gate frames: to ASTM A53/A53M, galvanized steel pipe, standard weight 45 mm outside diameter pipe for outside frame, 35 mm outside diameter pipe for interior bracing.

.1 Fabricate gates as indicated with electrically welded joints, and hot-dip galvanized after welding.

.2 Furnish gates with galvanized malleable iron hinges, latch and latch catch with provision for padlock which can be attached and operated from either side of installed gate.

.3 Furnish double gates with chain hook to hold gates open and/or centre rest with drop bolt for closed position, as indicated.

.9 Fittings and hardware: to CAN/CGSB-138.2, cast aluminum alloy unless otherwise indicated.

.1 Tension bar bands: 3 x 20 mm minimum galvanized steel or 5 x 20 mm minimum aluminum.

.2 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.

.3 Turnbuckles to be drop forged.

.10 Organic zinc rich coating: to CAN/CGSB-1.181 or MPI #18.

2.2 FINISHES

.1 Galvanizing:

.1 For chain link fabric: to CAN/CGSB-138.1 Grade 2.

.2 For pipe: 550 g/m2minimum to ASTM A90.

.3 For barbed wire: to ASTM A121, Class 2 CAN/CGSB-138.2.

.4 For other fittings: to ASTM A123/A123M.

PART - 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for chain link fence and gate installation in accordance with manufacturer's written instructions.

- .1 Visually inspect substrate in presence of Consultant.
- .2 Inform of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written notice to proceed from Consultant and Owner.

3.2 ERECTION OF FENCE

.1 Erect fence along lines as indicated and to CAN/CGSB-138.3.

.2 Excavate post holes to dimensions indicated.

.3 Space line posts equally, as indicated and measured parallel to ground surface.

.4 Space straining posts at equal intervals not to exceed 150 m if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade, is greater than 150 m.

.5 Install additional straining posts at sharp changes in grade and where directed by Consultant.

.6 Install corner post where change in alignment exceeds 10 degrees.

.7 Install end posts at end of fence and at buildings.

.8 Install gate posts on both sides of gate openings.

.9 Place concrete in post holes then embed posts into concrete to depths indicated.

- .1 In softscape areas: extend concrete 50 mm above ground level and slope to drain away from posts.
- .2 In hardscape areas: terminate concrete 150 mm below indicated finished grade level and slope to drain away from posts.
- .3 Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.

.10 Install rails, braces and fence fabric after concrete has cured, minimum of 5 days.

.11 Install brace between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface or as indicated].

- .1 Install braces on both sides of corner and straining posts in similar manner.

.12 Install caps and/or overhang tops as indicated.

.13 Install top rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.

.14 Install bottom and middle rails where and as indicated.

.15 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.

.16 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals.

- .1 Install fabric on side of fence as indicated.

.17 Secure fabric to all posts, rails and/or tension wires with tie wires at 450 mm intervals.

.1 Give tie wires minimum two twists.

3.3 INSTALLATION OF GATES

.1 Deliver gates to site fully assembled.

.2 Install gates in locations as indicated.

.3 Level ground between gate posts and set gate bottom approximately 40 mm above ground surface.

.1 Ensure bottom of gate is clear of ground surface minimum 25 mm through entire angle of swing.

.4 Determine position of centre gate rest for double gate.

.1 Cast gate rest in concrete as directed.

.2 Dome concrete above ground level to shed water.

.5 Install gate stops where indicated.

3.4 TOUCH UP

.1 Clean damaged surfaces or field welds with wire brush removing loose and cracked coatings. Apply two coats of organic zinc-rich paint to damaged areas and field welded areas.

.1 Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

.2 Prevent over-spray during touch-up. Clean overspray from any affected surfaces.

END OF SECTION 32 31 13

PART - 1 GENERAL

1.1 SUMMARY

.1 Section includes site furnishings supply and installation requirements.

1.2 RELATED REQUIREMENTS

.1 Section 01 41 00 Regulatory Requirements

.2 Section 03 30 00.09 Cast-in-Place Concrete – Short Form

.3 Section 31 23 33.01 Excavating, Trenching and Backfilling

.4 Section 31 32 19 Geosynthetics

.5 Section 32 11 23 Aggregate Base Courses

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's instructions, printed product literature and data sheets for furnishings and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit shop drawings indicating dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.

1.4 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for care and cleaning of site furnishings.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with the General Conditions and with manufacturer's written instructions

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in off-ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect furnishings from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

PART - 2 PRODUCTS

2.1 SUBSTITUTION REQUESTS

.1 For products marked "or equal," submissions for approved equal will be reviewed after award and must be submitted within 10 business days of purchase order issuance. Submissions must include complete manufacturer documentation to allow for comparison with the specified product. In the event of rejection of submission, Contractor will be responsible to provide the specified product. The Owner will not accept any cost or delay due to rejection of submission.

2.2 BENCH

.1 Use Toronto Parks, Forestry and Recreation standard benches or equal.

.1 Manufacturer: Classic Displays Inc.
.2 Model: "Accessible Riverside"
  .1 Length: 6-feet / 1.8 metres.
  .2 Side arms: included (both sides).
  .3 Centre arm: not included.
  .4 Surface mount.
  .5 Total number of benches required: 17
.3 Model: "Accessible Riverside" Backless Bench
  .1 Length: 6-feet / 1.8 metres.
  .2 Side arms: included (both sides).
  .3 Centre arm: not included.
  .4 Surface mount.
  .5 Total number of benches required: 2
.4 Finishes:
  .1 Metal castings and accessories: black.
  .2 Slats: recycled lumber in "sand" colour.

2.3 SHADE UMBRELLA TABLES

.1 Use Knill umbrella tables or equal.
  .1 Manufacturer: Knill Fabrication Limited; tel. 519.442.2424
  .2 Single Post Shade Table - Model: “ST-CC-4S-1G” with curved roof panels
    .1 Provide (2) 4-seater shade tables and (1) 3-seater shade table
    .2 Direct-bury post installation with concrete footing.
  .3 Finishes:
    .1 Colour for all shade tables: “Sky” (RAL #5012)

2.4 SHADE UMBRELLAS

.1 Use Knill single post shade umbrellas or equal.
  .1 Manufacturer: Knill Fabrication Limited; tel. 519.442.2424
  .2 Single Post Shade Structure - Model: “650975” with curved roof panels
    .1 Provide (2) shade umbrellas.
    .2 Direct-bury post installation with concrete footing.
  .3 Finishes:
    .1 Colour for all shade umbrellas: “Greenspoke Green” (RAL #6018)

2.5 ADIRONDACK CHAIRS

.1 Use Knill single post shade umbrellas or equal.
  .1 Manufacturer: The Woodmill; tel. 1.888.597.5573
  .2 Model: “Raised Adirondack Deluxe Chair” - with standard 6” arm rests
    .1 Provide (4) Adirondack chairs.
    .2 Surface-mounted to new concrete pavement. Contractor shall provide galvanized hardware for mounting.
  .3 Finishes:

.1 Colour for (2) chairs shall be “aruba”; colour for (2) chairs shall be “yellow”

2.6 PICNIC TABLE

.1 Use Toronto Parks, Forestry and Recreation standard tables or equal.
- .1 Manufacturer: W.H. Reynolds (distributed by Bleacher Guys).
- .2 6-foot Accessible Model: "LT6-BF-PT Accessible Picnic Table"
  - .1 Length: 6-feet / 1.8 metres.
  - .2 Surface mount.
  - .3 Total number of picnic tables required: 2
- .3 Finishes:
  - .1 Metal frame and accessories: galvanized.
  - .2 Slats: untreated cedar.

2.7 BIKE RACKS

.1 Use Maglin 300-Series bike racks or equal.
- .1 Manufacturer: Maglin Site Furniture; tel. 1.800.716.5506
- .2 Model: “MBR-300-4-S” – 300 Series 4-ring bike racks
  - .1 Provide (9) bike racks.
  - .2 Surface-mounted to new concrete pavement. Contractor shall provide galvanized hardware for mounting.
- .3 Finishes:
  - .1 Colour for all bike racks shall be powdercoat in “black”.

2.8 PRECAST PING PONG TABLE

.1 Use Ping Pong Table from Ed’s Concrete Products or equal.
- .1 Manufacturer: Ed’s Concrete Products; tel. 1.877.265.6590
- .2 Model: Precast Ping Pong Table with stainless steel net
  - .1 Provide (1) ping pong table
  - .2 Table to be gravity set on new concrete pavement.
- .3 Finishes:
  - .1 Natural concrete finish.

2.9 PICKLEBALL NET ASSEMBLY

.1 Pickleball net assembly shall consist of a full, operating set of equipment including all items and accessories described below as may be necessary to furnish a single pickleball court.

.2 Use the following, or equal:
- .1 Manufacturer: Douglas Sports
- .2 Posts: "SW-36 Deluxe Pickleball Posts 2-7/8” OD”
  - .1 Length/height: 54” (137.16 cm) length / 36” (91.44 cm) finished height.
  - .2 Material: 2-7/8” (7.3 cm) outside diameter, 8-guage steel.
  - .3 Accessories: external mounted aluminum hand reel, die-cast zinc caps.
- .3 Ground Sleeves: "GS-24PVC PVC Ground Sleeves 24” Long for 2-7/8” OD Posts.”

.4 Center Pipe Anchor: “Center Pipe Anchor."

.5 Net: “JTN-30 Pickleball Net.”

.6 Finishes:

.1 “Black” coloured posts.

2.10 NATURAL ROUNDED BOULDERS (FOR SPLASH PAD AREA)

.1 Use rounded natural granite boulders of the sizes indicated.

.1 Use stone in a variety of colours and textures/patterning.

.2 Remove from site any cracked, broken or damaged stone, or any stone not sized according to drawings.

.2 Geotextiles according to Section 31 32 19

.3 Aggregate base and backfill according to Sections 31 23 33.01 and 32 11 23.

PART - 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for exterior site furnishing installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written notice to proceed from Consultant and Owner.

3.2 PREPARATION

.1 Locate and protect utility lines.

.2 Notify and acquire written acknowledgement from utility authorities before beginning installation Work

3.3 INSTALLATION

.1 Assemble furnishings in accordance with manufacturer's written recommendations.

.2 Install furnishings manufacturer's written instructions: true, plumb, and securely anchored.

.1 Use tamper-proof fasteners.

.2 Where threaded rods are used, they shall be supplied in appropriate lengths and inserted to such depths that cutting will not be required unless agreed in writing by the Owner and Consultant.

.1 If cutting is required, cut down to less than 2 threads.

.2 Rods cut by the Contractor or supplied with cut ends shall be painted with 2 coats of zinc-based primer. Minimize overspray.

.3 Bed natural log and stone materials securely and level as indicated.

.1 Prepare base according to sections 31 23 33.01 and 32 11 23.

.2 Install geotextiles if required according to Section 31 32 19

.3 Backfill and compact in maximum 150 lifts according to Section 31 23 33.01.

.4 Touch-up damaged finishes to satisfaction of Owner and Consultant.

3.4 PICKLEBALL NET ASSEMBLY INSTALLATION

.1 Provide concrete footings for posts and centre tie-downs as recommended by the manufacturer and according to Section 03 30 00.09 Cast-in-Place Concrete – Short Form

.1 Ensure footings (other than centre tie-downs) are bedded at least 1,200 mm below finished surface.

.2 If applicable, obtain anchorage placement templates from supplier in advance and cast anchorage into footings and into walls to be used as footings.

.2 Install all components and demonstrate operation for Consultant, Owner and Owner's staff representatives.

.1 If directed, remove all nets, removable hoops, sleeved posts or other accessories following demonstration, and reinstall at park opening or deliver to Owner's staff as directed.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by site furnishings installation.

END OF SECTION 32 33 00

PART - 1 GENERAL

1.1 SUMMARY

.1 Section includes supply and installation for Playground Equipment and Fitness Equipment.

1.2 RELATED REQUIREMENTS

.1 Section 03 30 00.09 Cast-in-Place Concrete – Short Form

.2 Section 31 23 33.01 Excavating, Trenching and Backfilling

.3 Section 32 11 23 Aggregate Base Courses

.4 Section 32 18 16.13A Engineered Cedar Wood Fibre Playground Safety Surface (PFR)

.5 Section 32 18 16.13B Seamless Rubber Playground Safety Surface (PFR)

1.3 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 CSA Z614, Children’s playground equipment and surfacing, latest version.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's instructions, printed product literature and data sheets for furnishings and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit shop drawings indicating dimensions, sizes, assembly, anchorage and installation details for each article of playground equipment specified.

.1 Shop drawings shall include colour renderings to verify pre-selected colour scheme, unless otherwise noted.

.4 Installation instructions:

.1 A copy of the installation instructions shall be provided to the Consultant and Owner prior to inspection of the playground equipment.

1.5 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for care and cleaning of playground equipment.

.2 Provide manufacturer's warranties.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with the General Conditions and with manufacturer's written instructions

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in off-ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect furnishings from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

PART - 2 PRODUCTS

2.1 SUBSTITUTION REQUESTS

.1 For products marked "or equal," submissions for approved equal will be reviewed after award and must be submitted within 10 business days of purchase order issuance. Submissions must include complete manufacturer documentation to allow for comparison with the specified product. In the event of rejection of submission, Contractor will be responsible to provide the specified product. The Owner will not accept any cost or delay due to rejection of submission.

2.2 PLAYGROUND EQUIPMENT SUPPLIED BY ABC RECREATION INC. OR EQUAL

.1 Refer to Supplier's Quotation and Drawings appended to these specifications.

- .1 Manufacturer: Landscape Structures (distributed by ABC Recreation).
- .2 Quote #022Q4322-03
- .3 Equipment List:
  - .1 "Playbooster Structure" (ages 1.5 – 12 years)
  - .2 "Playbooster Structure" (ages 1.5 – 5 years)
  - .3 3-Bay arch swing with 3 belt-seats, 2 full-bucket seats and 1 accessible seat (supplied by Others – see below)
  - .4 “Chill Spinner”
  - .5 “Curva Spinner”
  - .6 “Bobble Rider – Double”
  - .7 “Bobble Rider – Single”
  - .8 “Saddle Spinner”
  - .9 “Oodle Swing”
- .4 Playground equipment shall include all fasteners, accessories, sleepers and/or mounting or bracing equipment and footings required for a complete installation.
- .5 Playground equipment shall be supplied complete with manufacturer's standard touch-up and maintenance kit, if applicable.
- .6 Finishes:
  - .1 Standard finishes as described in supplier's quote.
  - .2 Colour Scheme: as per manufacturer’s drawing #220923A-R3-CJ dated November 6th, 2023. *Contractor shall confirm colour scheme with Consultant prior to ordering.

.2 Supplier's pricing to include installation services.

2.3 ACCESSIBLE SWING SEAT (SUPPLIED BY PLAYPOWER CANADA, OR EQUAL).

.1 Accessible swing seat shall be “Mirage” seat supplied by Playpower LT Canada.

- .1 Playground equipment shall include all fasteners, accessories, sleepers and/or mounting or bracing equipment and footings required for a complete installation.
- .2 Playground equipment shall be supplied complete with manufacturer's standard touch-up and maintenance kit, if applicable.
- .3 Finishes:
  - .1 Standard finishes as per manufacturer’s quote.

.2 Supplier's pricing to include installation services.

2.4 FITNESS EQUIPMENT SUPPLIED BY PLAYPOWER LT CANADA OR EQUAL

.1 Refer to Supplier's Quotation appended to these specifications.
- .1 Manufacturer: TrekFit (distributed by Playpower LT Canada).
- .2 Quote #RW112101
- .3 Fitness Equipment List:
  - .1 “Long Bench”
  - .2 “Cargo Net”
  - .3 “Pull-up Bars – Triple”
- .4 Fitness equipment shall include all fasteners, accessories, sleepers and/or mounting or bracing equipment and footings required for a complete installation.
- .5 Fitness equipment shall be supplied complete with manufacturer's standard touch-up and maintenance kit, if applicable.
- .6 Finishes:
  - .1 Standard finishes as described in supplier's quote.

.2 Supplier's pricing to include installation services.

PART - 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions:
- .1 Verify that safety zone requirements are met for all articles of playground equipment prior to commencing installation.
  - .1 Constructed borders such as concrete, asphalt, timber or the like should not be installed in advance of playground equipment installation. Installation of these borders in advance of playground equipment installation shall be at the Contractor's risk.
- .2 Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for exterior site furnishing installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Consultant.
  - .2 Inform of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written notice to proceed from Consultant and Owner.

3.2 PREPARATION

.1 Locate and protect utility lines.
- .1 Notify and acquire written acknowledgement from utility authorities before beginning installation Work.

.2 Contractor shall prepare the base and/or drainage layers for playground equipment according to applicable sections.
- .1 Coordinate with playground and fitness equipment supplier-installers to confirm requirements for base preparation.

3.3 COORDINATION

.1 Contractor relationship with designated supplier-installer shall be as though the designated supplier-installer were a sub-contractor.

.1 Contractor shall provide purchase order and make payments (including deposits) to the designated supplier-installer.

.2 Contractor shall provide site conveniences for the supplier-installer staff including parking space, washrooms and sanitary facilities.

.3 Provision of construction power and water shall be subject to site constraints (ie if no on-site electrical service exist, Contractor may reasonably require supplier-installer to provide their own generators.

.4 Supplier-installer shall be required to comply with Contractor's health and safety and reasonable general site management requirements.

.2 Contractor is responsible for coordinating schedule and sequence of works with designated supplier-installers.

.1 Storage of equipment on site is the Contractor's responsibility.

.2 Owner will not entertain costs or delays resulting from Contractor's failure to coordinate.

.3 Contractor is responsible for coordinating overall layout, including ensuring that the work of multiple supplier-installers proceeds according to project drawings.

3.4 INSTALLATION

.1 Playground and fitness equipment installation shall be performed in accordance with the manufacturer’s instructions and shall meet or exceed the requirements of CAN/CSA Standard Z614.

.2 Where applicable, the requirements of section 03 30 00.09 shall apply to any concrete work undertaken under this section.

.3 Installation of playground equipment shall be done by supplier's or their preferred installer.

.4 Supplier-installer is responsible for confirming quality and completeness of installation prior to installation of safety surfacing.

3.5 FIELD QUALITY CONTROL

.1 Playground Inspection Agency:

.1 Consultant and/or Owner shall arrange for a qualified playground inspection agency to perform inspection.

.2 Consultant and/or Owner may require playground inspection prior to safety surfacing installation as well as at completion of safety surfacing.

.2 Inspection:

.1 Detailed inspection to confirm all playground equipment conforms in every respect to the standards set forth in CSA Z614.

.3 Playground will not be accepted or be considered complete until it passes the inspection.

.1 Costs for reinspection after a failed inspection may be charged to the Contractor.

.2 Owner will not entertain costs or delays resulting from repairs or adjustments required to pass inspections.

3.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by playground or fitness equipment installation.

END OF SECTION 32 33 00.01

PART - 1 GENERAL

1.1 SUMMARY

.1 Section includes supply, installation, testing and commission of Splashpad Equipment.

.1 Item includes work of all trades and disciplines as may be required to construct a complete and operational splashpad facility as described in the drawings and specifications.

1.2 RELATED REQUIREMENTS

.1 Section 03 30 00.09 Cast-in-Place Concrete – Short Form

.2 Section 31 23 33.01 Excavating, Trenching and Backfilling

.3 Section 32 11 23 Aggregate Base Courses

.4 Coordinate with the work of electrical and civil engineering disciplines.

1.3 REFERENCE STANDARDS

.1 Provincial and municipal codes and by-laws for electrical, plumbing and civil works as indicated in related drawings and specifications.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's instructions, printed product literature and data sheets for all splash-pad features, equipment and infrastructure. Include product characteristics, performance and engineering criteria (including water-use), physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit shop drawings indicating arrangement, dimensions, sizes, assembly, anchorage and installation details for the entire splash-pad system as a whole and each component individually.

.1 Shop drawings to include pipe and wiring layouts for the splashpad system.

.2 Shop drawings shall include colour renderings to verify pre-selected colour scheme.

.4 Installation instructions:

.1 A copy of the installation instructions shall be provided to the Consultant and Owner prior to installation.

1.5 CLOSEOUT SUBMITTALS

.1 Provide Electrical Safety Authority (ESA) certificates for completed work.

.2 Provide electronic and printed copies of installation, operation and maintenance manuals for the entire splash-pad system.

.3 Touch-up supplies, operating tools, accessories (winterization caps), and/or spare parts as may be included.

.4 Provide manufacturer's warranties.

1.6 QUALITY ASSURANCE

.1 Installer Qualifications: An entity that can demonstrate at least five years experience in performing similar work to that specified here and employs installers and supervisors who

are trained and experienced with splashpad installation. Submit proof of qualifications upon request. Proof of qualifications shall not be required for tender evaluation.

.2 Use only qualified tradespersons for plumbing and electrical work.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with the General Conditions and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in off-ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect furnishings from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

PART - 2 PRODUCTS

2.1 SUBSTITUTION REQUESTS

.1 For products marked "or equal," submissions for approved equal will be reviewed after award and must be submitted within 10 business days of purchase order issuance. Submissions must include complete manufacturer documentation to allow for comparison with the specified product. In the event of rejection of submission, Contractor will be responsible to provide the specified product. The Owner will not accept any cost or delay due to rejection of submission.

2.2 GENERAL

.1 All products, materials and equipment incorporated into the splashpad shall be new, of the specified manufacture and model, complete in all respects and in perfect working order.

.2 Products, materials and equipment not listed in these specifications but required for complete installation of the splashpad system (including plumbing and electrical) shall be considered part of the work and are to be provided as part of the base bid cost.

2.3 EQUIPMENT SUPPLIED BY ABC RECREATION / VORTEX OR EQUAL

.1 Refer to Supplier's Quotation and Drawings appended to these specifications.

.1 Quote # 022Q4343-03, dated March 4, 2024.

.2 Equipment List:

.1 (1 each) Spray Loop

.2 (1 each) Whale Tail

.3 (2 each) Bollard Activator N°1

.4 (1 each) Aqua Dome N°1

.5 (1 each) Fish N°1

.6 (1 each) Sea Silhouette Turtle

.7 (2 each) Bow N°2

.8 (1 each) Boat Anchor N°1

.9 (1 each) Water Distribution System (WCC) Wall Mounted Command Center, 2.0 Flow-Through, Single 2" inlet, with Pressure Regulator, Backflow Preventer, 1 x Activation Device, 16 - 1-1/2" PVC Solenoid Valve Line with Ball-Valve, 1x MaestroPRO controller, flow through standard 24 out / 12 in 120V.

.10 (12 each) Installation Kit Double Liner, Safe Swap Ground Spray anchoring System.

.11 (2 each) Interchangeable Ground Geyser Kit for Large Format for Pipe-in-Pipe.

.12 (6 each) Interchangeable Directional / Jet Stream Kit.

.13 (2 each) Interchangeable Water Jelly Spray Kit.

.14 (2 each) Interchangeable Spidey Spray No.2 Kit.

.15 (2 each) Polara Momentary Bull Dog 3 Vandal Resistant Piezo (YELLOW).

.16 (2 each) Bulldog to Vortex Adapter, 4 Hole to 2 Hole Powder Coated.

.17 (1 each) 9'x 42" x 5'H Custom Manifold Vault.

.18 (1 each) 112" x 46" x 24" foundation w/floor (from Acton Precast)

.19 (1 each) rain sensor on metal pole with bracket.

.20 (1 each) rain diverter junction box.

.3 Splash-pad equipment shall be supplied and installed as a true "pipe-in-pipe" system.

.4 Splash-pad equipment shall include all fasteners, accessories (winterizing caps), anchorage and/or mounting or bracing equipment and footings required for a complete installation.

.5 Splash-pad equipment shall be supplied complete with manufacturer's standard touch-up and maintenance kit, if applicable.

.6 Finishes:

.1 Standard finishes as described in supplier's quote.

.2 Colour scheme shall be as per manufacturer's final renderings – drawing #39099 – Version C". *Contractor shall confirm colour scheme with Consultant prior to ordering equipment.

.2 Supplier's pricing to include installation services.

2.4 OTHER MATERIALS AND EQUIPMENT

.1 Splash pad drains (2 required) shall be standard catch basins (T-705.010) c/w with goss trap and custom frame and grate as per details.

.2 Splashpad backup (over-flow) drain (1 required): provide Zurn model Z-154 drain: 12" square top prom-deck drain with heel-proof grate with "polished nickel bronze" finish, vandal-proof secured top, sediment bucket and rotatable frame; as supplied by Zurn Industries or approved equal

.3 Provide pipe, fittings and connections as indicated on the drawings to connect splashpad drain, backup drain and to drain splashpad vault all in conformance with the requirements of the civil drawings.

.4 Additional items are to be provided where and as indicated on the Civil Engineer's drawings.

PART - 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions:

.1 Stake or paint layout of spray features, drains, piping and concrete surface for Consultant's review prior to commencing installation.

.2 Verify that clearance requirements are met for all spray features prior to commencing installation.

.3 Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for exterior site furnishing installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written notice to proceed from Consultant and Owner.

3.2 PREPARATION

.1 Locate and protect utility lines.

.1 Notify and acquire written acknowledgement from utility authorities before beginning installation Work.

.2 Contractor shall prepare the base for concrete splash-pad surface according to applicable sections.

.1 Coordinate with splash-pad equipment supplier-installers to confirm requirements for base preparation.

3.3 COORDINATION

.1 Contractor relationship with designated supplier-installer shall be as though the designated supplier-installer were a sub-contractor.

.1 Contractor shall provide purchase order and make payments (including deposits) to the designated supplier-installer.

.2 Contractor shall provide site conveniences for the supplier-installer staff including parking space, washrooms and sanitary facilities.

.3 Provision of construction power and water shall be subject to site constraints (ie if no on-site electrical service exist, Contractor may reasonably require supplier-installer to provide their own generators.

.4 Supplier-installer shall be required to comply with Contractor's health and safety and reasonable general site management requirements.

.2 Contractor is responsible for coordinating schedule and sequence of works with designated supplier-installers.

.1 Storage of equipment on site is the Contractor's responsibility.

.2 Owner will not entertain costs or delays resulting from Contractor's failure to coordinate.

.3 Contractor is responsible for coordinating overall layout, including ensuring that the work of multiple supplier-installers proceeds according to project drawings.

3.4 INSTALLATION

.1 Splashpad equipment installation shall be performed in accordance with the manufacturer’s instructions and shall meet or exceed applicable electrical and plumbing codes and by-laws.

.2 All products shall be installed level, plumb and at the location and orientation indicated.

.3 Where applicable, the requirements of section 03 30 00.09 shall apply to any concrete work undertaken under this section.

.1 All concrete joints in the splashpad and surrounding area shall be caulked.

.4 Installation of splashpad equipment shall be done by supplier or their preferred installer.

.5 Supplier-installer is responsible for confirming quality and completeness of installation prior to installation of safety surfacing.

3.5 FIELD QUALITY CONTROL

.1 Work of other sections shall be inspected according to the relevant sections.

.2 Contractor shall obtain all inspections required by provincial or municipal codes including but not limited to ESA.

.3 Contractor shall perform pressure-test on all water piping to ensure a leak-free installation.

.1 Submit records of successful pressure test prior to installation of concrete surface.

3.6 COMMISSIONING

.1 Contractor is responsible for the following minimum commissioning activities:

.1 Operation, testing and fine-tuning of splashpad system prior to demonstration to Owner's Representatives. (Notify Consultant at least 48 hours ahead of testing. Consultant's attendance is at their discretion.)

.2 Demonstrate system operation, and maintenance to Owner's Representatives.

.1 Provide any additional fine-tuning of system that may be identified during demonstration.

.3 Provide first-year system winterization when requested by Owner between October 1 and November 1.

.4 Provide first-year spring start-up when requested by Owner between May 1 and June 15.

.2 Contractor shall clean and flush splash-pad deck surface and piping prior to commissioning the system.

3.7 CLEANING

.1 Conform to Section 01 74 00.

3.8 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by splashpad equipment installation.

END OF SECTION 32 33 00.03

PART - 1 GENERAL

1.1 SUMMARY

.1 Section Includes:

- .1 Water bottle filler.
- .2 Piping (drain connections and water services).
- .3 Manual Valves.
- .4 Hosebibs.
- .5 Backflow preventers.
- .6 Valve boxes.

1.2 RELATED REQUIREMENTS

.1 Section 01 41 00 Regulatory Requirements

.2 Section 03 30 00.09 Cast-in-Place Concrete – Short Form

.3 Section 31 23 33.01 Excavating, Trenching and Backfilling

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

- .1 Provide manufacturer's instructions, printed product literature and data sheets for bottle fillers and plumbing equipment, and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

- .1 Submit shop drawings indicating dimensions, sizes, assembly, anchorage and installation details for each model specified.

1.4 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for care and cleaning of site furnishings.

.2 Provide manufacturer’s standard warranty to Owner.

1.5 REGULATORY REQUIREMENTS

.1 Perform work in compliance with applicable codes and standards.

1.6 PERMITS

.1 Permits for work completed under this section are the Contractor’s responsibility.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with the General Conditions and with manufacturer's written instructions

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

- .1 Store materials in off-ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect furnishings from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

PART - 2 PRODUCTS

2.1 SUBSTITUTION REQUESTS

.1 For products marked "or equal," submissions for approved equal will be reviewed after award and must be submitted within 10 business days of purchase order issuance. Submissions must include complete manufacturer documentation to allow for comparison with the specified product. In the event of rejection of submission, Contractor will be responsible to provide the specified product. The Owner will not accept any cost or delay due to rejection.

2.2 WATER BOTTLE FILLER

.1 Use MDF Bottle Filling Station as follows:

- .1 Manufacturer: Most Dependable Fountains Inc. (www.mostdependable.com)
- .2 Model: 10155SM-SS (Combined bottle filler and water fountain, to include “pet fountain” and stainless steel carrier).
- .3 Finishes:
  - .1 Colour: blue.

2.3 PIPE AND FITTINGS

.1 Size and type of all pipe shall be as indicated on the drawings.

- .1 Fittings to match size and type of pipe unless otherwise indicated.

.2 Drain lines shall be CSA approved Class 200, SDR 26 pipe.

- .1 Piping of diameter size 75 mm or less shall have solvent welded, belled end joints.
- .2 Piping of diameter size 100 mm and larger shall have rubber gasket joints.

.3 Water lines shall be type 'K' copper pipe.

.4 All water distribution lines shall be sleeved using PVC pipe 2.5 times or greater in diameter than the pipe being so sleeved.

2.4 MANUAL VALVES

.1 Size of valves shall match size of piping unless otherwise

.2 Curb Valves (AKA "STOP-AND-WASTE VALVES)

- .1 Description:
  - .1 Standard: AWWA C800.
  - .2 NPS 1 (DN 25) and Smaller Pressure Rating: 100 psig (690 kPa) minimum.
  - .3 NPS 1-1/4 to NPS 2 (DN 32 to DN 50) Pressure Rating: 80 psig (550 kPa) minimum.
  - .4 Body Material: Brass or bronze with ball or ground-key plug.
  - .5 End Connections: Matching piping.
  - .6 Stem: With wide-tee head.

.3 Curb-Valve Casing (Valve Box):

- .1 Standard: Similar to AWWA M44 for cast-iron valve casings.
- .2 Top Section: Telescoping, of length required for depth of burial of curb valve.
- .3 Barrel: Approximately 3-inch (75-mm) diameter.
- .4 Plug: With lettering "WATER."
- .5 Bottom Section: With base of size to fit over valve.
- .6 Base Support: Concrete collar.

.4 Shutoff Rods for Curb-Valve Casings: Furnish [one] [two] <Insert number> steel, tee-handle shutoff rod(s) with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve for Project.

.5 City of Toronto approved materials for stop and waste valves include:

.1 Valve Box for service valves on watermain (<300mm) – 105mm slide top w/guide plate and 149mm diam cover-Bibby-Ste-Croix VB1200, Mueller Canada MVB-bottom section only

.2 Services diam 32mm, 38mm, 50mm main stops w/compression joint-Cambridge Brass series 102, A.Y. McDonald 4701T, Ford F-100 and F-600, Mueller H15008

.3 Curb Stops w/compression joint-Cambridge Brass century ball valve, Ford ball valve B-44 series, Mueller H15209, A.Y. McDonald 6100 T ball valve

.4 Self-draining stop and drain-Emco series-15790, Mueller H15219

.6 Brass Ball Valves:

.1 Description:

.1 Standard: MSS SP-110.

.2 SWP Rating: 150 psig (1035 kPa).

.3 CWP Rating: 600 psig (4140 kPa).

.4 Body Design: Two piece.

.5 Body Material: Forged brass.

.6 Ends: Threaded or solder joint if indicated.

.7 Seats: PTFE or TFE.

.8 Stem: Brass.

.9 Ball: Chrome-plated brass.

.10 Port: Full or regular, but not reduced.

2.5 HOSEBIBS

.1 New hosebibs shall be heavy-duty, brass bodied fittings.

.1 Hoesbib shall be 3/4" (20 mm) size with male fitting unless otherwise indicated.

.2 Hosebibs hall be furnished complete with an operating handle.

.3 Furnish hosebib complete with vacuum-breaker fitting.

2.6 BACKFLOW PREVENTERS

.1 New backflow preventers shall be as follows:

.1 Primary valve body material: brass.

.2 Type: double-check.

.3 Connections: union joint connections on both sides.

2.7 VALVE BOXES

.1 Plastic Boxes (pedestrian traffic areas only):

.1 Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.

.1 Size, shape, materials as indicated for each plastic box type indicated on the reviewed shop drawings.

.2 Furnish all valve boxes with lockable covers.

.2 Drainage Backfill: Clear stone, 3/4 inch (19 mm) size.

PART - 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for exterior site furnishing installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written notice to proceed from Consultant and Owner.

3.2 PREPARATION

.1 Locate and protect utility lines.

.2 Notify and acquire written acknowledgement from utility authorities prior to starting.

.3 Existing water and/or drain services:

.1 Verify that existing services are disconnected or isolated.

.1 Confirm that elevations of drain connections support gravity drainage from the bottle-filler location.

.2 Carefully expose existing service, ensuring portions to be re-used are not damaged.

.1 Inform Consultant immediately of any unexpected conditions.

.3 Cleanly cut the existing pipe(s) at the indicated location(s).

.4 Remove any abandoned utility lines within the area to be excavated.

.1 Cap, or otherwise seal lines at cut-off points.

.5 Record known locations of maintained, re-routed and abandoned underground utilities on the as-built drawings.

3.3 SERVICES

.1 Extend water service to fountain location as indicated.

.1 Install all pipes, fittings, and other equipment according to applicable codes and bylaws, and as indicated.

.2 Terminate pipe with excess length to accommodate adjustment during installation.

.2 Connect drain line between fountain location and on-site sanitary maintenance hole.

.1 Make connection to maintenance hole per City of Toronto Standards.

3.4 INSTALLATION

.1 Assemble and install bottle-filling station in accordance with manufacturer's written recommendations.

.1 Install bottle filler is installed true, plumb, and securely anchored.

.2 Use tamper-proof fasteners.

.2 Touch-up damaged finishes to satisfaction of Owner and Consultant.

.3 Pressure testing of the system is required before the work will be accepted by the City.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by site furnishings installation.

END OF SECTION 32 33 10

PART - 1 GENERAL

1.1 SUMMARY

.1 This Section specifies topsoil, topsoil amendments, the stripping of topsoil, the preparation of existing grades, the placing of topsoil and finish grading.

1.2 RELATED REQUIREMENTS

.1 Section 31 22 13 Rough Grading

.2 Section 31 23 33.01 Excavating, Trenching and Backfilling

1.3 MEASUREMENT PROCEDURES

.1 Topsoil stripping will be measured in square metres.

.2 Supplying, placing and spreading of topsoil will be measured in square metres.

.1 Specified depth of topsoil shall be measured and reviewed by Consultant after settlement and consolidation as specified.

.3 Measure supply and application of soil amendments, including fertilizer, in square metres of area treated.

.4 Measure finish grading in square metres.

1.4 REFERENCE STANDARDS

.1 Agriculture and Agri-Food Canada

.1 The Canadian System of Soil Classification, Third Edition, 1998.

.2 Canadian Council of Ministers of the Environment (CCME)

.1 PN1340 (latest revision), Guidelines for Compost Quality.

.3 Canadian Society of Landscape Architects (CSLA)/Canadian Nursery Landscape Association (CNLA)

.1 Canadian Landscape Standard, Second Edition

.2 Canadian Nursery Stock Standard, Ninth Edition

1.5 DEFINITIONS

.1 Compost:

.1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil amendment.

.2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.

.3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below 25), and contain no toxic or growth inhibiting contaminates.

.4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category A.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Quality control submittals:

.1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.

.2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.7 QUALITY ASSURANCE

.1 Qualifications: Provide proof of qualifications when requested by Consultant.

.2 Contractor Qualifications:

.1 Landscape Contractor: to be a Member in Good Standing Landscape Ontario.

.2 Landscape Supervisor: Landscape Horticulturist Journeyperson or Landscape Industry Certified Technician with Softscape Installation designation or equivalent.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Divert unused soil amendments from landfill to official hazardous material collections site.

.2 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

PART - 2 PRODUCTS

2.1 TOPSOIL

.1 Topsoil for lawn areas: mixture of particulates, micro-organisms and organic matter which provides suitable medium for supporting intended plant growth.

.1 Soil texture based on The Canadian System of Soil Classification, to consist of:

.1 0% particles over 40 mm size

.2 1% maximum coarse gravel (particles over 19 mm size)

.3 2% maximum all gravel (any particles over 2mm size)

.4 50-60% sand (0.05 to 2 mm particle sizes)

.5 10-25% silt (0.002 to 0.05 mm particle sizes)

.6 0-20%clay (particle sizes below 0.002 mm)

.7 35% maximum combined silt and clay fraction

.8 3-10% organic matter by weight.

.2 Acidity / pH shall be between 6.0 and 8.0.

.3 Contain no toxic elements or growth inhibiting materials.

.4 Finished surface free from:

.1 Debris and stones over 50 mm diameter.

.2 Coarse vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

.5 Consistency: friable when moist, with well-formed peds throughout.

2.2 SOIL AMENDMENTS

.1 Fertilizer shall be applied as recommended by agronomic soil-testing agency.

.2 Peatmoss where indicated shall be:

.1 Derived from partially decomposed species of horticultural grade Sphagnum Mosses.

.2 Texture ranging from porous to spongy fibrous, fairly elastic, and substantially homogeneous.

.3 Free of wood and deleterious material which could prohibit growth.

.4 Shredded particle minimum size: 5 mm.

.5 pH range of 3.5 to 6.5.

.3 Sand where indicated shall be: washed coarse silica sand, medium to coarse textured.

.4 Organic matter: compost Category A in accordance with CCME PN1340, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.

.5 Limestone where indicated shall be:

.1 Ground agricultural limestone.

.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.6 Use industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.3 SOURCE QUALITY CONTROL

.1 Advise Consultant of source of topsoil to be utilized with sufficient lead time for testing if required.

.1 Provide standard test results from source, current to within 1 year of installation.

.2 Consultant and Owner may, at their own discretion request or conduct verification testing of soil materials at the source or from stockpiles delivered to site.

.2 Contractor is responsible to amend or replace soil delivered to site if it is found not to meet the characteristics indicated in submissions.

.3 Contractor is responsible for amendments to imported soil(s) as recommended by agronomic testing.

.1 Where testing is not completed by authority of Consultant or Owner, Contractor shall be responsible for providing suitable "all-purpose" fertilizer subject to Consultant and Owner's review.

PART - 3 EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until removal.

.3 Remove erosion and sedimentation controls only when directed to do so by Owner or Consultant.

.1 Restore and stabilize areas disturbed during removal.

3.2 STRIPPING OF TOPSOIL

.1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected as determined Consultant.

.2 Begin topsoil stripping after area has been cleared rocks over 50 mm, all vegetation including invasive and noxious plants and their reproductive parts and after all of the above have been removed from the site.

.1 Rototill vegetation to retain as component of topsoil only if instructed on drawings or in writing by Consultant.

.3 Strip topsoil to full depth, or to depths as may be indicated.

.1 Do not mix topsoil with subsoil.

.2 Where depth of topsoil encountered varies from that indicated in the soil report, Contractor shall immediately inform Consultant and Owner.

.4 Stockpile in locations agreed with Owner and Consultant.

.1 Stockpile height not to exceed 2 m

.2 Stockpile to be protected from erosion, adverse weather conditions, contamination from invasive plant material, and compaction.

.3 Avoid placing stockpile in low areas where natural drainage or storm water could pond or erode these materials during inclement weather.

.5 Dispose of unused topsoil legally off-site.

3.3 PREPARATION OF EXISTING GRADE

.1 Verify that rough grading has been performed correctly and within specified tolerances.

.1 If discrepancies occur, notify Consultant.

.2 Grade soil, eliminate uneven areas and low spots, ensure positive drainage.

.3 Remove debris, roots, branches, stones larger than of 50 mm diameter and other deleterious materials.

.1 Remove soil contaminated with calcium chloride, toxic material and petroleum products.

.2 Remove debris which protrudes more than 75 mm above surface.

.3 Dispose of removed material off site.

.4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.

.1 Cross-cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.4 PLACING AND SPREADING OF TOPSOIL

.1 Place topsoil after Consultant has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 150 mm.

.3 Keep topsoil 15 mm below finished grade for sodded areas.

.4 Spread topsoil to the depths indicated.

.5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

.6 Avoid spreading or grading in wet, frozen, or saturated state.

3.5 SOIL AMENDMENTS

.1 Apply and thoroughly mix soil amendments into topsoil at the rates indicated and to the depths indicated.

3.6 FINISH GRADING

.1 Grade to eliminate rough spots and low areas and ensure positive drainage.

.1 Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Consolidate topsoil to required bulk density using heavy rolling equipment.

.1 Leave surfaces smooth, uniform and firm against deep foot-printing.

3.7 TOLERANCES

.1 Fine grade surface to be parallel with finished surface. Slopes shall not deviate from finished slopes.

.2 Surface to be generally smooth with localized deviations not to exceed 20 mm from required elevations.

.3 Any areas found to be graded incorrectly or outside of tolerances shall be regraded promptly to Owner and Consultant's satisfaction.

3.8 ACCEPTANCE

.1 Owner and Consultant will inspect topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.9 SURPLUS MATERIAL

.1 Dispose of surplus materials legally off-site.

END OF SECTION 32 91 19.13

PART - 1 GENERAL

1.1 SUMMARY

.1 This Section includes sod, sod placement, preparation and maintenance.

1.2 RELATED REQUIREMENTS

.1 Section 31 91 19.13 Topsoil Placement and Grading

1.3 REFERENCE STANDARDS

.1 Canadian Society of Landscape Architects (CSLA) / Canadian Nursery Landscape Association (CNLA)

.1 Canadian Landscape Standard [2020], Second Edition

.2 Canadian Nursery Stock Standard [2017], Ninth Edition

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling:

.1 Schedule sod laying to coincide with preparation of soil surface.

.2 Schedule sod installation when frost is not present in ground.

.3 All sod shall be installed on the same day it is delivered to site.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for sod, and fertilizer (if required) and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements of seed mix, seed purity, and sod quality.

.4 Test Reports: if requested submit certified test reports showing compliance with specified performance characteristics and physical properties of seed mix, seed purity, and sod quality.

1.6 QUALITY ASSURANCE

.1 Qualifications: Provide proof of qualifications when requested by Owner or Consultant.

.2 Contractor Qualifications:

.1 Landscape Contractor: to be a Member in Good Standing of Landscape Ontario.

.2 Landscape Sodding Supervisor: Landscape Horticulturist Journeyperson or Landscape Industry Certified Technician with Softscape Installation designation or equivalent.

.3 Landscape Maintenance Supervisor: Landscape Horticulturist Journeyperson or Landscape Industry Certified Technician with Turf Maintenance designation or equivalent.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with grower's or manufacturer's name and address.

.2 Storage and Handling Requirements:

.1 Store materials in accordance with supplier's recommendations.

.2 Replace defective or damaged materials with new.

.3 For palletized sod products:

.1 Sod shall not be dumped or dropped from vehicle.

.2 Provide wind protection measures to protect sod during transportation against wind exposure and to prevent drying.

.3 Ensure sod freshness and healthy conditions when they arrive on site.

.4 Provide weather protection measures as required to keep sod fresh and moist.

.5 During the growing season, and where feasible, sod should be delivered to the site within 36 hours of harvest and be installed within 24 hours of delivery.

.6 Allow sod to dry sufficiently after becoming water-logged to prevent tearing or damage during handling.

PART - 2 PRODUCTS

2.1 MATERIALS

.1 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop.

.1 Number One Kentucky Bluegrass Sod - Fescue Sod: Nursery Sod grown solely from seed mixture of cultivars of Kentucky Bluegrass and Chewing Fescue or Creeping Red Fescue, containing not less than 40% Kentucky Bluegrass cultivars and 30% Chewing Fescue or Creeping Red Fescue cultivars.

.2 Turf Grass Nursery Sod quality:

.1 Not more than 1 broadleaf weed and up to 1% native grasses per 40 m2.

.2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.

.3 Mowing height limit: 35 to 65 mm.

.4 Soil portion of sod: 6 to 15 mm in thickness.

.2 Sod establishment support:

.1 Geotextile fabric: biodegradable.

.2 Wooden pegs: 17 x 8 x 200 mm.

.3 Biodegradable starch pegs: 17 x 8 x 200 mm.

.3 Water:

.1 Water from a municipal, potable source, free of impurities that would inhibit plant growth.

.1 Contractor to notify Owner and Consultant of source.

.4 Fertilizer:

.1 To Canada "Fertilizers Act" and Fertilizers Regulations.

.2 Complete, synthetic, slow release with 65% of nitrogen content in water-insoluble form.

.1 Install fertilizer according to manufacturer's directions.

2.2 SOURCE QUALITY CONTROL

.1 All sod shall be from a single source in accordance with reviewed submittals.

PART - 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed are acceptable for sod installation in accordance with manufacturer's written instructions and that grades are correct and prepared in accordance with Section 32 91 19.13 - Topsoil Placement and Grading.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written notice to proceed from Consultant and Owner.

3.2 PREPARATION

.1 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.

.2 Fine grade surface free of humps and hollows to smooth, even grade, to tolerance of plus or minus 10 mm, surface to drain naturally.

.3 Remove and dispose off-site of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials.

3.3 SOD PLACEMENT

.1 Lay sod during active growing season for type of sod. Laying sod during dry, freezing, or over frozen soil is unacceptable.

.2 If growing medium surface is dry, it shall be lightly moistened immediately before laying sod.

.3 Lay sod flush with adjoining grass areas, paving and top surface of curbs, unless shown otherwise on the drawings.

.4 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.

.5 Lay sod sections in rows, joints staggered a minimum of 25 cm. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.

3.4 SOD PLACEMENT ON SLOPES AND PEGGING

.1 Start laying sod at bottom of slopes.

.2 Peg sod on slopes steeper than three (3) horizontal to one (1) vertical, within one (1) m of catch basins and within one (1) m of drainage channels and ditches to following pattern:

.1 100 mm below top edge at 200 mm on centre for first sod sections along contours of slopes.

.2 Not less than 6 pegs per square metre.

.3 Not less than 9 pegs per square metre in drainage structures. Adjust pattern as directed by [Departmental Representative] [DCC Representative] [Consultant].

.4 Drive pegs to 20 mm above soil surface of sod sections.

3.5 FERTILIZING PROGRAM

.1 Fertilize at time of installation and at intervals during establishment period if longer than 30 days.

3.6 Waste Management:

.1 Divert unused fertilizer from landfill to official hazardous material collections site.

3.7 PROTECTION BARRIERS

.1 Protect newly sodded areas from deterioration with snow fence on rigid frame as directed by Consultant.

.2 Remove protection only when directed by Owner or Consultant.

.3 Maintain protective measures in good conditions until acceptance of sod.

3.8 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following operations from time of installation until acceptance.

.1 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 100 mm.

.2 Cut grass to 75 mm when or before it reaching height of 125 mm.

.3 Grass cutting shall include adjacent lawn areas if enclosed within work area.

.4 Maintain sodded areas weed free 95%.

.5 Fertilize areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water it well.

.2 Temporary barriers or signage to be maintained where required to protect newly established sod.

3.9 ACCEPTANCE

.1 Sod areas will be accepted by provided that:

.1 Sodded areas are properly established as determined by Owner and Consultant.

.2 Sod is free of bare and dead spots.

.3 No surface soil is visible from height of 1500 mm when grass has been cut to height of 75 mm.

.4 Sodded areas have been cut minimum 2 times before acceptance.

.2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

.3 When environmental conditions allow, all sodded areas showing shrinkage cracks shall be top-dressed and seeded with a seed mix matching the original.

END OF SECTION 32 92 23

PART - 1 GENERAL

1.1 SUMMARY

.1 This Section specifies plant material supply, installation and maintenance, including various accessories and related work.

.2 For the purposes of this Section, "Ground Covers" shall include all non-woody plants (i.e. perennials, annuals, grasses).

1.2 RELATED REQUIREMENTS

.1 Section 31 22 13 - Rough Grading

.2 Section 31 23 33.01 - Excavation Trenching and Backfilling

.3 Section 32 91 19.13 - Topsoil Placement and Grading

1.3 REFERENCE STANDARDS

.1 Agriculture and Agri-Food Canada (AAFC).

.1 Plant Hardiness Zones in Canada.

.2 Canadian Society of Landscape Architects (CSLA)/ Canadian Nursery Landscape Association (CNLA)

.1 Canadian Landscape Standard (2020), Second Edition

.2 Canadian Nursery Stock Standard (2017), Ninth Edition

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Safety Data Sheets (SDS).

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling: provide schedule for planting operations to Consultant and Owner at least 7 days in advance of shipment of plant material.

.2 Schedule to include:

.1 Quantity and type of plant material.

.2 Shipping dates.

.3 Arrival dates on site.

.4 Planting dates.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for trees, shrubs, ground cover, fertilizer, mycorrhiza, anti-desiccant, anchoring equipment, mulch and/or any other materials or items to be provided under this Section. Include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit WHMIS SDS if requested.

1.6 QUALITY ASSURANCE

.1 Qualifications: Provide proof of qualifications when requested by Owner or Consultant.

.2 Contractor Qualifications:

.1 Landscape Contractor: to be a Member in Good Standing of Landscape Ontario.

.2 Landscape Planting Supervisor: Landscape Horticulturist Journeyperson or Landscape Industry Certified Technician with Softscape Installation designation or equivalent.

.3 Landscape Maintenance Supervisor: Landscape Horticulturist Journeyperson or Landscape Industry Certified Technician with Ornamental Maintenance designation or equivalent.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.1 Protect plant material from frost, excessive heat, wind and sun during delivery.

.2 Protect plant material from damage during transportation:

.1 Wrap or tie branches of trees securely and protect plant material against abrasion, exposure and extreme temperatures during transit. Avoid binding of planting stock with rope or wire that would damage bark, break branches or destroy the natural shape of plant. Give full support to root ball of large trees during lifting. No plant will be accepted when the ball of earth surrounding its roots has been severely cracked or broken prior to or during planting.

.2 Delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.

.3 Delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.

.4 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.

.3 All materials shall be inspected by the Contractor for damage in transit. No defective material shall be delivered to the site.

.2 Storage and Handling Requirements:

.1 Immediately store and protect plant material which will not be installed within one hour.

.2 Protect stored plant material from frost, wind and sun to ensure planting success as follows:

.1 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

.3 Any material damaged after delivery shall be removed from the site immediately and replaced.

PART - 2 PRODUCTS

2.1 PLANT MATERIAL

.1 Type of root preparation, sizing, grading and quality: comply to Canadian Nursery Stock Standard.

.1 Source of plant material: grown in comparable zone to planting site, in accordance with Plant Hardiness Zones in Canada.

.2 All stock shall have been dug while dormant.

.3 Plant material shall be planted in zone specified as appropriate for its species.

.4 Plant material in location appropriate for its species.

.2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system and densely foliated.

.3 Trees: with straight trunks, well and characteristically branched for species. Trees of each species are to be of a consistent form.

.4 Container-grown stock:

.1 Trees must have been grown in a container for a minimum of one growing season but not longer than two seasons.

.2 Root system must be able to "hold" soil when removed from container.

.3 Plants that have become root-bound are not acceptable.

.4 Container stock shall have been fertilized with slow release fertilizer.

2.2 WATER

.1 Water from a municipal, potable source, free of impurities that would inhibit plant growth.

.1 Contractor to notify Owner and Consultant of source.

2.3 STAKES

.1 T-bar, steel, 40 x 40 x 5 x 2440 mm (Master Halco Heavy-Duty, brown colour, or equal.)

.2 Wood, pointed one end, 38 x 38 x 2300 mm.

2.4 WIRE TIGHTENER

.1 turnbuckle, galvanized steel, 9.5 mm diameter with 270 mm open length.

2.5 GUYING WIRE

.1 3 mm diameter multi-wire steel cable, plastic coated.

2.6 CLAMPS

.1 U-bolt: galvanized, 13 mm diameter, c/w curved retaining bar and hex nuts.

.2 Crimp type.

2.7 ANCHORS

.1 Wood: 38 x 38 x 460 mm.

.2 Drive-in type: 18 mm diameter x 120 mm long, aluminum.

2.8 GUYING COLLAR

.1 Tube: plastic, 25 mm diameter, nylon reinforced.

.1 Ensure that plastic tube to remain soft and pliable under all weather conditions.

2.9 TRUNK PROTECTION

.1 Plastic: perforated spiralled strip.

2.10 MULCH

.1 Shredded wood: varying in size from 25 to 125 mm in length, from coniferous trees.

2.11 FERTILIZER

.1 Synthetic commercial type as recommended by soil test report or as indicated.

2.12 FLAGGING TAPE

.1 Fluorescent pink or orange colour.

2.13 WATERING BAG

.1 TREEGATOR ORIGINAL 15-gallon watering bag or equal.

2.14 SOURCE QUALITY CONTROL

.1 Consultant shall review plant material before planting.

.1 Make arrangements for approval of plant material at source by the Consultant at a time mutually agreed upon.

.2 Prior approval shall not invalidate rejection of stock at later inspection at site should it prove defective, damaged or substandard.

.3 All plants shall conform to the varieties specified in the plant list and be legibly tagged with their proper name and size.

.4 No substitutions will be accepted without prior written acceptance by the Consultant.

PART - 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for planting installation.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written notice to proceed from Consultant and Owner.

3.2 EXCAVATION AND PREPARATION OF PLANTING AREAS

.1 Establishment of sub-grade for planting beds in accordance with Section 31 22 13.

.2 Preparation of planting beds in accordance with Section 32 91 19.13 - Topsoil Placement and Grading.

.1 Provide drainage for planting pits in heavy soil if natural drainage does not exist. Have method approved by Consultant.

.3 For individual planting holes:

.1 Stake out location for Consultant's review prior to excavating.

.2 Excavate to depth and width as indicated on drawings.

.3 Execute excavation work in accordance with Section 31 23 33.01

.4 Remove subsoil, rocks, roots, debris and toxic material from excavated material that will be used as planting soil for trees and individual shrubs. Dispose of excess material.

.5 Scarify sides of planting hole.

.6 Remove water which enters excavations before planting. Notify Consultant if water source is ground water.

3.3 JOB CONDITIONS:

.1 Installation of Work of this Section shall be done under weather conditions and in suitable growth season for each specified material, and as approved by Consultant.

.2 Do not install plant materials when ambient temperatures may drop below 2-degrees Celsius or rise above 32-degrees Celsius.

.3 Plants noted on the Plant List for spring planting only must be moved while dormant and must be planted between April 1 and May 15 only.

.4 When planting in late fall or early spring, prevent freezing of bottom of plant pits.

3.4 PLANTING

.1 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball.

.1 Do not pull burlap or rope from under root ball.

.2 Plant vertically in locations as indicated on drawings or directed Consultant.

.1 Orient plant material to give best appearance in relation to areas of public access / views.

.3 For trees and shrubs:

.1 Backfill soil in 150 mm lifts.

.1 Tamp each lift to eliminate air pockets.

.2 When two thirds of depth of planting pit has been backfilled, fill remaining space with water.

.3 After water has penetrated into soil, backfill to finish grade.

.2 Form watering saucer as indicated on drawings.

.4 Perform backfilling work in accordance with Section 31 23 33.01

.5 Water plant material thoroughly.

.6 After soil settlement has occurred, fill with soil to finish grade.

.7 Install watering bag(s) in accordance with manufacturer's recommendations.

3.5 TRUNK PROTECTION

.1 Install trunk protection on deciduous trees only as indicated on drawings or directed by Consultant.

.2 Install trunk protection before installation of tree supports.

3.6 TREE SUPPORTS

.1 Install tree supports only as indicated on drawings or directed by Consultant.

.2 Use single stake tree support for deciduous trees less than 3 m in height and evergreens less than 2 m in height.

.1 Place stake on prevailing wind side and 1500 mm minimum from trunk.

.2 Drive stake 600 mm minimum into undisturbed soil beneath roots.

.1 Ensure stake is secure, vertical and unsplit.

.3 Install 150 mm long guying collar 1500 mm above grade.

.4 Thread Type 1 guying wire through guying collar tube.

.1 Twist wire to form collar and secure firmly to stake. Cut off excess wire.

.3 Use three 3 guy wires and anchors for deciduous trees greater than 3 m in height or 12 cm caliper and evergreens greater than 2 m in height.

.1 Install guying collars above branch to prevent slipping at approximately 2/3 height for evergreens and 1/2 height for deciduous trees. Collar mounting height not to exceed 2.5 m above grade.

.2 Guying collars to be of sufficient length to encircle tree plus 50 mm space for trunk clearance. Thread guy wire through collar encircling tree trunk and secure to lead wire by clamp or multi-wraps; cut wire ends close to wrap. Spread lead wires equally proportioned about trunk at 120 degrees.

.3 Install anchors at equal intervals about tree and away from trunk so guy wire will form 45 degree angle with ground. Install anchor at angle to achieve maximum resistance for guy wire.

.4 Attach guy wire to anchors. Tension wire and secure by multi-wraps or installing clamps.

.5 Install wire tightener ensuring that guys are secure and leave room for slight movement of tree but do not allow for root system to shift into growing medium.

.6 Saw tops off wooden anchors which extend in excess of 100 mm above grade or as directed by Consultant.

.1 Paint tops of stakes with fluorescent orange or pink paint.

.7 Install flagging tape to guys as indicated on drawings or directed by Consultant.

.4 After tree supports have been installed, remove broken branches with clean, sharp tools.

3.7 MULCHING

.1 Ensure soil settlement has been corrected before mulching.

.2 Spread mulch as indicated on drawings.

3.8 ACCEPTANCE

.1 Plant material will be accepted by Owner no sooner than 90 days following planting, provided that plant material exhibits healthy growing condition and is free from disease, insects and fungal organisms.

.1 For plant material installed between September 15 and November 15, the 90-day period shall commence on the date of planting. Days between November 15 and April 15 shall not be counted towards the 90 days.

.2 For plant material installed after October 15 the 90-day period shall run from April 15 to July 15.

3.9 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following maintenance operations from time of planting to acceptance by Owner.

.1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.

.1 Monitor and maintain self watering product during establishment period.

.2 Water evergreen plant material thoroughly in late fall before freeze-up to saturate soil around root system.

.2 Remove weeds monthly or more frequently through mechanical methods only.

.3 Replace or re-spread damaged, missing or disturbed mulch.

.4 Cultivate non-mulched areas, as required to keep top layer of soil friable.

.5 Use appropriate control methods if required, to control insects, fungus and disease, in accordance with federal, provincial and municipal regulations. Obtain product approval from Consultant before application.

.6 Remove dead or broken branches from plant material.

.7 Keep trunk protection and guy wires in proper repair and adjustment.

.8 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

3.10 MAINTENANCE DURING WARRANTY PERIOD

.1 From time of acceptance to end of warranty period, perform following maintenance operations.

.1 Inspect plant material monthly or more frequently for the length of the warranty period.
  .1 A site inspection report is to be provided to the Consultant outlining any issues that exist impacting the health/quality/warranty of the plant material.
.2 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.
  .1 Self watering product to be monitored and maintained during warranty period.
  .2 Reform damaged watering saucers.
.3 Remove weeds monthly or more frequently through mechanical methods only.
.4 Replace or re-spread damaged, missing or disturbed mulch.
.5 Cultivate non-mulched areas, cultivate monthly to keep top layer of soil friable.
.6 Use appropriate control methods if required, to control insects, fungus and disease, in accordance with federal, provincial and municipal regulations. Obtain product approval from Consultant before application.
.7 Apply fertilizer in early spring as indicated by soil test.
.8 Remove dead, broken or hazardous branches from plant material.
.9 Keep trunk protection and tree supports in proper repair and adjustment.
.10 Remove trunk protection, tree supports and level watering saucers at end of warranty period.
.11 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

3.11 ADJUSTMENT AND REPLACEMENT

.1 Adjustment and replacement work shall be performed as specified in this Section with materials of same size, variety and quality of material to be replaced.
.2 Replacement work shall be done under an additional guarantee of the same length and conditions as described in this Specification. It shall date from time of Consultant's approval of replacement work.
.3 Replace plant stock that in the opinion of the Consultant is dead, or not in satisfactory growing state, or does not meet specification requirements.
  .1 Remove dead stock immediately.
  .2 Replace stock at proper time during planting season.
.4 At the discretion of the Consultant unacceptable plant material may be left, its guarantee period extended, and again inspected next planting season. At this time, Consultant may decide if replacement will be made and the guarantee extended accordingly.
.5 If settlement occurs after acceptance, the Contractor may be responsible for re-grading and re-planting.

3.12 PROTECTION

.1 Protect installed plants from damage during construction.

END OF SECTION 32 93 10

PART - 1 GENERAL

1.1 SUMMARY

.1 This Section specifies requirements for constructing sub-drains with granular filter and/or geotextile filter material.

1.2 RELATED REQUIREMENTS

.1 Section 31 23 33.01 Excavating, Trenching and Backfilling

.2 Section 31 32 19 Geosynthetics.

1.3 REFERENCE STANDARDS

.1 Reference to the listed standards shall be considered to include related standards and documents or standards referenced within the listed documents.

.2 Ontario Provincial Standard Specifications (OPSS):

.1 OPSS MUNI 405 Pipe Subdrains

.2 OPSS MUNI 1840 Non-Pressure Polyethylene Plastic Pipe Products

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for pipes, pipe fittings, tiles, and aggregate and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Certificates:

.1 If requested by Consultant, submit manufacturer's certification that drain pipe materials meet requirements of this Section.

.2 Certification to be marked on pipe.

.4 Test and Evaluation Reports:

.1 If requested by Consultant, submit manufacturer's test data that drain pipe materials meet requirements of this Section.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's recommendations.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations.

.2 Store and protect pipes and tiles from damage.

.3 Replace defective or damaged materials with new.

PART - 2 PRODUCTS

2.1 MATERIALS

.1 All pipe and fittings: to OPSS 1840, size(s) as indicated.

.2 Bedding gravel in accordance with Section 31 23 33.01– Excavating, Trenching and Backfilling and as indicated on the drawings.

.3 Granular filter material in accordance with Section 31 23 33.01– Excavating, Trenching and Backfilling and as indicated on the drawings.

.4 Aggregate for French drain: in accordance with Section 31 23 33.01– Excavating, Trenching and Backfilling and as indicated on the drawings.

.5 Geotextile filter: In accordance with Section 31 32 19 Geosynthetics.

PART - 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate as exist or as previously installed under other Sections or Contracts are acceptable for rough grading installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written notice to proceed from Consultant and Owner

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until removal.

.3 Remove erosion and sedimentation controls only when directed to do so by Owner or Consultant.

.1 Restore and stabilize areas disturbed during removal.

3.3 TRENCHING

.1 Perform trenching and backfilling in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

.2 Place bedding or filter material after review of trench by Consultant.

3.4 BEDDING

.1 Place layer of bedding material as indicated and compact to minimum 95% of maximum density to ASTM D698.

3.5 INSTALLATION OF PIPE SUB-DRAINS

.1 Lay pipe drains on prepared bed, true to line and grade with inverts smooth and free of sags or high points.

.1 Ensure barrel of each pipe is in contact with bed throughout full length.

.2 Begin laying at outlet and proceed in upstream direction.

.3 Lay perforated pipes with perforations as indicated. If not indicated, place perforations downward.

.4 Lay bell and spigot pipe with bell ends facing upstream.

.1 Do not mortar joints.

.5 Cover joints of bell and spigot pipe with two-ply tar paper strips not less than 150 mm wide.

.1 Use strips of sufficient length to permit ends to be laid flat on bedding and turned outward on either side of pipe for a minimum distance of 75 mm.

.6 Make joints tight in accordance with manufacturer's instructions.

.7 Make watertight connections to existing drains, new or existing manholes and catch basins where indicated or as directed by Consultant.

.8 Plug open upstream ends of pipes with watertight concrete, steel or wood bulkheads.

.9 Surround pipe with bedding gravel and compact as indicated.

.10 Surround and cover drain with filter material in uniform 150 mm layers to elevation as indicated and compact to at least 95% maximum density to ASTM D698.

.11 Wrap or sleeve perforated pipe with geotextile filter as indicated.

.12 Backfill remainder of trench to Section 31 23 33.01 - Excavating, Trenching and.

.13 Do not place bedding, bedding surround and backfill materials in frozen condition.

.14 Protect sub-drains against flotation during installation.

.15 Install "Y" connections to surface as indicated, for flushing.

3.6 TOLERANCES

.1 Trenches shall be sloped smoothly, parallel to specified pipe slope. Slopes shall not deviate from indicated grades.

.2 Bottom of trench to be generally smooth with localized deviations not to exceed 50 mm from required elevations.

.3 Bedding layer to be generally smooth with localized deviations not to exceed 20 mm from required elevations.

.4 Any areas found to be graded incorrectly or outside of tolerances shall be regraded promptly to Owner and Consultant's satisfaction.

END OF SECTION 33 41 16

1 General

1.1 **DESCRIPTION**

.1 The Work of this Section includes the provision of all labour, materials, equipment, and services required to install the perimeter foundation and underslab drainage system, as indicated on the drawings, specified herein, and required for a complete project.

.2 The work includes, but is not necessarily limited to, the following:

.1 Installation of a perimeter weeping tile system, integrated with a drainage composite, and connected to the stormwater management system.

.2 Installation of an underslab drainage system connected to the perimeter weeping tile system.

.3 Application of drainage composite over the waterproofed surface of the foundation walls, extending from the footing to 50 mm below the finished grade elevation.

.3 The drainage composite installation shall extend from the footing to 50 mm below the finished grade elevation to ensure proper drainage and protection.

1.2 **REFERENCES**

.1 ASTM C117-13, Standard Test Method for Materials Finer than 75 µm (No. 200 Seive) in Mineral Aggregates by Washing.

.2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D1248-12, Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.

1.3 **ADMINISTRATIVE REQUIREMENTS**

.1 Pre-Installation Meeting:

.1 Conduct a pre-installation meeting in accordance with Section 01 31 19.

.2 Ensure an independent inspection and testing company attends the pre-installation meeting.

.3 Pre-Installation Meeting: Two weeks prior to commencing work of this section, arrange for the manufacturer's qualified installer to visit the site and review preparatory and installation procedures to be followed, conditions under which the work will be done, and inspect the surfaces to receive the work of this section. Consultant is responsible for scheduling the date and time of the meeting.

1.4 **SUBMITTALS**

.1 Submit all required submittals in accordance with Section 01 33 00.

.2 Product Data Sheets: Provide the manufacturer's product data sheets for all products proposed for use in the work of this section. Ensure these include specifications, performance criteria, and installation guidelines.

1.5 **QUALITY ASSURANCE**

.1 Installer Qualification: Trained and approved by the manufacturer, and having the necessary experience, staff, and training to install manufacturer's products. Manufacturer's willingness to sell its products to installers does not in itself confer qualification on installer. Provide letter of certification from manufacturer stating that installer is a certified applicator of its products, and is familiar with proper procedures and installation requirements recommended by the manufacturer. Installer shall have proven experience with exterior facade systems for a minimum of ten (10) years and to have completed at least ten (10) major wall facade projects.

.2 Manufacturer's Site Inspection: The manufacturer's qualified installer will inspect the site weekly, providing inspection reports and photographs, to verify that the work of this section is correctly installed.

.3 Source Limitations: Obtain each type of product from a single manufacturer.

.4 Panel Lines and Angles: sharp and true.

.5 The Zero Carbon Building – Design Standard v4 Requirements:

.1 The Zero Carbon Building – Design Standard v4 requirements shall apply to all relevant sections and work for this project, whether specifically indicated or not.

.2 Compliance with the requirements needed to achieve The Zero Carbon Building – Design Standard v4 - Design certification will be used as one criterion to evaluate requests for substitutions or alternates.

.6 Mock-up:

.1 Before proceeding with the final purchase of materials and fabrication of porcelain ceramic-faced wall panel system components, prepare a mock-up of the work. Ensure the mock-up incorporates materials and methods of fabrication and installation identical to the project requirements.

.2 Install the mock-up at a location directed by the Consultant. Retain the accepted mock-up as the quality standard for the acceptance of the completed cladding.

.3 Provide a mock-up of sufficient size and scope to demonstrate the typical pattern of seams, fastening details, edge construction, finish texture, and colour.

.4 Provide 4-panel mock-up, including samples of all 4 panel depths, demonstrating:

.1 Parapet return conditions.

.2 Edge return.

.3 Panel return.

.4 Curtain Wall jamb return.

.5 Soffit return.

.5 Notify 72 hours before installation of mock-up for inspection by Consultant. Do not proceed with panel system work until mock-up has been approved.

2 Products

2.1 **MATERIALS**

.1 Drainage Aggregate: Clear 19 mm (3/4") stone conforming to OPSS 1004.

.2 Geotextile Filter Cloth: Non-woven geotextile made from polypropylene or polyester fibers, or a combination of both.

.1 Weight: Minimum 136 g/m² (4.0 oz/yd²), ASTM D5261.

.2 Grab tensile strength: Minimum 445 N (120 Pound Force), ASTM D4632/D4632M-15a.

.3 Water flow rate: Minimum 2460 l/min/m² (60 gpm/ft²), ASTM D4491/D4491M-15.

.4 Puncture resistance: Minimum 180 N (41 Pound Force), ASTM D4833/D4833M-08(2013)e1.

.5 Apparent Opening Size (AOS): Minimum 0.212 mm (0.008”), ASTM D4751-12.

.6 UV stability: 70% at 500 hours, ASTM D4355-07.

.7 Acceptable Products:

.1 Fiberweb, Inc. ‘Typar Geotextiles Typar 3401’.

.2 Tencate ‘Mirafi 150N’.

.3 Terrafix Geosynthetics Inc. ‘Terrafix 270R’.

.3 Drainage Weepers and Fittings (Weepers):

.1 100 mm minimum diameter, flexible high-density polyethylene (HDPE), BNQ 3624-115-2007.

.2 Fully perforated with a one-piece geotextile filter sock; non-perforated at pass-through transfer ports and connections to sump pits.

.3 Includes manufacturer’s standard connector fittings, caps, and insert couplings.

.4 Acceptable Product:

.1 ‘Big O Drain Tubing’ by Armtec or approved equivalent

.4 Vertical Drainage Sheet:

.1 Dimpled, high-impact resistant plastic core with attached filter fabric.

.2 Fabric width: 100 mm (4") wider than filter channel material.

.3 Roll width: 1220 mm (48") minimum, with a 100 mm (4") end flap at the top.

.4 Core Material: Virgin polypropylene or polystyrene.

.5 Acceptable Products:

.1 W.R. Meadows 'Sealtight Mel-Drain 5035'.

.2 Hydrotech ‘Hydrodrain 400’.

.3 Carlisle Coatings & Waterproofing ‘CCW MiraDRAIN 6000’.

.4 TerraFix Geosynthetics Inc. ‘Terradrain 600’.

.5 Grace 'Hydroduct 200'.

.6 Cosella-Dorken Products Inc. 'Delta-Drain 6000 HI-X'.

.7 'TREMDrain 1000' by Tremco Incorporated.

.5 Horizontal Drainage Sheet:

.1 Prefabricated deck drainage system with a 25 mm (1") flange running the full length of one longitudinal edge for overlapping and interlocking of dimples.

.2 Woven geotextile securely bonded to each dimple of the molded polymeric or fused filament polyester core.

.3 Geotextile extends beyond the edges of the core for overlap with adjacent panels.

.4 Acceptable Products:

.1 Carlisle Coatings & Waterproofing ‘MiraDRAIN 9000’.

.2 Terrafix Geosynthetics Inc. ‘Terrafix 900’.

.3 W.R. Grace ‘Hydroduct-660’.

.4 W.R. Meadows ‘Sealtight Mel-Drain 7055’.

.5 CETCO ‘Aquadrain 20H’.

.6 Cosella-Dorken Products Inc. ‘Delta-Drain 9000’.

.7 Tremco Incorporated ‘TREMDrain GR’.

3 Execution

3.1 **EXAMINATION**

.1 Ensure that the graded subgrade conforms to the required drainage pattern before placing the filter bed material.

.2 Report any improper slopes, unstable areas, areas requiring additional compaction, or other unsatisfactory conditions to the Consultant.

.3 Prior to installing the drainage composite and perimeter weeping tile system, confirm that the foundations, foundation dampproofing, and foundation waterproofing have been reviewed and approved by the Consultant.

.4 Verify that the substrate receiving the drainage composite is dry and free of dirt, debris, or other contaminants that could inhibit the proper securement of the drainage composite.

.5 Begin installation of the foundation drainage only after all identified deficiencies have been corrected.

3.2 COORDINATION

.1 Coordinate with the cast-in-place concrete installer to schedule the installation of the underslab drainage system. Ensure the system is reviewed and accepted by the Consultant prior to pouring the floor slab.

.2 Verify that the foundation wall includes proper provisions for connecting the underslab drainage system to the perimeter weeping tile.

.3 Coordinate with Section 31 23 10 "Excavating, Trenching and Backfilling," and schedule the work so that backfilling is executed immediately following the inspection and acceptance by the Consultant of the drainage composite and perimeter weeping tile installation.

3.3 PERIMETER WEEPERS INSTALLATION

.1 Install weepers with the following minimum grade to outlets, unless otherwise indicated: 1.1 0.0%.

.2 Provide manufactured fittings, including cleanouts, to connect weepers.

.3 Connect weepers to the indicated sump or outlet.

.4 Following quality control inspection, surround weepers with a minimum of 150 mm (6") of drainage aggregate.

.5 Wrap the drainage aggregate with geotextile filter cloth. Overlap filter cloth joints by a minimum of 200 mm (8").

.6 Provide a complete foundation drainage system around the perimeter of the foundation wall and beneath the slab-on-grade, as specified in the drawings.

.7 Ensure the pipe interior and coupling surfaces are clean before installation.

.8 Lay drainage pipes on the prepared bed, maintaining true alignment and grade. Ensure inverts are smooth, free of sags, and without high points.

.9 Begin laying pipes at the outlet and proceed in the upstream direction.

.10 Lay pipes with face perforations and coupling slots facing downward.

.11 Use fittings recommended by the manufacturer and ensure all joints are tight, following the manufacturer's instructions.

.12 Do not use shims to establish the pipe slope.

.13 Where applicable, position the pipe immediately adjacent to the footings.

.14 Connect the drainage system to the storm drainage system as indicated on the site services drawings.

.15 Encase all pipes in a continuous filter-fabric sock.

.16 Protect pipe ends from damage and ingress of foreign materials. Plug upstream ends of pipes with plastic plugs.

.17 Provide flush cleanouts at all changes in building direction and in straight pipe runs exceeding 15 m.

.18 Install back-flow valves as necessary to prevent reverse flow in the drainage system.

.19 Do not cover the completed weeper installation until quality control inspection is complete.

3.4 UNDERSLAB WEEPERS INSTALLATION

.1 Install weepers with the following minimum grade to outlets, unless otherwise indicated: 1.1 0.5% minimum.

.2 Provide manufactured fittings to connect weepers.

.3 Locate weepers at a 200 mm (8") invert below the underside of the concrete slab, unless otherwise indicated.

.4 Connect weepers to the indicated sump or outlet.

.5 Coordinate underslab weeper installation with the vertical drainage sheet installation.

.6 Following quality control inspection, surround weepers with a minimum of 150 mm (6") of drainage aggregate.

.7 Wrap the drainage aggregate with geotextile filter cloth, overlapping joints by a minimum of 200 mm (8") and pinning cloth together with hot-dipped galvanized nails.

.8 Do not cover the completed weeper installation until quality control inspection is complete.

3.5 VERTICAL DRAINAGE SHEET INSTALLATION

.1 Apply the drainage composite over the entire surface of the wall, from the footing to 100 mm above the site grading elevation, following the manufacturer's instructions.

.2 Begin applying the drainage composite at the bottom of the wall, as indicated.

.3 Carefully peel back the filter fabric approximately 300 mm from the lower edge. Tuck the exposed drainage core behind the foundation drainage pipe, wrapping it around the outside face of the footing. Ensure the filter fabric is wrapped around the outside of the pipe to prevent soil or fine aggregate from entering the system.

.4 Adhere the drainage composite to the substrate using strips of adhesive, self-adhering tape, or mastic as required.

.5 At the top edge of the drainage composite, tuck the excess filter fabric behind the drainage core to prevent soil infiltration. Secure it to the wall with adhesive, self-adhering tape, or mastic.

.6 For inside corners, cut the drainage core without cutting the filter fabric to maintain continuity.

.7 At outside corners, cut the entire drainage composite and cover the cut ends with filter fabric or tape. Ensure that overlapping fabric is properly adhered.

.8 Shoring Application

.1 Attach vertical drainage sheet with integral filter fabric continuously to shoring using galvanized roofing nails

.2 Cut the plastic face of the vertical drainage sheet coinciding with connection openings.

.3 Ensure channel panels coincide with drainage transfer ports at the base of concrete walls and extend a minimum of 100 mm below transfer ports to form a collection sump.

.4 Cut the backing to expose the drainage cavity at the port.

.9 Position the panel with the fabric facing the shoring or soil. Nails must pin the panel directly against the shoring or soil, ensuring the fabric lies flat to minimize voids. Install the sheet to prevent concrete and soils from migrating into drainage channels.

.10 Backfilled Application

.1 Attach the vertical drainage sheet to the waterproofing assembly with integral filter fabric, using the manufacturer’s recommended adhesive compatible with the waterproofing system. Do not puncture or damage the waterproofing integrity.

.2 Position the sheet with the flat side against the wall and the filter fabric toward the soil/drainage side. Install the sheet to prevent soils from migrating into drainage channels.

.3 Before backfilling, inspect the drainage composite for any damage and repair it as necessary using appropriate fabric and/or drain core material.

.11 Connecting Adjacent Sheets

.1 Connect adjacent sheets at longitudinal edges and ends by pulling back the filter fabric to expose the flange.

.1 Butt edges dimple to dimple, or interlock the next panel over two dimples.

.2 Ensure connections are in shingle fashion for proper water flow.

.3 Overlap fabric in the direction of water flow, and cover terminal edges with the filter fabric flap. If fabric is insufficient, cut out 3 dimples to provide additional fabric for wrapping the core.

.12 Do not cover the completed vertical drainage installation until the quality control inspection is complete.

3.6 HORIZONTAL DRAINAGE SHEET INSTALLATION

.1 Install the sheet to prevent soils from migrating into drainage panels. Protect the sheet from high loads that could puncture or crush it.

.2 Wrap edge conditions with filter fabric flaps, ensuring flaps wrap around the plastic backing. Overlap adjacent layers in the direction of water flow.

.3 Ensure a minimum filter fabric overlap of 100 mm (4").

3.7 DRAINAGE FILL BED BACKFILL

.1 Place filter bed backfill only after the pipe installation has been reviewed and approved by the Consultant.

.2 Place a minimum of 300 mm thickness of coarse filter aggregate over the perforated pipe.

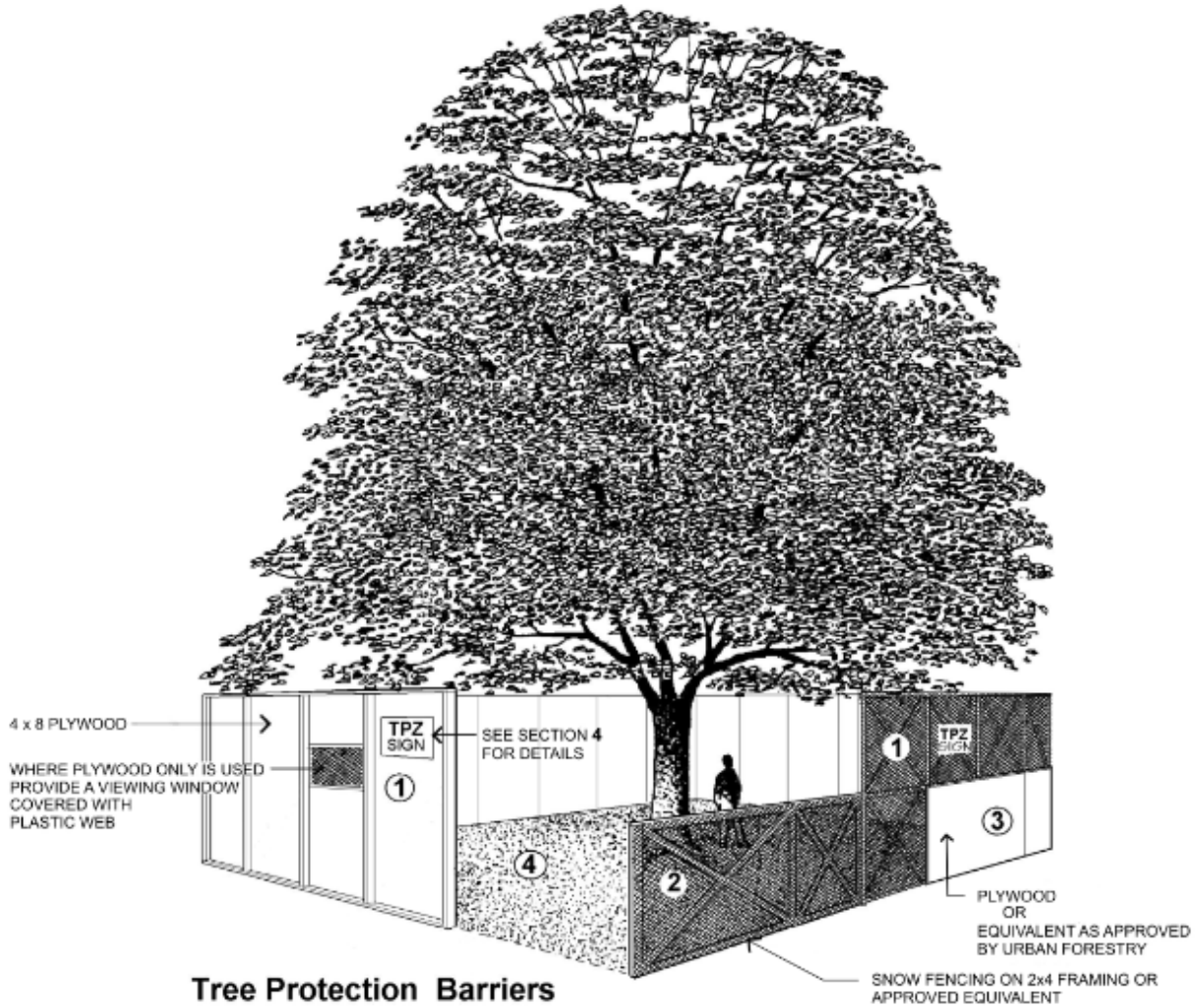
.3 Extend the filter aggregate up to and along the foundation wall to a minimum of 300 mm above the top of the pipe.

.4 Place the filter bed manually in 150 mm lifts. Consolidate each lift by light hand tamping, ensuring that the pipe remains in its intended position without displacement.

END OF SECTION

Parks, Forestry & Recreation
Urban Forestry

Tree Protection Policy
and
Specifications for Construction Near Trees



Tree Protection Barriers

July 2016

Table of Contents

1. Introduction

Maintenance, growth and enhancement of the urban forest are important goals of the City of Toronto. Preserving and protecting healthy trees can help the City to achieve these goals. Considering tree protection in the initial stages of construction planning may mean the difference between preserving a healthy tree and having to remove it. Plans created with tree protection in mind help protect the city's urban forest.

The tree protection policy and specifications outlined below reflect the policy of Toronto City Council. Anyone failing to adhere to the tree protection policy and specifications will be financially responsible for any resulting damage to trees and may be charged under the provisions of the applicable City of Toronto tree by-law or subject to orders to comply.

Prior to commencing with any demolition or construction activity it is important that an arborist[1] determines the location, species, size and condition of trees on the property and surrounding properties and becomes familiar with the tree protection by-laws that could impact the proposal.

The following by-laws protect trees in the City of Toronto:

- **Street Tree By-law**, City of Toronto Municipal Code Chapter 813, Article II, protects all trees situated on City streets.
- **Private Tree By-law**, Article III, Chapter 813 of the City of Toronto Municipal Code protects trees on private property with diameter of 30cm or more and trees of any diameter that were planted as a condition of a permit issued under this bylaw or a site plan agreement.
- The **Ravine & Natural Feature Protection By-law**, Chapter 658 of the City of Toronto Municipal Code prohibits and regulates the injury and destruction of trees, as well as filling, grading and dumping within designated areas of the City. There is no minimum diameter for a tree to qualify for protection under the Ravine and Natural Feature Protection By-law. Trees of any size located in the designated areas qualify for protection.
- The **Parks By-law**, Municipal Code Chapter 608, Article VII protects all trees located in a City park.

All above noted by-laws are implemented by Urban Forestry under the authority of the General Manager, Parks, Forestry and Recreation. City of Toronto's tree protection by-laws can be found at www.toronto.ca/trees.

Types of Tree Damage

Physical injury to the trunk, crown and roots of a tree will occur if construction equipment is permitted close to trees or if structures are built into the growing space of a tree. Inappropriate pruning may also result in tree injury. Physical injuries are permanent and can be fatal.

[1] Arborist – An expert in the care and maintenance of trees including an arborist qualified by the Ontario Training and Adjustment Board Apprenticeship and Client Services Branch, a certified arborist qualified by the International Society of Arboriculture, a consulting arborist registered with the American Society of Consulting Arborists, a registered professional forester or a person with other similar qualifications as approved by the General Manager, Parks, Forestry and Recreation.

Root cutting is another type of physical injury that can significantly impact the health of a tree. The majority of tree roots are found in the upper 30 to 60 cm of soil. Excavation for foundations or utility installation may cut roots if the excavation is too close to trees. Trees can become destabilized and may fall over if anchor roots are severed.

Compaction of the soil in the tree root zone is one of the leading causes of tree decline in Toronto's urban forest. Soil compaction occurs primarily from vehicles and equipment moving across the root zones. Piling or storing materials or debris on top of the root system can also result in soil compaction. Soil compaction causes the pore spaces in the soil, which contains air and water necessary for root growth, to be reduced. Without space available for oxygen and water, tree roots will suffocate and tree decline will follow. With rutting, a form of intense compaction, roots are severed by the tires of equipment. Root destruction can also be caused by changes to the existing grade. Adding soil on top of tree roots can smother them by reducing the amount of oxygen and water they can receive. Only a few centimetres of added soil can have a detrimental impact on tree health.

The structural elements of a tree in an optimal growing environment are shown on Figure 1. This figure illustrates the terms used in this policy.

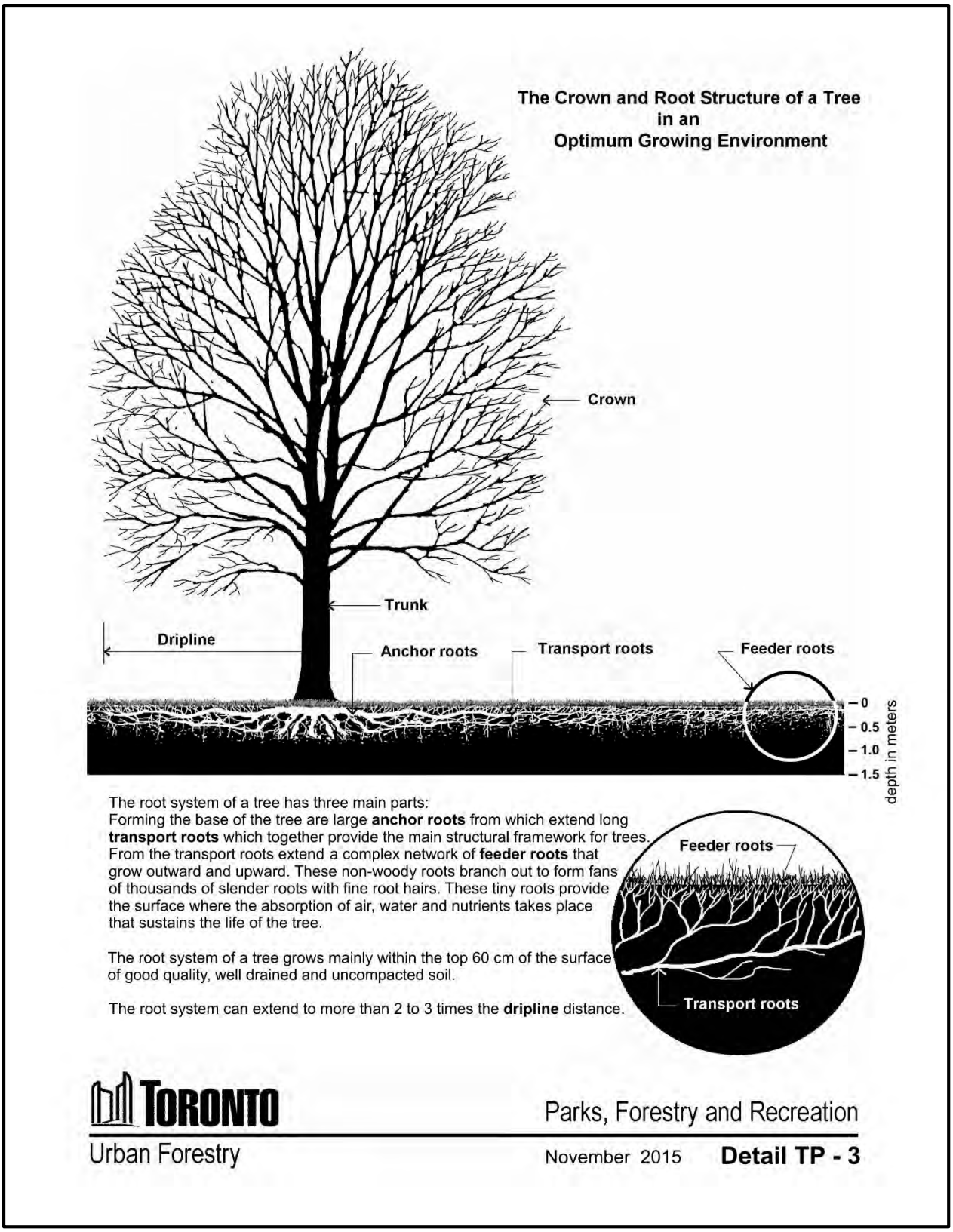


Figure 1: Urban Forestry Detail TP-3

2. Protecting Trees

There are a number of steps that can be taken to protect trees prior to, during and after any construction project. Hiring an arborist should be the first step. An arborist can advise on current tree maintenance requirements and determine the impact the proposal will have on trees and the surrounding natural environment.

An inventory of trees on subject and adjacent properties that may be impacted by the proposed work should be prepared in accordance with the City tree by-laws so that the project can be designed with tree protection in mind. A tree protection plan prepared by an arborist will identify the location, species, size and condition of all trees within the area of consideration, identify the extent of injury where applicable and outline proposed tree protection measures for the trees identified for protection.

The **area of consideration** for trees protected under the Private Tree By-law (Municipal Code, Chapter 813, Article III) includes the entire area of site disturbance, including construction related traffic and material storage, and extends 6m beyond the limit of site disturbance. For trees protected under Ravine and Natural Feature Protection By-law (Municipal Code, Chapter 658), the area of consideration includes the area of site disturbance and 12m area beyond.

The following chart provides the required distances for determining a **minimum tree protection zone** (TPZ) for trees located on a City street, in parks and on private property subject to Private Tree By-law and for trees located in areas regulated under the Ravine and Natural Feature Protection By-law. The minimum tree protection zones are based on the diameter of the tree. While these guidelines provide minimum protection distances for the anchor and transport roots of a tree, there can still be significant loss of the feeder roots beyond the established tree protection zone. Feeder roots are responsible for water and nutrient absorption and gas exchange. **For this reason, Urban Forestry may require a TPZ larger than the minimum, depending on the tree and the surrounding environment.**

Trunk Diameter (DBH)[1]	Minimum Protection Distances Required[2] City-owned and Private Trees	Minimum Protection Distances Required Trees in Areas Protected by the Ravine and Natural Feature Protection By-law
		Whichever of the two is greater:
<10cm	1.2 m	The drip line[4] or 1.2 m
10- 29 cm	1.8 m	The drip line or 3.6 m
30[3] – 40 cm	2.4 m	The drip line or 4.8 m
41 – 50 cm	3.0 m	The drip line or 6.0 m
51 – 60 cm	3.6 m	The drip line or 7.2 m
61 – 70cm	4.2 m	The drip line or 8.4 m
71 – 80cm	4.8 m	The drip line or 9.6 m
81 – 90 cm	5.4 m	The drip line or 10.8 m
91 – 100 cm	6.0 m	The drip line or 12.0 m
>100 cm	6 cm protection for each 1 cm diameter	12cm protection for each 1 cm diameter or the drip line[5]

Table 1: Minimum Tree Protection Zone (TPZ) Determination

[1]Diameter at breast height (DBH) measurement of tree stem taken at 1.4 metres (m) above the ground.
[2]MinimumTree Protection Zone distances are to be measured from the outside edge of the tree base.
[3]Diameter (**30** cm) at which trees qualify for protection under the Private Tree By-law.
[4]The drip line is defined as the area beneath the outer most branch tips of a tree.
[5]Converted from ISA Arborists' Certification Study Guide, general guideline for tree protection barriers of 1 foot of diameter from the stem for each inch of stem diameter.

The diagram below shows how the TPZ is determined:

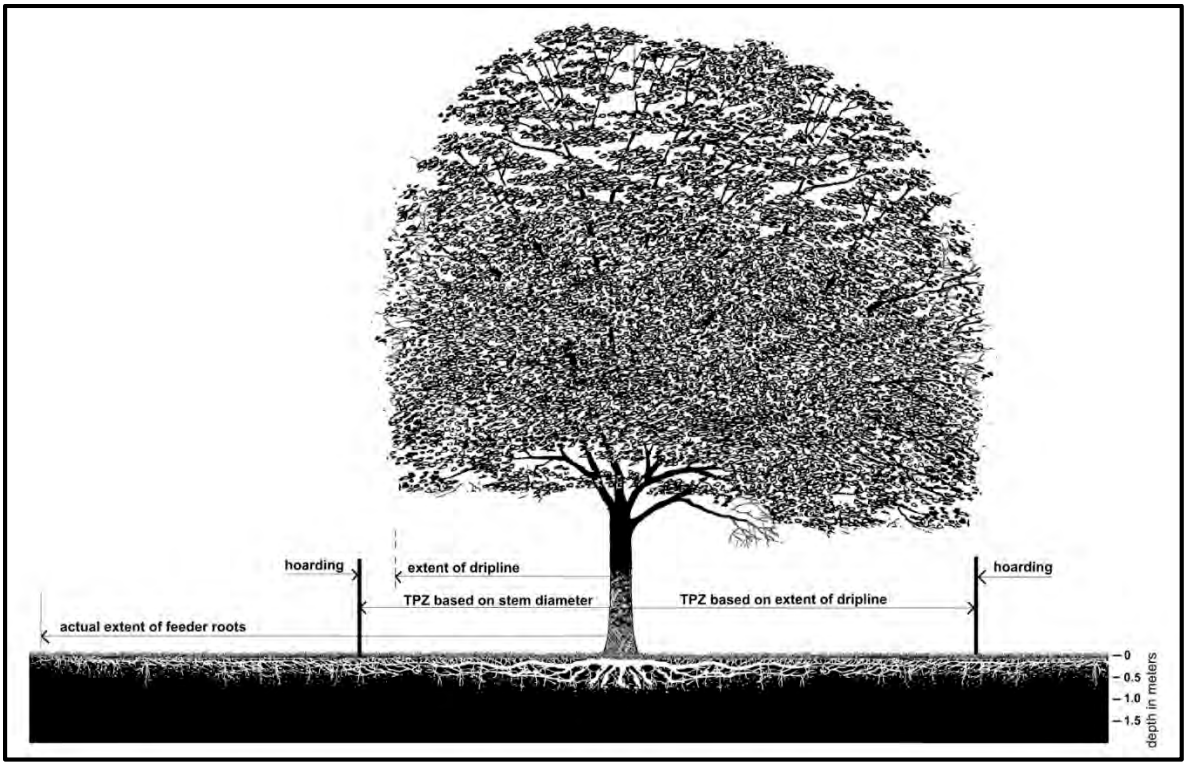


Figure 2: Minimum Tree Protection Zone (TPZ) Determination

In some cases, disturbances in the TPZ may be unavoidable, in which case, the TPZ must be adjusted in consultation with the arborist and Urban Forestry. In these situations, it may be necessary to implement other tree protection measures such as horizontal root protection as noted in section 3 of this document.

In addition to establishing and creating tree protection zones, it may be necessary to implement other protective measures, such as adding mulch to the root zone, aeration of the soil, pruning for deadwood or removing limbs that may be impacted by construction activity. This is also the time to determine the location where new trees can be planted to compliment the construction project and help with the renewal and growth of the urban forest.

Prior to commencing with any excavation, roots approved for pruning by Urban Forestry must first be exposed using pneumatic (air) excavation, by hand digging or by using a low pressure hydraulic (water) excavation. This **exploratory excavation** must be undertaken by an experienced operator under the supervision of a qualified and experienced arborist. The water pressure for hydraulic excavation must be low enough that root bark is not damaged or

removed. This will allow a proper pruning cut and minimize tearing of the roots. The arborist retained to carry out root pruning must contact Urban Forestry no less than three (3) working days prior to conducting any specified work.

Exploratory excavation may also be required for open face cuts outside the minimum tree protection zone (TPZ).

Communication between owners and their designated agents, arborists, contractors and sub-contractors throughout the construction process is critical to ensure that everyone involved is aware of the issues surrounding tree protection, and fully understands the tree protection methodology. Construction damage to trees is often irreversible.

Prohibited Activities Within a TPZ

Except where authorized by Urban Forestry, any activity which could result in injury or destruction of a protected tree or natural feature, or alteration of grade within a Ravine and Natural Feature Protection (RNFP) area, is prohibited within a TPZ, including, but not limited to, any of the following examples:

- demolition, construction, replacement or alteration of permanent or temporary buildings or structures, parking pads, driveways, sidewalks, walkways, paths, trails, dog runs, pools, retaining walls, patios, decks, terraces, sheds or raised gardens
- installation of large stones or boulders
- altering grade by adding or removing soil or fill, excavating, trenching, topsoil or fill scraping, compacting soil or fill, dumping or disturbance of any kind
- storage of construction materials, equipment, wood, branches, leaves, soil or fill, construction waste or debris of any sort
- application, discharge or disposal of any substance or chemical that may adversely affect the health of a tree e.g. concrete sluice, gas, oil, paint, pool water or backwash water from a swimming pool
- causing or allowing water or discharge, to flow over slopes or through natural areas
- access, parking or movement of vehicles, equipment or pedestrians
- cutting, breaking, tearing, crushing, exposing or stripping tree's roots, trunk and branches.
- nailing or stapling into a tree, including attachment of fences, electrical wires or signs
- stringing of cables or installing lights on trees
- soil remediation, removal of contaminated fill
- excavating for directional or micro-tunnelling and boring entering shafts

The above mentioned prohibitions are for area(s) designated as a TPZ. If possible, these prohibitions should also be implemented outside the TPZ in areas where tree roots are located. The roots of a tree can extend from the trunk to approximately 2-3 times the distance of the dripline.

3. Tree and Site Protection Measures

The following are examples of specific tree and site protection measures that may be required by Urban Forestry:

- Plywood tree protection hoarding (minimum 19mm or ¾"), or equivalent barriers, as approved by Urban Forestry, shall be installed in locations as detailed in an Urban Forestry approved Tree Protection Plan. Tree protection barriers must be made of 2.4m (8ft) high plywood hoarding or equivalent as approved by Urban Forestry. Height of hoarding may be less than 2.4m (8ft), to accommodate tree branches that may be lower, or as approved by Urban Forestry. Within a City road allowance where visibility is a consideration, 1.2m (4ft) high orange plastic web snow fencing on a 38 x 89mm (2"x 4") frame should be used. The detail on tree protection barrier construction is shown on Figure 4 in section 7 of this document
- In specific situations where the required full minimum tree protection zone (TPZ) cannot be provided, a **horizontal** (on grade) **root protection**, designed by a qualified professional such as arborist or landscape architect, may be considered, subject to approval by Urban Forestry. Urban Forestry's objective is zero soil compaction within the tree protection zone, therefore best efforts must be made to achieve this objective using materials and best practices available that minimize the vertical loading and spread the loading horizontally.
- Any area designated for stockpiling of excavated soil must be outside of TPZs and be enclosed with sediment control fencing. Sediment control fencing shall be installed in the locations as indicated in an Urban Forestry approved Tree Protection Plan. The sediment control fencing must be installed to Ontario Provincial Standards (OPSD-219.130 – see Section 7, Figure 5) and to the satisfaction of Urban Forestry. When feasible, the sediment control fencing can be attached to the tree protection barrier as shown in Figure 6. Sediment control fencing near trees shall be constructed as per detail shown on Figure 6 of this document

4. Tree Protection Signage

Figure 3: Tree Protection Sign

A sign that is similar to the illustration above may be required to be mounted on all sides of a tree protection barrier for trees protected by the Street Tree By-law and the Private Tree By-law. The sign should be a minimum of 40cm x 60cm and made of white corrugated plastic board or equivalent material. The sign may also be acquired from Urban Forestry Tree Protection and Plan Review (TPPR) district service counters.

5. Tree Protection Plan

All construction related applications must include a Tree Protection Plan that shows details of tree protection, prepared in conjunction with an arborist report or in consultation with an arborist, when protected trees are in proximity to the proposed work. All Tree Protection Plans must be legible, prepared at a usable metric scale and include the following information:

- Show all existing buildings, structures, hard surfaces and all existing trees within the area of consideration (as defined in Section 2 of this document). Depending on the extent of site disturbance, trees on neighbouring properties may need to be included. Note that area of disturbance must include all areas that will be disturbed by the proposed work, including the areas required for over-dig, stockpiling, construction traffic, vehicular access and construction staging
- The extent of the crown (drip line) or the extent of minimum tree protection zone TPZ (whichever is greater) of each existing tree
- Proposed changes on site, including all proposed structures, services, hard surfaces and grade changes
- Indicate vehicular access and construction staging areas. Areas proposed for temporary stockpiling of fill or excavated material shall be fenced with sediment control to prevent sediment runoff
- Indicate location of any excavation that requires root pruning
- Indicate trees proposed to be removed and/or injured
- Highlight and label tree protection barriers and the proposed tree protection zones. (See Table 1 to determine size of tree protection zone. Distances are to be measured from base of tree)
- The extent of proposed tree injury, where applicable.
- Include a comprehensive legend

See Section 6, Tree Protection Plan Notes, and Section 7, Tree Protection Plan Details, for further information.

6. Tree Protection Plan Notes

The following notes are to be included on tree protection plans submitted for construction related applications:

General Notes

- It is the applicants' responsibility to discuss potential impacts to trees located near or wholly on adjacent properties or on shared boundary lines with their neighbours. Should such trees be injured to the point of instability or death the applicant may be held

responsible through civil action. The applicant would also be required to replace such trees to the satisfaction of Urban Forestry

- Tree protection barriers shall be installed to standards as detailed in this document and to the satisfaction of Urban Forestry
- Tree protection barriers must be installed using plywood clad hoarding (minimum 19mm or ¾" thick) or an equivalent approved by Urban Forestry
- Where required, signs as specified in Section 4, Tree Protection Signage must be attached to all sides of the barrier
- Prior to the commencement of any site activity such as site alteration, demolition or construction, the tree protection measures specified on this plan must be installed to the satisfaction of Urban Forestry
- Once all tree/site protection measures have been installed, Urban Forestry staff must be contacted to arrange for an inspection of the site and approval of the tree/site protection requirements. Photographs that clearly show the installed tree/site protection shall be provided for Urban Forestry review
- Where changes to the location of the approved TPZ or sediment control or where temporary access to the TPZ is proposed, Urban Forestry must be contacted to obtain approval prior to alteration
- Tree protection barriers must remain in place and in good condition during demolition, construction and/or site disturbance, including landscaping, and must not be altered, moved or removed until authorized by Urban Forestry
- No construction activities including grade changes, surface treatments or excavation of any kind are permitted within the area identified on the Tree Protection Plan or Site Plan as a minimum tree protection zone (TPZ). No root cutting is permitted. No storage of materials or fill is permitted within the TPZ. No movement or storage of vehicles or equipment is permitted within the TPZ. The area(s) identified as a TPZ must be protected and remain undisturbed at all times
- All additional tree protection or preservation requirements, above and beyond the installation of tree protection barriers, must be undertaken or implemented as detailed in the Urban Forestry approved arborist report and/or the approved tree protection plan and to the satisfaction of Urban Forestry
- If the minimum tree protection zone (TPZ) must be reduced to facilitate construction access, the tree protection barriers must be maintained at a lesser distance and the exposed portion of TPZ must be protected using a horizontal root protection method approved by Urban Forestry
- Any roots or branches indicated on this plan which require pruning, as approved by Urban Forestry, must be pruned by an arborist. All pruning of tree roots and branches must be in accordance with good arboricultural practice. Roots that have received approval from Urban Forestry to be pruned must first be exposed using pneumatic (air) excavation, by hand digging or by a using low pressure hydraulic (water) excavation. The water pressure for hydraulic excavation must be low enough that root bark is not damaged or removed. This will allow a proper pruning cut and minimize tearing of the roots. The arborist retained to carry out crown or root pruning must contact Urban Forestry no less than three working days prior to conducting any specified work
- The applicant/owner shall protect all by-law regulated trees in the area of consideration that have not been approved for removal throughout development works to the satisfaction of Urban Forestry

- Convictions of offences respecting the regulations in the Street Tree By-law and Private Tree By-law are subject to fines. A person convicted of an offence under these by-laws is liable to a minimum fine of $500 and a maximum fine of $100,000 per tree, and /or a Special Fine of $100,000. The landowner may be ordered by the City to stop the contravening activity or ordered to undertake work to correct the contravention
- Prior to site disturbance the owner must confirm that no migratory birds are making use of the site for nesting. The owner must ensure that the works are in conformance with the Migratory Bird Convention Act and that no migratory bird nests will be impacted by the proposed work

The following additional notes shall be added on plans for properties regulated by the Ravine and Natural Feature Protection Bylaw:

- Ravine and Natural Feature Protection By-law (RNFP) note:

Ravine & Natural Feature Protection By-law

The Ravine & Natural Feature Protection By-law, Chapter 658 of the City of Toronto Municipal Code, regulates the injury and destruction of trees, dumping of refuse and changes to grade within protected areas.
Under this by-law protected trees may not be removed, injured or destroyed, and protected grades may not be altered, without written authorisation from Urban Forestry Ravine & Natural Feature Protection, on behalf of the General Manager of Parks, Forestry & Recreation.
Convictions of offences respecting the regulations in the Ravine and Natural Feature Protection By-law are subject to fines, and the landowner may be ordered by the court to restore the area to the satisfaction of the City. A person convicted of an offence under this Bylaw is liable to a minimum fine of $500 and a maximum fine of $100,000 for each tree destroyed, a maximum fine of $100,000 for any other offence committed under this chapter, and /or a Special Fine of $100,000. A person convicted of a continuing offence, including failure to comply with ravine permit conditions is liable to a maximum fine of not more than $10,000 for each day or a part of a day that the offence continues.

- The exact location of the limit of the RNFP area must be shown on all pertinent plans including Tree Protection Plan. The applicant/owner shall have this limit marked on their survey or other plans drawn to a suitable scale. This service costs $72.37 plus tax and can be requested by contacting the City of Toronto, Information and Technology, Geospatial Competency Centre, Map Service Counter at 416-392-2506 or mapsales@toronto.ca. This line may then be transferred onto other plans to be submitted.
- Sediment control fencing shall be installed in the locations as indicated in the Urban Forestry approved sediment control plan. The sediment control fencing must be installed to Ontario Provincial Standards (OPSD-219.130, see Section 7, Figure 5) and to the satisfaction of Urban Forestry. Sediment control near trees and over root zones shall be installed as shown on Figure 6 of this document and to the satisfaction of Urban Forestry.

7. Tree Protection Plan Details

The following diagrams provide details for tree protection barriers and sediment protection barriers:

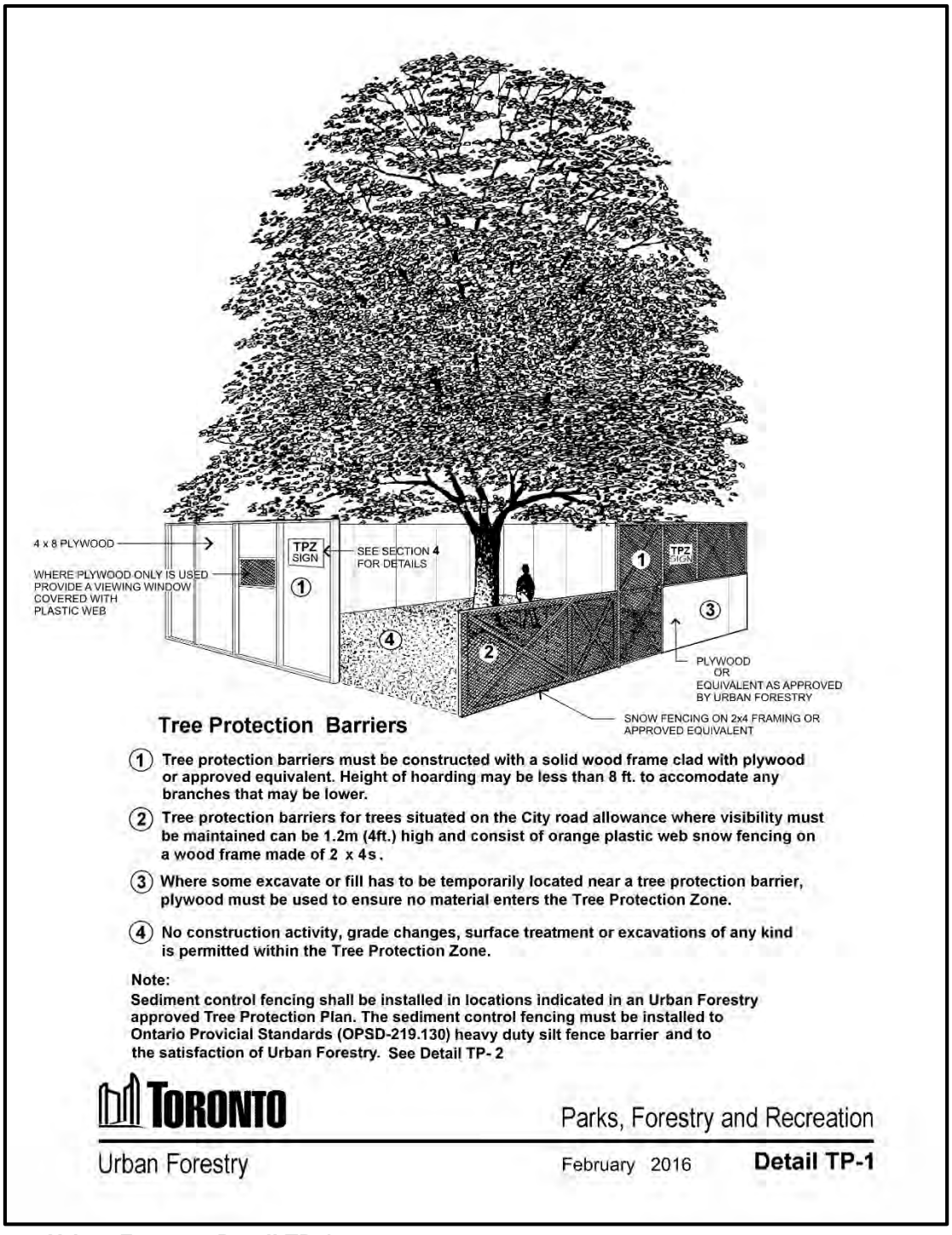


Figure 4: Urban Forestry Detail TP-1

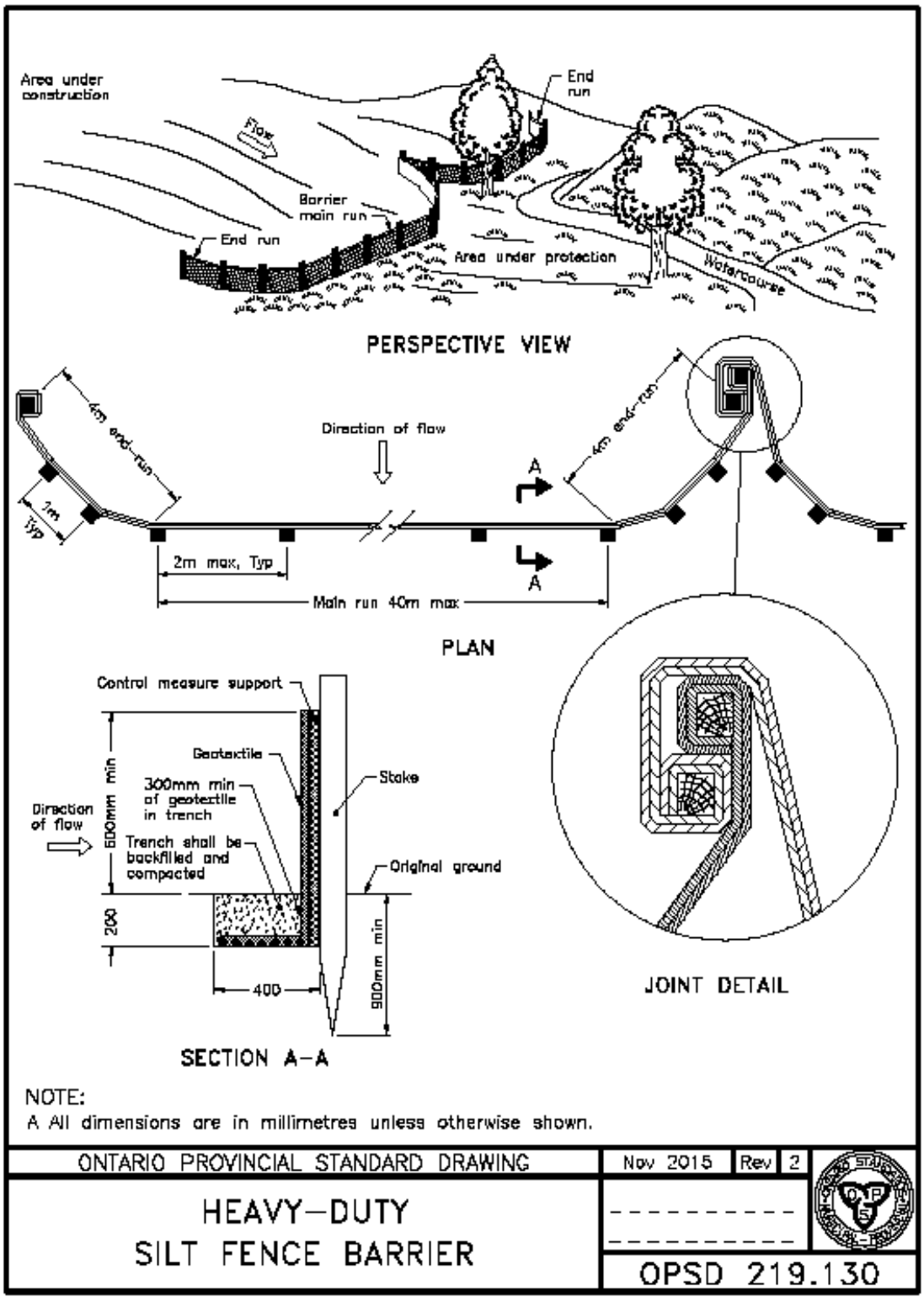


Figure 5: OPSD Detail for Heavy Duty Silt Fence Barrier

The following detail shall be used when constructing sediment protection fencing near trees.

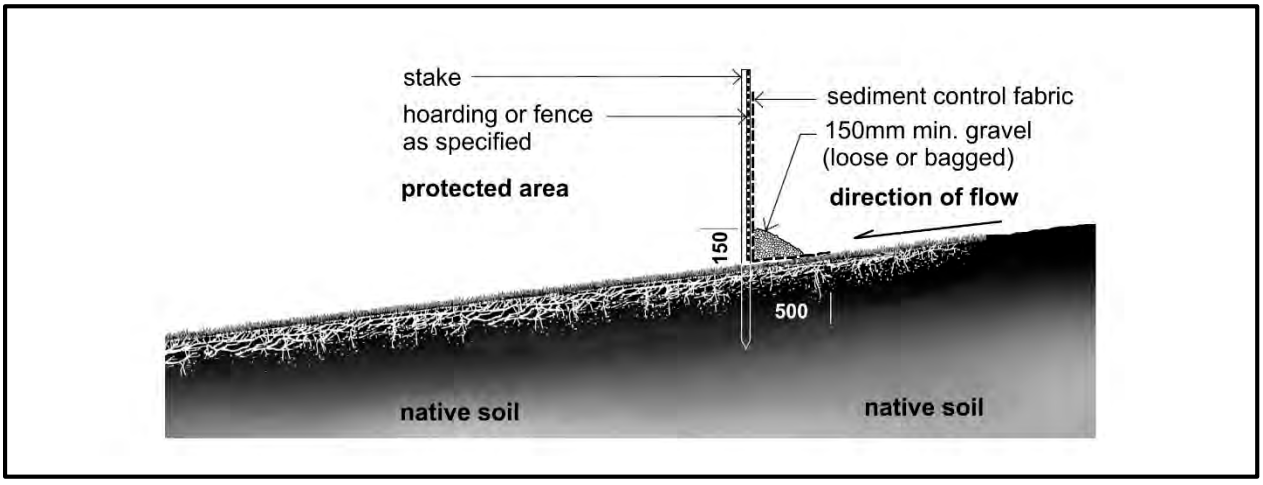


Figure 6: Sediment control barriers for use over tree root zone

8. Permits for Tree Removal or Injury

If the full minimum tree protection zone (TPZ) as identified in Section 2 cannot be provided, a permit to injure the tree must be obtained.

Any requests for removal or injury of a tree protected by City by-laws must be made on the appropriate application forms and submitted to Urban Forestry at the appropriate address. Permit application forms are available at www.toronto.ca/trees. Any requests for tree relocation will be considered as a tree injury.

If approval is granted for removal of a City-owned tree, applicants will assume all costs involved, which include appraised tree value, removal, and tree replacement costs. If approval is granted for removal of private trees or trees in ravine and natural feature protected areas, the permit will be subject to conditions, including tree replacement. If approval is granted for injury of City-owned, private trees or trees in ravine and natural feature protected areas, the permit will be subject to conditions, including implementation of a Tree Protection Plan, as determined by Urban Forestry.

In some instances, where the tree is healthy and the management of the tree or forest cover has not been addressed to the satisfaction of Urban Forestry, requests received by Urban Forestry may be forwarded to a Community Council and City Council for approval.

Urban Forestry does not have the authority to issue a permit to injure or remove a heritage tree[2]. Such requests would be forwarded to a Community Council and/or City Council for approval.

Butternut (*Juglans cinerea, L.*) is an endangered species. Butternuts and their habitat are protected under Endangered Species Act (S.O. 2007, c.6) available on the Government of Ontario website at http://www.ontario.ca/laws/statute/07e06/v1. A permit to injure or remove a butternut tree must be obtained from the Ministry of Natural Resources and Forestry Ontario.

[2] Heritage Tree – A tree that has been designated under Part IV of the Ontario Heritage Act or trees recognized as heritage trees by the Ontario Heritage Tree Program of Trees Ontario.

Any person who contravenes any provision of the City's tree protection by-law is guilty of an offence.

More information on tree protection and permit application forms for tree removal and injury are available on Urban Forestry web page at www.toronto.ca/trees.

For additional information regarding the removal or injury of trees protected under City by-laws, please call 311.

9. Tree Guarantee Deposits

Tree Protection Guarantee

Urban Forestry may request a **tree protection guarantee** to secure the protection of trees that may be impacted by work on city streets, or to secure the satisfaction of all conditions of permit issuance. Tree protection guarantees held by the City shall only be released by the City provided that all construction activities are complete, compliance with all permit terms and conditions has been verified, there has been no encroachment into the minimum tree protection zone (TPZ) and the trees are healthy and in a state of vigorous growth.

Where Urban Forestry has confirmed an unauthorized encroachment into the TPZ or the terms and conditions of a permit have not been complied with, Urban Forestry will retain the guarantee until satisfactory compliance.

It is the applicant's responsibility to submit a written request to Urban Forestry for the refund of the tree protection guarantee deposit as soon as construction and landscaping is completed.

Tree Planting Security

Urban Forestry may request a **tree planting security deposit** in an amount equal to the cost of planting and maintenance for two (2) years in order to ensure compliance with approved landscape or replanting plans. The security deposit may be held by the City after the planting of the trees for a period of two (2) years and shall be released by the City provided that the trees have been maintained, are healthy and in a state of vigorous growth upon inspection, two (2) years after planting. It is the applicant's responsibility to advise Urban Forestry that trees have been planted in accordance with approved plans, in order that the two (2) year maintenance period begin.

Prior to release by the City, any dead/dying trees must be replaced, deadwood and sucker growth should be pruned, and mulch should be topped up where necessary. If stakes and ties were used, they must be removed within one (1) year. Any encroachments are to be removed prior to assumption, including walkways, timbers or bricks that result in increased height of soil or mulch around the trees, and lights in trees.

It is the applicant's responsibility to submit a written request to Urban Forestry for the refund of a Tree Guarantee Deposit, two (2) years after the completion of all construction activity and/or two (2) years after tree planting. This request should be made during the growing season, not while

the trees are dormant, so that a site inspection can be arranged to confirm the trees are acceptable. The City will not release security deposits where trees are not in good condition, or if there are encroachments.

Financial securities must be in the form of a certified cheque, letter of credit or an alternative acceptable to Urban Forestry, with amounts payable to the Treasurer, City of Toronto.

10. Emergency Repairs to Utilities

The utility company is responsible for notifying Urban Forestry by calling 311 as soon as possible when by-law regulated trees are involved, so that an inspector can be dispatched. Urban Forestry staff may be contacted after hours by calling 311, and requesting the assistance of an on-call Urban Forestry inspector.

11. Tree Species that are Intolerant of Construction Disturbance

The following tree species are intolerant of construction disturbance, and tree protection plans must take this into account. The tree protection zones required by these species may need to be quite extensive to avoid damage to the roots and crown associated with compaction, excavation or construction above grade that will impact the branches.

Acer rubrum (red maple)
Acer saccharum (sugar maple)
Betula papyrifera (paper birch)
Carya glabra (pignut hickory)
Fagus grandifolia (American beech)
Liriodendron tulipifera (tulip tree)
Ostrya virginiana (ironwood)
Pinus resinosa (red pine)
Pinus strobus (white pine)
Prunus serotina (black cherry)
Quercus alba (white oak)
Quercus velutina (black oak)
Tsuga canadensis (eastern hemlock)
Tilia americana (basswood)

12. Contact Information

Tree Protection and Plan Review (City-owned and Private Trees)

North York District
5100 Yonge Street, 3rd Floor
Toronto, ON, M2N 5V7
Telephone: 416-395-6670
Fax: 416-395-7886
tpprnorth@toronto.ca

Etobicoke York District
399 The West Mall, Main Floor, North Block
Toronto, ON, M9C 2Y2
Telephone: 416-338-6596
Fax: 416-394-8935
tpprwest@toronto.ca

Scarborough District
150 Borough Drive, 5th Floor
Toronto, ON, M1P 4N7
Telephone: 416-338-5566
Fax: 416-396-4170
tppreast@toronto.ca

Toronto and East York District
50 Booth Avenue, 2nd Floor
Toronto, ON, M4M 2M2
Telephone: 416-392-7391
Fax: 416-392-7277
tpprsouth@toronto.ca

Ravine and Natural Feature Protection

General Enquiries
Telephone: 416-392-2513
Fax: 416-392-1915
Email: rnfp@toronto.ca

Office Location
18 Dyas Road, 1st Floor
Toronto, ON, M3B 1V5

Areas regulated under Ravine and Natural Feature Protection By-law can be viewed using the City's mapping tool available at www.toronto.ca/trees.