



G5480

JUNE 2024

**GEOHYDROLOGY ASSESSMENT
145 WELLINGTON STREET WEST
TORONTO, ONTARIO**

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PREPARED FOR:

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1.0 INTRODUCTION

H & R Reit – 145 Wellington (the Client) intends to redevelop the property located at 145 Wellington Street, M5J 1H8, Toronto, Ontario, (hereafter referred to as ‘the Site’). MCR Engineers Ltd. was retained to conduct a Geohydrology Assessment for the Site to evaluate the requirements for temporary dewatering and permanent drainage for the proposed redevelopment.

1.1 SCOPE OF WORK

The objectives of the Geohydrology Assessment are to determine the following:

- Hydrogeological conditions of the Site, including the groundwater and phreatic surface, subsurface elevations and flow patterns and the interaction with the design and construction of the proposed development.
- Reviewing the available background information for the Site obtained from MCR’s files, City of Toronto, and architectural drawings.
- Estimate the potential temporary dewatering flow rates during construction and assessment of potential impacts on the surrounding environment.
- Estimate the long-term flow rates from the Private Water Drainage System (PWDS) of the proposed building.
- Assess the permitting requirements for both dewatering and discharge with the Ministry of Environment, Conservation and Parks (MECP) and the City of Toronto – Toronto Water (the City), respectively.
- Summarize the findings in a Geohydrology Assessment Report.

1.2 SITE DESCRIPTION

The Site is located on the south-east corner of Wellington Street West and Simcoe Street at the municipal address of 145 Wellington Street West. The Site is rectangular in shape, with an area of approximately 1,482.1 m².

The Site is bounded by Wellington Street West to the north, commercial buildings to the east, a parking lot to the south and Simcoe Street to the west.

The Site is currently occupied by a midrise office building with three levels of underground parking.

According to the Survey Plan by Speight, Van Nostrand & Gibson Limited (Appendix A), the Site is legally described as: Lot D and Part of Lots C and E, And Part of Lane (Closed by By-Law 434-85), Registered Plan D-47, City of Toronto.

1.3 PROPOSED DEVELOPMENT

The Site is proposed for mixed-use residential and commercial development consisting of a sixty-five [65] storey building with a mechanical penthouse floor over three [3] levels of below grade parking. The lowest ground finished floor elevation (FFE) is expected to be at 83.10 meters above sea level (masl). The P3 FFE is expected to be at a depth of 9.40 m, corresponding to an approximate elevation of 73.70 masl.

Presently, it is assumed that the proposed building will be founded in shale supported by conventional spread/strip footings or raft foundation. The size of the shoring plan layout was assumed to cover approximately 50 m by 30 m.

With spread/strip footings, a sub-floor Private Water Drainage System (PWDS) with perimeter weeping tile will be required. It is understood that the existing foundation walls will be used as shoring. If this is not acceptable, a soldier pile and lagging shoring system will be required for temporary dewatering/excavation except where adjacent structures exist or heritage structures are to remain, in which case a caisson shoring system would be necessary.

1.4 PROPERTY OWNERSHIP

The Site is owned and intended for redevelopment by H & R Reit – 145 Wellington. The Client is represented by Mr. David Cox, with the following contact information:

H & R Reit – 145 Wellington
3625 Dufferin Street, Suite 500

Toronto, Ontario
M3K 1N4

Ms. Ionna Laksono
Manager, Development and Construction
Email: ilaksono@hr-reit.com

1.5 REVIEW OF PREVIOUS REPORTS

The following geo-environmental reports were provided/completed for review prior to initiating the investigation:

- MCR report titled: *Geotechnical Report, Proposed Mixed Use, Residential/Commercial Development, 145 Wellington Street West, Toronto, Ontario*, prepared for H&R Reit – 145 Wellington, dated June 2024.

2.0 HYDROGEOLOGICAL CONDITIONS

2.1 PHYSICAL SETTING

The Site is located in the central portion of the City of Toronto and is situated in a mixed-use residential and commercial area. The nearest major intersection is Simcoe Street and Wellington Street West, located at the north-western corner of the Site. There are no water bodies or areas of natural significance within 30 m of the Site boundaries. The nearest surface water body is Lake Ontario, around 810 m southwest of the Site.

The Site is located at an average geodetic elevation of approximately 83 masl (272 ft), and the topography across the Site is generally flat with a gentle slope towards the south-east.

The Site is bounded by the following properties/features:

North	Wellington Street West
South	Parking Lot
East	Commercial building
West	Simcoe Street

2.2 TOPOGRAPHY

According to Topographic Map30 M/11, 9th Edition, published in July 2013 by Natural Resources Canada; Earth Sciences Sector; Canada Centre for Mapping and Earth Observation, ground surface in the area of the Site slopes up to the south-east.

2.3 REGIONAL GEOLOGY AND HYDROGEOLOGY

According to the geological map entitled "Quaternary Geology of Ontario, Southern Sheet" Map 2556, published by the Ontario Ministry of Development and Mines, dated 1991, the overburden in the study area consists of undifferentiated, predominantly sandy silt to silt matrix, commonly rich in clasts, often high in total matrix carbonate content. The groundwater typically tends to flow towards south towards Lake Ontario.

According to the Ontario Ministry of Development and Mines, Map No. 2554 “Bedrock Geology of Ontario, Southern Sheet, 1991”, the bedrock typically consists of Upper Ordovician shale, limestone, dolostone and siltstone.

It should be noted that the subsurface soil, rock and ground water conditions described above represent generalized conditions only and should not be considered site specific.

2.4 LOCAL GEOLOGY AND HYDROGEOLOGY

On a local scale, geological conditions and hydrogeology are similar to the ones at a regional scale. Locally, surface groundwater flow may be influenced by underground structures (e.g., service trenches, catch basins, and building foundations or surface watercourses). No surface water features are present onsite and there are no Provincially Significant Wetlands in the vicinity of the Site.

3.0 SCOPE OF INVESTIGATION

3.1 OVERVIEW OF SITE INVESTIGATION

- Three boreholes (BH 1 to BH 3) were advanced as part of the field investigation in March 2019 due to Site access limitations.
- The boreholes were drilled from the existing P3 floor slab to an approximate depth of 4.60 m, using rock coring.
- All boreholes were equipped with a monitoring well for long term groundwater monitoring and water sampling for a total of three [3] wells.
- It is in MCRs opinion that considering the existing building is founded in bedrock, the recommended five [5] wells as per the Terms of Reference, will not be necessary to characterize the soil/groundwater of the Site.
- Drawing No.1 shows the borehole location on the Site Layout and the borehole log is presented in Appendix C.
- Groundwater levels were recorded from the monitoring well on April 4, 2019 and the data is represented in Table 1.
- Groundwater samples were collected from BH 1 for chemical analysis of the City of Toronto Sewers By-Law criteria.

3.2 MONITORING WELL INSTALLATION

All monitoring wells by MCR were installed with a 50 mm diameter schedule 40 PVC pipe and a 3.05 m long slotted well screen. Well screens were surrounded by a silica sand pack to at least 0.6 m above the top of screen with a bentonite seal extending from above the sand pack to within 0.5 m of the ground surface. All monitoring wells were completed with a flush mounted cover at ground surface. Monitoring well installation was done in accordance with the *Ontario Water Resources Act, Sections 35 to 50*.

3.3 ELEVATION SURVEYING

Borehole elevations, referred to in this report, are geodetic and are referenced to Toronto Benchmark No. 2556 CT, with a published elevation of 81.256 m. The borehole elevation is shown on the borehole log in Appendix C.

3.4 GROUNDWATER SAMPLING

All groundwater sampling activities were conducted in accordance with Ontario Regulation (O.Reg.) 153/04, as amended to O.Reg. 511/09, July 2011. All monitoring wells were developed prior to sampling activities using a Waterra Hydrolift II (HL-1217) inertial lift pump by purging at least three well volumes or until the monitoring well was purged dry. Groundwater samples were obtained at least 24 hours' post-development under static conditions. No samples were field filtered prior to laboratory analysis in accordance with the standard.

3.5 GROUNDWATER ANALYSIS

All groundwater samples were submitted to ALS Laboratory Group (ALS) of Richmond Hill, Ontario, certified by the Canadian Association for Laboratory Accreditation (CALA), for chemical analysis. The Certificates of Analysis received are included in Appendix D. The contact information for the laboratory used is included below.

ALS Laboratory Group

95 West Beaver Creek Road
Richmond Hill, ON L4B 1H2

Groundwater samples were submitted for bulk chemical analysis for the criteria provided in the *Toronto Municipal Code, Chapter 681, Sewers By-law*. The results of chemical analysis were compared to the criteria provided in *Table 1 – Limits for Sanitary and Combined Sewers Discharge* and *Table 2 – Limits for Storm Sewer Discharge*. These guidelines establish the maximum allowable concentrations of specific analytical parameters for water discharged into either the municipal sanitary and/or storm sewer system respectively.

4.0 INVESTIGATION RESULTS

4.1 GEOLOGY

Due to Site limitations for drilling, the boreholes were drilled from the existing P3 floor slab and were at an approximate elevation of 73.65 masl. Based on the investigation the geologic formations beneath the Site are illustrated in the borehole log (Appendix C) and include the following (from surface to depth):

Concrete Slab/Granular Base: A concrete slab, approximately 125 mm in thickness, was present at the surface of all the boreholes. A granular base varying from 275 to 300 mm in thickness and consisting of clear stone was encountered below the concrete slab in Boreholes 1 and 2.

Subject to the extent of excavations, MCR recommends additional testing to be conducted to assess the fill, if encountered, for the purpose of offsite disposal, prior to the tendering and award of the excavation work.

Also, although no cobbles or boulders were encountered during the geotechnical investigation, due to the drilling directly into shale bedrock, the proposed excavations might also be in soils that went through historic periods of glaciation. As a result, glacial drop stones, ranging from gravel to boulders can be encountered within the overburden.

Shale Bedrock: Grey, moist shale bedrock was detected below the clear stone/concrete slab in all the boreholes and extend to the maximum explored depth of the boreholes. The shale bedrock was encountered at approximate Elevations ranging from 73.50 to 73.25.

The depth to shale bedrock should be confirmed during shoring installation and general excavation.

Groundwater: Upon completion of drilling, groundwater was not measured due to rock coring techniques.

On April 4, 2019, the groundwater levels were measured at depths of 0.73, 4.28

and 1.17 m in boreholes BH 1, BH 2 and BH 3, respectively. The results are summarized on the Record of Borehole Sheets in Appendix C and Table 1.

As the existing building is found in shale bedrock, it is in MCR's opinion that three (3) boreholes are representative of the soil profile of the Site. Additional boreholes will not provide any useful information for the soil profile and hydrogeological conditions of the Site.

4.2 GROUNDWATER LEVEL MONITORING

All groundwater measurement data is presented in the enclosed Table 1. Water levels were measured manually with an electric water level meter. All water levels were measured with respect to the geodetic borehole elevations. The monitoring wells must be decommissioned prior to construction, in accordance with Regulation 903 by a qualified contractor.

The interpreted groundwater flow direction is based on the 2019 round of water table elevation measurements, since this event provided water table elevations from the majority of the monitoring wells. Confidence in the groundwater flow direction could be increased with additional rounds of water table elevation measurements.

4.3 GROUNDWATER QUALITY

Groundwater samples collected in April 2019 from BH 1 were analyzed for the City of Toronto Sewers By-Law criteria. The results of chemical analysis (Table 2) indicate that the sample complies with the *Table 1 Limits for Sanitary & Combined Sewers Discharge* for all parameters analyzed. The following exceedances were recorded for the *Table 2 Limits for Storm Sewer Discharge*: Total Suspended Solids (174.0 mg/L vs. 15 mg/L) and Total Manganese (0.431 mg/L vs. 0.05 mg/L).

4.4 GROUNDWATER DISCHARGE ASSESSMENT

Presently, the groundwater sample collected onsite can be discharged to the City sanitary or combined sewer system with no additional filtration or treatment. A filtration/treatment system for suspended solids and manganese would be

required prior to discharging to the storm sewer system. A dewatering contractor should be approached to explore the possibility of treatment if discharge to the storm sewer is required.

5.0 REVIEW AND EVALUATION

5.1 TEMPORARY DEWATERING ASSESSMENT

The excavation for the proposed three level underground parking structure will extend into shale bedrock. Positive dewatering, such as well points and sump pumps, will be required for the proposed excavation.

In addition, the (weathered) sedimentary bedrock can be fractured, fissured, or contain water-bearing bedding planes. When these bedding planes are intercepted in rock excavation, a substantial amount of water, often under a significant hydrostatic head, may be encountered. The depths and condition of shale bedrock vary across the Site; therefore, its quality should be confirmed during shoring installation and general excavation through inspections in the field.

For the proposed three underground levels, groundwater is required to be drawn down 1 m below the underside of the footing. The assumed foundation elevation is approximately 72.20 masl. However, for the purpose of temporary/construction dewatering, given the encountered subsurface conditions, groundwater cannot be lowered with well points below the average top elevation of shale bedrock at approximately 73.35 masl. Localized trenches and sumps can be used within bedrock to lower the water level below the underside of the P3 slab and footings, to an approximate elevation of 71.20 masl. This result is preliminary and should be confirmed during the construction phase and final stage of detailed design.

The maximum groundwater level recorded in the monitoring wells is at an elevation of 72.94 masl, representing an approximate 1 – 2 m hydrostatic head requiring dewatering. The shoring plan layout was assumed to cover approximately 50 m by 30 m.

Theoretically, the groundwater drawdown for a single well pumping can be described as:

$$Q = -2\pi r K h \frac{dh}{dr} \quad (1)$$

By integrating Equation (1) and separating variables h and r , we obtain

$$h^2 = -\frac{Q}{\pi K} \ln(r/r_w) + h_w^2 \quad (2)$$

Where:

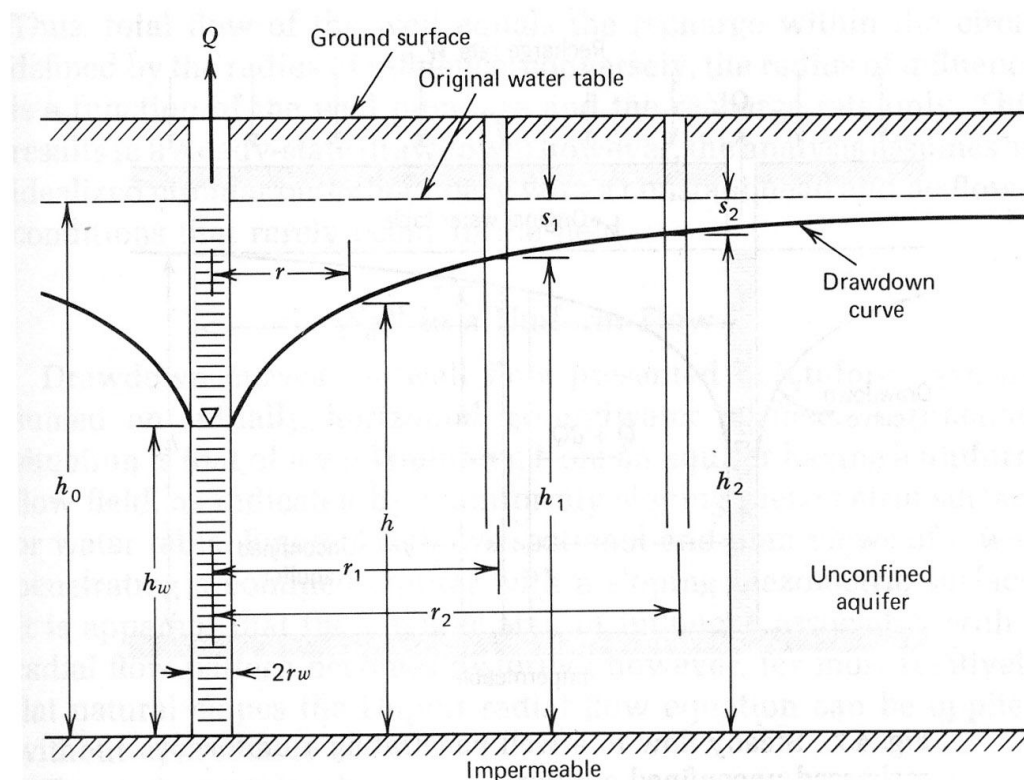
h [m] is the height of the water table above an impervious base

Q [m^3/day] is the rate of pumping discharge

K [m/day] is hydraulic conductivity

R [m] is the radius from the center of well location

r_w [m] is the radius of pumping well (see Schematic A below).



Schematic A: Radial flow to an unconfined aquifer (Todd, 1980)

5.1.1 Numerical Analysis

The abovementioned Site parameters were used to calculate the estimated steady state discharge rate for temporary construction dewatering. Groundwater monitoring data is presented in Table 3. The calculations for temporary dewatering rates are shown in Table 4.

The average hydraulic conductivity (K) of the aquifer was conservatively estimated at 0.30 m/day due to the presence of shale bedrock. The estimated steady state discharge rate for temporary construction dewatering was calculated at approximately 38 m³/day (7 USG/min), with a safety factor of 1.50. The steady state discharge rate is 25 m³/day (5 USG/min) without the safety factor.

The initial drawdown pumping rate would be higher to relieve the stored groundwater pressure (prior to the start of construction). Considering the soils onsite being mainly shale, the average specific yield is estimated as 5%. The total yield from the groundwater stored within the soil pore would be about 130 m³.

The additional discharge rate to remove the groundwater stored in the pore spaces during initial drawdown could range from 7 m³/day for a 20-day drawdown period to 4 m³/day for a 30-day drawdown period. A factor of two should be applied to account for unforeseen conditions, including potential impact of wet weather conditions and fluctuations in the groundwater table.

Additional pumping may be required to remove surface water from the Site. Assuming a rainfall event of 25 mm over a 24-hour period, about 38 m³/day of water may need to be removed from the Site following rain events.

Accordingly, the following pumping rates are required:

	Typical	Maximum	Units
Groundwater	38	52	m ³ /day
Precipitation	0	38	m ³ /day
Total	38	90	m ³ /day

5.1.2 Pumping Test

Considering that the entire existing underground is presently founded in shale bedrock, it is in MCR's opinion that a pumping/field drawdown test will not provide any useful or relevant information in this specific case.

5.2 PERMANENT FOUNDATION DRAIN FLOW RATES

For the proposed redevelopment, it is understood that the lowest ground finished floor elevation (FFE) will be at an elevation of 83.10 meters above sea level (masl). The FFE of the P3 underground floor will be at an elevation of 73.70 masl.

A sub-floor Private Water Drainage System (PWDS) with perimeter/underfloor weeping tile is proposed for the development. The invert of the PWDS is assumed to be approximately 0.5 m below the FFE of the P3 slab, i.e., at approximately 73.20 masl.

The long-term water level for the PWDS was considered the maximum water level recorded plus an additional 1 m to account for the seasonal fluctuation as well as wet weather accumulation.

The proposed PWDS is shown in Drawing No. 2. The slotted pipes should slope to a minimum of 1% slope. Perimeter drainage pipes, with a positive gravity outlet, should be solid PVC with a minimum 0.5% slope. In addition, silt traps must be provided at convenient/accessible locations.

5.2.1 Numerical Analysis

The abovementioned Site parameters were used to calculate the estimated steady state discharge rate for the PWDS. Groundwater monitoring data is presented in Table 3. The calculations for permanent drainage flow rates are shown in Table 5.

The average hydraulic conductivity (K) of the aquifer was conservatively estimated at 0.30 m/day due to the presence of shale bedrock. The estimated steady state discharge rate for the PWDS was calculated at 17 m³/day (3 USG/min).

Please note that due to the presence of bedding planes/vertical fissures in the bedrock, the discharge volume might increase with time. Monitoring of permanent sumps is recommended for quality and quantity of discharge.

5.3 MECP PERMIT TO TAKE WATER REQUIREMENT

The Permit to Take Water (PTTW) requirements for construction site dewatering have been updated to the current O.Reg.63/16 amendment to Environmental Protection Act. In accordance with the updated regulation, construction site dewatering will require a complete PTTW application when water takings greater than 400,000 L/day are predicted. Groundwater taking between 50,000 L/day and 400,000 L/day will require a limited PTTW via an online application process through the Environmental Activity and Sector Registry (EASR). Groundwater taking from a proposed building structure by means of a PWDS will require a PTTW when water taking is greater than 50,000 L/day. The complete permit application process for PTTW takes approximately twelve weeks to review and is required prior to applying for the discharge permits.

The maximum anticipated temporary dewatering discharge rate was calculated at 90 m³/day. Therefore, a limited online PTTW application through the ESAR will be required to be applied for with the MECP.

The anticipated flow rate from the PWDS was calculated at 17 m³/day. Therefore, a PTTW application for the PWDS will not be required for the proposed building.

In accordance with the current Ontario Regulation 387/04 for Water Taking, every person to whom a permit has been issued under Section 34 of the Act shall collect and record data on the volume of water taken daily. The data collected shall be measured by a flow meter or calculated using a method acceptable to a Director.

5.4 TORONTO WATER DISCHARGE PERMIT REQUIREMENTS

The City of Toronto – Toronto Water requires that any private water to be discharged into the City sewer system must have a permit or agreement in place in order to discharge; this applies to all water not purchased from the City water supply. For temporary dewatering during the construction phase, this includes all groundwater and storm water that is collected or encountered during site excavation.

The groundwater quality sample collected in April 2019 indicated that the water onsite could be discharged into the City sanitary and combined sewer system without additional filtration/treatment required. A filtration and treatment system for suspended solids and manganese would be required prior to discharging to the storm sewer system. A dewatering contractor should be approached to explore the possibility of treatment if discharge to the storm sewer is required. A short-term temporary discharge permit must be applied for construction dewatering with Toronto Water.

A long-term permanent discharge permit must be applied for the proposed PWDS since the drainage system is located below the long-term groundwater elevation. The permanent discharge permit will involve coordination with the mechanical and site servicing consultant to provide calculations and drawing specifications for the ultimate discharge location and the sampling port required by Toronto Water.

5.5 ENVIRONMENTAL PROTECTION

The Site is located within the Lake Ontario drainage basin and the lake is approximately 810 m southwest of the Site. The Site is located in the City of Toronto urban environment which obtains its municipal water supply from Lake Ontario. Therefore, there are no potable groundwater users within the vicinity of the Site.

Temporary groundwater dewatering will lower the groundwater table to below the foundation levels. It is assumed that the extracted water will be discharged into the sanitary sewer or with some filtration/treatment, into the storm sewer. Updated groundwater monitoring will be conducted by the dewatering contractor prior to and during construction activities to ensure that no additional adverse groundwater impacts are identified throughout the project's construction.

6.0 CONCLUSIONS AND RECOMMENDATIONS

MCR Engineers Ltd. were retained to conduct a Geohydrology Assessment for the Site in relation to the proposed redevelopment. The Site is currently occupied by a midrise office building with three levels of underground parking.

The Site is proposed for mixed-use residential and commercial development consisting of a sixty-five [65] storey building with a mechanical penthouse floor over three [3] levels of below grade parking. The lowest ground finished floor elevation (FFE) is expected to be at 83.10 meters above sea level (masl). The P3 FFE is expected to be at a depth of 9.40 m, corresponding to an approximate elevation of 73.70 masl.

Presently, it is assumed that the proposed building will be founded in shale supported by conventional spread/strip footings or raft foundation. The size of the shoring plan layout was assumed to cover approximately 50 m by 30 m.

With spread/strip footings, a sub-floor Private Water Drainage System (PWDS) with perimeter weeping tile will be required. It is understood that the existing foundation walls will be used as shoring. If this is not acceptable, a soldier pile and lagging shoring system will be required for temporary dewatering/excavation except where adjacent structures exist or heritage structures are to remain, in which case a caisson shoring system would be necessary.

The excavation for the proposed three level underground parking structure will extend into shale bedrock. Positive dewatering, such as well points and sump pumps, will be required for the proposed excavation.

In addition, the (weathered) sedimentary bedrock can be fractured, fissured, or contain water-bearing bedding planes. When these bedding planes are intercepted in rock excavation, a substantial amount of water, often under a significant hydrostatic head, may be encountered. The depths and condition of shale bedrock vary across the Site; therefore, its quality should be confirmed during shoring installation and general excavation through inspections in the field.

For the proposed three underground levels, groundwater is required to be drawn

down 1 m below the underside of the footing. The assumed foundation elevation is approximately 72.20 masl. However, for the purpose of temporary/construction dewatering, given the encountered subsurface conditions, groundwater cannot be lowered with well points below the average top elevation of shale bedrock at approximately 73.35 masl. Localized trenches and sumps can be used within bedrock to lower the water level below the underside of the P3 slab and footings, to an approximate elevation of 71.20 masl. This result is preliminary and should be confirmed during the construction phase and final stage of detailed design.

The maximum groundwater level recorded in the monitoring wells is at an elevation of 72.94 masl, representing an approximate 1 – 2 m hydrostatic head requiring dewatering.

The anticipated discharge rate for temporary construction dewatering was calculated between 38 – 90 m³/day (7 – 17 USG/min). Therefore, based on the amended O.Reg. 63/16 to the Environmental Protection Act, a limited online PTTW will be required through the ESAR from the MECP and a temporary discharge permit will be required from the Toronto Water.

The estimated steady state discharge rate from the PWDS was calculated at 17 m³/day (3 USG/min). Therefore, a PTTW will not be required from the MECP for the PWDS. A long-term permanent discharge permit will be required from Toronto Water since the drainage system will be installed below the long-term groundwater elevation.

The selected dewatering contract must be performance driven and the contractor must provide a performance bond. In addition, upon completion of system's installation, the contractor must produce a written statement that "The system installed is robust enough to lower and maintain groundwater at least 1.0 m below the lowest footing elevation, without impacting the integrity of shoring or foundation soils."

Presently, the groundwater sample collected onsite can be discharged to the City sanitary or combined sewer system with no additional filtration or treatment. A filtration/treatment system for suspended solids and manganese would be required prior to discharging to the storm sewer system. A dewatering contractor should be

approached to explore the possibility of treatment if discharge to the storm sewer is required.

The application process, where a PTTW is required, can take at least three months for a review by the MECP and has to be approved prior to applying for discharge permits. It is recommended that applications to Toronto Water for discharge permits be applied for at least four months prior to the required start dates. Applications are to be supported by drawings and calculations provided by the mechanical and the site servicing consultant and coordination is required amongst all disciplines.

7.0 REFERENCES

1. Ontario Ministry of the Environment. Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act. April 15, 2011.
2. Ontario Ministry of Northern Development and Mines. *Quaternary Geology of Ontario - Southern Sheet*, Map 2556, 1991.
3. Ontario Ministry of Northern Development and Mines. *Bedrock Geology of Ontario-Southern Sheet*, Map 2544, 1991.
4. D.K. Todd, *Groundwater Hydrology*, 2nd Edition, John Wiley & Sons, New York, 1980.
5. L.W. Mays, *Water Resources Engineering*, 1st Edition, John Wiley & Sons, New York, 2001.
6. R.F. Craig, *Soil Mechanics*, 7th Edition, Spon Press, London, 2004.
7. MCR report titled: *Geotechnical Report, Proposed Mixed Use, Residential/Commercial Development, 145 Wellington Street West, Toronto, Ontario*, prepared for H&R Reit – 145 Wellington, dated June 2024.

8.0 STATEMENT OF LIMITATIONS

MCR Engineers Ltd. conducted the work associated with this report in accordance with the scope of services, time and budget limitations imposed for this work. The work has been conducted according to reasonable and generally accepted local standards for an environmental consultant at the time of the work. No other warranty or representation, expressed or implied, is included or intended in this report.

The work was designed to provide an overall assessment of the environmental conditions at the Site. The conclusions presented in this report are based on the information obtained during the investigation. The work is intended to reduce the client's risk with respect to environmental impairment. No work can completely eliminate the possibility of further environmental impairment on the Site.

It should be noted that subsurface conditions might vary at locations and depths other than those locations where borings, surveys or explorations were made by MCR. Other contaminants, not tested for in this work, may also potentially be present on the Site. Even with exhaustive investigation, it is not possible to warranty the Site will be free of contaminants. Should conditions, not observed during the work, become apparent, MCR should be immediately notified to assess the situation and conduct additional work, where required. The findings of this report are based on conditions as they were observed at the time of the work.

No assurance is made regarding changes in conditions subsequent to the time of the work. Remediation cost estimates is based on the available information. The estimated costs for remediation only represent the costs for the clean-up of known contaminants that have been identified during the work. Additional costs may be incurred as a result of other contaminants or areas of contamination identified by subsequent work.

Regulatory statutes are subject to interpretation. These statutes and their interpretation may change over time, thus these issues should be reviewed with appropriate legal counsel.

MCR relied on information provided by others in this report. MCR cannot guarantee the accuracy, completeness and reliability of the information provided by others, although MCR staff attempted to seek clarification on information provided and verifies authenticity, where practical.

The information provided in this report can be relied upon by City of Toronto regarding the short and long term Sanitary Discharge Agreement applications for the Site.

9.0 CLOSURE

In accordance with your request and authorization, MCR Engineers Ltd. completed this Geohydrology Assessment Report. This report presented the methodology, findings and conclusions of the investigation. The Statement of Limitations for all work performed as part of this investigation is included.

We trust that the information provided in this report is sufficient for your present requirements. Should you have any further questions, please do not hesitate to contact our office. Thank you for retaining MCR Engineers Ltd. for this project.

Respectfully,
MCR Inc.



Prepared By:
Richard Sukhu, P.Eng.

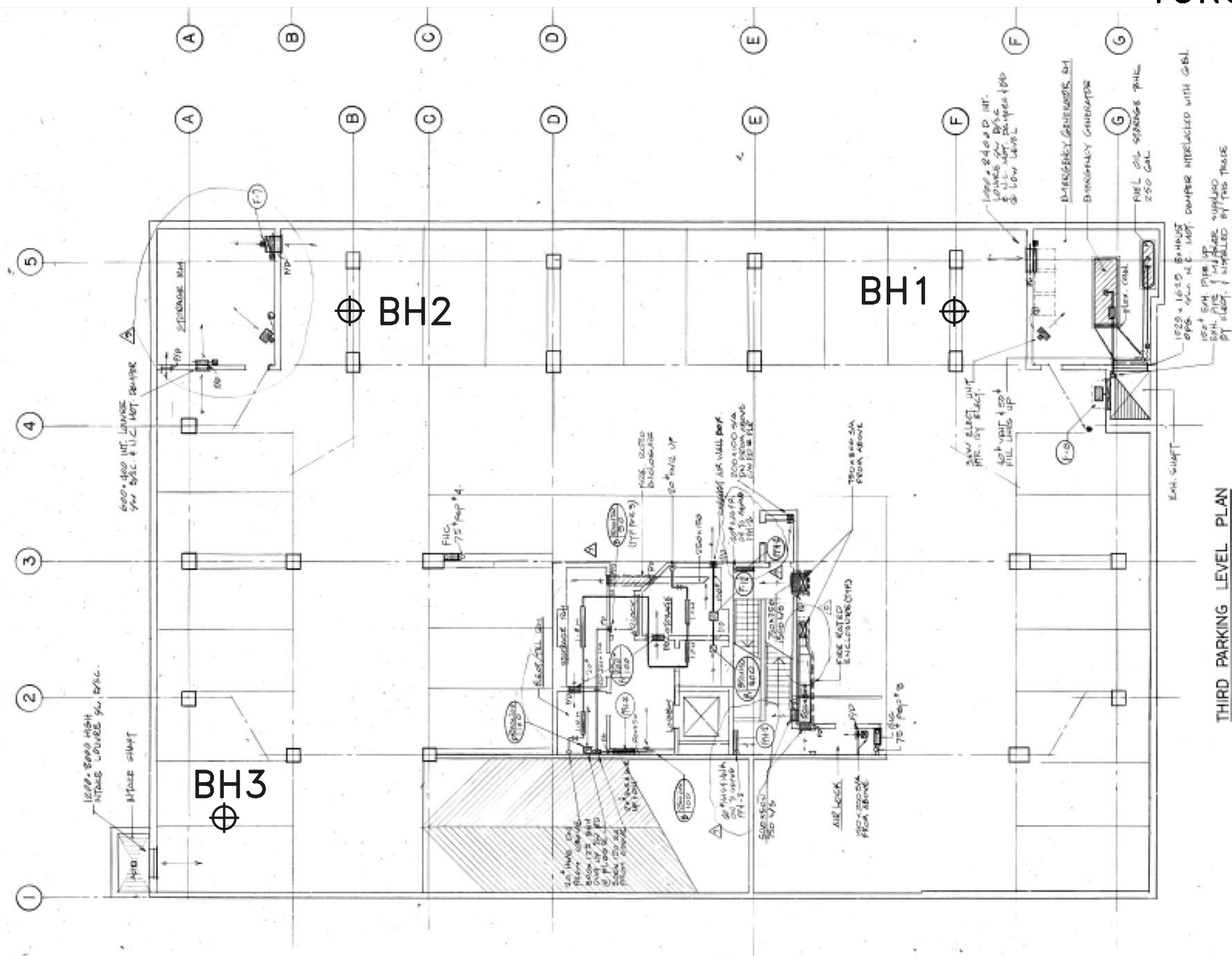
A handwritten signature in black ink, appearing to read "Lad Rak".

Reviewed By:
Lad Rak, P.Eng., M.Eng., QPESA

Date of Issue: June 12, 2024

FIGURES

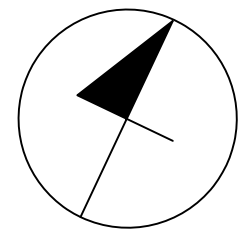
145 WELLINGTON STREET WEST TORONTO, ONTARIO



THIRD PARKING LEVEL PLAN

Legend

 GROUNDWATER MONITORING WELL
BY McCLYMONT & RAK ENGINEERS
INC., MARCH/APRIL 2019

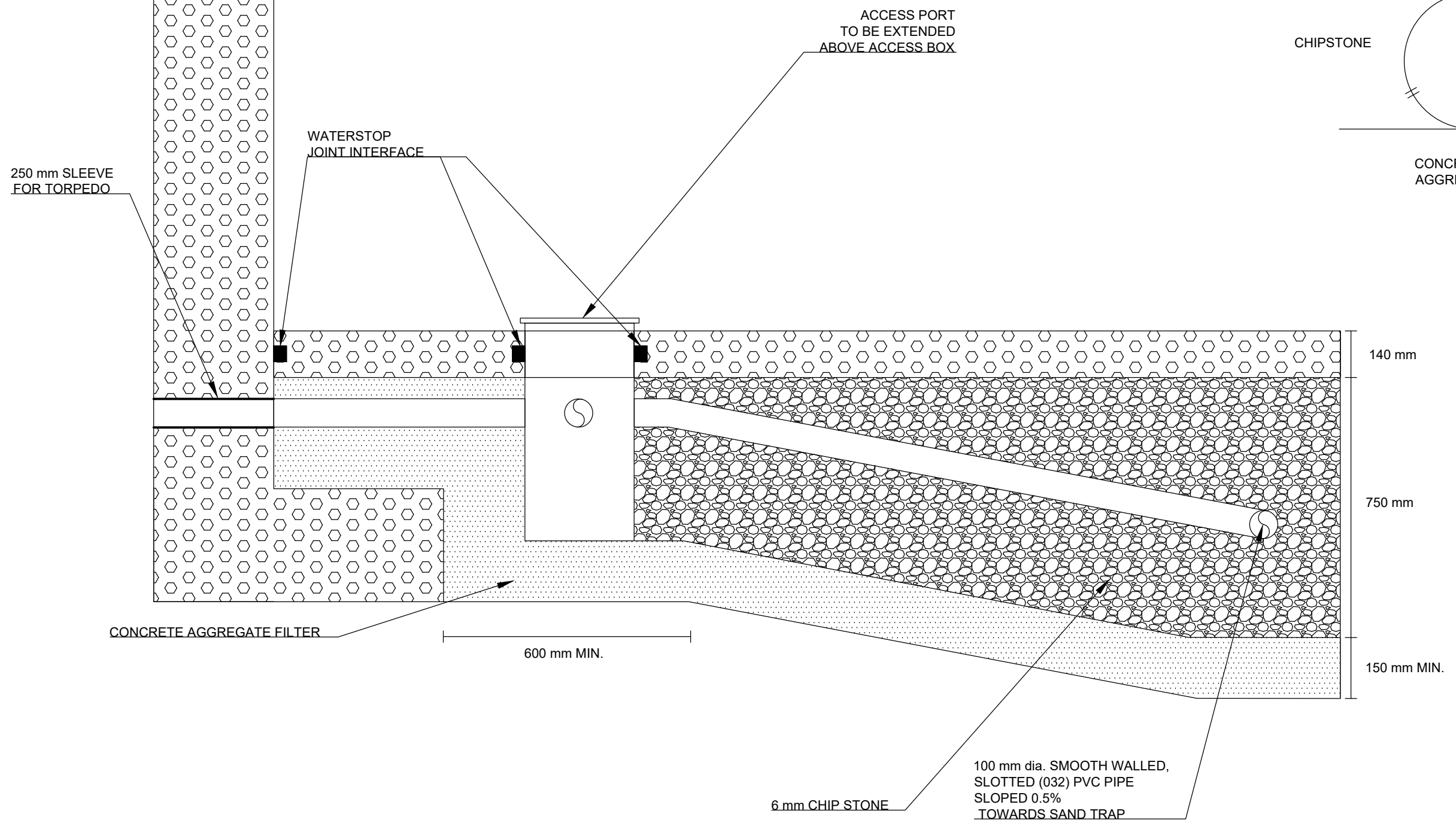
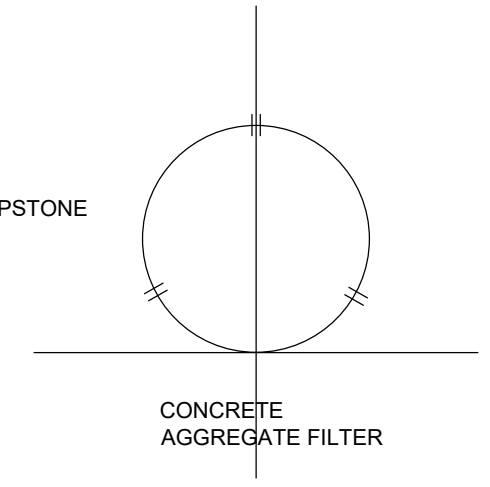


MCR | MCR ENGINEERS LTD.
GEO-ENVIRONMENTAL CONSULTANTS

BOREHOLE LOCATION PLAN

Scale	N/A	Project No.	GE5480
Date	MAY 2019	Drawing No.	1

CROSS SECTION:
100 mm dia.
SMOOTH PVC PIPE



PRIVATE WATER DRAINAGE SYSTEM	
Scale:	NTS
Drawing No.	2

TABLES

TABLE 1
CONSTRUCTION DETAILS AND ELEVATION OF MONITORING WELLS

MONITORING WELL ID	GROUND SURFACE ELEVATION (masl)	WATER LEVEL (mbgs)	GROUNDWATER ELEVATION (masl)	DATE OF MEASUREMENT (mm/dd/yyyy)	DEPTH OF WELL (mbgs)	DEPTH OF BENTONITE (mbgs)	LENGTH OF SCREEN (m)	INSIDE DIAMETER OF PIPE (mm)	TOP OF MONITORING WELL
BH 1	73.67	-	-	2019-03-28	4.57	0.90	3.05	50	FLUSH MOUNT
		0.73	72.94	2019-04-04					
BH 2	73.67	-	-	2019-03-29	4.57	0.90	3.05	50	FLUSH MOUNT
		4.28	69.39	2019-04-04					
BH 3	73.64	-	-	2019-04-03	4.57	0.90	3.05	50	FLUSH MOUNT
		1.17	72.47	2019-04-04					
Min	73.64	0.73	69.39	-	4.57	-	-	-	-
Max	73.67	4.28	72.94	-	4.57	-	-	-	-
Average	73.66	2.06	71.60	-	4.57	-	-	-	-

NOTE:

mbgs - meters below ground surface

masl - meters above sea level

N/A - Not Applicable

NF - Not Found

MCR ENGINEERS LTD.
GEO-ENVIRONMENTAL CONSULTANTS

TABLE 2
GROUNDWATER ANALYTICAL RESULTS - CITY OF TORONTO SEWERS BY-LAW DISCHARGE CRITERIA
MCR JOB#: G5480
SITE ADDRESS: 145 Wellington Street, Toronto, ON

PARAMETER	UNITS	LIMITS FOR STORM SEWER DISCHARGE	LIMITS FOR SANITARY & COMBINED SEWERS DISCHARGE	BH 1
				08-Apr-19
pH	pH Units	6.0 - 9.5	6.0 - 11.5	7.85
Total Suspended Solids	mg/L	15	350	174.0
Fluoride (F-)	mg/L	-	10	0.24
Total Kjeldahl Nitrogen (TKN)	mg/L	-	100	1.21
Total Phosphorus (P)	mg/L	0.4	10	<0.0030
Total Cyanide (CN)	mg/L	0.02	2	<0.0020
Escherichia Coli	CFU/100mL	200	-	<2
Total Aluminum (Al)	mg/L	-	50	4.58
Total Antimony (Sb)	mg/L	-	5	<0.0010
Total Arsenic (As)	mg/L	0.02	1	0.0017
Total Cadmium (Cd)	mg/L	0.008	0.7	<0.000050
Total Chromium (Cr)	mg/L	0.08	4	0.011
Total Cobalt (Co)	mg/L	-	5	0.0049
Total Copper (Cu)	mg/L	0.04	2	0.011
Total Lead (Pb)	mg/L	0.12	1	0.00129
Total Manganese (Mn)	mg/L	0.05	5	0.431
Total Mercury (Hg)	mg/L	0.0004	0.01	<0.000010
Total Molybdenum (Mo)	mg/L	-	5	0.0228
Total Nickel (Ni)	mg/L	0.08	2	0.0125
Total Selenium (Se)	mg/L	0.02	1	<0.00050
Total Silver (Ag)	mg/L	0.12	5	0.00169
Total Tin (Sn)	mg/L	-	5	<0.0010
Total Titanium (Ti)	mg/L	-	5	0.0395
Total Zinc (Zn)	mg/L	0.04	2	<0.030
Chromium (VI)	mg/L	0.04	2	<0.00050
Biological Oxygen Demand	mg/L	15	300	<2.0
Total Oil & Grease (Animal/Vegetable)	mg/L	-	150	<2.0
Total Oil & Grease Mineral/Synthetic	mg/L	-	15	<1.0
Phenols-4AAP	mg/L	0.008	1	0.0047
Benzene	µg/L	2	10	<0.50
Chloroform	µg/L	2	40	<1.0
1,2-Dichlorobenzene	µg/L	5.6	50	<0.50
1,4-Dichlorobenzene	µg/L	6.8	80	<0.50
cis-1,2-Dichloroethylene	µg/L	5.6	4000	<0.50
Dichloromethane (Methylene Chloride)	µg/L	5.2	2000	<2.0
trans-1,3-Dichloropropene	µg/L	5.6	140	<0.50
Ethylbenzene	µg/L	2	160	<0.50
1,1,1,2-Tetrachloroethane	µg/L	17	1400	<0.50
Tetrachloroethylene	µg/L	4.4	1000	<0.50
Toluene	µg/L	2	16	<0.50
Trichloroethylene	µg/L	7.6	400	<0.50
o-Xylene	µg/L	-	-	<0.50
m+p-Xylenes	µg/L	-	-	<1.0
Xylene (Total)	µg/L	4.4	1400	<1.1
Total PAHs (18 PAHs)	µg/L	2	5	<1.7
Bis(2-ethylhexyl)phthalate	µg/L	8.8	12	<2.0
3,3'-Dichlorobenzidine	µg/L	0.8	2	<0.40
Di-n-butylphthalate	µg/L	15	80	<1.0
Pentachlorophenol	µg/L	2	5	<0.50
Total PCBs	µg/L	0.4	1	<0.040
Nonylphenol	µg/L	1	20	<1.0
Total Nonylphenol Ethoxylates	µg/L	10	200	<2.0

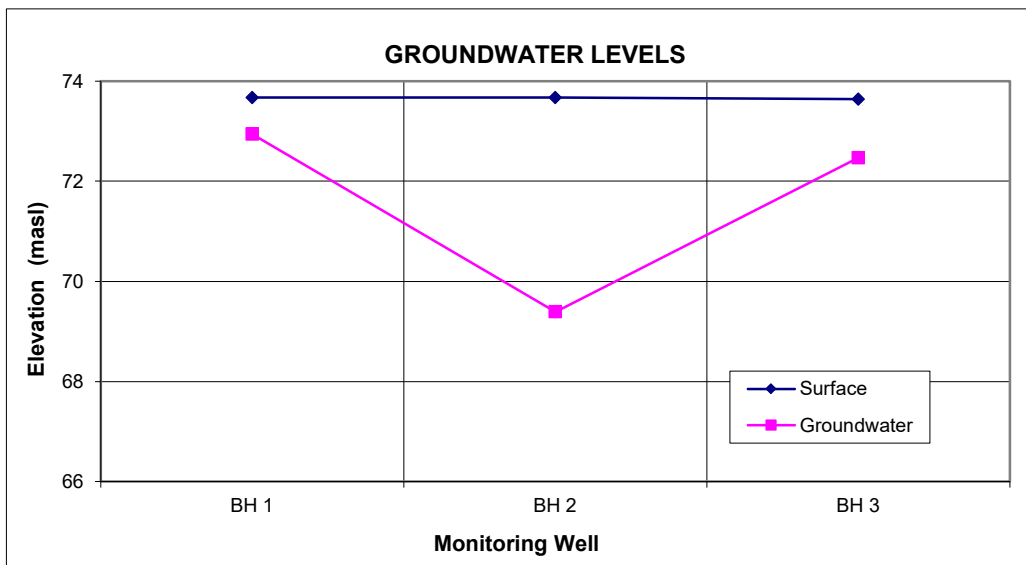
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- BOLD** Non-Detect Exceeds Criteria - Table 1 Sanitary and Combined Sewer
- BOLD** Exceeds Criteria - Table 2 Storm Sewer Criteria
- BOLD** Non-Detect Exceeds Criteria - Table 2 Storm Sewer Criteria

MCR	MCR ENGINEERS LTD.	GROUNDWATER
	GEO-ENVIRONMENTAL CONSULTANTS	

Project: Proposed Mixed-Use Residential and Commercial Development
 Location: 145 Wellington Street West, Toronto, ON
 Date: June-24
 Project #: G5480

TABLE 3
GROUNDWATER MONITORING DATA

Borehole Number	Surface Elevation	Water Level Depth	Water Level Elevation	Monitoring Date	NOTES
	(masl)	(mbgs)	(masl)	(mm/dd/yyyy)	
BH 1	73.67	0.73	72.94	4-4-2019	
BH 2	73.67	4.28	69.39	4-4-2019	
BH 3	73.64	1.17	72.47	4-4-2019	
Average	73.66	2.06	71.60		
Max			72.94		



MCR	MCR ENGINEERS LTD.	GROUNDWATER
	GEO-ENVIRONMENTAL CONSULTANTS	

Project: Proposed Mixed-Use Residential and Commercial Development
 Location: 145 Wellington Street West, Toronto, ON
 Date: June-24
 Project #: G5480

TABLE 4
DISCHARGE ESTIMATION OF CONSTRUCTION DEWATERING

Site Parameters	Units
Initial Water Level before Dewatering	72.94 (m)
Lowest Water Level during Construction Dewatering	71.20 (m)
Length of Site X	50.00 (m)
Width of Site W	30.00 (m)
Equivalent Radius r_e	21.85 (m)
Hydraulic Conductivity of Aquifer (k)	0.30 (m/day)
Aquifer Bottom Elevation	69.20 (m)
Applied Radius of Influence (Ro)	9.73 (m)
Height btw Initial Water Level and Aquifer Bottom (H)	3.74 (m)
Height btw Lowest Water Level and Aquifer Bottom (h_w)	2.00 (m)
Radius of Influence (R)	31.58 (m)
Factor of Safety (FS)	1.50

$$Q = \frac{\pi k (H^2 - h_w^2)}{\ln(R/r)}$$

Estimated steady-state discharge of dewatering	38 (m³/day)
	7 (USG/min)

MCR	MCR ENGINEERS LTD.	GROUNDWATER
	GEO-ENVIRONMENTAL CONSULTANTS	

Project: Proposed Mixed-Use Residential and Commercial Development
 Location: 145 Wellington Street West, Toronto, ON
 Date: June-24
 Project #: G5480

TABLE 5
DISCHARGE ESTIMATION OF PERMANENT DRAINAGE SYSTEM

Site Parameters	Units
Initial Water Level before Dewatering	73.94 (m)
Lowest Water Level under PDS conditions	73.20 (m)
Length of Site X	50.00 (m)
Width of Site W	30.00 (m)
Equivalent Radius r_e	21.85 (m)
Hydraulic Conductivity of Aquifer (k)	0.30 (m/day)
Aquifer Bottom Elevation	72.20 (m)
Applied Radius of Influence (Ro)	4.14 (m)
Height btw Initial Water Level and Aquifer Bottom (H)	1.74 (m)
Height btw Lowest Water Level and Aquifer Bottom (h_w)	1.00 (m)
Radius of Influence (R)	25.99 (m)
Factor of Safety (FS)	1.50

$$Q = \frac{\pi k (H^2 - h_w^2)}{\ln(R/r)}$$

Estimated steady-state discharge of dewatering	17 (m ³ /day)
	3 (USG/min)

APPENDIX A

PLAN OF SURVEY WITH TOPOGRAPHY OF
LOT D AND PART OF LOTS C AND E
AND PART OF LANE (CLOSED BY BY-LAW 434-85)
REGISTERED PLAN D-47
 CITY OF TORONTO

SCALE 1 : 200



SPEIGHT, VAN NOSTRAND & GIBSON LIMITED
 ONTARIO LAND SURVEYORS
 2019

C THE REPRODUCTION, ALTERATION OR USE OF THIS PLAN IN WHOLE OR IN PART, WITHOUT THE EXPRESS PERMISSION OF SPEIGHT, VAN NOSTRAND & GIBSON LIMITED IS STRICTLY PROHIBITED.

ELEVATION NOTE

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM THE CITY OF TORONTO BENCHMARK No. 12219740247, also known as CT247.

LOCATION :
 SOUTHEAST CORNERFRONT STREET WEST AND SIMCOE STREET
 BENCHMARK ON 7 STOREY OFFICE BLDG. 0.4M FROM CORNER 0.33 METRES ABOVE GRADE.

ELEVATION:
 PUBLISHED ELEVATION = 81.256 metres.

BEARING NOTE

BEARINGS SHOWN HEREON ARE ASTRONOMIC AND ARE REFERRED TO THE EASTERLY LIMIT OF SIMCOE STREET AS SHOWN ON BOUNDARIES ACT PLAN BA-490, HAVING A BEARING OF N16°46'50"W.

METRIC

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

LEGEND

SYMBOL	DENOTES	DESCRIPTION
■	SURVEY MONUMENT FOUND	
□	SURVEY MONUMENT PLANTED	
WT	WITNESS MONUMENT	
SIB	STANDARD IRON BAR	
SSIB	SHORT STANDARD IRON BAR	
IB	IRON BAR	
CC	CUT CROSS	
N,S,E,W	NORTH, SOUTH, EAST, WEST	
OU	ORIGIN UNKNOWN	
1075	BOUNDARIES ACT PLAN BA-490	
P1	HOLDING AND JONES LIMITED, O.L.S.	
P2	PLAN 63R-3289	
P3	SPEIGHT, VAN NOSTRAND & GIBSON LIMITED, O. L. S.	
	- PLAN DATED JUNE 15, 2018	
	PLAN 66R-30319	
MH	MANHOLE	
SIA	SIAMESE CONNECTION	
WMH	WATER MANHOLE	
HMH	HYDRO MANHOLE	
BMH	BELL MANHOLE	
CB	CATCH BASIN	
FF	FLOOR FINISH	
WV	WATER VALVE	
GV	GAS VALVE	
HW	HAND WELL	
MET	METER	
ATS	AUTOMATIC TRAFFIC SIGNAL	
CLS	CONCRETE LIGHT STANDARD	
MLS	METAL LIGHT STANDARD	
ICV	IRRIGATION CONTROL VALVE	
B	BOLLARD	
OH	OVERHEAD WIRE	
○	DECIDUOUS TREE	
✱	CONIFEROUS TREE	
■	CONCRETE	
■	BRICK	
■	METAL	

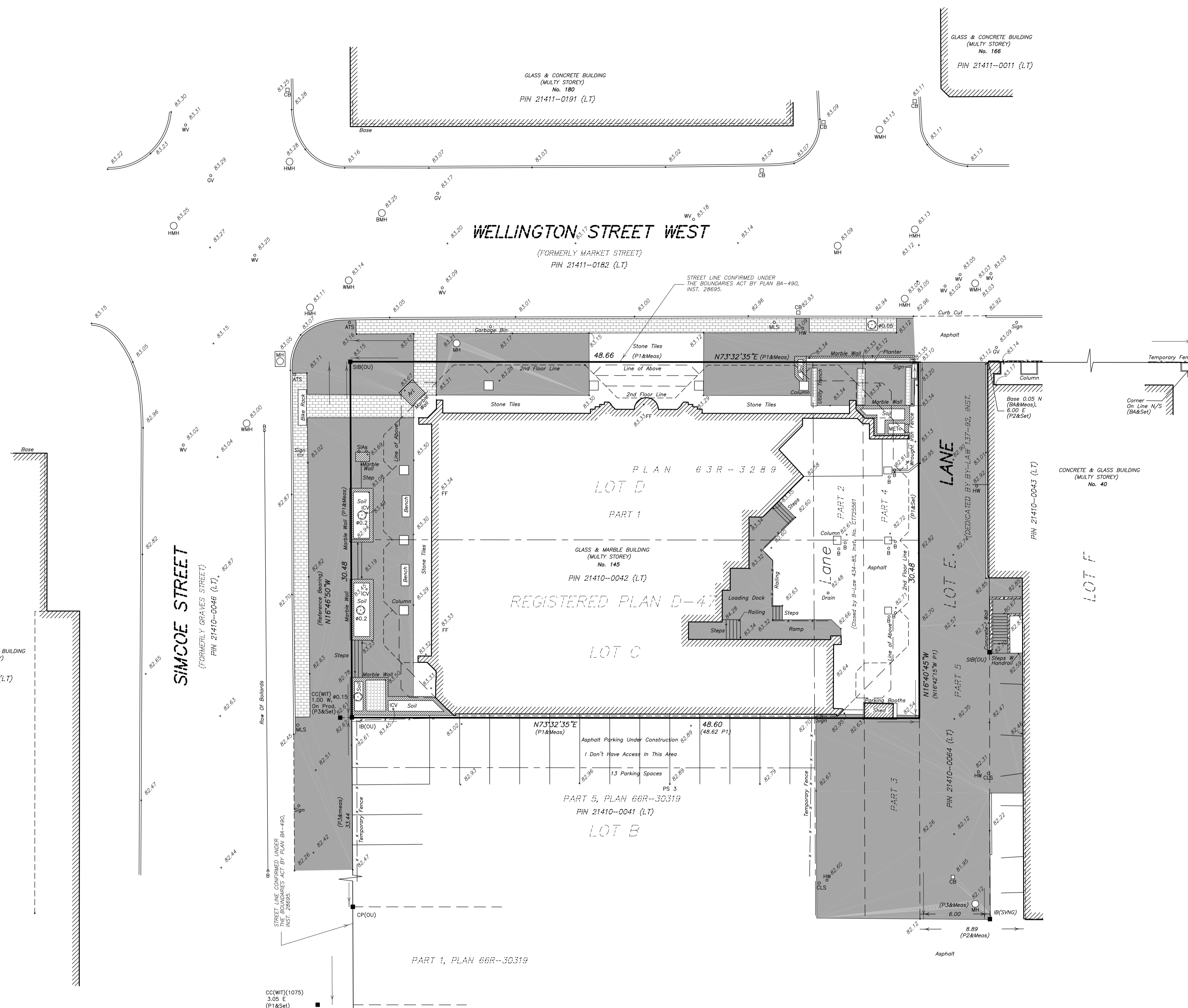
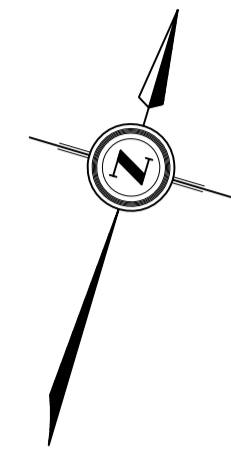
SURVEYOR'S CERTIFICATE

I CERTIFY THAT :
 1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT,
 THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
 2. THE SURVEY WAS COMPLETED ON FEBRUARY 17, 2019.

DATE : _____
 D. A. WILTON
 ONTARIO LAND SURVEYOR

SPEIGHT, VAN NOSTRAND & GIBSON LIMITED
 ONTARIO LAND SURVEYORS
 750 OAKDALE ROAD, Units 65 & 66
 TORONTO, ONTARIO M3N 2Z4
 TEL. 416 749-5VNG(7864) FAX 416 749-7866
 E-MAIL: toronto@svng.on.ca





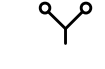

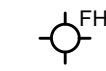
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REF. No. :	14-D47	UPDATED :	

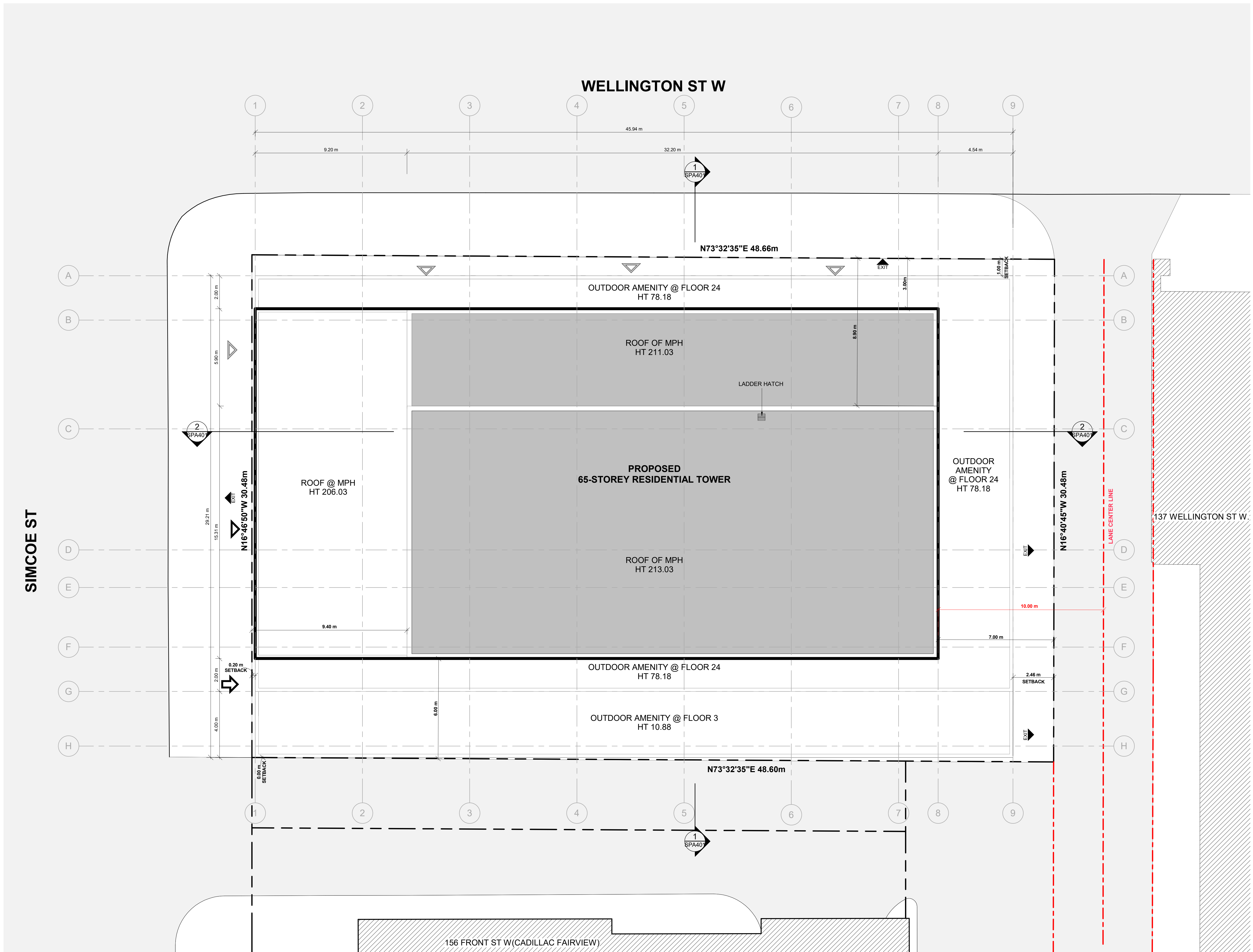


APPENDIX B

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LEGEND

-  PRIMARY RESIDENTIAL ENTRANCE
-  RETAIL ENTRANCE
-  SECONDARY RESIDENTIAL ENTRANCE
-  EXIT
-  SIAMESE CONNECTION
-  CONVEX MIRROR
-  FIRE HYDRANT



#	DATE	ISSUED FOR	DESCRIPTION	BY
1	2024-04-10	Issued for PAC		LLE



PROJECT
145 Wellington Street West
Toronto, ON

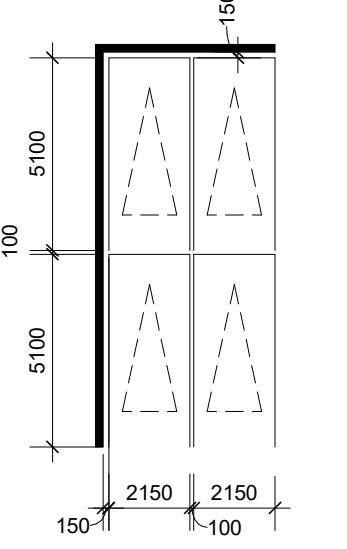
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SITE PLAN / ROOF PLAN

PROJECT NO.	18-167P01
PROJECT DATE	2024-04-10
DRAWN BY	RYT
CHECKED BY	LLE
SCALE	1 : 100

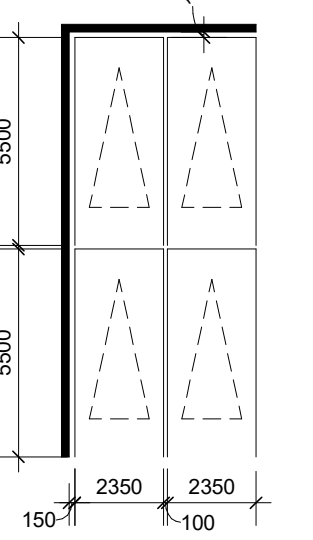
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AUTOMATIC PARKING DIMENSIONS:
STANDARD PARKING PALLET:
MIN 2.15 x 5.1 x 2.0m HIGH



XL PARKING PALLET:
MIN 2.35 x 5.5 x 2.0m HIGH



#	DATE	ISSUED FOR	DESCRIPTION	BY
1	2024-04-10	Issued for PAC		LLE



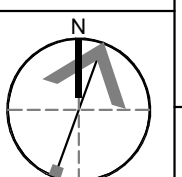
PROJECT: **145 Wellington Street West**

Toronto, ON

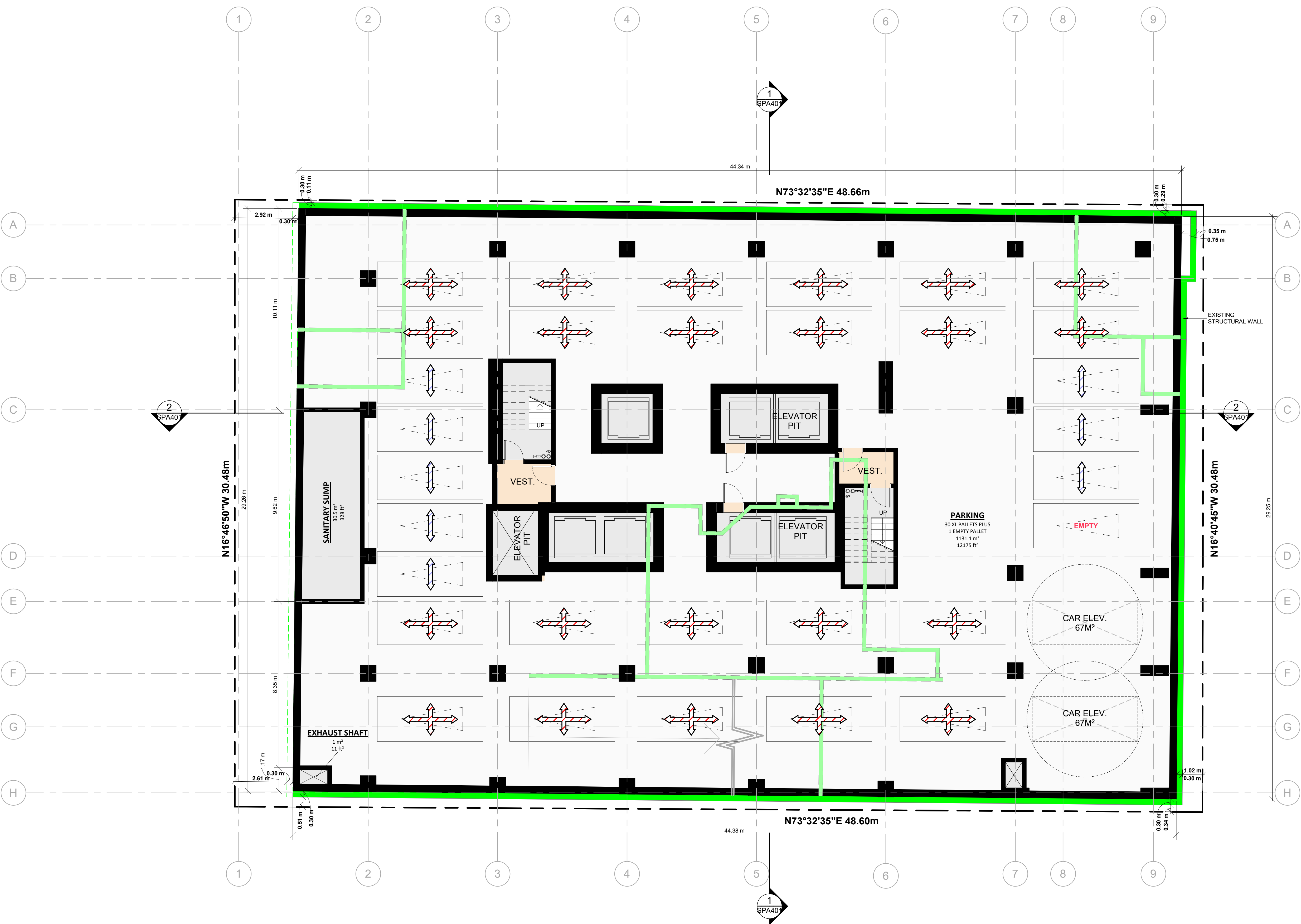
DRAWING:

UG LEVEL 03

PROJECT NO.
18-167P01
PROJECT DATE
2024-04-10
DRAWN BY
RYT
CHECKED BY
LLE
SCALE
As indicated

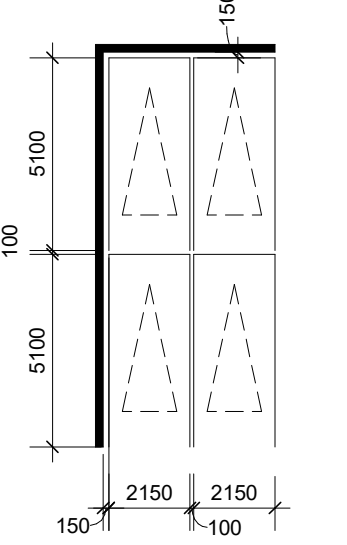


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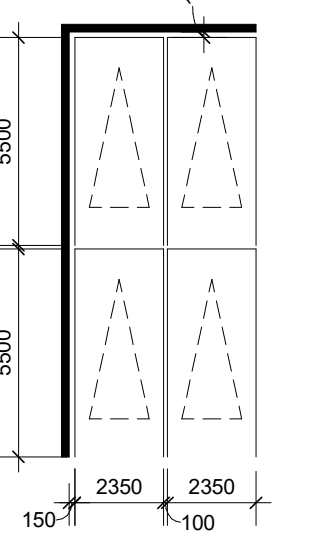


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AUTOMATIC PARKING DIMENSIONS:
STANDARD PARKING PALLET:
MIN 2.15 x 5.1 x 2.0m HIGH



XL PARKING PALLET:
MIN 2.35 x 5.5 x 2.0m HIGH



#	DATE	ISSUED FOR	DESCRIPTION	BY
1	2024-04-10	Issued for PAC		LLE

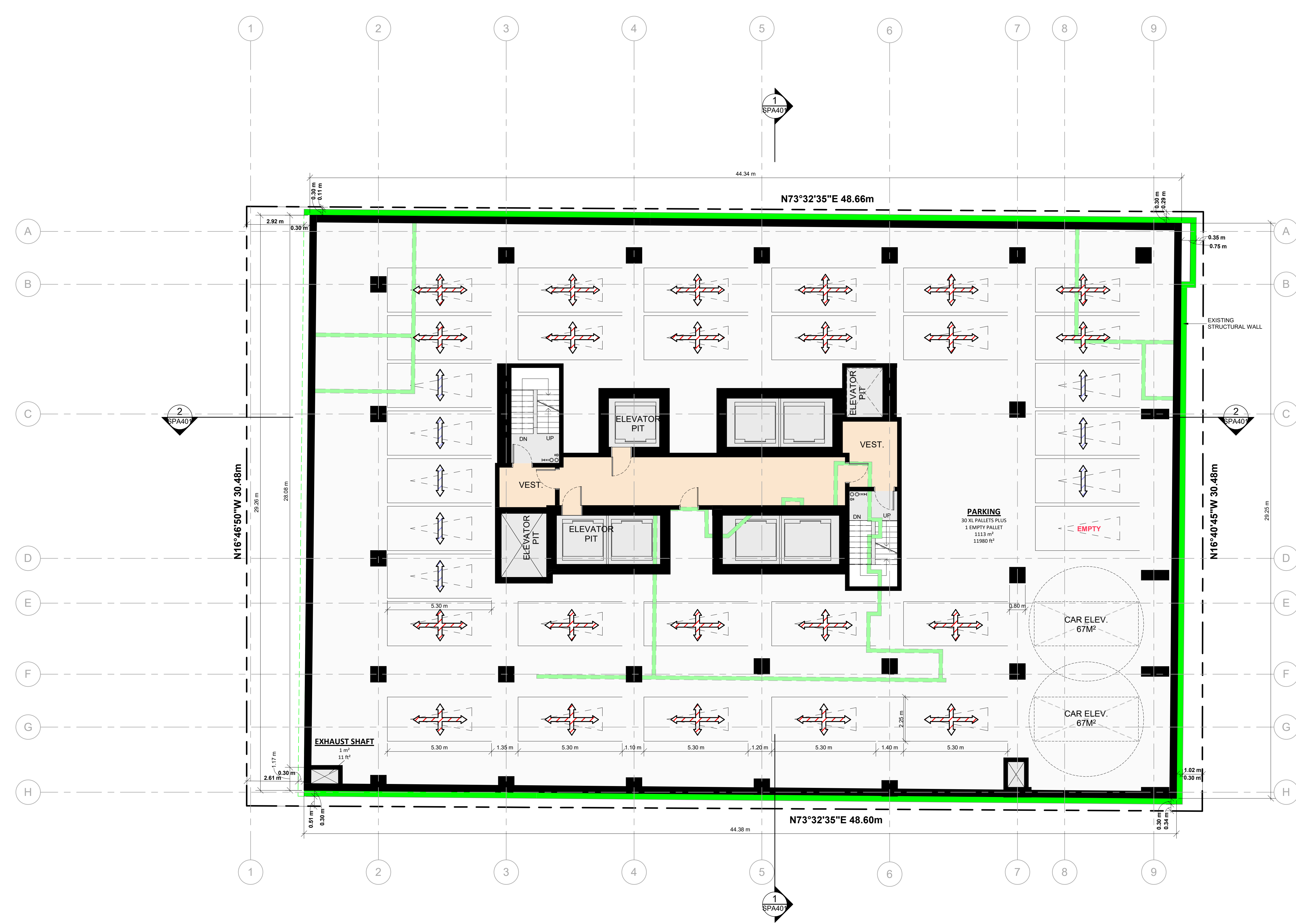


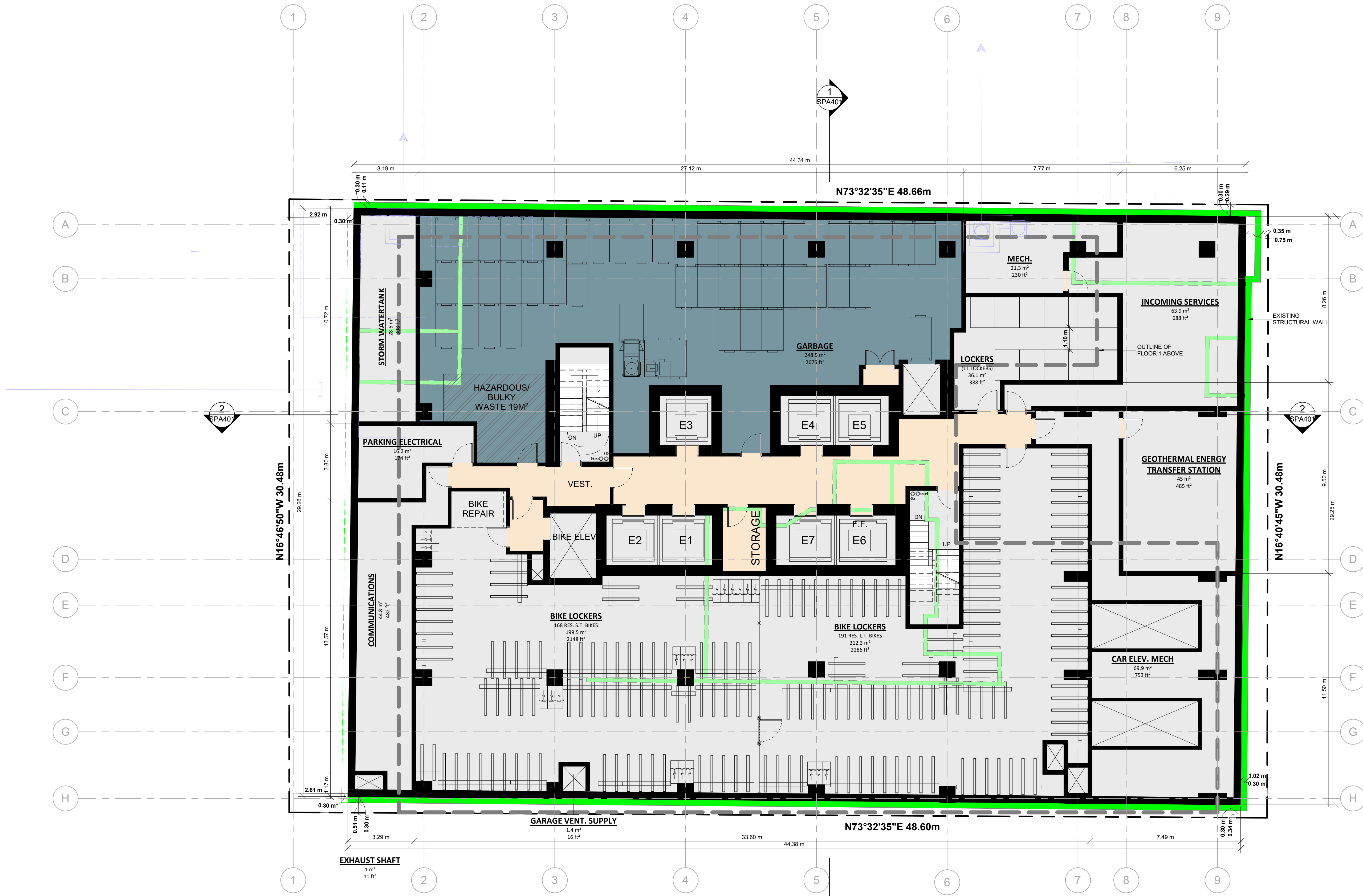
PROJECT
145 Wellington Street West
Toronto, ON

DRAWING
UG LEVEL 02

PROJECT NO.	18.167P01
PROJECT DATE	2024-04-10
DRAWN BY	RYT
CHECKED BY	LLE
SCALE	As indicated

DRAWING NO.	SPA102	REV.	1
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#	DATE	ISSUED FOR	DESCRIPTION	BY
1	2024-04-10	Issued for PAC		LLE



PROJECT
145 Wellington Street West
Toronto, ON





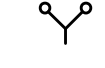

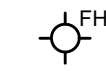
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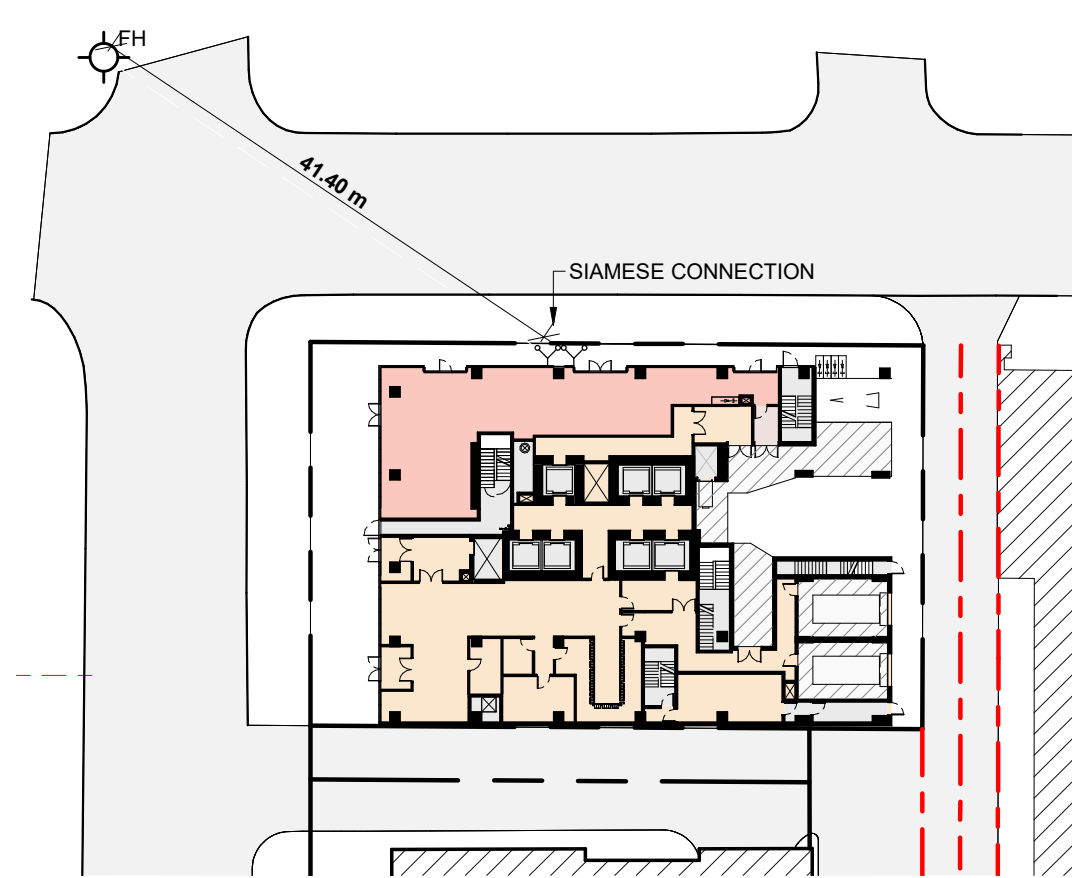
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PROJECT DATE	2024-04-10
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CHECKED BY	LLE
SCALE	1 : 100

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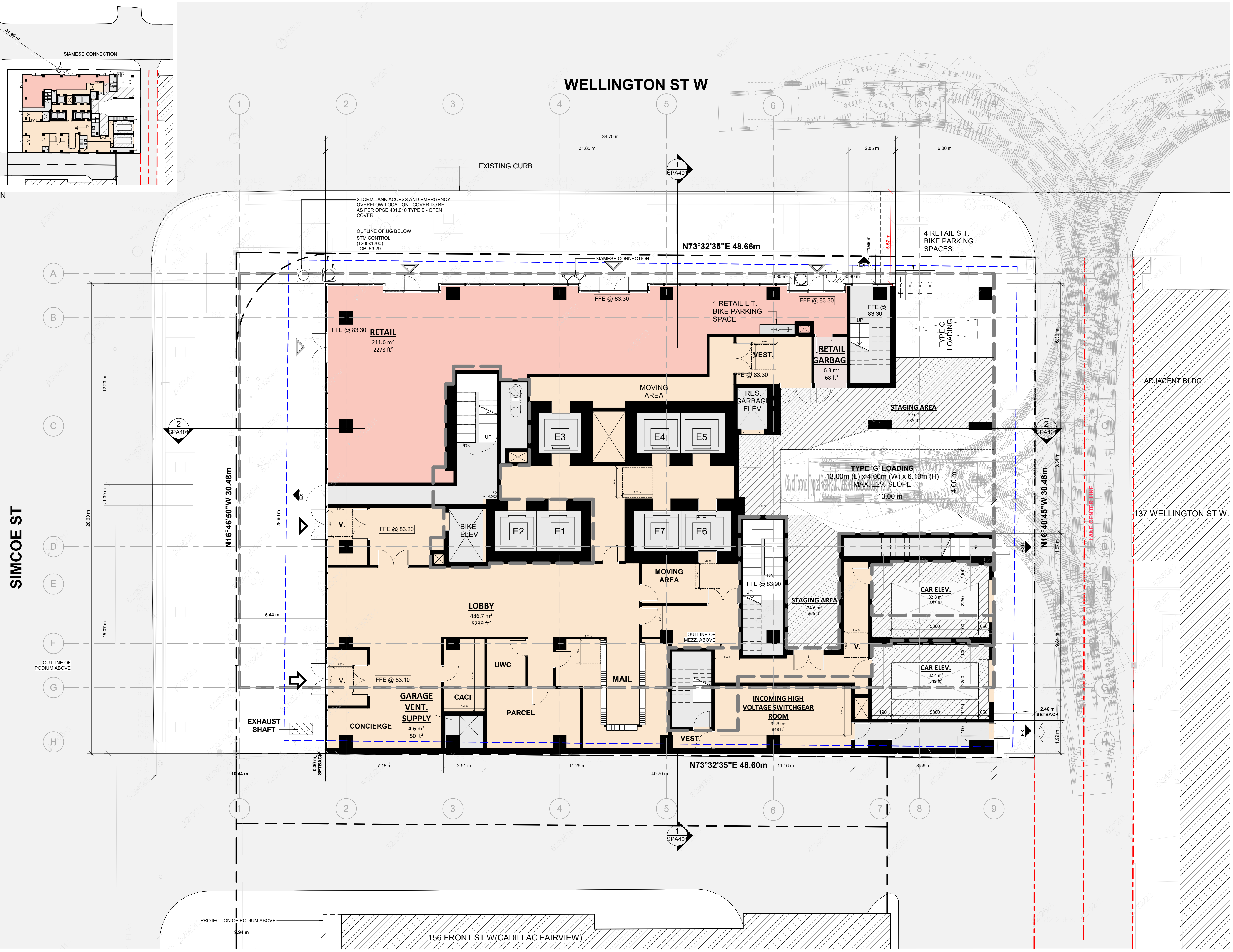
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LEGEND

-  PRIMARY RESIDENTIAL ENTRANCE
-  RETAIL ENTRANCE
-  SECONDARY RESIDENTIAL ENTRANCE
-  EXIT
-  SIAMESE CONNECTION
-  CONVEX MIRROR
-  FIRE HYDRANT



2 KEY PLAN
SPA150 1:600



#	DATE	DESCRIPTION	BY
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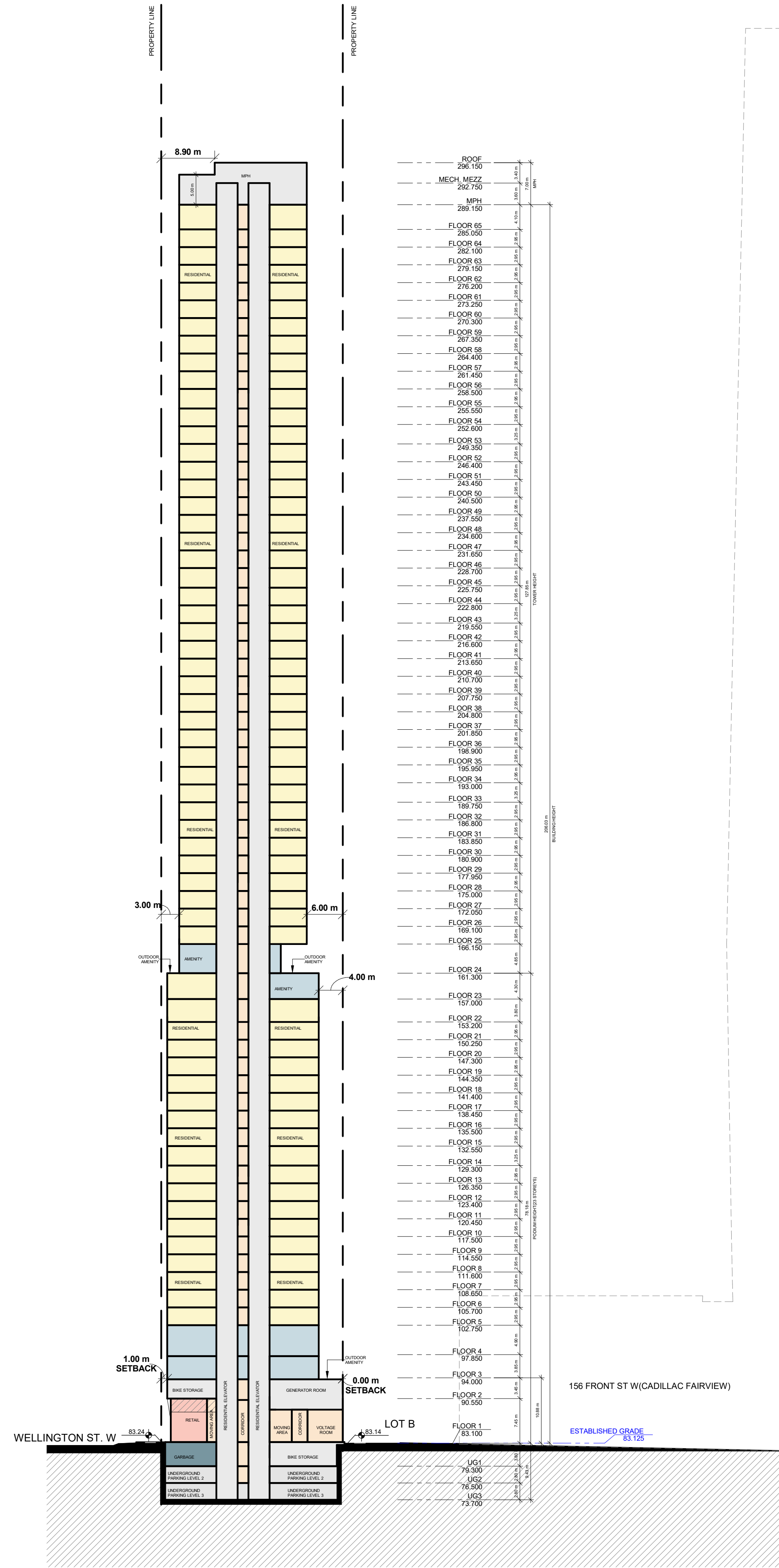
PROJECT
145 Wellington Street West
Toronto, ON

DRAWING
FLOOR 01

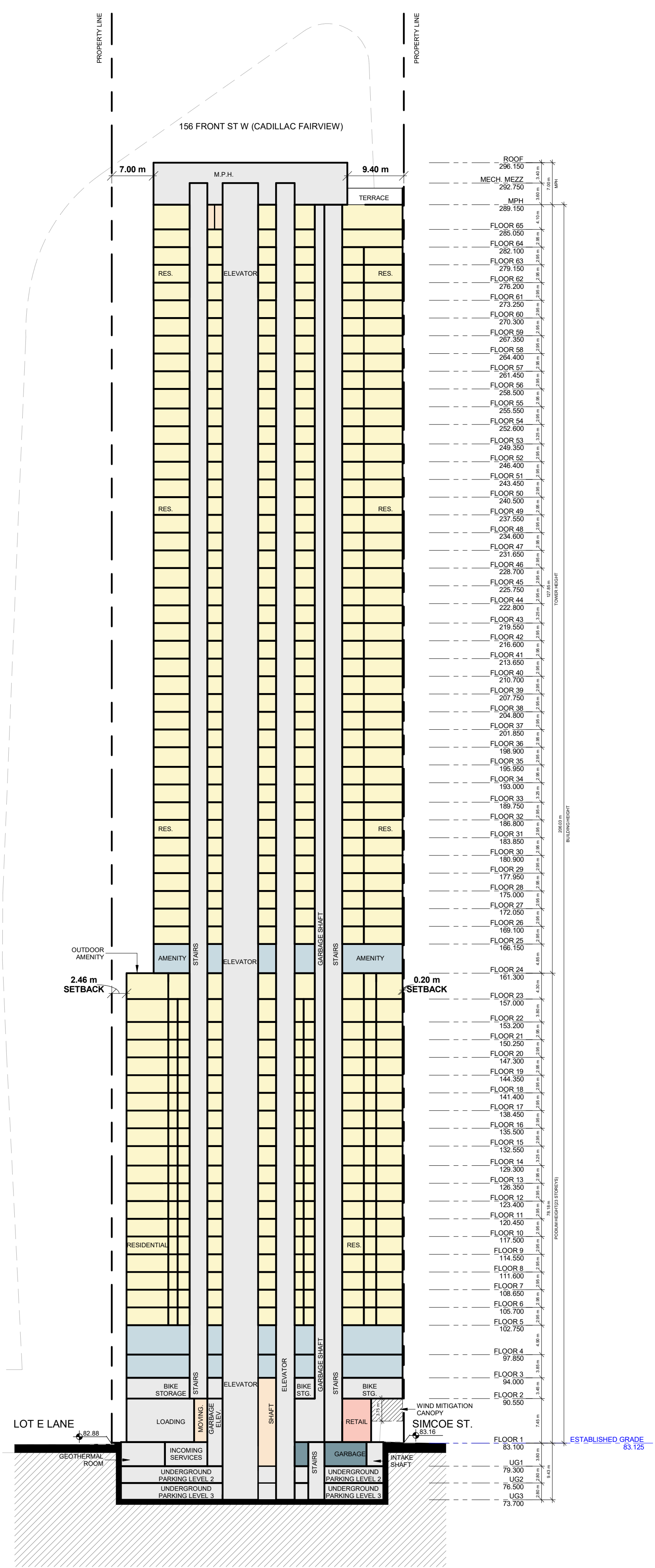
PROJECT NO.
18-167P01
PROJECT DATE
2024-04-10
DRAWN BY
RYT
CHECKED BY
LLE
SCALE
As indicated

DRAWING NO.	REV.
SPA150	1

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1 NORTH - SOUTH SECTION
SPA407 1: 500



2 EAST - WEST SECTION
SPA407 1: 500

#	DATE	ISSUED FOR	DESCRIPTION	BY
1	2024-04-10	Issued for PAC		LLE



PROJECT
145 Wellington Street West
Toronto, ON

DRAWING
BUILDING SECTIONS

PROJECT NO.
18.167P01
PROJECT DATE
2024-04-10
DRAWN BY
RYT
CHECKED BY
LLE
SCALE
1 : 500

DRAWING NO.	REV.
SPA401	1

APPENDIX C

RECORD OF BOREHOLE 1

PROJECT : GE5480
 LOCATION : 145 Wellington Street West, Toronto, Ontario
 STARTED : March 27, 2019
 COMPLETED : March 28, 2019

**MC CLYMONT & RAK
 ENGINEERS, INC.**

SHEET 1 OF 1
 DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE			SAMPLES		ORGANIC VAPOUR READINGS (ppm)				SHEAR STRENGTH: Cu, KPa				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	100 200 300 400				20 40 60 80					
								% LEL - (hexane)				WATER CONTENT, PERCENT					
							20 40 60 80				wp 10 20 30 40 w 10 20 30 40						
		GROUND SURFACE		73.67													
		125 mm CONCRETE SLAB		73.54												Flush Mount Cover	
		275 mm GRANULAR FILL: crushed limestone ("clear stone"), brown, moist, compact.		73.54 0.13	1	SS	>100										
		SHALE: grey, moist. -weathered in the upper 800 mm.		73.27 0.40												Bentonite	
		-clay filled fissures at 1.2 m depth.														1.52 m Long 50 mm ID PVC Riser	
2	POWER BORING ROCK CORING				1	CO										Silica Sand	
					2	CO										72.15	
					3	CO											
					4	CO											
					5	CO										3.05 m Long 50 mm ID Well Screen	
4																	
		End of Borehole		69.10 4.57												69.10	

GROUNDWATER ELEVATIONS

SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: 0.73 m bgs

DEEP/DUAL INSTALLATION
 WATER LEVEL:

LOGGED : FR
 CHECKED : LM

RECORD OF BOREHOLE 2

PROJECT : GE5480
 LOCATION : 145 Wellington Street West, Toronto, Ontario
 STARTED : March 29, 2019
 COMPLETED : March 29, 2019

**MC CLYMONT & RAK
 ENGINEERS, INC.**

SHEET 1 OF 1
 DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE			SAMPLES		ORGANIC VAPOUR READINGS (ppm)				SHEAR STRENGTH: Cu, KPa				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	nat V - ⊗ rem V - ●				Q - ✕ U - ▲					
								% LEL - (hexane) □				WATER CONTENT, PERCENT					
		GROUND SURFACE		73.67													
		125 mm CONCRETE SLAB		73.54 0.13	1	CO	100									Flush Mount Cover	
		300 mm GRANULAR FILL: crushed limestone ("clear stone"), brown, moist, compact.		73.24 0.43												Bentonite	
		SHALE: grey, moist. -weathered in the upper 750 mm.														1.52 m Long 50 mm ID PVC Riser	
					1	CO										Silica Sand	
2	POWER BORING ROCK CORING				2	CO										72.15	
					3	CO											
					4	CO											
4																	
		End of Borehole		69.10 4.57													
		Note: 1) Water level was not measured on completion of drilling due to use of water. 2) Combustible vapour reading was 0 ppm at 1.8 m depth in open borehole. 3) Soil samples were screened using a Rkl Eagle gas meter with methane response mode off. 4) Water level was measured at 4.28 m bgs on April 4, 2019.															

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: 4.28 m bgs

▼ DEEP/DUAL INSTALLATION
 WATER LEVEL:

LOGGED : FR
 CHECKED : LM

MCR LOG ENVIRONMENTAL 5480.GPJ 5/9/19

RECORD OF BOREHOLE 3

PROJECT : GE5480
 LOCATION : 145 Wellington Street West, Toronto, Ontario
 STARTED : March 31, 2019
 COMPLETED : April 3, 2019

**MC CLYMONT & RAK
 ENGINEERS, INC.**

SHEET 1 OF 1
 DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE			SAMPLES		ORGANIC VAPOUR READINGS (ppm)				SHEAR STRENGTH: Cu, KPa				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	100 200 300 400				20 40 60 80					
								% LEL - (hexane)				WATER CONTENT, PERCENT					
		GROUND SURFACE		73.64													
		125 mm CONCRETE SLAB	▾	73.51												Flush Mount Cover	
		SHALE: grey, moist. -weathered in the upper 950 mm.	▾	73.51 0.13	1	SS	>100									Bentonite	
																1.52 m Long 50 mm ID PVC Riser	
																▽	
					1	CO										Silica Sand	
																72.12	
					2	CO										3.05 m Long 50 mm ID Well Screen	
					3	CO											
					4	CO											
																69.07	
		End of Borehole		69.02 4.62													

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: 1.17 m bgs

▾ DEEP/DUAL INSTALLATION
 WATER LEVEL:

LOGGED : FR
 CHECKED : LM

MCR LOG ENVIRONMENTAL 5480.GPJ 5/9/19

APPENDIX D



MCCLYMONT & RAK ENG. INC
ATTN: Jeremy Bobro
111 ZENWAY BLVD.
UNIT 4
VAUGHAN ON L4H 3H9

Date Received: 08-APR-19
Report Date: 15-APR-19 15:15 (MT)
Version: FINAL

Client Phone: 416-675-0160

Certificate of Analysis

Lab Work Order #: L2254907
Project P.O. #: NOT SUBMITTED
Job Reference: E5480
C of C Numbers: 17-630730
Legal Site Desc:



Mathy Mahadera
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 95 West Beaver Creek Road, Unit 1, Richmond Hill, ON L4B 1H2 Canada | Phone: +1 905 881 9887 | Fax: +1 905 881 8062
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Summary of Guideline Exceedances

Guideline		Grouping	Analyte	Result	Guideline Limit	Unit
ALS ID	Client ID					
Ontario Toronto Sanitary Discharge Sewer By-Law 100-2016 (FEB 4,2016) - Ontario Toronto Sanitary Discharge Sewer By-Law						
(No parameter exceedances)						
Ontario Toronto Sanitary Discharge Sewer By-Law 100-2016 (FEB 4,2016) - Ontario Toronto Storm Sewer By-Law						
L2254907-1	BH1	Physical Tests	Total Suspended Solids	174	15	mg/L
		Total Metals	Manganese (Mn)-Total	0.431	0.05	mg/L

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Physical Tests - WATER

Lab ID L2254907-1
Sample Date 08-APR-19
Sample ID BH1

Analyte	Unit	Guide Limits		
		#1	#2	
pH	pH units	6.00-11.5	6.0-9.5	7.85
Total Suspended Solids	mg/L	350	15	174 ^{DLHC}

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Anions and Nutrients - WATER

Lab ID L2254907-1
Sample Date 08-APR-19
Sample ID BH1

Analyte	Unit	Guide Limits		
		#1	#2	
Fluoride (F)	mg/L	10	-	0.24 ^{DLDS}
Total Kjeldahl Nitrogen	mg/L	100	-	1.21
Phosphorus, Total	mg/L	10	0.4	<0.0030

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Cyanides - WATER


Lab ID L2254907-1
Sample Date 08-APR-19
Sample ID BH1


Guide Limits
Unit #1 #2

Analyte	Unit	#1	#2	
Cyanide, Total	mg/L	2	0.02	<0.0020

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

 Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

 Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Bacteriological Tests - WATER

Lab ID	L2254907-1
Sample Date	08-APR-19
Sample ID	BH1

	Guide Limits
Unit	#1 #2

Analyte	Unit	#1	#2	<2 ^{DLM}
E. Coli	CFU/100m L	-	200	<2 ^{DLM}

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Total Metals - WATER

Lab ID L2254907-1
Sample Date 08-APR-19
Sample ID BH1

Analyte	Unit	Guide Limits		
		#1	#2	
Aluminum (Al)-Total	mg/L	50	-	4.58 ^{DLHC}
Antimony (Sb)-Total	mg/L	5	-	<0.0010 ^{DLHC}
Arsenic (As)-Total	mg/L	1	0.02	0.0017 ^{DLHC}
Cadmium (Cd)-Total	mg/L	0.7	0.008	<0.000050 ^{DLHC}
Chromium (Cr)-Total	mg/L	4	0.08	0.0110 ^{DLHC}
Cobalt (Co)-Total	mg/L	5	-	0.0049 ^{DLHC}
Copper (Cu)-Total	mg/L	2	0.04	0.011 ^{DLHC}
Lead (Pb)-Total	mg/L	1	0.12	0.00129 ^{DLHC}
Manganese (Mn)-Total	mg/L	5	0.05	0.431 ^{DLHC}
Mercury (Hg)-Total	mg/L	0.01	0.0004	<0.000010
Molybdenum (Mo)-Total	mg/L	5	-	0.0228 ^{DLHC}
Nickel (Ni)-Total	mg/L	2	0.08	0.0125 ^{DLHC}
Selenium (Se)-Total	mg/L	1	0.02	<0.000050 ^{DLHC}
Silver (Ag)-Total	mg/L	5	0.12	0.00169 ^{DLHC}
Tin (Sn)-Total	mg/L	5	-	<0.0010 ^{DLHC}
Titanium (Ti)-Total	mg/L	5	-	0.0395 ^{DLHC}
Zinc (Zn)-Total	mg/L	2	0.04	<0.030 ^{DLHC}

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Speciated Metals - WATER

Lab ID	L2254907-1
Sample Date	08-APR-19
Sample ID	BH1

Analyte	Unit	Guide Limits		
		#1	#2	
Chromium, Hexavalent	mg/L	2	0.04	<0.00050

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Aggregate Organics - WATER

Lab ID L2254907-1
Sample Date 08-APR-19
Sample ID BH1

Analyte	Unit	Guide Limits		
		#1	#2	
BOD	mg/L	300	15	<2.0
Oil and Grease, Total	mg/L	-	-	<2.0
Animal/Veg Oil & Grease	mg/L	150	-	<2.0
Mineral Oil and Grease	mg/L	15	-	<1.0
Phenols (4AAP)	mg/L	1.0	0.008	0.0047

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Volatile Organic Compounds - WATER

Lab ID L2254907-1
Sample Date 08-APR-19
Sample ID BH1

Analyte	Unit	Guide Limits		
		#1	#2	
Benzene	ug/L	10	2	<0.50
Chloroform	ug/L	40	2	<1.0
1,2-Dichlorobenzene	ug/L	50	5.6	<0.50
1,4-Dichlorobenzene	ug/L	80	6.8	<0.50
cis-1,2-Dichloroethylene	ug/L	4000	5.6	<0.50
Dichloromethane	ug/L	2000	5.2	<2.0
trans-1,3-Dichloropropene	ug/L	140	-	<0.50
Ethylbenzene	ug/L	160	2	<0.50
1,1,2,2-Tetrachloroethane	ug/L	1400	17	<0.50
Tetrachloroethylene	ug/L	1000	4.4	<0.50
Toluene	ug/L	16	2	<0.50
Trichloroethylene	ug/L	400	7.6	<0.50
o-Xylene	ug/L	-	-	<0.50
m+p-Xylenes	ug/L	-	-	<1.0
Xylenes (Total)	ug/L	1400	4.4	<1.1
Surrogate: 4-Bromofluorobenzene	%	-	-	89.3
Surrogate: 1,4-Difluorobenzene	%	-	-	99.7

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Polycyclic Aromatic Hydrocarbons - WATER

Analyte	Unit	Guide Limits		
		#1	#2	
Lab ID L2254907-1 Sample Date 08-APR-19 Sample ID BH1				
Acenaphthene	ug/L	-	-	<0.010
Anthracene	ug/L	-	-	<0.010
Benzo(a)anthracene	ug/L	-	-	<0.010
Benzo(a)pyrene	ug/L	-	-	<0.010
Benzo(b)fluoranthene	ug/L	-	-	<0.010
Benzo(e)pyrene	ug/L	-	-	<0.050
Benzo(ghi)perylene	ug/L	-	-	<0.010
Benzo(k)fluoranthene	ug/L	-	-	<0.010
Chrysene	ug/L	-	-	<0.010
Dibenz(a,h)acridine	ug/L	-	-	<0.050
Dibenz(a,j)acridine	ug/L	-	-	<0.050
Dibenzo(a,h)anthracene	ug/L	-	-	<0.010
Dibenzo(a,i)pyrene	ug/L	-	-	<0.050
7H-Dibenzo(c,g)carbazole	ug/L	-	-	<0.050
1,3-Dinitropyrene	ug/L	-	-	<1.0
1,6-Dinitropyrene	ug/L	-	-	<1.0
1,8-Dinitropyrene	ug/L	-	-	<1.0
Fluoranthene	ug/L	-	-	<0.010
Fluorene	ug/L	-	-	<0.010
Indeno(1,2,3-cd)pyrene	ug/L	-	-	<0.010
Naphthalene	ug/L	-	-	0.013
Perylene	ug/L	-	-	<0.010
Phenanthrene	ug/L	-	-	<0.010
Pyrene	ug/L	-	-	<0.010
Surrogate: 2-Fluorobiphenyl	%	-	-	77.7
Surrogate: d14-Terphenyl	%	-	-	66.9
Surrogate: p-Terphenyl d14	%	-	-	85.0
Total PAHs	ug/L	5	2	<1.7

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Phthalate Esters - WATER

Lab ID	L2254907-1
Sample Date	08-APR-19
Sample ID	BH1

Analyte	Unit	Guide Limits		
		#1	#2	
Bis(2-ethylhexyl)phthalate	ug/L	12	8.8	<2.0
Surrogate: 2-fluorobiphenyl	%	-	-	83.8
Surrogate: p-Terphenyl d14	%	-	-	99.7

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Semi-Volatile Organics - WATER

Lab ID L2254907-1
Sample Date 08-APR-19
Sample ID BH1

Analyte	Unit	Guide Limits		
		#1	#2	
3,3'-Dichlorobenzidine	ug/L	2	0.8	<0.40
Di-n-butylphthalate	ug/L	80	15	<1.0
Surrogate: 2-Fluorobiphenyl	%	-	-	83.8
Surrogate: p-Terphenyl d14	%	-	-	99.7

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Phenolics - WATER

Lab ID	L2254907-1
Sample Date	08-APR-19
Sample ID	BH1

Analyte	Unit	Guide Limits		
		#1	#2	
Pentachlorophenol	ug/L	5	2	<0.50
Surrogate: 2,4,6-Tribromophenol	%	-	-	97.0

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Polychlorinated Biphenyls - WATER

Lab ID	L2254907-1
Sample Date	08-APR-19
Sample ID	BH1

Analyte	Unit	Guide Limits		
		#1	#2	
Aroclor 1242	ug/L	-	-	<0.020
Aroclor 1248	ug/L	-	-	<0.020
Aroclor 1254	ug/L	-	-	<0.020
Aroclor 1260	ug/L	-	-	<0.020
Total PCBs	ug/L	1	0.4	<0.040
Surrogate: 2-Fluorobiphenyl	%	-	-	58.8

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Organic Parameters - WATER

Lab ID L2254907-1
Sample Date 08-APR-19
Sample ID BH1

Analyte	Unit	Guide Limits		
		#1	#2	
Nonylphenol	ug/L	20	1	<1.0
Nonylphenol Diethoxylates	ug/L	-	-	0.16
Total Nonylphenol Ethoxylates	ug/L	200	10	<2.0
Nonylphenol Monoethoxylates	ug/L	-	-	<2.0

Guide Limit #1: Ontario Toronto Sanitary Discharge Sewer By-Law

Guide Limit #2: Ontario Toronto Storm Sewer By-Law

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
625-33DCBENZIDINE-WT	Water	3,3-Dichlorobenzidine	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD.			
625-BIS-2-PHTH-WT	Water	Bis(2-ethylhexyl)phthalate	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD.			
625-DNB-PHTH-WT	Water	Di-n-Butyl Phthalate	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD.			
625-PAH-LOW-WT	Water	EPA 8270 PAH (Low Level)	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.			
625-PCP-WT	Water	Pentachlorophenol	SW846 8270
BOD-WT	Water	BOD	APHA 5210 B
This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.			
CN-TOT-WT	Water	Cyanide, Total	ISO 14403-2
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
EC-WW-MF-WT	Water	E. Coli	SM 9222D
A 100 mL volume of sample is filtered through a membrane, the membrane is placed on mFC-BCIG agar and incubated at 44.5 – 0.2 °C for 24 – 2 h. Method ID: WT-TM-1200			
F-IC-N-WT	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
<p>Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.</p>			
MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
<p>Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.</p> <p>Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
NP,NPE-LCMS-WT	Water	Nonylphenols and Ethoxylates by LC/MS-MS	J. Chrom A849 (1999) p.467-482
<p>Water samples are filtered and analyzed on LCMS/MS by direct injection.</p>			
OGG-SPEC-CALC-WT	Water	Speciated Oil and Grease A/V Calc	CALCULATION
<p>Sample is extracted with hexane, sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.</p>			
OGG-SPEC-WT	Water	Speciated Oil and Grease-Gravimetric	APHA 5520 B
<p>The procedure involves an extraction of the entire water sample with hexane. Sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.</p>			
P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
<p>This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.</p>			
PAH-EXTRA-WT	Water	Sanitary Sewer Use By-Law Additional PAH	SW846 8270
PAH-SUM-CALC-WT	Water	TOTAL PAH's	CALCULATION
<p>Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.</p>			
PCB-WT	Water	Polychlorinated Biphenyls	EPA 8082
<p>PCBs are extracted from an aqueous sample at neutral pH with aliquots of dichloromethane using a modified separatory funnel technique. The extracts are analyzed by GC/MSD.</p>			
PH-WT	Water	pH	APHA 4500 H-Electrode
<p>Water samples are analyzed directly by a calibrated pH meter.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days</p>			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
<p>An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.</p>			
SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1°C for a minimum of four hours or until a constant weight is achieved.			
TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
Total xylenes represents the sum of o-xylene and m&p-xylene.			

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

17-630730

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guideline limits are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.



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Client: MCCLYMONT & RAK ENG. INC
 111 ZENWAY BLVD. UNIT 4
 VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-33DCBENZIDINE-WT Water								
Batch R4597708								
WG3024508-2 LCS								
3,3'-Dichlorobenzidine			61.9		%		50-140	11-APR-19
WG3024508-1 MB								
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	11-APR-19
Surrogate: p-Terphenyl d14			94.5		%		40-130	11-APR-19
625-BIS-2-PHTH-WT Water								
Batch R4597708								
WG3024508-2 LCS								
Bis(2-ethylhexyl)phthalate			91.3		%		50-140	11-APR-19
WG3024508-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	11-APR-19
Surrogate: 2-fluorobiphenyl			84.1		%		40-130	11-APR-19
Surrogate: p-Terphenyl d14			94.5		%		40-130	11-APR-19
625-DNB-PHTH-WT Water								
Batch R4597708								
WG3024508-2 LCS								
Di-n-butylphthalate			91.3		%		50-150	11-APR-19
WG3024508-1 MB								
Di-n-butylphthalate			<1.0		ug/L		1	11-APR-19
Surrogate: 2-Fluorobiphenyl			84.1		%		40-130	11-APR-19
Surrogate: p-Terphenyl d14			94.5		%		40-130	11-APR-19
625-PAH-LOW-WT Water								
Batch R4595207								
WG3024508-2 LCS								
Acenaphthene			75.5		%		50-140	11-APR-19
Anthracene			77.3		%		50-140	11-APR-19
Benzo(a)anthracene			77.2		%		50-140	11-APR-19
Benzo(a)pyrene			75.7		%		60-130	11-APR-19
Benzo(b)fluoranthene			74.8		%		50-140	11-APR-19
Benzo(ghi)perylene			87.0		%		50-140	11-APR-19
Benzo(k)fluoranthene			78.2		%		50-140	11-APR-19
Chrysene			88.7		%		50-140	11-APR-19
Dibenzo(a,h)anthracene			83.3		%		50-140	11-APR-19
Fluoranthene			79.2		%		50-140	11-APR-19
Fluorene			79.1		%		50-140	11-APR-19
Indeno(1,2,3-cd)pyrene			84.2		%		50-140	11-APR-19



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Client: MCCLYMONT & RAK ENG. INC
 111 ZENWAY BLVD. UNIT 4
 VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-PAH-LOW-WT	Water							
Batch	R4595207							
WG3024508-2 LCS								
Indeno(1,2,3-cd)pyrene			84.2		%		50-140	11-APR-19
Naphthalene			75.2		%		50-130	11-APR-19
Perylene			67.0		%		50-140	11-APR-19
Phenanthrene			75.4		%		50-140	11-APR-19
Pyrene			75.8		%		50-140	11-APR-19
WG3024508-1 MB								
Acenaphthene			<0.010		ug/L		0.01	11-APR-19
Anthracene			<0.010		ug/L		0.01	11-APR-19
Benzo(a)anthracene			<0.010		ug/L		0.01	11-APR-19
Benzo(a)pyrene			<0.010		ug/L		0.01	11-APR-19
Benzo(b)fluoranthene			<0.010		ug/L		0.01	11-APR-19
Benzo(ghi)perylene			<0.010		ug/L		0.01	11-APR-19
Benzo(k)fluoranthene			<0.010		ug/L		0.01	11-APR-19
Chrysene			<0.010		ug/L		0.01	11-APR-19
Dibenzo(a,h)anthracene			<0.010		ug/L		0.01	11-APR-19
Fluoranthene			<0.010		ug/L		0.01	11-APR-19
Fluorene			<0.010		ug/L		0.01	11-APR-19
Indeno(1,2,3-cd)pyrene			<0.010		ug/L		0.01	11-APR-19
Naphthalene			<0.010		ug/L		0.01	11-APR-19
Perylene			<0.010		ug/L		0.01	11-APR-19
Phenanthrene			<0.010		ug/L		0.01	11-APR-19
Pyrene			<0.010		ug/L		0.01	11-APR-19
Surrogate: 2-Fluorobiphenyl			80.2		%		40-130	11-APR-19
Surrogate: p-Terphenyl d14			85.3		%		40-130	11-APR-19
625-PCP-WT	Water							
Batch	R4597708							
WG3024508-2 LCS								
Pentachlorophenol			88.4		%		50-140	11-APR-19
WG3024508-1 MB								
Pentachlorophenol			<0.50		ug/L		0.5	11-APR-19
Surrogate: 2,4,6-Tribromophenol			79.0		%		40-150	11-APR-19
BOD-WT	Water							



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Client: MCCLYMONT & RAK ENG. INC
 111 ZENWAY BLVD. UNIT 4
 VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-WT								
	Water							
Batch	R4601263							
WG3024240-2	DUP	L2255094-1						
BOD		<2.0	<2.0	RPD-NA	mg/L	N/A	20	14-APR-19
WG3024240-3	LCS							
BOD			96.5		%		85-115	14-APR-19
WG3024240-1	MB							
BOD			<2.0		mg/L		2	14-APR-19
CN-TOT-WT								
	Water							
Batch	R4593605							
WG3024144-3	DUP	L2254324-1						
Cyanide, Total		<2.0	<2.0	RPD-NA	mg/L	N/A	20	09-APR-19
WG3024144-2	LCS							
Cyanide, Total			87.3		%		80-120	09-APR-19
WG3024144-1	MB							
Cyanide, Total			<0.0020		mg/L		0.002	09-APR-19
WG3024144-4	MS	L2254324-1						
Cyanide, Total			81.2		%		70-130	09-APR-19
CR-CR6-IC-WT								
	Water							
Batch	R4593390							
WG3024476-4	DUP	WG3024476-3						
Chromium, Hexavalent		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	09-APR-19
WG3024476-2	LCS							
Chromium, Hexavalent			102.1		%		80-120	09-APR-19
WG3024476-1	MB							
Chromium, Hexavalent			<0.00050		mg/L		0.0005	09-APR-19
WG3024476-5	MS	WG3024476-3						
Chromium, Hexavalent			101.0		%		70-130	09-APR-19
EC-WW-MF-WT								
	Water							
Batch	R4593427							
WG3023847-3	DUP	L2254904-1						
E. Coli		0	<10	RPD-NA	CFU/100mL	N/A	65	10-APR-19
WG3023847-1	MB							
E. Coli			0		CFU/100mL		1	10-APR-19
F-IC-N-WT								
	Water							
Batch	R4596467							
WG3024837-4	DUP	WG3024837-3						
Fluoride (F)		<0.020	<0.020	RPD-NA	mg/L	N/A	20	10-APR-19
WG3024837-2	LCS							



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Client: MCCLYMONT & RAK ENG. INC
 111 ZENWAY BLVD. UNIT 4
 VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WT		Water						
Batch	R4596467							
WG3024837-2	LCS							
Fluoride (F)			100.8		%		90-110	10-APR-19
WG3024837-1	MB							
Fluoride (F)			<0.020		mg/L		0.02	10-APR-19
WG3024837-5	MS	WG3024837-3						
Fluoride (F)			96.8		%		75-125	10-APR-19
HG-T-CVAA-WT		Water						
Batch	R4592944							
WG3023800-3	DUP	L2254871-1						
Mercury (Hg)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	09-APR-19
WG3023800-2	LCS							
Mercury (Hg)-Total			97.3		%		80-120	09-APR-19
WG3023800-1	MB							
Mercury (Hg)-Total			<0.000010		mg/L		0.00001	09-APR-19
WG3023800-4	MS	L2254871-2						
Mercury (Hg)-Total			93.6		%		70-130	09-APR-19
MET-T-CCMS-WT		Water						
Batch	R4593167							
WG3023513-4	DUP	WG3023513-3						
Aluminum (Al)-Total		0.067	0.072		mg/L	8.1	20	09-APR-19
Antimony (Sb)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	09-APR-19
Arsenic (As)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	09-APR-19
Cadmium (Cd)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	09-APR-19
Chromium (Cr)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	09-APR-19
Cobalt (Co)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	09-APR-19
Copper (Cu)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	09-APR-19
Lead (Pb)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	09-APR-19
Manganese (Mn)-Total		0.216	0.217		mg/L	0.6	20	09-APR-19
Molybdenum (Mo)-Total		0.00884	0.00885		mg/L	0.1	20	09-APR-19
Nickel (Ni)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	09-APR-19
Selenium (Se)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	09-APR-19
Silver (Ag)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	09-APR-19
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	09-APR-19
Titanium (Ti)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	09-APR-19
Zinc (Zn)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	09-APR-19
WG3023513-2	LCS							



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Client: MCCLYMONT & RAK ENG. INC
 111 ZENWAY BLVD. UNIT 4
 VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R4593167							
WG3023513-2	LCS							
Aluminum (Al)-Total			104.1		%		80-120	09-APR-19
Antimony (Sb)-Total			97.6		%		80-120	09-APR-19
Arsenic (As)-Total			95.6		%		80-120	09-APR-19
Cadmium (Cd)-Total			96.3		%		80-120	09-APR-19
Chromium (Cr)-Total			96.9		%		80-120	09-APR-19
Cobalt (Co)-Total			91.8		%		80-120	09-APR-19
Copper (Cu)-Total			97.4		%		80-120	09-APR-19
Lead (Pb)-Total			98.9		%		80-120	09-APR-19
Manganese (Mn)-Total			99.8		%		80-120	09-APR-19
Molybdenum (Mo)-Total			101.7		%		80-120	09-APR-19
Nickel (Ni)-Total			97.0		%		80-120	09-APR-19
Selenium (Se)-Total			94.7		%		80-120	09-APR-19
Silver (Ag)-Total			97.7		%		80-120	09-APR-19
Tin (Sn)-Total			92.1		%		80-120	09-APR-19
Titanium (Ti)-Total			95.1		%		80-120	09-APR-19
Zinc (Zn)-Total			98.8		%		80-120	09-APR-19
WG3023513-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	09-APR-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	09-APR-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	09-APR-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	09-APR-19
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	09-APR-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	09-APR-19
Copper (Cu)-Total			<0.0010		mg/L		0.001	09-APR-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	09-APR-19
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	09-APR-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	09-APR-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	09-APR-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	09-APR-19
Silver (Ag)-Total			<0.000050		mg/L		0.00005	09-APR-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	09-APR-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	09-APR-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	09-APR-19
WG3023513-5	MS	WG3023513-6						



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Client: MCCLYMONT & RAK ENG. INC
 111 ZENWAY BLVD. UNIT 4
 VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R4593167							
WG3023513-5 MS		WG3023513-6						
Aluminum (Al)-Total			105.5		%		70-130	09-APR-19
Antimony (Sb)-Total			97.5		%		70-130	09-APR-19
Arsenic (As)-Total			97.5		%		70-130	09-APR-19
Cadmium (Cd)-Total			101.2		%		70-130	09-APR-19
Chromium (Cr)-Total			97.3		%		70-130	09-APR-19
Cobalt (Co)-Total			88.6		%		70-130	09-APR-19
Copper (Cu)-Total			91.2		%		70-130	09-APR-19
Lead (Pb)-Total			88.7		%		70-130	09-APR-19
Manganese (Mn)-Total			N/A	MS-B	%		-	09-APR-19
Molybdenum (Mo)-Total			109.7		%		70-130	09-APR-19
Nickel (Ni)-Total			92.0		%		70-130	09-APR-19
Selenium (Se)-Total			99.1		%		70-130	09-APR-19
Silver (Ag)-Total			93.7		%		70-130	09-APR-19
Tin (Sn)-Total			92.2		%		70-130	09-APR-19
Titanium (Ti)-Total			99.6		%		70-130	09-APR-19
Zinc (Zn)-Total			93.2		%		70-130	09-APR-19
NP,NPE-LCMS-WT								
	Water							
Batch	R4593062							
WG3022819-3 DUP		WG3022819-5						
Nonylphenol		<1.0	<1.0	RPD-NA	ug/L	N/A	30	09-APR-19
Nonylphenol Monoethoxylates		<2.0	<2.0	RPD-NA	ug/L	N/A	30	09-APR-19
Nonylphenol Diethoxylates		<0.10	<0.10	RPD-NA	ug/L	N/A	30	09-APR-19
WG3022819-2 LCS								
Nonylphenol			89.4		%		75-125	09-APR-19
Nonylphenol Monoethoxylates			102.5		%		75-125	09-APR-19
Nonylphenol Diethoxylates			105.0		%		75-125	09-APR-19
WG3022819-1 MB								
Nonylphenol			<1.0		ug/L		1	09-APR-19
Nonylphenol Monoethoxylates			<2.0		ug/L		2	09-APR-19
Nonylphenol Diethoxylates			<0.10		ug/L		0.1	09-APR-19
WG3022819-4 MS		WG3022819-5						
Nonylphenol			102.0		%		50-150	09-APR-19
Nonylphenol Monoethoxylates			99.5		%		50-150	09-APR-19
Nonylphenol Diethoxylates			118.5		%		50-150	09-APR-19



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Client: MCCLYMONT & RAK ENG. INC
 111 ZENWAY BLVD. UNIT 4
 VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OGG-SPEC-WT								
	Water							
Batch	R4593741							
WG3023491-2	LCS							
Oil and Grease, Total			96.7		%		70-130	08-APR-19
Mineral Oil and Grease			84.9		%		70-130	08-APR-19
WG3023491-1	MB							
Oil and Grease, Total			<2.0		mg/L		2	08-APR-19
Mineral Oil and Grease			<1.0		mg/L		1	08-APR-19
P-T-COL-WT								
	Water							
Batch	R4595484							
WG3025029-3	DUP	L2255589-1						
Phosphorus, Total		0.0296	0.0270		mg/L	9.2	20	11-APR-19
WG3025029-2	LCS							
Phosphorus, Total			106.2		%		80-120	11-APR-19
WG3025029-1	MB							
Phosphorus, Total			<0.0030		mg/L		0.003	11-APR-19
WG3025029-4	MS	L2255589-1						
Phosphorus, Total			89.6		%		70-130	11-APR-19
PAH-EXTRA-WT								
	Water							
Batch	R4596131							
WG3024508-2	LCS							
Benzo(e)pyrene			91.6		%		60-130	11-APR-19
1,3-Dinitropyrene			190.3	LCS-H	%		60-130	11-APR-19
1,6-Dinitropyrene			145.7	LCS-H	%		60-130	11-APR-19
Dibenz(a,h)acridine			100.8		%		60-130	11-APR-19
1,8-Dinitropyrene			127.5		%		60-130	11-APR-19
Dibenz(a,j)acridine			75.0		%		60-130	11-APR-19
7H-Dibenzo(c,g)carbazole			95.8		%		60-130	11-APR-19
Dibenzo(a,i)pyrene			83.9		%		60-130	11-APR-19
WG3024508-1	MB							
Benzo(e)pyrene			<0.050		ug/L		0.05	11-APR-19
1,3-Dinitropyrene			<1.0		ug/L		1	11-APR-19
1,6-Dinitropyrene			<1.0		ug/L		1	11-APR-19
Dibenz(a,h)acridine			<0.050		ug/L		0.05	11-APR-19
1,8-Dinitropyrene			<1.0		ug/L		1	11-APR-19
Dibenz(a,j)acridine			<0.050		ug/L		0.05	11-APR-19
7H-Dibenzo(c,g)carbazole			<0.050		ug/L		0.05	11-APR-19
Dibenzo(a,i)pyrene			<0.050		ug/L		0.05	11-APR-19



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Client: MCCLYMONT & RAK ENG. INC
 111 ZENWAY BLVD. UNIT 4
 VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-EXTRA-WT		Water						
Batch	R4596131							
WG3024508-1	MB							
Surrogate: d14-Terphenyl			67.2		%		40-130	11-APR-19
PCB-WT		Water						
Batch	R4596747							
WG3023583-2	LCS							
Aroclor 1242			94.5		%		65-130	09-APR-19
Aroclor 1248			85.3		%		65-130	09-APR-19
Aroclor 1254			105.2		%		65-130	09-APR-19
Aroclor 1260			107.8		%		65-130	09-APR-19
WG3023583-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	09-APR-19
Aroclor 1248			<0.020		ug/L		0.02	09-APR-19
Aroclor 1254			<0.020		ug/L		0.02	09-APR-19
Aroclor 1260			<0.020		ug/L		0.02	09-APR-19
Surrogate: 2-Fluorobiphenyl			71.5		%		50-150	09-APR-19
PH-WT		Water						
Batch	R4593178							
WG3023640-16	DUP	WG3023640-15						
pH		7.89	7.89	J	pH units	0.00	0.2	09-APR-19
WG3023640-14	LCS							
pH			6.99		pH units		6.9-7.1	09-APR-19
PHENOLS-4AAP-WT		Water						
Batch	R4593587							
WG3023874-3	DUP	L2254904-1						
Phenols (4AAP)		0.0047	0.0043		mg/L	8.0	20	09-APR-19
WG3023874-2	LCS							
Phenols (4AAP)			95.7		%		85-115	09-APR-19
WG3023874-1	MB							
Phenols (4AAP)			<0.0010		mg/L		0.001	09-APR-19
WG3023874-4	MS	L2254904-1						
Phenols (4AAP)			91.1		%		75-125	09-APR-19
SOLIDS-TSS-WT		Water						



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Client: MCCLYMONT & RAK ENG. INC
 111 ZENWAY BLVD. UNIT 4
 VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TSS-WT		Water						
Batch	R4597007							
WG3025440-3 DUP		L2255491-2						
Total Suspended Solids		2930	3040		mg/L	3.7	20	12-APR-19
WG3025440-2 LCS								
Total Suspended Solids			100.1		%		85-115	12-APR-19
WG3025440-1 MB								
Total Suspended Solids			<2.0		mg/L		2	12-APR-19
TKN-WT		Water						
Batch	R4601548							
WG3027530-3 DUP		L2254907-1						
Total Kjeldahl Nitrogen		1.21	1.20		mg/L	0.9	20	15-APR-19
WG3027530-2 LCS								
Total Kjeldahl Nitrogen			98.6		%		75-125	15-APR-19
WG3027530-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	15-APR-19
WG3027530-4 MS		L2254907-1						
Total Kjeldahl Nitrogen			94.6		%		70-130	15-APR-19
VOC-ROU-HS-WT		Water						
Batch	R4592740							
WG3015005-4 DUP		WG3015005-3						
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	09-APR-19
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	09-APR-19
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	09-APR-19
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	09-APR-19
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	09-APR-19
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	09-APR-19
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	09-APR-19
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	09-APR-19
m+p-Xylenes		<1.0	<1.0	RPD-NA	ug/L	N/A	30	09-APR-19
o-Xylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	09-APR-19
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	09-APR-19
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	09-APR-19
trans-1,3-Dichloropropene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	09-APR-19
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	09-APR-19
WG3015005-1 LCS								
1,1,2,2-Tetrachloroethane			92.8		%		70-130	09-APR-19
1,2-Dichlorobenzene			106.8		%		70-130	09-APR-19



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Client: MCCLYMONT & RAK ENG. INC
 111 ZENWAY BLVD. UNIT 4
 VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4592740							
WG3015005-1	LCS							
1,4-Dichlorobenzene			112.2		%		70-130	09-APR-19
Benzene			113.0		%		70-130	09-APR-19
Chloroform			108.8		%		70-130	09-APR-19
cis-1,2-Dichloroethylene			104.7		%		70-130	09-APR-19
Dichloromethane			106.0		%		70-130	09-APR-19
Ethylbenzene			106.9		%		70-130	09-APR-19
m+p-Xylenes			110.9		%		70-130	09-APR-19
o-Xylene			102.1		%		70-130	09-APR-19
Tetrachloroethylene			107.9		%		70-130	09-APR-19
Toluene			109.1		%		70-130	09-APR-19
trans-1,3-Dichloropropene			101.1		%		70-130	09-APR-19
Trichloroethylene			107.9		%		70-130	09-APR-19
WG3015005-2	MB							
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	09-APR-19
1,2-Dichlorobenzene			<0.50		ug/L		0.5	09-APR-19
1,4-Dichlorobenzene			<0.50		ug/L		0.5	09-APR-19
Benzene			<0.50		ug/L		0.5	09-APR-19
Chloroform			<1.0		ug/L		1	09-APR-19
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	09-APR-19
Dichloromethane			<2.0		ug/L		2	09-APR-19
Ethylbenzene			<0.50		ug/L		0.5	09-APR-19
m+p-Xylenes			<1.0		ug/L		1	09-APR-19
o-Xylene			<0.50		ug/L		0.5	09-APR-19
Tetrachloroethylene			<0.50		ug/L		0.5	09-APR-19
Toluene			<0.50		ug/L		0.5	09-APR-19
trans-1,3-Dichloropropene			<0.50		ug/L		0.5	09-APR-19
Trichloroethylene			<0.50		ug/L		0.5	09-APR-19
Surrogate: 1,4-Difluorobenzene			101.0		%		70-130	09-APR-19
Surrogate: 4-Bromofluorobenzene			92.6		%		70-130	09-APR-19
WG3015005-5	MS	WG3015005-3						
1,1,2,2-Tetrachloroethane			93.9		%		50-150	09-APR-19
1,2-Dichlorobenzene			106.3		%		50-150	09-APR-19
1,4-Dichlorobenzene			110.4		%		50-150	09-APR-19
Benzene			113.6		%		50-150	09-APR-19



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Client: MCCLYMONT & RAK ENG. INC
 111 ZENWAY BLVD. UNIT 4
 VAUGHAN ON L4H 3H9

Contact: Jeremy Bobro

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4592740							
WG3015005-5 MS		WG3015005-3						
Chloroform			110.2		%		50-150	09-APR-19
cis-1,2-Dichloroethylene			104.8		%		50-150	09-APR-19
Dichloromethane			107.3		%		50-150	09-APR-19
Ethylbenzene			105.5		%		50-150	09-APR-19
m+p-Xylenes			109.4		%		50-150	09-APR-19
o-Xylene			101.0		%		50-150	09-APR-19
Tetrachloroethylene			105.2		%		50-150	09-APR-19
Toluene			108.2		%		50-150	09-APR-19
trans-1,3-Dichloropropene			96.5		%		50-150	09-APR-19
Trichloroethylene			107.0		%		50-150	09-APR-19

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Legend:

Limit ALS Control Limit (Data Quality Objectives)
DUP Duplicate
RPD Relative Percent Difference
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Material
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

