ABS

GEOTECHNICAL INVESTIGATION

PROPOSED MID-RISE RESIDENTIAL DEVELOPMENT AT 630 MONTREAL ROAD, OTTAWA, ONTARIO

CLIENT CODE: **GMBC100**
F/N: **UO-24-1324-00**

October 2025

CLIENT: **MB CANADA GROUP INC.**

ABS

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CONFIDENTIAL
Report presented to

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CLIENT: **MB CANADA GROUP INC.**

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REGISTRY OF REVISIONS AND ISSUANCES

REVISION #	DATE	DESCRIPTION OF MODIFICATION AND/OR ISSUANCE
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An electronic copy in PDF format	Mr. Mohamed (Max) Mahi | President

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1.0 INTRODUCTION

Groupe ABS Inc. (ABS) was retained by GMBC (the "Client") to complete a geotechnical investigation to support the design of the proposed residential development (the "Project") at the civic address 630 Montreal Road, Ottawa, Ontario (the "Site").

This investigation was carried out per the professional services proposal prepared by ABS (F/N: H241324) dated May 27, 2025. The proposal and the scope of work were accepted by the Client by means of a signed back proposal on May 28, 2025.

This report is prepared specifically and exclusively for GMBC and consultants potentially collaborating on the Project. The use of this report or the reliance on it by any third party is the responsibility of such third party. Any modifications to the Project must be reported to ABS so that the scope and relevance of the geotechnical investigation and the recommendations contained in this report can be reviewed and adjusted, if necessary. This report is subject to the limitations presented in Section 7.

This report presents the results of the investigation performed in accordance with the general terms of reference outlined above. It is understood that the Project will be performed in accordance with applicable codes and standards within its jurisdiction.

It is worth noting the Client previously retained ABS to complete a Phase II Environmental Site Assessment (ESA). The Phase II ESA is submitted under a separate cover.

2.0 SITE AND PROJECT DESCRIPTION

2.1 SITE DESCRIPTION

The Site for the Project is located at the northwest corner of the intersection on Montreal Road and Borthwick Avenue, with a municipal address of 630 Montreal Road in Ottawa, Ontario. The surrounding area consists of a mixture of existing commercial and residential developments, with adjacent properties situated to the east and south of the Site.

At the time of our field investigation, remnants of previously demolished structures including two (2) dwellings were observed on-site, including wood debris and minor concrete fragments. The Site is vegetated along its periphery, with the boundaries delineated by small trees, bushes, and grass cover. Overhead hydro lines are present along the northern and western sides of the property.

Topographically, the Site exhibits a gentle slope descending from the north-eastern boundary toward the central portion, while the eastern, western, and southern sections are relatively flat; the elevations for the ground surface at the Site based on our field investigation borehole survey were found to be near 77.984 to 79.635 meters above sea level (masl).

2.2 PROJECT DESCRIPTION

Our understanding of the Project is based on our communication, files and information provided by the Client. It is understood by ABS that the Project will consist of designing and constructing a mid-rise residential building which will include nine (9) above ground storeys, and two (2) levels of underground parking.

At the time of completing this report, the Client had provided ABS with the following documents:

- Architectural/Conceptual Drawings: Racine Ottawa 630 Montreal Road, Ottawa, ON by Yves Lussier Architect (File No.: DO7-12-21-0189, Plan No.: 18965, dated March 27, 2024);
- Elevation Plan Drawings: Racine Ottawa 630 Montreal Road, Ottawa, ON by Yves Lussier Architect, dated December 7, 2023;
- Site Plan Control Design 630 Montreal Road, Ottawa, ON Drawings by LRL Engineering (Ref. No: 210682, dated September 15, 2025);
- Plan of Survey of Part of Lots 3, 4 & 5, Registered Plan 343, City of Ottawa (Job No.: AB28300, Ref. No.: 12(a)-343GR)
- Geotechnical Investigation Report: ÉTUDE GÉOTECHNIQUE POUR UNE NOUVELLE CONSTRUCTIONS by Enviro-Experts (Ref. No.: E2021-3260, dated January 17, 2022); and,
- Summary of the Geotechnical Report by Enviro-Experts (Ref. No.: E2021-3260, dated May 3, 2023).

Based on our communication with the Client, and our review of the conceptual, and elevation plan drawings, we understand that the development will include two (2) levels of underground parking, which will extend to approximate depths of at least 8.3 metres below the existing ground surface (mbgs), and an elevator pit; we are assuming the elevator pit to extend an additional 3 m below proposed footing depths, i.e., 11.3 mbgs. We also understand that the Client previously retained a consultant, Enviro-Experts, to complete a Geotechnical Investigation Report for the Project in 2020; this report, referenced above, was completed and dated January 17, 2022. Based on our review of the Geotechnical Investigation Report by Enviro-Experts, a total of four (4) boreholes were drilled, three (3) of which included monitoring well installs. These boreholes extended to depths of 1.8 mbgs, 6.6 mbgs, 6.7 mbgs, and 12.0 mbgs. Based on our communication with the Client, we understand that the report by Enviro-Experts was not completed in accordance with the Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa and was non-compliant.

The Architect's conceptual, and elevation plan drawings are attached at the end of this report for reference in Appendix 5, and one (1) of the boreholes from the Enviro-Experts geotechnical investigation was considered as a reliant borehole and is included in Appendix 1, and in the borehole logs in Appendix 2.

3.0 GEOTECHNICAL FIELD INVESTIGATION

The ABS scope of work for this geotechnical investigation was documented in our proposal and included the below tasks.

3.1 UNDERGROUND UTILITY CLEARANCE

Public and private utility clearances were completed for the Site prior to undertaking the geotechnical field investigation. ABS completed the utility public locates request through Ontario One Call and retained a subcontractor to complete the Site's utility private locate clearances.

3.2 FIELDWORK

The fieldwork for this geotechnical investigation was conducted from June 10 through 12, 2025. The investigation included the advancement of three (3) Boreholes labelled BH25-1, BH25-2, and BH25-3 to depths ranging from 11.84 to 14.88 mbgs (elevations near 63.63 to 67.80 masl) by a geotechnical drilling subcontractor, George Downing Estate Drilling Ltd. of Grenville-sur-la-Rogue, Quebec. The boreholes were drilled by using a CME 55 truck-mounted drill rig, outfitted with hollow stem continuous flight augers and HQ casing diamond wireline coring.

Soil samples were obtained at 0.75 m intervals by using a 51 mm outside diameter split spoon sampler. The compactness or density of cohesionless soils were assessed by using Standard Penetration Test (SPTs). Advancement into the bedrock was performed by using casings and HQ double-walled wireline diamond coring methods.

Monitoring wells were installed in Boreholes BH25-2 and BH25-3. Each well consisted of a flush-mount protective cover at the surface. A 1.5 m long well screen was installed at the bottom of each borehole, positioned within the bedrock to facilitate groundwater monitoring. Both monitoring wells for this investigation were developed, and groundwater level measurements were made.

The annular space surrounding the screen was backfilled with clean silica sand from the base of the borehole to approximately 0.3 m above the top of screen. A bentonite hole plug seal was placed from 0.3 m above the screen to approximately 0.61 m below the ground surface. The remaining upper portion of the borehole, from 0.61 m below ground surface to the surface, was backfilled with sand to complete the installation. The location of all drilled boreholes is presented in Figure GEO-01 in Appendix 1, and the respectable borehole logs are provided in Appendix 2.

3.3 SITE LAYOUT AND SURVEYING OPERATIONS

A geodetic survey for the boreholes was completed using an Emlid Reach RS2+ Multi-band RTK GNSS receiver, which was operated in Real-Time Kinematic (RTK) mode using Networked Transport of RTCM via Internet Protocol (NTRIP) to receive real-time correction data and enable centimeter-level accuracy.

The coordinates and elevations of the boreholes are referenced to the Canadian Spatial Reference System (CSRS) UTM NAD 1983 Zone 18 North coordinate system.

The location, coordinates, and elevation of the boreholes in this geotechnical investigation report are presented on Figure GEO-01 in Appendix 1, and their respectable logs in Appendix 2.

4.0 GEOTECHNICAL LABORATORY TESTING

The samples collected during the field investigation were transported to ABS's laboratory for the purposes of sample and log reviews, analysis, identification, and classification. All samples underwent a thorough visual examination by a senior geotechnical engineer. Geotechnical laboratory testing was performed on representative selected soil samples, and included:

- Grain Size Analyses on four (4) representative soil samples;
- Water content on fourteen (14) representative soil samples;
- Uniaxial compressive strength and unit weight on six (6) representative rock core samples; and,
- Corrosion potential (pH, chloride, sulphate, resistivity, sulphide, and Redox potential) on two (2) representative soil samples.

The results of the geotechnical laboratory testing are included in Appendix 3.

All samples recovered from the boreholes which were not subject to laboratory testing will be stored for a period of three (3) months from the date of the final report. Afterward, they will be disposed of unless a written notice regarding their disposition is provided to ABS.

5.0 SOIL STRATIGRAPHY AND PROPERTIES

The stratigraphy of the soil and bedrock encountered in the ABS and Enviro-Experts borehole locations is summarized in the tables below and detailed in the borehole logs presented in Appendix 2.

TABLE 1: SUMMARY OF THE ENCOUNTERED STRATIGRAPHY – ABS BOREHOLES

BOREHOLE	ASPHALT DEPTH (mbgs) [EL. (masl)]	GRANULAR BASE DEPTH (mbgs) [EL. (masl)]	SAND/SILTY GRAVELLY SAND (FILL) DEPTH (mbgs) [EL. (masl)]	SILTY SAND/SANDY SILT DEPTH (mbgs) [EL. (masl)]	SILTY SAND/SANDY GRAVEL (TILL) DEPTH (mbgs) [EL. (masl)]	BEDROCK DEPTH (mbgs) [EL. (masl)]
BH25-1	--	--	0.0 – 3.05 [77.98 – 74.93]	3.05 – 5.33 [74.93 – 72.65]	5.33 – 8.66 [72.65 – 69.32]	8.66 – 11.91* [69.32 – 66.07]
BH25-2 (MW)	0.0 – 0.03 [79.64 – 79.61]	0.03 – 0.15 [79.61 – 79.49]	0.15 – 3.05 [79.49 – 76.59]	--	3.05 – 6.86 [76.59 – 72.78]	6.86 – 11.84* [72.78 – 67.80]
BH25-3 (MW)	0.0 – 0.03 [78.51 – 78.48]	0.03 – 0.15 [78.48 – 78.36]	0.15 – 3.05 [78.36 – 75.46]	--	3.05 – 5.38 [75.46 – 73.13]	5.38 – 14.88* [73.13 – 63.63]

*Borehole terminated at noted depth.

TABLE 2: SUMMARY OF THE ENCOUNTERED STRATIGRAPHY – ENVIRO-EXPERTS BOREHOLES

BOREHOLE	ASPHALT DEPTH (mbgs)	GRANULAR BASE DEPTH (mbgs)	SAND/SILTY GRAVELLY SAND (FILL) DEPTH (mbgs)	SILTY SAND/SANDY SILT DEPTH (mbgs)	SILTY SAND/SANDY GRAVEL (TILL) DEPTH (mbgs)	BEDROCK DEPTH (mbgs)
F-01	0.0 – 0.05	--	0.05 – 2.39	--	2.39 – 9.00	9.00 – 12.04*

*Borehole terminated at noted depth.

5.1 SUBSURFACE SOIL, ROCK, AND GROUNDWATER CONDITIONS

5.1.1 Asphalt and Granular Base

The ABS Boreholes BH25-2 and BH25-3 were located on existing asphaltic pavement; the thickness of the asphalt measured in the boreholes was approximately 30 mm. The Enviro-Experts Borehole F-01 was located on existing asphaltic pavement as well; the thickness of the asphalt measured in this borehole was 50 mm.

In the ABS Boreholes BH25-2 and BH25-3, the asphalt was underlain by a layer of granular base course material consisting of gravelly sand to sand and gravel. The thickness of the granular base course was approximately 125 mm.

5.1.2 FILL

A layer of FILL was encountered in all the ABS boreholes, either below the granular base or at the surface. This layer of FILL generally consisted of sand, trace gravel, trace silt/silty gravelly sand. It was observed to be reddish to greyish brown in colour and recovered in damp to moist state with moisture contents ranging from 6 to 10%. The recorded SPT 'N' value in the FILL ranged from 6 to 17 blows/300 mm, indicating that the FILL is loose to compact. The FILL layer extended either from the ground surface or below the granular base to maximum depths of 3.05 mbgs corresponding to elevations near 74.93 to 76.59 masl.

In the Enviro-Experts Borehole F-01, the FILL was encountered below the asphalt. It consisted of sand and gravel to sand with traces of gravel, and was brown in colour. The recorded SPT 'N' value for the FILL in this Borehole ranged from 9 to 31 blows/300 mm, indicating that the FILL is loose to dense. The FILL deposit in this Borehole extended from 0.05 to 2.39 mbgs.

Two (2) samples from the deposit underwent grain-size sieve analysis testing, and six (6) samples underwent moisture content determination. The test results are summarized in Table 3 and are included in Appendix 3.

TABLE 3: GRAIN SIZE ANALYSIS AND WATER CONTENT TESTS SUMMARY – FILL

BOREHOLE [SAMPLE ID]	DEPTH (mbgs) [ELEVATION (masl)]	SIZE FRACTION (%)				W_N (%)	REMARKS
		GRAVEL	SAND	SILT	CLAY		
BH25-1 [SS1]	0.0 – 0.61 [77.98 – 77.37]	--	--	--	--	10	--
BH25-1 [SS2]	0.76 – 1.37 [77.22 – 76.61]	7.0	88.3	4.7		--	Sand, traces of gravel, traces of silt
BH25-1 [SS3]	1.52 – 2.13 [76.46 – 75.85]	--	--	--	--	6	--
BH25-2 [SS2]	0.76 – 1.37 [78.88 – 78.27]	--	--	--	--	10	--
BH25-2 [SS4]	2.29 – 2.90 [77.35 – 76.74]	--	--	--	--	7	--
BH25-3 [SS1]	0.0 – 0.61 [78.51 – 77.90]	28	50.7	21.3		--	Silty gravelly sand
BH25-3 [SS2]	0.76 – 1.37 [77.75 – 77.14]	--	--	--	--	7	--
BH25-3 [SS4]	2.29 – 2.90 [76.22 – 75.61]	--	--	--	--	6	--

5.1.3 Silty Sand/Sandy Silt

In the ABS Borehole BH25-1, a layer of native silty sand/sandy silt with trace clay was encountered below the FILL. It was observed to be brown to greyish brown in colour and recovered in a damp to wet state

with moisture contents ranging from 7 to 21 %. The recorded SPT 'N' value within the silty sand/sandy silt ranged from 10 to 17 blows/300 mm, indicating a compact density/stiff consistency. The silty sand/sandy silt extended from 3.05 to 5.33 mbgs corresponding to elevations near 72.65 to 74.93 masl.

Two (2) samples from the deposit underwent water content determination testing. The test results are summarized in Table 4 and are included in Appendix 3.

TABLE 4: WATER CONTENT TESTS SUMMARY – SILTY SAND/SANDY SILT

BOREHOLE [SAMPLE ID]	DEPTH (mbgs) [ELEVATION (masl)]	SIZE FRACTION (%)				W_N (%)	REMARKS
		GRAVEL	SAND	SILT	CLAY		
BH25-1 [SS5]	3.05 – 3.66 [74.93 – 74.32]	--	--	--	--	7	--
BH25-1 [SS7]	4.57 – 5.18 [73.41 – 72.80]	--	--	--	--	21	--

5.1.4 Sand/Sand and Gravel (TILL)

In all the ABS boreholes, a lay of sand, some gravel, trace silt/ sand and gravel, trace silt was encountered below the native silty sand/sandy silt or the FILL material. It was observed to be brown/brownish grey to greyish black in colour and recovered in a moist to wet state with moisture contents ranging from 4 to 14 %. The recorded SPT 'N' value within the till layer ranged from 5 to over 50 blows/300 mm, indicating that the till layer is loose to very dense. The depths of the till layer ranged from approximately 3.05 to 8.66 mbgs corresponding to elevations near 69.32 to 76.59 masl.

In the Enviro-Experts Borehole F-01, the sand/gravelly sand with traces of silt (TILL) was encountered below the FILL. It was brown in colour and recovered in a moist to wet state. The recorded SPT 'N' value for the sand/gravelly sand (TILL) in this Borehole ranged from 3 to 37 blows/300 mm, indicating that the sand/gravelly sand (TILL) is loose to dense. The sand/gravelly sand (TILL) deposit in this Borehole extended from 2.39 to 9.00 mbgs.

Two (2) samples from the deposit underwent grain-size sieve analysis testing, and six (6) samples underwent moisture content testing. The test results are summarized in Table 5 and are included in Appendix 3.

TABLE 5: GRAIN SIZE ANALYSIS AND WATER CONTENT TESTS SUMMARY – SAND/SAND AND GRAVEL (TILL)

BOREHOLE [SAMPLE ID]	DEPTH (mbgs) [ELEVATION (masl)]	SIZE FRACTION (%)				W_N (%)	REMARKS
		GRAVEL	SAND	SILT	CLAY		
BH25-1 [SS9]	6.1 – 6.71 [71.88 – 71.27]	--	--	--	--	10	--
BH25-1	7.62 – 8.23	--	--	--	--	7	--

BOREHOLE [SAMPLE ID]	DEPTH (mbgs) [ELEVATION (masl)]	SIZE FRACTION (%)				W_N (%)	REMARKS
		GRAVEL	SAND	SILT	CLAY		
[SS11]	[70.36 – 69.75]						
BH25-2 [SS6]	3.81 – 4.42 [75.83 – 75.22]	--	--	--	--	5	--
BH25-2 [SS8]	5.33 – 5.94 [74.31 – 73.70]	13.0	78.9	8.1		14	Sand, some gravel, traces of silt
BH25-2 [SS10]	6.86 – 7.47 [72.78 – 72.17]	--	--	--	--	12	--
BH25-3 [SS6]	3.81 – 4.42 [74.70 – 74.09]	--	--	--	--	4	--
BH25-3 [SS7]	4.57 – 5.18 [73.97 – 73.33]	38.0	52.2	9.8		--	Sand and Gravel, traces of silt

5.1.5 Bedrock

Bedrock was encountered and cored in all the ABS boreholes. The rock was generally described as Shale, which was slightly weathered, strong, and black to greyish black in colour; in Borehole BH25-3, some of the shale was interbedded with limestone. The rock was poor to fair quality at the top, becoming of good to excellent quality with depth based on the Rock Quality Designation (RQD) with minimal joints, clay seams, and fracturing, if any. The top of the rock was encountered at depths ranging from 5.38 to 8.66 mbgs corresponding to elevations near 69.32 to 73.13 masl.

In the Enviro-Experts Borehole F-01, bedrock was encountered below the sand/gravelly sand (TILL). The bedrock was described as very poor to fair quality based on the RQD. The rock was encountered at a depth of 9.00 mbgs.

Photographs of the recovered ABS rock cores are included in Appendix 4.

Six (6) samples from the rock underwent unit weight and unconfined compressive strength testing. The test results are summarized in Table 6 and are included in Appendix 3.

TABLE 6: UNIT WEIGHT AND UNCONFINED COMPRESSIVE STRENGTH - BEDROCK

BOREHOLE ID [SAMPLE ID]	DEPTH (mbgs) [ELEVATION (masl)]	UCS (MPA)	UNIT WEIGHT (kN/m^3)
BH25-1 [RC-2]	8.89 – 10.41 [69.09 – 67.57]	44.8	25.2
BH25-1 [RC-3]	10.41 – 11.91 [67.57 – 66.07[	44.7	25.5
BH25-2 [RC-1]	7.32 – 8.84 [72.34 – 70.80]	70.9	25.3
BH25-2	8.84 – 10.34	36.0	25.6

BOREHOLE ID [SAMPLE ID]	DEPTH (mbgs) [ELEVATION (masl)]	UCS (MPA)	UNIT WEIGHT (kN/m³)
[RC-2]	[70.84 – 69.30]		
BH25-3 [RC-6]	10.36 – 11.86 [68.15 – 66.65]	63.0	25.6
BH25-3 [RC-8]	13.41 – 14.88 [65.10 – 63.63]	61.9	26.2

5.2 GROUNDWATER

For this geotechnical investigation, ABS installed a total of two (2) monitoring wells in Boreholes BH25-2 and BH25-3. Groundwater level was measured in the ABS boreholes including monitoring wells, and the measurements are presented in Table 7 below.

TABLE 7: GROUNDWATER LEVEL MEASUREMENT SUMMARY

BOREHOLE ID	WELL SCREEN DETAILS		WATER LEVEL OBSERVATION	
	SCREEN INTERVAL (mbgs) [EL. (masl)]	SCREENED MATERIAL	WATER LEVEL (mbgs) [EL. (masl)]	MEASUREMENT DATE
BH25-1	N/A	Shale	6.00 [71.98]	June 11, 2025
BH25-2	10.34 - 11.84 [66.30 – 67.80]	Shale	5.69 [73.95]	June 18, 2025
BH25-3	13.38 – 14.88 [65.13 – 63.63]	Shale interbedded with Limestone	3.71 [74.80]	June 18, 2025

It is important to note and emphasize that the groundwater levels are subject to seasonal fluctuations. A higher groundwater level condition will likely develop in the spring, during the thaw, and following rainfall events.

5.3 CHEMICAL ANALYSIS

Chemical analyses were conducted by Eurofins Environment Testing in Ottawa to determine the pH, resistivity, sulphate, chloride, sulphide, electric conductivity, and Redox potential of representative soil samples. The laboratory results for the chemical analysis are shown in Table 8 and included in Appendix 3.

TABLE 8: SOIL CHEMICAL ANALYSIS RESULTS

BOREHOLE ID	SAMPLE	DEPTH (mbgs) [EL. (M)]	pH	SULPHATE (%)	CHLORIDE (%)	RESISTIVITY (Ohm-cm)	REDOX (mV)	SULPHIDE (%)	ELECTRIC CONDUCTIVITY (ms/cm)
BH25-1	SS11	7.62 – 8.23 [70.36 – 69.75]	8.11	0.07	0.018	1317	213	1.86	0.754
BH25-2	SS3	1.52 – 2.13 [78.12 – 77.51]	8.52	<0.01	0.002	6024	257	0.01	0.166

6.0 GEOTECHNICAL DISCUSSIONS AND RECOMMENDATIONS

Based on this Geotechnical Investigation Report and our understanding of the Project, the Site is suitable for the proposed development.

The following discussion and recommendations are based on our understanding of the Project. Any changes to the Project will require a review to assess the impact on the recommendations given herein. This geotechnical report is based on the factual data obtained from the boreholes advanced at the Site by ABS and are intended for use by the Client and Designers only. Contractors bidding on this Project or conducting work associated with this Project should make their own interpretation of the factual data and/or carry out their own investigations.

Important factors to be considered for the design and construction of the proposed Project are expected to include the following:

- **Deep Excavations:** All excavations for this Project will need to be completed and maintained in accordance with the requirements of the Occupational Health and Safety Act (OHSA) Regulations for Construction, as discussed in section 6.2 of this report. Designers and Contractors should review the geometry of planned excavations including depths and sloping requirements. We are assuming that excavations will extend to approximate depths of 8.3 to 11.3 mbgs, into the bedrock. The Client should retain Contractors with significant experience working on similar projects. Contractors will need to assess the use of Engineered Shoring methods versus open cut methods;
- **Construction Dewatering:** Excavations for this Project will penetrate through the fill, sands and into the bedrock, below the groundwater table. As such, an Environmental Activity and Sector Registry (EASR) or Permit to Take Water (PTTW) may be required. Discussions regarding requirements for these permits is further discussed in section 6.2.5;
- **Foundation Bearing Pressures:** The ABS recommended foundation bearing pressures provided in Section 6.6 assume that foundations for the building will be designed and constructed on the weathered shale bedrock at depths near 8.3 mbgs. ABS completed unconfined compressive strength on representative rock core samples at various depths; higher bearing pressures can be provided should the Client consider extending the building foundation depths beyond 8.3 mbgs.

Based on the ABS boreholes, laboratory tests, and subsurface conditions encountered in the boreholes, the following comments and recommendations are provided.

6.1 SITE PREPARATION

6.1.1 General Grading and Interference with Existing Underground Utilities

Grading of the Site will need to be conducted during the early stages of construction. This will provide a positive control of surface water, directing it away from excavations and subgrades. Subgrades will need to be protected from surface water runoff or groundwater accumulation.

Designers will need to review locations of all proposed excavation and compare with the location of all existing underground utilities, if any. Existing utilities which will be exposed will need to be supported, rerouted, or removed during construction and/or excavation.

6.1.2 Subgrade Preparation for Footings on Rock

Subgrade preparation for footings founded on rock will involve the removal of all fill, organic matter, and loose bedrock. Any pieces of rock that can be easily manipulated by conventional excavation equipment should be removed, as directed by the Geotechnical Engineer. Final subgrade surfaces should be brushed and/or air blown clean, and dry. The exposed bedrock surface should be examined and approved by the Geotechnical Engineer to confirm the competency of foundation to support the design bearing pressures.

Additional excavation of fractured rock to achieve a sound bedrock subgrade surface may be necessary. It is recommended that a unit price item for additional rock excavation and replacement with concrete fill be incorporated into the tender documents.

All footing subgrades must be reviewed and approved by the Geotechnical Engineer.

6.2 EXCAVATIONS

ABS is anticipating the excavations for this Project to extend to approximate depths of 8.3 to 11.3 mbgs and may consist of open cut excavations and/or Engineered Shoring. All excavations for this Project must be carried out in accordance with the OHSA. It should be noted that any encroachment into the public-right-of-way will require a municipal consent agreement, which will be for, including but not limited to any shoring systems, and/or tiebacks or any other temporary or permanent features that are included in the design. The following excavation recommendations should be considered a supplement to, and not a replacement of the OHSA requirements for Construction Projects.

6.2.1 Open Excavations

Should open excavations be used during construction, the following OHSA recommendations will need to be considered:

- The existing FILL on Site would be considered "Type 3 Soils" according to OHSA. "Type 3 Soils" must be sloped from its bottom with a slope having a minimum gradient of 1H:1V. Excavations into the fill soils should be relatively straightforward with conventional excavation equipment;
- The native soils on Site would generally be considered "Type 3 Soil" according to OHSA. "Type 3 Soils" must be sloped from its bottom with a slope having a minimum gradient of 1H:1V. However, if excavations proceed below the water table, become wet or muddy, or exhibit signs of seepage, they would become a "Type 4 Soil". Excavations in "Type 4 Soils" must be sloped from its bottom with a slope having a minimum gradient of 3H:1V. Excavations into the native soils should be relatively straightforward with conventional excavation equipment;
- For excavations through multiple soil types, the side slope geometry is governed by the soil with the highest number designation. Excavation side-slopes should not be unduly left exposed to inclement weather;
- For excavations into bedrock, there may be an upper weathered rock zone that may require some shoring depending on the degree of weathering. The bedrock quality and site-specific requirements need to be assessed during construction by the Geotechnical Engineer. For planning purposes, a weathered bedrock is recommended to be treated as a "Type 2 Soil". Sound rock would generally be self-supporting; and,
- Vertical cuts into the bedrock will be possible. However, the exposed rock surface should be inspected by the Geotechnical Engineer to ensure stability, particularly at areas where groundwater seepage occurs from the rock. Remedial works, such as steel mesh shotcrete should be implemented, if deemed necessary.

Where workers must enter excavations extending deeper than 1.2 m below grade, the excavation side-walls must be suitably sloped and/or braced in accordance with OHSA and Regulations for Construction Projects.

6.2.2 Bedrock Excavation and Blasting

Bedrock excavation will require line drilling, pneumatic, or hydraulic breakers such as hoe-rams or heavy excavation equipment equipped for rock excavation. Controlled blasting techniques may also need to be used, subject to the laws and blasting restrictions that are in effect for the area. Designers are referred to the OPSS.MUNI 120 and the City of Ottawa Special Provision F-1201 specifications for the use of explosives. In general, these documents require a blasting plan to be prepared by a Blasting Engineer.

They also require conducting pre-condition surveys on nearby buildings, utilities, structures, water wells, and facilities likely to be affected by the blast, within a minimum 150 m of the location where explosives are to be used. Vibration monitoring during the blasting in nearby structures or infrastructure will be required. The frequency dependent peak vibration limits from the City of Ottawa Special Provision F-1201 are specified in the table below.

TABLE 9: MAXIMUM PEAK PARTICLE VELOCITY VALUES

ELEMENT	FREQUENCY (Hz)	PEAK PARTICLE VELOCITY (mm/s)
Structures and Pipelines	≤ 40	20
	> 40	50

6.2.3 Excavations Adjacent to Infrastructure

Designers and Contractors will need to review the geometry of the planned excavations regarding requirements for depths and sloping. This will need to be compared to the location of existing adjacent infrastructure, if any, to ensure they are not undermined. Undermining can be prevented by ensuring that excavations do not penetrate below an imaginary line constructed outwards and downwards at a slope of 10H:7V from the toe of existing or proposed footings.

If the limitations of undermining cannot be met, then an engineered shoring or underpinning systems will be required.

Given the proximity of nearby residential and/or commercial buildings, utilities, exterior structures, and to mitigate impact due to excavations, similar to Section 6.2.2, ABS recommends completing a pre-construction survey in accordance with the City of Ottawa Special Provision F-1011 as well as vibration monitoring during construction. Remote monitoring station seismographs for residential and commercial buildings/exterior structures and mobile monitoring station seismographs for underground utilities are typically recommended for vibration monitoring. Such services are provided by vibration monitoring specialist engineers during construction.

6.2.4 Engineered Shoring

Due to the anticipated depth of excavation as well as the Site property limits and neighboring residential/commercial structures, it is expected that Designers and Contractors may consider the use of Engineered Shoring systems through the overburden soils and the upper weathered layer of bedrock.

Engineered shoring systems often include but are not limited to soldier piles, slide rail systems, sheet piles, permanent diaphragm walls, secant or tangent walls, etc. The appropriate method should be selected by the Project Designers and Contractors considering the space restrictions, depths of excavations, soil and groundwater conditions, and cost and availability of materials. The Engineered Shoring system will need to be designed by a Professional Engineer considering the following aspects:

- Lateral earth pressures;
- Loads from any adjacent structures, or infrastructure being retained;
- Hydraulic pressures of the groundwater;
- Seismic loadings;
- Freeze-thaw action on the face of the excavations;
- Expansion and contraction of shoring elements;
- Pre-stressing loads, or post tensioning loads on tie backs;
- Possible surcharge loads throughout construction (i.e., trucks, equipment, stockpiles, etc.);
- Compatibility with proposed waterproofing systems for the sub-surface levels; and,
- Vibrations caused by construction methods.

It is recommended that the Client retain Contractors and Designers who have significant experience with similar deep excavations, soil conditions. Shop drawings should be submitted to the Designers and reviewed by the Geotechnical Engineer well in advance of construction. The lateral pressure parameters to assist Designers and Contractors are discussed in Section 6.8.

6.2.5 Construction Dewatering and EASR/PTTW

As part of this Geotechnical Investigation, ABS installed a total of two (2) monitoring wells; the groundwater levels for the two (2) ABS monitoring wells are provided in section 5.2.

Based on the monitoring well observations, the water levels encountered at the Site were approximately 3.71 to 6.00 mbgs, corresponding to approximate elevations near El. 74.80 to 71.98 masl. As excavations for this Project will extend to depths ranging from 8.3 to 11.3 mbgs (below the groundwater), dewatering during construction will be required.

Due to expectations that deep excavations will likely penetrate below the groundwater levels at the Site (based on the ABS water level observations), construction dewatering may potentially have an impact on adjacent properties, utilities, and/or structures. It is recommended that settlement monitoring of nearby/adjacent properties, utilities, and/or structures as well as groundwater monitoring is monitored during construction to mitigate any potential settlement. Should engineered shoring systems be considered, a waterproofing system such as soldier, sheet, or secant piles which includes a combination of structural supports and waterproofing membranes designed to prevent water intrusion and soil collapse during deep excavations is recommended.

Both surface water and groundwater seepage are anticipated in the excavation and will need to be controlled. Water quantities will depend on seasonal conditions, depths of excavations, presence and lateral extents of fractured rock zones, and the duration that excavations are left open. Groundwater will travel easily through the fill material, and especially near the fill-native interface. The same is likely at the soil-rock interface and through fractured rock zones. Existing utility trenches which join or intersect the

excavations may act as a drain and supply off-Site water into the excavations. These may need to be plugged at the outset of construction to mitigate this possibility.

Comprehensive construction dewatering techniques should be used during excavation for the building, such as pumping from sumps, and/or ditches. Dewatering measures beyond conventional sump pump techniques such as a positive dewatering system to temporarily lower the static groundwater level may be required.

Based on the Ontario Regulation (O.Reg.) 387/04, a regulation in the Ontario Water Resources Act (Section 34 – 34.11), dewatering or water takings of more than 50,000 L per day requires registration with the Ministry of Environment, Conservation and Parks (MECP) for an Environmental Activity and Sector Registry (EASR) or a Permit to Take Water (PTTW) submission.

For EASR, the Client is referred to the water taking user guide for EASR or O.Reg. 63/16 to determine whether the water taking is required to be registered. For PTTW applications, there are three (3) categories of permits, and they include:

- Category 1: Water takings are anticipated to have a lower risk of causing an unacceptable environmental impact/interference
- Category 2: Water takings are anticipated to having a higher potential of causing unacceptable environmental impact or interference
- Category 3: Water takings are anticipated to have the highest potential of causing unacceptable environmental impactor interference

Review of applications for PTTW with the MECP may take at least 3 months or longer depending on MECP comments.

It should be noted, ABS were not retained to complete a hydrogeological assessment to determine potential groundwater inflow in advance of construction and determine whether or not an EASR or PTTW is required.

6.3 FROST PROTECTION

Based on the Ontario Ministry of Transportation (MTO) foundation frost penetration depths for Southern Ontario map (OPSD 3090.101), the design frost depth for the Site is 1.8 mbgs. All foundations for unheated/isolated structures or underground utilities must be provided with a minimum of 1.8 m of soil cover for frost protection.

Where an adequate depth of soil cover cannot be provided, an equivalent insulation detail should be designed or approved by a Geotechnical Engineer; this will need to be designed or pre-approved prior to placement of any foundations or underground utilities.

Should construction take place during the winter season, exposed subgrades and underlying soils must be protected by the Contractor against freezing for the entire duration of construction, or until adequate frost protection is in place. Backfill should not be placed or compacted in a frozen condition or placed on frozen subgrades.

6.4 SEISMIC SITE CLASSIFICATION

In accordance with the Ontario Building Code (OBC), structures designed under Part Four of the code must be designed to resist a minimum earthquake force. The parameters for determination of the Site Classification for Seismic Site Response are set out in Table 4.1.8.4.A of the OBC.

Based on the results of the field drilling, and the subsurface stratigraphy as revealed in the boreholes, ABS recommends that the building be designed to **"Site Class C"** with footings placed on bedrock, as per table 4.1.8.4.A of the OBC, and subject to the limitations of the Code.

It is possible to prove an increased Site Class, however, additional geophysical testing by using shear wave velocity would be required. An increased Site Class can often result in significant design savings especially for large structures and structures with post-disaster importance. ABS can provide the geophysical testing, if requested by the Client.

6.5 LIQUEFACTION INDUCED SETTLEMENT

As the foundations for the proposed development will be founded on bedrock, the potential for liquefaction induced settlement for the building structure would not be applicable.

6.6 FOUNDATIONS

Based on our understanding of the Project, and review of the architectural/conceptual drawings, we are anticipating the foundations for the building will be at a depth of 8.3 mbgs, and elevator pit at 11.3 mbgs. It is worth mentioning that based on the Boreholes completed at the Site, the top of rock depths ranged from 5.38 to 9.00 mbgs; therefore, ABS recommends the foundation of the building to be designed and constructed on top of rock.

6.6.1 Foundations on Bedrock

For concrete pads and/or strip footings founded on the weathered shale bedrock, the recommended factored bearing capacity under Ultimate Limit State (ULS) conditions would be 500 kPa. This includes a geotechnical resistance factor of $\Phi = 0.5$. Under Serviceability Limit States (SLS) conditions, there is no recommended bearing capacity as settlement under the ULS condition is expected to be nil. Designers should limit footing dimensions to 1.0 m for pad footings, and 0.5 m for strip footings.

Subgrade preparation for footings founded on rock will involve the removal of all soils to expose sound bedrock. Any pieces of rock that can be easily manipulated by conventional excavation equipment should be removed, as directed by the Geotechnical Engineer. Final subgrade surfaces should be brushed and/or air blown clean, and dry. The exposed surface should be examined by the Geotechnical Engineer to assess its competency.

6.6.2 Foundations on Engineered Fill

The use of Engineered Fill may be used directly over the bedrock, subject to approval by the Geotechnical Engineer, to correct irregularities in the design subgrades, and to backfill over-excavated areas.

If Engineered Fill is used below footings, then it would have reduced geotechnical resistance factors from those available on the bedrock. For footings founded on Engineered Fill, the recommended factored bearing pressure under ULS conditions would be 225 kPa. This includes a geotechnical resistance factor of $\Phi = 0.5$. A corresponding recommended SLS value for footings on Engineered Fill would be 150 kPa. This assumes a maximum tolerable differential settlement in the order of 19 mm and a maximum tolerable total settlement in the order of 25 mm. Designers should limit footing dimensions to 1.0 m for pad footings, and 0.5 m for strip footings.

When Engineered Fill is being placed below future load bearing structures, the extents of the Engineered Fill should extend a minimum of 0.3 m beyond the edge of the footings or structure on all sides and then must be continued downwards and outwards at a 1H:1V slope until the approved subgrade level. This footprint can become quite large if the Engineered Fill is required to be deep.

Subgrade preparation below Engineered Fill will be similar to that for footings as noted above. The exposed surface should be examined by the Geotechnical Engineer to assess the competency. Engineered Fill must be treated in accordance with the requirements in Section 6.9.

6.7 RESISTANCE TO FOUNDATION UPLIFT

Resistance to foundation uplift or overturning forces can be provided by considering the dead weight of the structures and backfill soils, increasing the dead weight of the structure using additional concrete, or with the use of additional rock anchors.

In the case that grouted rock anchors are considered, rock anchors may be designed based on a frictional stress between grout and intact bedrock; a conservative allowable working stress value of 690 kPa may be used to calculate the length of the required bond zone. The bond zone must be entirely within sound bedrock; below the weathered zone.

In order to mobilize the shear stress in the rock, the load at the top of the anchor must be properly transferred through the upper bedrock to the bond zone to prevent progressive grout fail and ensure

proper performance. Therefore, a "free length" is required through the foundation element, the weathered rock zone, and down to the bond zone.

The mass of rock mobilized by a rock anchor may be assumed to be based upon a 60° cone drawn upward from a point located at the lower one-third point of the bond zone and spaced such that the theoretical cones do not overlap. Designers should review the spacing of anchors and take into account of any overlapping cones (i.e. avoid doubling up on rock mass calculations for overlapping cones). The bulk unit weight of bedrock may be assumed to be approximately 25 kN/m^3. The corresponding buoyant unit weight would be approximately 15 kN/m^3. It is recommended that Designers consider the water level to be near the surface, and therefore, use submerged unit weights for the rock mass calculations.

6.8 LATERAL EARTH PRESSURES

The following soil parameters used in the determination of earth pressure acting on basement walls and temporary Engineered Shoring are defined and provided below.

TABLE 10: DEFINED LATERAL EARTH PRESSURE SOIL PARAMETERS

PARAMETER	DEFINITION	UNITS
ϕ'	Angle of Internal Friction	Degrees
γ	Bulk Density	kN/m^3
C_U	Undrained Shear Strength	kPa
C'	Effective Cohesion	Degrees
K_o	active earth pressure coefficient (Rankine)	Dimensionless
K_a	at-rest earth pressure coefficient (Rankine)	Dimensionless
K_p	passive earth pressure coefficient (Rankine)	Dimensionless

6.8.1 Statis Conditions

The appropriate un-factored static condition values for use in the design of structures subject to unbalanced earth pressures at this Site are tabulated as follows:

TABLE 11: LATERAL EARTH PRESSURE DESIGN PARAMETERS – STATIC CONDITIONS

MATERIAL	PARAMETER						
	ϕ' (°)	γ(kN/m^3)	c' (°)	C_U (kPA)	K_o	K_a	K_p
FILL - Loose to compact	28	18	-	-	0.53	0.36	2.77

Silty Sand/Sandy Silt - Compact	30	20	-	-	0.50	0.33	3.00
Sand/Sand and Gravel (TILL) - Loose to Compact	32	22	-	-	0.47	0.31	3.25
Sand/Sand and Gravel (TILL) - Very Dense	36	22	-	-	0.41	0.26	3.85
Bedrock	37	25	-	-	0.40	0.25	4.02
New Compacted Granular Backfill	32	22	-	-	0.47	0.31	3.25

For yielding retaining walls, the active earth pressure coefficients, K_a, is recommended to be used. The resultant of the applicable static or at-rest force is assumed to act at 1/3H above the base of the wall where H is the Height of the wall.

6.9 ENGINEERED FILL

All new fill soils that underlie slabs, footings, are in building interiors, or other structural applications are considered to be Engineered Fill.

For this Project, Engineered Fill may be required to backfill the interior below the floor slab, and to correct deficiencies in the footing subgrades. To qualify as Engineered Fill, the following strict requirements must be met:

- Prior to placing any Engineered Fill, all unsuitable fill materials must be removed, and the subgrade approved by the Geotechnical Engineer. Any deficient areas should be repaired prior to placement;
- The proposed fill material must be tested for grain size and standard Proctor; it must be reviewed and approved by the Geotechnical Engineer before being considered as Engineered Fill. Typically, a crushed well-graded granular material such as an Ontario Provincial Standard Specification (OPSS) 1010 Granular 'A' or Granular 'B' Type II type material is suitable. However, other suitable granular materials may be proposed and considered depending on the Site-specific conditions;
- Engineered Fill should be placed in maximum loose lifts of 200 mm and adequately compacted to achieve 100% of its Standard Proctor Maximum Dry Density (SPMDD). Engineered Fill must have full-time compaction testing on-Site by geotechnical personnel; and,
- When Engineered Fill is being placed below future load bearing structures, the extents of the Engineered Fill should extend a minimum of 0.3 m beyond the edge of the footings or structure on all sides, and then must be continued downwards and outwards at a 1H:1V slope until the approved subgrade level. This footprint can become quite large if the Engineered Fill is required to be deep.

Fill that is placed on un-approved subgrades and/or without prior approval and/or review by the Geotechnical Engineer will not be considered as Engineered Fill and may need to be excavated and replaced.

6.10 EXTERIOR STRUCTURE BACKFILL (WALLS, PAVED AREAS, SIDEWALKS, EXTERIOR SLABS, LANDSCAPE, ETC.)

The exterior backfill placed against new structures should be a compactable free-draining non-frost susceptible material. Typically, a pit -run sandy soil meeting the grading requirements of an OPSS 1010 Granular 'B' Type I is acceptable, however, other materials may be considered if they are tested and approved by the Geotechnical Engineer ahead of time. In landscaped areas (without asphalt cover), the upper 0.3 m below landscape details should be a low permeable soil to reduce surface water infiltration. Backfill should be placed and compacted as outlined below.

- Backfill should not be placed in a frozen condition, or placed on a frozen subgrade;
- The entrance slabs should slope away from the building;
- Entrance slabs should be supported on frost walls founded below the design frost depth, or alternatively, have insulation details designed to ensure they do not heave;
- For backfill that would underlie paved areas, sidewalks or exterior slabs-on-grade, each lift should be uniformly compacted to at least 98% of its SPMDD;
- For backfill on exteriors that would underlie landscaped areas, each lift should be uniformly compacted to at least 95% of its SPMDD; and,
- Exterior grades should be sloped away from the structures, and roof drainage downspouts should be placed so that water flows away from the structure wall.

6.11 BASEMENT SLAB ON GRADE

It is important to note that ABS has not been provided with the design for the floor slab loadings. ABS is assuming that a typical floor slab loading of a maximum 24 kPa would be applicable. The bedrock subgrade for the floor slab will need to be prepared by the Contractor and reviewed and approved by the Geotechnical Engineer prior to placement of Engineered Fill.

Subgrade preparation should include the removal of any disturbed or loose rock. Any unsuitable subgrade areas will need to be sub-excavated and replaced with suitable Engineered Fill material compacted to 100 % of its SPMDD.

A capillary moisture barrier consisting of a layer of 19 mm clear stone or an OPSS 1010 Granular 'A' at least 200 mm thick should underlie the slab. This layer should be compacted to 100 % of its SPMDD and placed on approved subgrade surfaces.

For design purposes and based upon a properly prepared native subgrade surface covered with 200 mm of 19 mm clear stone or OPSS 1010 Granular 'A' compacted to 100 % its SPMDD, a typical preliminary modulus of subgrade reaction appropriate for the slab design would be approximately 30,000 kN/m^3.

6.12 PERIMETER DRAINAGE AND WATERPROOFING

Sub-floor weeping pipes 100 mm in diameter must be placed under the basement slab-on-grade at a maximum spacing of 8 m (subject to confirmation at the time of construction). The weeping tiles must be covered with a minimum of 150 mm of clear stone. They should be placed a minimum of 0.5 m below the basement floor slab, above the founding level of the footings.

The exterior basement walls of the proposed building will be poured up against the shored or grouted walls of the excavation, prefabricated drainage sheets (Terradrain 600 or equivalent) must be placed continuously against the excavation / shoring walls. These should drain through drainage ports in the walls into a perimeter solid pipe and channel all the water into the sump pits in the building. The maximum spacing of the drainage ports must not exceed 6 m, subject to confirmation at the time of construction.

The perimeter foundation and sub-floor drains must be connected to a positive frost-free outlet from which the water can be removed or connected to a sump located in the lowest level of the basement. The water from the sump must be pumped out to a suitable discharge point.

The installation of the perimeter and sub-floor drains as well as the outlet must conform to the applicable plumbing code requirements.

Based on the elevation of the water table we recommend a waterproofing membrane such as a WR Meadows MEL-ROL PRECON or equivalent for walls. These types of membranes adhere to the concrete and provide a waterproof seal between the membrane and poured concrete. Water stops should be installed at cold joints in the foundation walls and floor-wall joints.

The near surface soils at this site are susceptible to frost effects which would have the potential to deform hard landscaping adjacent to the building. At locations where the building is expected to have flush entrances, care must be taken in detailing the exterior slabs / sidewalks, providing insulation / drainage / non-frost susceptible backfill to maintain the flush threshold during freezing weather conditions.

6.13 UNDERGROUND UTILITIES

6.13.1 Pipe Bedding and Cover

The following are recommendations for the service trench bedding and cover materials:

- Watermain and sewer bedding must be placed on a uniformly competent subgrade within a trench that's maintained in a dry condition. Any unsuitable material in the subgrade including organics, unsuitable fill, soft spots or local anomalies must be excavated out and replaced with suitable

material such as an OPSS 1010 Granular 'B' Type I or similar, subject to approval by the Geotechnical Engineer. Geotechnical staff should be retained to approve the subgrade prior to the placement of pipe bedding;

- Bedding for buried utilities should consist of an OPSS 1010 Granular 'A' or Granular 'B' Type II (conforming to City of Ottawa specification S.P. F-3147) material, and placed in accordance with municipal requirements;
- The use of clear 19 mm stone is not recommended for use as pipe bedding. The voids in the stone can cause a low gradient water flow and infiltration of fines from the surrounding soils and/or cover materials, which can cause settlement and loss of support to pipes and structures;
- The cover material should be a service sand material like an OPSS 1010 Granular 'B' Type I or an OPSS 1010 Granular 'A' (conforming to City of Ottawa specification S.P. F-3147) material;
- Pipe bedding and backfill for flexible pipes should be undertaken in accordance with OPSD 802.010; and,
- The bedding and cover materials should be compacted to a minimum of 95% SPMDD. Bedding and cover details should follow the applicable governing design detail (i.e. City of Ottawa, OPSD).

6.13.2 Backfill

Backfill above the cover for the underground sewers should be in accordance with the following recommendations:

- The existing FILL material and native soils may be used as backfill material with the approval of the Geotechnical Engineer. Imported suitable pit-run sandy soil material such an OPSS 1010 Granular 'B' Type I would also be suitable for use as service backfill material as well; and,
- The backfill should be placed and compacted in uniform lift thickness compatible with the selected compaction equipment and not thicker than 300 mm. Each lift should be compacted to a minimum 95% of its SPMDD.

6.14 CHEMICAL CHARACTERIZATION OF SUBSURFACE SOIL

Two (2) soil samples were submitted to Eurofins Environment Testing in Ottawa for testing of chemical properties relevant to exposure of concrete elements to sulphate attacks as well as potential soil corrosivity effects on buried metallic structural elements. Test results are presented in Section 5.3 and the laboratory results for the chemical analysis are shown in Appendix 3.

The American Water Works Association (AWWA) publication 'Polyethylene Encasement for Ductile-Iron Pipe Systems' ANSI/AWWA C105/A21.5-10 dated October 1, 2010, assigns points based on the results of the above tests. A soil that has a total point score of 10 or more is potentially corrosive to ductile iron pipe. Based on the results obtained for the samples submitted, the Site soils are slightly corrosive (BH25-2, SS3) to corrosive (BH25-1, SS11) to ductile iron pipe.

The analytical results of the soil samples were compared with applicable Canadian Standards Association (CSA) A23.1-04 and are given in the table below.

TABLE 12: ADDITIONAL REQUIREMENT FOR CONCRETE SUBJECTED TO SULPHATE ATTACK

CLASS OF EXPOSURE	DEGREE OF EXPOSURE	WATER SOLUBLE SULPHATE IN SOIL SAMPLE (%)	CEMENTING MATERIAL TO BE USED
S-1	Very Severe	> 2.0	HS or HSb
S-2	Severe	0.2 – 2.0	HS or HSb
S-3	Moderate	0.1 – 0.2	MS, MSb, LH, HS, or HSb

The chemical sulphate content analyses for selected soil samples tested indicate a sulphate concentration ranging from less than 0.01 to 0.07 % in soil, as shown in Section 5.3. The results were compared with Canadian Standards Association (CSA) Standards A23.1 for sulphate attack potential on concrete structures and possesses a low risk for sulphate attack on concrete material.

6.15 CONSTRUCTION INSPECTIONS AND MONITORING

The recommendations presented in this report assume that adequate and satisfactory inspections and monitoring during construction by qualified geotechnical personnel will be provided. This will include:

- Review and approval of all subgrade and footing base inspections by geotechnical staff;
- Part time compaction testing of bedding, and cover soils;
- Full time compaction testing of Engineered Fill;
- Periodic testing of concrete; and,
- Proof testing and performance testing of rock anchors.

7.0 SCOPE OF THE REPORT AND LIMITATION OF LIABILITY

The characteristics of the soil and rock described in this report are based on boreholes and exploration trenches conducted at a specific period and depict the nature of the site precisely where these boreholes were carried out. Thus, the characteristics between sampling points can vary significantly from the conditions encountered at the exact location where the samples were taken.

Furthermore, it should be noted that soil and rock formations may differ on the same site, and the boundaries between the various formations presented in this report should not be considered fixed. Groupe ABS Inc. cannot guarantee the accuracy of these boundaries, which depend on factors such as the number of boreholes or the sampling method.

Additionally, the properties of the soil and rock can be significantly altered after construction activities are carried out on the site or on adjacent sites. They can also be indirectly affected by exposure to freezing or weather conditions.

The groundwater conditions presented in this report apply solely to the study site. The groundwater levels indicated correspond only to the levels observed during the specified works, on the specified date and location. It should be noted that these conditions may vary depending on precipitation, snowmelt, or seasons. Moreover, construction activities or modifications to the physical conditions of the study site or adjacent sites can also alter groundwater conditions.

In this report, the descriptions of the sampled materials were conducted using commonly recognized methods of identification and classification in geotechnical engineering. These methods may involve judgment and interpretation. In practice, these descriptions are presumed to be accurate and correct.

The results of tests and analyses are valid only for the samples described in this report. The interpretation of field and laboratory results, as well as the recommendations provided, is applicable only to the study site and the information available for the project at the time of writing this report. They do not apply to any other project or site.

The recommendations given in this report are primarily intended for the project design team. The number of boreholes needed to determine all subsurface conditions may exceed the number of boreholes conducted for design purposes. If the project design is modified, Groupe ABS Inc. should be consulted to ensure that the recommendations in this report are still valid. In the event of modifications to the recommendations, additional field or laboratory work may be necessary.

It is recommended that site visits be conducted by Groupe ABS Inc. as the work progresses to confirm, and if necessary, modify the interpretations or recommendations provided in this report. If such verifications are not possible, Groupe ABS Inc. will assume no responsibility for the geotechnical interpretation that third parties may make of this report, especially if the design is altered or if site conditions differ from those described in this report.

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APPENDIX 1

LOCATION OF BOREHOLES
FIGURE GEO-01

Source : ©2025 Google

Legend

- Study site
- Borehole completed by ABS
- Borehole/Monitoring Well Completed by ABS
- Borehole/Monitoring Well Drilled by Others

Geodesic coordinates (UTM NAD83(CSRS))			
Borehole	Easting (m)	Northing (m)	Elevation (m)
BH25-1	449840.2	5032309.0	77.98
BH25-2	449853.9	5032335.9	79.64
BH25-3	449847.6	5032320.9	78.51

Issue date of plan: June 2025

ABS
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Ottawa (ON) K1G 4H3
Phone: 613.913.9702 | Email:ottawa@groupeabs.com

Drawn by: K. Si Moussa, Drafter
Reviewed by: A. Mohammad

Client: MB Canada Group Inc.

Title: Borehole location plan

Project: Preliminary Geotechnical Investigation for a Proposed Mid-rise Residential Building

Location: 630 Montreal Road, Ottawa, Ontario

Scale: 1:600 | Client code: GMBC100
F/N: GO-24-1324-00 | Drawing # GEO-01 | 1/1
Client ref.:

0 5m 10m 15m 20m 25m

Note: All indications in this drawing are located approximately, according to satellite images and/or chaining. The graphical registers are, for their part, georeferenced with the lot limits. It should be noted that only the surveys recorded by the surveyor are georeferenced. This information will be indicated in the legend.
This drawing should be read in accordance with the report that accompanies it.

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APPENDIX 2

BOREHOLE RESULTS
BOREHOLE LOGS

BOREHOLE LOG

Borehole N°
BH25-1

Project Name: **Preliminary Geotechnical Investigation for a Proposed Mid-rise Residential Build**

CRN: **GMBC100** F/N: **GO-24-1324-00**

Client: **MB Canada Group Inc.**

Location: **630 Montreal Road, Ottawa, Ontario**

Contractor: **George Downing Estate Drilling Ltd**

Holllow stem auger: **Auger**

Borehole Diameter: **203 mm** Core Diameter: **63,5 mm**

Field Technician: **A.R. Senghani, J. Brooks,** Prepared by: **K. Si Moussa, Drafter**

Geodesic Coordinates (UTM NAD83 (SCRS)) Zone: 18
X : **449840.2**
Y : **5032309.0**
Z : **77.98**

Plan Number: **GEO-01**

Date of Borehole: **2025-06-11**

Depth of Borehole (m) : **11.91**

SAMPLE STATE
- Disturbed
- Intact (thin wall sampler)
- Lost
- Diamond core

TERMINOLOGY

"traces"	1-10 %
"some"	10-20 %
adjective (sandy...)	20-35 %
"and"	35-50 %

CLASSIFICATION

Clay	< 0,002 mm
Silt	0.002 to 0.08 mm
Sand	0.08 to 5 mm
Gravel	5 to 80 mm
Cobbles	80 to 300 mm
Blocks	> 300 mm

COMPACTION INDEX "N"

Very Loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very Dense	>50

CONSISTENCY "Cu" (kPa)

Very Soft	< 12
Soft	12 - 25
Firm	25 - 50
Stiff	50 - 100
Very Stiff	100 - 200
Hard	> 200

ROCK QUALITY DESIGNATION

QUALIFIER	% RQD
Very Poor	<25
Poor	25-50
Fair	50-75
Good	75-90
Excellent	90-100

VISUAL CONTAMINATION (hydrocarbons)
A : Absent
D : Disseminated
P : Pervasive

DEGREE OF PLASTICITY

	"W_L"	S_t = Cu/Cu_r
Low	< 30 %	< 2
Medium	30 - 50 %	2 - 4
High	> 50 %	4 - 8
Very high		8 - 16
Sensitive		> 16

CALIBER
P : 148 mm
N : 64 mm
B : 51 mm

WATER LEVEL
Date: 2025-06-11
Depth(m) : 6 m
Water Infiltration
Groundwater table

DEPTH (m)	DEPTH - ft	ELEVATION (m)	STRATIGRAPHIC DESCRIPTION	SYMBOL	TYPE NO	SUB-SAMPLE	CALIBER	STATE	RECOVERY	N, R or RQD	BLOW COUNTS /15 cm Fragmentation (mm)	VOC (ppm)	VISUAL CONTAMINATION (hydrocarbons) A	D	P	GRAPHIC	WATER LEVELS	LAB TESTS
		77.98	Level															
		0.00	Fill : Sand, trace silt, reddish brown, damp, loose.		SS-1		N		75	6	2-3-3-4							Wn = 10.0%
1			- Trace gravel, brown, compact.		SS-2		N		58	12	3-5-7-6							
	5		-Loose.		SS-3		N		58	8	2-3-5-7							
2			-Greyish brown compact.		SS-4		N		58	16	2-9-7-8							
3	10	74.93																
		3.05	Native : Silty Sand, greyish brown, damp, compact.		SS-5		N		83	17	7-9-8-8							Wn = 7.0%
4		74.17																
		3.81	Sandy Silt, brown, wet, stiff.		SS-6		N		67	13	5-6-7-6							
	15				SS-7		N		67	10	2-4-6-15							Wn = 21.0%
5		72.65																
		5.33	Sand, some gravel, trace silt,															
		72.34	brown, wet, very dense (TILL).		SS-8		N		92	90	26-34-56-51							
		5.64	Silty Gravel, some sand, some															
6	20		clay , brownish grey, wet, very dense (TILL).		SS-9		N		100	R	20-22 > 50 cm							Wn = 10.0%
			-Clayey, grey.															
7					SS-10		N		67	R	16-34 > 70 cm							
	25		-Greyish black.		SS-11		N		100		22-46-44 > 70 cm							Wn = 7.0%

GRAPHIC: ▲ : N (standard pen.) △ : Nc (dynamic pen.) ▼ : Cu (laboratory) ▽ : Cur (laboratory) × : Cu (field) + : Cur (field)
W_p W_n W_l
20 40 60 80

WATER LEVELS: 71.98 m

LAB TESTS
G : grain size analysis
H : hydrometer test
CA : chemical analysis
LI : liquid limit
PI : plastic limit
w : water content
Qu : rock comp. strength
Cur : disturbed shear strength
Cu : undrained shear strength
Cc : consolidation coefficient
k : permeability
Dup : duplicate

Remark(s) : GWL at 6.0 m on June 11, 2025 in open borehole.

Verified by: **A.R. Senghani** Approved by: **A. Mohammad** Date of report 2025-06-26

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BOREHOLE LOG

Borehole N°

BH25-1

DEPTH (m)	DEPTH - ft	STRATIGRAPHY: ELEVATION (m)	STRATIGRAPHIC DESCRIPTION	SYMBOL	SAMPLES: TYPE NO	SUB-SAMPLE	CALIBER	STATE	RECOVERY	N, R or RQD	BLOW COUNTS /15 cm Fragmentation (mm)	VOC (ppm)	VISUAL CONTAMINATION (hydrocarbons): A	D	P	GRAPHIC	WATER LEVELS	LAB TESTS
			- Cobbles and boulders.															
		69.32			RC-1		N		100	*49*								TCR = 100% SCR = 56% RQD = 49%
		8.66	BEDROCK : Shale, black, slightly weathered, strong, fair quality based on RQD.															
9	30																	
			-Good quality based on RQD.		RC-2		N		100	*76*								UCS = 44.8 MPa TCR = 100% SCR = 83% RQD = 76%
10																		
	35																	
11			- Ecellent quality based on RQD.		RC-3		N		100	*92*								UCS = 44.7 MPa TCR = 100% SCR = 97% RQD = 92%
		66.07																
12		11.91	END OF THE BOREHOLE															
	40																	
13																		
	45																	
14																		
15																		
	50																	
16																		
	55																	
17																		
18																		
	60																	
19																		
	65																	
20																		
21																		
	70																	
22																		

GRAPHIC: ▲ : N (standard pen.); △ : Nc (dynamic pen.); ▼ : Cu (laboratory); ▽ : Cur (laboratory); × : Cu (field); + : Cur (field); W_p W_n W_l; 20 40 60 80

LAB TESTS: G : grain size analysis; H : hydrometer test; CA : chemical analysis; LI : liquid limit; PI : plastic limit; w : water content; Qu : rock comp. strength; Cur : disturbed shear strength; Cu : undrained shear strength; Cc : consolidation coefficient; k : permeability; Dup : duplicate

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BOREHOLE LOG

Borehole N°
BH25-2

Project Name: **Preliminary Geotechnical Investigation for a Proposed Mid-rise Residential Build**

CRN: **GMBC100** F/N: **GO-24-1324-00**

Client: **MB Canada Group Inc.**

Location: **630 Montreal Road, Ottawa, Ontario**

Geodesic Coordinates (UTM NAD83 (SCRS)) Zone: 18
X : **449853.9**
Y : **5032335.9**
Z : **79.64**

Contractor: **George Downing Estate Drilling Ltd**

Holllow stem auger: **Auger**

Plan Number: **GEO-01**

Borehole Diameter: **203 mm** Core Diameter: **63.5 mm**

Date of Borehole: **2025-06-12**

Field Technician: **A.R. Senghani, J. Brooks,** Prepared by: **K. Si Moussa, Drafter**

Depth of Borehole (m) : **11.84**

SAMPLE STATE
- Disturbed
- Intact (thin wall sampler)
- Lost
- Diamond core

TERMINOLOGY

"traces"	1-10 %
"some"	10-20 %
adjective (sandy...)	20-35 %
"and"	35-50 %

CLASSIFICATION

Clay	< 0,002 mm
Silt	0.002 to 0.08 mm
Sand	0.08 to 5 mm
Gravel	5 to 80 mm
Cobbles	80 to 300 mm
Blocks	> 300 mm

COMPACTION INDEX "N"

Very Loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very Dense	>50

CONSISTENCY "Cu" (kPa)

Very Soft	< 12
Soft	12 - 25
Firm	25 - 50
Stiff	50 - 100
Very Stiff	100 - 200
Hard	> 200

ROCK QUALITY DESIGNATION

QUALIFIER	% RQD
Very Poor	<25
Poor	25-50
Fair	50-75
Good	75-90
Excellent	90-100

VISUAL CONTAMINATION (hydrocarbons)
A : Absent
D : Disseminated
P : Pervasive

DEGREE OF PLASTICITY

	"W_L"	$S_t = Cu/Cu_r$
Low	< 30 %	< 2
Medium	30 - 50 %	2 - 4
High	> 50 %	4 - 8
Very high		8 - 16
Sensitive		> 16

CALIBER
P : 148 mm
N : 64 mm
B : 51 mm

WATER LEVEL
Date: 2025-06-18
Depth(m) : 5.7 m
Water Infiltration
Groundwater table

DEPTH (m)	DEPTH - ft	ELEVATION (m)	STRATIGRAPHIC DESCRIPTION	SYMBOL	TYPE NO	SUB-SAMPLE	CALIBER	STATE	RECOVERY	N, R or RQD	BLOW COUNTS /15 cm Fragmentation (mm)	VOC (ppm)	VISUAL CONTAMINATION (hydrocarbons) A	D	P	GRAPHIC	WATER LEVELS	LAB TESTS
		79.64	Level															
		0.00	Asphalt.															
		79.61	Granular base.															
		0.025	Fill : Silty Sand, some gravel,															
		79.49	grey, moist, very loose.															
		0.15			SS-1		N		42	3	2-1-10							
1					SS-2		N		38	8	3-5-3-5							Wn = 10.0%
			-Loose															
	5	78.12																
		1.52	Sand, trace silt, trace gravel,															
			brown, moist, loose.		SS-3		N		46	6	1-2-4-4							
2																		
					SS-4		N		58	8	3-4-4-6							Wn = 7.0%
		76.59																
3	10	3.05	Native : Sand, some gravel,															
			trace silt, brown, moist, loose		SS-5		N		33	5	3-3-2-2							
			(TILL).															
4					SS-6		N		54	13	2-5-8-8							Wn = 5.0%
			-Trace gravel, compact.															
	15																	
5			- Some silt, light brown.		SS-7		N		63	19	6-10-9-9							
			- Some gravel, wet.		SS-8		N		63	19	4-10-9-11							Wn = 14.0%
6		73.54																
	20	6.10	Silty Gravel, some sand,															
			brown, wet, very dense (TILL).		SS-9		N		31	R	50/15 cm							
		72.78																
7		6.86	Inferred Bedrock : weathered															
		72.32	Shale, greish black.		SS-10				17	R	50/8 cm							Wn = 12.0%
		7.32	Bedrock : Shale, black, slightly															
	25		weathered, strong, poor quality		RC-1				100	*42*								
			based on RQD.															

GRAPHIC: ▲ : N (standard pen.) △ : Nc (dynamic pen.) ▼ : Cu (laboratory) ▽ : Cur (laboratory) × : Cu (field) + : Cur (field)
W_p W_n W_l
20 40 60 80

WATER LEVELS: ▼ 73.94 m

LAB TESTS
G : grain size analysis
H : hydrometer test
CA : chemical analysis
LI : liquid limit
PI : plastic limit
w : water content
Qu : rock comp. strength
Cur : disturbed shear strength
Cu : undrained shear strength
Cc : consolidation coefficient
k : permeability
Dup : duplicate

Remark(s) : GWL at 5,7 m on June 18, 2025

Verified by: **A.R. Senghani** Approved by: **A. Mohammad** Date of report 2025-06-26

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BOREHOLE LOG

Borehole N°

BH25-2

DEPTH (m)	DEPTH - ft	STRATIGRAPHY: ELEVATION (m)	STRATIGRAPHIC DESCRIPTION	SYMBOL	SAMPLES: TYPE NO	SUB-SAMPLE	CALIBER	STATE	RECOVERY	N, R or RQD	BLOW COUNTS /15 cm Fragmentation (mm)	VOC (ppm)	VISUAL CONTAMINATION (hydrocarbons): A	D	P	GRAPHIC	WATER LEVELS	LAB TESTS
9	30		- fair quality based on RQD															TCR = 100% SCR = 67% RQD = 42% UCS = 70.9 MPa
					RC-2				100	*64*								TCR = 100% SCR = 79% RQD = 64%
10																		
	35																	UCS = 36.0 MPa
11					RC-3				100	*66*								TCR = 100% SCR = 76% RQD = 66%
		68.03																
12	40	11.84	END OF THE BOREHOLE															
13																		
	45																	
14																		
15	50																	
16																		
	55																	
17																		
18	60																	
19																		
	65																	
20																		
21																		
	70																	
22																		

GRAPHIC: ▲ : N (standard pen.); △ : Nc (dynamic pen.); ▼ : Cu (laboratory); ▽ : Cur (laboratory); × : Cu (field); + : Cur (field); W_p W_n W_l; 20 40 60 80

LAB TESTS: G : grain size analysis; H : hydrometer test; CA : chemical analysis; LI : liquid limit; PI : plastic limit; w : water content; Qu : rock comp. strength; Cur : disturbed shear strength; Cu : undrained shear strength; Cc : consolidation coefficient; k : permeability; Dup : duplicate

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BOREHOLE LOG

Borehole N°
BH25-3

Project Name: **Preliminary Geotechnical Investigation for a Proposed Mid-rise Residential Build**

CRN: **GMBC100** F/N: **GO-24-1324-00**

Client: **MB Canada Group Inc.**

Location: **630 Montreal Road, Ottawa, Ontario**

Geodesic Coordinates (UTM NAD83 (SCRS)) Zone: 18
X : **449847.6**
Y : **5032320.9**
Z : **78.51**

Contractor: **George Downing Estate Drilling Ltd**

Holllow stem auger: **Auger**

Plan Number: **GEO-01**

Borehole Diameter: **203 mm** Core Diameter: **63,5 mm**

Date of Borehole: **2025-06-10**

Field Technician: **A.R. Senghani, J. Brooks,** Prepared by: **K. Si Moussa, Drafter**

Depth of Borehole (m) : **14.88**

SAMPLE STATE
- Disturbed
- Intact (thin wall sampler)
- Lost
- Diamond core

TERMINOLOGY

"traces"	1-10 %
"some"	10-20 %
adjective (sandy...)	20-35 %
"and"	35-50 %

CLASSIFICATION

Clay	< 0,002 mm
Silt	0.002 to 0.08 mm
Sand	0.08 to 5 mm
Gravel	5 to 80 mm
Cobbles	80 to 300 mm
Blocks	> 300 mm

COMPACTION INDEX "N"

Very Loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very Dense	>50

CONSISTENCY "Cu" (kPa)

Very Soft	< 12
Soft	12 - 25
Firm	25 - 50
Stiff	50 - 100
Very Stiff	100 - 200
Hard	> 200

ROCK QUALITY DESIGNATION

QUALIFIER	% RQD
Very Poor	<25
Poor	25-50
Fair	50-75
Good	75-90
Excellent	90-100

VISUAL CONTAMINATION (hydrocarbons)
A : Absent
D : Disseminated
P : Pervasive

DEGREE OF PLASTICITY

	"W_L"	$S_t = Cu/Cu_r$
Low	< 30 %	< 2
Medium	30 - 50 %	2 - 4
High	> 50 %	4 - 8
Very high		8 - 16
Sensitive		> 16

CALIBER
P : 148 mm
N : 64 mm
B : 51 mm

WATER LEVEL
Date: 2025-06-18
Depth(m) : 3.71 m
Water Infiltration
Groundwater table

DEPTH (m)	DEPTH - ft	ELEVATION (m)	STRATIGRAPHIC DESCRIPTION	SYMBOL	TYPE NO	SUB-SAMPLE	CALIBER	STATE	RECOVERY	N, R or RQD	BLOW COUNTS /15 cm Fragmentation (mm)	VOC (ppm)	VISUAL CONTAMINATION (hydrocarbons) A	D	P	GRAPHIC	WATER LEVELS	LAB TESTS
		78.51	Level															
		0.00	Asphalt.															
		78.48	Granular base.															
		0,025	Fill : Silty Gravely Sand,															
		78.36	greyish brown, damp,															
		0.15	compact.															
1		77.90	Sand, trace silt, brown, damp,		SS-1		N		63	17	6-9-8-4							
		0.61	loose.															
	5				SS-2		N		63	8	3-4-4-6							Wn = 7.0%
2			- Trace gravel, moist.		SS-3		N		67	6	4-3-3-5							
					SS-4		N		42	10	4-5-5-4							Wn = 6.0%
3		75.46																
	10	3.05	Native : Sand, some gravel,		SS-5		N		38	12	1-8-4-13							
			trace silt, brown, moist,															
4			compact (TILL).		SS-6		N		56	22	5-10-12-17							Wn = 4.0%
			- Trace gravel.															
	15				SS-7		N		42	R	11-34 > 50 cm							
5			-Gravel, wet, very dense.															
		73.13	-Cobbles and boulders.															
		5.38	Bedrock : Shale, black, slightly		RC-1				81	0								TCR = 81%
			weathered, strong, very poor															SCR = 20%
6			quality based on RQD.															RQD = 0%
	20				RC-2				100	75								TCR = 100%
			-Good quality based on RQD.															SCR = 88%
7																		RQD = 75%
	25				RC-3				100	72								

GRAPHIC: ▲ : N (standard pen.) △ : Nc (dynamic pen.) ▼ : Cu (laboratory) ▽ : Cur (laboratory) × : Cu (field) + : Cur (field); W_p W_n W_l; 20 40 60 80

WATER LEVELS: ▽ 74.8 m

LAB TESTS
G : grain size analysis
H : hydrometer test
CA : chemical analysis
Ll : liquid limit
Pl : plastic limit
w : water content
Qu : rock comp. strength
Cur : disturbed shear strength
Cu : undrained shear strength
Cc : consolidation coefficient
k : permeability
Dup : duplicate

Remark(s) : GWL at 3,71 m mbgs on June 18, 2025

Verified by: **A.R. Senghani** Approved by: **A. Mohammad** Date of report 2025-06-26

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BOREHOLE LOG

Borehole N°

BH25-3

DEPTH (m)	DEPTH - ft	STRATIGRAPHY: ELEVATION (m)	STRATIGRAPHIC DESCRIPTION	SYMBOL	SAMPLES: TYPE NO	SUB-SAMPLE	CALIBER	STATE	RECOVERY	N, R or RQD	BLOW COUNTS /15 cm Fragmentation (mm)	VOC (ppm)	VISUAL CONTAMINATION (hydrocarbons): A	D	P	GRAPHIC	WATER LEVELS	LAB TESTS
			- Fair quality based on RQD.															TCR = 100% SCR = 81% RQD = 72%
		69.67			RC-4													
9	30	8.84	Shale interbedded with limestone, black to greyish black, strong, fair quality based on RQD.		RC-5				100	*72*								TCR = 100% SCR = 92% RQD = 72%
10																		
	35				RC-6				100	*99*								TCR = 100% SCR = 100% RQD = 99% UCS = 63.0 MPa
11																		
12	40				RC-7				98	*97*								TCR = 98% SCR = 98% RQD = 97%
13																		
	45				RC-8				100	*95*								UCS = 61.9 MPa TCR = 100% SCR = 100% RQD = 95%
14																		
		63.63																
15	50	14.88	END OF THE BOREHOLE															
16																		
	55																	
17																		
18	60																	
19																		
	65																	
20																		
21																		
	70																	
22																		

GRAPHIC: ▲ : N (standard pen.); △ : Nc (dynamic pen.); ▼ : Cu (laboratory); ▽ : Cur (laboratory); X : Cu (field); + : Cur (field); W_p W_n W_l; 20 40 60 80

LAB TESTS: G : grain size analysis; H : hydrometer test; CA : chemical analysis; LI : liquid limit; PI : plastic limit; w : water content; Qu : rock comp. strength; Cur : disturbed shear strength; Cu : undrained shear strength; Cc : consolidation coefficient; k : permeability; Dup : duplicate

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E-2020-3260

ENVIRO-EXPERTS

FORAGE No. F-01
ÉLÉVATION 99.18

RAPPORT DE SONDAGE
FEUILLE 01 de 05

LEGENDE:
- CF CUILLÈRE FENDUE
- TM TUBE À PAROI MINCE
- CR CAROTTIER DIAMANTÉ
- NIVEAU D'EAU

PROJET: Étude Géotechnique
N/PROJET: E-2020 - 3260
CLIENT : M. Max Mahi
ADRESSE : 630 Chemin de montréal, Ottawa, Ontario, Canada.
DÉCRIT PAR: F.A. VÉRIFIÉE PAR: H.A.
DATE (Début): 25 Septembre 2020 DATE (fin): 25 Septembre 2020

- GRAVIER
- SABLE
- SILT
- ARGILE

W: TENEUR EN EAU
Od : CONSOLIDATION OEUDOMÉTRIQUE
AG : ANALYSE GRANULOMÉTRIQUE
AC : ANALYSE CHIMIQUE

PROFONDEUR (PIED)	PROFONDEUR (M)	ELEVATION (m)	STRATIGRAPHE	DESCRIPTION DES SOLS ET DU ROC Mesure niveau d'eau: 25 septembre 2020 : Sec	ÉCHANTILLON ÉTAT	TYPE ET NUMÉRO	RÉCUP.(%)	AUTRES ESSAIS	RÉSULTATS DES ESSAIS COUPS 6po/15cm OU RQD	INDICE DE PÉNÉTRATION
		99.18		SURFACE DU SOL						
0	0	99.13		Béton bitumineux (5 cm).						
				Remblai : Sable silteux et gravier.		CF-1	25		2-10-7-12	17
2				Pierre concassée et sable.		CF-2	50		25-15-16-14	31
4	1			Sable brun avec des traces de gravier.		CF-3	40		20-5-4-10	9
6				Sable brun, présence de débrit de béton.		CF-4	25		20-7-7-8	14
8	2	96.74		Sol naturel : Sable un peu grossier, brun .		CF-5	50		6-5-6-5	11
10	3			Sable un peu grossier compact, brun .		CF-6	45		5-6-7-7	13
12				Idem .		CF-7	50		5-6-5-5	11
14	4			Sable lâche, un peu grossier .		CF-8	40		5-5-4-4	9
16				Idem .		CF-9	60		3-3-2-2	5
18	5			Sable lâche humide , un peu grossier, brun.		CF-10	50		2-2-2-2	4
20	6			Sable lâche saturé en eau , un peu grossier, brun.		CF-11	20		0-1-2-2	3
22				Sable lâche saturé en eau , grossier, brun.		CF-12	40		12-13-12-12	25
24	7			Sable graveleux avec un peu de silt.		CF-13	70	▲	28-20-17-6	37
26	8			Cuillère vide. Refus à la cuillère fendue .		CF-14			10-12-50/2"	
28				Forage destructif. Refus à la tarière à 8,99 mètre .						
30	9	90.19		Roc :		CR-1				

RÉSULTATS DES ESSAIS

(CU) CISAILLEMENT AU CÔNE SUÉDOIS
(C_{UV}) SCISSOMÈTRE ■ Chantier
○ TENEUR EN EAU (%) ▲ Lab.
⊢ LIMITES D'ATTENBERG (%)
● INDICE "N" (Coups/12 po-30 cm)

0 10 20 30 40 50 60 70 80 90

Analyse granulométrique

E-2020-3260

ENVIRO-EXPERTS

FORAGE No. F-01
ÉLÉVATION 99,18

RAPPORT DE SONDAGE
FEUILLE 02 de 05

LEGENDE:
- CF CUILLÈRE FENDUE
- TM TUBE À PAROI MINCE
- CR CAROTTIER DIAMANTÉ
- NIVEAU D'EAU

PROJET: Étude Géotechnique
N/PROJET: E-2020 - 3260
CLIENT : M. Max Mahi
ADRESSE : 630 Chemin de Montréal, Ottawa, Ontario, Canada.
DÉCRIT PAR: F.A. VÉRIFIÉE PAR: H.A.
DATE (Début): 25 Septembre 2020 DATE (fin): 25 Septembre 2020

- GRAVIER
- SABLE
- SILT
- ARGILE

W: TENEUR EN EAU
Od : CONSOLIDATION OEUDOMÉTRIQUE
AG : ANALYSE GRANULOMÉTRIQUE
AC : ANALYSE CHIMIQUE

PROFONDEUR (PIED)	PROFONDEUR (M)	ELEVATION (m)	STRATIGRAPHE	DESCRIPTION DES SOLS ET DU ROC	ÉCHANTILLON ÉTAT	ÉCHANTILLON TYPE ET NUMÉRO	ÉCHANTILLON RÉCUP.(%)	ÉCHANTILLON AUTRES ESSAIS	RÉSULTATS DES ESSAIS COUPS 6po/15cm OU RQD	RÉSULTATS DES ESSAIS INDICE DE PÉNÉTRATION
30	9									
32	10			Roc de très mauvaise qualité.		CR–1			RQD = 20%	
34										
36	11			Roc de qualité moyenne.		CR–2			RQD = 58%	
38										
40	12	87.14		Fin du forage à 12.04 mètre.						
42	13									
44										
46	14									
48										
50	15									
52	16									
54										
56	17									
58	18									

RÉSULTATS DES ESSAIS

(CU) CISAILLEMENT AU CÔNE SUÉDOIS.
(C_{UV}) SCISSOMÈTRE
○ TENEUR EN EAU (%) ■ Chantier
LIMITES D'ATTENBERG (%) ▲ Lab.
● INDICE "N" (Coups/12 po–30 cm)

0 10 20 30 40 50 60 70 80 90

Résistance à la compression = 48.7 MPa

APPENDIX 3

GEOTECHNICAL LABORATORY TESTS
TEST RESULTS

TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,224
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-1 SS1	Depth :	0 - 0.61 m
Use:		Customer reference:	GMBC100

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	9.9		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,239
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-1 SS3	Depth :	1.52 - 2.13m
Use:		Customer reference:	GMBC100

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	5.6		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,242
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-1 SS5	Depth :	3.05 - 3.66m
Use:		Customer reference:	GMBC100

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	7.0		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,244
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-1 SS7	Depth :	4.57 - 5.18m
Use:		Customer reference:	GMBC100

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	20.8		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,245
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample: BH21-1 SS9		Depth :	6.1 - 6.71m
Use:		Customer reference:	GMBC100

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	10.2		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,246
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-1 SS11	Depth :	7.62 - 8.23m
Use:		Customer reference:	GMBC100

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	6.8		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,254
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-2 SS2	Depth :	0.76 - 1.37m
Use:		Customer reference:	GMBC100

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	10.1		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,257
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-2 SS4	Depth :	2.29 - 2.9m
Use:		Customer reference:	GMBC100

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	7.0		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,259
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-2 SS6	Depth :	3.81 - 4.42m
Use:		Customer reference:	GMBC100

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	4.6		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,262
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-2 SS10	Depth :	6.86 - 7.47 m
Use:		Customer reference:	GMBC100

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	11.3		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,266
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-3 SS2	Depth :	0.76 - 1.37m
Use:		Customer reference:	GMBC100

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	7.0		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,268
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-3 SS4	Depth :	2.29 - 2.9m
Use:		Customer reference:	GMBC100

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	5.6		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,269
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-3 SS6	Depth :	3.81 - 4.42m
Use:		Customer reference:	GMBC100

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	3.4		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

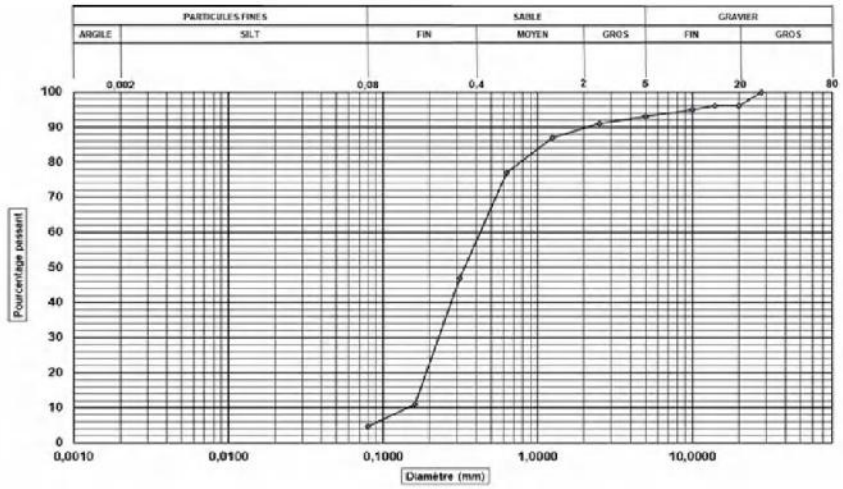
TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,236
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-1 SS2	Depth :	0.76-1.37m
Use:		Customer reference:	GMBC100

Granulometric curve



Granulometry BNQ 2501-025

% passing sieve		Requirements	Status
80 mm	100		
56 mm	100		
40 mm	100		
31.5 mm	100		
28 mm	100		
20 mm	96		
14 mm	96		
10 mm	95		
5 mm	93		
2.5 mm	91		
1.25 mm	87		
0.630 mm	77		
0.315 mm	47		
0.160 mm	11		
0.080 mm	4.7		

D10 (mm)	0.143	**D30 (mm)**	0.229	**D60 (mm)** 0.425	
Cu	2.97	**Cc**	0.86		

Percentage of particle size fractions

Fine Fraction		Coarse Fraction		
Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Pebbles (%)
4.7		88.3	7.0	N / A

Simple description: Sand, traces of gravel, traces of silt.

Tests	Unit	Result	Requirements	Status

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

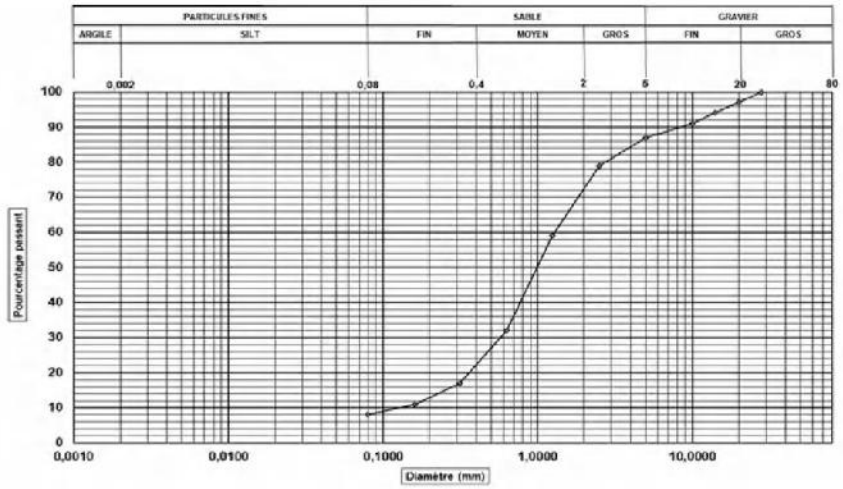
TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,261
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-2 SS8	Depth :	5.33 - 5.94m
Use:		Customer reference:	GMBC100

Granulometric curve



Granulometry BNQ 2501-025

% passing sieve		Requirements	Status
80 mm	100		
56 mm	100		
40 mm	100		
31.5 mm	100		
28 mm	100		
20 mm	97		
14 mm	94		
10 mm	91		
5 mm	87		
2.5 mm	79		
1.25 mm	59		
0.630 mm	32		
0.315 mm	17		
0.160 mm	11		
0.080 mm	8.1		

D10 (mm)	0.126	**D30 (mm)**	0.574	**D60 (mm)** 1,294	
Cu	10.27	**Cc**	2.02		

Percentage of particle size fractions

Fine Fraction		Coarse Fraction		
Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Pebbles (%)
8.1		78.9	13.0	N / A

Simple description: Sand, some gravel, traces of silt.

Tests	Unit	Result	Requirements	Status
Determination of water content / BNQ 2501-170	%	13.7		

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

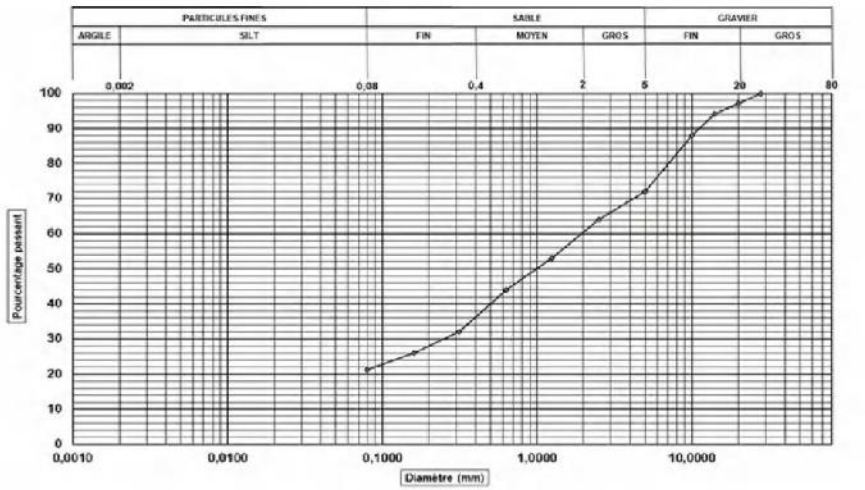
TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,265
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-3 SS1	Depth :	0 - 0.61 m
Use:		Customer reference:	GMBC100

Granulometric curve



Granulometry BNQ 2501-025

% passing sieve		Requirements	Status
80 mm	100		
56 mm	100		
40 mm	100		
31.5 mm	100		
28 mm	100		
20 mm	97		
14 mm	94		
10 mm	88		
5 mm	72		
2.5 mm	64		
1.25 mm	53		
0.630 mm	44		
0.315 mm	32		
0.160 mm	26		
0.080 mm	21.3		

D10 (mm)	N / A	**D30 (mm)**	0.251	**D60 (mm)**	1,943	**Cu** N / A	**Cc** N / A

Percentage of particle size fractions

Fine Fraction			Coarse Fraction	
Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Pebbles (%)
21.3		50.7	28.0	N / A

Simple description: Silty gravelly sand.

Tests	Unit	Result	Requirements	Status

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

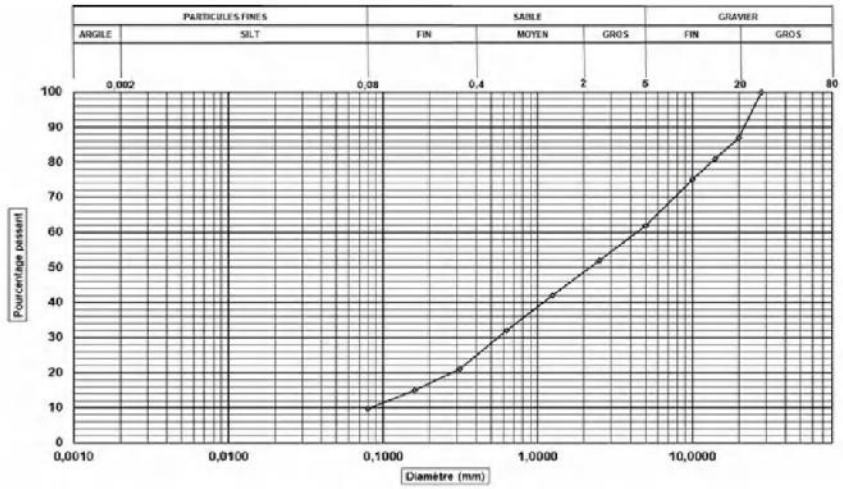
TESTS ON GRANULAR MATERIALS

Project: 630 Montreal Road
Client: MB Canada Group Inc.
N/Ref: GO24132400 V/Ref: Client #: GMBC100

Sampling

Material type:	Natural soil	Lab No.:	358,270
Collected by:	Alpesh Ramesh Senghani	Collected on:	2025-06-16
Supplier/Career:	In place / In situ	Caliber:	Natural soil
Location of the sample:	BH25-3 SS7	Depth :	4.57 - 5.18m
Use:		Customer reference:	GMBC100

Granulometric curve



Granulometry BNQ 2501-025

% passing sieve		Requirements	Status
80 mm	100		
56 mm	100		
40 mm	100		
31.5 mm	100		
28 mm	100		
20 mm	87		
14 mm	81		
10 mm	75		
5 mm	62		
2.5 mm	52		
1.25 mm	42		
0.630 mm	32		
0.315 mm	21		
0.160 mm	15		
0.080 mm	9.8		

D10 (mm)	0.082	**D30 (mm)**	0.555	**D60 (mm)** 4,353	
Cu	52.98	**Cc**	0.86		

Percentage of particle size fractions

Fine Fraction		Coarse Fraction		
Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Pebbles (%)
9.8		52.2	38.0	N / A

Simple description: Sand and gravel, traces of silt.

Tests	Unit	Result	Requirements	Status

Remarks

Prepared by: Maude Brouillette Fischbach

Verified by: Amer Mohammad

Date : 2025-06-19

ROCK CORE TEST

ASTM D 4543 and ASTM D 7012

ABS/REF:GO24132400

Date: 2025-06-25

Customer:	MB Group Canada Inc.	Customer	GMBC100
Project :	630, Montreal Road		
Part of structure :	BH25		

ROCK CORE SAMPLES						
Sample number	358 247	358 252	358 263	358 264	358 271	358 272
Borehole identification	BH25-1	BH25-1	BH25-2	BH25-2	BH25-3	BH25-3
Stroke identification	RC2	RC3	RC1	RC2	RC6	RC8
Depth (m)	9.2 - 9.3 m	10,4 - 10,6 m	8.4 - 8.5 m	10 - 10,1 m	11,1 - 11,4 m	13,9 - 14,1 m
Core drilling carried out by	A - Senghani	A - Senghani	A - Senghani	A-Senghani	A - Senghani	A - Senghani
LITHOLOGICAL DESCRIPTION						
Nature	Shale	Clayey limestone	Shale	Shale	Clay Limestone	Clayey limestone
Presence of interbeds	Litage	-	Litage	Litage	-	-
Intrusion	No	No	No	No	No	No
COMPRESSIVE STRENGTH						
Preparation of ends by sawing	Yes	Yes	Yes	Yes	Yes	Yes
Flatness and angle	C	C	C	C	C	C
Length after cut (mm)	99,64	154,88	94,64	98,90	157,13	155,64
Loading rate (MPa/s)	0,5	0,5	0,5	0,5	0,5	0,5
Core diameter (mm)	63,06	63,34	63,15	63,22	63,26	63,15
Carrot weight (g)	797,90	1 270,10	764,30	808,80	1 290,10	1 303,10
Height/diameter ratio	1,6	2,5	1,5	1,6	2,5	2,5
Correction factor	1,0	1,0	1,0	1,0	1,0	1,0
Breaking load (kN)	140	141	222	113	198	194
Area (mm^2)	3 123	3 151	3 132	3 139	3 143	3 132
Compressive strength (MPa)	**44,8**	**44,7**	**70,9**	**36,0**	**63,0**	**61,9**
Density (kN/m^3)	25,2	25,5	25,3	25,6	25,6	26,2
Density (kg/m^3)	2 568	2 599	2 579	2 609	2 609	2 670
Appearance after breakage	Shattered	Splintered	Shattered	Shattered	Shattered	Exploded

NOTES

Press (compression) Model: 1500 KN Serial no. : 21005777

Prepared by : Imane Djerrab Verified by: Amer Mohammad Date: 2025-06-25

Ref: LG027 (R07 2022-01-10)

* Contractions used in the report: Compliant - C, Non-compliant - NC, Not available - N/A

Certificate of Analysis

Client: Groupe ABS
850 Industrial Ave (Suite B)
Ottawa, ON
K1G 4H3
Attention: Mr. Amer Mohammad
PO#:
Invoice to: Groupe ABS

Report Number: 3017271
Date Submitted: 2025-06-16
Date Reported: 2025-06-24
Project: G024132400
COC #: 124134

Dear Amer Mohammad:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____
Patrick Jacques, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: https://directory.cala.ca/.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

eurofins | Environment Testing

Client: Groupe ABS
850 Industrial Ave (Suite B)
Ottawa, ON
K1G 4H3
Attention: Mr. Amer Mohammad
PO#:
Invoice to: Groupe ABS

Report Number: 3017271
Date Submitted: 2025-06-16
Date Reported: 2025-06-24
Project: G024132400
COC #: 124134

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1770962 Soil 2025-06-10 BH25-2 SS3	1770963 Soil 2025-06-11 BH25-1 SS11
Anions	Cl	0.002	%			0.002	0.018
	SO4	0.01	%			<0.01	0.07
General Chemistry	Electrical Conductivity	0.05	mS/cm			0.166	0.754
	pH	2.00				8.52	8.11
	Resistivity	1	ohm-cm			6024	1317
Moisture	Moisture-Humidite	0.1	%			7.1	7.7
Redox Potential	REDOX Potential		mV			257	213
Subcontract	S2-	0.01	%			0.01	1.86

Guideline = *** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

Client: Groupe ABS
850 Industrial Ave (Suite B)
Ottawa, ON
K1G 4H3
Attention: Mr. Amer Mohammad
PO#:
Invoice to: Groupe ABS

Report Number: 3017271
Date Submitted: 2025-06-16
Date Reported: 2025-06-24
Project: G024132400
COC #: 124134

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 477234 **Analysis/Extraction Date** 2025-06-18 **Analyst** AsA **Method** C CSA A23.2-4B			
Chloride	<0.002 %	114	75-125
Run No 477267 **Analysis/Extraction Date** 2025-06-18 **Analyst** NK **Method** Cond-Soil			
Electrical Conductivity	<0.05 mS/cm	100	90-110
pH	5.10	97	90-110
Resistivity			
Run No 477280 **Analysis/Extraction Date** 2025-06-18 **Analyst** IP **Method** C SM2580B			
REDOX Potential	205 mV	98	97-103
Run No 477283 **Analysis/Extraction Date** 2025-06-18 **Analyst** IP **Method** ASTM 2216			
Moisture-Humidite			80-120
Run No 477453 **Analysis/Extraction Date** 2025-06-23 **Analyst** IP **Method** AG SOIL			
SO4	<0.01 %	98	70-130
Run No 477537 **Analysis/Extraction Date** 2025-06-24 **Analyst** AET **Method** SUBCONTRACT-SGS			

Guideline = *** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

Client: Groupe ABS
850 Industrial Ave (Suite B)
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Attention: Mr. Amer Mohammad
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Report Number: 3017271
Date Submitted: 2025-06-16
Date Reported: 2025-06-24
Project: G024132400
COC #: 124134

QC Summary

Analyte	Blank	QC % Rec	QC Limits
S2-			

Guideline = *** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

eurofins 124134

STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

3017271

CLIENT INFORMATION

Company: Groupe ABS Inc.
Contact: Amer Mohammad
Address: 8-850 Industrial Avenue, Ottawa, ON
Telephone: Cell: 613-316-9513
Email: #1: amohammad@groupeabs.com
Email: #2:
Project: GO241324OO Quote #: 192463

INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☐ NO ☐)

Company:
Contact: Email: #1:
Address: Email: #2:
Telephone: PO #:

TURN-AROUND TIME (Business Days)

☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☑ 5-7 Days (Standard)

Please contact Lab in advance to determine rush availability. *For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%. **For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

TCLP, SPLP, PFAS, and NP/NPE the rush surcharges are 100% (3 day) and 50% (4 day). For farm soils the rush surcharge is 100% (3-5 days). Regular TAT is 10 days.

REGULATION/GUIDELINE REQUIRED

☐ Sanitary Sewer, City:
☐ Storm Sewer, City:
ODWSOG [Use DW COC if samples are for human consumption]
PWQO
☐ O.Reg. 347 (TCLP)
Other:

☐ O. Reg. 153/04
The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04. Analysis of full parameter list only Yes ☐ No ☐
Table # ____, Coarse / Fine, Surface / subsurface
Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment

☐ O. Reg 406 Excess Soils
Table # _____ Full depth/Strat/Ceiling/mSPLP Leachate
Type: Com-Ind /Res-Park /Agri/All Other
Category: Surface /Subsurface

The optimal temperature conditions during transport is 4 - 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. This COC must not be used for drinking water samples. The COC must be complete upon submission of the samples, there will be a $25 surcharge if required information is missing (required fields are shaded in grey).

Occasionally, situations arise in which Eurofins Environment Testing Canada (Ottawa) is unable to process a sample after receipt. By signing this chain-of-custody form, the client agrees that Eurofins Environment Testing Canada (Ottawa) may subcontract samples to a laboratory that is similarly accredited. This subcontracted laboratory will perform the same analysis using the same or similar methodology. Agreements made in advance to subcontract to a specific laboratory will be honored.

Sample Details

Field Filtered →

Sample ID	Date/Time Collected	Sample Matrix	# of Containers	O.Reg.153/04 parameters: PHC F1-F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganics	Metals only	Conventional (Cyanide, Sulphide)	Warranty (reduce Sulphide)	RN# (Lab Use Only)
BH25-2, SS3	25/06/10	Soil									X		1770962
BH25-3, SS11	25/06/11	Soil									X		63

	PRINT NAME	LOCATION	SIGN	DATE/TIME	TEMP (°C)
Sampled By:	ALPESH SENGHANI	OTTAWA		25/06/10-11	
Relinquished By:	A. "	"		"	
Received By:					
Received By:	Mithel Shibu	Ott		16/June/2025 8:15am	23°C

COMMENTS:

FOR INTERNAL LAB USE ONLY

CUSTODY SEAL: ☐ YES ☐ NO Ice packs submit ☐ Yes ☐ No

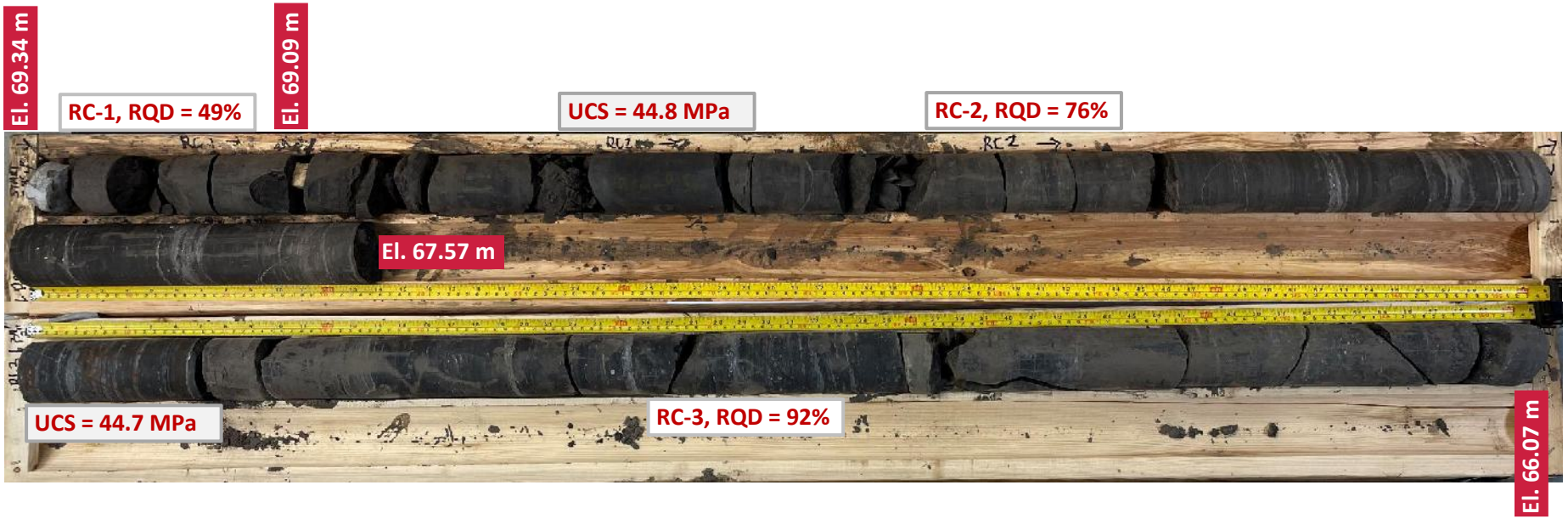
APPENDIX 4

ROCK CORE PHOTOGRAPHS

Retrieved Rock Cores

Client:	**MB Canada Group Inc.**	Project No.:	**GO-24-1324-00**
Project:	**Proposed Mid-rise Residential Development – 630 Montreal Road, Ottawa, Ontario**	Client No.:	**GMBC100**
Site:	**630 Montreal Road in Ottawa, ON**	Drilling Contractor:	**George Downing Estate Drilling Ltd**
Field Tech:	**Alpesh R. Senghani**		

Borehole: BH25-1

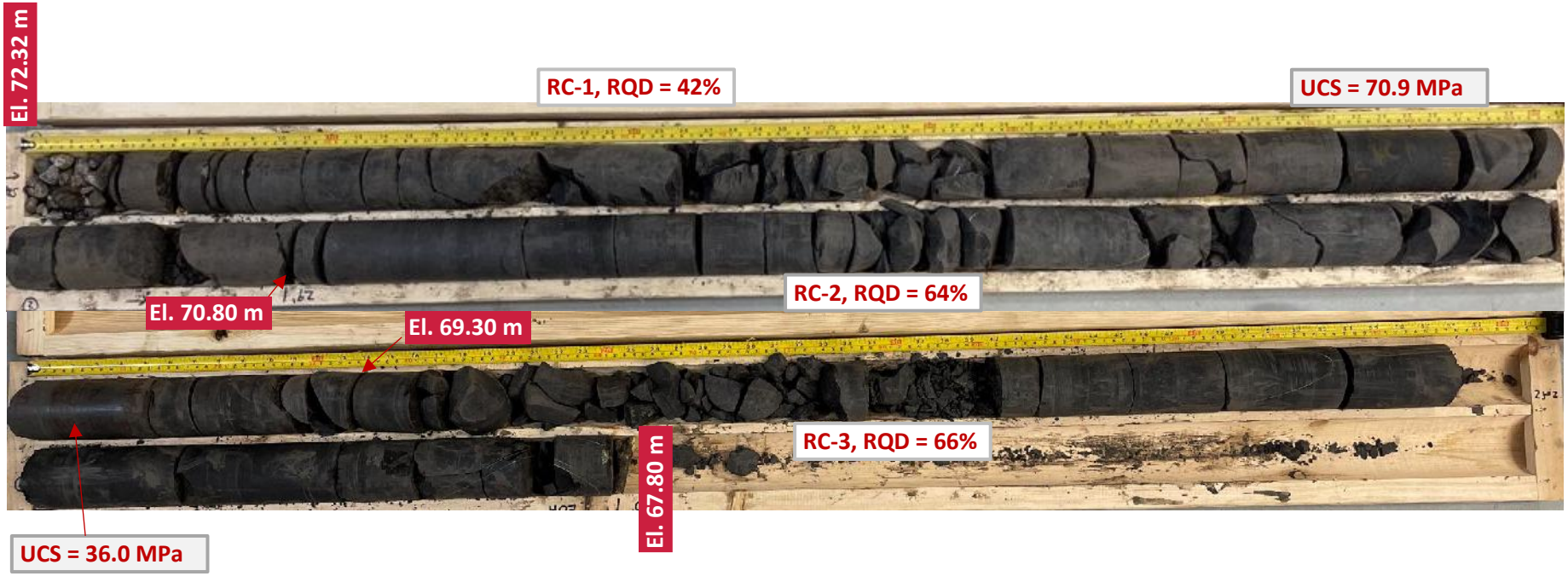


Prepared by: Alpesh R. Senghani	Verified by: Amer Mohammad	Date: 2025-06-27

Retrieved Rock Cores

Client:	**MB Canada Group Inc.**	Project No.:	**GO-24-1324-00**
Project:	**Proposed Mid-rise Residential Development – 630 Montreal Road, Ottawa, Ontario**	Client No.:	**GMBC100**
Site:	**630 Montreal Road in Ottawa, ON**	Drilling Contractor:	**George Downing Estate Drilling Ltd**
Field Tech:	**Jim Brooks**		

Borehole: BH25-2

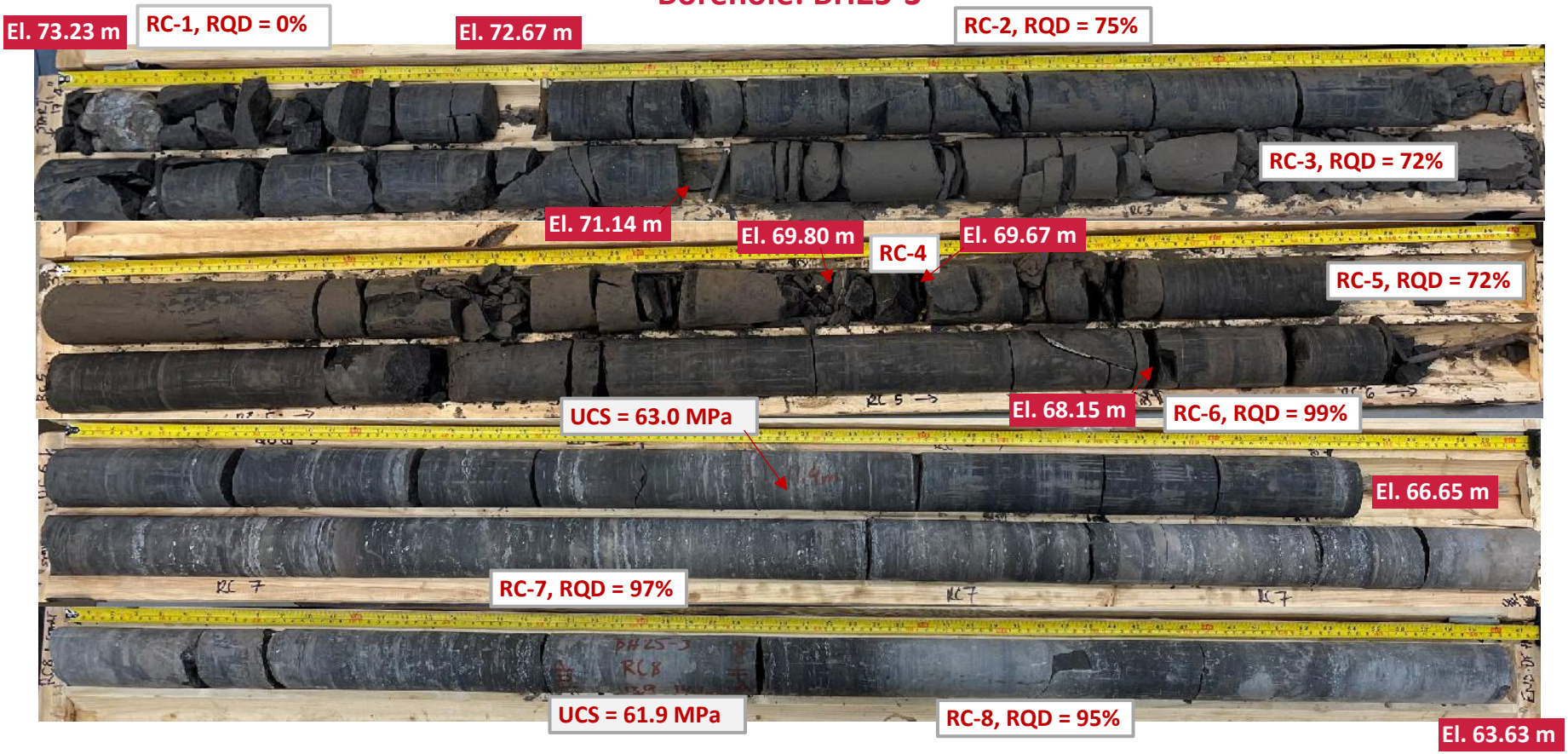


Prepared by: Alpesh R. Senghani	Verified by: Amer Mohammad	Date: 2025-06-27

Retrieved Rock Cores

Client:	**MB Canada Group Inc.**	Project No.:	**GO-24-1324-00**
Project:	**Proposed Mid-rise Residential Development – 630 Montreal Road, Ottawa, Ontario**	Client No.:	**GMBC100**
Site:	**630 Montreal Road in Ottawa, ON**	Drilling Contractor:	**George Downing Estate Drilling Ltd**
Field Tech:	**Alpesh R. Senghani**		

Borehole: BH25-3



Prepared by: Alpesh R. Senghani	Verified by: Amer Mohammad	Date: 2025-06-27

APPENDIX 5

CONCEPTUAL AND ELEVATION PLAN DRAWINGS

Maître dans l'art du développement immobilier
MB Groupe Canada
DEVELOPPER

YVES LUSSIER ARCHITECT
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(514) 924-8306 OAA 10140

ONTARIO ASSOCIATION of ARCHITECTS
YVES LUSSIER
LICENCE
10140

RACINE ▪ OTTAWA ▪

630 Montréal Road, Ottawa, On

LOT 45 AND PART OF LOTS 3, 4 & 5, REGISTEDED PLAN 343 (CITY OF OTTAWA)	
. ACTUAL LAND AREA	970.77 M²*
*AFTER CITY ROAD WIDENING	
. BUILDING FOOTPRINT (GFA):	502.55 M²
. NUMBER OF DWELLINGS:	56 UNITS

FILE NUMBER: DO7-12-21-0189
PLAN NUMBER: 18965

PERSPECTIVES

A 01 | 18

REVISION 9 / 27 -03 - 2024

DO7-12-21-0189

NO DE DOSSIER : 2020-117

NO DE DOSSIER 2020-117

MB GROUPE — Maître dans l'art du développement immobilier

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PERSPECTIVES
A 02 | 18
REVISION 9 / 27 -03 - 2024

D07-12-21-0189

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PERSPECTIVES
A 03 | 18
REVISION 9 / 27 -03 - 2024

NO DE DOSSIER : 2020-117

DO7-12-21-0189

NO DE DOSSIER 2020-117

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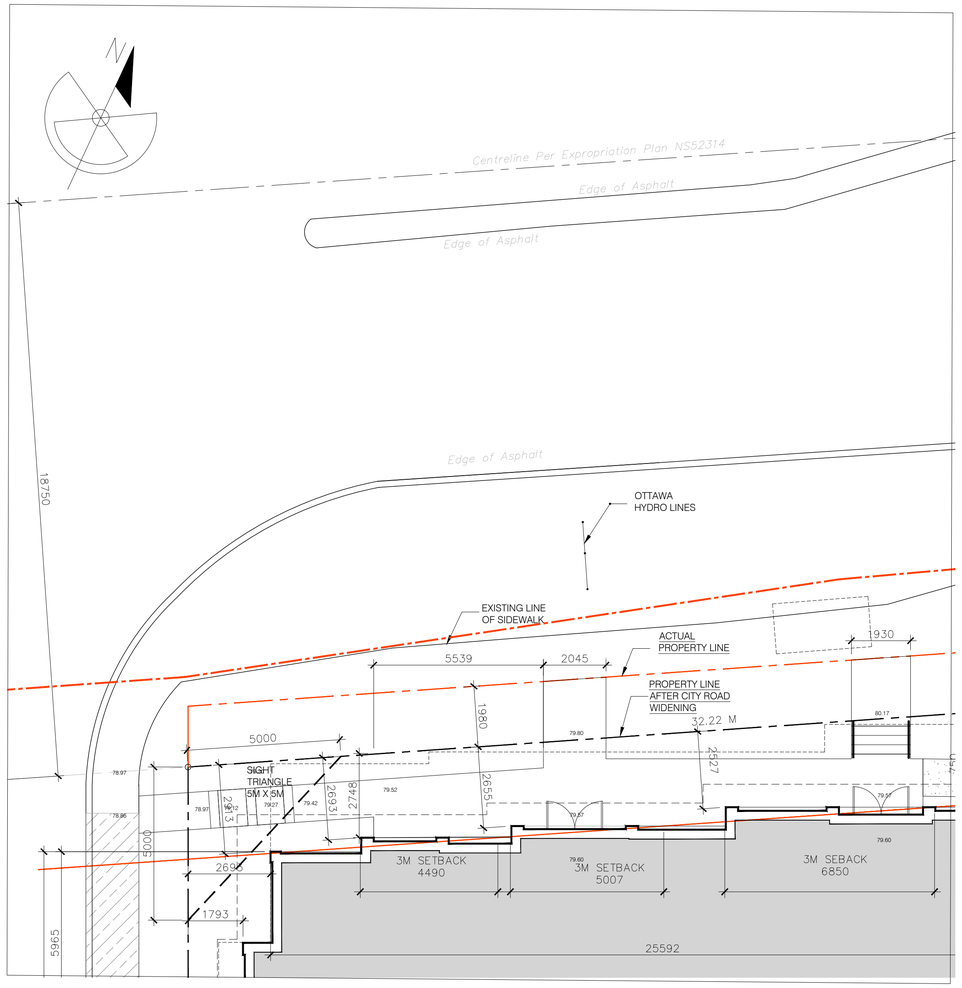
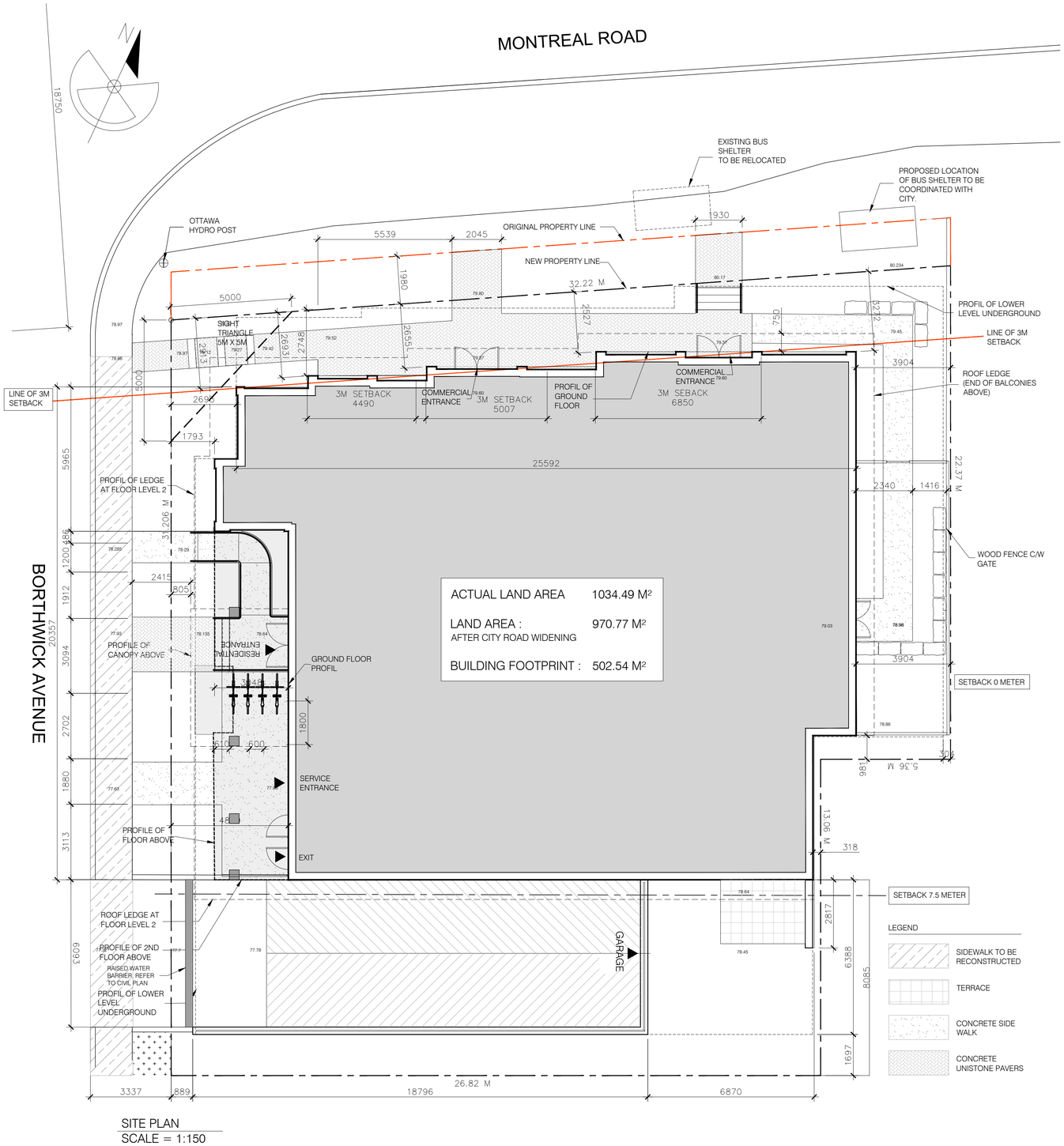
PERSPECTIVES
A 04 | 18
REVISION 9 / 27 -03 - 2024

D07-12-21-0189





SITE PLAN
SCALE = 1:150

ZONING COMPLIANCE TABLE

Zoning Provision	Requirement	Proposed
Minimum **lot width**	No minimum	32.2 m
Minimum **lot area**	No minimum	970,77 m2
Maximun **building height**	(ii) in any area up to and including 20 metres from a property line abutting a R4 residential zone	30.1 m
	(iii) in any area over 20 metres and up to 30 metres from a property line abutting a R4 zone	30.1 m
	(iv) in any area : 1. Outside of the areas identified in (i) through (iii)	30.1 m
Minimum **front yard setback**	0 m	3.15 m
Minimum **interior setback**	(i) First 20 metres from the street: 3.0 m	3.9 m
	(i) Beyond 20 metres from the street: 7.5 m	0.32 m
Minimum **rear yard setback**	(i) Any building wall within 20 metres of a lot line abutting a public street: 3.0 m	7.4 m
	All other cases: 7.5 m	7.4 m

Zoning Provision	Requirement	Proposed
Minimum required **amenity area** Apartment Building, mid-high rise	Total Amenity Area: 6m2 per dwelling unit, and 10% of the gross floor area of each rooming unit.	348 m2
	Communal Amenity Area: A minimum of 50% of the required total amenity area	174 m2
Parking: Minimum **parking space** rate for Area X – Sec. 102, Table 101, dwelling, mid-high-rise apartment	0.5 per dwelling unit (56 units x 0.5) = 28 spaces	28 parking spaces
Minimum **visitor parking** space rate for Area X, apartment dwelling low or mid-high-rise apartment – Sec. 102, Table 102 (iii) No visitor parking required for the first 12 units on a lot within areas X, Y, Z and B – Sec. 102(2)	0.1 per dwelling unit (56 units - 12 spaces = 44 spaces)	4 parking spaces
Minimum **parking retail store** space rate for Area X, retail store - Sec. 102, Table 102	1.25 per 100m2 of gross floor area (225.20 m2/100 m2 x 1.25 = 2.8 spaces)	3 parking spaces
	Note 2 parking spaces are less then 2.6m wide Actual dimension is 2.49 m	

2023-11-01

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R A C I N E ▪ O T T A W A ▪
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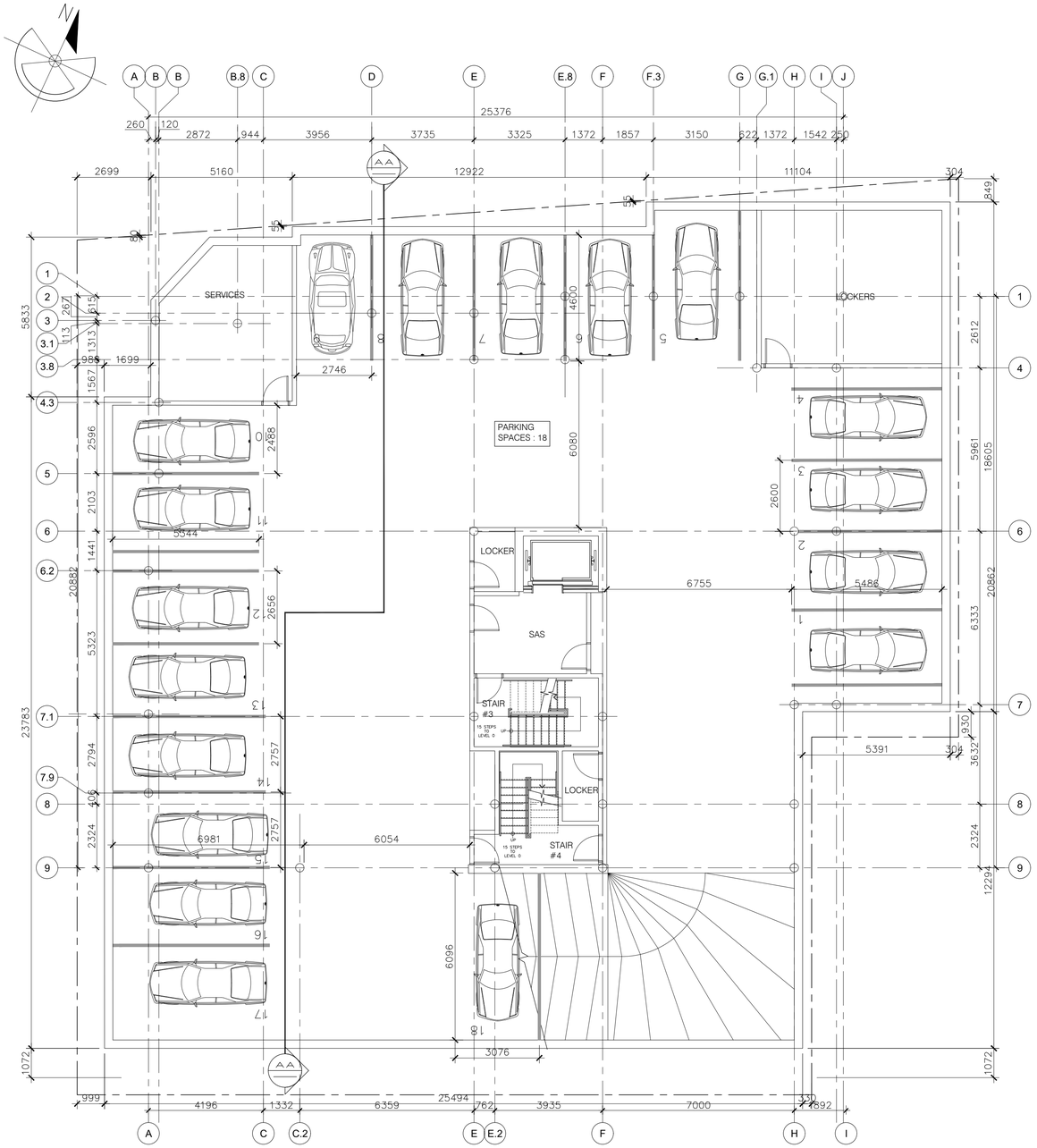
PLAN NUMBER: 18965

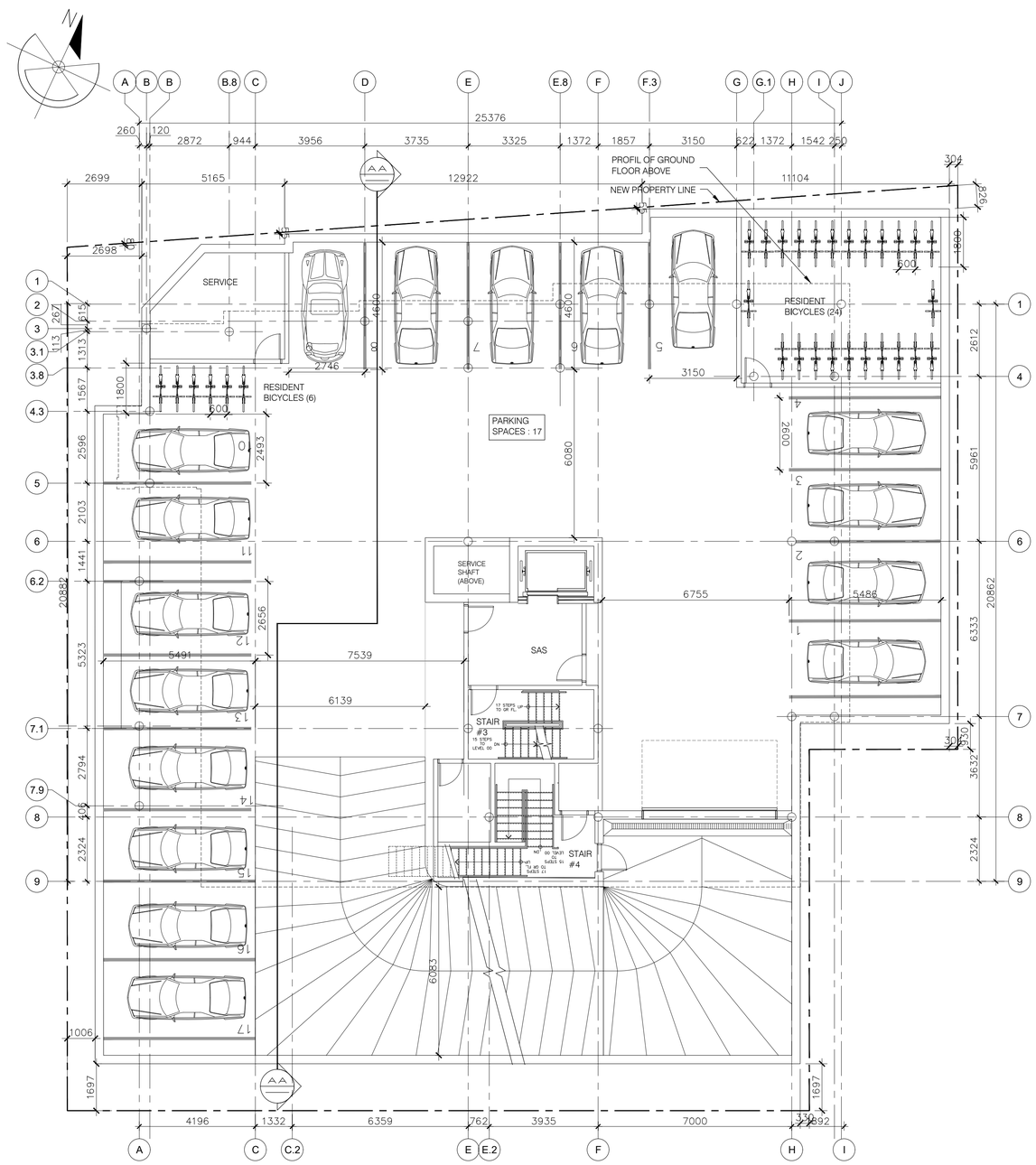
SITE PLAN
A 05 | 18
REVISION 9 / 27 -03 - 2024

D07-12-21-0189

NO DE DOSSIER 2020-117



SECOND BASEMENT - LEVEL 00
SCALE = 1:100



FIRST BASEMENT - LEVEL 01
SCALE - 1:100

USE	RATE	DWELLING UNITS	PARKING REQUIRED	BICYCLE REQUIRED
RESIDENTIAL, TENANT	0.5 PER DWELLING UNIT*	56 UNITS	28	28
RESIDENTIAL, VISITOR	0.1 PER DWELLING UNIT* * NO PARKING IS REQUIRED FOR THE FIRST 12 UNITS	42 UNITS	4	-
RETAIL STORE	1.25 /100 M²	206.5 M²	3	-
TOTAL REQUIRED			35	28
TOTAL PROJECTED: TWO PARKING LEVELS			35	28

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PARKING LEVELS
A 06 | 18
REVISION 9 / 27 -03 - 2024

DO7-12-21-0189

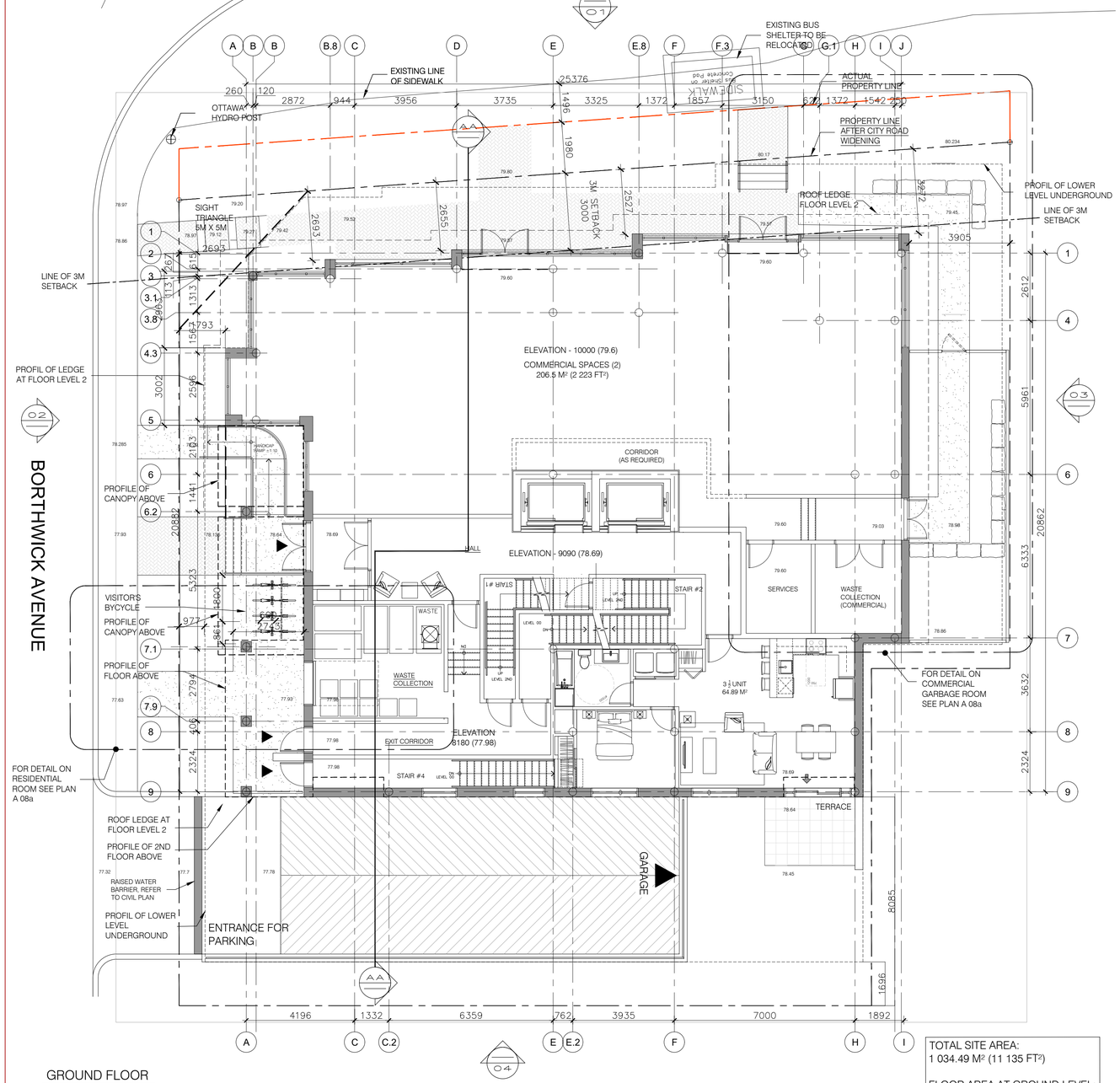
AMENITY AREA FOR 54 UNITS:			
	REQUIRED	SUPPLIED	TYPE
COMMUNAL AMENITY	162 M²	174 M²	ROOF TERRACE
PRIVATE AMENITY (SMALLEST BALCONY AREA : 3.93 M² X 56 UNITS = 220 M²)	162 M²	220 M²	PRIVATE BALCONIES
TOTAL	324 M²	394 M²	

Racine - Ottawa 2023-11-07

Type of unit	3 1/2	4 1/2	Floor area
Area (intérior)	Refer to plans		
Ground floor	0	1	502.54 m.c.
1st	2	0	240.45 m.c.
2nd	5	2	536.48 m.c.
3thrd	5	2	536.48 m.c.
4th	5	2	536.48 m.c.
5th	5	2	536.48 m.c.
6fh	5	2	536.48 m.c.
7th	3	3	477.58 m.c.
8th	3	3	477.58 m.c.
9th	4	2	473.34 m.c.
Total unit / type	37	19	**Total floor area**
Total of units	**56**		**4853.89 m.c.**

MONTREAL ROAD

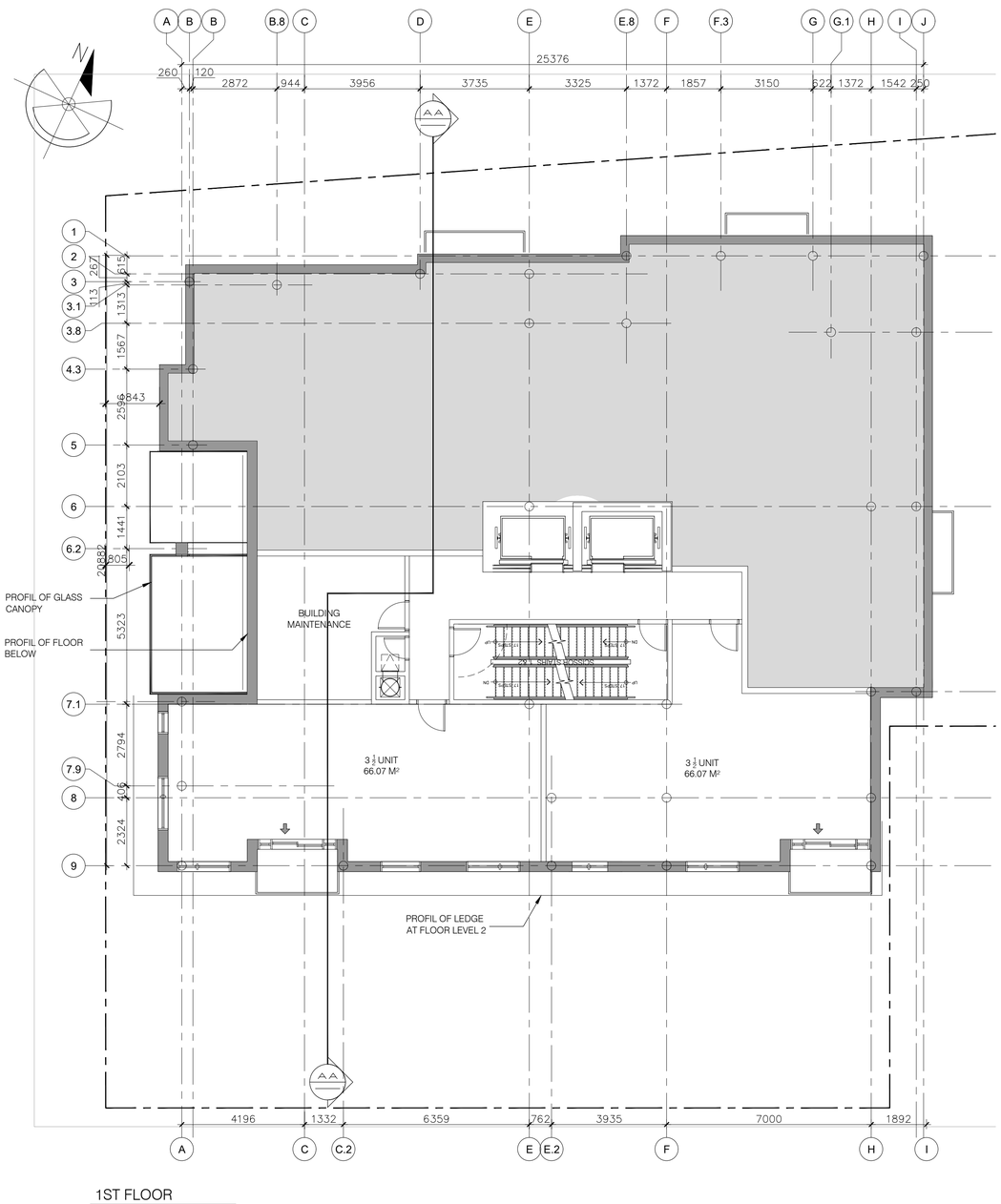
BORTHWICK AVENUE



GROUND FLOOR
SCALE = 1:100

TOTAL SITE AREA:
1 034.49 M² (11 135 FT²)

FLOOR AREA AT GROUND LEVEL:
502.54 M² (5 409.3 FT²)



1ST FLOOR
SCALE = 1:100

NO DE DOSSIER 2020-117

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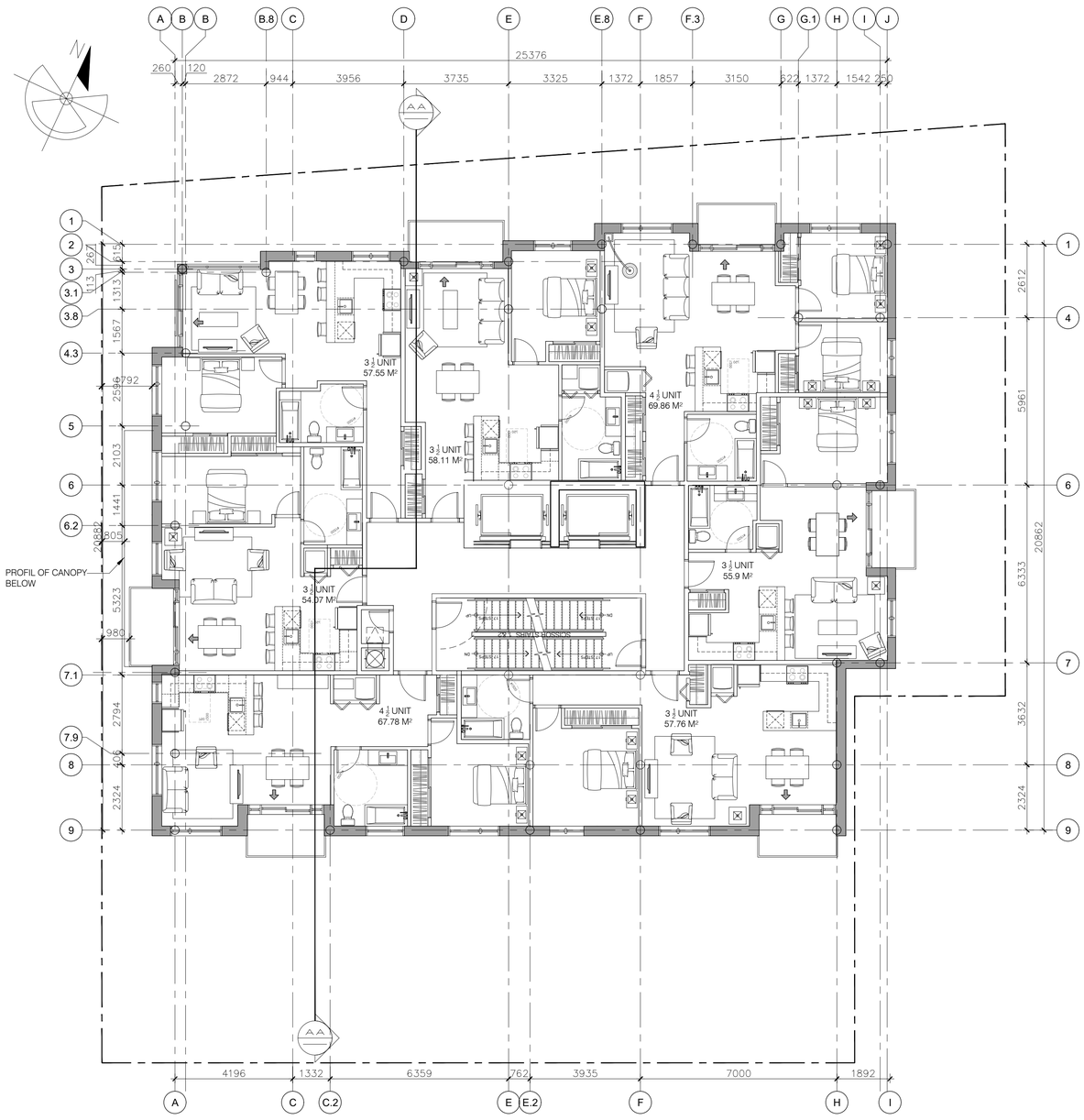
GROUND FLOOR
A 07 | 18
REVISION 9 / 27 -03 - 2024

DO7-12-21-0189



2TH FLOOR
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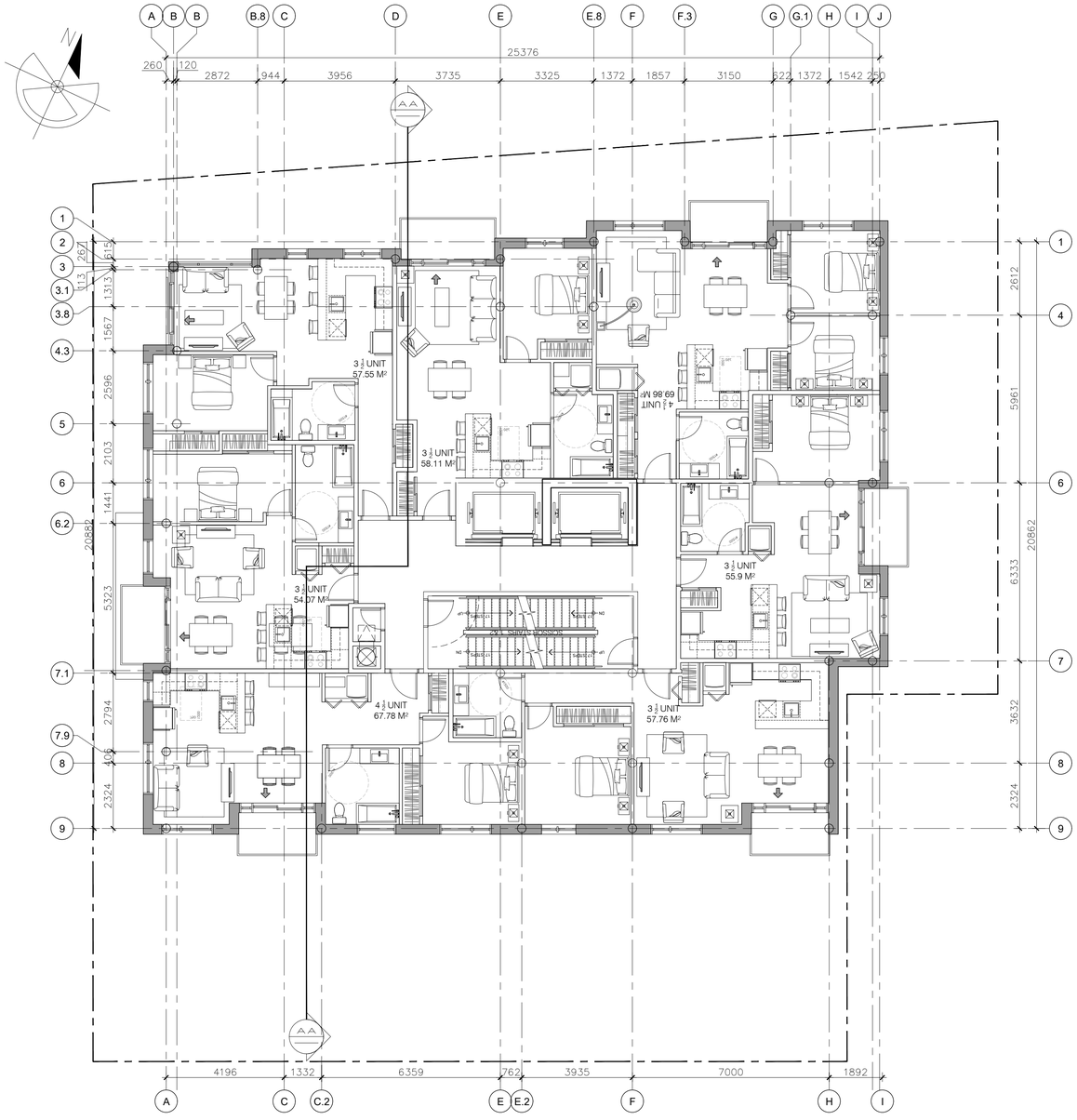

3RD to 6TH FLOOR
SCALE = 1:100

NO DE DOSSIER 2020-117

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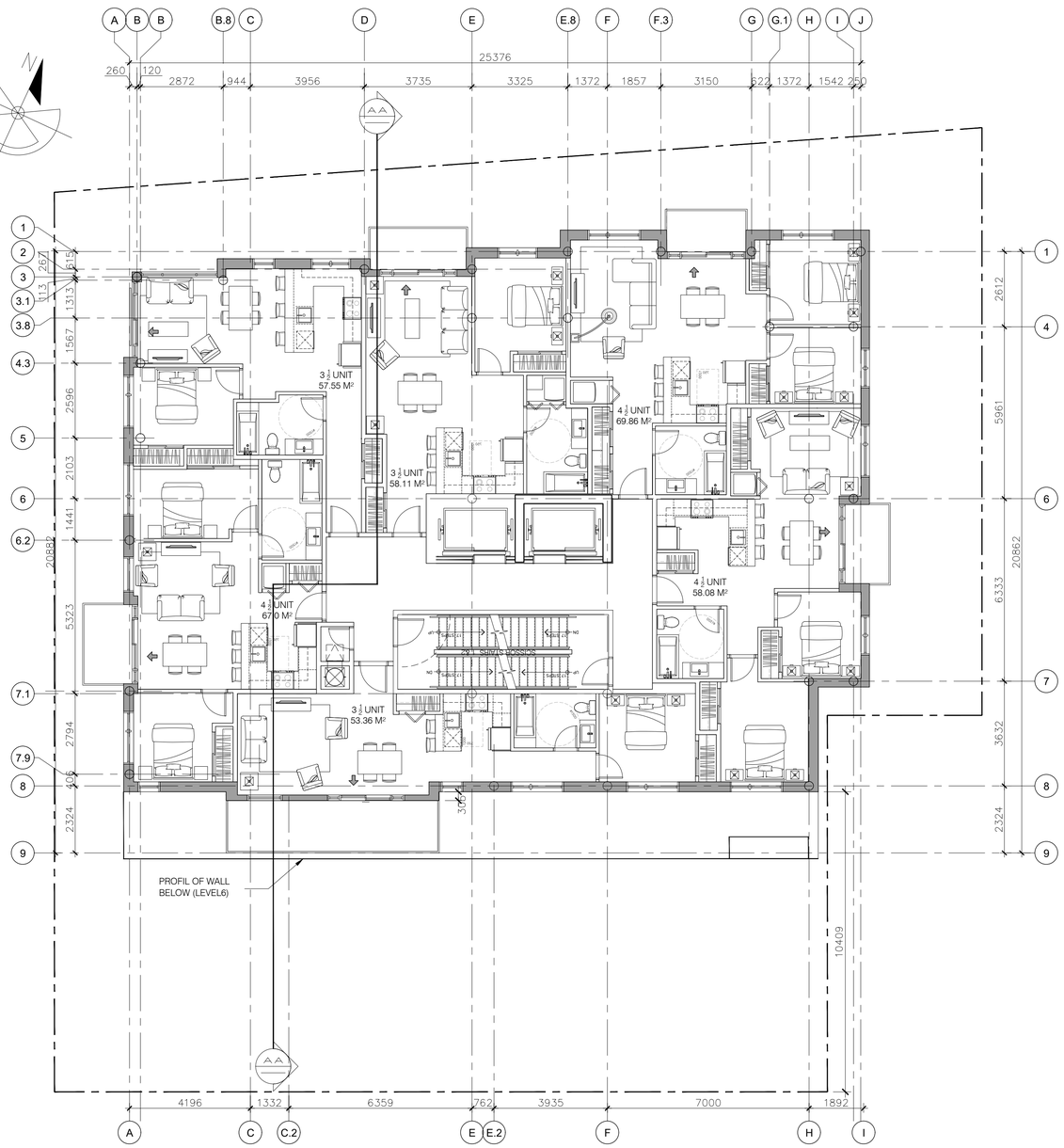
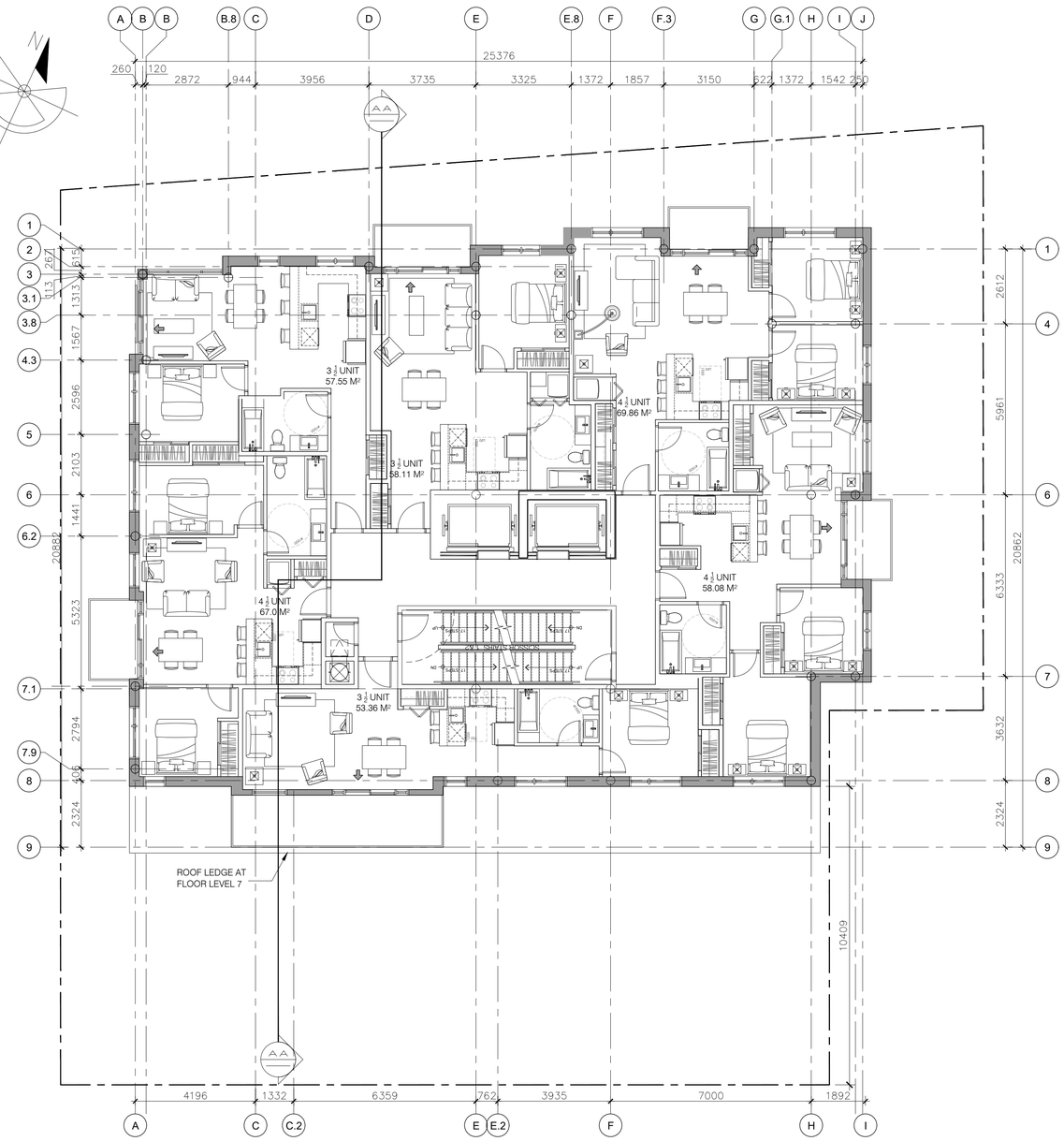
FLOORS 2 TO 6
A 08 | 18
REVISION 9 / 27 -03 - 2024

DO7-12-21-0189



7TH FLOOR
SCALE = 1:100



8TH FLOOR
SCALE = 1:100

NO DE DOSSIER 2020-117

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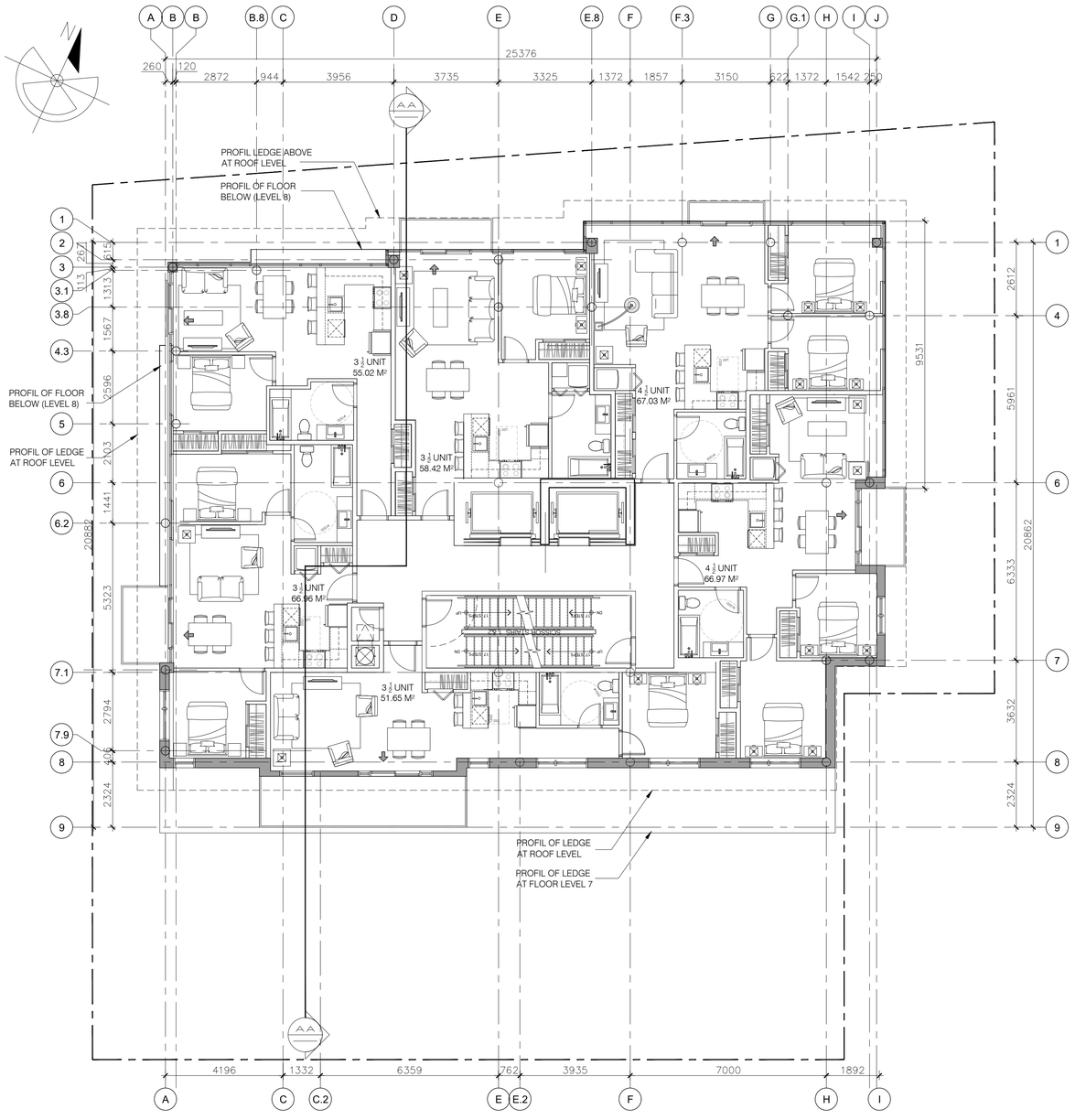
FLOORS 7 AND 8
A 09 | 18
REVISION 9 / 27 -03 - 2024

DO7-12-21-0189



9TH FLOOR
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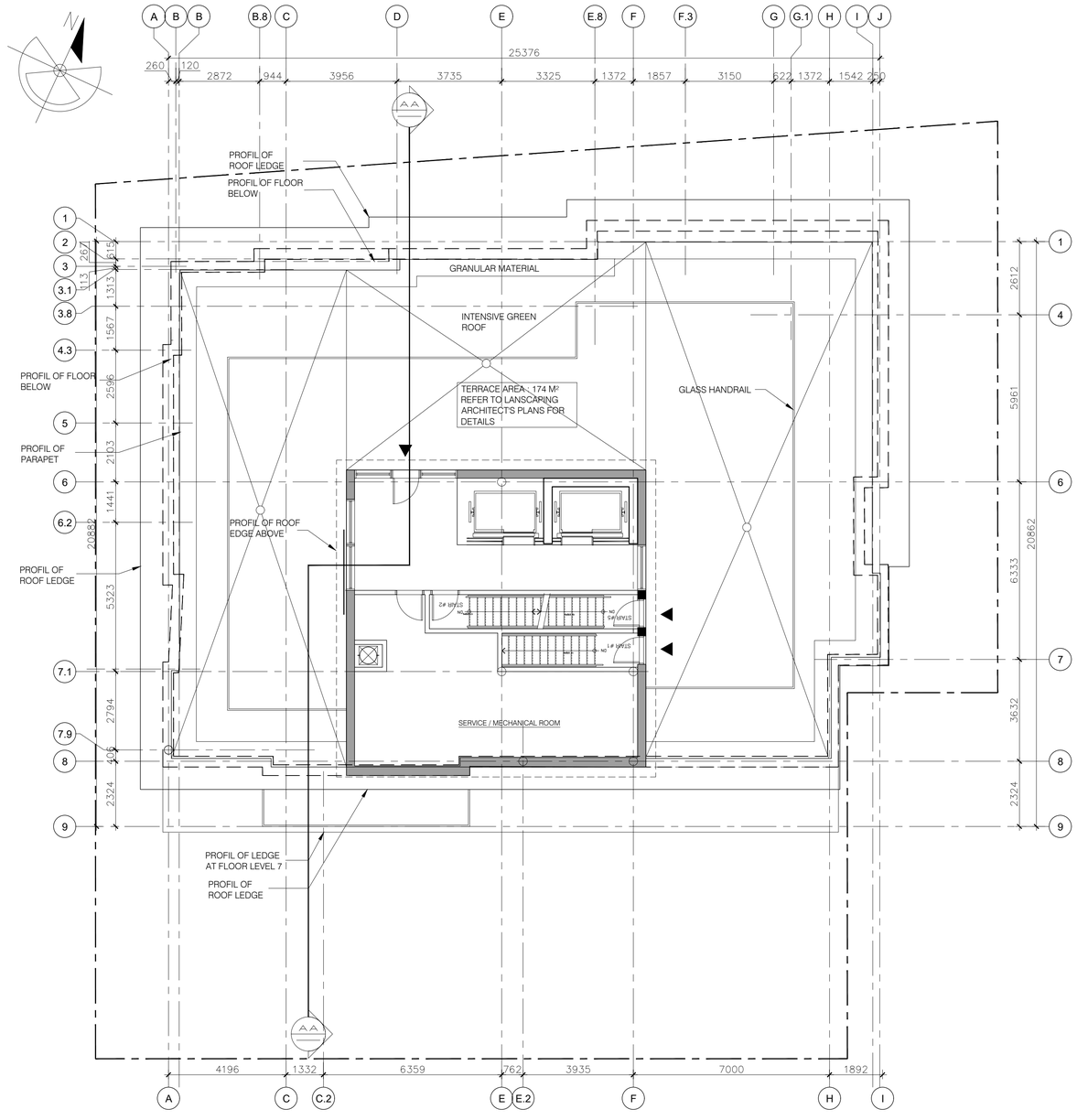

ROOF TERRACE
SCALE= 1:100

NO DE DOSSIER 2020-117

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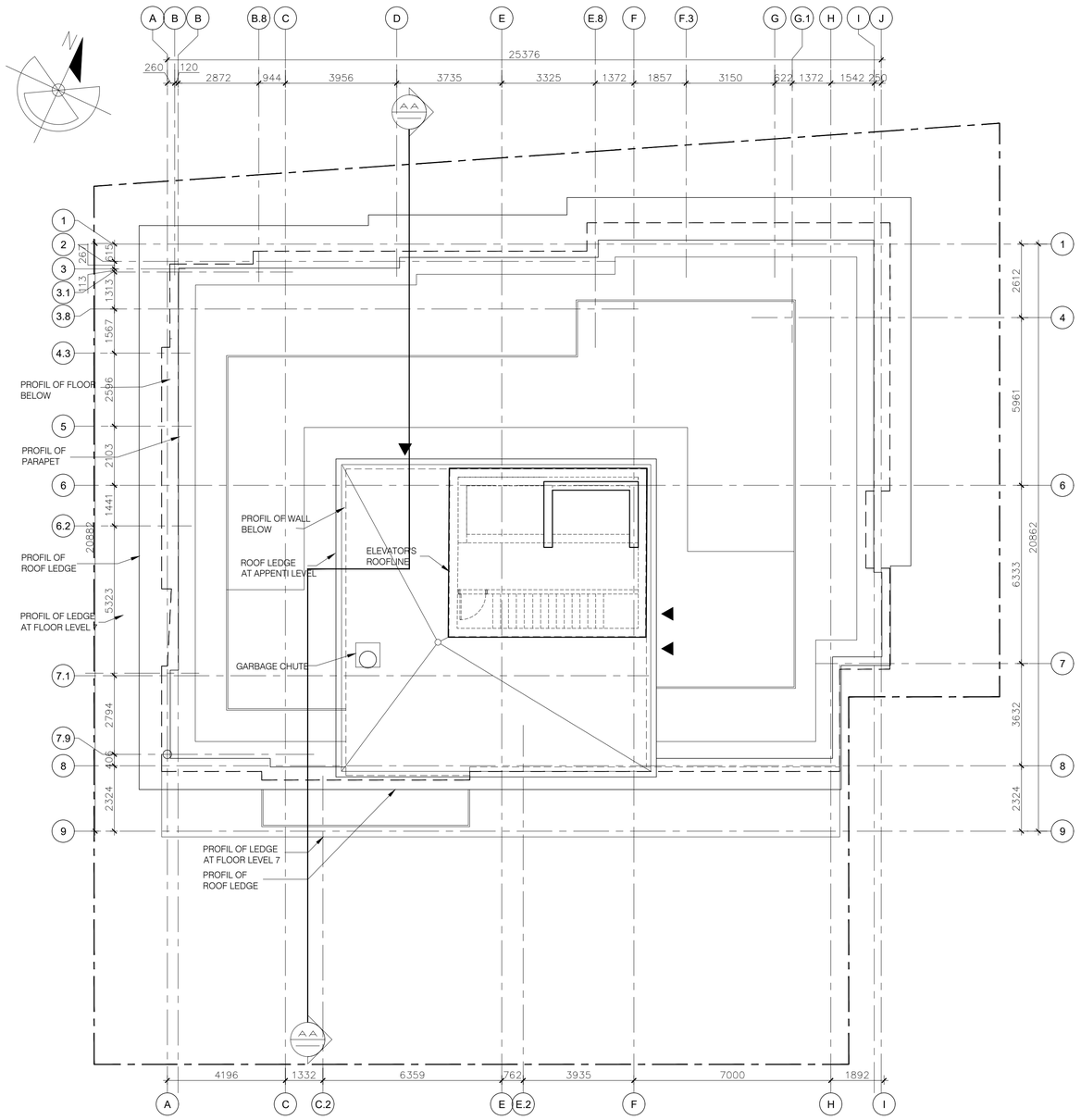
FLOOR 9 AND TERRACE LEVEL
A 10 | 18
REVISION 9 / 27 -03 - 2024

DO7-12-21-0189



NO DE DOSSIER 2020-117

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ROOF LEVEL
A 11 | 18
REVISION 9 / 27 -03 - 2024

DO7-12-21-0189

RESIDENTIAL - WASTE AND RECYCLING COLLECTION

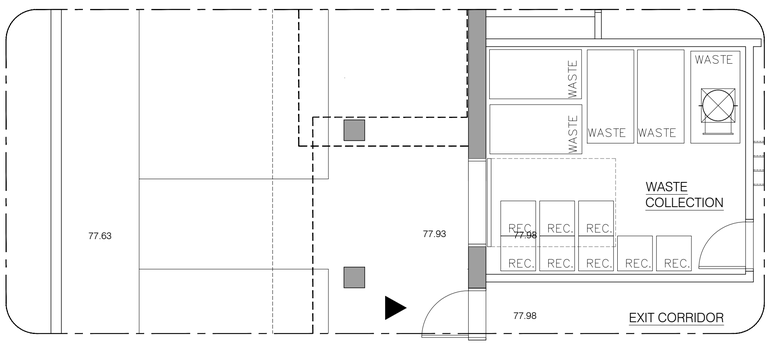
RESIDENTIAL WASTE ARE COLLECTED THOUGH A GARBAGE CHUTE INTO A WASTE BIN LOCATED ON THE GROUND FLOOR. THE BINS WILL BE MANAGED BY THE BUILDING INTENDANT.

THE RECYCLING WILL BE PICKED UP ON EACH FLOOR, ONCE A WEEK BY THE BUILDING INTENDANT, OR BROUGHT DOWN BY THE TENANT, TO THE WASTE COLLECTION ROOM LOCATED ON THE GROUND FLOOR. THE RECYCLING WILL THEN BE DEPOSITED IN THE APPROPRIATE RECYCLING BINS.

METHOD:
TRASH AND RECYCABLE WOULD THEN BE TAKEN ON DAYS OF COLLECTION BY THE BUILDING INTENDANT TO THE STREET CURB (BORTHWICK AVENUE).

THE BUILDING INTENDANT WILL BRING THEM BACK, ON THE SAME DAY, TO THE WASTE COLLECTION ROOM.

SIZE OF ROOM: 3350MM X 3455MM
NUMBER OF RECYCLING CAN : 5 BINS - 965 X 1800 (750L)
NUMBER OF TRASH CAN : 8 (65L)



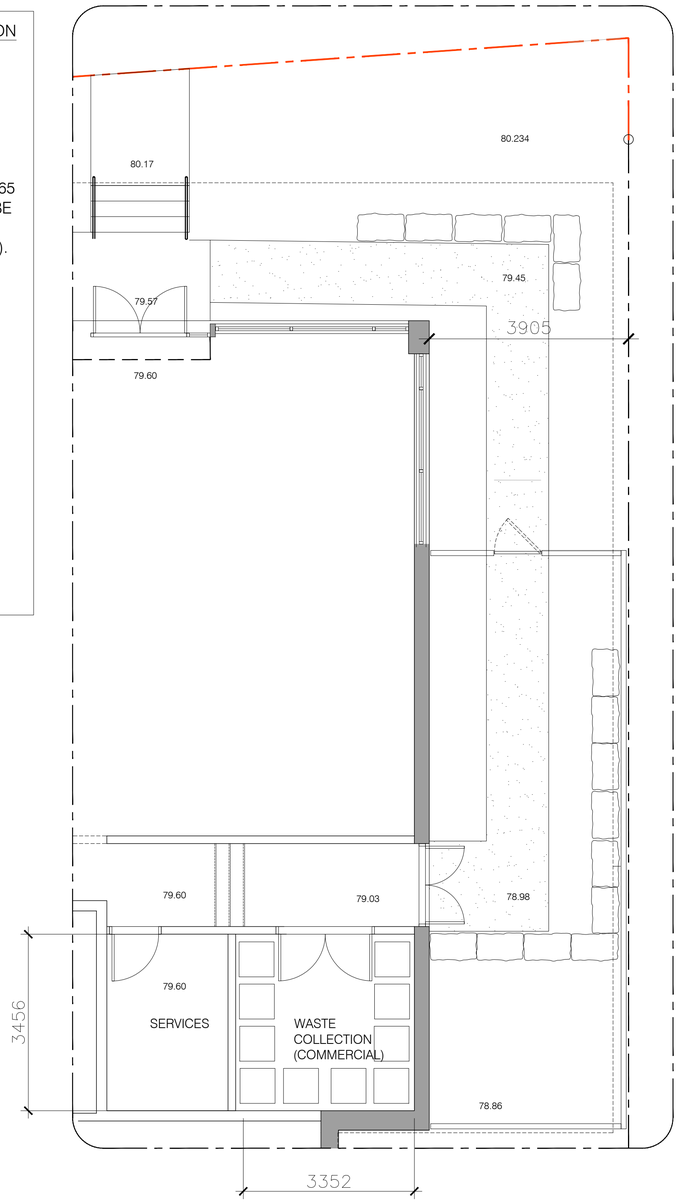
COMMERCIAL - WASTE AND RECYCLING COLLECTION

COMMERCIAL WASTE AND RECYCLING ARE COLLECTED BY EACH TENANT AND STORED IN A SPECIALLY DEDICATED ROOM ACCESSIBLE THROUGH THE BACK STORE.

METHOD:
TRASH AND RECYCABLE ARE THEN COLLECTED IN 65 GALS CAN WITH WHEELS. THE UNIT WOULD THEN BE TAKEN ON DAYS OF COLLECTION TROUGH THE COURTYARD UP TO THE STREET (MONTREAL ROAD).

THEN THE PERSON IN CHARGE WILL BRING THEM BACK, ON THE SAME DAY, TO THE STORAGE AREA.

SIZE OF ROOM: 3350MM X 3455MM
NUMBER OF RECYCLING CAN : 5
NUMBER OF TRASH CAN : 5



NO DE DOSSIER 2020-117

MB Groupe Canada
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RACINE ▪ OTTAWA ▪
630 Montréal Road, Ottawa, On

LOT 45 AND PART OF LOTS 3, 4 & 5, REGISTEDED PLAN 343 (CITY OF OTTAWA)	
. ACTUAL LAND AREA	970.77 M²*
*AFTER CITY ROAD WIDENING	
. BUILDING FOOTPRINT (GFA):	502.55 M²
. NUMBER OF DWELLINGS:	56 UNITS

FILE NUMBER: DO7-12-21-0189
PLAN NUMBER: 18965

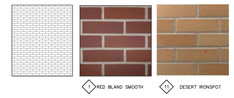
WASTE AND RECYCLING COLLECTION
A 12 | 18
REVISION 9 / 27 -03 - 2024

DO7-12-21-0189

01 NORTH ELEVATION
1:100

MATERIAL LEGEND OF EXTERIOR FINISHES

1 / 11 MASONRY CLADDING / BRICK:
BRICK: ENDICOTT BRICK
SERIES: ARCHITECTURAL
COLOR: SEE BELOW
FORMAT: MODULAR
DIMENSIONS: 194mmX92mmX57mm



1 RED BLAND SMOOTH 11 DESERT IRONSPOT

2 GLAZING
TYPE 1 : CURTAIN WALL
TYPE 2 : STANDARD
FRAME : ALUMINIUM
COLOR : BLACK
GLASS : THERMOS CLEAR

3 PRECAST PANELS:
COLOR: CONCRETE COLORS

SAMPLE TO BE RECEIVED

4 SPANDREL PANEL
CURTAIN WALL
FRAME COLOR : BLACK
GLASS : THERMOS CLEAR WITH OPAQUE BAKING

5 FLASHING AND FACIA OF THE PARAPET PREPAINTED STEEL
TYPE : ALPOLIC OR EQUIVALENT
COLOR: TO MATCH CONCRETE

5a PREFINISH ALUMINIUM
COLOR : BROWNISH
TO MATCH BRICK

6 / 7 CONCRETE BALCONY C/W CLEAR TEMPERED GLASS HANDRAIL AND PREPAINTED ALUMINIUM SUPPORTS.
COLOR: BLACK

8 PREFINISH ALUMINIUM
COLOR : BROWNISH
TO MATCH BRICK

9 PREFINISH ALUMINIUM
BRAND : DYZAL
FINISH : WOOD GRAIN
COLOR : JATOBA LIGHT GREY

NO DE DOSSIER 2020-117

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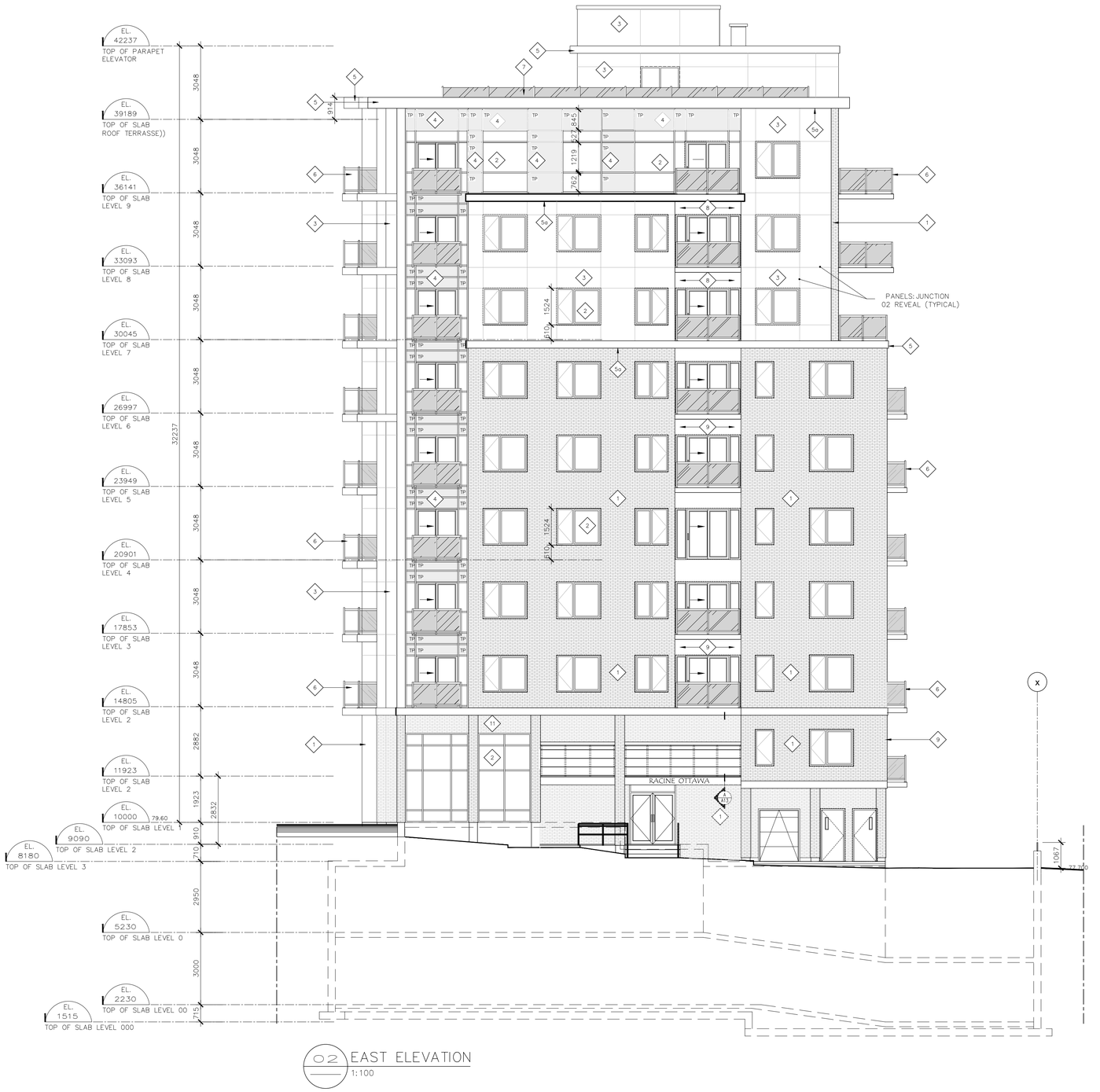
. ACTUAL LAND AREA	970.77 M²*
*AFTER CITY ROAD WIDENING	
. BUILDING FOOTPRINT (GFA):	502.55 M²
. NUMBER OF DWELLINGS:	56 UNITS

FILE NUMBER: DO7-12-21-0189
PLAN NUMBER: 18965

NORTH ELEVATION
A 13 | 18
REVISION 9 / 27 -03 - 2024

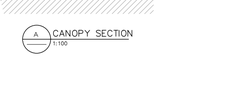
DO7-12-21-0189



02 EAST ELEVATION
1:100

MATERIAL LEGEND OF EXTERIOR FINISHES

1 / 11 MASONRY CLADDING / BRICK:
BRICK: ENDICOTT BRICK
SERIES: ARCHITECTURAL
COLOR: SEE BELOW
FORMAT: MODULAR
DIMENSIONS: 194mmX92mmX57mm



2 GLAZING
TYPE 1 : CURTAIN WALL
TYPE 2 : STANDARD
FRAME : ALUMINIUM
COLOR : BLACK
GLASS : THERMOS CLEAR

3 PRECAST PANELS:
COLOR: CONCRETE COLORS
SAMPLE TO BE RECEIVED

4 SPANDREL PANEL
CURTAIN WALL
FRAME COLOR : BLACK
GLASS : THERMOS CLEAR WITH OPAQUE BAKING

5 FLASHING AND FACIA OF THE PARAPET PREPAINTED STEEL
TYPE : ALPOLIC OR EQUIVALENT
COLOR: TO MATCH CONCRETE

5a PREFINISH ALUMINIUM
COLOR : BROWNISH
TO MATCH BRICK

6 / 7 CONCRETE BALCONY C/W CLEAR TEMPERED GLASS HANDRAIL AND PREPAINTED ALUMINIUM SUPPORTS.
COLOR: BLACK

8 PREFINISH ALUMINIUM
COLOR : BROWNISH
TO MATCH BRICK

9 PREFINISH ALUMINIUM
BRAND : DYZAL
FINISH : WOOD GRAIN
COLOR : JATOBA LIGHT GREY

A CANOPY SECTION
1:100

Maître dans l'art du développement immobilier
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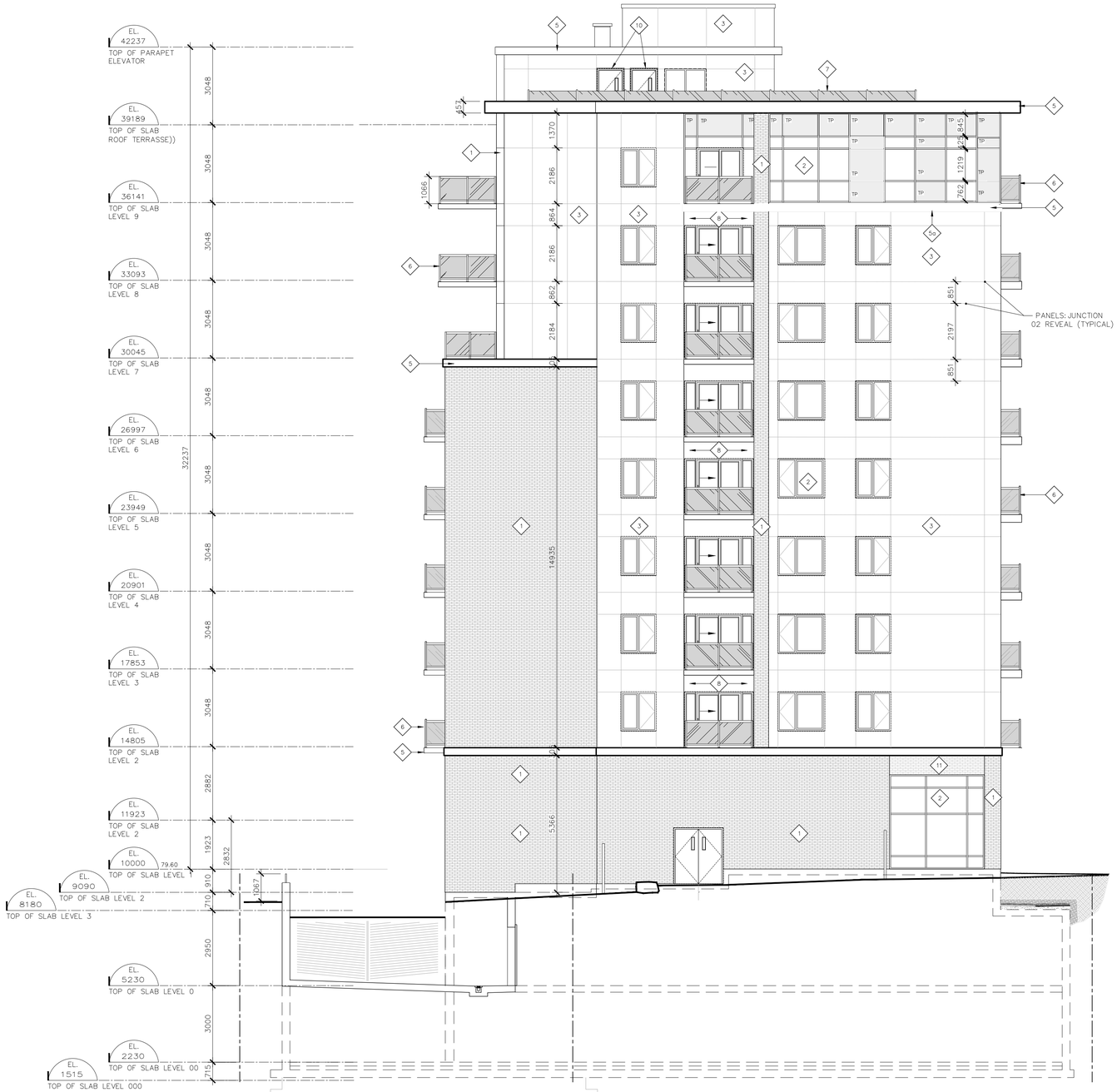
LOT 45 AND PART OF LOTS 3, 4 & 5, REGISTEDED PLAN 343 (CITY OF OTTAWA)	
. ACTUAL LAND AREA	970.77 M²*
*AFTER CITY ROAD WIDENING	
. BUILDING FOOTPRINT (GFA):	502.55 M²
. NUMBER OF DWELLINGS:	56 UNITS

FILE NUMBER: DO7-12-21-0189
PLAN NUMBER: 18965

EAST ELEVATION
A 14 | 18
REVISION 9 / 27 -03 - 2024

DO7-12-21-0189



03 WEST ELEVATION
1 ; 100

MATERIAL LEGEND OF EXTERIOR FINISHES

1 / 11 MASONRY CLADDING / BRICK:
BRICK: ENDICOTT BRICK
SERIES: ARCHITECTURAL
COLOR: SEE BELOW
FORMAT: MODULAR
DIMENSIONS: 194mmX92mmX57mm

1 RED BLAND SMOOTH 11 DESERT IRONSPOT

2 GLAZING
TYPE 1 : CURTAIN WALL
TYPE 2 : STANDARD
FRAME : ALUMINIUM
COLOR : BLACK
GLASS : THERMOS CLEAR

3 PRECAST PANELS:
COLOR: CONCRETE COLORS
SAMPLE TO BE RECEIVED

4 SPANDREL PANEL
CURTAIN WALL
FRAME COLOR : BLACK
GLASS : THERMOS CLEAR WITH OPAQUE BAKING

5 FLASHING AND FACIA OF THE PARAPET PREPAINTED STEEL
TYPE : ALPOLIC OR EQUIVALENT
COLOR: TO MATCH CONCRETE

5a PREFINISH ALUMINIUM
COLOR : BROWNISH
TO MATCH BRICK

6 / 7 CONCRETE BALCONY C/W CLEAR TEMPERED GLASS HANDRAIL AND PREPAINTED ALUMINIUM SUPPORTS.
COLOR: BLACK

8 PREFINISH ALUMINIUM
COLOR : BROWNISH
TO MATCH BRICK

9 PREFINISH ALUMINIUM
BRAND : DYZAL
FINISH : WOOD GRAIN
COLOR : JATOBA LIGHT GREY

NO DE DOSSIER 2020-117

MB Groupe Canada
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(514) 924-8306 OAA 10140

RACINE ▪ OTTAWA ▪
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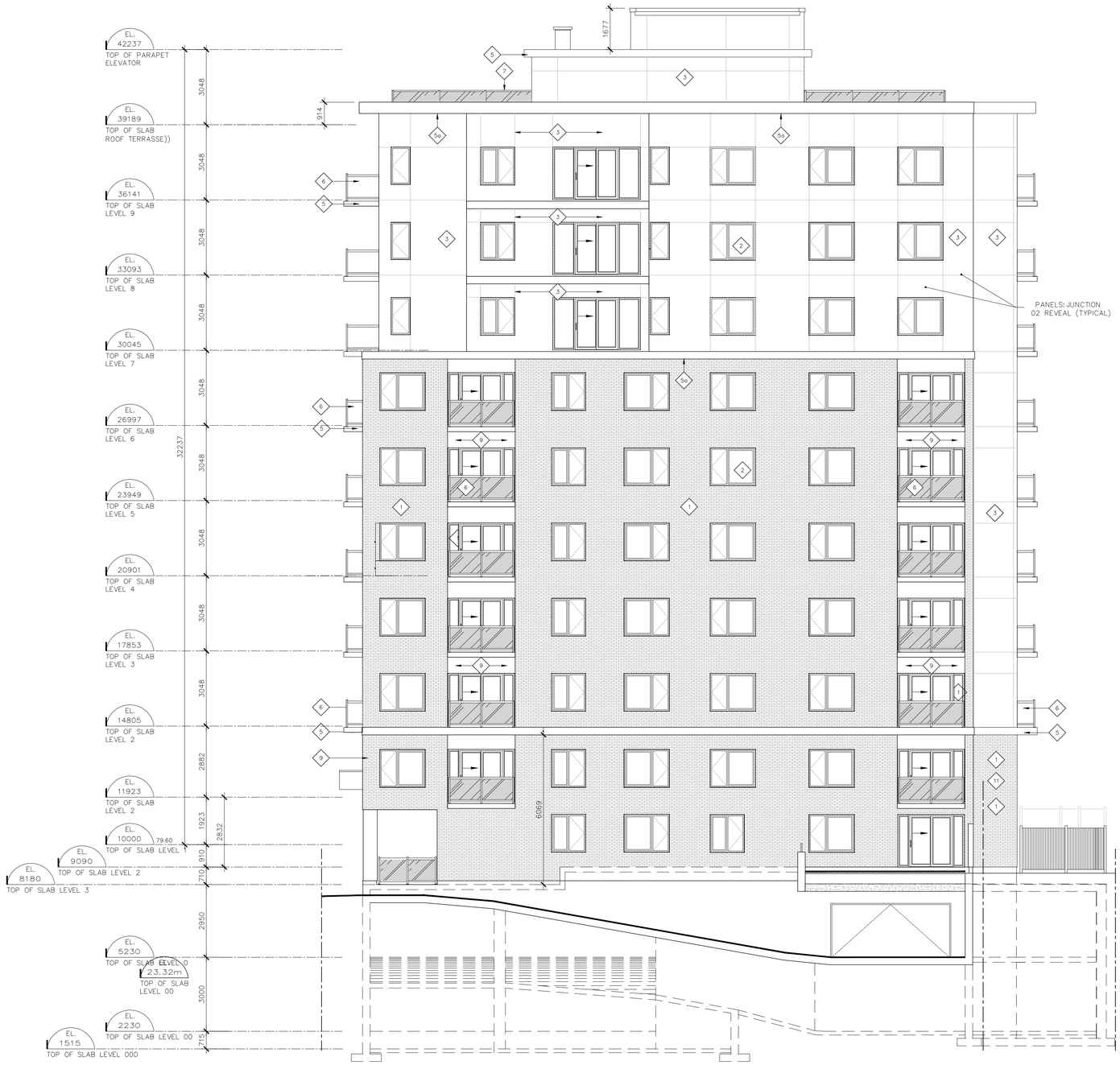
LOT 45 AND PART OF LOTS 3, 4 & 5, REGISTEDED PLAN 343 (CITY OF OTTAWA)	
. ACTUAL LAND AREA *AFTER CITY ROAD WIDENING	970.77 M²*
. BUILDING FOOTPRINT (GFA):	502.55 M²
. NUMBER OF DWELLINGS:	56 UNITS

FILE NUMBER: DO7-12-21-0189
PLAN NUMBER: 18965

WEST ELEVATION
A 15 | 18
REVISION 9 / 27 - 03 - 2024

DO7-12-21-0189



04 SOUTH ELEVATION
1:100

MATERIAL LEGEND OF EXTERIOR FINISHES

1 / 11 MASONRY CLADDING / BRICK:
BRICK: ENDICOTT BRICK
SERIES: ARCHITECTURAL
COLOR: SEE BELOW
FORMAT: MODULAR
DIMENSIONS: 194mmX92mmX57mm

2 GLAZING
TYPE 1 : CURTAIN WALL
TYPE 2 : STANDARD
FRAME : ALUMINIUM
COLOR : BLACK
GLASS : THERMOS CLEAR

3 PRECAST PANELS:
COLOR: CONCRETE COLORS

SAMPLE TO BE RECEIVED

4 SPANDREL PANEL
CURTAIN WALL
FRAME COLOR : BLACK
GLASS : THERMOS CLEAR WITH OPAQUE BAKING

5 FLASHING AND FACIA OF THE PARAPET PREPAINTED STEEL
TYPE : ALPOLIC OR EQUIVALENT
COLOR: TO MATCH CONCRETE

5a PREFINISH ALUMINIUM
COLOR : BROWNISH
TO MATCH BRICK

6 / 7 CONCRETE BALCONY C/W CLEAR TEMPERED GLASS HANDRAIL AND PREPAINTED ALUMINIUM SUPPORTS.
COLOR: BLACK

8 PREFINISH ALUMINIUM
COLOR : BROWNISH
TO MATCH BRICK

9 PREFINISH ALUMINIUM
BRAND : DYZAL
FINISH : WOOD GRAIN
COLOR : JATOBA LIGHT GREY

NO DE DOSSIER 2020-117

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*AFTER CITY ROAD WIDENING	
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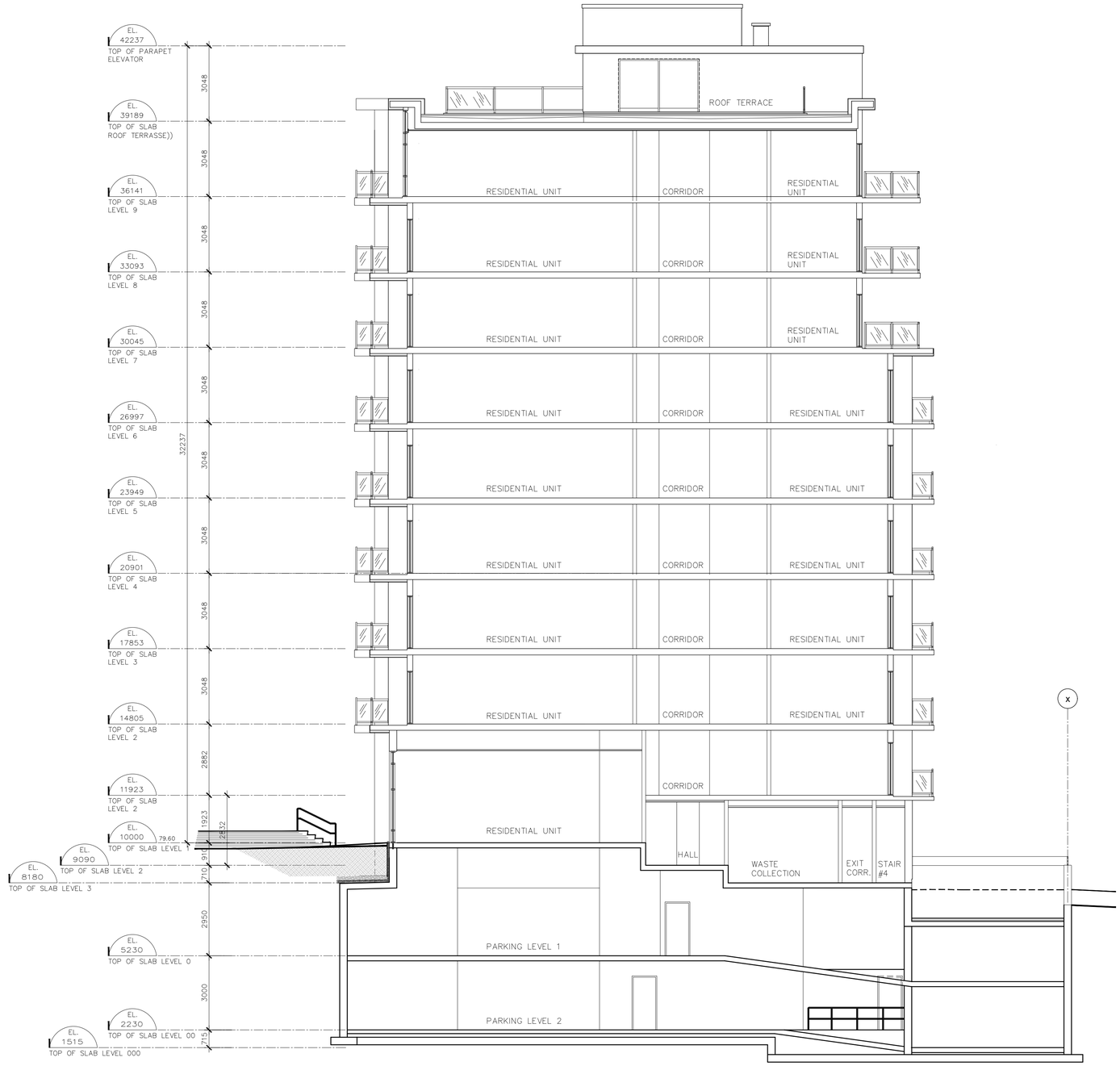
. NUMBER OF DWELLINGS:	56 UNITS

FILE NUMBER: DO7-12-21-0189
PLAN NUMBER: 18965

SOUTH ELEVATION
A16 | 18
REVISION 9 / 27 -03 - 2024

DO7-12-21-0189



AA SECTION NORTH/SOUTH
1:100

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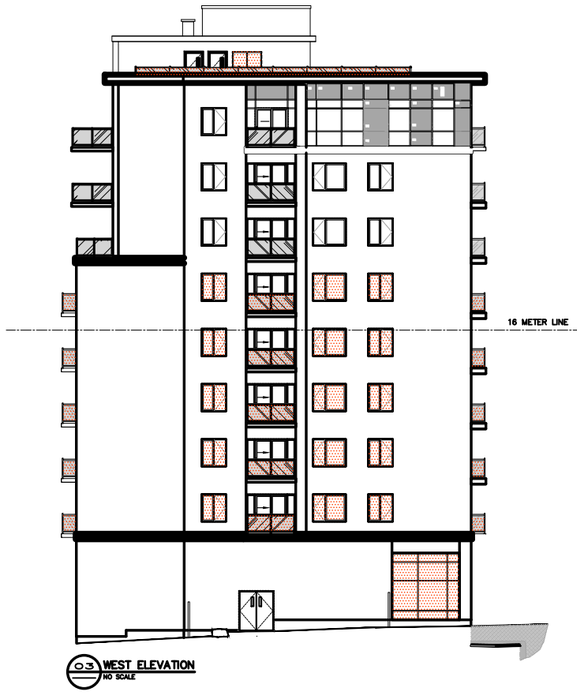
. BUILDING FOOTPRINT (GFA):	502.55 M²
. NUMBER OF DWELLINGS:	56 UNITS

FILE NUMBER: DO7-12-21-0189
PLAN NUMBER: 18965

SECTION NORTH/SOUTH
A 17 | 18
REVISION 9 / 27 -03 - 2024

NO DE DOSSIER 2020-117

D07-12-21-0189

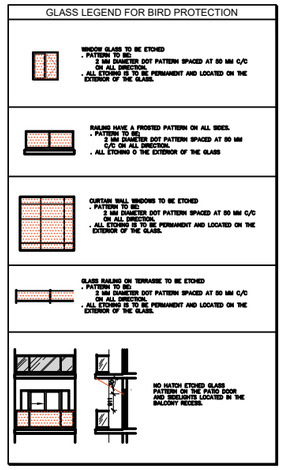


03 WEST ELEVATION
NO SCALE

01 NORTH ELEVATION
NO SCALE

02 EAST ELEVATION
NO SCALE

04 SOUTH ELEVATION
NO SCALE



NO DE DOSSIER 2020-117

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PLAN NUMBER: 18965

SECTION NORTH/SOUTH
A18 | 18
REVISION 9 / 27 -03 - 2024

D07-12-21-0189