PATERSON GROUP

Groundwater Impact Assessment

Proposed Multi-Storey Building

5497 Manotick Main Street
Ottawa, Ontario

Prepared for 12213559 Canada Inc.

Report PH4593-1 REV.01 dated October 17, 2022

Table of Contents

Appendices

1.0 INTRODUCTION

Paterson Group (Paterson) was commissioned by 12213559 Canada Inc. to complete a Groundwater Impact Assessment (GIA) for the proposed residential building to be located at 5497 Manotick Main Street in the City of Ottawa, Ontario (Refer to Paterson Drawing PH4593 -1- Site Plan in Appendix 1 and P^2 Concepts Drawing SP-01 titled "Site Plan" dated Oct 23, 2020 in Appendix 4)

The following report has been prepared specifically and solely for the aforementioned project described herein. It contains a hydrogeological review and assessments pertaining to the proposed development as it is understood by Paterson at the time of writing this report.

1.1 Proposed Development

Based on available design plans, it is understood that the proposed development will consist of a multi-storey residential building with a below-grade level. At finished grades, the proposed building will be surrounded by landscaped areas, parking areas, and access lanes. It is anticipated the proposed development will be municipally serviced.

2.0 Background Information

The field program for the geotechnical investigation (Report PG5957-1 by Paterson Group (Paterson)) was carried out on September 3, 2021. At that time, a total of three (3) boreholes were advanced across the site to a maximum depth of 6.1 m below ground surface (bgs) using a low clearance drill rig. BH1-21 encountered auger refusal at 5.69 m bgs, and a Dynamic Cone Penetration Test (DCPT) was completed in BH2-21 where it encountered practical DCPT refusal at 7.57 m bgs. The test hole locations were distributed in a manner to provide general coverage of the subject site. The approximate locations of the test holes are presented on drawing PG5957 - 1 - Test Hole Location Plan included in Appendix 2.

3.0 SITE CONDITIONS

At the time of the geotechnical field investigation, the subject site consisted of an approximately 0.22 ha property bounded by a residential property to the northwest, the Rideau River to the north-east, a commercial area to the south-east, and Manotick Main Street to the south-west. The ground surface across the site slopes downward toward the north-east side of the property from approximate geodetic elevations of 87.4 m to 84.6 m.

The subject site consists of an existing commercial building and parking lot in the south-western half of the site which is surrounded on the north-west and south-east sides by mature trees. The north-eastern half of the subject site is grass covered with some mature trees and an existing retaining wall structure along the Rideau River.

3.1 Geology

Generally, the soil profile at the borehole locations consists of topsoil or asphaltic concrete overlying fill material which is underlain by brown, hard to very stiff silty clay or compact silty sand. BH 3-21 had a thicker silty sand fill material layer (2.6 m compared to 0.4 m) but was not underlain by silty clay. The silty clay or silty sand was further underlain by a glacial till deposit consisting of a dense silty sand with gravel, cobbles, and boulders. Practical refusal to augering was encountered at test hole BH 1-21 at a depth of approximately 5.7 m bgs. A DCPT was performed at BH 2-21, commencing at a depth of 6.1 m bgs, with practical DCPT refusal occurring at a depth of 7.57 m bgs. Specific details of the soil profile at each test hole location are presented on the borehole logs included in Appendix 2.

According to surficial mapping prepared by the Ontario Geological Survey (OGS Earth, MRD128-Revised) the subject site is located in an area where the surficial geology is recorded to consist of a fine-textured glaciomarine deposit of silt and clay, with minor amounts of sand and gravel. This information is consistent with the results of Paterson's geotechnical field investigation. The surficial mapping is presented in Appendix 1 as PH4593 - 2 - Surficial Geology Plan.

Fill

Fill material consisting of silty sand with trace amounts of gravel, crushed stone, organics, and topsoil was observed underlying the topsoil or asphaltic concrete and extended to a maximum depth of 2.7 m bgs.

Silty Clay

A hard to very stiff brown silty clay was encountered underlying the fill material at BH 1-21 and extended to a maximum depth of 3.8 m bgs.

Silty Sand

Compact silty sand with trace amounts of gravel was encountered underlying the fill material at BH 2-21 and extended to a maximum depth of 3.7 m bgs.

Glacial Till

A compact to very dense glacial till deposit comprised of brown silty sand with various amounts of gravel, cobbles, and boulders was encountered underlying the silty clay (BH 1-21), silty sand (BH 2-21), or fill (BH 3-21) layer at all test hole locations.

Bedrock

Based on available geological mapping provided by the Ontario Geological Survey (OGS, MRD 219), the site is located in the Oxford Formation and consists of dolostone with minor shale, and sandstone. The overburden drift thickness has been mapped to be in the range of 5 to 10 m bgs which is consistent with the auger and DCPT refusals recorded during the geotechnical field program. The bedrock geology is presented in Appendix 1 as PH4593 – 3 - Bedrock Geology Plan.

Karst Features

The term “karst” refers to a geologic formation characterized by the dissolution of carbonate bedrock, such as limestone or dolostone. For karstification to occur, precipitation must be allowed to infiltrate the top of the bedrock to dissolutionally enlarge previously existing joints and bedding planes. Based on available mapping by the Ontario Geological Survey (OGS, GRS005), there is no inferred, potential or known karstification in the subject area.

3.2 Hydrogeology

Existing Aquifer Systems

Aquifer systems may be defined as a geological media, either overburden soils or fractured bedrock, which permit the movement of groundwater under hydraulic gradients. Although groundwater has been observed within the overburden material at the subject site, the depth of the overburden aquifer makes the development of significant water supply wells unlikely. Water supply wells in the vicinity are likely found in the bedrock aquifer.

Bedrock aquifer mapping, provided by Natural Resources Canada Urban Geology of the National Capital Region mapping, was reviewed as part of this assessment. Using this tool, it was found that the subject site primarily accesses the March and Oxford formation aquifer systems.

Potable water supply wells completed within a 150 m radius of the subject site, excluding sites north of the Rideau River, encountered water-bearing fractures at depths typically ranging from 7 to 51 m bgs. Sites north of the Rideau River were excluded as the groundwater flow direction is towards the Rideau River.

Groundwater Levels

Groundwater was observed in the piezometer at the borehole location BH 1-21, however, no water was observed from the piezometer at borehole location BH 3-21. The piezometer in BH2-21 was reported to be destroyed during the site visit to record the groundwater levels. Water levels at the subject site were observed to vary from 82.1 m asl to less than 78.6 m asl at the time of the geotechnical field investigation. The water level of less than 78.6 m asl is due to the piezometer in BH 3-21 being dry at the time of the site visit. It should be noted that water can become trapped in backfilled boreholes completed in low permeability materials resulting in an artificially elevated water table, and that groundwater levels can fluctuate both seasonally and in conjunction with precipitation events. As such, water levels may vary at the time of construction.

Hydraulic Gradients

Vertical hydraulic gradients were not measured at the subject site as the previous studies completed did not warrant the installation of monitoring well nests.

Based on groundwater measurements taken from the piezometers at the time of the time of the field investigation, an approximate horizontal hydraulic gradient and direction was calculated in the overburden material. The horizontal hydraulic gradient between any 2 points is the slope of the hydraulic head between those points:

$$i=(h_2-h_1)/L$$

Where: i=horizontal hydraulic gradient
h=water level (m asl)
L=horizontal distance between test hole locations

Using the above noted formula, an initial water level height of 82.12, an assumption of 78.6 m bgs for the second point, and a distance of approximately 50 m, the horizontal hydraulic gradient has been calculated to be approximately 0.07 in a northeastern direction. Shallow groundwater flow in the vicinity of the subject site is expected to reflect local topography. Regional groundwater flow is considered to be in a northeastern direction towards the nearby Rideau River.

Hydraulic Conductivity

The hydraulic conductivity values were conservatively estimated based upon previous experience at similar sites in the area and typical published values for similar stratigraphy. The hydraulic conductivity values are interpreted to range from approximately 1×10^{-7} to 1×10^{-9} m/sec for stiff silty clay and are dependent on the moisture level and consistency of the deposit. The hydraulic conductivity values are interpreted to range from 1×10^{-4} to 1×10^{-7} m/sec for silty sand and are dependent on the moisture level and consistency of the deposit. The hydraulic conductivity values are interpreted to range from approximately 1×10^{-6} to 1×10^{-8} m/sec for glacial till with a silty sand matrix and is dependent on the ratios of the various materials in the deposit.

Based on the available drawings and discussion with the client regarding the subject site, the maximum depth of foundation excavation is expected to be approximately 3.0 m bgs (84.3 m asl). Given the observed groundwater infiltration levels in the test holes and approximate excavation depths, the excavation is expected to be above the recorded water table of 82.12 m asl in the onsite boreholes.

Groundwater Recharge and Discharge

In general, groundwater will follow the path of least resistance from areas of higher hydraulic head to areas of lower hydraulic head. While upward and downward hydraulic gradients may be indicative of discharge and recharge respectively, other factors must be considered.

Based on the hydraulic conductivity estimates obtained from published literature, the glacial till is considered to have a higher hydraulic conductivity than the silty clay overburden soil, which is generally considered to act as a confining layer. It is expected that the majority of surface water will either flow down-gradient as perched water within the fill material or as sheet drainage where silty clay is present. In areas of silty sand, there is likely to be vertical drainage and thus contribute to the volume of recharge in the events of significant precipitation. However, given the frequency of such events, the volume of recharge within the site boundaries is expected to be minimal.

With regards to discharge zones, neither the topographical nor geological conditions are suitable for discharge to be occurring on a large scale at the subject site, with only limited discharge potential in the drainage ditches located in the surrounding area.

4.0 POTENTIAL IMPACTS

4.1 Adverse Effects on Adjacent Structures

The overburden in the area generally consists of topsoil or asphaltic concrete overlying fill material which is further underlain by silty clay or silty sand, and glacial till. Practical refusal to augering was encountered at a depth of 5.7 m bgs in BH 1-21. The potential dewatering volumes due to groundwater infiltration into the excavation footprint is anticipated to be low to moderate depending on variations in the majority composition of the overburden material as the recorded groundwater level is well below the expected depth of excavation. Any water infiltration is likely to be from precipitation rather than groundwater sources. Additionally, given the nature of the development (residential multi-storey building with one basement level), the duration of the excavation on site is expected to be short term in duration. Furthermore, the radius of influence expected to develop as a result of dewatering during construction will be minimal. As such, any effects related to ground surface settlement due to the water taking activities during construction are expected to be negligible.

4.2 Adverse Effects on Neighbouring Water Wells

A search of the Ontario Water Well Records database indicates there are several wells within 250 m of the site as depicted on drawing PH4593 - 4 - MECP Water Well Location Plan (Appendix 1). The wells that are currently in use were noted to be screened in the bedrock aquifer system with sufficient vertical and horizontal separation between the maximum potential depth of excavation and the depth of the wells. Furthermore, water takings at the subject site are expected to be short term in duration, given the nature of the proposed development. Due to the vertical/horizontal separation between the maximum potential depth of excavation, the short-term nature of the water takings and the limited radius of influence expected to develop as a result of dewatering activities, it is not expected that any of the water takings will negatively affect the water quantity and/or quality of nearby well users.

Construction is expected to take place in the compact, brown silty sand with trace gravel or hard to very stiff brown silty clay and is not expected to take place within dense till. Furthermore, the construction depth is expected to not exceed 3 m in depth and construction techniques that result in excessive vibration (i.e hoe ramming) will not be required. It is understood that bedrock excavation is not anticipated to be required as part of the foundation excavation. Excavation to the depth of glacial till is not anticipated in the area of BH3-22 even though the glacial till is present at a depth of 2.77 m bgs based on the site plan and borehole location.

A series of calculations were carried out on theoretical radii of influence for a maximum servicing trench excavation of 3.0 m bgs and withdrawing water from a conservative half meter depth from the underlying glacial till. Note that the groundwater level is well below the proposed depth of excavation and significant dewatering should not be necessary; thus, the following calculation is a conservative estimate. To estimate the equivalent radius of the excavation, the approximate house dimensions of 34 m (length) by 23 m (width) were used and converted to an equivalent radius. These calculations were completed based on Sichardt (1992) using the equation:

$R = r_e + 3000*\Delta h(k^{0.5})$

R = radius of influence (m)
r_e = equivalent radius of excavation (m)
Δh = thickness of drawdown within the aquifer (m)
k = hydraulic conductivity (m/sec)

For the purposes of completing the calculations, the following assumptions were made:

- r_e = 18.14 m
- $k = 1 \times 10^{-6}$ m/s for glacial till
- Δh = 0.5 m

Using the above equation and assumptions, a radius of influence of approximately 1.6 m will develop as a steady state condition, extending from the edge of the excavation, in the area of the subject site.

Given the hydrogeological characteristics of the subject site, the theoretical radii of influence for the potential excavation related to the development and the depth of water supply wells within 500 m, no long-term groundwater monitoring program is required.

Surrounding groundwater quality is not anticipated to be affected by construction as high vibration construction techniques will not be required. Furthermore, the local surficial groundwater flow is expected to follow the topography towards the Rideau River rather than towards other wells. Based on local well records, well depths are between 13.5 to 53 m, which is well below the depth of excavation. Therefore, it is anticipated that groundwater quality will not be affected by construction.

However, a baseline water quality sampling program has been recommended to be completed prior to commencing construction on site. The premise of the program is to obtain groundwater quality information from the water supply wells in the vicinity of the proposed development prior to the project commencing. This

ensures that all parties involved (developer, homeowners, and City of Ottawa) are protected should a concern arise during or after construction.

Baseline Water Sampling Program

As noted above, the excavation for the proposed development is not expected to encounter the water table. However, using a highly conservative value of 0.5 m saturated thickness, the theoretical radius of influence for the proposed development is expected to be 1.6 m from the edge of the excavation at the time of construction. The domestic wells in the area are assumed to be screened within a bedrock aquifer. Furthermore, bedrock excavation and construction techniques causing excessive vibration will not be required as part of the proposed development.

Based on the water service mapping provided by the City of Ottawa, as well as all the available information, a total of three (3) potential privately serviced lots have been identified to be included in the Baseline Groundwater Monitoring Program.

The following municipal addresses are proposed to be included in the Baseline Groundwater Monitoring Program:

- 5491 Manotick Main Street
- 5495 Manotick Main Street
- 5500 Manotick Main Street

The homeowners of the aforementioned properties will be invited to participate in the baseline sampling program by attempting two visits in person, once during the day and once during the evening after normal work hours and by sending a registered letter if in person contact has not been made. In instances where the homeowner is not present at the time of the initial daytime visit, a contact letter outlining the proposed sampling program will be left at the property for future sampling. The following visit will be completed in the evening with a second contact letter if the homeowner is still not available. Homeowners will have approximately three (3) weeks to respond. Interested homeowners will be interviewed for the purpose of obtaining baseline water quality information followed by the collection and submission of a raw water sample.

The parameters that are being analyzed as part of the sampling program consist of the "Subdivision Water Quality Package" offered by Eurofins Environmental Testing Canada Inc. This package includes; alkalinity, bacteria, colour, conductivity, pH, hardness, IC anions, NH3, TKN, DOC, phenols, sulphide, metals, Tannin & Lignin, TDS and turbidity.

A draft copy of the registered letter has been submitted to the City of Ottawa for review and will be approved prior to distribution and commencement of the baseline water quality sampling program outlined above.

4.3 Soil, Surface Water and Groundwater

A search of the MECP Brownfields Environmental Site Registry was conducted as part of this assessment. No recorded Brownfield sites were identified within 500 m of the subject site.

All excess soils, with the exception of engineered crushed stone fill, generated by construction activities that will be transported on-site or off-site should be handled as per Ontario Regulation 406/19: On-Site and Excess Soil Management.

With respect to surface water features, there are none located within the theoretical radius of influence for the subject site. The nearest surface water feature is the Rideau River, located approximately 30 m northeast of the site and is outside the theoretical radius of influence of 1.6 m.

It is expected that a multi-barrier approach (such as hay bales, geosocks, silt fencing, etc.) to a non-frozen, well vegetated area will be utilized in order to promote re-infiltration of discharge water prior to reaching the adjacent surface water features noted above. In addition, the turbidity of the water shall not exceed 8 NTU above background levels when discharging within 30 m of a watercourse. Therefore, adverse effects to surface water features resulting from dewatering activities at the subject site are expected to be negligible.

The groundwater that is pumped from the excavations must be managed in an appropriate manner. The contractor may be required to implement a water management and treatment program to dispose of the pumped water. It is expected the groundwater will be discharged to overland. Further treatment may be required should the discharge not meet the required guidelines.

4.4 Adjacent Permits to Take Water

A search of the MECP Permit to Take Water (PTTW) database provided no active PTTW and two (2) expired PTTW within 500 m of the subject site. A search of the MECP Environmental Activity and Sector Registry (EASR) database provided no water taking permits within 500 m of the subject site.

4.5 Existing Servicing

The site is currently serviced by a private well and septic system. The well will be required to be properly decommissioned by a licensed well contractor as per O.Reg. 903 prior to construction.

5.0 RECOMMENDATIONS

Further testing and site preparation is recommended for the detailed Groundwater Impact Assessment. The following aspects of the program should be performed prior to commencing construction for the proposed residential development:

- ❑ All existing wells within the proposed residential development should be properly decommissioned as per O.Reg. 903 prior to construction, if they are not intended to be maintained in accordance with the regulations.

- ❑ In the interest of public perception, a baseline water sampling program is recommended prior to commencing construction on site consisting of the three addresses noted in Section 4.2.

- ❑ Prior to and during site development, it is recommended that construction best management practices with respect to fuels and chemical handling, spill prevention, and erosion and sediment control be followed.

- ❑ For any water taking of volumes greater than 50,000 L/day, either an Environmental Activity and Sector Registration (EASR) or a Permit To Take Water (PTTW) is required from the MECP, dependant on dewatering requirements.

6.0 STATEMENT OF LIMITATIONS

The recommendations provided in this report are in accordance with our present understanding of the project.

A hydrogeological review of this nature is a limited sampling of a site. The recommendations are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around the test locations. Should any conditions at the site be encountered which differ from those at the test locations, we request notification immediately in order to permit reassessment of our recommendations.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than 12213559 Canada Inc. or their agent(s) is not authorized without review by Paterson Group for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.

Alexander Schopf, E.I.T, PhD
Junior Hydrogeologist

Erik Ardley, P.Geo
Hydrogeologist

APPENDIX 1

DRAWING PH4593 - 1 - SITE PLAN

DRAWING PH4593 - 2 – SURFICIAL GEOLOGY PLAN

DRAWING PH4593 - 3 – BEDROCK GEOLOGY PLAN

DRAWING PH4593 - 4 - MECP WATER WELL LOCATION PLAN

PATERSON GROUP
SOLUTION ORIENTED ENGINEERING

NO.	REVISIONS	DATE	INITIAL

12213559 CANADA INC.

GROUNDWATER IMPACT ASSESSMENT
PROPOSED MULTI-STOREY BUILDING
5497 MANOTICK MAIN STREET

OTTAWA, ONTARIO

Title:

SITE PLAN

Scale: 1:750	Date: 07/2022
Drawn by: JM	Report No.: PH4593-REP.01
Checked by: AS	Dwg. No.: PH4593-1
Approved by: EA	Revision No.:

11x17

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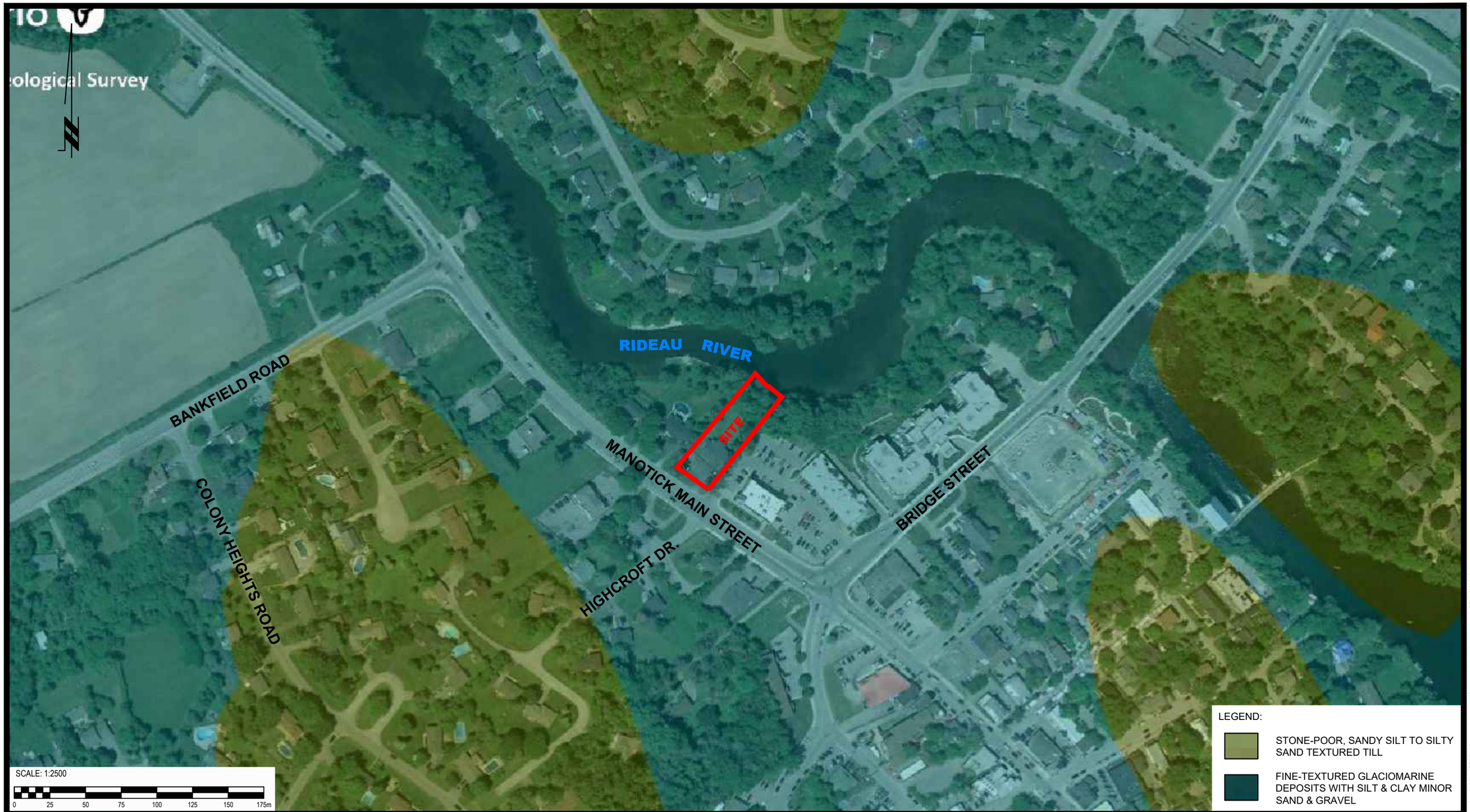

PATERSON GROUP
SOLUTION ORIENTED ENGINEERING

NO.	REVISIONS	DATE	INITIAL

12213559 CANADA INC.

GROUNDWATER IMPACT ASSESSMENT
PROPOSED MULTI-STOREY BUILDING
5497 MANOTICK MAIN STREET

OTTAWA, ONTARIO

Title:

SURFICIAL GEOLOGY PLAN

Scale: 1:2500	Date: 07/2022
Drawn by: JM	Report No.: PH4593-REP.01
Checked by: AS	Dwg. No.: PH4593-2
Approved by: EA	Revision No.:

11x17

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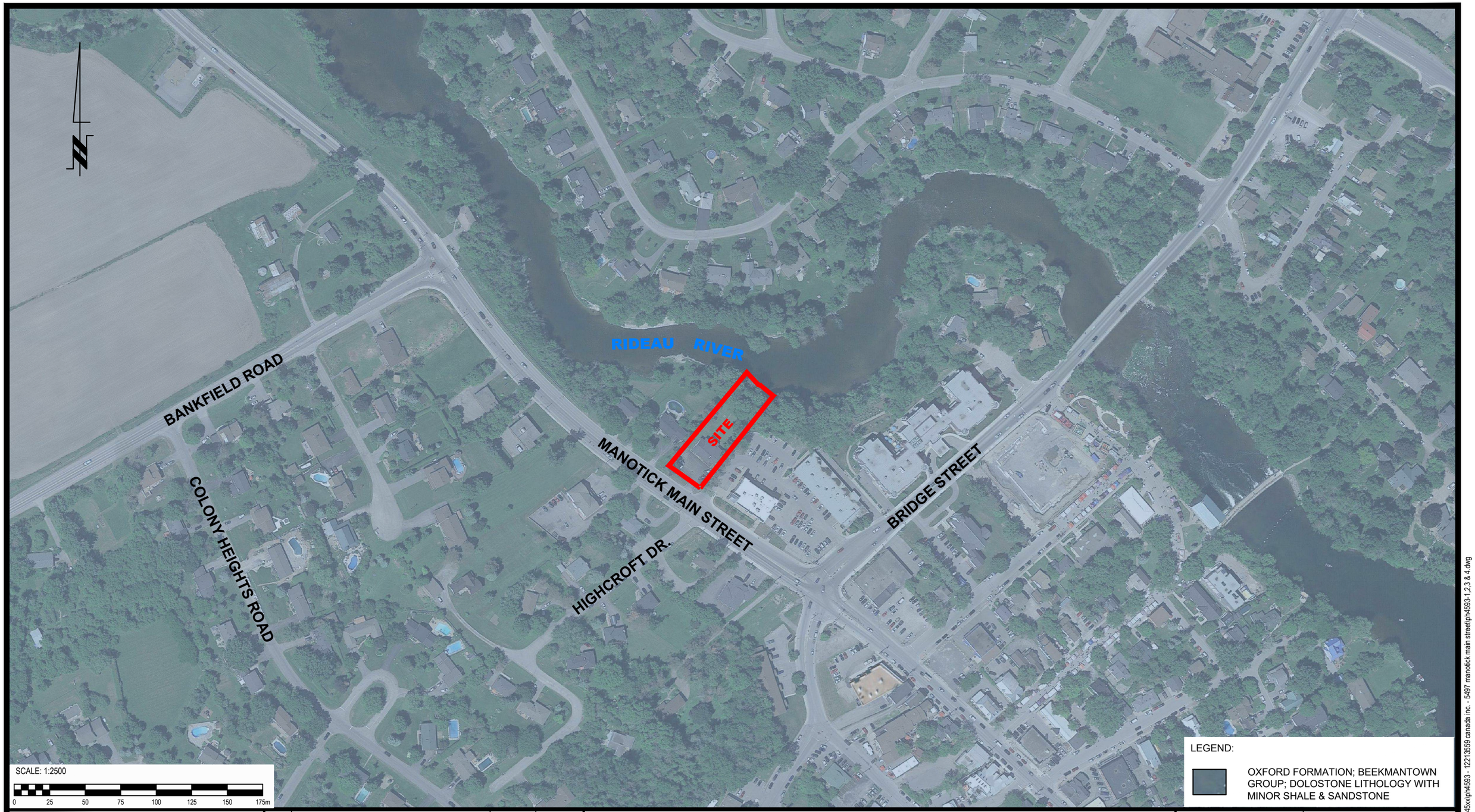

PATERSON GROUP
SOLUTION ORIENTED ENGINEERING

NO.	REVISIONS	DATE	INITIAL

12213559 CANADA INC.

GROUNDWATER IMPACT ASSESSMENT
PROPOSED MULTI-STOREY BUILDING
5497 MANOTICK MAIN STREET

OTTAWA, ONTARIO

Title:

BEDROCK GEOLOGY PLAN

Scale: 1:2500	Date: 07/2022
Drawn by: JM	Report No.: PH4593-REP.01
Checked by: AS	Dwg. No.: PH4593-3
Approved by: EA	Revision No.:

11x17

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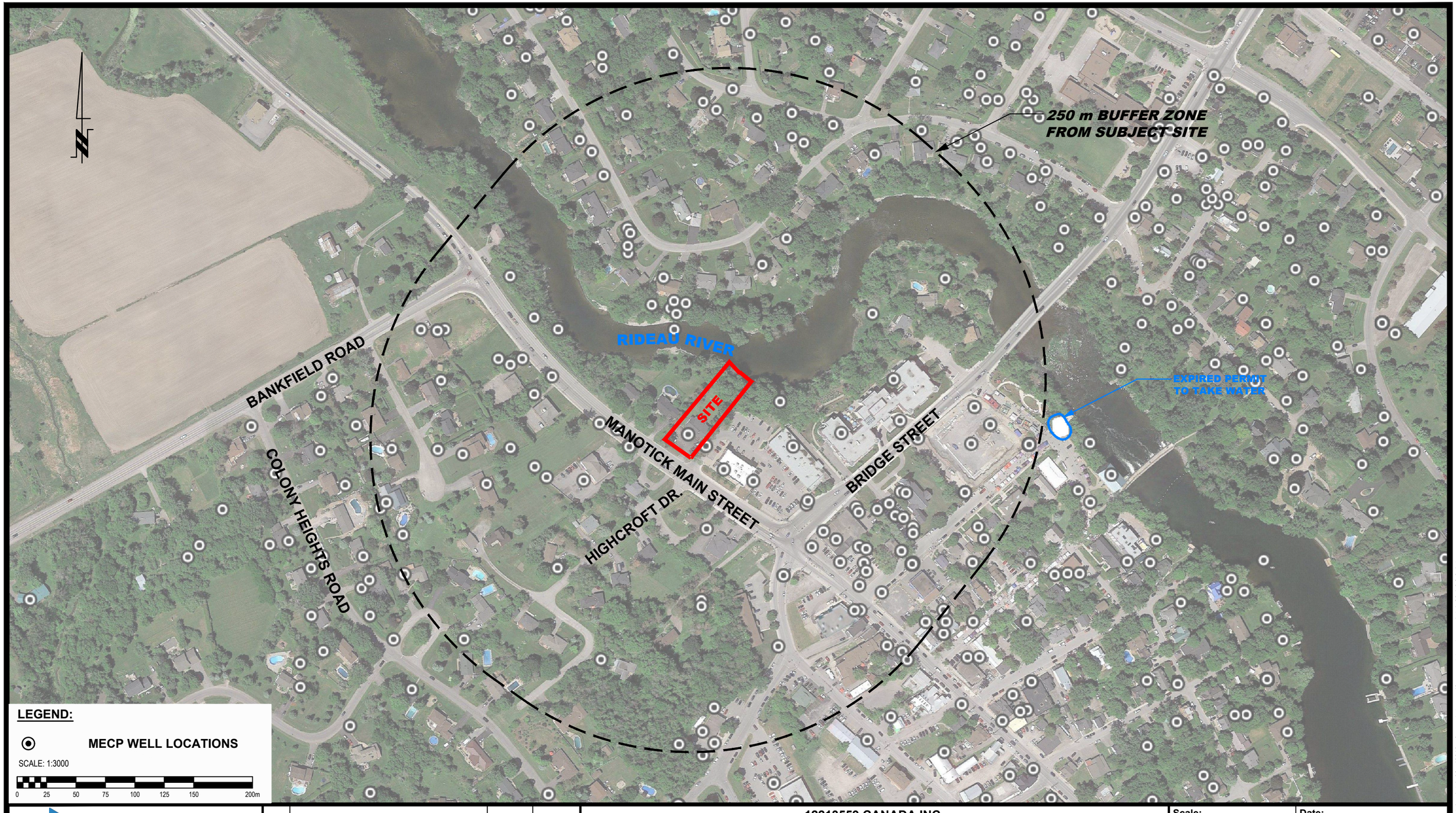

PATERSON GROUP
SOLUTION ORIENTED ENGINEERING

NO.	REVISIONS	DATE	INITIAL

12213559 CANADA INC.

GROUNDWATER IMPACT ASSESSMENT
PROPOSED MULTI-STOREY BUILDING
5497 MANOTICK MAIN STREET

OTTAWA, ONTARIO

Title:

MECP WATER WELL LOCATION PLAN

Scale: 1:3000	Date: 07/2022
Drawn by: JM	Report No.: PH4593-REP.01
Checked by: AS	Dwg. No.: PH4593-4
Approved by: EA	Revision No.:

11x17

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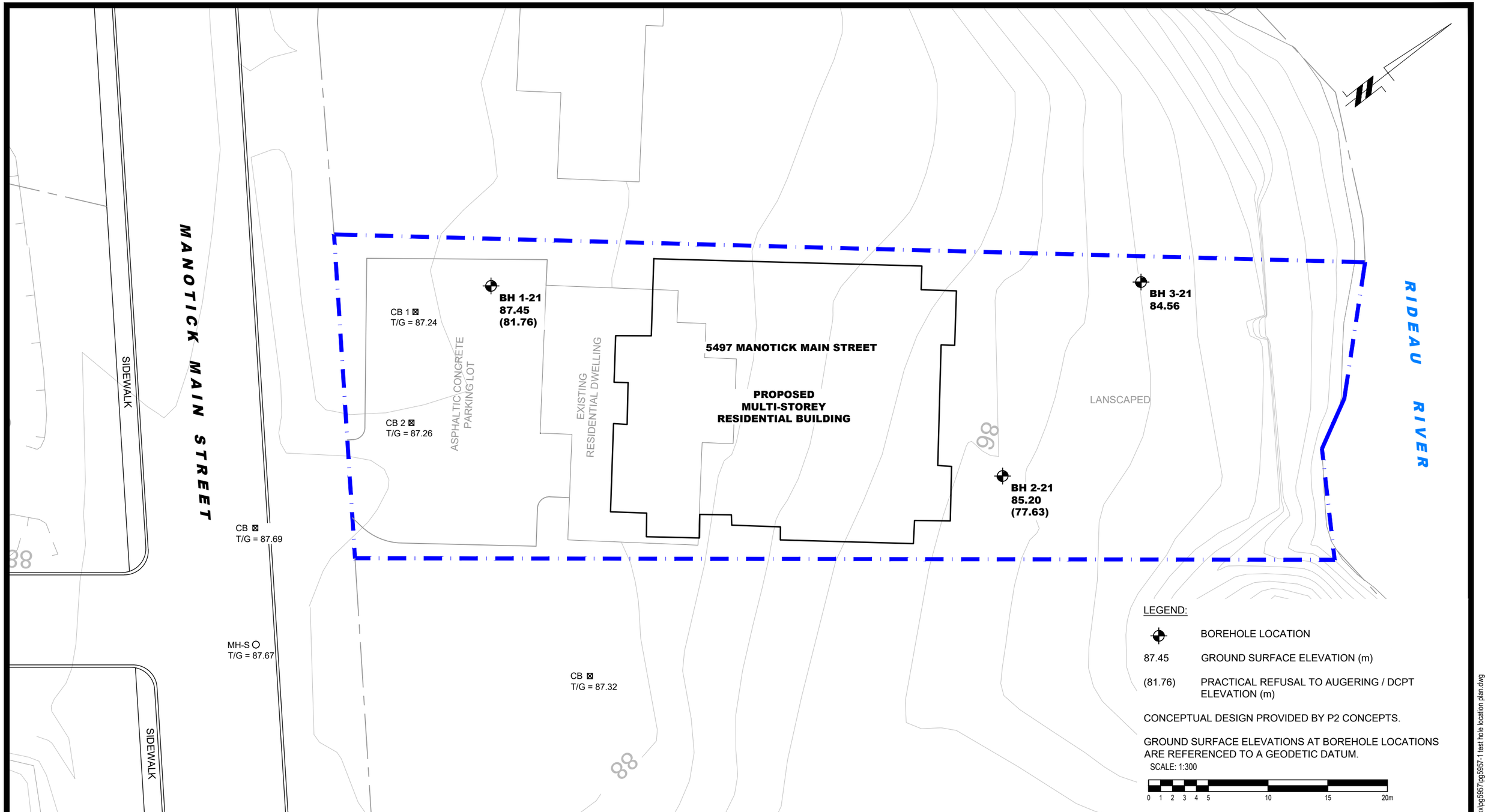
APPENDIX 2

PG5957-1 - TEST HOLE LOCATION PLAN

PATERSON – SOIL PROFILE AND TEST DATA SHEETS



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NO.	REVISIONS	DATE	INITIAL

12213559 CANADA INC.
GEOTECHNICAL INVESTIGATION
PROPOSED MULTI-STOREY RESIDENTIAL BUILDING
5497 MANITOCK MAIN STREET
OTTAWA, ONTARIO

Title:
TEST HOLE LOCATION PLAN

Scale: 1:300	Date: 09/2021
Drawn by: JM	Report No.: PG5957-1
Checked by: NP	Dwg. No.: PG5957-1
Approved by: FAS	Revision No.:

11x17

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patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Multi-Storey Building - 5497 Manotick Main St.
Ottawa, Ontario

DATUM Geodetic

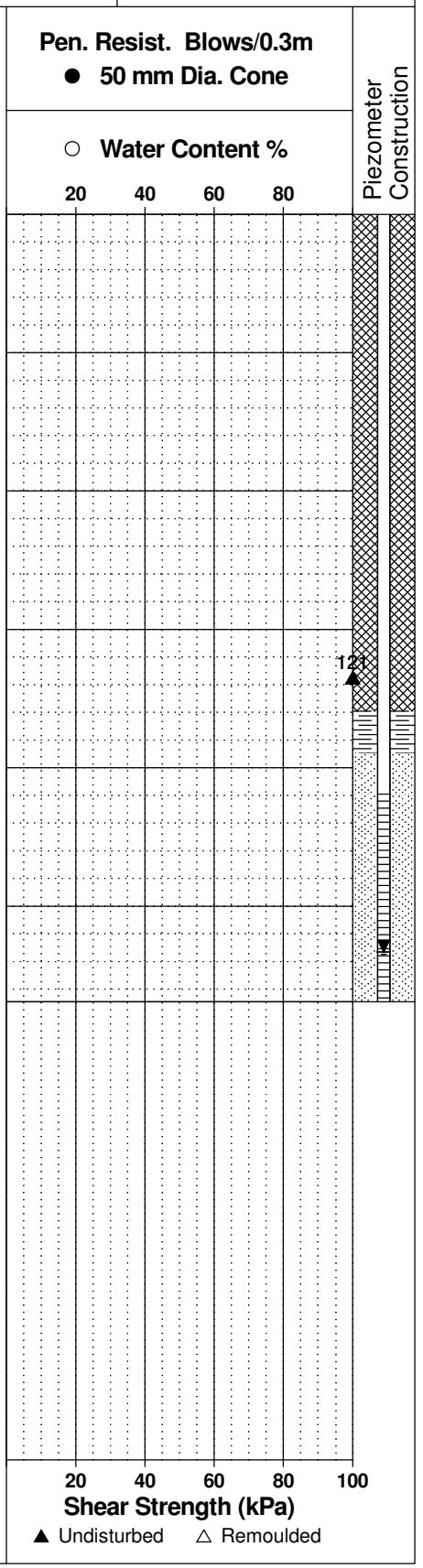
FILE NO. PG5957

REMARKS

HOLE NO. BH 1-21

BORINGS BY CME-55 Low Clearance Drill **DATE** September 3, 2021

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.45
Asphaltic concrete 0.08							
FILL: Brown silty sand, trace gravel and crushed stone 0.46		AU	1				
		SS	2	92	8	1	86.45
Hard to very stiff, brown **SILTY CLAY**		SS	3	83	8	2	85.45
		SS	4	83	5		
		SS	5	100		3	84.45
3.81							
		SS	6	78	62	4	83.45
GLACIAL TILL: Very dense, brown silty sand with gravel, cobbles and boulders		SS	7	42	47	5	82.45
		SS	8	45	50+		
5.69							
End of Borehole							
Practical refusal to augering at 5.69m depth							
(GWL @ 5.33 - September 8, 2021)							



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Multi-Storey Building - 5497 Manotick Main St.
Ottawa, Ontario

DATUM Geodetic

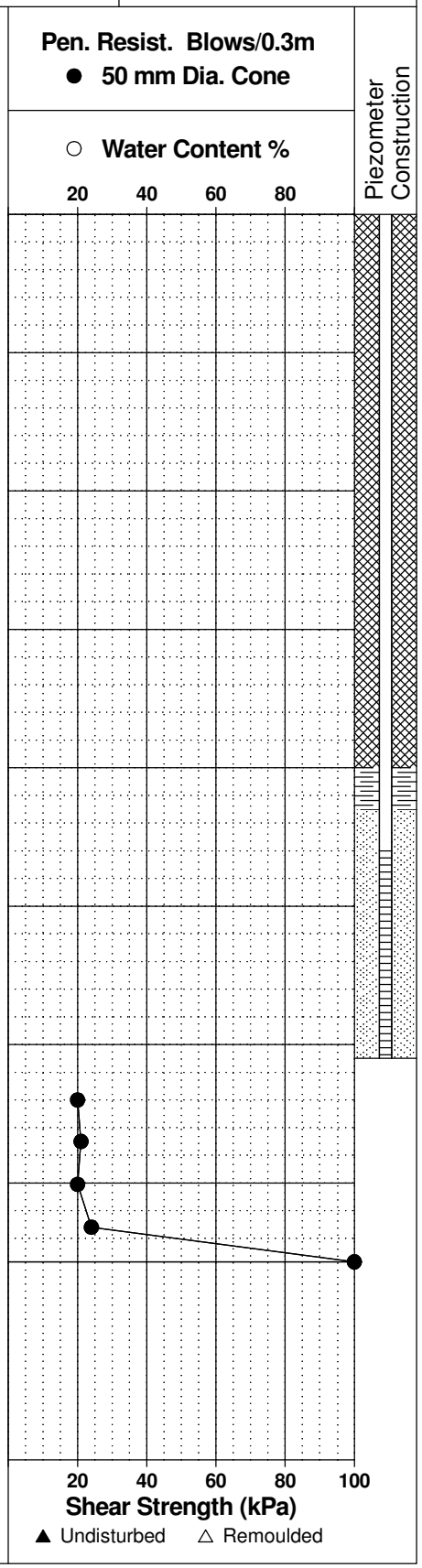
REMARKS

BORINGS BY CME-55 Low Clearance Drill **DATE** September 3, 2021

FILE NO. PG5957

HOLE NO. BH 2-21

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	85.20
TOPSOIL 0.13							
FILL: Brown silty sand, trace organics 0.46		AU	1				
		SS	2	33	12	1	84.20
Compact, brown **SILTY SAND,** trace gravel		SS	3	50	10	2	83.20
		SS	4	58	14		
		SS	5	58	11	3	82.20
3.66							
		SS	6	44	50+	4	81.20
GLACIAL TILL: Dense, brown silty sand with gravel, cobbles and boulders		SS	7	50	28	5	80.20
		SS	8	58	53		
6.10						6	79.20
Dynamic Cone Penetration Test commenced at 6.10m depth.						7	78.20
7.57							
End of Borehole							
Practical DCPT refusal at 7.57m depth.							
(Piezometer destroyed - Sept. 8, 2021)							



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Multi-Storey Building - 5497 Manotick Main St.
Ottawa, Ontario

DATUM Geodetic

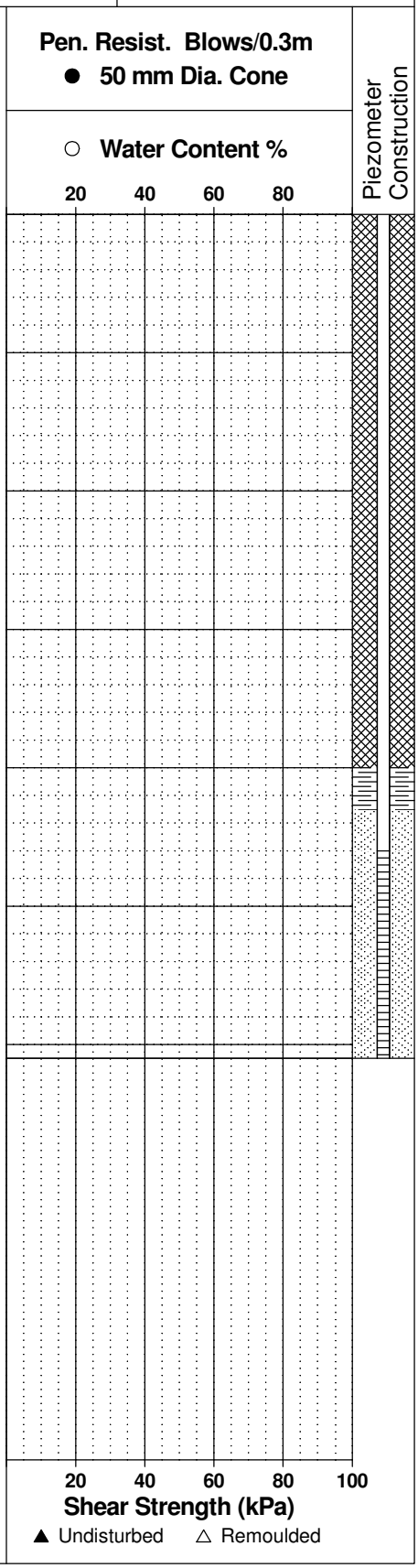
FILE NO. PG5957

REMARKS

HOLE NO. BH 3-21

BORINGS BY CME-55 Low Clearance Drill **DATE** September 3, 2021

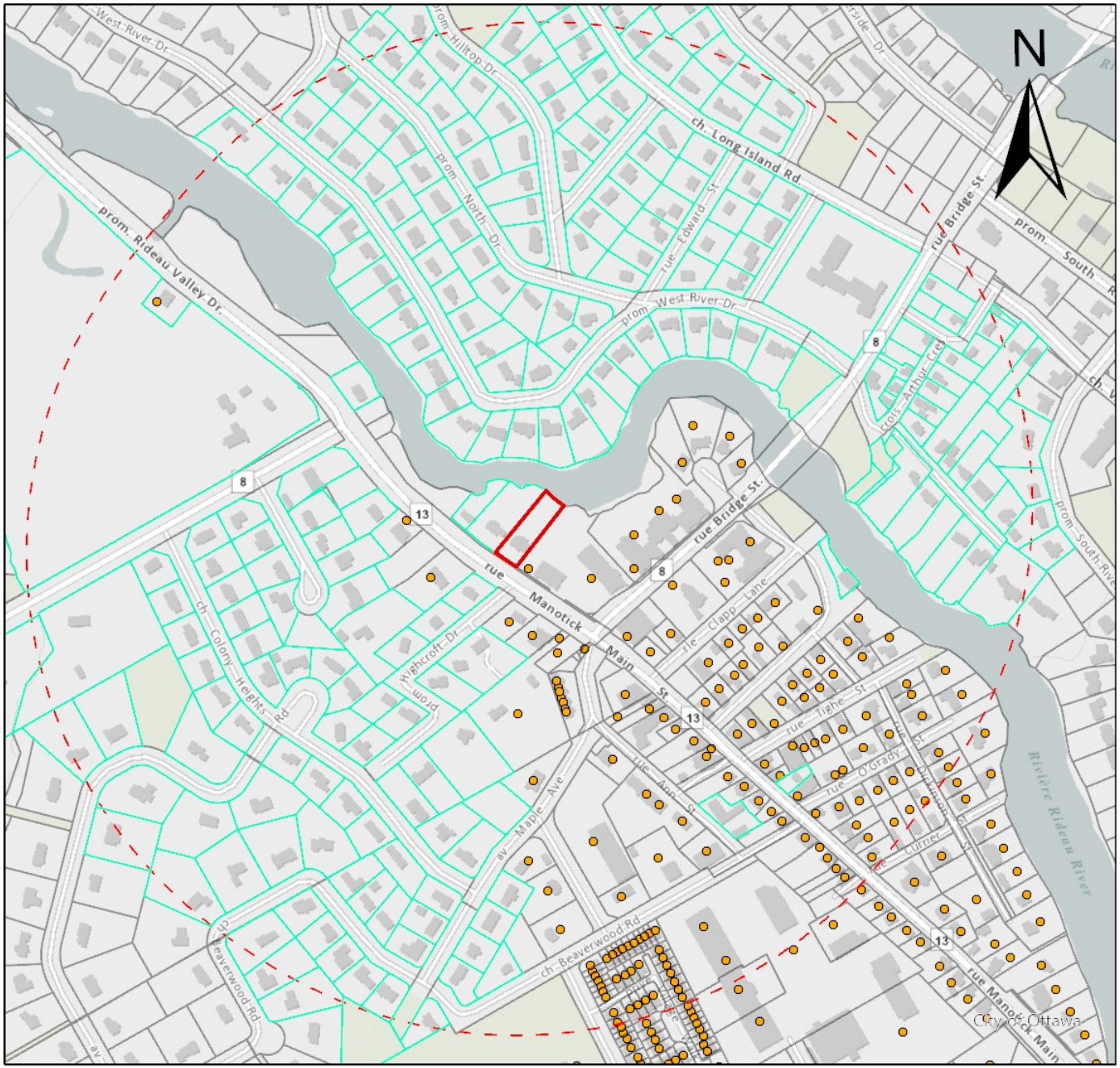
SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	84.56
TOPSOIL 0.10		AU	1				
FILL: Brown silty sand, trace topsoil		SS	2	50	19	1	83.56
- trace gravel by 1.2m depth		SS	3	67	8	2	82.56
2.74		SS	4	58	24		
		SS	5	25	15	3	81.56
GLACIAL TILL: Compact, brown silty sand with gravel, cobbles and boulders		SS	6	33	26	4	80.56
- loose by 4.6m depth		SS	7	25	8	5	79.56
		SS	8	17	7		
6.10						6	78.56
End of Borehole							
(BH dry - September 8, 2021)							



APPENDIX 3

WATER SERVICE PLAN – CITY OF OTTAWA

HOMEOWNER LETTER



0 0.13 0.25 0.5 Kilometers

5497 Manotick Main Street

Water Service Locations
within 500 meters

Legend

- Property parcels
- Serviced Locations
- 5497 Manotick Main St.
- 500m Buffer
- Possibly Unserviced Locations

Feb-15-22

PATERSON GROUP

Consulting Engineers
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
Tel: (613) 226-7381

Geotechnical Engineering
Environmental Engineering
Hydrogeology
Materials Testing
Building Science
Rural Development Design
Retaining Wall Design
Noise and Vibration Studies

patersongroup.ca

August 23, 2022

File No.: PH4593

Attention: **Owner/Occupant**

Subject: **Baseline Water Well Testing**

Dear Owner/Occupant,

Paterson Group Inc. (Paterson), an Ottawa based Geotechnical, Environmental, and Hydrogeological Engineering Consulting Firm, is carrying out a baseline well water sampling program in your area, along with a short interview. This baseline well sampling program is being completed as a requirement by the City of Ottawa prior to starting construction works for the proposed development to be located at 5497 Manotick Main Street in Ottawa (Manotick). The sample results will be used as a baseline to provide a reference water quantity and quality in the unlikely event that construction works impact your well.

We are anticipating carrying out the well sampling program over a three-week period **(August 10 through August 26, 2022)**. We would like to take this opportunity to schedule an appointment to sample your well when convenient.

As part of the baseline well sampling program, we are requesting access to your property to collect a raw water sample from an untreated tap/spigot. It is preferred to sample an untreated outdoor location to reduce potential for close contact and maintain social distance. Participants will be asked if they can provide a copy of the Well Record from when the well was installed, but water samples will be taken even if the record is not available. The program will consist of a brief interview with our field staff regarding the well history, determining the location of the well on the property and taking a water sample from an exterior tap/spigot should the water not be subject to any filtration or treatment measures. The entire process will take **15 to 20 minutes**. The interview can be done either in person at the time of sampling, or over the phone in order to limit social interaction.

The purpose of the sampling program is to protect homeowners against possible effects of construction on the adjacent properties, for which contingency plans will be in place. Well water testing includes several chemical parameters (not only bacteria) and the results will be provided to you **free of charge** (value of approximately $350).

Homeowner names, addresses with related analytical results, and contact information **will not** be released publicly by Paterson or the client. The information will be provided to the City where they have noted they will not share the report and that all personal information will remain private. If there are any questions as to how the parties will handle your information, please reach out to the appropriate person noted below.

Please contact Alexander Schopf at Paterson Group (613-807-4147) or via email at (aschopf@patersongroup.ca) to schedule an appointment to sample your well. Please contact Tessa Di Iorio at the City of Ottawa (613-406-6465) or via email at (tessa.diiorio@ottawa.ca) should you require further information or if you have questions about the City's requirement for the well water sampling program.

We will continue to follow Public Health Ontario and Ottawa Public Health recommendations related to COVID-19 throughout these times. Please let us know if there are any health-related concerns you may have regarding the sampling.

Best Regards,

Paterson Group Inc.

Alexander Schopf, PhD., EIT

APPENDIX 4

P^2 CONCEPTS DRAWING SP-01

1 / A-2 **FRONT ELEVATION**

SCALE = 1:75

2 / A-2 **RIGHT SIDE ELEVATION**

SCALE = 1:75

CLIENT:

12213559 Canada Inc

P2 concepts
739 RIDGEWOOD AVE., UNIT 201
OTTAWA, ONTARIO, K1V 6A8

No.	REVISIONS	BY	DATE
11			
10			
09			
08			
07			
06	FOR REVIEW	PE	SEPT 24 2021
05	FOR REVIEW	PE	SEPT 14 2021
04	FOR REVIEW	PE	JUNE 29 2021
03	FOR REVIEW	PE	MAY 14 2021
02	FOR REVIEW	PE	APR. 27 2021
01	FOR REVIEW OVERALL REDESIGN	PE	APR. 16 2021

STAMP

NORTH ARROW

DESIGNED BY: P.E.

DRAWN BY: P.E.

APPROVED BY: B.K.

PROJECT

5497 MANOTICK MAIN

DRAWING TITLE

FRONT & RIGHT SIDE ELEVATIONS

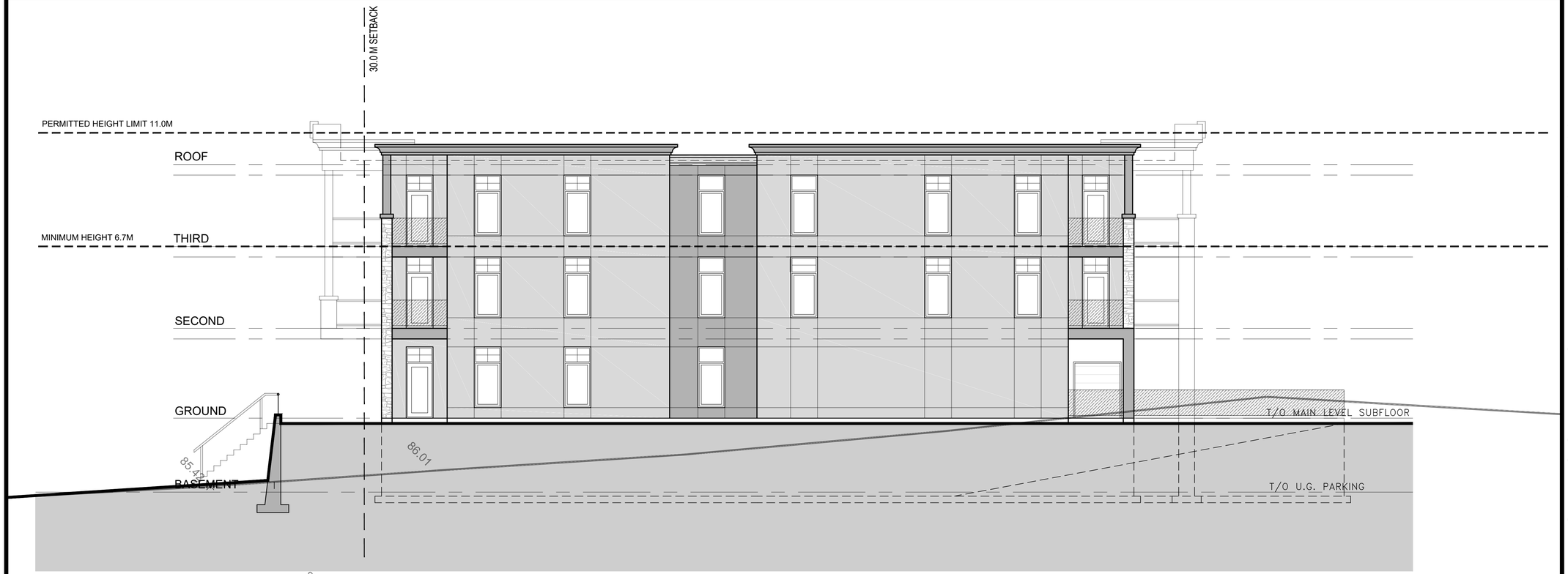
PROJECT NO. 0387

DATE SEPT. 24, 2021

A-02

1 A-3 **REAR ELEVATION**

SCALE = 1:75



2 A-3 **LEFT SIDE ELEVATION**

SCALE = 1:75

CLIENT:

12213559 Canada Inc

P2 concepts
739 RIDGEWOOD AVE., UNIT 201
OTTAWA, ONTARIO, K1V 6A8

No.	REVISIONS	BY	DATE
11			
10			
09			
08			
07			
06			
05			
04			
03	FOR REVIEW	PE	SEPT. 24, 2021
02	FOR REVIEW	PE	SEPT. 17, 2021
01	FOR REVIEW	PE	JUNE 30, 2021

STAMP

NORTH ARROW

DESIGNED BY:	DRAWN BY:	APPROVED BY:
P.E.	P.E.	B.K.

PROJECT

5497 MANOTICK MAIN

DRAWING TITLE

REAR & LEFT SIDE ELEVATIONS

PROJECT NO.
0387

DATE
SEPT 24, 2021

A-03

1 A-4 **NORTH EAST VIEW**
SCALE = N/A

3 A-4 **NORTH WEST VIEW**
SCALE = N/A

2 A-4 **SOUTH WEST VIEW**
SCALE = N/A

4 A-4 **SOUTH VIEW**
SCALE = N/A

CLIENT:

12213559 Canada Inc

P2 concepts
739 RIDGEWOOD AVE., UNIT 201
OTTAWA, ONTARIO, K1V 6A8

No.	REVISIONS	BY	DATE
11			
10			
09			
08			
07			
06			
05			
04			
03	FOR REVIEW	PE	SEPT. 24, 2021
02	FOR REVIEW	PE	SEPT. 17, 2021
01	FOR REVIEW	PE	JUNE 30, 2021

STAMP

NORTH ARROW

DESIGNED BY:	DRAWN BY:	APPROVED BY:
P.E.	P.E.	B.K.

PROJECT

5497 MANOTICK MAIN

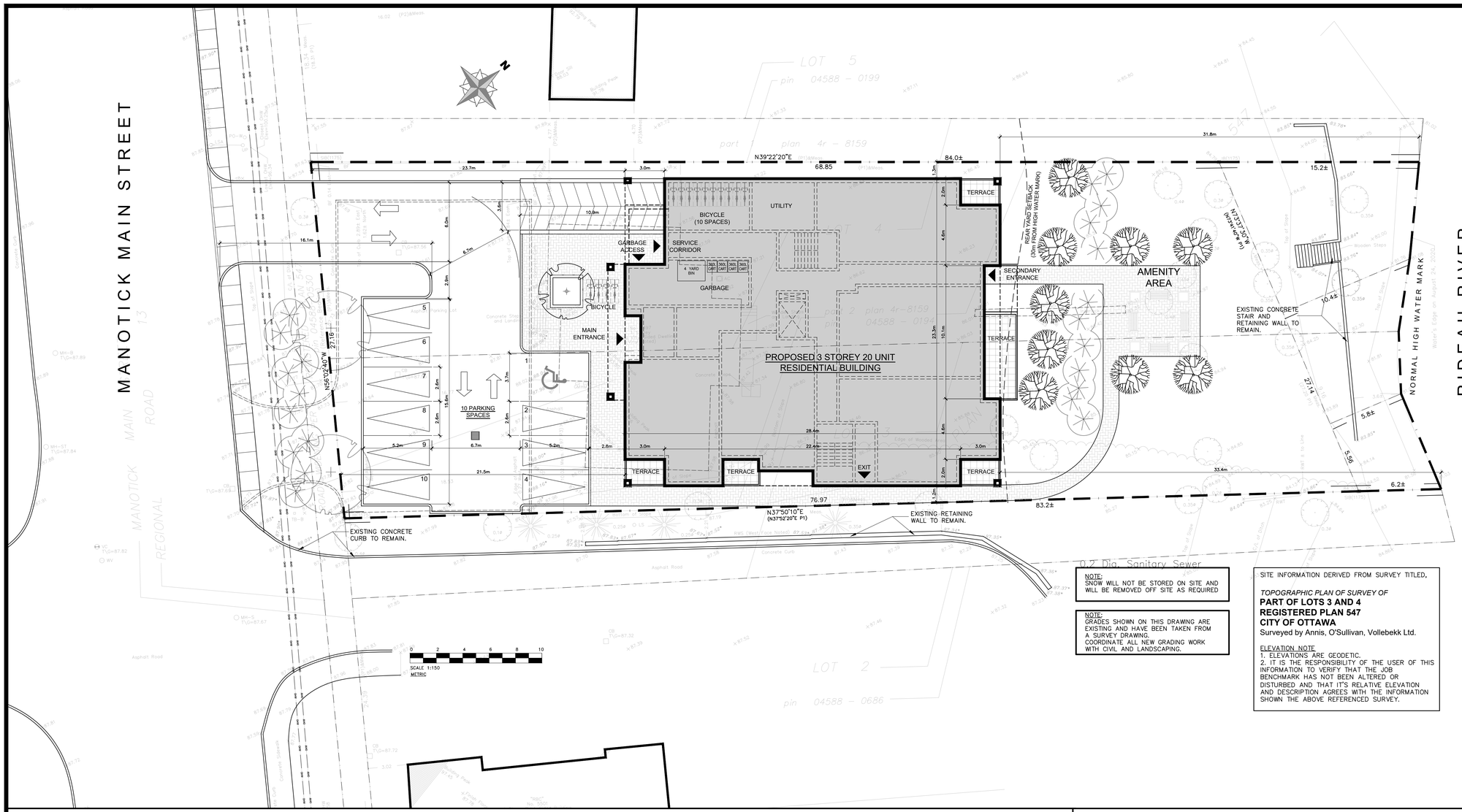
DRAWING TITLE

MASSING STUDY

PROJECT NO.
0387

DATE
SEPT 24, 2021

A-04



1 SP-01 **SITE PLAN**

SCALE = 1:150

NOTE:
SNOW WILL NOT BE STORED ON SITE AND WILL BE REMOVED OFF SITE AS REQUIRED

NOTE:
GRADES SHOWN ON THIS DRAWING ARE EXISTING AND HAVE BEEN TAKEN FROM A SURVEY DRAWING. COORDINATE ALL NEW GRADING WORK WITH CIVIL AND LANDSCAPING.

SITE INFORMATION DERIVED FROM SURVEY TITLED,

TOPOGRAPHIC PLAN OF SURVEY OF
PART OF LOTS 3 AND 4
REGISTERED PLAN 547
CITY OF OTTAWA
Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

ELEVATION NOTE
1. ELEVATIONS ARE GEODETIC.
2. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT IT'S RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN THE ABOVE REFERENCED SURVEY.

SITE STATISTICS 5497 MANOTICK MAIN

ITEM	REQUIRED	PROVIDED
Zone	VM9 Village Mixed Use	VM9 - EXCEPTION
Lot Area	1350 SQ. M.	2169 SQ. M.
Lot Width	20 M. min.	27.2 M.
Maximum Building Height	6.7 M MIN. - 11.0M MAX	10.9 M - 3 STOREYS
Front Yard	3.0 M MAX	VARY (21.1m AT CLOSEST)
Side Yard — Corner	3.5M MIN. - 4.0M MAX	N/A
Side Yard — Interior	NO MIN.	1.2M
Rear Yard	7.5M MIN. (30.0 M FROM WATER MARK)	(30.0 M FROM WATER MARK)
Building Footprint		608 SQ. M.
Lot Coverage	NO MAX	
Number of Dwelling units		21 UNITS (10 ONE BEDROOM, 11 TWO BEDROOMS)
PARKING SPACES REQUIRED		
RESIDENTIAL	1.2 PER x 21 = 25 SPACES	(10 SURFACE) (16 UNDERGROUND) 26 SPACES
Required Bike Racks	10.5 REQUIRED (0.5 SPACES/DWELLING)	10 INTERIOR and 4 EXTERIOR
Landscaping — Hard		
Landscaping — Soft		

CLIENT:
12213559 Canada Inc

P2 concepts
739 RIDGEWOOD AVE., UNIT 201
OTTAWA, ONTARIO, K1V 6A8

LEGEND:
- PROPOSED NEW BUILDING
- NEW UNIT PAVERS
- PROPERTY LINE
- ADJACENT LOT PROPERTY LINES
- E — EXISTING OVERHEAD HYDRO LINE
- NEW WOOD FENCE
- HP EXISTING HYDRO POLE TO REMAIN
- ENTRANCE ARROWS
- NEW BIKE RACKS
- NEW PARKING
- EXISTING CONCRETE CURB
- LIGHT STANDARD
- WALL MOUNTED LIGHTING FIXTURE
- EXTERIOR SOFFIT LIGHTING FIXTURE
- EXTERIOR WALL MOUNTED LIGHT FIXTURE

No.	REVISIONS	BY	DATE
11			
10	FOR REVIEW	PE	MAY 14 2021
09	FOR REVIEW	PE	APR. 27 2021
08	FOR REVIEW OVERALL REDESIGN	PE	APR. 16 2021
07	FOR REVIEW	PE	MAR. 16 2021
06	FOR REVIEW	PE	FEB. 16 2021
05	REVISIONS TO SITE ACCESS	PE	JAN. 06 2021
04	FOR REVIEW	PE	NOV. 24 2020
03	FOR REVIEW	PE	NOV. 16 2020
02	FOR REVIEW	PE	OCT. 09 2020
01	FOR REVIEW	PE	SEPT. 24 2020

STAMP

NORTH ARROW

DESIGNED BY: P.E.
DRAWN BY: P.E.
APPROVED BY: B.K.

PROJECT
5497 MANOTICK MAIN

DRAWING TITLE
SITE PLAN

PROJECT NO. 0387
DATE OCT. 23, 2020

SP-01