PATERSON GROUP

Confederation Line Level 1 Proximity Study

Proposed High-Rise Building

1546 Scott Street – Ottawa, Ontario

Prepared for Reid's Heritage Properties

Report PG6510-1 dated January 30, 2023

Table of Contents

Appendices

1.0 Introduction

Paterson Group (Paterson) was commissioned by Reid's Heritage Properties to conduct a Level 1 Confederation Line Proximity Study for the proposed development to be located at 1546 Scott Street in the City of Ottawa.

The objectives of the current study were to:

- Review all current information available from the City of Ottawa with regards to the infrastructure of the Confederation Line in the vicinity of the subject site.
- Liaison between the City of Ottawa and Reid's Heritage Properties consultant team involved with the aforementioned project.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains a collaboration of architectural, civil, structural, geotechnical, and shoring design information as they pertain to the aforementioned project.

2.0 Development Details

Based on current plans, it is understood that the proposed development at the subject site will consist of a high-rise building. This structure will have up to 4 below-grade levels which will extend beyond the limits of the overlying building to the property lines.

The following is known about the LRT Confederation Line in the vicinity of the subject site:

- The subject site is proposed to be located to the south of the existing LRT Confederation Line, which was completed in 2019.
- The proposed high-rise building is anticipated to be located approximately 41 m south of the existing transitway, which extends down to approximate geodetic elevation 56 m.
- Based on the subsurface profile encountered within the boreholes at 1546 Scott Street, and our experience in the general area, bedrock is expected at approximate depths of 0.8 to 2.9 m below the existing ground surface, which corresponds to approximate geodetic elevations 59 m to 61 m.

3.0 Construction Methodology and Impact Review

Paterson has prepared a construction methodology summary along with possible impacts on the adjacent segment of Confederation Line, based on the current building design details. The Construction Methodology and Impact Review is provided in Appendix A and presents the anticipated construction items, impact review, and mitigation program recommended for the proposed high-rise building. The primary issue will be vibrations associated with the bedrock blasting removal program. It is recommended that a vibration monitoring program be implemented to ensure vibration levels remain below recommended tolerances. Details of the recommended vibration monitoring program are presented below.

3.1 Vibration Monitoring and Control Program

Proposed Vibration Limits

Due to the existing Confederation Line alignment located in the vicinity of the subject site, the contractor should take extra precaution to minimize vibrations. The monitoring program will be required for the full duration of the shoring installation (if required) and blasting operations. The purpose of the vibration monitoring and control program (VMCP) is to provide a description of the measures to be applied by the contractor to manage excavation operations and any other vibration sources during the construction for the proposed development. The VMCP will also provide a guideline for assessing results against the relevant vibration impact assessment criteria and recommendations to meet the required limits.

The monitoring program will incorporate real time results at the LRT Confederation Line located in the vicinity of the subject site. The monitoring equipment should consist of a tri-axial seismograph, capable of measuring vibration intensities up to 254 mm/s at a frequency response of 2 to 250 Hz.

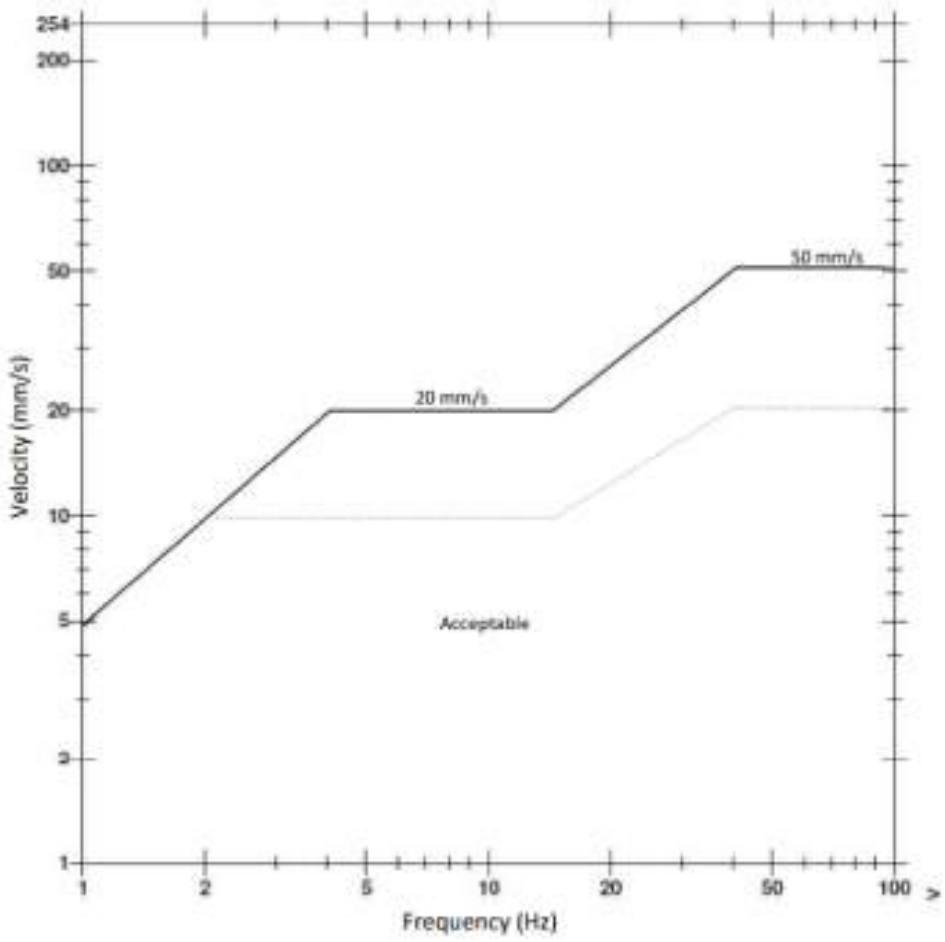
The location of the seismograph should be reviewed periodically throughout construction to ensure that the monitoring equipment remains along the alignment of the proposed Confederation Line with the closest radius to the construction activities. The seismograph locations should be approved by the project manager prior to installation.

During construction, the vibration monitor will be relocated for the ‘worst case’ location for each construction activity. When an event is triggered, Paterson will review the results and provide any necessary feedback. Otherwise, the vibration results will be summarized in the weekly report.

Proposed Vibration Limits

The excavation operations should be planned and conducted under the supervision of a licensed professional engineer who is an experienced bedrock excavation consultant. The following table outlines the vibration limits for the LRT Confederation Line:

Figure 1 - Proposed Vibration Limits at the LRT Confederation Line



Monitoring Data

The monitoring protocol should include the following information:

Warning Level Event (indicated by the light blue line on Figure 1)

- ❑ Paterson will review all vibrations over the established warning level, and.
- ❑ Paterson will notify the contractor if any vibrations occur due to construction activities and are close to exceedance level.

Exceedance Level Event (indicated by the black line on Figure 1)

- ❑ Paterson will notify all the relevant stakeholders via email
- ❑ Ensure monitors are functioning
- ❑ Issue the vibration exceedance result

The data collected will include the following:

- ❑ Measured vibration levels
- ❑ Distance from the construction activity to monitoring location
- ❑ Vibration type

Monitoring should be compliant with all related regulations.

3.2 Incident/Exceedance Reporting

In case an exceedance occurs from construction activities, the Senior Project Management and any relevant personnel should be notified immediately. A report should be completed which contains the following:

- ❑ Identify the location of vibration exceedance
- ❑ The date, time and nature of the exceedance
- ❑ Purpose of the exceeded monitor and current vibration criteria
- ❑ Identify the likely cause of the exceedance
- ❑ Describe the response action that has been completed to date
- ❑ Describe the proposed measures to address the exceedance.

The contractor should implement mitigation measures for future excavation or any construction activities as necessary and provide updates on the effectiveness of the improvement. Response actions should be pre-determined prior to excavation, depending on the approach provided to protect elements. Processes and procedures should be in-place prior to completing any vibrations to identify issues and react in a quick manner in the event of an exceedance.

4.0 Proximity Study Requirement Responses

Based on the O-Train System Proximity Study Guidelines dated April 2022, a Level 1 Confederation Line Proximity Study is considered to be required for the proposed development. A Level 1 Proximity Study is required where the proposed development is located within the City of Ottawa's Development Zone of Influence.

The following table lists the applicable requirements for Level 1 study for each item and our associated responses:

Table 1
List of Confederation Line Level 1 Proximity Study Requirements

Level 1 Projects	Response
A site plan of the development	See Site Plan Sketch (Drawing No. ASK-1) prepared by Tregebov Cogan Architecture presented in Appendix A.
Floor Plan of the development	Refer to the Architectural Drawings (Drawing Nos. A1.01 through A.601) prepared by Tregebov Cogan Architecture presented in Appendix A.
Development Cross Section	See Section 'A' (Drawing No. ASK-2) prepared by Tregebov Cogan Architecture presented in Appendix A.
Geotechnical Report prepared in accordance with the City's Geotechnical Investigation and Reporting Guidelines for Development Applications	Refer to Geotechnical Investigation prepared by Yuri Mendez Engineering (Report No. 47-CEI-R2[1] dated May 10, 2022) presented in Appendix B.
Up-to-date property survey of existing and proposed property lines prepared to strata reference plan standards, signed and sealed by an Ontario Land Surveyor	Refer to the Survey Plan prepared by Fairhall Moffat and Woodland Ltd. (Job No. AC14400) Presented in Appendix A
Utility Service Plan	Refer to the Servicing Plan (Drawing No. C-001 Revision 2 dated August 5, 2022) prepared by IBI Group presented in Appendix A.
Stormwater Management Plan and Grading Plan	Refer to the Storm Drainage Area Plan (Drawing No. C-500 Revision 2 dated August 5, 2022) and Grading Plan (Drawing No. C-200 Revision 4 dated January 25, 2023) prepared by IBI Group presented in Appendix A.

Architectural Drawings and Landscape Plans	Refer to the Architectural Drawings (Drawing Nos. A1.01 through A.601) prepared by Tregebov Cogan Architecture presented in Appendix A.
Noise and Vibration Study prepared in accordance with the City's environmental noise control guidelines (required for all applications within 75m of light rail transit)	Please refer to the Noise Feasibility Study dated October 27, 2021 and Vibration Feasibility Study dated December 22, 2021, presented in Appendix A.

We trust that this information satisfies your immediate request.

Best Regards,

Paterson Group Inc.

Otillia McLaughlin B.Eng.

Scott S. Dennis P.Eng.

APPENDIX A

Construction Methodology and Impact Review

Trillium Line Proximity Plan

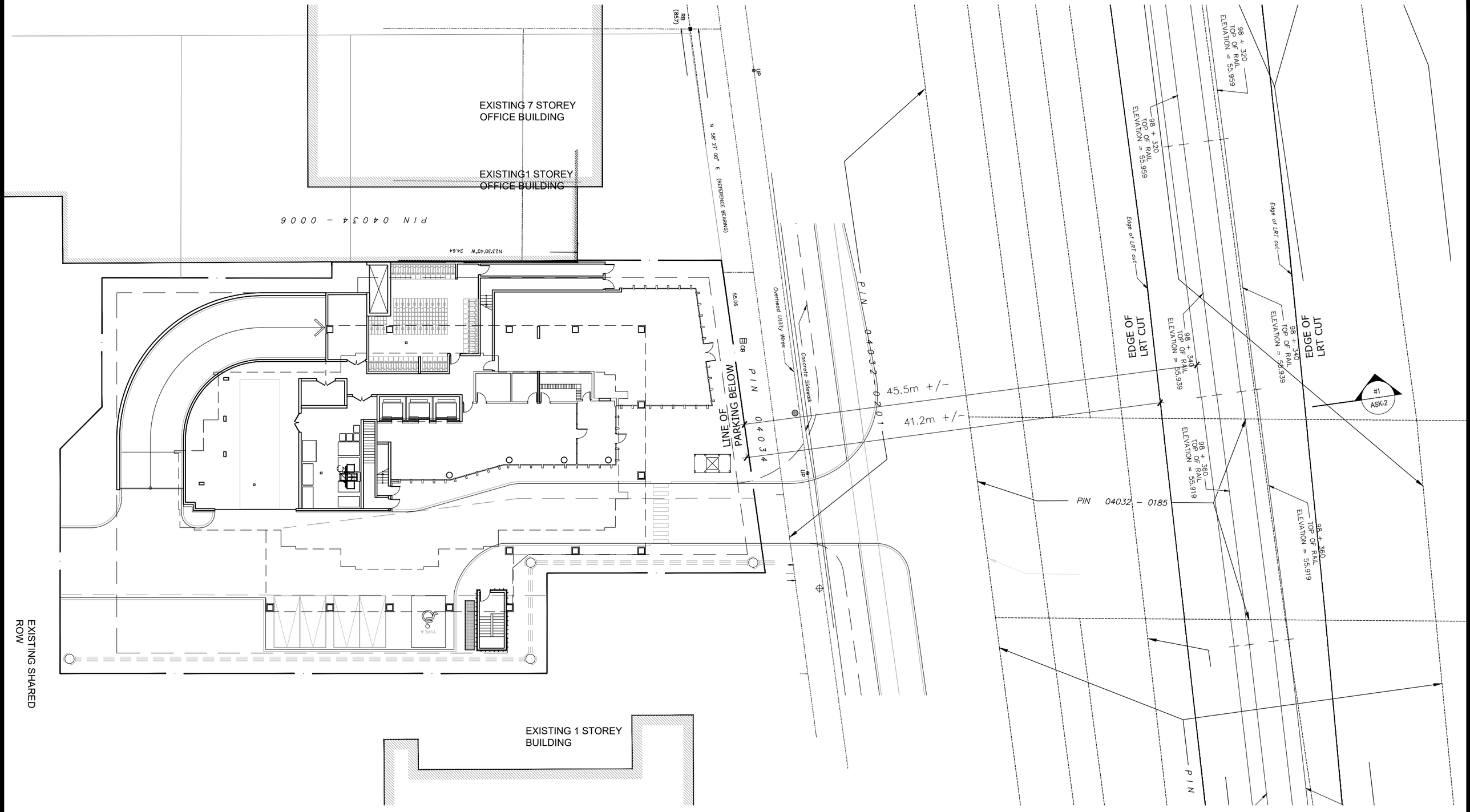
Cross Section 'A'

Topographic Plan of Survey

Relevant Architectural & Civil Drawings prepared by others

Noise Feasibility Study & Vibration Feasibility Study prepared by others

Construction Methodology and Impact Review		
Construction Item	**Potential Impact**	**Mitigation Program**
Item A – Installation of Temporary Shoring System – Where adequate space is not available for the overburden to be sloped, the overburden along the perimeter of the proposed building footprint will need to be shored in order to complete the construction of the underground parking levels. The shoring system is anticipated to consist of a soldier pile and lagging or interlocking sheet pile system.	Vibration issues during shoring system installation	Design of the temporary shoring system, in particular vibrations during installation, will take into consideration the presence of the LRT Confederation Line. Installation of the shoring system is not anticipated to have an adverse impact on the LRT Confederation Line, nonetheless, a vibration monitoring device is recommended to be installed to monitor vibrations. The vibration monitor would be remotely connected to permit real time monitoring.
Item B – Bedrock Blasting and Removal Program – Blasting of bedrock will be required for the proposed high rise building and underground parking structure construction. It is expected that up to approximately 10 m of bedrock removal will be required based on the current design concepts for the proposed high-rise building.	Structural damage of LRT Confederation Line due to blasting program	Structural damage to the LRT Confederation line during bedrock blasting and removal is not anticipated, nonetheless, a vibration monitoring device is recommended to be installed to monitor vibrations. The vibration monitor would be remotely connected to permit real time monitoring.
Item C – Construction of Footings and Foundation Walls – The proposed high-rise building will include 4 levels of underground parking. Therefore footings will be places over a clean surface sounded Limestone bedrock bearing surface.	Building footing loading on adjacent LRT Confederation Line, and excavation within the lateral support zone of the LRT Confederation Line.	Due to the distance between the proposed building and the LRT Confederation Line, the zone of influence from the proposed footings will not intersect the rail line structure and associated infrastructure. Further, although the underground parking levels for the proposed high-rise building will extend approximately 12 to 13 m below the existing ground surface, due to the approximate distance of 41 m between the proposed high-rise building and the rail line structure, the building excavation will not impact the lateral support sone of the LRT Confederation Line.



TREGEBOV COGAN *ARCHITECTURE*
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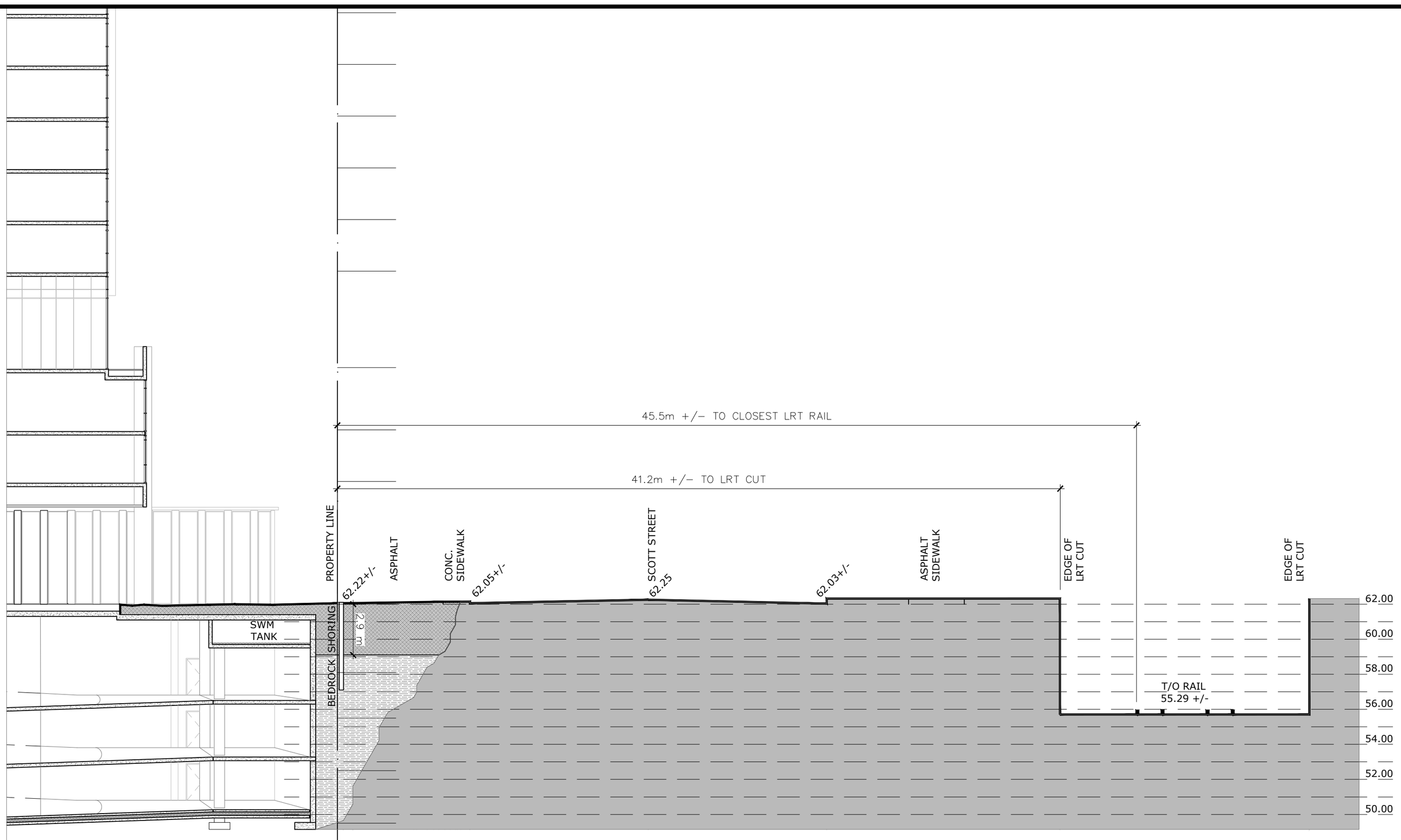
Toronto, ON M4T 1M9
office@tcarchitecture.ca
647-352-3350

SITE PLAN SKETCH
1546 SCOTT STREET
OTTAWA, ON

JANUARY 19, 2023
1:350

ASK-1



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SECTION 'A'
1546 SCOTT STREET
OTTAWA, ON

JANUARY 19, 2023
1:200
ASK-2

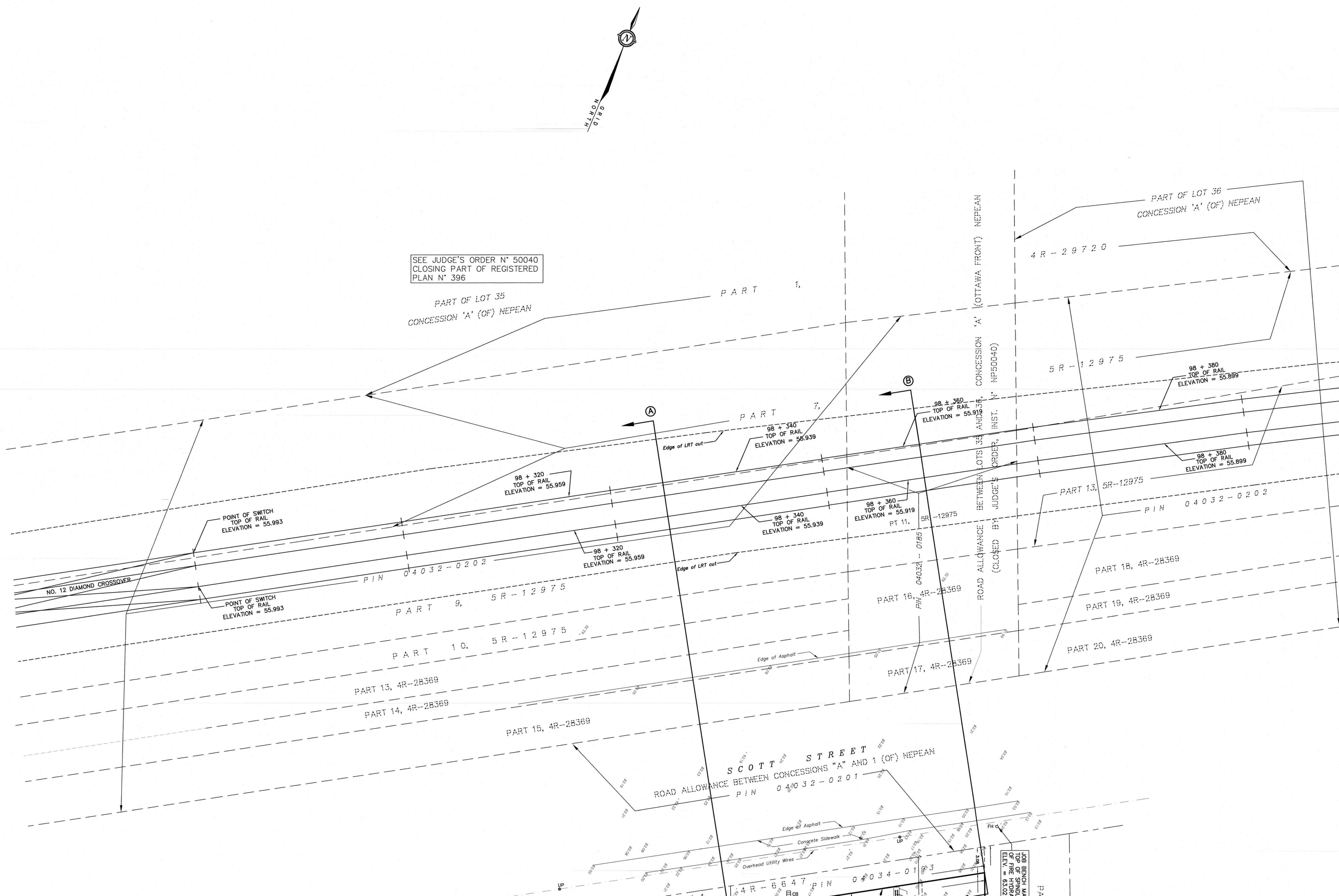
METRIC
DISTANCES AND ELEVATIONS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

PLAN SHOWING FEATURES FOR CONFEDERATION LINE PROXIMITY STUDY

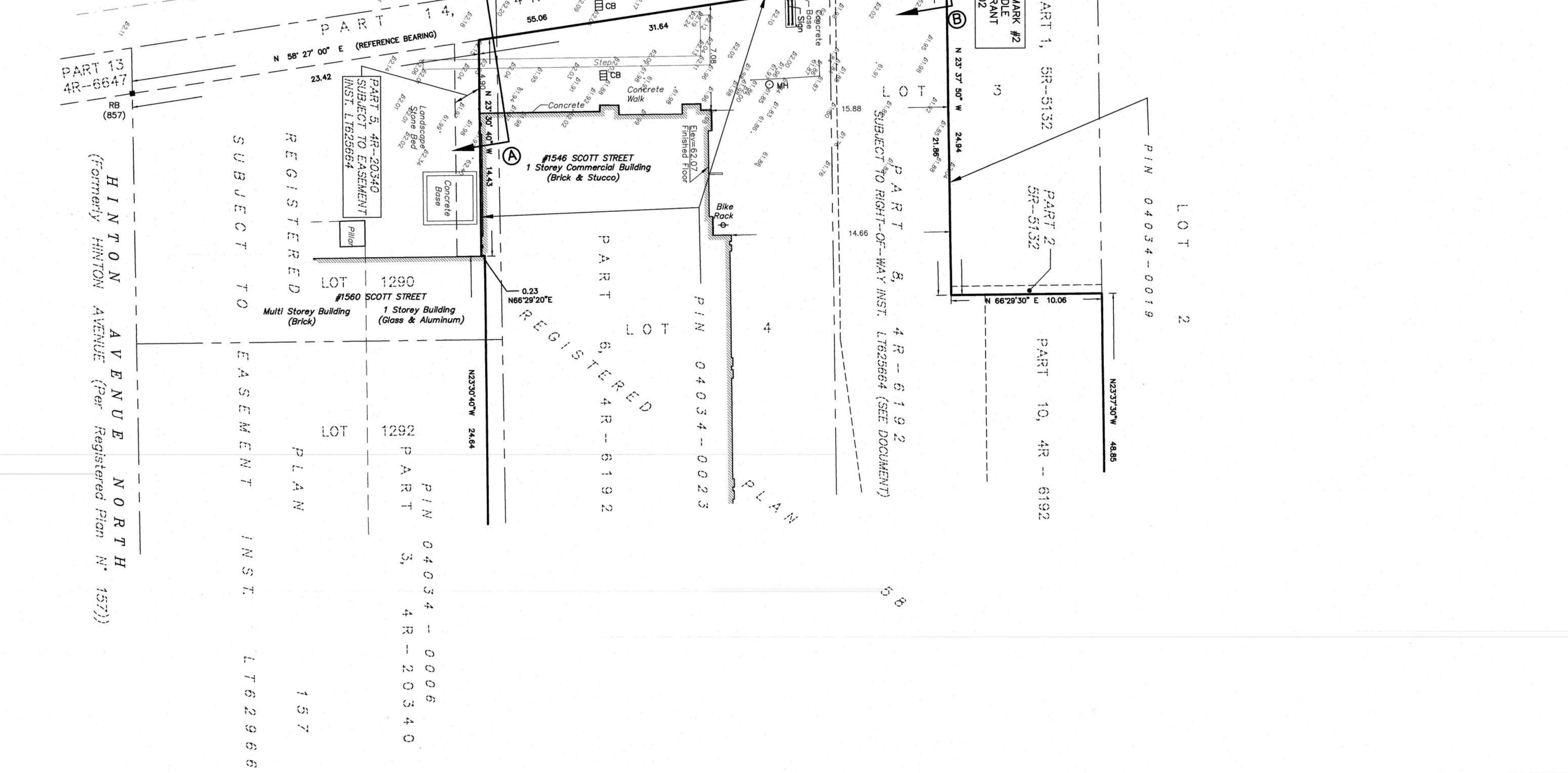
PART OF LOTS 3 AND 4
REGISTERED PLAN 58
PART OF REGISTERED PLAN 396, PART OF LOTS 34, 35 & 36, PART OF THE ROAD ALLOWANCE BETWEEN LOTS 35 & 36 (As Closed) CONCESSION 'A' (OTTAWA FRONT) GEOGRAPHIC TOWNSHIP OF NEPEAN
CITY OF OTTAWA

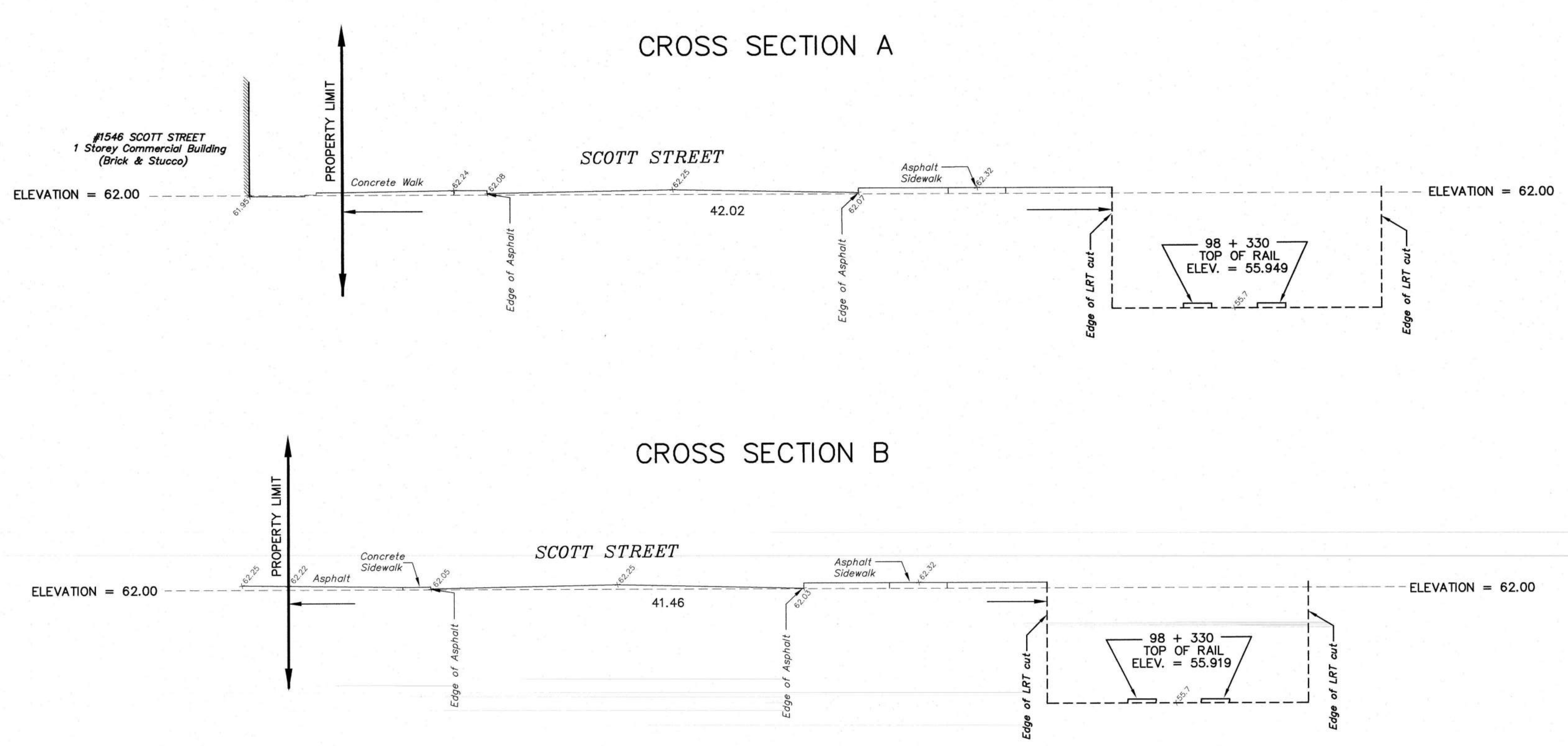
SCALE 1 : 200
0 5 10 20 metres

FAIRHALL, MOFFATT & WOODLAND LIMITED
ONTARIO LAND SURVEYORS



GRID NORTH
SEE JUDGE'S ORDER N° 50040 CLOSING PART OF REGISTERED PLAN N° 396
PART OF LOT 35 CONCESSION 'A' (OF) NEPEAN
PART OF LOT 36 CONCESSION 'A' (OF) NEPEAN
4R-29720
5R-12975
PART 1
PART 7
PART 9, 5R-12975
PART 10, 5R-12975
PART 13, 5R-12975
PART 13, 4R-28369
PART 14, 4R-28369
PART 15, 4R-28369
PART 16, 4R-28369
PART 17, 4R-28369
PART 18, 4R-28369
PART 19, 4R-28369
PART 20, 4R-28369
PIN 04032-0202
NO. 12 DIAMOND CROSSOVER
POINT OF SWITCH TOP OF RAIL ELEVATION = 55.993
98 + 320 TOP OF RAIL ELEVATION = 55.959
98 + 340 TOP OF RAIL ELEVATION = 55.939
98 + 360 TOP OF RAIL ELEVATION = 55.919
98 + 380 TOP OF RAIL ELEVATION = 55.899
Edge of LRT cut
ROAD ALLOWANCE BETWEEN LOTS 35 AND 36, CONCESSION 'A' (OTTAWA FRONT) NEPEAN (CLOSED BY JUDGE'S ORDER, INST. NP50040)
SCOTT STREET
ROAD ALLOWANCE BETWEEN CONCESSIONS "A" AND 1 (OF) NEPEAN
PIN 04032-0201
Edge of Asphalt
Concrete Sidewalk
Overhead Utility Wires
PART 14, 4R-6647
PIN 04034-0193
PART 13 4R-6647
N 58°27'00" E (REFERENCE BEARING)
#1546 SCOTT STREET 1 Storey Commercial Building (Brick & Stucco)
#1560 SCOTT STREET
Multi Storey Building (Brick)
1 Storey Building (Glass & Aluminum)
JOB BENCH MARK #2 TOP OF SPINDLE OF FIRE HYDRANT ELEV. = 63.02
HINTON AVENUE NORTH (Formerly HINTON AVENUE (Per Registered Plan N° 157))
SUBJECT TO EASEMENT INST. LT629665
REGISTERED PLAN 157
LOT 1290
LOT 1292
PART 3, 4R-20340
PIN 04034-0006
PART 6, REGISTERED 4R-6192
PART 8, 4R-6192 SUBJECT TO RIGHT-OF-WAY INST. LT625664 (SEE DOCUMENT)
PIN 04034-0023
LOT 4
LOT 3
LOT 2
PLAN 58
PART 1, 5R-5132
PART 2, 5R-5132
PART 10, 4R-6192
PIN 04034-0019
N 66°29'30" E 10.06
Bike Rack





CROSS SECTION A
#1546 SCOTT STREET 1 Storey Commercial Building (Brick & Stucco)
PROPERTY LIMIT
SCOTT STREET
Concrete Walk
Asphalt Sidewalk
ELEVATION = 62.00
42.02
Edge of Asphalt
Edge of LRT cut
98 + 330 TOP OF RAIL ELEV. = 55.949
CROSS SECTION B
PROPERTY LIMIT
SCOTT STREET
Concrete Sidewalk
Asphalt
Asphalt Sidewalk
ELEVATION = 62.00
41.46
Edge of Asphalt
Edge of LRT cut
98 + 330 TOP OF RAIL ELEV. = 55.919

ELEVATION NOTES

1. ELEVATIONS SHOWN HEREON ARE REFERRED TO GEODETIC DATUM (CGVD28).
2. ELEVATIONS FOR MANHOLE COVERS AND CATCH BASINS HAVE TO BE INDEPENDENTLY CONFIRMED BEFORE THEY CAN BE ACCEPTED FOR FINAL DESIGN OR CONSTRUCTION PURPOSES.
3. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARKS HAVE NOT BEEN ALTERED OR DISTURBED AND THAT THEIR RELATIVE ELEVATION AND DESCRIPTION AGREE WITH THE INFORMATION SHOWN ON THIS DRAWING.

NOTES

1. BEARINGS ARE GRID AND DERIVED FROM THE SOUTHERLY LIMIT OF SCOTT STREET AS SHOWN ON PLAN 4R-20340 AS HAVING A BEARING OF N58°27'00"E AND ARE REFERRED TO THE CENTRAL MERIDIAN 76°30'W LONGITUDE MTM ZONE 9, (NAD83 ORIGINAL).
2. INFORMATION SHOWN IS COMPILED FROM PLANS 4R-29720, 4R-28368, TOPOGRAPHIC SURVEY BY FAIRHALL MOFFATT AND WOODLAND LIMITED DATED JANUARY 09, 2020 AND LRT AS-BUILT PLANS PREPARED BY MARSHALL MACKLIN MONAGHAN AND PROVIDED BY THE CITY OF OTTAWA.

LEGEND

□	SURVEY MONUMENT SET
■	SURVEY MONUMENT FOUND
SIB	STANDARD IRON BAR
SSIB	SHORT STANDARD IRON BAR
IB	IRON BAR
CC	CUT CROSS
CN	CONCRETE NAIL
MN	MAGNETIC NAIL
ø	ROUND
PIN	PROPERTY IDENTIFIER NUMBER
(857)	FAIRHALL, MOFFATT & WOODLAND LIMITED, O.L.S.
○ MH	MANHOLE
CB	CATCH BASIN
⊗ UP	UTILITY POLE

SURVEYOR'S CERTIFICATE

1. PLAN PREPARED JANUARY 12, 2023

JOHN H. GUTRI
ONTARIO LAND SURVEYOR

Fairhall Moffatt & Woodland LIMITED OTTAWA
ONTARIO LAND SURVEYORS
Surveying and Land Information Services
100-600 TERRY FOX DRIVE, KANATA, ONTARIO K2L 4B6
TEL: (613) 591-2580 FAX: (613) 591-1495
www.fmw.on.ca

JOB No.	AC14400
	E 364849 , N 5029673
REFERENCE No.	135(a) - 157
S:\JOBS\AC14400\DWG\	ac144_compiled.dwg (KG)

1546 SCOTT STREET, OTTAWA, ON

SITE PLAN AGREEMENT / ZBA

PRINT DATE :AUGUST 18, 2022

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K7M 8N7

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N2L 3V3

TRAFFIC ENGINEER:
IBI GROUP
400-333 Preston Street,
Ottawa, Ontario
K1S 5N4

CIVIL ENGINEER:
IBI GROUP
400-333 Preston Street,
Ottawa, Ontario
K1S 5N4

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K2B 5W9

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N1G 4P6

SURVEYOR:
FAIRHALL, MOFFATT & WOODLAND LTD.
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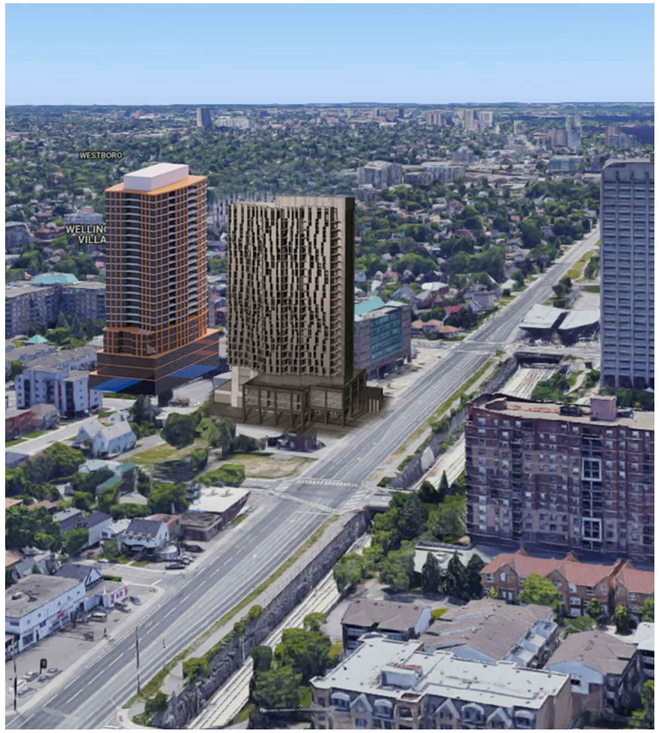
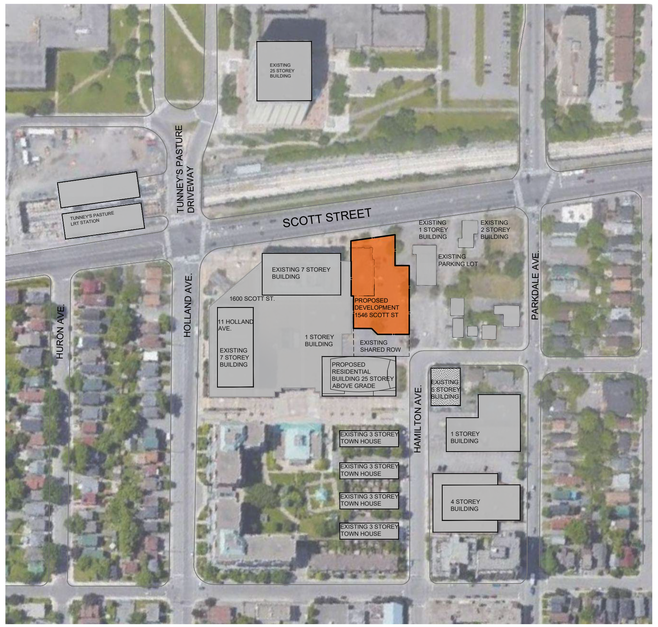


4 OVERVIEW

Scale: N.T.S



3 CONTEXT PLAN

Scale: N.T.S

1546 SCOTT STREET
OTTAWA, ON

LEGAL DESCRIPTION
PLAN OF SURVEY
PART OF LOTS 3&4 (NORTH OF BULLMAN STREET) AND PART OF LOTS 3&4 (SOUTH OF SCOTT STREET) REGISTER PLAN 58 AND PART OF LOTS 1290,1292 &1303 REGISTER PLAN 157 CITY OF OTTAWA

SITE DATA	
EXISTING LOT AREA	**2,524.5 m²**
RESIDENTIAL GFA	**14,060 m²**
COMMERCIAL GFA	**200 m²**
TOTAL GFA	**14,260 m²**
FSI(GFA/LOT AREA)	**5.6**
LOT COVERAGE	**1,588 m²**
LOT COVERAGE %	**62.9%**

SETBACKS	GROUND	2ND/3RD	TOWER
FRONT YARD	2.4 m	8.6 m	11.2 m
INTERIOR SIDE YARD	10.2m EAST 0.0 m WEST	1.9 m EAST 6.5 m WEST	4.1 m EAST 8.9 m WEST
REAR	0.6 m	13.1m	11.6 m

BUILDING HEIGHT		REQUIRED (EASL)	PROPOSED (EASL)
MINIMUM	FOR ALL USES WITHIN 400 M. OF A RAPID TRANSIT STATION, OTHER THAT A GAS BAR IT IS PERMITTED BY AN AXCEPTION	6.7m	148.2
MAXIMUM		98.35m	148.2

LANDSCAPE	PROVIDED	PROVIDED %
AREA	646.0 m²	26%

LANDSCAPE PROVISION FOR PARKING LOT	REQUIRED	PROVIDED
MINIMUM 15% AS PERIMETER OR INTERIOR LANDS AREA	15.0%	18.5%

FLOOR AREA DETAILS

							SUITE COUNT		
FLOOR LEVEL	FLOOR AREA	COMMERCIAL GFA	RESIDENTIAL GFA	AMENITY INDOOR	AMENITY PRIVATE	AMENITY OUTDOOR	1 BR	2 BR	TOTAL
F1		200 m²							0
F2	966 m²	0	780 m²		17 m²		6	4	10
F3	966 m²	0	780 m²		17 m²		6	4	10
F4	660 m²	0		790 m²		200 m²	0	0	0
F5	715 m²	0	595 m²		17 m²		6	4	10
F6	715 m²	0	595 m²		17 m²		6	4	10
F7	715 m²	0	595 m²		17 m²		6	4	10
F8	715 m²	0	595 m²		17 m²		6	4	10
F9	715 m²	0	595 m²		17 m²		6	4	10
F10	715 m²	0	595 m²		17 m²		6	4	10
F11	715 m²	0	595 m²		17 m²		6	4	10
F12	715 m²	0	595 m²		17 m²		6	4	10
F13	715 m²	0	595 m²		17 m²		6	4	10
F14	715 m²	0	595 m²		17 m²		6	4	10
F15	715 m²	0	595 m²		17 m²		6	4	10
F16	715 m²	0	595 m²		17 m²		6	4	10
F17	715 m²	0	595 m²		17 m²		6	4	10
F18	715 m²	0	595 m²		17 m²		6	4	10
F19	715 m²	0	595 m²		17 m²		6	4	10
F20	715 m²	0	595 m²		17 m²		6	4	10
F21	715 m²	0	595 m²		17 m²		6	4	10
F22	715 m²	0	595 m²		17 m²		6	4	10
F23	715 m²	0	595 m²		17 m²		6	4	10
F24	715 m²	0	595 m²		17 m²		6	4	10
F25	715 m²	0	600 m²		17 m²		6	4	10
TOTALS	**17,607 m²**	**200 m²**	**14,060 m²**	**790 m²**	**391 m²**	**200 m²**	**138**	**92**	**230**

AMENITY SPACE	REQUIRED			PROVIDED				
	RATE/UNIT	# OF UNITS	AREA REQUIRED	INDOOR		OUTDOOR	PRIVATE OUTDOOR	TOTAL AREA
	6.0 m²	230	1,380 m²	790 m²		200 m²	391 m²	1,381 m²
AMENITY SPACE REQUIRED			1,380 m²	TOTAL				1,381 m²

LOADING DOCK	
REQUIRED	PROVIDED
LOADING DOCK REQUIRED FOR RESIDENTIAL AND COMMERCIAL	1 LOADING DOCK SHARED BY RESIDENTIAL AND COMMERCIAL

CAR PARKING

RESIDENTIAL PARKING	REQUIRED			PROVIDED	
UNIT TYPES	RATE	# OF UNITS	PARKING REQUIRED	PARKING LEVEL	RESIDENTIAL PARKING SPACES
				SURFACE	0
1 BEDROOM	0.0	138	0	P1 LEVEL	1
2 BEDROOM	0.0	92	0	P2 LEVEL	50
SUB-TOTAL		230	0	P3 LEVEL	50
				P4 LEVEL	26
TOTAL RESIDENTIAL PARKING REQUIRED			0	TOTAL	**127**

VISITOR PARKING	REQUIRED			PROVIDED	
	RATE	# OF UNITS MINUS 12	TOTAL SPACES	PARKING LEVEL	PARKING SPACES
VISITOR PARKING 0.1 x NUMBER OF UNITS MINUS THE FIRST 12 UNITS	0.1 PER UNIT	218	22	SURFACE	5
				P1	17
TOTAL VISITOR PARKING REQUIRED			22	TOTAL	**22**

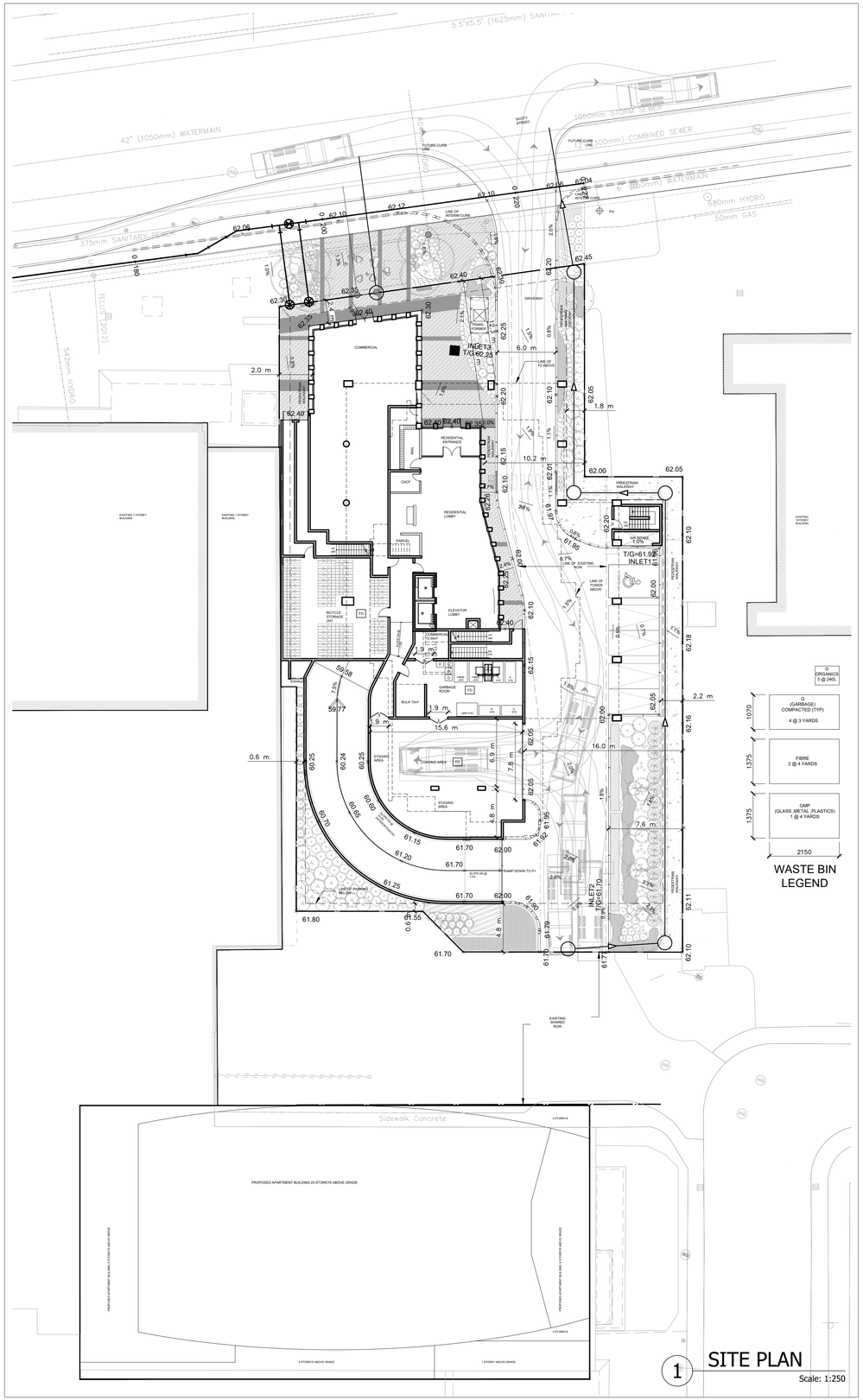
TOTAL PARKING PROVIDED SUMMARY	RESIDENTIAL	VISITOR	TOTAL NUMBER OF PARKING ON SITE
TOTAL	**127**	**22**	149

BICYCLE PARKING

RESIDENTIAL	REQUIRED			PROVIDED	
	RATE	# OF UNITS	PARKING REQUIRED	PARKING LOCATION	NO. OF PARKING SPOTS
	0.5 PER UNIT	230	115.00	OUTDOOR	6
				F1-INDOOR	61
				P1- INDOOR	169
TOTAL RESIDENTIAL BICYCLE PARKING REQUIRED			115	TOTAL	**236**

COMMERCIAL PARKING	REQUIRED			PROVIDED	
	RATE	AREA	PARKING REQUIRED	PARKING LOCATION	NO. OF PARKING SPOTS
COMMERCIAL 1 PER 250 m2	1 PER 250 m2	200 m²	1	OUTDOOR	6
TOTAL COMMERCIAL BICYCLE PARKING REQUIRED			1	BIKE PARKING PROVIDED	6

2 SITE STATISTICS



1 SITE PLAN

Scale: 1:250

CONSULTANTS:

PLANNER
IBI GROUP
650 Dalton Avenue
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CIVIL ENGINEER
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Ottawa, ON K1S 5N4
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NOISE & VIABRATION STUDY
AGILE RESPONSE
85 Bathurst Drive,
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Waterloo, ON N2V 1Z5

GEOTECH
YURI MENDEZ ENGINEERING
196 Britannia Road,
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Tel: + 1 613 899 0834

WIND STUDY
RWDI
600 Southgate Drive,
Guelph, ON N1G 4P6
Tel: +1 519 823 1311

SURVEYOR
FAIRHALL, MOFFATT & WOODLAND LTD.
600 Terry Fox Dr #100
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tel +1 613 591-2580

Site Grading and Servicing information is for reference only. Refer to Site Grading Plan Drawing C-200, Storm Drainage Area Plan C-500 and Site Servicing Plan Drawing C-001 prepared by IBI GROUP, dated Aug 18, 2022, for the purpose of obtaining site grading and servicing information.

Landscaping information is for reference only. Refer to the Landscape Plan Drawings L-1, L-2, LD1, LD2 and LD3 prepared by IBI GROUP dated Aug 18, 2022, for full landscape details.

Building classification:
OBC 3.2.2.42, Group C, Any Height, Any Area, Sprinklered

DATE	No.	ISSUE
2022-08-18	02	SPA/ZBA
2021-11-24	01	SPA/ZBA

ARCHITECT:
TREGEBOV COGAN *ARCHITECT*
40 St. Clair Avenue East, Suite 303
Toronto, ON M4T 1M9
PHONE: 647.352.3350

OWNER:
REID'S Heritage Properties

PROJECT NAME:
EVOKE

1546 SCOTT STREET OTTAWA,ON
Based on :
TOPOGRAPHY SURVEY OF PART OF LOTS 3&4 (NORTH OF BULLMAN STREET) AND PART OF LOTS 3 & 4 (SOUTH OF SCOTT STREET)
REGISTERED PLAN 58 & PART OF LOTS 1290, 1292 & 1303 REGISTERED PLAN 157
CITY OF OTTAWA
PREPARED BY FAIRHILL, MOFFATT & WOODLAND LIMITED, ONTARIO LAND SURVEYORS
JAN 21, 2020

DRAWING TITLE:
SITE PLAN
CONTEXT PLAN
SITE STATISTICS

PRINT DATE: 2022-08-18

NORTH

ONTARIO ASSOCIATION of ARCHITECTS
MICHAEL COGAN
LICENCE 7264

PROJ. No.: 1085

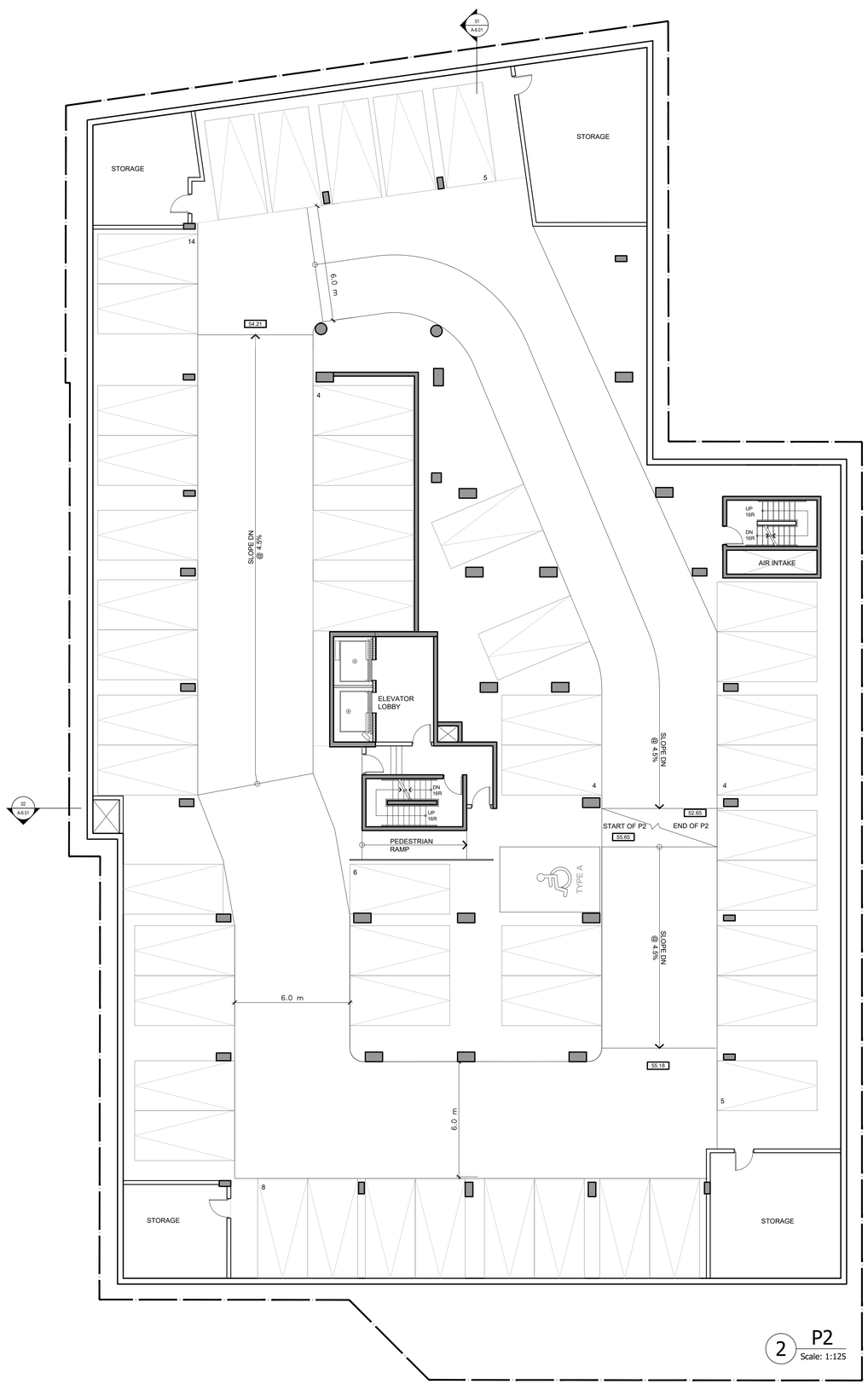
CITY FILE #: D02-21-0148
CITY PLAN #: 18666

SCALE: 1:250, AS NOTED

DRAWN BY: MC

DWG NO. **A1.01**

SPA AND ZBA



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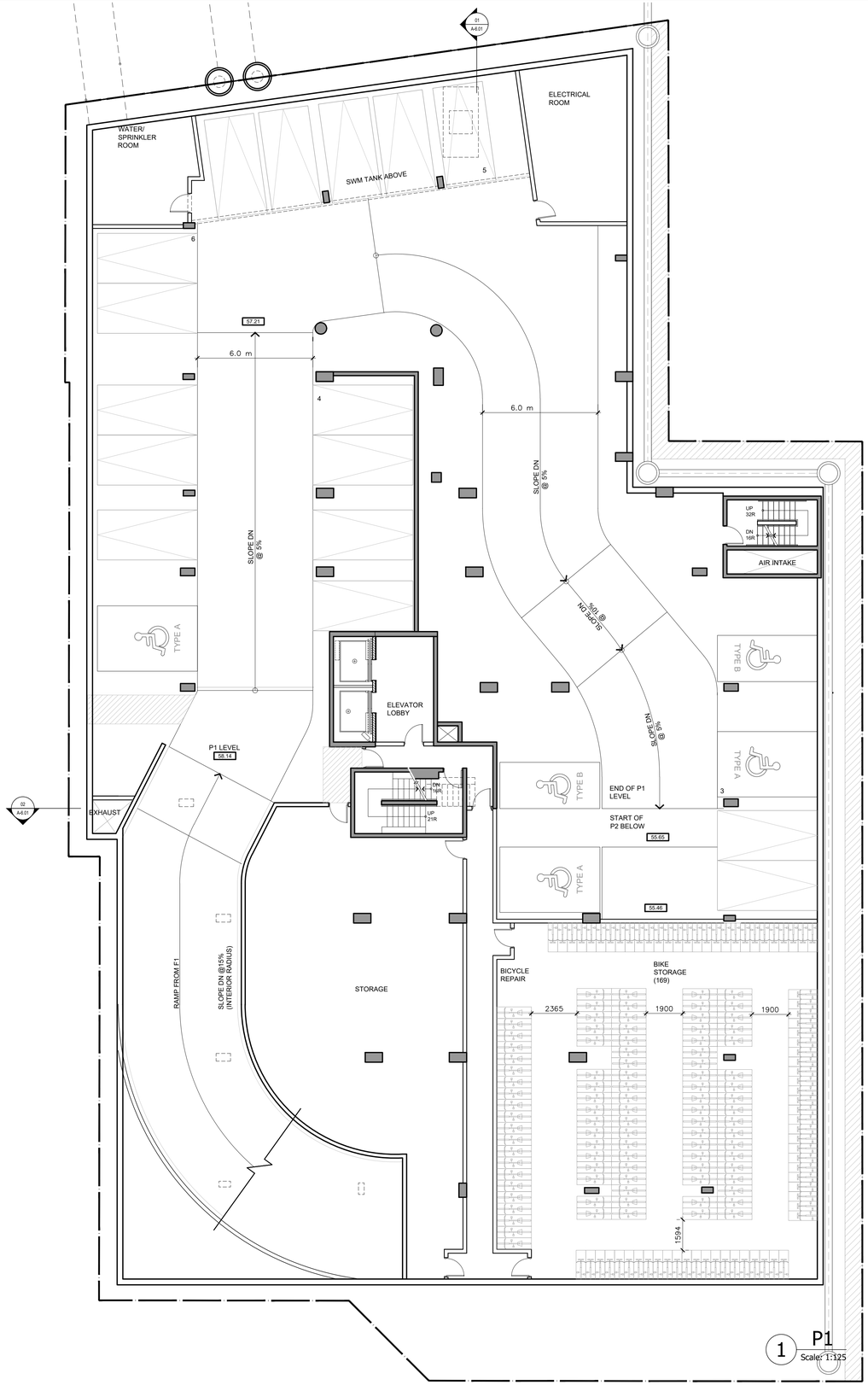

1 P1
Scale: 1:125

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Waterloo, ON N2V 1Z5

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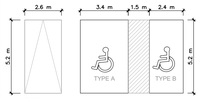
BICYCLE PARKING DIMENSIONS

PARKING SPACES DIMENSIONS



Building classification:
OBC 3.2.2.42, Group C, Any Height, Any Area, Sprinklered

DATE	No.	ISSUE
2022-08-18	02	SPA/ZBA
2021-11-24	01	SPA/ZBA

ARCHITECT:

TREGEBOV COGAN *ARCHITECT*

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PHONE: 647.352.3350

OWNER:

REID'S Heritage Properties

PROJECT NAME:

EVOKE

1546 SCOTT STREET OTTAWA,ON

Based on :
TOPOGRAPHY SURVEY OF PART OF LOTS 3&4 (NORTH OF BULLMAN STREET) AND PART OF LOTS 3 & 4 (SOUTH OF SCOTT STREET) REGISTERED PLAN 58 & PART OF LOTS 1290, 1292 & 1303 REGISTERED PLAN 157 CITY OF OTTAWA.
PREPARED BY FAIRHILL, MOFFATT & WOODLAND LIMITED, ONTARIO LAND SURVEYORS
JAN 21, 2020

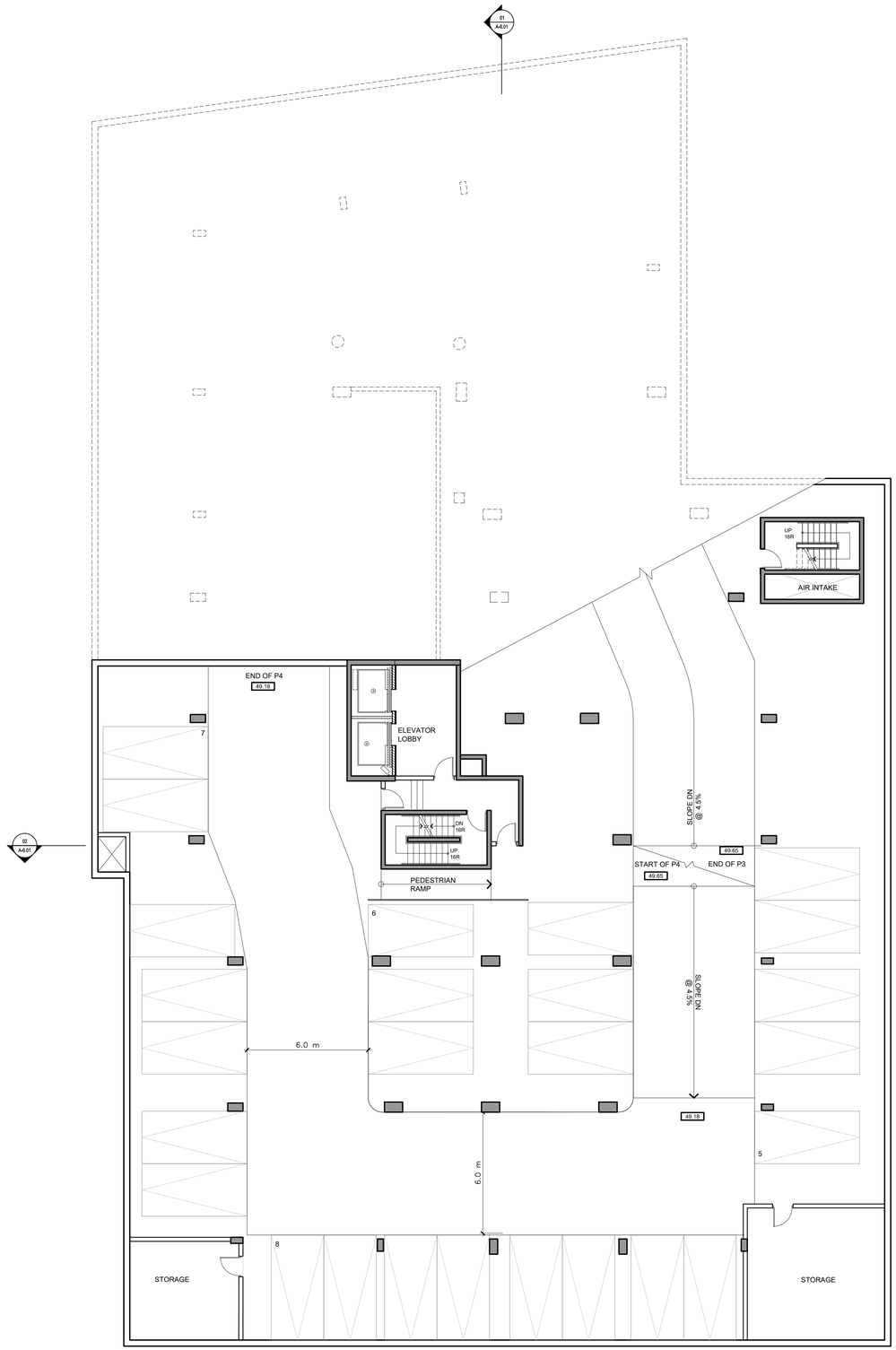
DRAWING TITLE:
P1 & P2 LEVEL PLAN

PRINT DATE: 2022-08-18

NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
MICHAEL COGAN
LICENCE
7264

PROJ. No.: 1085	CITY FILE #: D02-21-0148 CITY PLAN #: 18666
SCALE: 1:125	DWG NO. **A2.01**
DRAWN BY: MC	SPA AND ZBA



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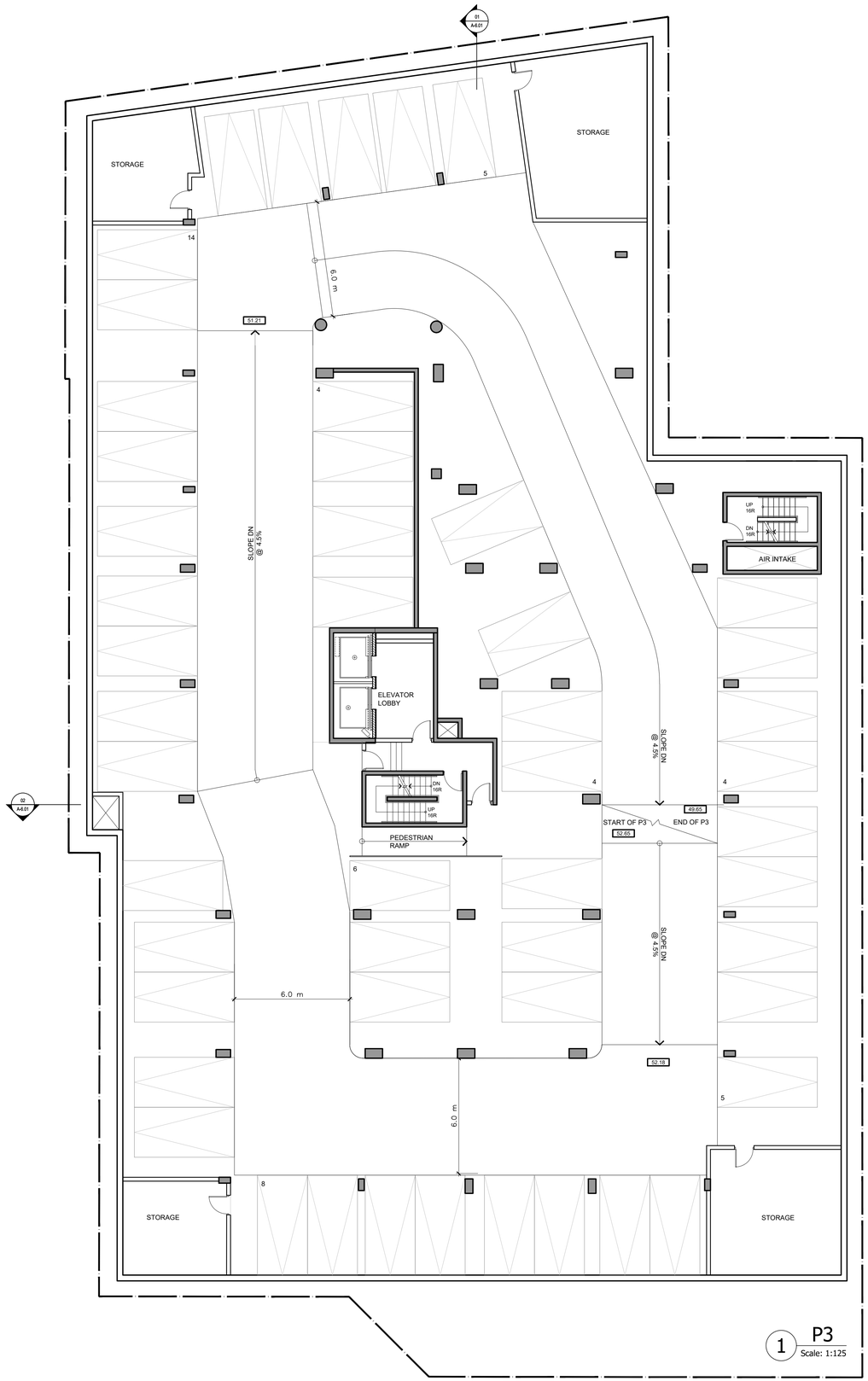

1 P3
Scale: 1:125

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RWDI
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Guelph, ON N1G 4P6
Tel: +1 519 823 1311

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600 Terry Fox Dr #100
Kanata, ON K2L 4B6
tel +1 613 591-2580

Building classification:
OBC 3.2.2.42, Group C, Any Height, Any Area, Sprinklered

DATE	No.	ISSUE
2022-08-18	02	SPA/ZBA
2021-11-24	01	SPA/ZBA

ARCHITECT:
TREGEBOV COGAN *ARCHITECT*
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PHONE: 647.352.3350

OWNER:
REID'S Heritage Properties

PROJECT NAME:
EVOKE
1546 SCOTT STREET OTTAWA,ON
Based on :
TOPOGRAPHY SURVEY OF PART OF LOTS 3&4 (NORTH OF BULLMAN STREET) AND PART OF LOTS 3 & 4 (SOUTH OF SCOTT STREET) REGISTERED PLAN 58 & PART OF LOTS 1290, 1292 & 1303 REGISTERED PLAN 157 CITY OF OTTAWA.
PREPARED BY FAIRHILL, MOFFATT & WOODLAND LIMITED, ONTARIO LAND SURVEYORS
JAN 21, 2020

DRAWING TITLE:
P3 & P4 LEVEL PLAN

PRINT DATE: 2022-08-18

ONTARIO ASSOCIATION OF ARCHITECTS
MICHAEL COGAN
LICENCE
7284

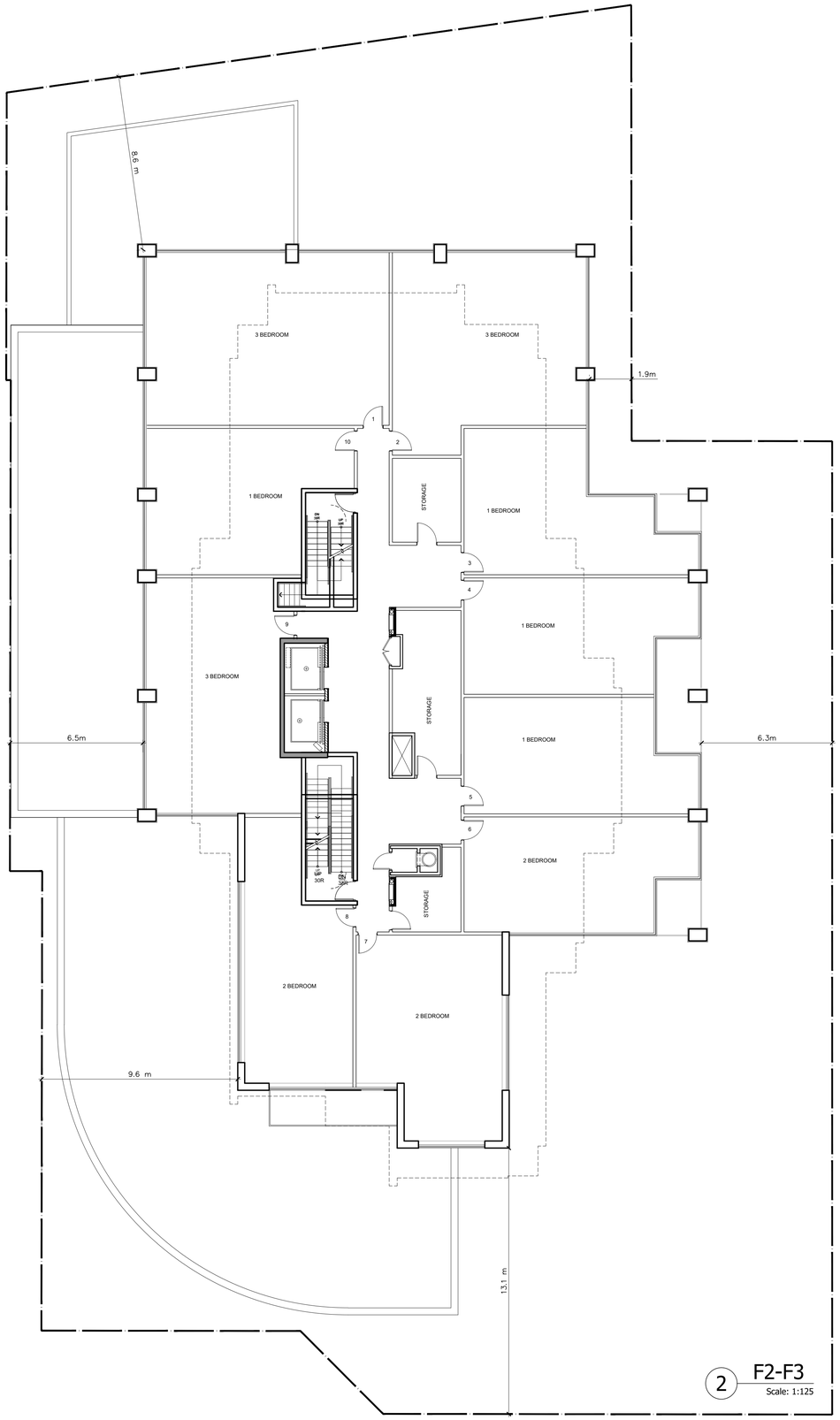
NORTH

PROJ. No.: 1085
CITY FILE #: D02-21-0148
CITY PLAN #: 18666

SCALE: 1:125

DRAWN BY: MC

DWG NO. **A2.02**
SPA AND ZBA



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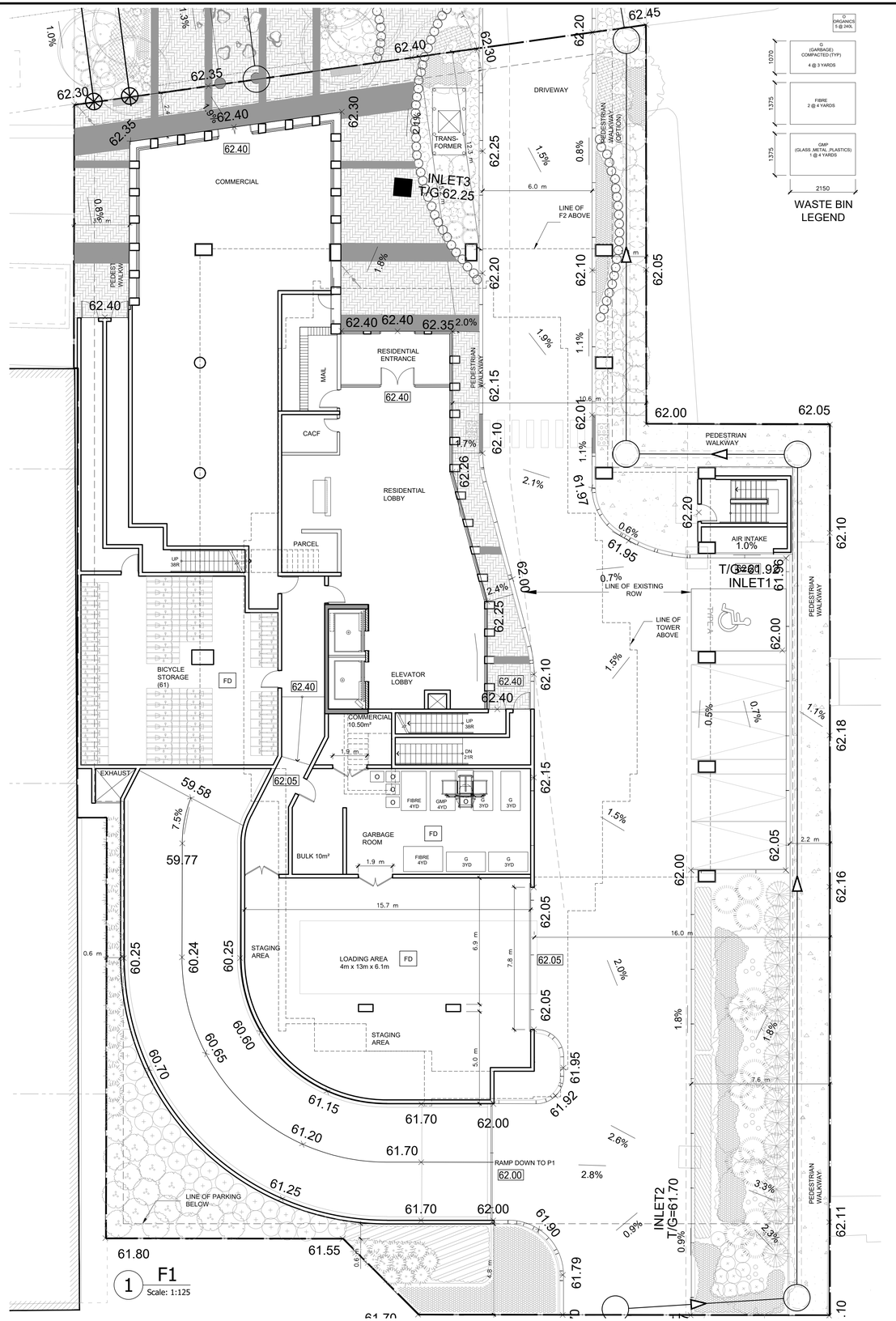
Scale: 1:125



1 F1
Scale: 1:125

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196 Britannia Road,
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WIND STUDY
RWDI
600 Southgate Drive,
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SURVEYOR
FAIRHALL, MOFFATT & WOODLAND LTD.
600 Terry Fox Dr #100
Kanata, ON K2L 4B6
tel +1 613 591-2580

Building classification:
OBC 3.2.2.42, Group C, Any Height, Any Area, Sprinklered

DATE	No.	ISSUE
2022-08-18	02	SPA/ZBA
2021-11-24	01	SPA/ZBA

ARCHITECT:
TREGEBOV COGAN *ARCHITECT*
40 St. Clair Avenue East, Suite 303
Toronto, ON M4T 1M9
PHONE: 647.352.3350

OWNER:
REID'S Heritage Properties

PROJECT NAME:
EVOKE

1546 SCOTT STREET OTTAWA,ON

Based on :
TOPOGRAPHY SURVEY OF PART OF LOTS 3&4 (NORTH OF BULLMAN STREET) AND PART OF LOTS 3 & 4 (SOUTH OF SCOTT STREET) REGISTERED PLAN 58 & PART OF LOTS 1290, 1292 & 1303 REGISTERED PLAN 157 CITY OF OTTAWA.
PREPARED BY FAIRHILL, MOFFATT & WOODLAND LIMITED, ONTARIO LAND SURVEYORS
JAN 21, 2020

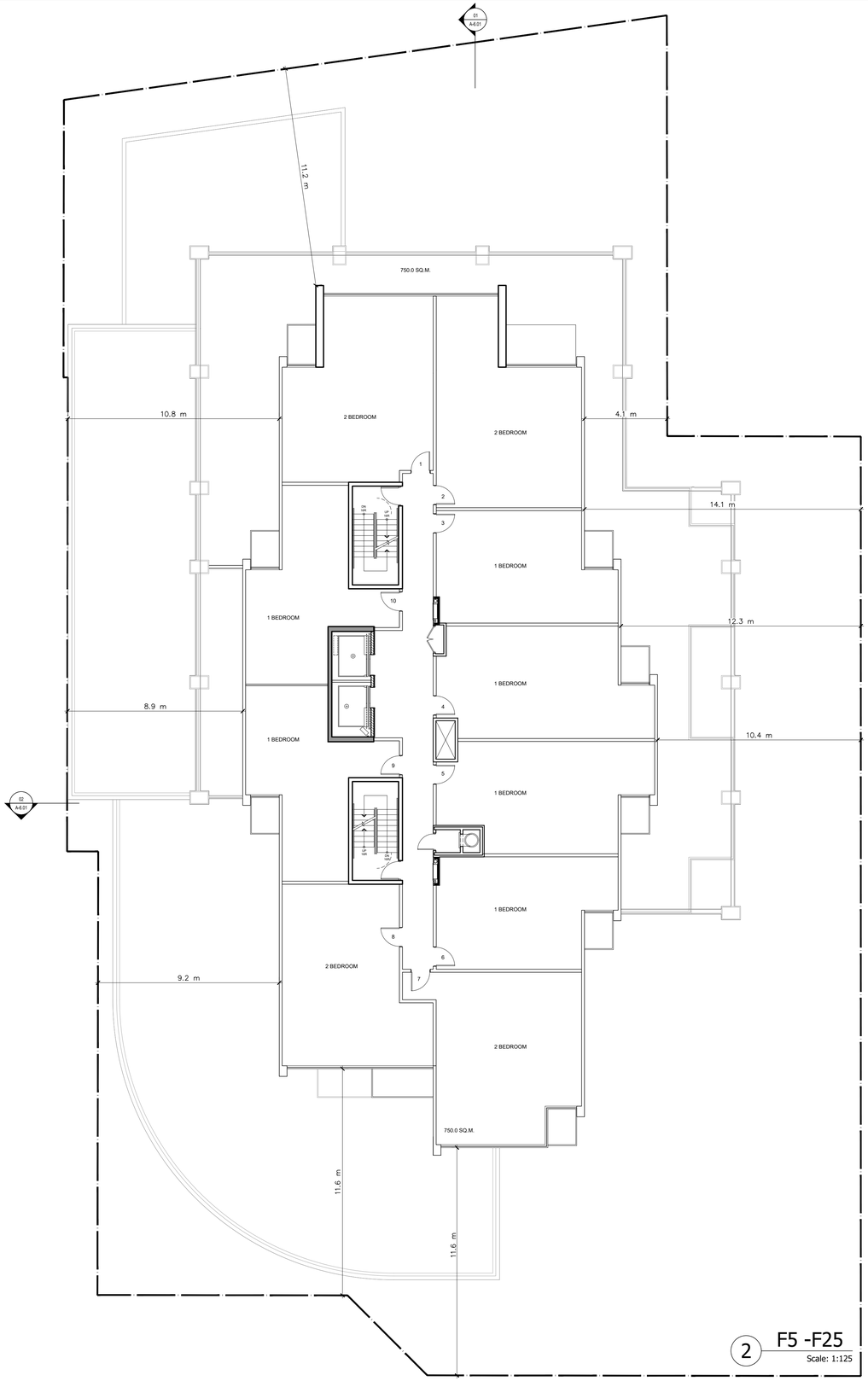
DRAWING TITLE:
F1 & F2-F3 LEVEL PLAN

PRINT DATE: 2022-08-18

NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
MICHAEL COGAN
LICENCE 7264

PROJ. No.: 1085
CITY FILE #: D02-21-0148
CITY PLAN #: 18666
SCALE: 1:125
DWG NO. **A2.03**
DRAWN BY: MC
SPA AND ZBA



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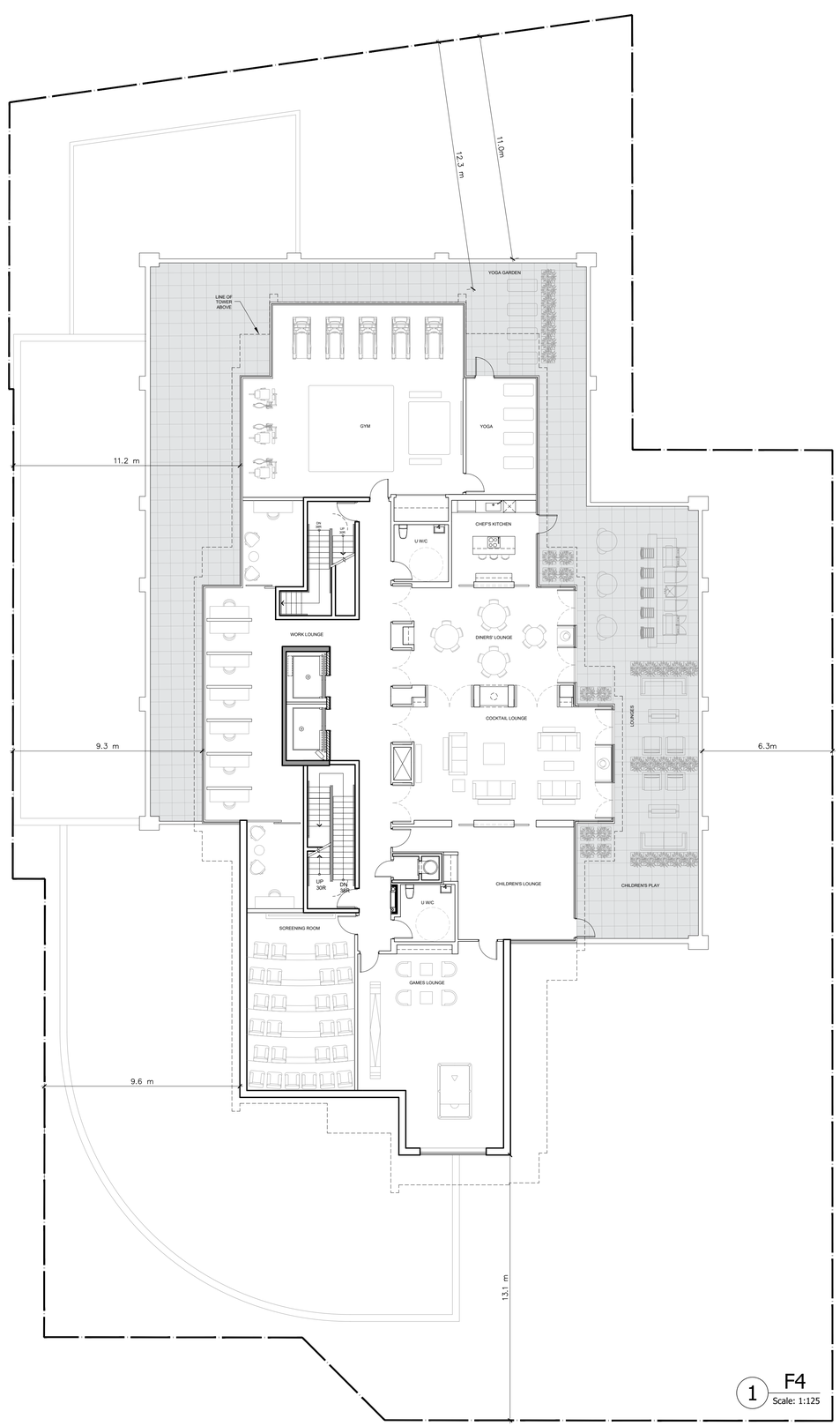

1 F4
Scale: 1:125

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650 Dalton Avenue
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SURVEYOR
FAIRHALL, MOFFATT & WOODLAND LTD.
600 Terry Fox Dr #100
Kanata, ON K2L 4B6
tel +1 613 591-2980

Building classification:
OBC 3.2.2.42, Group C, Any Height, Any Area, Sprinklered

DATE	No.	ISSUE
2022-08-18	02	SPA/ZBA
2021-11-24	01	SPA/ZBA

ARCHITECT:
TREGEBOV COGAN *ARCHITECT*
40 St. Clair Avenue East, Suite 303
Toronto, ON M4T 1M9
PHONE: 647.352.3350

OWNER:

REID'S Heritage Properties

PROJECT NAME:

EVOKE

1546 SCOTT STREET OTTAWA,ON

Based on :
TOPOGRAPHY SURVEY OF PART OF LOTS 3&4 (NORTH OF BULLMAN STREET) AND PART OF LOTS 3 & 4 (SOUTH OF SCOTT STREET) REGISTERED PLAN 58 & PART OF LOTS 1290, 1292 & 1303 REGISTERED PLAN 157 CITY OF OTTAWA.
PREPARED BY FAIRHILL, MOFFATT & WOODLAND LIMITED, ONTARIO LAND SURVEYORS
JAN 21, 2020

DRAWING TITLE:
F4 & F3-F25 LEVEL PLAN

PRINT DATE: 2022-08-18

NORTH

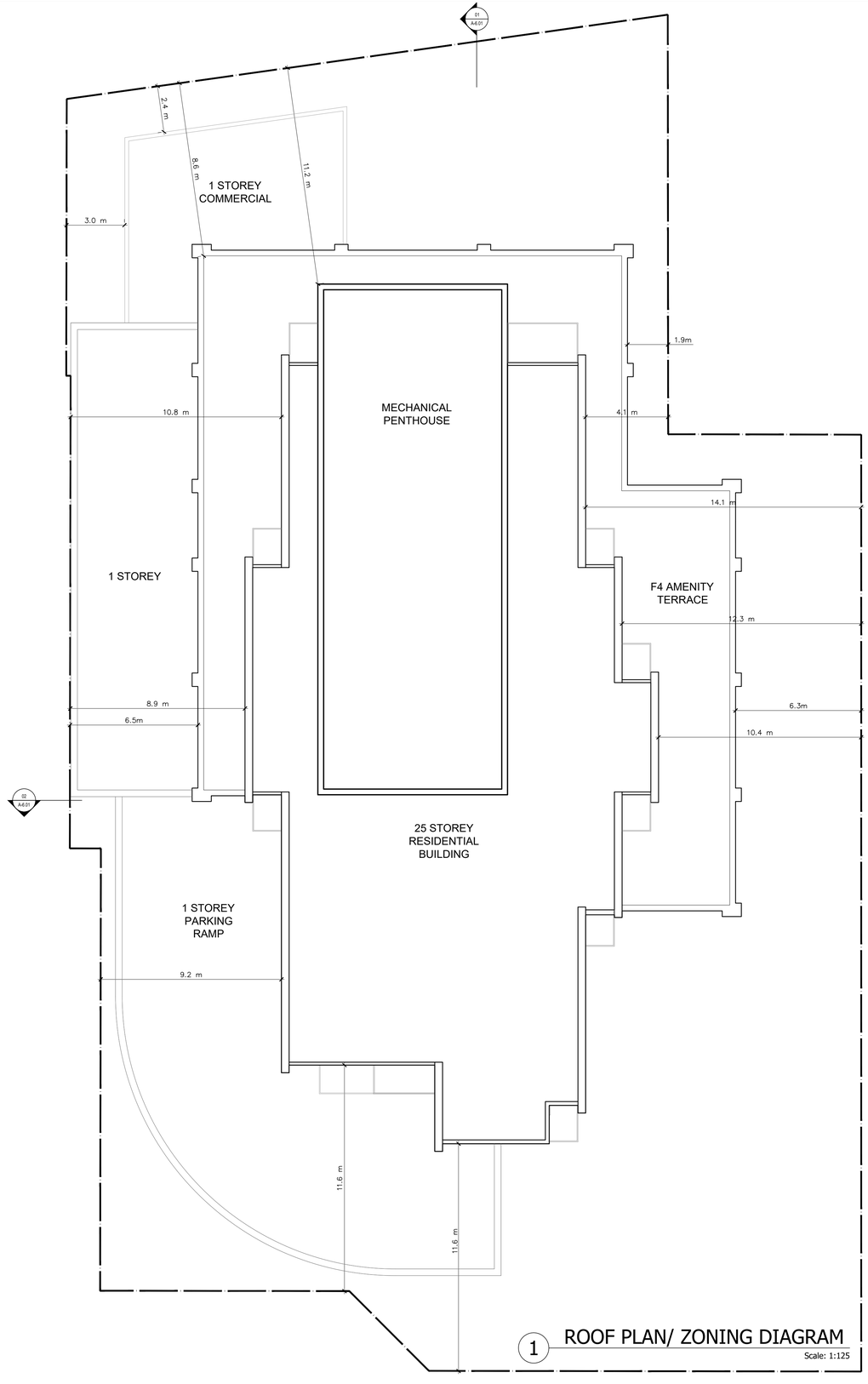
ONTARIO ASSOCIATION OF ARCHITECTS
MICHAEL COGAN
LICENCE
7264

PROJ. No.: 1085
CITY FILE #: D02-21-0148
CITY PLAN #: 18666

SCALE: 1:125

DRAWN BY: MC

DWG NO. **A2.04**
SPA AND ZBA



1 ROOF PLAN/ ZONING DIAGRAM

Scale: 1:125

CONSULTANTS:

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600 Terry Fox Dr #100
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Building classification:
OBC 3.2.2.42, Group C, Any Height, Any Area, Sprinklered

DATE	No.	ISSUE
2022-08-18	02	SPA/ZBA
2021-11-24	01	SPA/ZBA

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PHONE: 647.352.3350

OWNER:

REID'S Heritage Properties

PROJECT NAME:

EVOKE

1546 SCOTT STREET OTTAWA,ON

Based on :
TOPOGRAPHY SURVEY OF PART OF LOTS 3&4 (NORTH OF BULLMAN STREET) AND PART OF LOTS 3 & 4 (SOUTH OF SCOTT STREET) REGISTERED PLAN 58 & PART OF LOTS 1290, 1292 & 1303 REGISTERED PLAN 157 CITY OF OTTAWA.
PREPARED BY FAIRHILL, MOFFATT & WOODLAND LIMITED, ONTARIO LAND SURVEYORS
JAN 21, 2020

DRAWING TITLE:
ROOF PLAN/ ZONING SETBACK DIAGRAM

PRINT DATE: 2022-08-18

NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
MICHAEL COGAN
LICENCE
7264

PROJ. No.: 1085

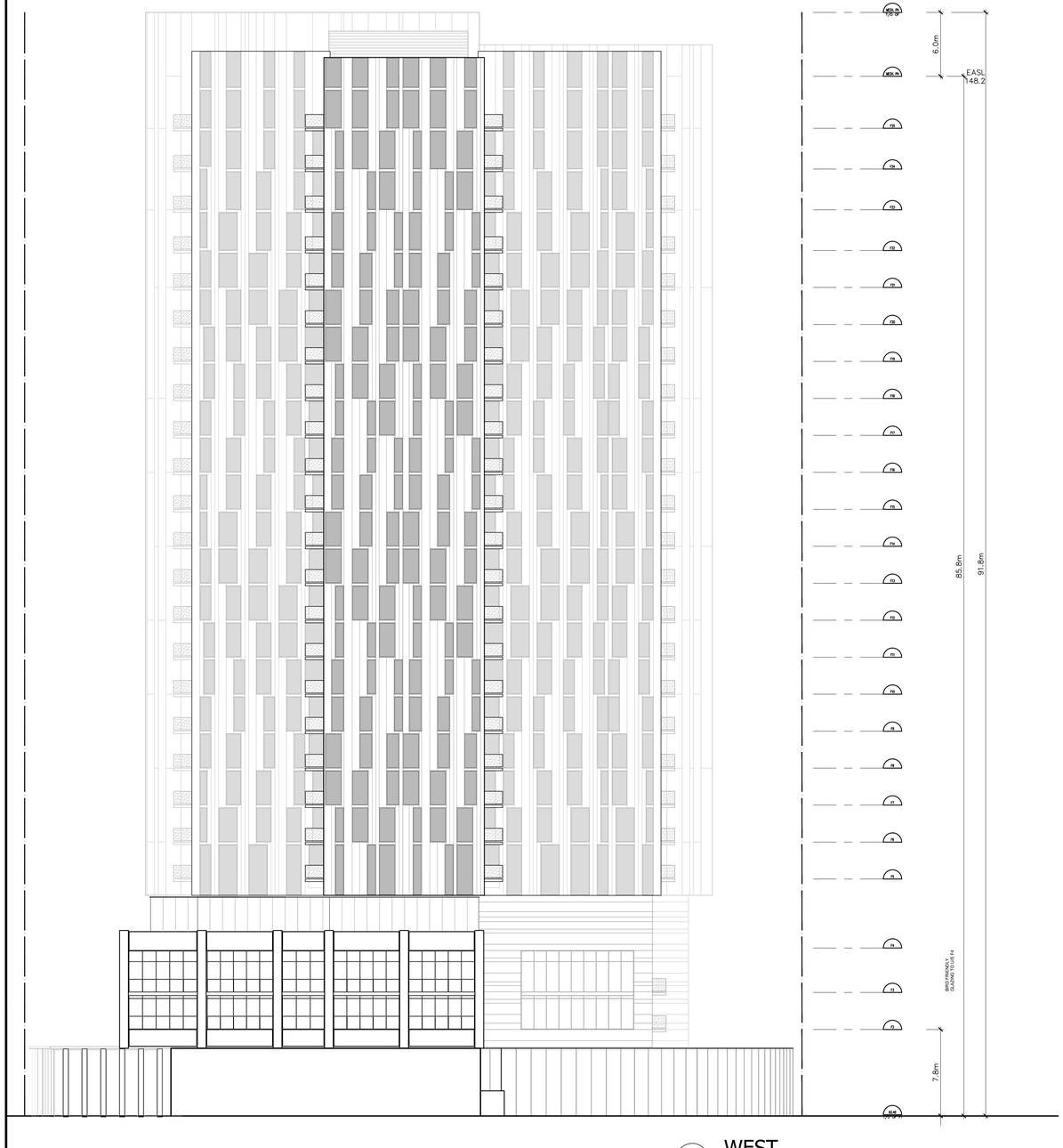
CITY FILE #: D02-21-0148
CITY PLAN #: 18666

SCALE: 1:125

DWG NO. **A2.05**

DRAWN BY: MC

SPA AND ZBA



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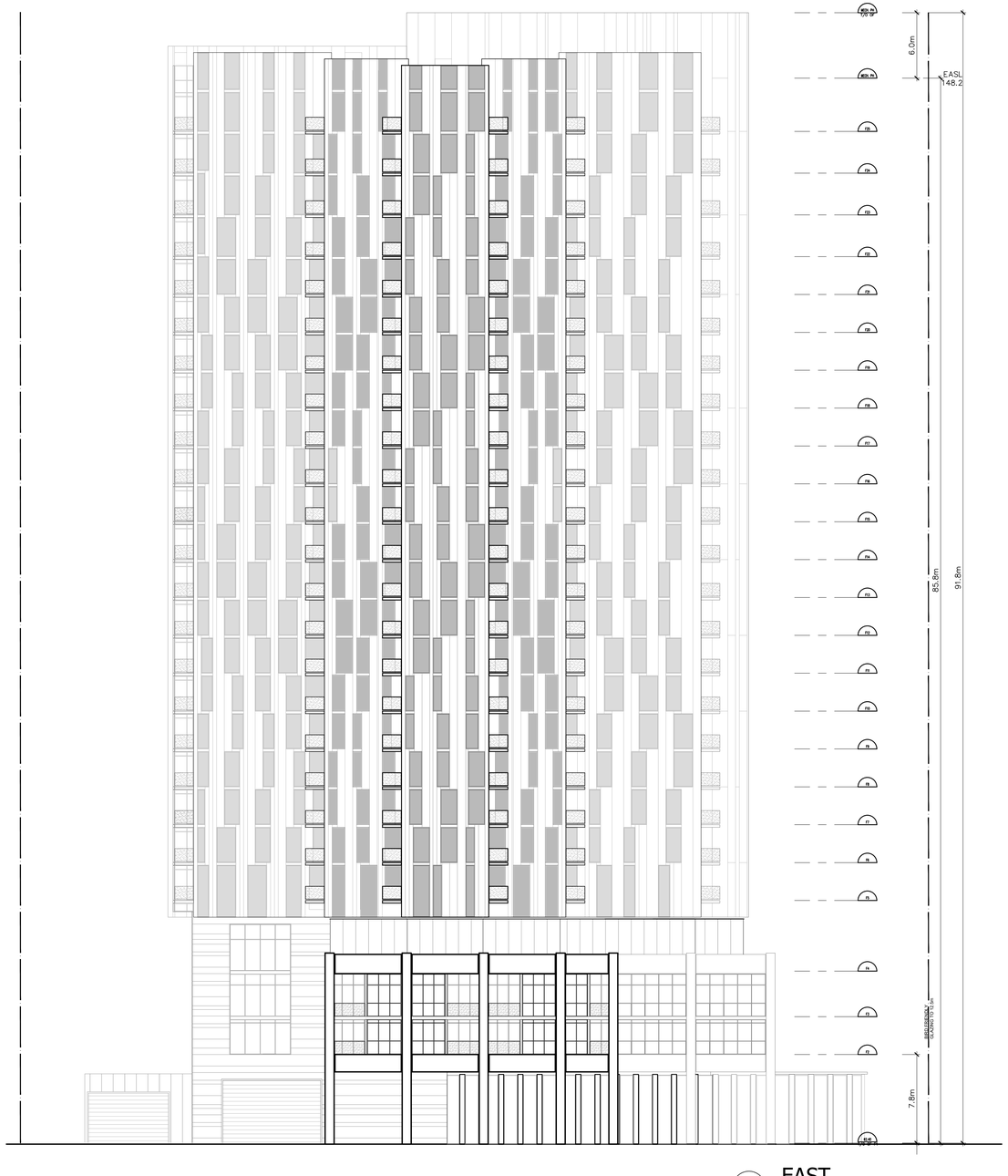

1 EAST

CONSULTANTS:

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Guelph, ON N1G 4P6
Tel: +1 519 823 1311

SURVEYOR
FAIRHALL, MOFFATT & WOODLAND LTD.
600 Terry Fox Dr #100
Kanata, ON K2L 4B6
tel +1 613 591-2580

LEGEND
BIRD FRIENDLY GLAZING EXTENDS TO t/o F3: VISUAL MARKERS
5mm Ø, 5cm APART.

Building classification:
OBC 3.2.2.42, Group C, Any Height, Any Area, Sprinklered

DATE	No.	ISSUE
2022-08-18	02	SPA/ZBA
2021-11-24	01	SPA/ZBA

ARCHITECT:
TREGEBOV COGAN *ARCHITECT*
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PHONE: 647.352.3350

OWNER:
REID'S Heritage Properties

PROJECT NAME:
EVOKE

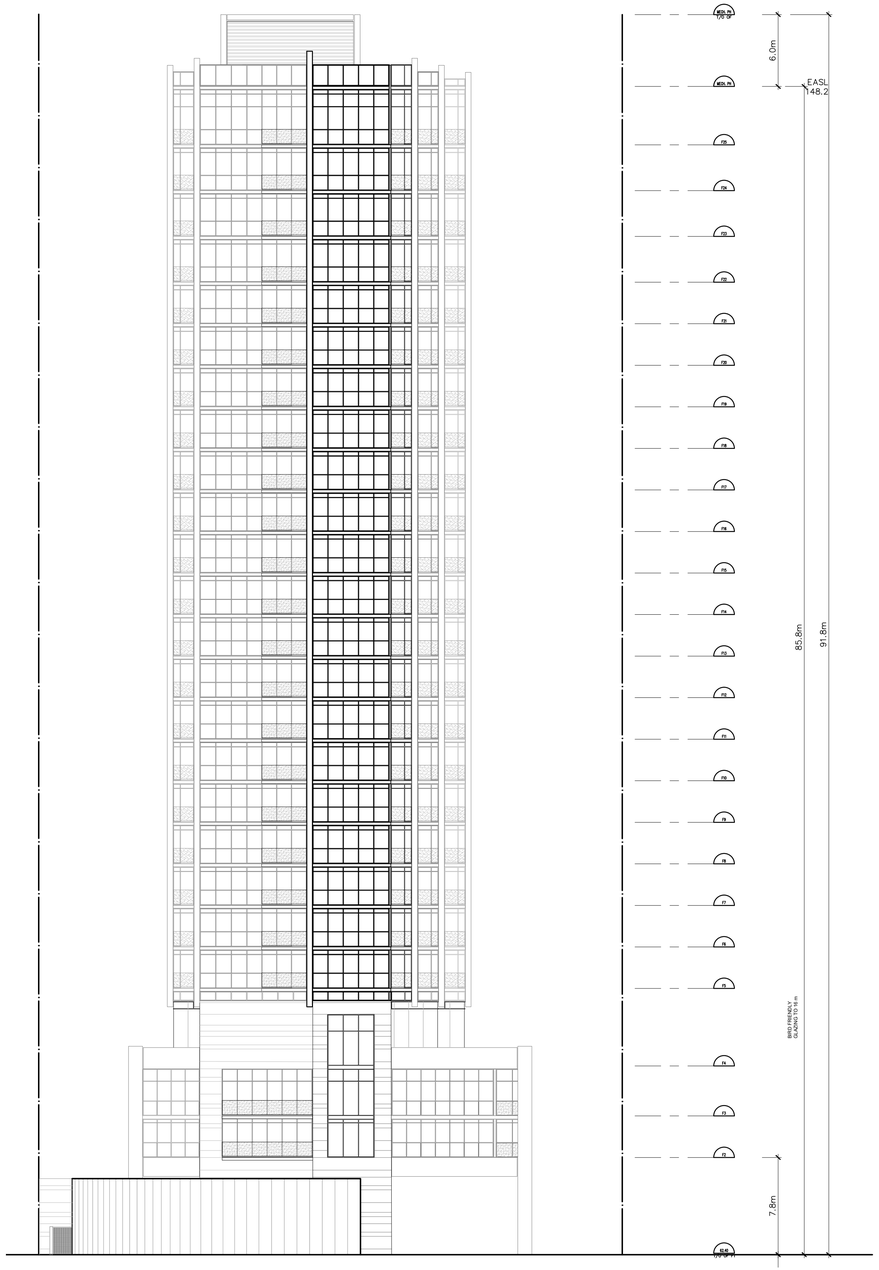
1546 SCOTT STREET OTTAWA,ON
Based on :
TOPOGRAPHY SURVEY OF PART OF LOTS 3&4 (NORTH OF BULLMAN STREET) AND PART OF LOTS 3 & 4 (SOUTH OF SCOTT STREET) REGISTERED PLAN 58 & PART OF LOTS 1290, 1292 & 1303 REGISTERED PLAN 157 CITY OF OTTAWA.
PREPARED BY FAIRHILL, MOFFATT & WOODLAND LIMITED, ONTARIO LAND SURVEYORS
JAN 21, 2020

DRAWING TITLE:
EAST AND WEST ELEVATIONS

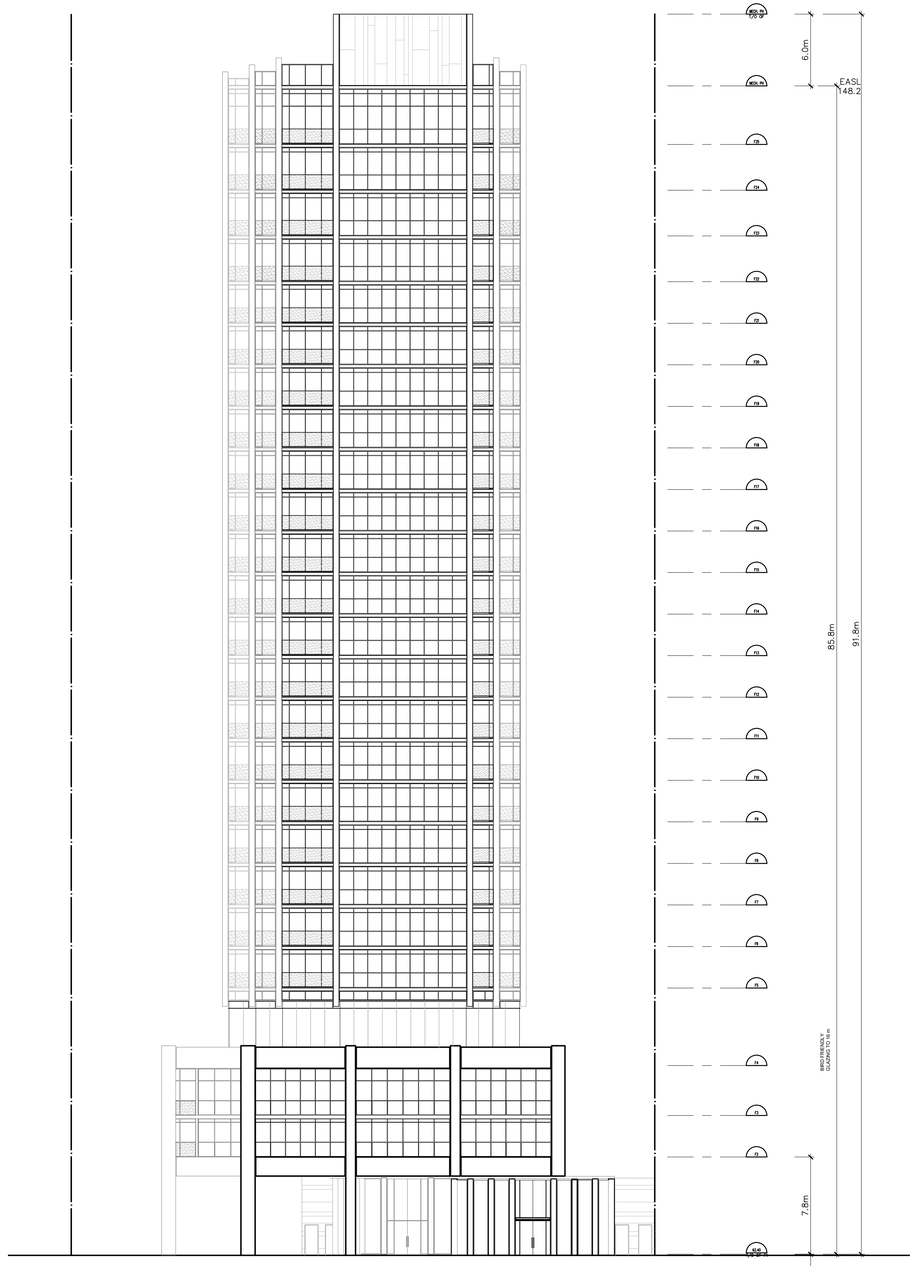
PRINT DATE: 2022-08-18

ONTARIO ASSOCIATION OF ARCHITECTS
MICHAEL COGAN
LICENCE
7284

PROJ. No.: 1085
CITY FILE #: D02-21-0148
CITY PLAN #: 18666
SCALE: 1:200
DRAWN BY: MC
DWG NO. **A5.01**
SPA AND ZBA



2 SOUTH



1 NORTH

CONSULTANTS:

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SURVEYOR
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600 Terry Fox Dr #100
Kanata, ON K2L 4B6
tel +1 613 591-2580

LEGEND
BIRD FRIENDLY GLAZING EXTENDS TO t/o F3: VISUAL MARKERS
5mm Ø, 5cm APART.

Building classification:
OBC 3.2.2.42, Group C, Any Height, Any Area, Sprinklered

DATE	No.	ISSUE
2022-08-18	02	SPA/ZBA
2021-11-24	01	SPA/ZBA

ARCHITECT:
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PHONE: 647.352.3350

OWNER:
REID'S Heritage Properties

PROJECT NAME:
EVOKE

1546 SCOTT STREET OTTAWA,ON
Based on :
TOPOGRAPHY SURVEY OF PART OF LOTS 3&4 (NORTH OF BULLMAN STREET) AND PART OF LOTS 3 & 4 (SOUTH OF SCOTT STREET) REGISTERED PLAN 58 & PART OF LOTS 1290, 1292 & 1303 REGISTERED PLAN 157 CITY OF OTTAWA.
PREPARED BY FAIRHILL, MOFFATT & WOODLAND LIMITED, ONTARIO LAND SURVEYORS
JAN 21, 2020

DRAWING TITLE:
NORTH AND SOUTH ELEVATIONS

PRINT DATE: 2022-08-18

ONTARIO ASSOCIATION OF ARCHITECTS
MICHAEL COGAN
LICENCE
7264

PROJ. No.: 1085	CITY FILE #: D02-21-0148 CITY PLAN #: 18666
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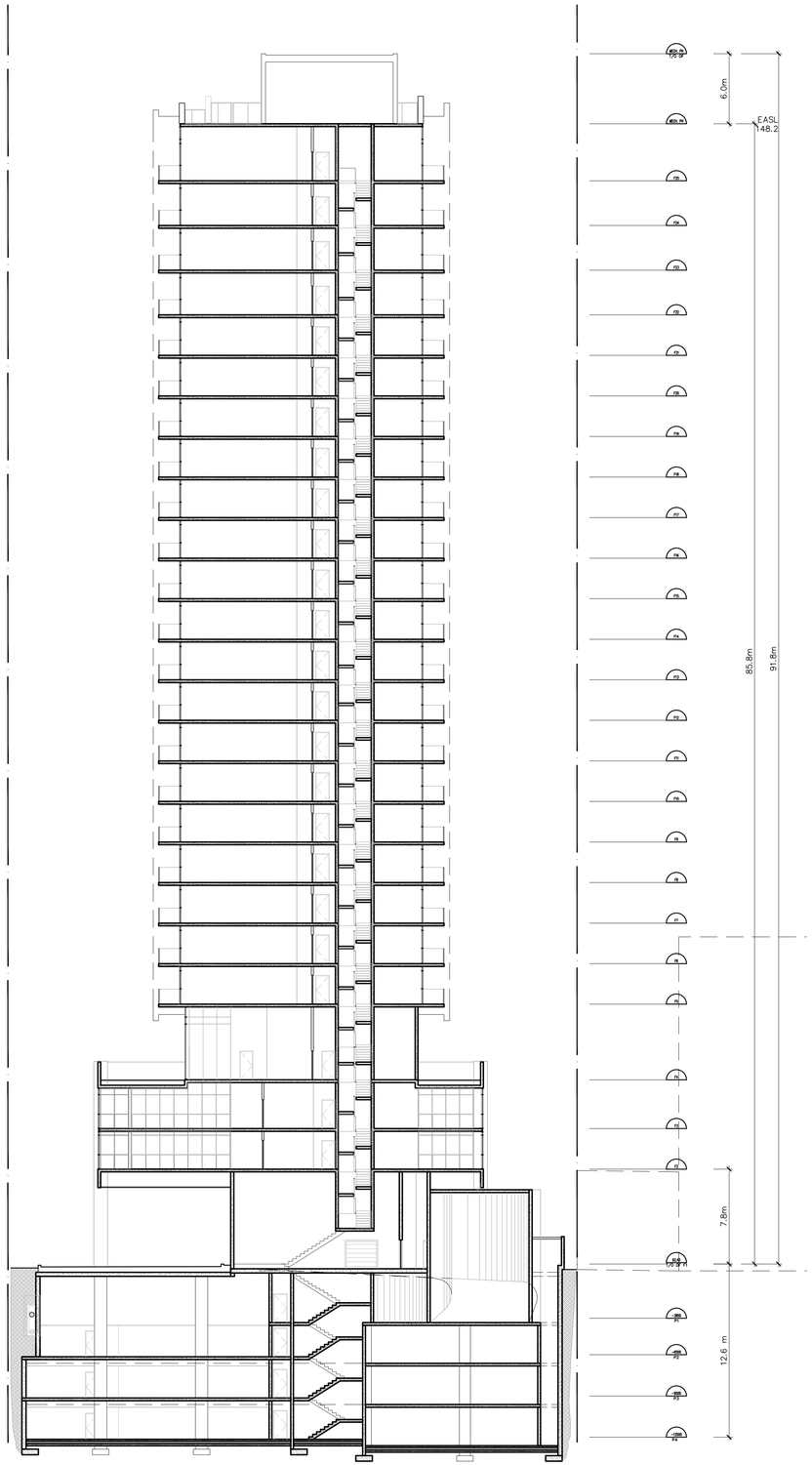
DRAWN BY: MC	SPA AND ZBA



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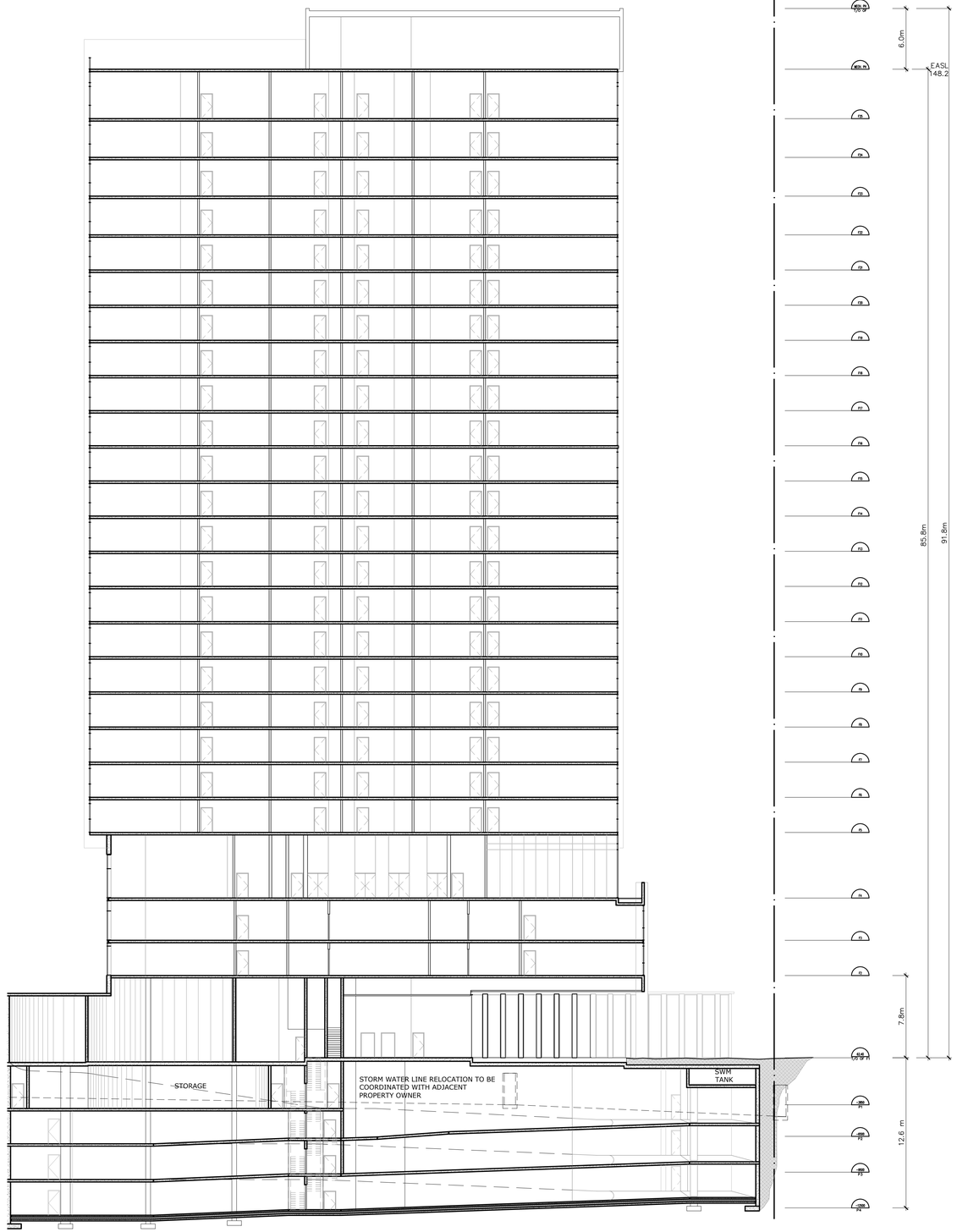

1 SECTION '1'
Scale: 1:200

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SURVEYOR
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tel +1 613 591-2580

Building classification:
OBC 3.2.2.42, Group C, Any Height, Any Area, Sprinklered

DATE	No.	ISSUE
2022-08-18	02	SPA/ZBA
2021-11-24	01	SPA/ZBA

ARCHITECT:
TREGEBOV COGAN *ARCHITECT*
40 St. Clair Avenue East, Suite 303
Toronto, ON M4T 1M9
PHONE: 647.352.3350

OWNER:
REID'S Heritage Properties

PROJECT NAME:
EVOKE

1546 SCOTT STREET OTTAWA,ON

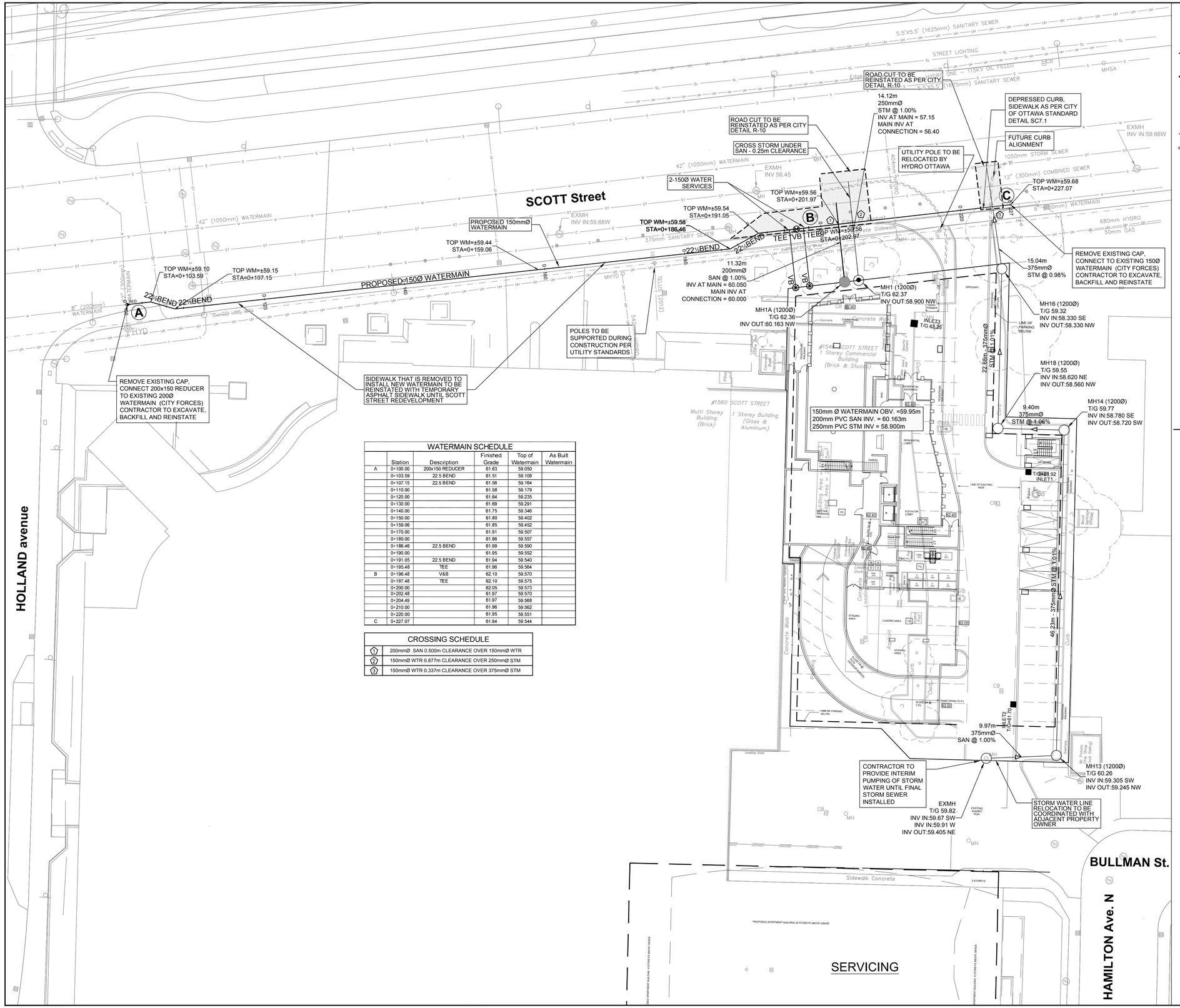
Based on :
TOPOGRAPHY SURVEY OF PART OF LOTS 3&4 (NORTH OF BULLMAN STREET) AND PART OF LOTS 3 & 4 (SOUTH OF SCOTT STREET) REGISTERED PLAN 58 & PART OF LOTS 1290, 1292 & 1303 REGISTERED PLAN 157 CITY OF OTTAWA.
PREPARED BY FAIRHILL, MOFFATT & WOODLAND LIMITED, ONTARIO LAND SURVEYORS
JAN 21, 2020

DRAWING TITLE:
SECTION A AND C

PRINT DATE: 2022-08-18

ONTARIO ASSOCIATION OF ARCHITECTS
MICHAEL COGAN
LICENCE
7254

PROJ. No.: 1085
CITY FILE #: D02-21-0148
CITY PLAN #: 18666
SCALE: 1:200
DWG NO. **A6.01**
DRAWN BY: MC
SPA AND ZBA



WATERMAIN SCHEDULE

	Station	Description	Finished Grade	Top of Watermain	As Built Watermain
A	0+100.00	200x150 REDUCER	61.63	59.050	
	0+103.59	22.5 BEND	61.51	59.108	
	0+107.15	22.5 BEND	61.56	59.164	
	0+110.00		61.58	59.179	
	0+120.00		61.64	59.235	
	0+130.00		61.69	59.291	
	0+140.00		61.75	59.346	
	0+150.00		61.80	59.402	
	0+159.06		61.85	59.452	
	0+170.00		61.91	59.507	
	0+180.00		61.96	59.557	
	0+186.46	22.5 BEND	61.99	59.590	
	0+190.00		61.95	59.552	
	0+191.05	22.5 BEND	61.94	59.540	
	0+195.48	TEE	61.96	59.564	
B	0+196.48	VAB	62.10	59.570	
	0+197.48	TEE	62.10	59.575	
	0+200.00		62.05	59.573	
	0+202.48		61.97	59.570	
	0+204.49		61.97	59.568	
	0+210.00		61.96	59.562	
	0+220.00		61.95	59.551	
C	0+227.07		61.94	59.544	

CROSSING SCHEDULE

1	200mmØ SAN 0.500m CLEARANCE OVER 150mmØ WTR
2	150mmØ WTR 0.877m CLEARANCE OVER 250mmØ STM
3	150mmØ WTR 0.337m CLEARANCE OVER 375mmØ STM

LEGEND

- PROPERTY LINE
- F.F.= 80.50 FINISHED FLOOR ELEVATION
- DEPRESSED CURB
- WATER METER (SEE MECH. DRWG. FOR EXACT LOCATION)
- REMOTE WATER METER (SEE MECH. DRWG. FOR EXACT LOCATION)
- SIAMESE CONNECTIONS (SEE MECH. DRWG. FOR EXACT LOCATION)
- GAS SERVICE
- RETAINING WALL C/W TOP OF WALL AND GRASS GRADE
- V&VB VALVE AND VALVE BOX
- V&VC VALVE AND VALVE CHAMBER
- 150Ø WATERMAIN WATER SERVICE
- 200Ø SAN SANITARY SEWER SERVICE
- 250Ø STM STORM SEWER SERVICE
- EXISTING CURB
- CB EXISTING CATCHBASIN
- WV EXISTING WATER VALVE
- LS EXISTING LAMP STANDARD
- UP EXISTING UTILITY POLE
- FH EXISTING FIRE HYDRANT
- MH EXISTING MANHOLE
- EXISTING SIGN
- BL EXISTING BOLLARDS
- EXISTING DECIDUOUS TREE
- S EXISTING SANITARY SEWER
- ST EXISTING STORM SEWER
- W EXISTING WATERMAIN
- G EXISTING GAS LINE
- UH EXISTING HYDRO EXISTING
- EXISTING OVERHEAD UTILITY WIRES
- C EXISTING COMBINED SEWER
- SL EXISTING STREET LIGHTING

NOTES:

1. ALL WORKS TO BE COMPLETED AS PER CURRENT CITY OF OTTAWA STANDARDS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS.

2. SEWER LATERALS TO BE PVC DR 35.

3. WATER MAIN AND SERVICES TO BE PVC. DR 18 CL150. MINIMUM COVER OF 2.4m FOR WATER SERVICE IS REQUIRED. USE THERMAL INSULATION AS PER CITY STANDARDS WHEN COVER IS LESS THAN 2.4m. WATER MAIN AND SERVICES TO HAVE RESTRAINTS AND THRUST BLOCKS AS PER CITY STD W23. W25.5 AND W25.6. NEW WATER MAIN TO HAVE TRACING WIRE PER STD W36

4. ALL SERVICE LATERAL AND SURFACE RESTORATION WORK IN ACCORDANCE WITH CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.

5. FULL PORT BACKWATER VALVE IS REQUIRED ON BOTH THE SANITARY AND STORM SERVICE CONNECTIONS.

6. WATER SERVICE CHLORINATION AND TESTING TO BE COMPLETED BY CITY FORCES.

7. BUILDING INFORMATION TAKEN FROM TREGEBOV COGAN ARCHITECTS DRAWINGS.

8. AN EROSION AND SEDIMENTATION CONTROL PLAN WILL BE IMPLEMENTED ON THIS SITE. AS A MINIMUM THAT PLAN WILL INCLUDE A LIGHT DUTY SILT FENCE BARRIER TO OPSD STANDARD 219.110 SURROUNDING THE SITE WHERE PRACTICAL AND SILT SACKS FITTED UNDER EXISTING STREET CATCH BASINS.

9. ALL SHOWN UTILITIES ARE APPROXIMATE AND ARE TO BE FIELD VERIFIED BY CONTRACTOR, ANY DISCREPANCIES ARE TO BE REPORTED TO IBI GROUP PRIOR TO CONTRACTOR MOBILIZING TO SITE.

10. CONTRACTOR RESPONSIBLE TO SUPPORT EXISTING UTILITIES THAT MAY BE AFFECTED DURING CONSTRUCTION

11. EXISTING CURBS AND SIDEWALKS ARE TO BE REMOVED AND REPLACED AS NOTED ON THE DRAWINGS.

12. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATER COURSE, DURING CONSTRUCTION ACTIVITIES. THIS INCLUDES LIMITING THE AMOUNT OF EXPOSED SOIL, USING FILTER CLOTH UNDER THE GRATES OF CATCHBASINS AND MANHOLES AND INSTALLING SILT FENCES AND EFFECTIVE SEDIMENT TRAPS. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCIES.

13. FOR GEOTECHNICAL INFORMATION SEE REPORT 47-CEI-R1BY YURI MENDEZ ENGINEERING.

15. CLAY SEAL TO BE INSTALLED IN SERVICE TRENCHES BETWEEN CONNECTION POINT AND CAP.

CLIENT
Reid's Heritage Properties
REID'S Heritage Properties
1515 Gordon Street, Suite 203 , Guelph, ON. N1L 1C9

IBI Group Professional Services (Canada) Inc.
is a member of the IBI Group of companies

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR SPA	2021-11-24
2	REVISED PER CITY COMMENTS	2022-07-05
2	REVISED PER NEW SITE PLAN	2022-08-05

NOT FOR CONSTRUCTION

SEE D10 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN


CONSULTANTS

1:250 0 2.5 7.5 12.5m

SEAL
LICENSED PROFESSIONAL ENGINEER L.D. 45. Yannoulopoulos 2022/08/05 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER S. E. LABADIE 100214983 2022/08/05 PROVINCE OF ONTARIO

IBI GROUP
Suite 400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 / 613 241 3300 fax 613 225 9868
ibigroup.com

PROJECT
EVOKE
1546 Scott Street, Ottawa

PROJECT NO: 132902

DRAWN BY:	CHECKED BY:
D.D.	J.B.
PROJECT MGR:	APPROVED BY:
D.G.Y.	J.B.

SHEET TITLE
GENERAL PLAN OF SERVICES

SHEET NUMBER	ISSUE
C-001	2

SCALE CHECK

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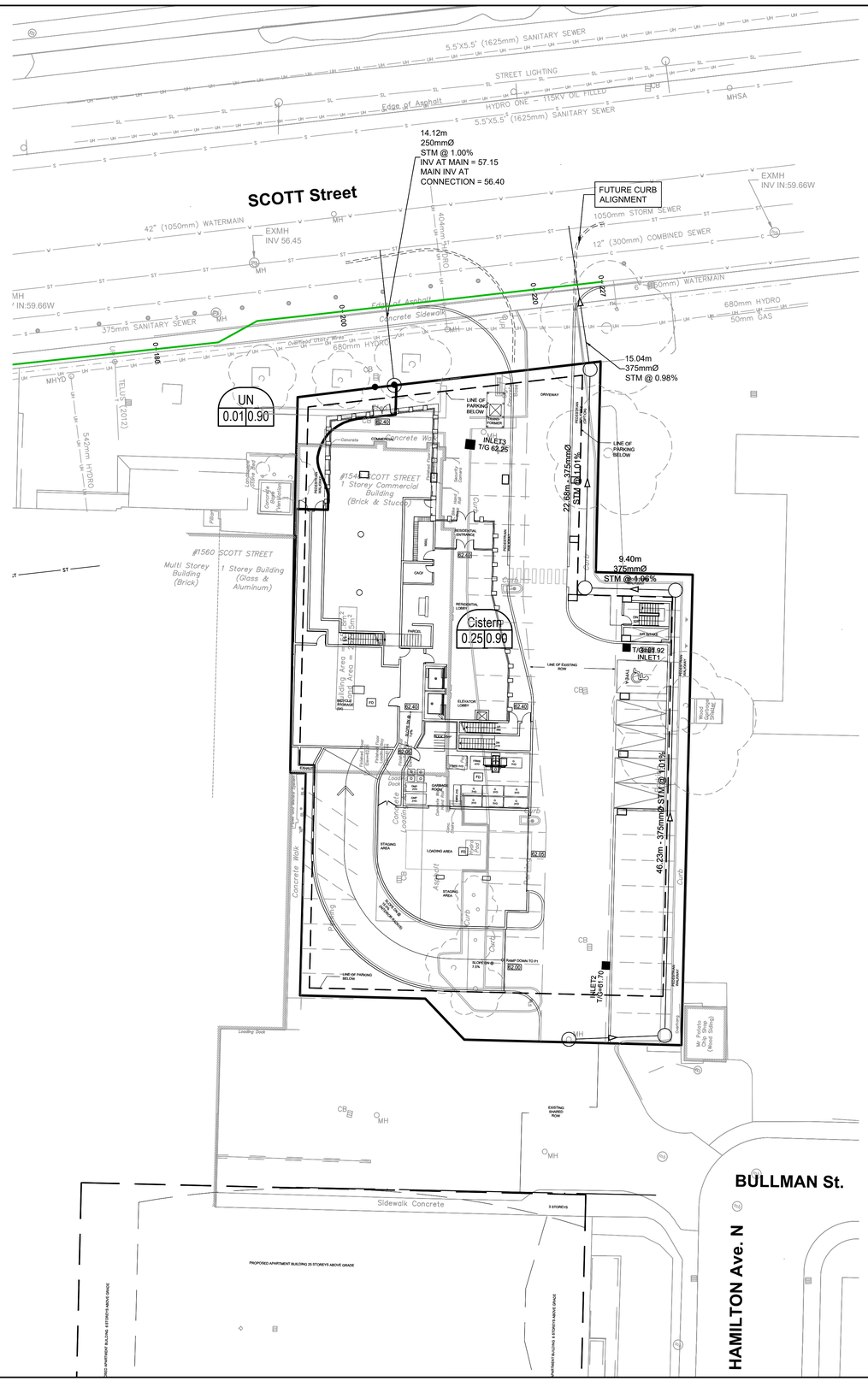
CITY FILE No. D02-02-21-0148

CITY PLAN No. 18666



CLIENT

REID'S
Heritage Properties

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR SPA	2021-11-24
2	REVISED PER CITY COMMENTS	2022-07-28
2	REVISED PER NEW SITE PLAN	2022-08-05

NOT FOR CONSTRUCTION

SEE C-010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN

CONSULTANTS

1:250 0 2.5 7.5 12.5m

SEAL

LICENCED PROFESSIONAL ENGINEER
L.D. G. Tannoulopoulos
2022/08/05
PROVINCE OF ONTARIO

LICENCED PROFESSIONAL ENGINEER
S. E. LABADIE
100214983
2022/08/05
PROVINCE OF ONTARIO

IBI GROUP
Suite 400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 / 613 241 3300 fax 613 225 9868
ibigroup.com

PROJECT

EVOKE

1546 Scott Street, Ottawa

PROJECT NO: 132902	
DRAWN BY: **D.D.**	CHECKED BY: **J.B.**
PROJECT MGR: **D.G.Y.**	APPROVED BY: **J.B.**

SHEET TITLE

STORM DRAINAGE AREA PLAN

SHEET NUMBER	ISSUE
C-500	2

SCALE CHECK

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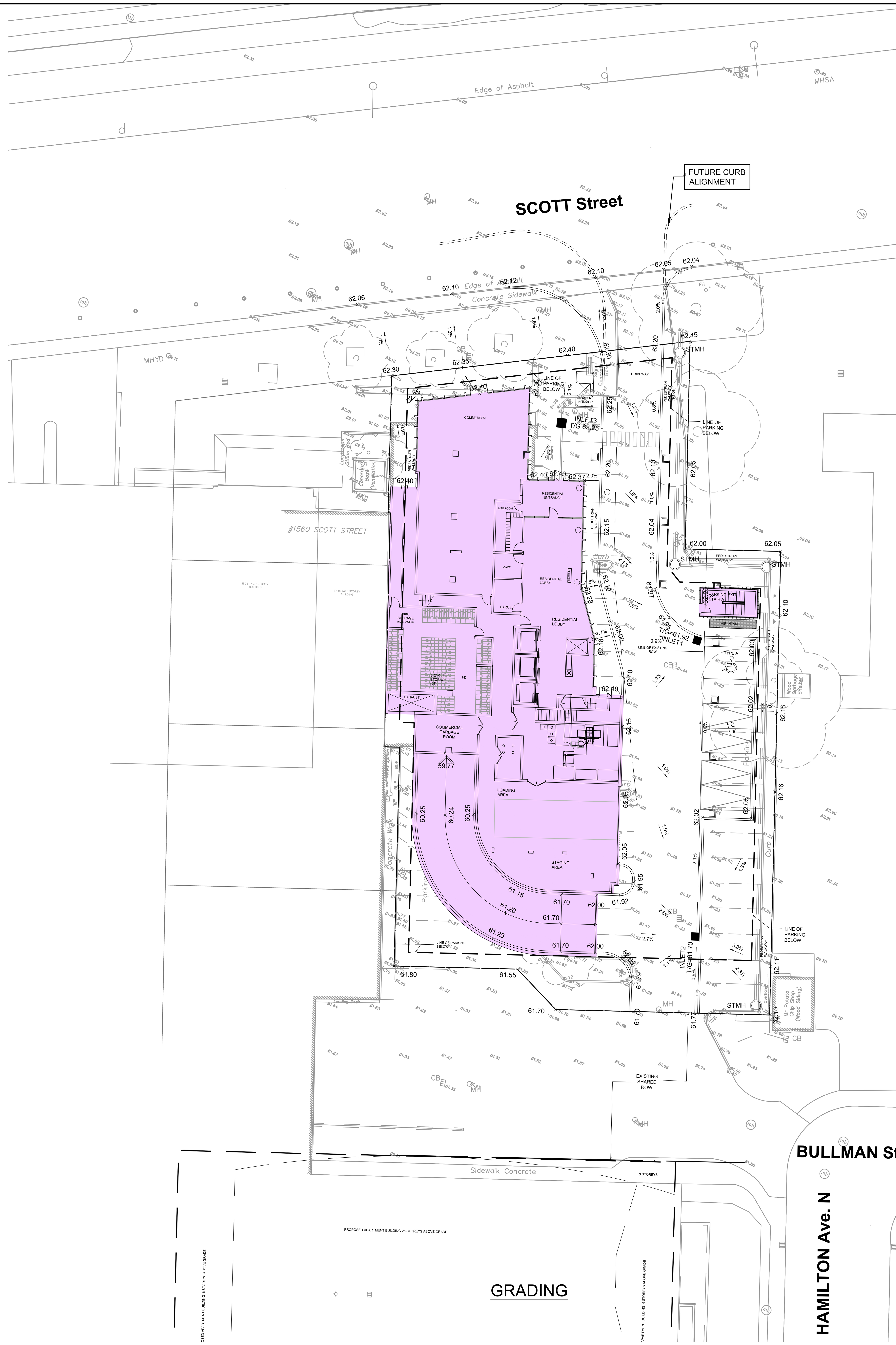
CITY FILE No. D02-02-21-0148

CITY PLAN No. 18666



LEGEND

	PROPERTY LINE
F.F.= 80.50	FINISHED FLOOR ELEVATION
	DEPRESSED CURB
M	WATER METER (SEE MECH. DRWG. FOR EXACT LOCATION)
RM	REMOTE WATER METER (SEE MECH. DRWG. FOR EXACT LOCATION)
	SIAMESE CONNECTIONS (SEE MECH. DRWG. FOR EXACT LOCATION)
105.30 T/W 103.50	RETAINING WALL C/W TOP OF WALL AND GRASS GRADE
	EXISTING CURB
CB	EXISTING CATCHBASIN
WV	EXISTING WATER VALVE
LS	EXISTING LAMP STANDARD
UP	EXISTING UTILITY POLE
FH	EXISTING FIRE HYDRANT
mh MH	EXISTING MANHOLE
	EXISTING SIGN
BL	EXISTING BOLLARDS
	EXISTING DECIDUOUS TREE
x62.04	EXISTING TOPO POINTS
	PROPOSED BUILDING

North

CLIENT

Reid's Heritage Properties

REID'S Heritage Properties

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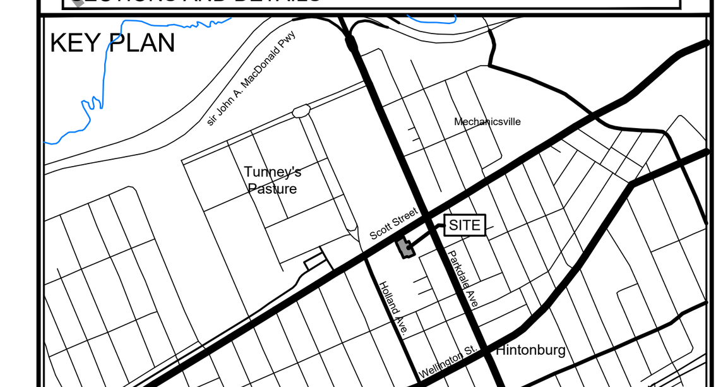
ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR SPA	2021-11-24
2	REVISED PER CITY COMMENTS	2022-07-06
3	REVISED PER NEW SITE PLAN	2022-08-05
4	REVISED PER CITY COMMENTS	2023-01-25

NOT FOR CONSTRUCTION

SEE 010 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN



CONSULTANTS

1:250 0 2.5 7.5 12.5m

SEAL

LICENSED PROFESSIONAL ENGINEER
D. G. Yannoulopoulos
2023/01/25
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
S. E. LABADIE
100214983
2023/01/25
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PROJECT

EVOKE

1546 Scott Street, Ottawa

PROJECT NO: 132902	
DRAWN BY: **D.D.**	CHECKED BY: **J.B.**
PROJECT MGR: **D.G.Y.**	APPROVED BY: **J.B.**

SHEET TITLE

GRADING PLAN

SHEET NUMBER	ISSUE
C-200	4

CITY PLAN No. 18873

SCALE CHECK 1 in 10mm

CITY FILE No. D07-12-21-0216

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HGC ENGINEERING

Howe Gastmeier Chapnik Limited
2000 Argentia Road, Plaza One, Suite 203
Mississauga, Ontario, Canada L5N 1P7
t: 905.826.4044

Noise Feasibility Study
Proposed Mixed-Use Development,
1546 Scott Street, Ottawa, Ontario

Prepared for:

Agile Response Consulting Limited (ARC)
on behalf of Reid's Heritage Properties
85 Bathurst Street, Unit D,
Waterloo, ON N2V 1Z5

Prepared by

Sheeba Paul, MEng, PEng

October 27, 2021

HGC Project No: 02100643

Table of Contents

1 Introduction and Summary

HGC Engineering was retained by ARC on behalf of Reid's Heritage Properties to conduct a noise feasibility study for a proposed mixed-use development located at 1546 Scott Street, Ottawa, Ontario. The subject site is located on the south side of Scott Street, east of Holland Avenue and west of Parkdale Avenue and north of Bullman Street. The analysis includes an assessment of the effect of traffic noise on the proposed development in accordance to the Ministry of the Environment, Conservation and Parks (MECP) and the City of Ottawa guidelines. The study is required by the City of Ottawa as part of the planning and approvals process.

The primary source of noise was determined to be road traffic on Scott Street. Secondary sources of noise include road traffic on Holland Avenue, Parkdale Avenue and traffic on the LRT line to the north. Road traffic data was obtained from the City of Ottawa personnel and from the City of Ottawa noise guidelines. These were used in conjunction with the site plan to predict future traffic sound levels at the proposed façades and in outdoor living areas. The predictions were evaluated with respect to the guidelines of MECP and the City of Ottawa, and were used to develop noise control recommendations.

The results of this study indicate that with suitable noise control measures integrated into the design of the proposed building, it is feasible to meet the MECP guideline sound levels. Central air conditioning is required for all dwelling units, and upgraded building constructions are required for the façade directly exposed to Scott Street. Noise warning clauses are also recommended to inform future occupants of the traffic noise impact, to address sound level excesses and to inform the future occupants of the neighbouring commercial/office uses.

A computer model of the area was created to predict the sound levels at the facades of the proposed building due to off-site stationary noise sources from existing commercial/office uses to the west and southwest. The results indicate that the sound emissions of the nearby stationary noise sources are expected to be within the MECP guideline sound levels during a worst case operational scenario. Noise mitigation for the existing stationary noise sources is not required due to high background sound levels from road traffic. Some administrative controls are recommended for the commercial/office building loading area.

Given the suspension of the operation of LRT trains on Line 1, ground-borne vibration at the site could not be verified at this time.

2 Site Description and Noise Sources

Figure 1 is a context plan indicating the location of the proposed site. The site is at the south side of Scott Street, east of Holland Ave and west of Parkdale Ave and north of Bullman Street, specifically at 1546 Scott Street. Figure 2 shows the Site Plan prepared by Tregebov Cogan Architecture dated April 20, 2021. The proposed development will include one 25-storey residential building, three levels of underground parking, a ground level commercial use, third floor amenity, with residential uses from levels 3 to 25 and a rooftop mechanical penthouse. Preliminary floor plans and elevations are included in Appendix D.

Surrounding Area

A site visit was conducted by HGC Engineering personnel on September 29, 2021. Site inspections and noise measurements of the rooftop equipment on the adjacent commercial/office buildings to the west of the subject site were conducted.

To the north of the site are existing office uses. A beer store is currently located on the site which will be removed. There are existing low rise residential dwellings to the west of Holland Avenue and east of Parkdale Avenue. There are also existing residences to the south of the commercial site, and east and west of Hamilton Avenue North. There is an existing 9-storey residential building to the south of the existing commercial buildings.

The primary source of traffic noise in the area is road traffic on Scott Street. Secondary sources of traffic noise include Parkdale Avenue and Holland Avenue. Highway 417 is approximately 800 m to the south, too far in distance to be considered in the analysis.

LRT

A light rail transit (LRT) line operated by OC Transpo is located on the north side of Scott Street. The LRT line terminates at Tunney's Pasture station located to the northwest of Holland Avenue and Scott Street. Line 1 service is suspended until further notice. The proposed residential building is located within 75 m of the LRT right of way. The City of Ottawa requested the assessment of

vibration due to the LRT in their proximity guidelines. HGC Engineering will continue to monitor the operation of the LRT on this line. A separate memo will be prepared related to ground-borne vibration, as necessary.

3 Noise Level Criteria

Guidelines for acceptable levels of traffic noise impacting residential developments are given in the MECP publication NPC-300, "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", release date October 21, 2013, and are listed in Table I below. The study also follows the City of Ottawa "Environmental Noise Control Guidelines" dated January 2016. The City of Ottawa *Confederation Line Proximity Study* Guidelines were also reviewd. The values in Table I are energy equivalent (average) sound levels [L_{EQ}] in units of A-weighted decibels [dBA].

Table I: MECP Road Traffic Noise Criteria (dBA)

Area	Daytime L_{EQ} (16 hour) Road	Nighttime L_{EQ}(8 hour) Road
Outdoor Living Area	55 dBA	--
Inside Living/Dining Rooms	45 dBA	45 dBA
Inside Bedrooms	45 dBA	40 dBA

Daytime refers to the period between 07:00 and 23:00. Nighttime refers to the time period between 23:00 and 07:00. The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace, or other area where passive recreation is expected to occur. Small balconies are not considered OLAs for the purposes of assessment. Terraces greater than 4 m in depth (measured perpendicular to the building façade) are considered to be OLAs.

The guidelines in the MECP publication allow the daytime sound levels in an Outdoor Living Area to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and rental agreements to the property. Where OLA sound levels exceed 60 dBA, physical mitigation is required to reduce the OLA sound level to below 60 dBA and as close to 55 dBA as technically, economically, and administratively practical. The maximum acoustic fence height in the City of Ottawa is 2.5 m unless approved by the City, with a maximum combined berm and face height of 4.5 m. In the case that the guideline criterion of 55 dBA cannot be met, it must be demonstrated to the

City of Ottawa that it is not technically feasible to meet the 55 dBA criterion with a warning clause.

A central air conditioning system as an alternative means of ventilation to opening windows is required for dwellings where nighttime sound levels outside bedroom or living/dining room windows exceed 60 dBA or daytime sound levels outside bedroom or living/dining room windows exceed 65 dBA. Forced-air ventilation with ducts sized to accommodate the future installation of air conditioning is required when nighttime sound levels at bedroom or living/dining room windows are in the range of 51 to 60 dBA or when daytime sound levels at bedroom or living/dining room windows are in the range of 56 to 65 dBA.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of window nighttime sound level is greater than 60 dBA or the daytime sound level is greater than 65 dBA due to road traffic noise.

Warning clauses to notify future residents of possible noise excesses are also required when nighttime sound levels exceed 50 dBA at the plane of the bedroom or living/dining room window and daytime sound levels exceed 55 dBA in the outdoor living area and at the plane of the bedroom or living/dining room window due to road traffic.

4 Traffic Sound Level Assessment

4.1 Road Traffic Data

Ultimate traffic data for Scott Street and Parkdale Avenue were obtained from the City of Ottawa Environmental Noise Guidelines dated January 2016 based on the width of the roadway and number of lanes, and is provided in Appendix A.

Existing/current traffic volumes were also obtained from the City of Ottawa. The higher of the ultimate and projected data was used in the analysis to determine for future traffic sound levels.

Ultimate traffic volume of 8 000 vehicles per day, obtained from the City of Ottawa Environmental Noise Control Guidelines, was applied to Codd`s Road with a posted speed limit of 50 km/h. A commercial vehicle percentage of 7% medium trucks and 5% heavy trucks was used in the analysis. Day and night traffic are spit to 92%/8% by volume respectively. The ultimate traffic volumes used in the analysis are provided in Table II.

Table II: Ultimate Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Scott Street (ultimate)	Daytime	19 430	1 104	1 546	22 000
	Nighttime	1 690	96	134	1 920
	Total	**21 120**	**1 200**	**1 680**	**24 000**
Holland Avenue (Ultimate)	Daytime	9 715	773	552	11 040
	Nighttime	845	67	48	960
	Total	**10 560**	**840**	**600**	**12 000**
Parkdale Avenue (ultimate)	Daytime	6 477	515	368	7 360
	Nighttime	563	45	32	640
	Total	**7 040**	**560**	**400**	**8 000**

4.2 LRT Traffic Data

Current LRT volumes at a station near Tunney's Pasture were obtained from the OC Transpo website, and are provided in Appendix B. The LRT traffic volumes have been escalated to the year 2031 assuming a conservative growth rate of 2.5% per year. The projected daytime and nighttime LRT volumes are listed in Table III.

Table III: 2031 Projected LRT Data

Location	Daytime Total Count	Nighttime Total Count	Speed (km/h)
LRT	545	61	80

4.3 Traffic Noise Predictions

To assess the levels of traffic noise which will impact the study area in the future, sound level predictions were made using STAMSON version 5.04, a computer algorithm developed by the MECP. Sample STAMSON output is included in Appendix C.

Predictions of the traffic sound levels were made at representative locations around the proposed development. For residential units, sound levels were predicted at the top storey bedroom and/or living/dining room windows during daytime and nighttime hours to investigate ventilation requirements. Sound levels were also predicted at the 2nd floor terrace to investigate the need for acoustic barriers. Figure 2 shows the site plan with prediction locations. The results of these predictions are summarized in Table IV.

Table IV: Predicted Road Traffic Sound Levels [dBA], Without Mitigation

Prediction Location	Description	Daytime – in the OLA $L_{EQ-16\ hr}$	Daytime – at the Façade $L_{EQ-16\ hr}$	Nighttime – at the Facade $L_{EQ-8\ hr}$
A	North façade facing Scott Street	--	71	63
B	West façade, facing Holland Avenue	--	67	59
C	East façade, facing Parkdale Avenue	--	65	58
D	South façade	--	61	54
E	2nd floor outdoor terrace	66+	--	--

Note: + a minimum 1.07 m high solid parapet is included in the analysis

5 Discussion and Recommendations

The sound level predictions indicate that the future traffic sound levels will exceed MECP guidelines at the façades facing Scott Street, the LRT, Holland Avenue and Parkdale Avenue and will require noise mitigation measures. The following discussion outlines the recommendations for acoustic barrier requirements, ventilation requirements, upgraded building façade construction, and warning clauses to achieve the noise criteria stated in Table I.

5.1 Outdoor Living Areas

A large terrace is indicated on the second floor measuring greater than 4 m in depth (prediction location [E]). The predicted sound level in these terraces which are considered as outdoor living areas will be up to 66 dBA, 11 dBA in excess of the MECP limit of 55 dBA assuming a minimum 1.07 m solid parapet wall along the roof edge, facing north. A solid parapet wall 2.5 m in height at prediction location [E] would reduce sound levels in the OLAs to 59 to 60 dBA. The 4 to 5 dBA sound level excess is acceptable to the MECP if it is acceptable to the municipality with the use of a noise warning clause. Appendix D provides a sample tall acoustic barrier construction for an elevated OLA. Alternatively, these areas may be shortened to less than 4 m in depth and a traffic noise assessment will not be required.

As a general note, the solid parapet wall can be constructed from any material (including transparent materials) provided it is of a solid construction with a surface density of no less than 20 kg/m^2 and is free of gaps within or below its extent.

Individual balconies and terraces may be provided for the proposed dwelling units. These balconies and terraces are less than 4 m in depth they are not considered to be OLAs by the MECP and sound level predictions are not required.

There are no other common outdoor amenity areas indicated on the site plan.

5.2 Indoor Living Areas and Ventilation Requirements

Central Air Conditioning

The predicted future sound levels outside the living room/dining room and bedroom windows at the prediction location facing Scott Street and the LRT will be greater than 65 dBA during the daytime hours. To address these excesses, these units require to be equipped with central air conditioning systems so that windows can be kept closed. Window or through-the-wall air conditioning units are not recommended because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall sound insulating properties of the envelope. Acceptable units are those housed in their closet with an access door for maintenance. The location, installation and sound ratings of the outdoor air conditioning devices should minimize noise impacts and comply with criteria of MECP publication NPC-300.

5.3 Building Façade Constructions

The predicted sound levels of façade facing Scott Street or Parkdale Avenue will exceed 65 dBA daytime and/or 60 dBA nighttime and thus will require additional building design to conform to the noise criteria. MECP guidelines recommend that the windows, walls, and doors be designed such that the indoor sound levels comply with MECP criteria listed in Table I.

Calculations were preformed to determine the building envelope constructions likely to be required to maintain indoor sound levels within MECP guidelines. Exterior wall constructions meeting the requirement of the Ontario Building Code will provide sufficient sound insulation. The calculation methods were developed by the National Research Council (NRC). They are based on the predicted sound levels at the building facades and the area of the facade components (walls, windows and doors) relative to the floor area of the adjacent room determined from the floor plans and building elevations.

These calculations assume insignificant sound transmission through the walls in comparison with the

windows. Exterior walls that are not glazed should have sufficient acoustical insulation value such that the noise transmitted through is negligible in comparison with the windows. These aspects can be verified as part of the detail design of the envelope, as needed.

Detailed floor plans and building elevations were not available at the time of this report, but preliminary calculations have been performed to determine the building envelope constructions likely to be required to maintain indoor sound levels within MECP guidelines. The required Sound Transmission Class (STC) ratings for window glazing is summarised below in Table V.

Table V: STC Requirements

Location	Description	Space	STC Glazing Requirements
A	North façade facing Scott Street	Living/Dining	STC-34
		Bedroom	STC-32
B	West façade, facing Holland Avenue	Living/Dining	OBC
		Bedroom	OBC
C	East façade, facing Parkdale Avenue	Living/Dining	STC-30
		Bedroom	OBC
D	South façade	Living/Dining	OBC
		Bedroom	OBC

Notes:
* Based on window to floor area ratios of 80% for living/dining rooms and bedrooms (60% fixed and 20% operable)
OBC – Ontario Building Code

In an urban environment such as this, a sound transmission class (STC) rating of 33 is recommended as a minimum.

The glazing requirements can be met using fairly standard sealed units. Operable sections, including doors and operable windows, must be well-fitted and weather-stripped in order to achieve the upper range of target STC values. Acoustical criteria for different facades can be optimized as part of the detail design of the development, when floor plans and elevations for the buildings are available.

Sample window assemblies which may achieve the STC requirements are summarized in Table VI below. Note that acoustic performance varies with manufacture's construction details, and these are only guidelines to provide some indication of the type of glazing likely to be required; the STC requirements in Table IV are provided as a guideline based on the preliminary drawings. Acoustical test data for the selected assemblies should be requested from the supplier, to ensure that the stated acoustic performance levels will be achieved by their assemblies.

Table VI: Glazing Assemblies for STC Requirements

STC Requirement	Glazing Configuration (STC)
28 – 29	Any double glazed unit
30 – 31	3(13)3
32 – 33	4(10)4
34 – 35	6(10)6

In Table VI, the number outside parentheses indicate minimum pane thicknesses in millimeters and the number in parentheses indicates the minimum inter-pane gap in millimeters.

Alternative assemblies may be required for operable windows and doors to achieve the required performance values, depending on the nature of seals.

6 Stationary Source Assessment

Noise sources associated with industrial and commercial facilities are assessed separately from traffic sources under MECP guidelines. These facilities are considered to be Stationary Sources of Sound and criteria for their assessment are contained in the following section.

6.1 Criteria Governing Stationary Noise Sources

An industrial or commercial facility is classified in MECP guidelines as a stationary source of sound (as opposed to sources such as traffic or construction, for example) for noise assessment purposes. The proposed development is located in an urban acoustical environment classified as Class I according to MECP guidelines, which can be characterized by the background sound level being dominated by traffic and human activity.

The façade of a residence, or any associated usable outdoor area, is considered a sensitive point of reception. NPC-300 stipulates that the exclusionary minimum sound level limit for a stationary noise source in an urban Class 1 area is 50 dBA during daytime (07:00 to 19:00) and evening (19:00 to 23:00) hours, and 45 dBA during nighttime hours (23:00 to 07:00). If the background sound levels due to road traffic exceed the exclusionary minimum limits, then the background sound level becomes the criterion. The background sound level is defined as the sound level that is present when the stationary source under consideration is not operating, and may include traffic noise and natural sounds.

Elevated background sound levels due to road traffic on the surrounding roadways (Scott Street, Parkdale Avenue, Holland Avenue and the LRT) is considerable especially at the façade adjacent to and with exposure to the traffic noise sources. Minimum background sound levels were calculated using the basic road element included in Cadna/A, which follows the German guideline RLS-90 for road traffic noise predictions. The higher of the minimum background sound levels due to road traffic on the surrounding roadways and the exclusionary minimum sound levels at the façades of the proposed building are shown in Figures 3a/b.

Commercial activities such as the occasional movement of customer vehicles, occasional deliveries, and garbage collection are not of themselves considered to be significant noise sources in the MECP guidelines. Accordingly, these sources have not been considered in this study, with the exception of truck loading activities near the receiving area of the traffic safety equipment supplier directly west of the site area. Noise from safety equipment (e.g. back-up beepers) are also not considered as stationary noise sources and therefore are not considered.

The MECP guidelines stipulate that the sound level impact during a "predicable worst case hour" be considered. This is defined to be an hour when a typically busy "planned and predictable mode of operation" occurs at the subject facility or facilities, coincident with a period of minimal background sound. Compliance with MECP criteria generally results in acceptable levels of sound at residential receptors although there may still be residual audibility during periods of low background sound.

6.2 Stationary Source Noise Predictions

Predictive noise modelling was used to assess the sound impact of the nearby stationary sources at the most critically impacted façades of the proposed building in accordance with MECP guidelines. The noise prediction model was constructed based on a review of the proposed site plan, site visit to the adjacent commercial/office rooftops, satellite aerial photos, and estimates of sound emission levels of stationary sources taken from manufacturer's data, sound measurements and similar past HGC Engineering project files.

Table VII: Source Sound Power Levels [dB re 10-12 W]

Source	Octave Band Centre Frequency [Hz]								Overall [dBA]
	63	125	250	500	1k	2k	4k	8k	
EngAir FW1058 (2 on each roof)	96	95	90	90	94	76	76	75	90
Tower Tech CT	83	82	85	85	82	77	72	68	86
Lennox LGH240	87	83	65	54	50	47	49	41	68
Exhaust Fan	--	79	76	71	72	64	59	55	75
Tractor Trailer Reefer	112	105	96	95	93	91	95	77	98
Tractor Trailer passby	101	100	94	96	97	95	91	86	101
EngAir FWE755	85	85	88	85	80	79	41	65	85

The above data were inputted into a predictive computer model. The software used for this purpose (*Cadna-A version 2021, build: 183.5110*) is a computer implementation of ISO Standard 9613-2.2 "Acoustics - Attenuation of Sound During Propagation Outdoors." The ISO method accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures such as barriers.

The following information and assumptions were used in the analysis.

- Rooftop mechanical equipment were assumed to be EngAir models on the roof of the commercial/office buildings, at height of 2.0 m above the roof (including an acoustic screen 4 m high, open to the above), exhaust fans and other mechanical equipment at a height of 1.0 m above the roof.
- There is a delivery area (loading bay) at the east of the commercial/office building. One tractor trailer was observed during the site visit with a reefer (but not operating). Tractor trailers were assumed to access the loading dock. Any reefer units and engines were assumed to not idle in the loading dock area.
- Sound data for the above sources was obtained from past HGC Engineering project files of similar facilities, which were either originally obtained from the manufacturer (for HVAC equipment) or measured at similar facilities.
- Location of stationary noise sources are shown in Figure 4. Rooftop HVAC units, exhaust fans, and truck paths are shown as green crosses and lines.

In this impact assessment, we have considered typical worst-case (busiest hour) scenarios for each time period to be as follows:

Assumed day worst-case scenario:

- All rooftop equipment on the roof of the commercial/office buildings operating continuously at 67% capacity (40 minutes out of an hour). Remaining rooftop equipment operating continuously at 50% capacity (30 minutes out of an hour).
- One tractor trailer accessing the loading area entering in and out at a speed of 10 km/h.
- No truck engine idling or reefer units on, at the loading area.

Assumed night worst-case scenario:

- All rooftop equipment operating at a 25% duty cycle to account for on/off cycling. The commercial/office buildings are closed and do not operate during the nightitme hours.
- No deliveries during the nighttime hours at the loading area.

6.3 Results

The unmitigated sound levels due to stationary noise sources impacting the façades of the proposed building are summarized in Table VIII, and presented graphically in Figures 5a and 5b.

Table VIII: Predicted Sound Levels from the Existing Commercial/Office Facilities on the Proposed Building [dBA]

		Daytime (07:00 – 23:00)	Nighttime (23:00 – 07:00)	Criteria (Daytime / Nighttime)
R1	NW façade	48	44	61/5
R2	West façade	50	45	60/50
R3	SW façade	50	46	57/47
R4	South façade	48	41	48/45

The results of the calculations indicate that the predicted sound levels due to the operation of the nearby stationary sources of noise during a worst-case operational scenario are expected to be within MECP limits at the façades of the proposed mixed-use building. Mitigation is not required. Figure 6a and 6b indicate the sound level contours.

Administrative Controls

The loading area to the south of the proposed building has the potential for sound level excesses at the south façade of the proposed building, if tractor trailer engines are allowed to idle or if any reefer units on trucks are allowed to run while the trucks are docked at the loading area.

Engines and reefer units are recommended to be turned off while at the loading area to minimize noise intrusions at future residential units, especially along the south façade.

6.4 Warning Clauses

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements and offers of purchase and sale for all lots with anticipated traffic sound level excesses. The following noise warning clauses are required for specific dwellings as indicated in Table IX.

Suggested wording for future dwellings which have minor sound level excesses is given below.

Type A:

> Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic and LRT traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.

Suggested wording for future dwellings that would require central air conditioning is given below.

Type B:

> This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Municipality's and the Ministry of the Environment, Conservation and Parks' noise criteria.

Suggested wording for future dwellings that would require central air conditioning is given below.

Type C:

> Purchasers/tenants are advised that due to the proximity of this development to nearby retail/commercial facilities, sound levels from these facilities may at times be audible.

These sample clauses are provided by the MECP as examples, and can be modified by the Municipality as required.

7 Impact of the Development on the Environment

Sound levels from stationary (non-traffic) sources of noise such as rooftop air-conditioners, cooling towers, exhaust fans, etc. should not exceed the minimum one-hour L_{EQ} ambient (background) sound level from road traffic, at any potentially impacted residential point of reception (on or off site), to comply with City of Ottawa noise bylaws. Typical minimum ambient sound levels in the area are expected to be up to 55 to 60 dBA during the day and about 5 - 10 dB less at night, at nearby residential receptors. Thus, any electro-mechanical equipment associated with this development (e.g. cooling towers, fresh-air handling equipment, etc.) should be designed such that they do not result in noise impact beyond these ranges. The proposed building will be higher than the existing neighbouring residential buildings and the mechanical equipment is proposed to be housed inside a mechanical penthouse, thus noise from the mechanical equipment on the roof of this building are not expected to substantially impact the neighbouring residential buildings.

8 Impact of the Development on Itself

Section 5.8.1.1 of the Ontario Building Code (OBC), released on January 1, 2020, specifies the minimum required sound insulation characteristics for demising partitions of dwelling units, in terms of Sound Transmission Class (STC) or Apparent Sound Transmission Class (ASTC) values. In order to maintain adequate acoustical privacy between separate suites in a multi-tenant building, inter-suite walls must meet or exceed STC-50 or ASTC-47. Suite separation from a refuse chute, or elevator shaft, must meet or exceed STC-55. In addition, it is recommended that the floor/ceiling constructions separating suites from any amenity, commercial or other mechanical spaces also meet or exceed STC-55. Tables 1 and 2 in Section SB-3 of the Supplementary Guideline to the OBC provide a comprehensive list of constructions that will meet the above requirements.

Tarion's Builder Bulletin B19R requires the internal design of condominium projects to integrate suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services in the development on its residents. If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself is maintained within acceptable levels.

9 Summary and Recommendations

The following list and Table X summarize the recommendations made in this report. The reader is referred to previous sections of the report where these recommendations are applied and discussed in more detail.

1. The second floor terrace adjacent to and with exposure to Scott Street requires an acoustic barrier to mitigate transportation noise levels. Refer to Section 5.1.

2. Central air conditioning will be required for proposed building. The location, installation and sound rating of the outdoor condensing units must be compliant with MECP Guideline NPC-300, as applicable

3. Upgraded glazing construction will be required for north façade, as indicated in Table V and X. Minimum building constructions are recommended in an urban area such as this.

4. The use of warning clauses in the property and tenancy agreements is recommended to inform future residents of traffic noise issues and to indicate the presence of the nearby commercial/office uses.

Table X: Summary of Noise Control Requirements and Noise Warning Clauses

Prediction Location	Acoustic Barrier	Ventilation Requirements*	Type of Warning Clause	STC Glazing Requirements
A North façade	--	Central A/C	A, B, C	LR/DR: STC-34 BR: STC-33
B West facade	--	Central A/C	A, B, C	LR/DR: STC-33 BR: STC-33
C East façade	--	Central A/C	A, B, C	LR/DR: STC-33 BR: STC-33
D South facade	--	Central A/C	A, B, C	LR/DR: STC-33 BR: STC-33

Notes:
* The location, installation and sound rating of the air conditioning condensers must be compliant with MECP Guideline NPC-300, as applicable.
-- no specific requirement
OBC – Construction meeting the Ontario Building Code
LR/DR: Living room/Dining room
BR: Bedroom

9.1 Implementation

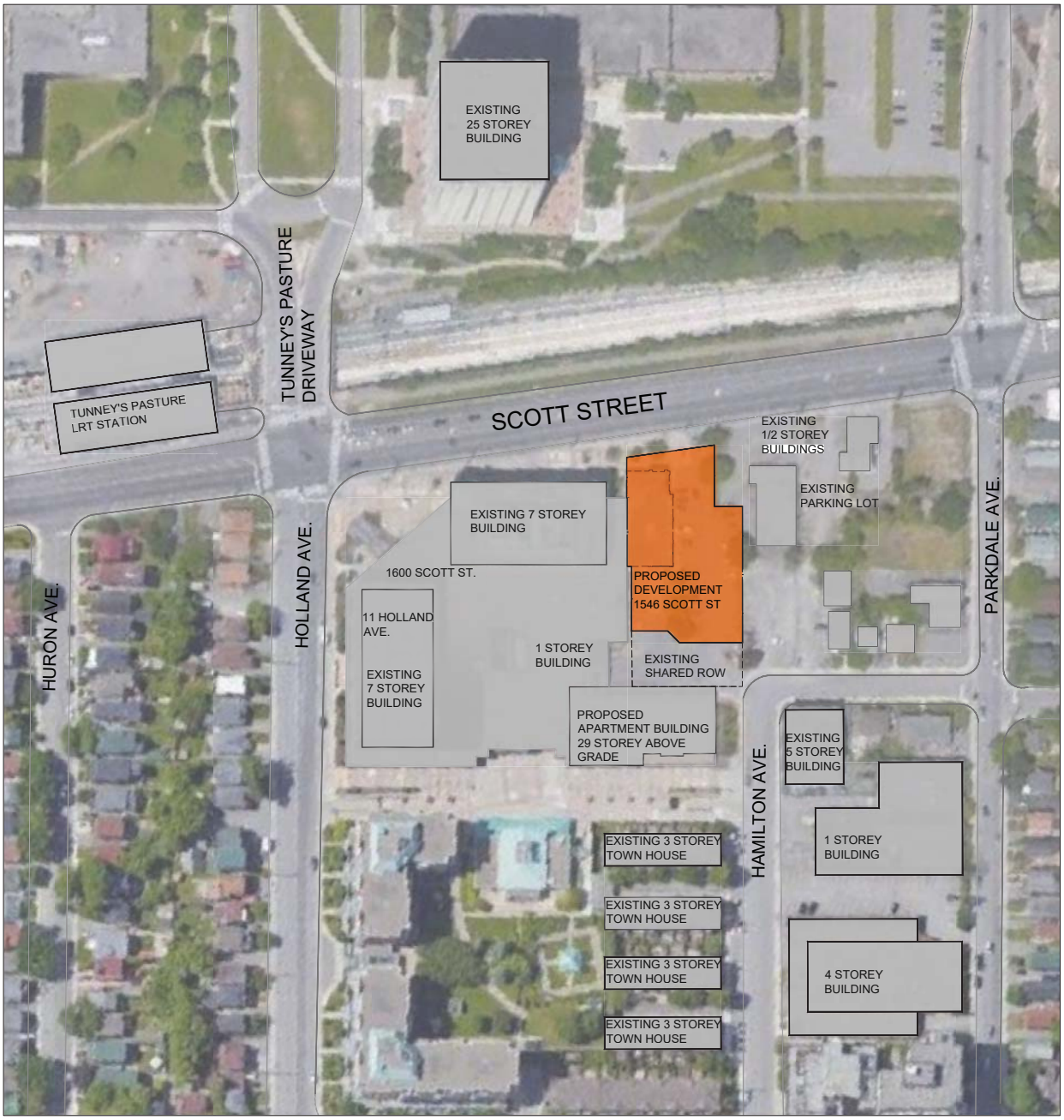
To ensure that the noise control recommendations outlined above are properly implemented, it is recommended that:

1. Prior to the issuance of building permits for this development, the Municipality's building inspector or a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should review the proposed glazing specifications to confirm that these meet the necessary STC values as specified in the noise report.

PARKING	
LEVEL	PARKING SPACES
F1	12
P1	29
P2	57
P3	57
TOTAL	155

AREAS			
LOT AREA	2,525 m²		
FSI	6.02		
LEVEL	AREA	SELLABLE	GFA
P1	2,254 m²	0	0
P2	2,254 m²	0	0
P3	1,110 m²	0	0
F1	846 m²	261 m²	261 m²
F2	1,411 m²	0	0
TOWER LEVELS	750 m²	650 m²	650 m²
SUITES AVG	10/FLOOR	65 m²/SUITE	230 SUITES
F3-F25	17,250 m²	14,950 m²	14,950 m²
TOTAL	25,124 m²	15,211 m²	15,211 m²

SITE INFORMATION



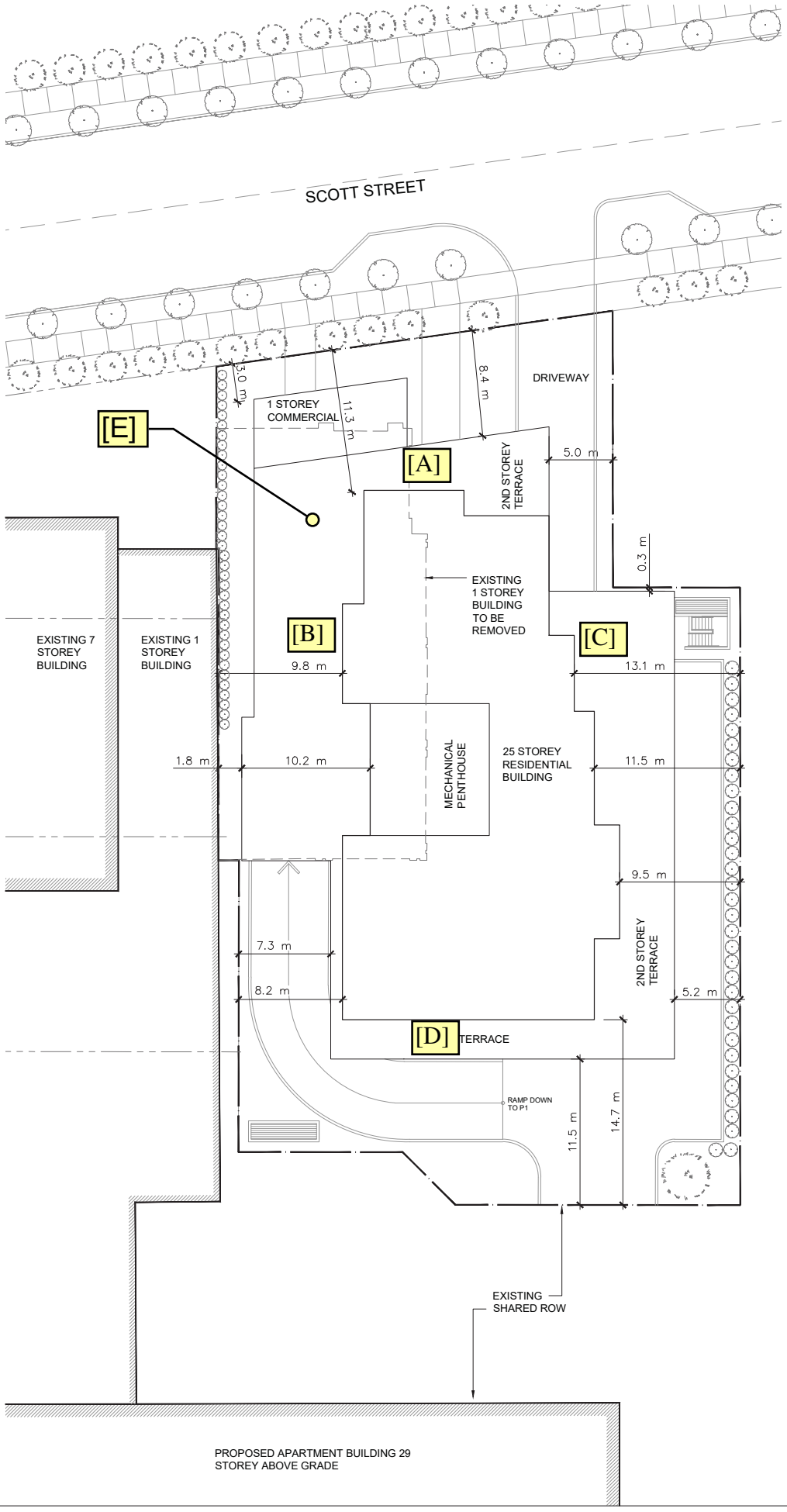
CONTEXT PLAN

TREGEBOV COGAN *ARCHITECTURE*
40 St. Clair Avenue East, Suite 303
Toronto, ON M4T 1M9
office@tcarchitecture.ca
647-352-3350

1546 SCOTT STREET
OTTAWA

CONTEXT PLAN
SCALE: 1:1500
DATE: APRIL 20, 2021

Figure 1 - Context Plan



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1546 SCOTT STREET
OTTAWA

SITE PLAN
SCALE: 1:300
DATE: APRIL 20, 2021

Figure 2 - Site Plan

Figure 3a: Daytime Background Sound levels

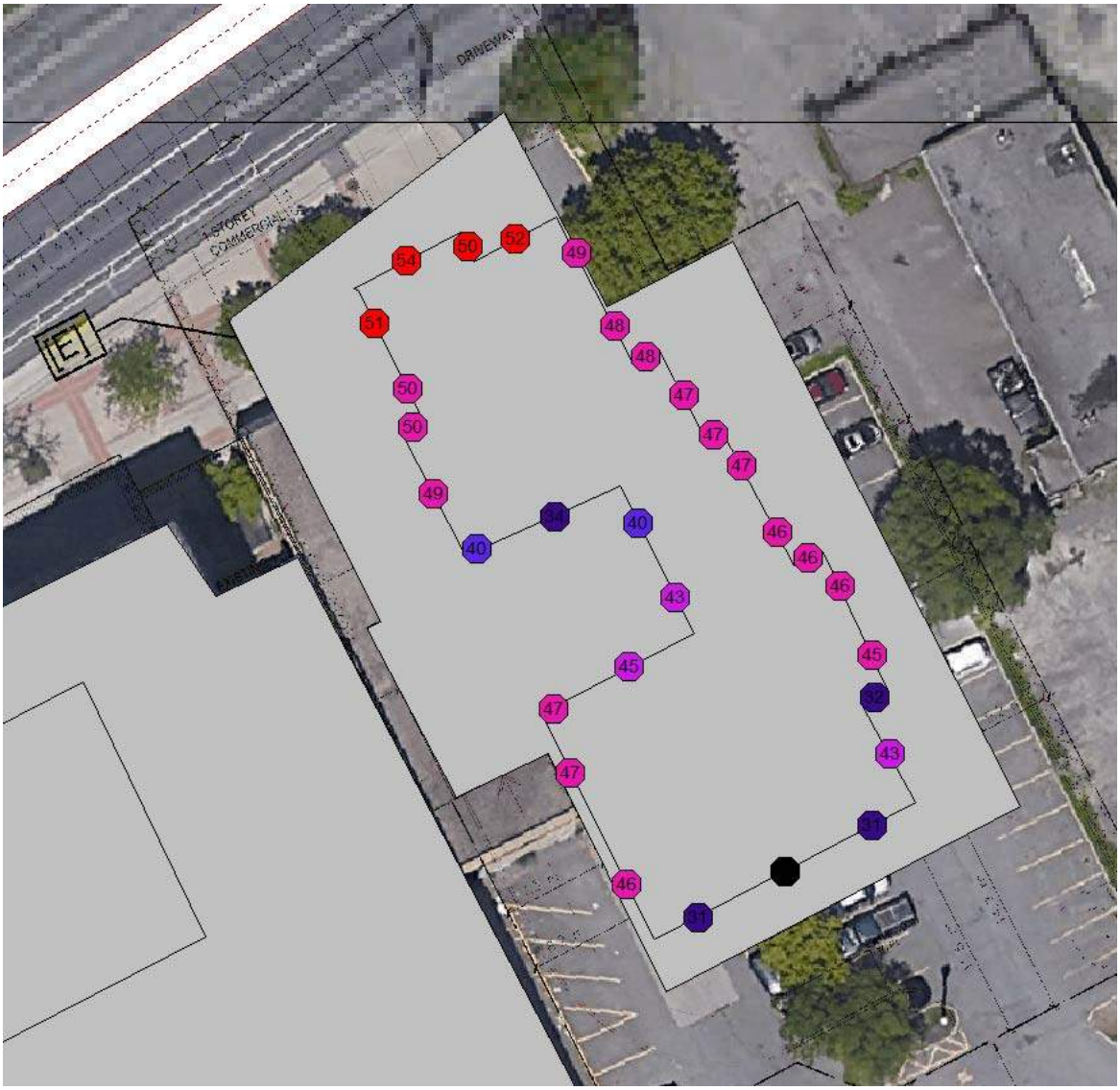


Figure 3b: Nighttime Background Sound Levels

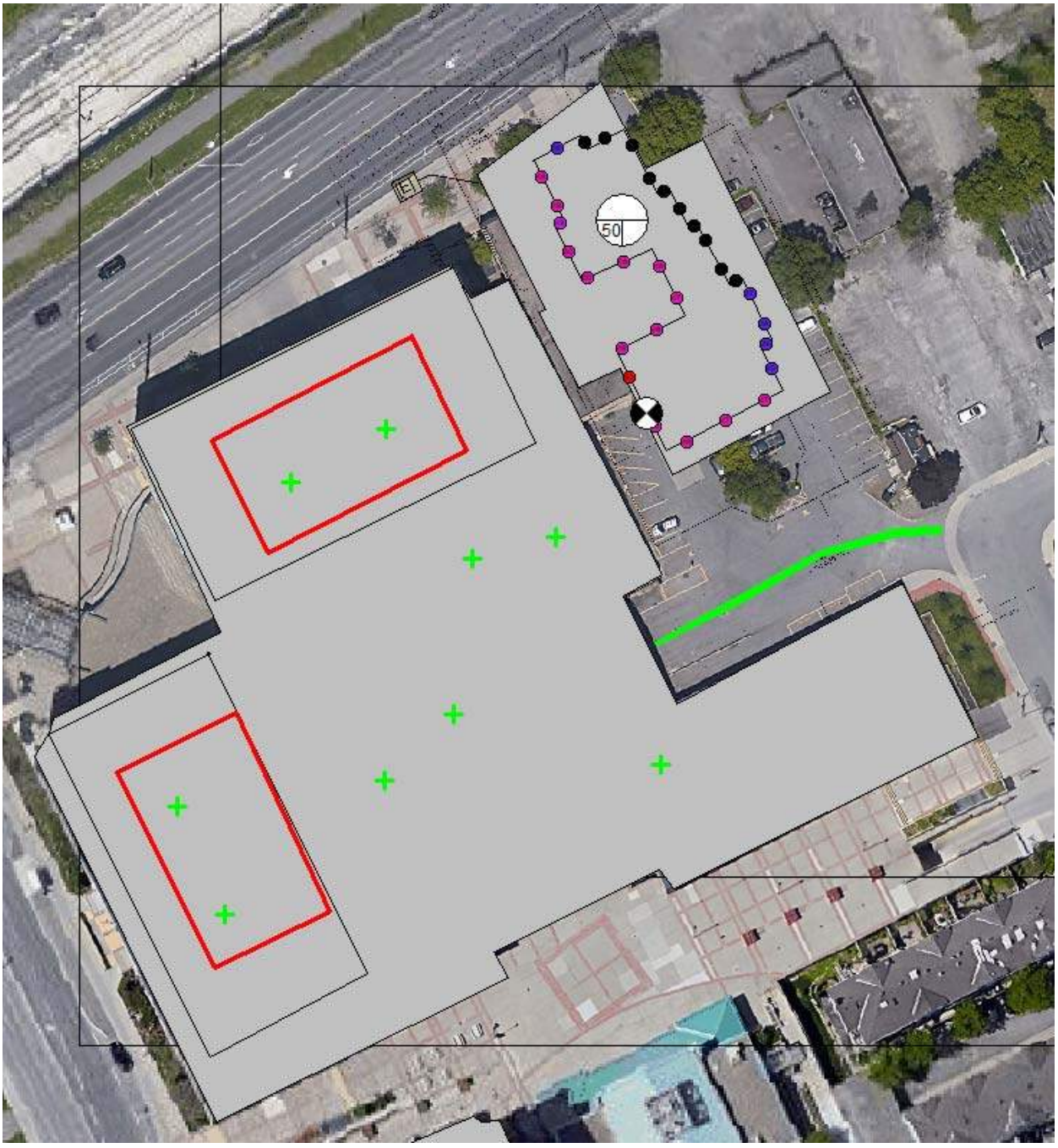


Figure 4: Noise Sources Associated with the Commercial/Office Buildings

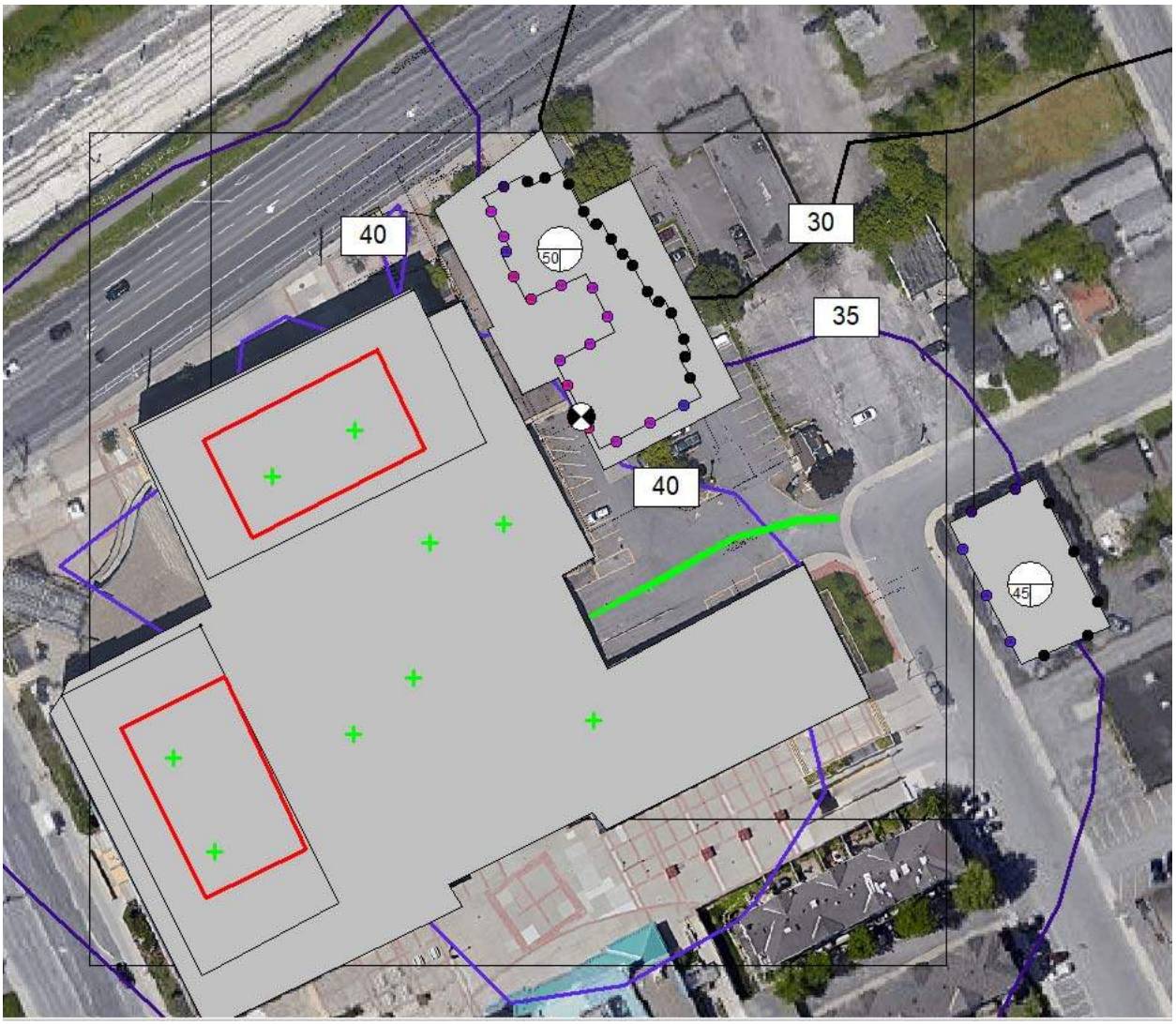


Figure 5a: Predicted Daytime Sound levels at Proposed Building, dBA

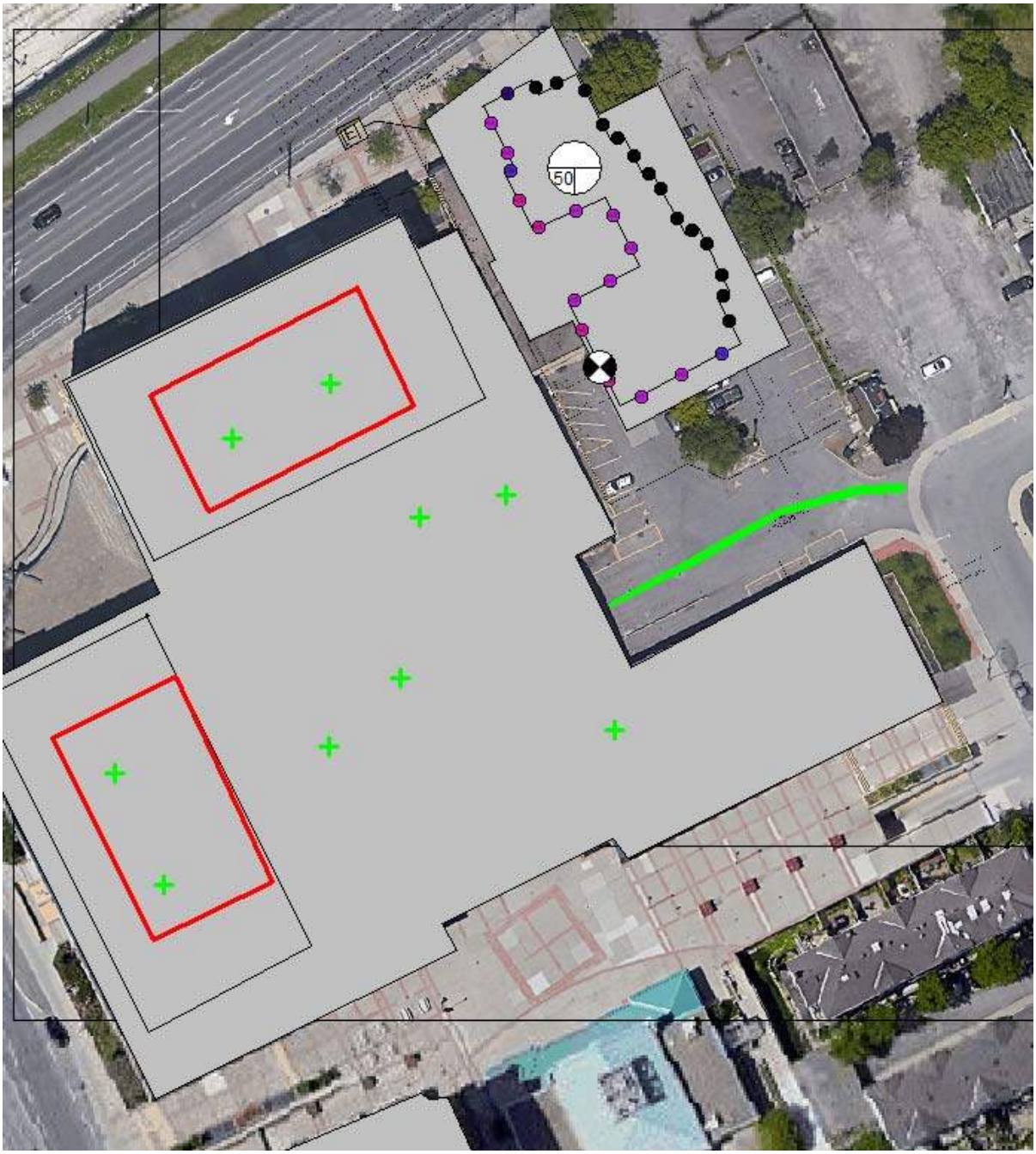


Figure 5b: Predicted Nighttime Sound Levels at Proposed Buildings, dBA

Appendix A

Road Traffic Information

Appendix B: Table of Traffic and Road Parameters To Be Used For Sound Level Predictions

Table B1 Traffic And Road Parameters To Be Used For Sound Level Predictions

Row Width (m)	Implied Roadway Class	AADT Vehicles/Day	Posted Speed Km/Hr	Day/Night Split %	Medium Trucks %	Heavy Trucks % [1]
NA [2]	Freeway, Queensway, Highway	18,333 per lane	100	92/8	7	5
37.5-44.5	6-Lane Urban Arterial-Divided (6 UAD)	50,000	50-80	92/8	7	5
34-37.5	4-Lane Urban Arterial-Divided (4-UAD)	35,000	50-80	92/8	7	5
23-34	4-Lane Urban Arterial-Undivided (4-UAU)	30,000	50-80	92/8	7	5
23-34	4-Lane Major Collector (4-UMCU)	24,000	40-60	92/8	7	5
30-35.5	2-Lane Rural Arterial (2-RAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Urban Arterial (2-UAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Major Collector (2-UMCU)	12,000	40-60	92/8	7	5
30-35.5	2-Lane Outer Rural Arterial (near the extremities of the City) (2-RAU)	10,000	50-80	92/8	7	5
20-30	2-Lane Urban Collector (2-UCU)	8,000	40-50	92/8	7	5

[1] The MOE Vehicle Classification definitions should be used to estimate automobiles, medium trucks and heavy trucks.

[2] The number of lanes is determined by the future mature state of the roadway.

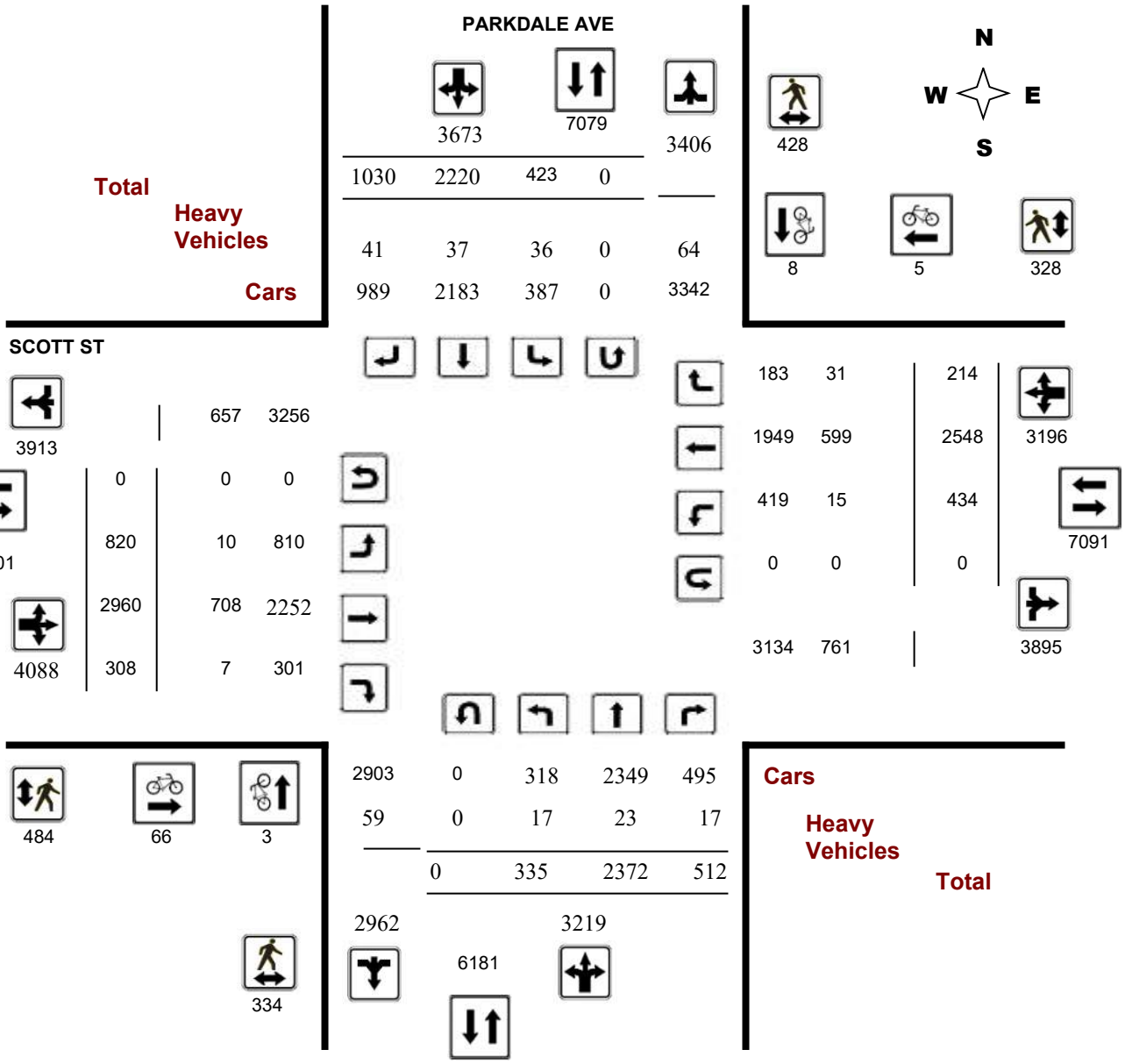
Transportation Services - Traffic Services

Turning Movement Count - Study Results

PARKDALE AVE @ SCOTT ST

Survey Date: Wednesday, November 29, 2017
Start Time: 07:00
WO No: 37314
Device: Miovision

Full Study Diagram



Appendix B

LRT Information

TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	RIDEAU O-TRAIN EAST / EST	UOTTAWA O-TRAIN EAST / EST	LEES O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN

The next service change is on Sunday, December 19.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Wed, Sep 29

1 Blair

TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	RIDEAU O-TRAIN EAST / EST	UOTTAWA O-TRAIN EAST / EST	LEES O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN
								05:02	05:04	05:07	05:09	05:11
04:56	04:58	05:00	05:02	05:04	05:06	05:08	05:10	05:12	05:14	05:17	05:19	05:21
05:04	05:06	05:08	05:10	05:12	05:14	05:16	05:18	05:20	05:22	05:25	05:27	05:29
05:11	05:13	05:15	05:17	05:19	05:21	05:23	05:25	05:27	05:29	05:32	05:34	05:36
05:19	05:21	05:23	05:25	05:27	05:29	05:31	05:33	05:35	05:37	05:40	05:42	05:44
05:27	05:29	05:31	05:33	05:35	05:37	05:39	05:41	05:43	05:45	05:48	05:50	05:52
05:35	05:37	05:39	05:41	05:43	05:45	05:47	05:49	05:51	05:53	05:56	05:58	06:00
05:43	05:45	05:47	05:49	05:51	05:53	05:55	05:57	05:59	06:01	06:04	06:06	06:08
05:51	05:53	05:55	05:57	05:59	06:01	06:03	06:05	06:07	06:09	06:12	06:14	06:16
										06:16	06:18	06:20
05:59	06:01	06:03	06:05	06:07	06:09	06:11	06:13	06:15	06:17	06:20	06:22	06:24
										06:24	06:26	06:28
06:07	06:09	06:11	06:13	06:15	06:17	06:19	06:21	06:23	06:25	06:28	06:30	06:32
										06:32	06:34	06:36
06:15	06:17	06:19	06:21	06:23	06:25	06:27	06:29	06:31	06:33	06:36	06:38	06:40
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06:31	06:33	06:35	06:37	06:39	06:41	06:43	06:45	06:47	06:49	06:52	06:54	06:56
06:34	06:36	06:38	06:40	06:42	06:44	06:46	06:48	06:50	06:52	06:55	06:57	06:59
06:38	06:40	06:42	06:44	06:46	06:48	06:50	06:52	06:54	06:56	06:59	07:01	07:03

TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	RIDEAU O-TRAIN EAST / EST	UOTTAWA O-TRAIN EAST / EST	LEES O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN	/	BLAIR O-TRAIN
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TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	RIDEAU O-TRAIN EAST / EST	UOTTAWA O-TRAIN EAST / EST	LEES O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN	BLAIR O-TRAIN
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TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	RIDEAU O-TRAIN EAST / EST	UOTTAWA O-TRAIN EAST / EST	LEES O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN	/	BLAIR O-TRAIN
														12:46
12:26	12:28	12:30	12:32	12:34	12:36	12:38	12:40	12:42	12:44	12:47	12:49			12:51
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TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	RIDEAU O-TRAIN EAST / EST	UOTTAWA O-TRAIN EAST / EST	LEES O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN	/	BLAIR O-TRAIN
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16:43	16:45	16:47	16:49	16:51	16:53	16:55	16:57	16:59	17:01	17:04	17:06			17:08
16:47	16:49	16:51	16:53	16:55	16:57	16:59	17:01	17:03	17:05	17:08	17:10			17:12
16:52	16:54	16:56	16:58	17:00	17:02	17:04	17:06	17:08	17:10	17:13	17:15			17:17
16:56	16:58	17:00	17:02	17:04	17:06	17:08	17:10	17:12	17:14	17:17	17:19			17:21
17:00	17:02	17:04	17:06	17:08	17:10	17:12	17:14	17:16	17:18	17:21	17:23			17:25
17:04	17:06	17:08	17:10	17:12	17:14	17:16	17:18	17:20	17:22	17:25	17:27			17:29
17:09	17:11	17:13	17:15	17:17	17:19	17:21	17:23	17:25	17:27	17:30	17:32			17:34
17:13	17:15	17:17	17:19	17:21	17:23	17:25	17:27	17:29	17:31	17:34	17:36			17:38
17:17	17:19	17:21	17:23	17:25	17:27	17:29	17:31	17:33	17:35	17:38	17:40			17:42
17:22	17:24	17:26	17:28	17:30	17:32	17:34	17:36	17:38	17:40	17:43	17:45			17:47
17:26	17:28	17:30	17:32	17:34	17:36	17:38	17:40	17:42	17:44	17:47	17:49			17:51
17:30	17:32	17:34	17:36	17:38	17:40	17:42	17:44	17:46	17:48	17:51	17:53			17:55
17:35	17:37	17:39	17:41	17:43	17:45	17:47	17:49	17:51	17:53	17:56	17:58			18:00
17:39	17:41	17:43	17:45	17:47	17:49	17:51	17:53	17:55	17:57	18:00	18:02			18:04
17:43	17:45	17:47	17:49	17:51	17:53	17:55	17:57	17:59	18:01	18:04	18:06			18:08
17:48	17:50	17:52	17:54	17:56	17:58	18:00	18:02	18:04	18:06	18:09	18:11			18:13
17:52	17:54	17:56	17:58	18:00	18:02	18:04	18:06	18:08	18:10	18:13	18:15			18:17
17:57	17:59	18:01	18:03	18:05	18:07	18:09	18:11	18:13	18:15	18:18	18:20			18:22
18:01	18:03	18:05	18:07	18:09	18:11	18:13	18:15	18:17	18:19	18:22	18:24			18:26
18:06	18:08	18:10	18:12	18:14	18:16	18:18	18:20	18:22	18:24	18:27	18:29			18:31
18:11	18:13	18:15	18:17	18:19	18:21	18:23	18:25	18:27	18:29	18:32	18:34			18:36
18:16	18:18	18:20	18:22	18:24	18:26	18:28	18:30	18:32	18:34	18:37	18:39			18:41

TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	RIDEAU O-TRAIN EAST / EST	UOTTAWA O-TRAIN EAST / EST	LEES O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN	BLAIR O-TRAIN
													18:46
18:26	18:28	18:30	18:32	18:34	18:36	18:38	18:40	18:42	18:44	18:47	18:49	18:51
18:31	18:33	18:35	18:37	18:39	18:41	18:43	18:45	18:47	18:49	18:52	18:54	18:56
18:36	18:38	18:40	18:42	18:44	18:46	18:48	18:50	18:52	18:54	18:57	18:59	19:01
18:41	18:43	18:45	18:47	18:49	18:51	18:53	18:55	18:57	18:59	19:02	19:04	19:06
18:47	18:49	18:51	18:53	18:55	18:57	18:59	19:01	19:03	19:05	19:08	19:10	19:12
18:51	18:53	18:55	18:57	18:59	19:01	19:03	19:05	19:07	19:09	19:12	19:14	19:16
18:56	18:58	19:00	19:02	19:04	19:06	19:08	19:10	19:12	19:14	19:17	19:19	19:21
19:01	19:03	19:05	19:07	19:09	19:11	19:13	19:15	19:17	19:19	19:22	19:24	19:26
19:06	19:08	19:10	19:12	19:14	19:16	19:18	19:20	19:22	19:24	19:27	19:29	19:31
19:11	19:13	19:15	19:17	19:19	19:21	19:23	19:25	19:27	19:29	19:32	19:34	19:36
19:16	19:18	19:20	19:22	19:24	19:26	19:28	19:30	19:32	19:34	19:37	19:39	19:41
19:21	19:23	19:25	19:27	19:29	19:31	19:33	19:35	19:37	19:39	19:42	19:44	19:46
19:26	19:28	19:30	19:32	19:34	19:36	19:38	19:40	19:42	19:44	19:47	19:49	19:51
19:31	19:33	19:35	19:37	19:39	19:41	19:43	19:45	19:47	19:49	19:52	19:54	19:56
19:36	19:38	19:40	19:42	19:44	19:46	19:48	19:50	19:52	19:54	19:57	19:59	20:01
19:42	19:44	19:46	19:48	19:50	19:52	19:54	19:56	19:58	20:00	20:03	20:05	20:07
19:46	19:48	19:50	19:52	19:54	19:56	19:58	20:00	20:02	20:04	20:07	20:09	20:11
19:51	19:53	19:55	19:57	19:59	20:01	20:03	20:05	20:07	20:09	20:12	20:14	20:16
19:56	19:58	20:00	20:02	20:04	20:06	20:08	20:10	20:12	20:14	20:17	20:19	20:21
20:01	20:03	20:05	20:07	20:09	20:11	20:13	20:15	20:17	20:19	20:22	20:24	20:26
20:06	20:08	20:10	20:12	20:14	20:16	20:18	20:20	20:22	20:24	20:27	20:29	20:31
20:11	20:13	20:15	20:17	20:19	20:21	20:23	20:25	20:27	20:29	20:32	20:34	20:36
20:16	20:18	20:20	20:22	20:24	20:26	20:28	20:30	20:32	20:34	20:37	20:39	20:41
20:21	20:23	20:25	20:27	20:29	20:31	20:33	20:35	20:37	20:39	20:42	20:44	20:46
20:26	20:28	20:30	20:32	20:34	20:36	20:38	20:40	20:42	20:44	20:47	20:49	20:51
20:31	20:33	20:35	20:37	20:39	20:41	20:43	20:45	20:47	20:49	20:52	20:54	20:56
20:37	20:39	20:41	20:43	20:45	20:47	20:49	20:51	20:53	20:55	20:58	21:00	21:02
20:41	20:43	20:45	20:47	20:49	20:51	20:53	20:55	20:57	20:59	21:02	21:04	21:06
20:46	20:48	20:50	20:52	20:54	20:56	20:58	21:00	21:02	21:04	21:07	21:09	21:11
20:51	20:53	20:55	20:57	20:59	21:01	21:03	21:05	21:07	21:09	21:12	21:14	21:16
20:56	20:58	21:00	21:02	21:04	21:06	21:08	21:10	21:12	21:14	21:17	21:19	21:21
21:01	21:03	21:05	21:07	21:09	21:11	21:13	21:15	21:17	21:19	21:22	21:24	21:26
21:06	21:08	21:10	21:12	21:14	21:16	21:18	21:20	21:22	21:24	21:27	21:29	21:31
21:11	21:13	21:15	21:17	21:19	21:21	21:23	21:25	21:27	21:29	21:32	21:34	21:36
21:16	21:18	21:20	21:22	21:24	21:26	21:28	21:30	21:32	21:34	21:37	21:39	21:41
21:21	21:23	21:25	21:27	21:29	21:31	21:33	21:35	21:37	21:39	21:42	21:44	21:46
21:26	21:28	21:30	21:32	21:34	21:36	21:38	21:40	21:42	21:44	21:47	21:49	21:51
21:32	21:34	21:36	21:38	21:40	21:42	21:44	21:46	21:48	21:50	21:53	21:55	21:57
21:36	21:38	21:40	21:42	21:44	21:46	21:48	21:50	21:52	21:54	21:57	21:59	22:01

TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	RIDEAU O-TRAIN EAST / EST	UOTTAWA O-TRAIN EAST / EST	LEES O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN	BLAIR O-TRAIN
													22:06
21:46	21:48	21:50	21:52	21:54	21:56	21:58	22:00	22:02	22:04	22:07	22:09	22:11
21:51	21:53	21:55	21:57	21:59	22:01	22:03	22:05	22:07	22:09	22:12	22:14	22:16
21:57	21:59	22:01	22:03	22:05	22:07	22:09	22:11	22:13	22:15	22:18	22:20	22:22
22:05	22:07	22:09	22:11	22:13	22:15	22:17	22:19	22:21	22:23	22:26	22:28	22:30
22:13	22:15	22:17	22:19	22:21	22:23	22:25	22:27	22:29	22:31	22:34	22:36	22:38
22:21	22:23	22:25	22:27	22:29	22:31	22:33	22:35	22:37	22:39	22:42	22:44	22:46
22:29	22:31	22:33	22:35	22:37	22:39	22:41	22:43	22:45	22:47	22:50	22:52	22:54
22:37	22:39	22:41	22:43	22:45	22:47	22:49	22:51	22:53	22:55	22:58	23:00	23:02
22:45	22:47	22:49	22:51	22:53	22:55	22:57	22:59	23:01	23:03	23:06	23:08	23:10
22:53	22:55	22:57	22:59	23:01	23:03	23:05	23:07	23:09	23:11	23:14	23:16	23:18
23:00	23:02	23:04	23:06	23:08	23:10	23:12	23:14	23:16	23:18	23:21	23:23	23:25
23:09	23:11	23:13	23:15	23:17	23:19	23:21	23:23	23:25	23:27	23:30	23:32	23:34
23:16	23:18	23:20	23:22	23:24	23:26	23:28	23:30	23:32	23:34	23:37	23:39	23:41
23:29	23:31	23:33	23:35	23:37	23:39	23:41	23:43	23:45	23:47	23:50	23:52	23:54
23:44	23:46	23:48	23:50	23:52	23:54	23:56	23:58	00:00	00:02	00:05	00:07	00:09
23:59	00:01	00:03	00:05	00:07	00:09	00:11	00:13	00:15	00:17	00:20	00:22	00:24
00:14	00:16	00:18	00:20	00:22	00:24	00:26	00:28	00:30	00:32	00:35	00:37	00:39
00:29	00:31	00:33	00:35	00:37	00:39	00:41	00:43	00:45	00:47	00:50	00:52	00:54
00:44	00:46	00:48	00:50	00:52	00:54	00:56	00:58	01:00	01:02	01:05	01:07	01:09
00:59	01:01	01:03	01:05	01:07	01:09	01:11	01:13	01:15	01:17	01:20	01:22	01:24

Appendix C

Sample STAMSON 5.04 Output

```
STAMSON 5.0        NORMAL REPORT        Date: 27-10-2021 18:59:52
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: north.te             Time Period: Day/Night 16/8 hours
Description:  Daytime and nighttime sound levels at the North façade
facing Scott Street, prediction location [A]

Road data, segment # 1: Scott EB (day/night)
----------------------------------------------
Car traffic volume  : 19430/1690  veh/TimePeriod  *
Medium truck volume :  1104/96    veh/TimePeriod  *
Heavy truck volume  :  1546/134   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  24000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   5.00
    Heavy Truck  % of Total Volume     :   7.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Scott EB (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  24.00 / 24.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Road data, segment # 2: Scott WB (day/night)
----------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00
```

```
Data for Segment # 2: Scott WB (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  31.00 / 31.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Road data, segment # 3: Holland (day/night)
-------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 3: Holland (day/night)
-----------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 125.00 / 125.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Road data, segment # 4: Parkdale (day/night)
--------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:
```

```
    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 4: Parkdale (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 120.00 / 120.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Results segment # 1: Scott EB (day)
-----------------------------------

Source height = 1.63 m

ROAD (0.00 + 69.24 + 0.00) = 69.24 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  71.28   0.00  -2.04   0.00   0.00   0.00   0.00
69.24
-------------------------------------------------------------------------
---

Segment Leq : 69.24 dBA

Results segment # 2: Scott WB (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 62.56 + 0.00) = 62.56 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  65.72   0.00  -3.15   0.00   0.00   0.00   0.00
62.56
-------------------------------------------------------------------------
---

Segment Leq : 62.56 dBA
```

```
Results segment # 3: Holland (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 53.50 + 0.00) = 53.50 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
     0     90   0.00  65.72   0.00  -9.21  -3.01   0.00   0.00   0.00
53.50
-------------------------------------------------------------------------
---

Segment Leq : 53.50 dBA

Results segment # 4: Parkdale (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 51.91 + 0.00) = 51.91 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90      0   0.00  63.96   0.00  -9.03  -3.01   0.00   0.00   0.00
51.91
-------------------------------------------------------------------------
---

Segment Leq : 51.91 dBA

Total Leq All Segments: 70.24 dBA

Results segment # 1: Scott EB (night)
-------------------------------------

Source height = 1.63 m

ROAD (0.00 + 61.63 + 0.00) = 61.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  63.67   0.00  -2.04   0.00   0.00   0.00   0.00
61.63
-------------------------------------------------------------------------
---

Segment Leq : 61.63 dBA
```

```
Results segment # 2: Scott WB (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 54.97 + 0.00) = 54.97 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  58.12   0.00  -3.15   0.00   0.00   0.00   0.00
54.97
-------------------------------------------------------------------------
---

Segment Leq : 54.97 dBA

Results segment # 3: Holland (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 45.90 + 0.00) = 45.90 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
     0     90   0.00  58.12   0.00  -9.21  -3.01   0.00   0.00   0.00
45.90
-------------------------------------------------------------------------
---

Segment Leq : 45.90 dBA

Results segment # 4: Parkdale (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 44.32 + 0.00) = 44.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90      0   0.00  56.36   0.00  -9.03  -3.01   0.00   0.00   0.00
44.32
-------------------------------------------------------------------------
---

Segment Leq : 44.32 dBA

Total Leq All Segments: 62.64 dBA
```

```
RT/Custom data, segment # 1: LRT (day/night)
-----------------------------------------
1 - 4-car SRT:
Traffic volume    :   545/61    veh/TimePeriod
Speed             :    80 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  55.00 / 55.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Results segment # 1: LRT (day)
------------------------------

Source height = 0.50 m

RT/Custom (0.00 + 58.99 + 0.00) = 58.99 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  64.64  -5.64   0.00   0.00   0.00   0.00  58.99
-------------------------------------------------------------------------

Segment Leq : 58.99 dBA

Total Leq All Segments: 58.99 dBA

Results segment # 1: LRT (night)
--------------------------------

Source height = 0.50 m

RT/Custom (0.00 + 52.49 + 0.00) = 52.49 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  58.14  -5.64   0.00   0.00   0.00   0.00  52.49
-------------------------------------------------------------------------

Segment Leq : 52.49 dBA

Total Leq All Segments: 52.49 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.56
                           (NIGHT): 63.04
```

```
STAMSON 5.0        NORMAL REPORT        Date: 27-10-2021 19:00:13
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: west.te              Time Period: Day/Night 16/8 hours
Description:    Daytime and nighttime sound levels at the West façade,
facing Holland Avenue, prediction location [B]

Road data, segment # 1: Scott EB (day/night)
----------------------------------------------
Car traffic volume  : 19430/1690  veh/TimePeriod  *
Medium truck volume :  1104/96    veh/TimePeriod  *
Heavy truck volume  :  1546/134   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  24000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   5.00
    Heavy Truck  % of Total Volume     :   7.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Scott EB (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  31.00 / 31.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Road data, segment # 2: Scott WB (day/night)
----------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00
```

```
Data for Segment # 2: Scott WB (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  40.00 / 40.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Road data, segment # 3: Holland (day/night)
------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 3: Holland (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 115.00 / 115.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Results segment # 1: Scott EB (day)
-----------------------------------

Source height = 1.63 m

ROAD (0.00 + 65.12 + 0.00) = 65.12 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90      0   0.00  71.28   0.00  -3.15  -3.01   0.00   0.00   0.00
65.12
```

```
-------------------------------------------------------------------------
---

Segment Leq : 65.12 dBA

Results segment # 2: Scott WB (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.45 + 0.00) = 58.45 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90      0   0.00  65.72   0.00  -4.26  -3.01   0.00   0.00   0.00
58.45
-------------------------------------------------------------------------
---

Segment Leq : 58.45 dBA

Results segment # 3: Holland (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 56.87 + 0.00) = 56.87 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  65.72   0.00  -8.85   0.00   0.00   0.00   0.00
56.87
-------------------------------------------------------------------------
---

Segment Leq : 56.87 dBA

Total Leq All Segments: 66.47 dBA

Results segment # 1: Scott EB (night)
-------------------------------------

Source height = 1.63 m

ROAD (0.00 + 57.51 + 0.00) = 57.51 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90      0   0.00  63.67   0.00  -3.15  -3.01   0.00   0.00   0.00
57.51
```

```
-------------------------------------------------------------------------
---

Segment Leq : 57.51 dBA

Results segment # 2: Scott WB (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 50.85 + 0.00) = 50.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90      0   0.00  58.12   0.00  -4.26  -3.01   0.00   0.00   0.00
50.85
-------------------------------------------------------------------------
---

Segment Leq : 50.85 dBA

Results segment # 3: Holland (night)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 49.27 + 0.00) = 49.27 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  58.12   0.00  -8.85   0.00   0.00   0.00   0.00
49.27
-------------------------------------------------------------------------
---

Segment Leq : 49.27 dBA

Total Leq All Segments: 58.86 dBA

RT/Custom data, segment # 1: LRT (day/night)
--------------------------------------------
1 - 4-car SRT:
Traffic volume    :   545/61    veh/TimePeriod
Speed             :    80 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  62.00 / 62.00  m
```

```
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Results segment # 1: LRT (day)
------------------------------

Source height = 0.50 m

RT/Custom (0.00 + 55.46 + 0.00) = 55.46 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90      0   0.00  64.64  -6.16  -3.01   0.00   0.00   0.00  55.46
-------------------------------------------------------------------------

Segment Leq : 55.46 dBA

Total Leq All Segments: 55.46 dBA

Results segment # 1: LRT (night)
--------------------------------

Source height = 0.50 m

RT/Custom (0.00 + 48.96 + 0.00) = 48.96 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90      0   0.00  58.14  -6.16  -3.01   0.00   0.00   0.00  48.96
-------------------------------------------------------------------------

Segment Leq : 48.96 dBA

Total Leq All Segments: 48.96 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.80
                           (NIGHT): 59.29
```

```
STAMSON 5.0        NORMAL REPORT        Date: 27-10-2021 19:00:34
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: east.te              Time Period: Day/Night 16/8 hours
Description:  Daytime and nighttime sound levels at the East façade,
facing Parkdale Avenue, prediction location [C]

Road data, segment # 1: Scott EB (day/night)
----------------------------------------------
Car traffic volume  : 19430/1690  veh/TimePeriod  *
Medium truck volume :  1104/96    veh/TimePeriod  *
Heavy truck volume  :  1546/134   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  24000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   5.00
    Heavy Truck  % of Total Volume     :   7.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Scott EB (day/night)
------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  47.00 / 47.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Road data, segment # 2: Scott WB (day/night)
----------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
```

```
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Scott WB (day/night)
-------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  54.00 / 54.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Road data, segment # 3: Parkdale (day/night)
-------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 3: Parkdale (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 110.00 / 110.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Results segment # 1: Scott EB (day)
-----------------------------------

Source height = 1.63 m
```

```
ROAD (0.00 + 63.31 + 0.00) = 63.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
     0     90   0.00  71.28   0.00  -4.96  -3.01   0.00   0.00   0.00
63.31
-------------------------------------------------------------------------
---

Segment Leq : 63.31 dBA

Results segment # 2: Scott WB (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.14 + 0.00) = 57.14 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
     0     90   0.00  65.72   0.00  -5.56  -3.01   0.00   0.00   0.00
57.14
-------------------------------------------------------------------------
---

Segment Leq : 57.14 dBA

Results segment # 3: Parkdale (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 55.30 + 0.00) = 55.30 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  63.96   0.00  -8.65   0.00   0.00   0.00   0.00
55.30
-------------------------------------------------------------------------
---

Segment Leq : 55.30 dBA

Total Leq All Segments: 64.77 dBA
```

```
Results segment # 1: Scott EB (night)
-------------------------------------

Source height = 1.63 m

ROAD (0.00 + 55.70 + 0.00) = 55.70 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
     0     90   0.00  63.67   0.00  -4.96  -3.01   0.00   0.00   0.00
55.70
-------------------------------------------------------------------------
---

Segment Leq : 55.70 dBA

Results segment # 2: Scott WB (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 49.54 + 0.00) = 49.54 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
     0     90   0.00  58.12   0.00  -5.56  -3.01   0.00   0.00   0.00
49.54
-------------------------------------------------------------------------
---

Segment Leq : 49.54 dBA

Results segment # 3: Parkdale (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 47.71 + 0.00) = 47.71 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  56.36   0.00  -8.65   0.00   0.00   0.00   0.00
47.71
-------------------------------------------------------------------------
---

Segment Leq : 47.71 dBA
```

```
Total Leq All Segments: 57.16 dBA

RT/Custom data, segment # 1: LRT (day/night)
-----------------------------------------
1 - 4-car SRT:
Traffic volume    :   545/61    veh/TimePeriod
Speed             :    80 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  81.00 / 81.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Results segment # 1: LRT (day)
------------------------------
Source height = 0.50 m

RT/Custom (0.00 + 54.30 + 0.00) = 54.30 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     0     90   0.00  64.64  -7.32  -3.01   0.00   0.00   0.00  54.30
-------------------------------------------------------------------------

Segment Leq : 54.30 dBA

Total Leq All Segments: 54.30 dBA

Results segment # 1: LRT (night)
--------------------------------
Source height = 0.50 m

RT/Custom (0.00 + 47.80 + 0.00) = 47.80 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     0     90   0.00  58.14  -7.32  -3.01   0.00   0.00   0.00  47.80
-------------------------------------------------------------------------

Segment Leq : 47.80 dBA

Total Leq All Segments: 47.80 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.14
                           (NIGHT): 57.64
```

```
STAMSON 5.0        NORMAL REPORT        Date: 27-10-2021 19:00:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: south.te             Time Period: Day/Night 16/8 hours
Description:   Daytime and nighttime sound levels at the south façade,
prediction location [D]

Road data, segment # 1: Holland (day/night)
-------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Holland (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 130.00 / 130.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Road data, segment # 2: Parkdale (day/night)
--------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
```

```
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Parkdale (day/night)
------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 116.00 / 116.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  72.00 m
Reference angle           :   0.00

Results segment # 1: Holland (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 53.33 + 0.00) = 53.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90      0   0.00  65.72   0.00  -9.38  -3.01   0.00   0.00   0.00
53.33
-------------------------------------------------------------------------
---

Segment Leq : 53.33 dBA

Results segment # 2: Parkdale (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 52.06 + 0.00) = 52.06 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
     0     90   0.00  63.96   0.00  -8.88  -3.01   0.00   0.00   0.00
52.06
-------------------------------------------------------------------------
---

Segment Leq : 52.06 dBA

Total Leq All Segments: 55.75 dBA
```

```
Results segment # 1: Holland (night)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 45.73 + 0.00) = 45.73 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90      0   0.00  58.12   0.00  -9.38  -3.01   0.00   0.00   0.00
45.73
-------------------------------------------------------------------------
---

Segment Leq : 45.73 dBA

Results segment # 2: Parkdale (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 44.47 + 0.00) = 44.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
     0     90   0.00  56.36   0.00  -8.88  -3.01   0.00   0.00   0.00
44.47
-------------------------------------------------------------------------
---

Segment Leq : 44.47 dBA

Total Leq All Segments: 48.16 dBA

RT/Custom data, segment # 1: LRT (day/night)
--------------------------------------------
1 - 4-car SRT:
Traffic volume    :   545/61    veh/TimePeriod
Speed             :    80 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  55.00 / 55.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
```

```
Elevation                 :  72.00 m
Reference angle           :   0.00

Results segment # 1: LRT (day)
------------------------------

Source height = 0.50 m

RT/Custom (0.00 + 58.99 + 0.00) = 58.99 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  64.64  -5.64   0.00   0.00   0.00   0.00  58.99
-------------------------------------------------------------------------

Segment Leq : 58.99 dBA

Total Leq All Segments: 58.99 dBA

Results segment # 1: LRT (night)
--------------------------------

Source height = 0.50 m

RT/Custom (0.00 + 52.49 + 0.00) = 52.49 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  58.14  -5.64   0.00   0.00   0.00   0.00  52.49
-------------------------------------------------------------------------

Segment Leq : 52.49 dBA

Total Leq All Segments: 52.49 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.68
                           (NIGHT): 53.85
```

```
STAMSON 5.0        NORMAL REPORT        Date: 27-10-2021 19:01:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ola2.te              Time Period: 16 hours
Description:  Daytime sound levels at the 2nd floor outdoor terrace,
prediction location [E] with minimum 1.1 m high solid parapet

Road data, segment # 1: Scott EB
--------------------------------
Car traffic volume  : 19430 veh/TimePeriod  *
Medium truck volume :  1104 veh/TimePeriod  *
Heavy truck volume  :  1546 veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Scott EB
--------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  21.00 m
Receiver height           :   1.50 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.10 m
Elevation                 :   4.00 m
Barrier receiver distance :   3.00 m
Source elevation          :   0.00 m
Receiver elevation        :   4.00 m
Barrier elevation         :   4.00 m
Reference angle           :   0.00

Road data, segment # 2: Scott WB
--------------------------------
Car traffic volume  :  9715 veh/TimePeriod  *
Medium truck volume :   773 veh/TimePeriod  *
Heavy truck volume  :   552 veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: Scott WB
--------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  28.00 m
Receiver height           :   1.50 m
```

```
Topography                 :      4       (Elevated; with barrier)
Barrier angle1             : -90.00 deg   Angle2 : 90.00 deg
Barrier height             :   1.10 m
Elevation                  :   4.00 m
Barrier receiver distance  :   3.00 m
Source elevation           :   0.00 m
Receiver elevation         :   4.00 m
Barrier elevation          :   4.00 m
Reference angle            :   0.00

Results segment # 1: Scott EB
------------------------------

Source height = 1.63 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.63 !        1.50 !        0.95 !         4.95

ROAD (0.00 + 64.67 + 0.00) = 64.67 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  71.28   0.00  -1.46   0.00   0.00   0.00  -5.15
64.67
-------------------------------------------------------------------------
---

Segment Leq : 64.67 dBA

Results segment # 2: Scott WB
------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.07 !         5.07

ROAD (0.00 + 58.00 + 0.00) = 58.00 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
```

```
   -90     90   0.00  65.72   0.00  -2.71   0.00   0.00   0.00  -5.01
58.00
-------------------------------------------------------------------------
---

Segment Leq : 58.00 dBA

Total Leq All Segments: 65.52 dBA

RT/Custom data, segment # 1: LRT
--------------------------------
1 - 4-car SRT:
Traffic volume    :   545 veh/TimePeriod
Speed             :    80 km/h

Data for Segment # 1: LRT
-------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  51.00 m
Receiver height           :   1.50 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.10 m
Elevation                 :   8.00 m
Barrier receiver distance :   3.00 m
Source elevation          :   0.00 m
Receiver elevation        :   8.00 m
Barrier elevation         :   8.00 m
Reference angle           :   0.00

Results segment # 1: LRT
------------------------

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        1.50 !        0.97 !         8.97

RT/Custom (0.00 + 54.23 + 0.00) = 54.23 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  64.64  -5.31   0.00   0.00   0.00  -5.10  54.23
-------------------------------------------------------------------------
```

```
Segment Leq : 54.23 dBA

Total Leq All Segments: 54.23 dBA

TOTAL Leq FROM ALL SOURCES:       65.83
```

```
STAMSON 5.0        NORMAL REPORT        Date: 27-10-2021 19:01:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ola2m.te             Time Period: 16 hours
Description:    Daytime sound levels at the 2nd floor outdoor terrace,
prediction location [E], with mitigation (2.5 m high solid
barrier/parapet)

Road data, segment # 1: Scott EB
--------------------------------
Car traffic volume  : 19430 veh/TimePeriod  *
Medium truck volume :  1104 veh/TimePeriod  *
Heavy truck volume  :  1546 veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Scott EB
------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  21.00 m
Receiver height           :   1.50 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   2.50 m
Elevation                 :   4.00 m
Barrier receiver distance :   3.00 m
Source elevation          :   0.00 m
Receiver elevation        :   4.00 m
Barrier elevation         :   4.00 m
Reference angle           :   0.00

Road data, segment # 2: Scott WB
--------------------------------
Car traffic volume  :  9715 veh/TimePeriod  *
Medium truck volume :   773 veh/TimePeriod  *
Heavy truck volume  :   552 veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: Scott WB
------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  28.00 m
```

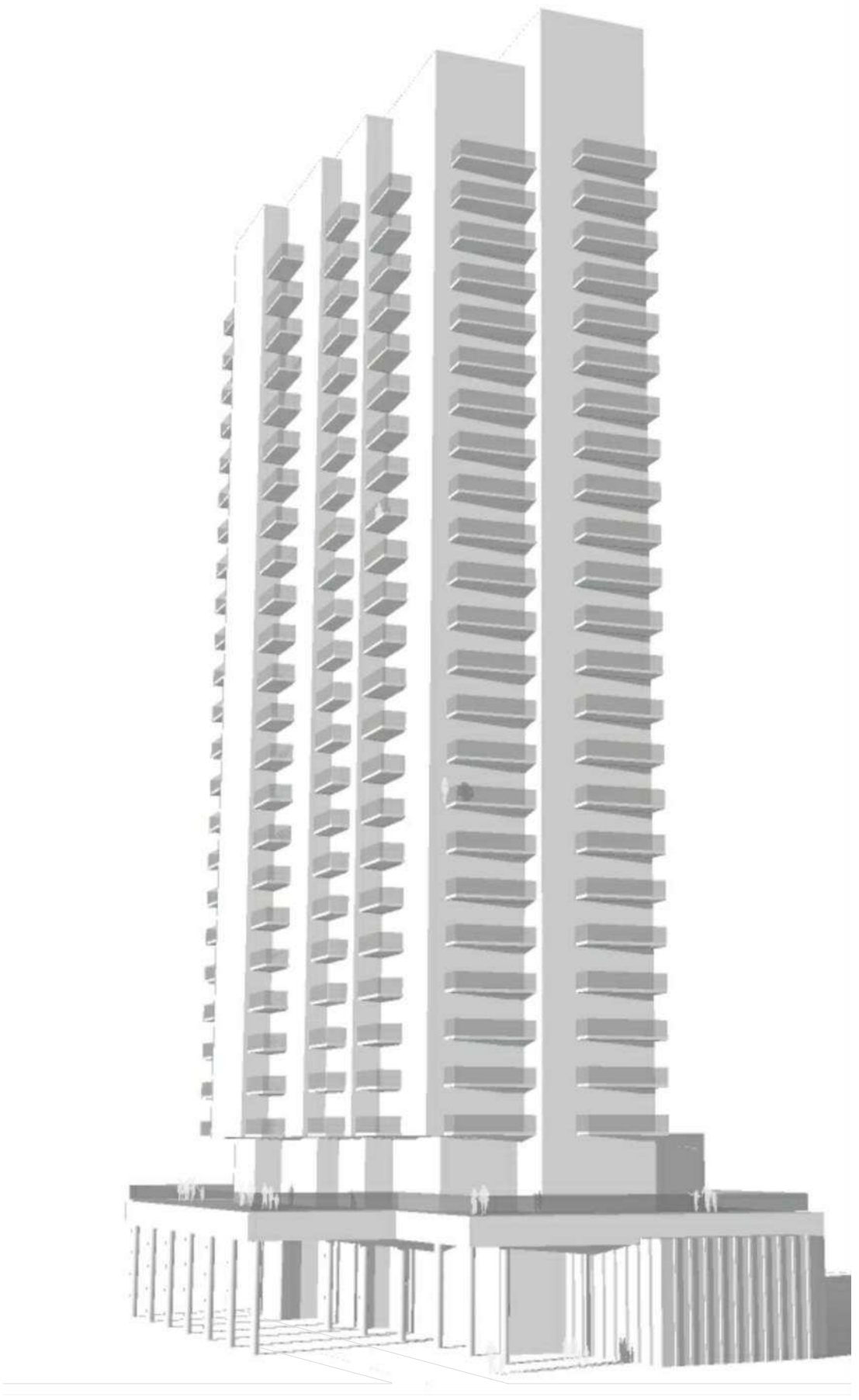
```
Receiver height           :   1.50 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   2.50 m
Elevation                 :   4.00 m
Barrier receiver distance :   3.00 m
Source elevation          :   0.00 m
Receiver elevation        :   4.00 m
Barrier elevation         :   4.00 m
Reference angle           :   0.00

Results segment # 1: Scott EB
------------------------------

Source height = 1.63 m

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.63 !        1.50 !        0.95 !         4.95

ROAD (0.00 + 58.71 + 0.00) = 58.71 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  71.28   0.00  -1.46   0.00   0.00   0.00 -11.11
58.71
-------------------------------------------------------------------------
---

Segment Leq : 58.71 dBA

Results segment # 2: Scott WB
------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.07 !         5.07

ROAD (0.00 + 52.48 + 0.00) = 52.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
```

```
-------------------------------------------------------------------------
---
   -90     90   0.00  65.72   0.00  -2.71   0.00   0.00   0.00 -10.53
52.48
-------------------------------------------------------------------------
---

Segment Leq : 52.48 dBA

Total Leq All Segments: 59.64 dBA

RT/Custom data, segment # 1: LRT
--------------------------------
1 - 4-car SRT:
Traffic volume    :   545 veh/TimePeriod
Speed             :    80 km/h

Data for Segment # 1: LRT
-------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  51.00 m
Receiver height           :   1.50 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   2.50 m
Elevation                 :   8.00 m
Barrier receiver distance :   3.00 m
Source elevation          :   0.00 m
Receiver elevation        :   8.00 m
Barrier elevation         :   8.00 m
Reference angle           :   0.00

Results segment # 1: LRT
------------------------

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        1.50 !        0.97 !         8.97

RT/Custom (0.00 + 48.56 + 0.00) = 48.56 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  64.64  -5.31   0.00   0.00   0.00 -10.76  48.56
```

```
-------------------------------------------------------------------------------

Segment Leq : 48.56 dBA

Total Leq All Segments: 48.56 dBA

TOTAL Leq FROM ALL SOURCES:       59.96
```

Appendix D

Supporting Drawings



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40 St. Clair Avenue East, Suite 303
Toronto, ON M4T 1M9
office@tcarchitecture.ca
647-352-3350

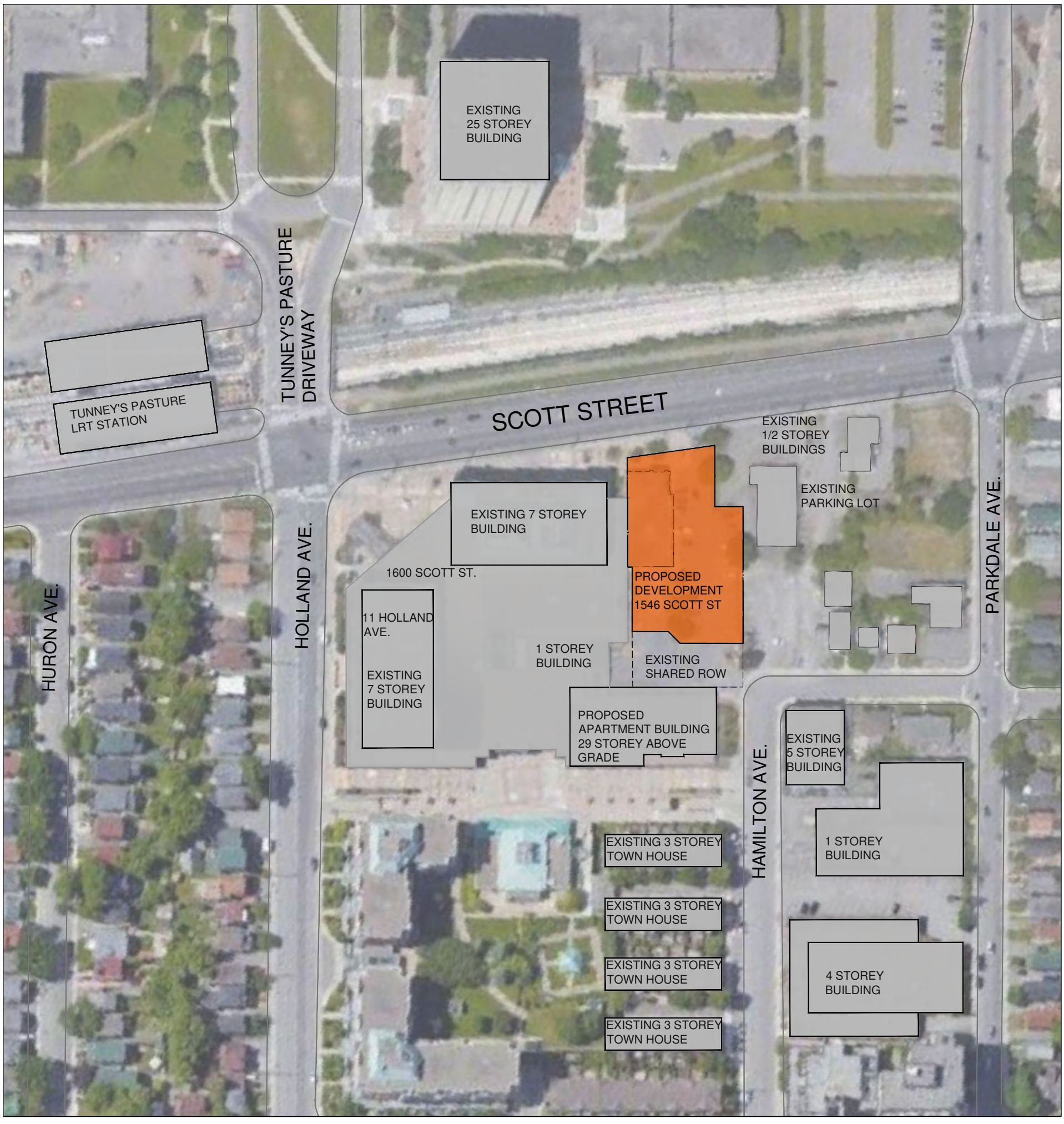
1546 SCOTT STREET
OTTAWA

APRIL 20, 2021

PARKING	
LEVEL	PARKING SPACES
F1	12
P1	29
P2	57
P3	57
TOTAL	155

AREAS			
LOT AREA	2,525 m²		
FSI	6.02		
LEVEL	AREA	SELLABLE	GFA
P1	2,254 m²	0	0
P2	2,254 m²	0	0
P3	1,110 m²	0	0
F1	846 m²	261 m²	261 m²
F2	1,411 m²	0	0
TOWER LEVELS	750 m²	650 m²	650 m²
SUITES AVG	10/FLOOR	65 m²/SUITE	230 SUITES
F3-F25	17,250 m²	14,950 m²	14,950 m²
TOTAL	25,124 m²	15,211 m²	15,211 m²

SITE INFORMATION



CONTEXT PLAN

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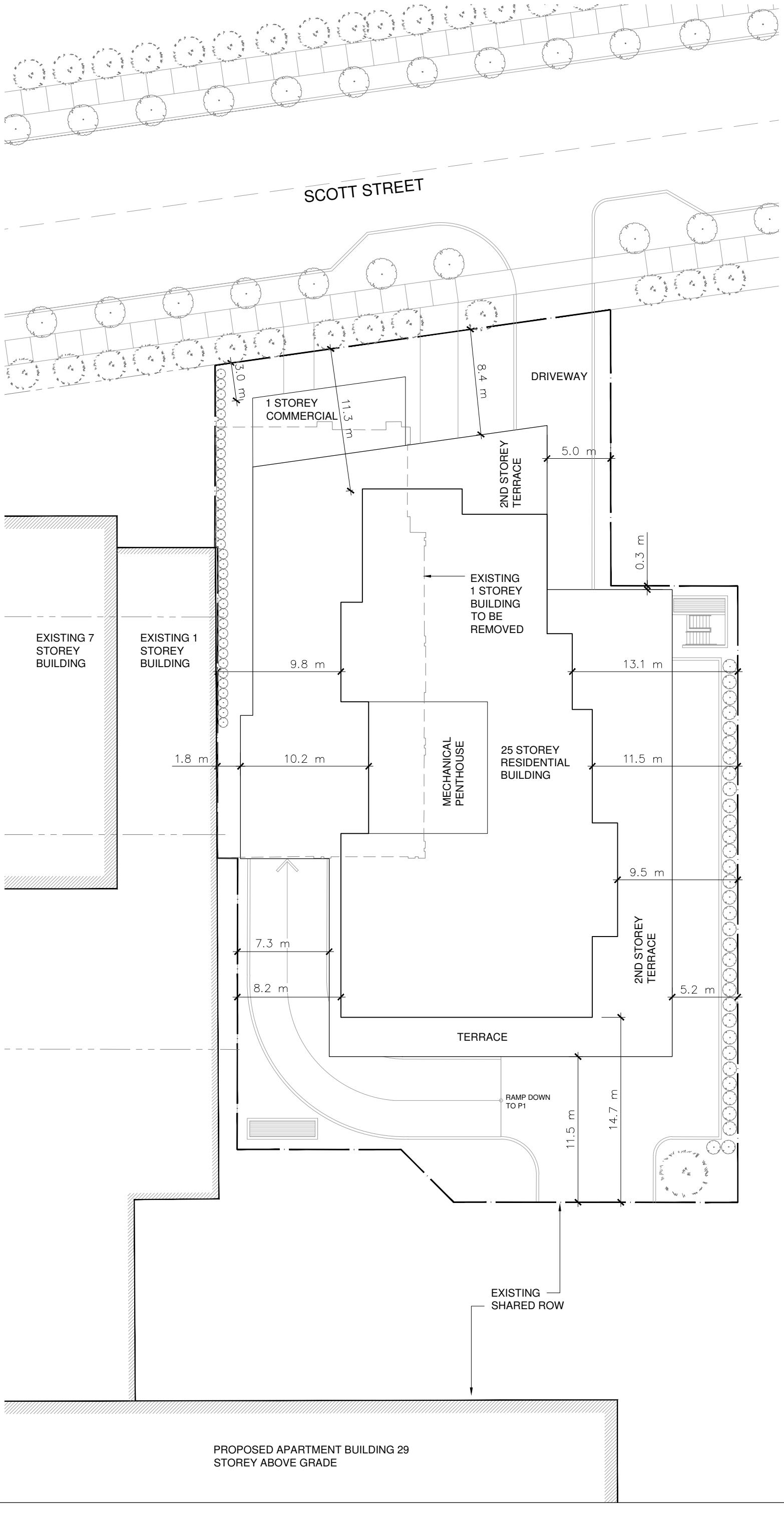
647-352-3350

1546 SCOTT STREET
OTTAWA

CONTEXT PLAN
SCALE: 1:1500
DATE: APRIL 20, 2021



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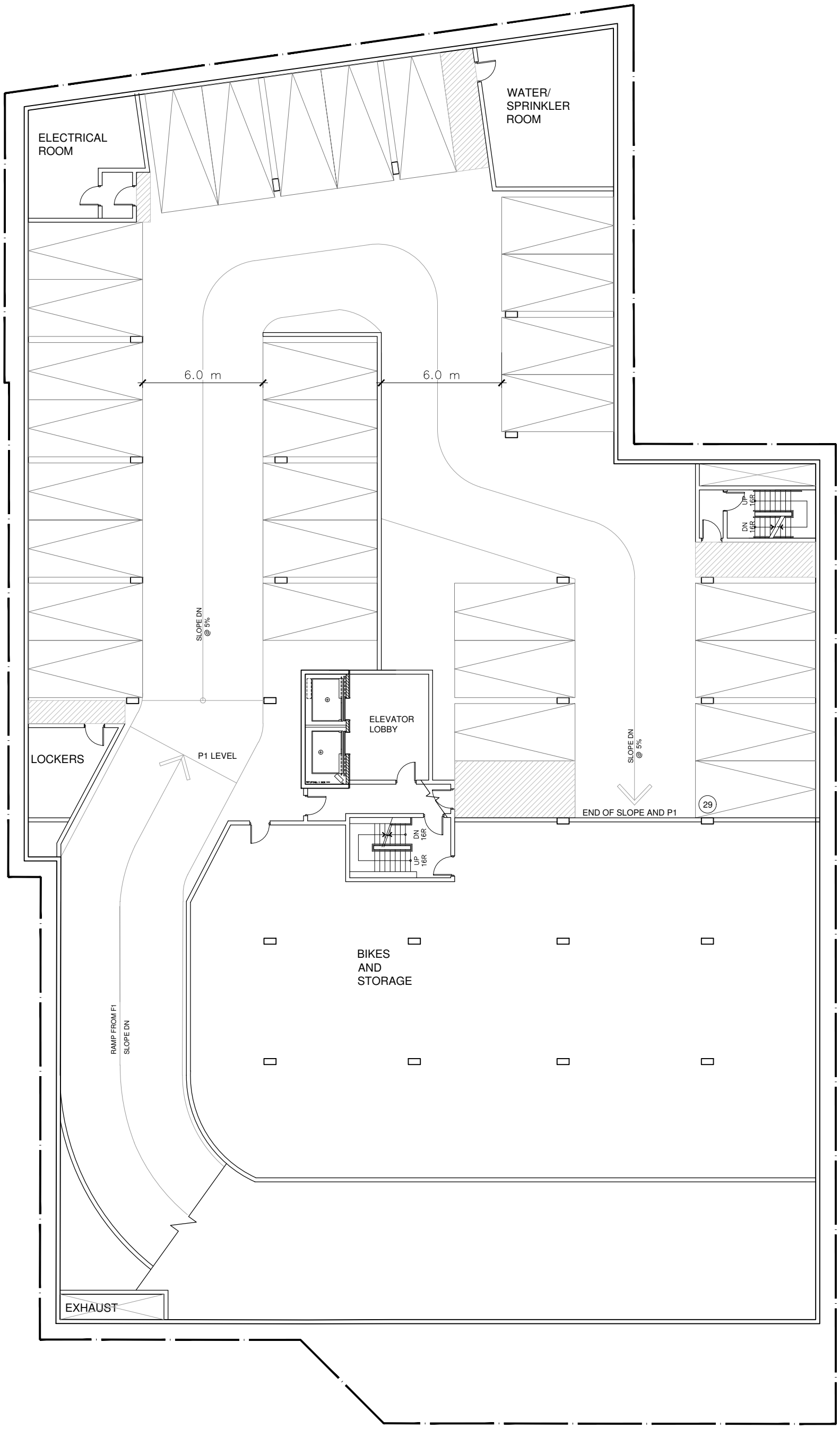
1546 SCOTT STREET
OTTAWA

SITE PLAN

SCALE: 1:300

DATE: APRIL 20, 2021



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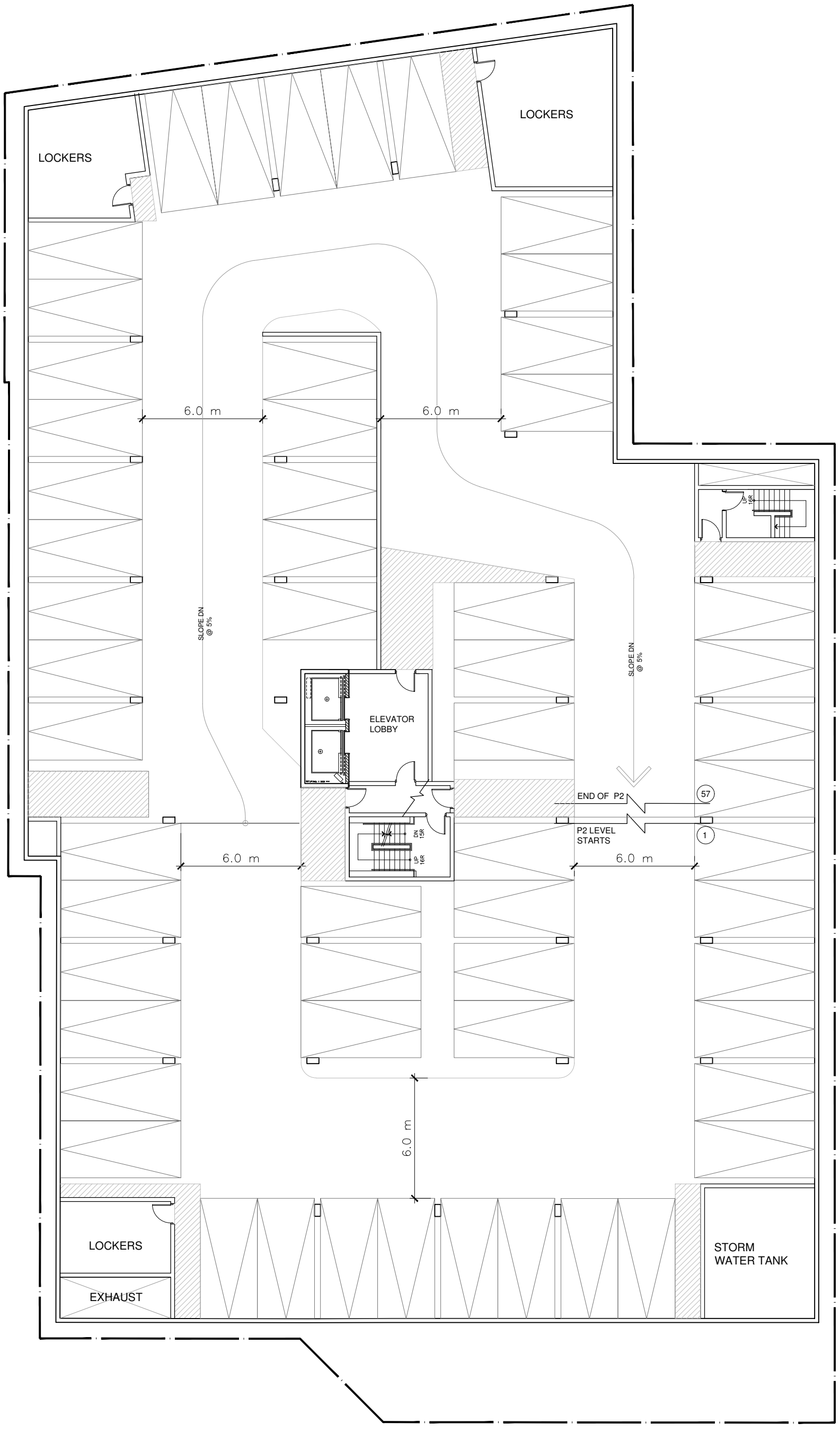
1546 SCOTT STREET
OTTAWA

P1

SCALE: 1:200

DATE: APRIL 20, 2021



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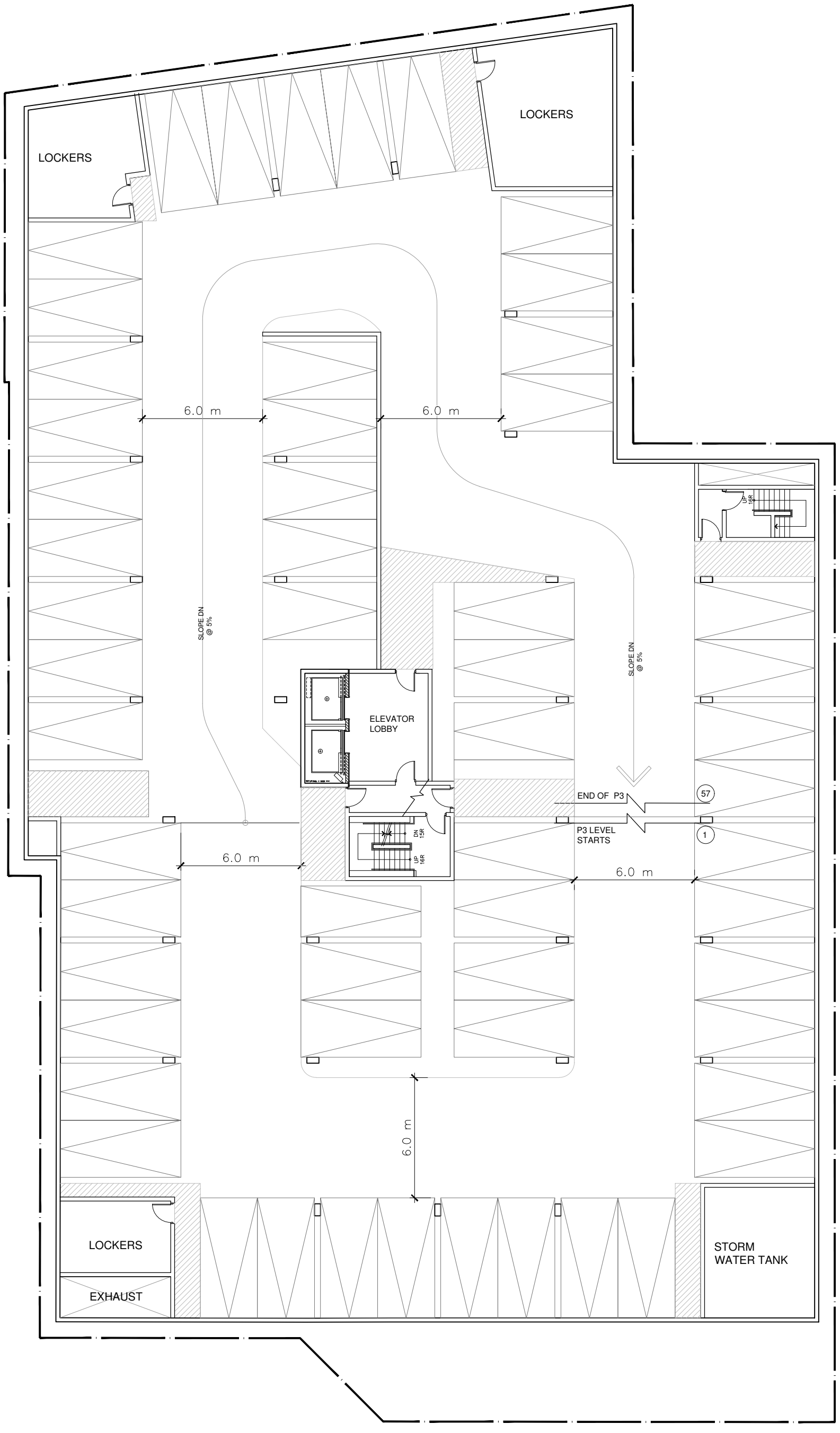
1546 SCOTT STREET
OTTAWA

P2

SCALE: 1:200

DATE: APRIL 20, 2021



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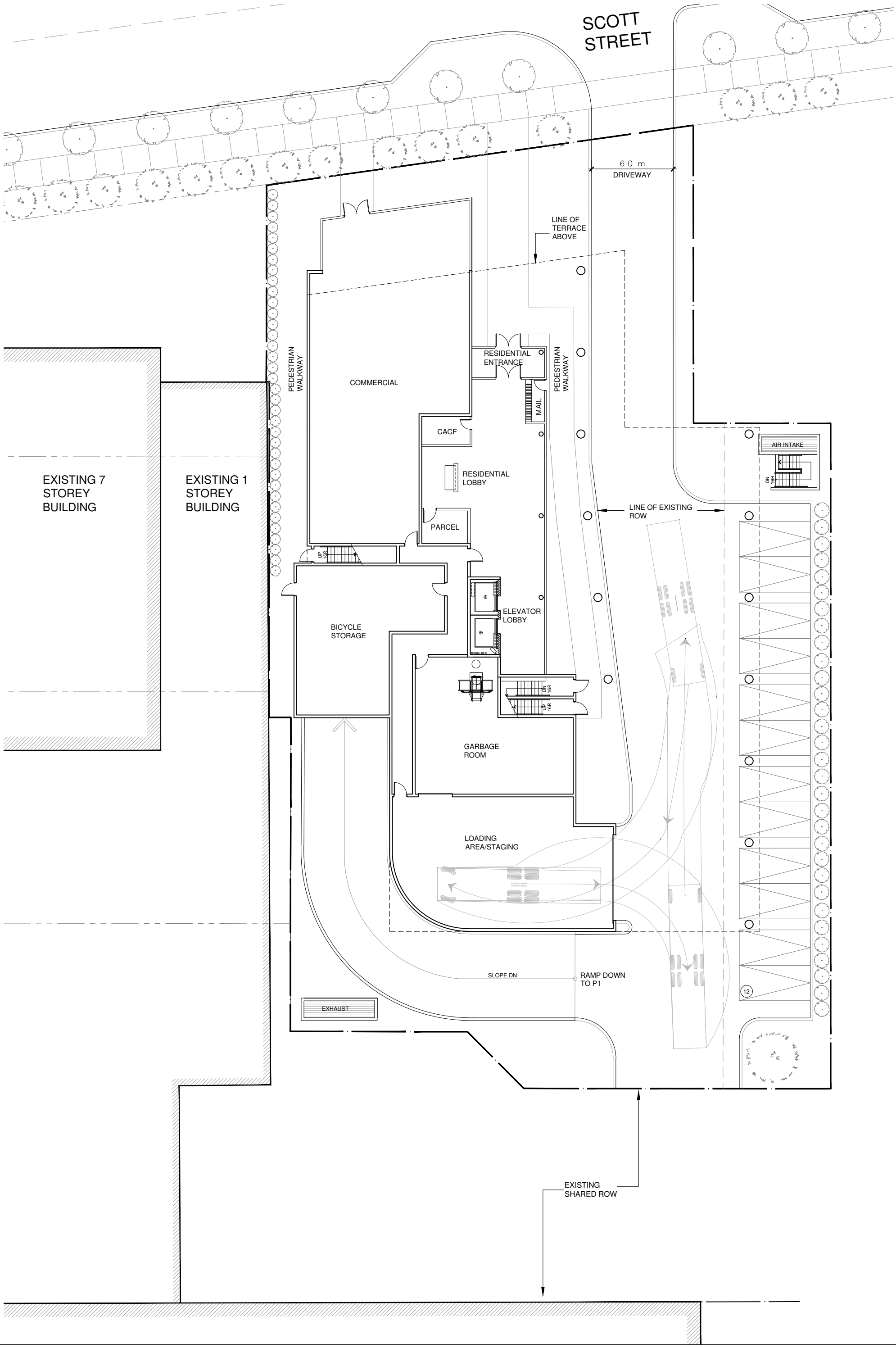
1546 SCOTT STREET
OTTAWA

P3

SCALE: 1:200

DATE: APRIL 20, 2021



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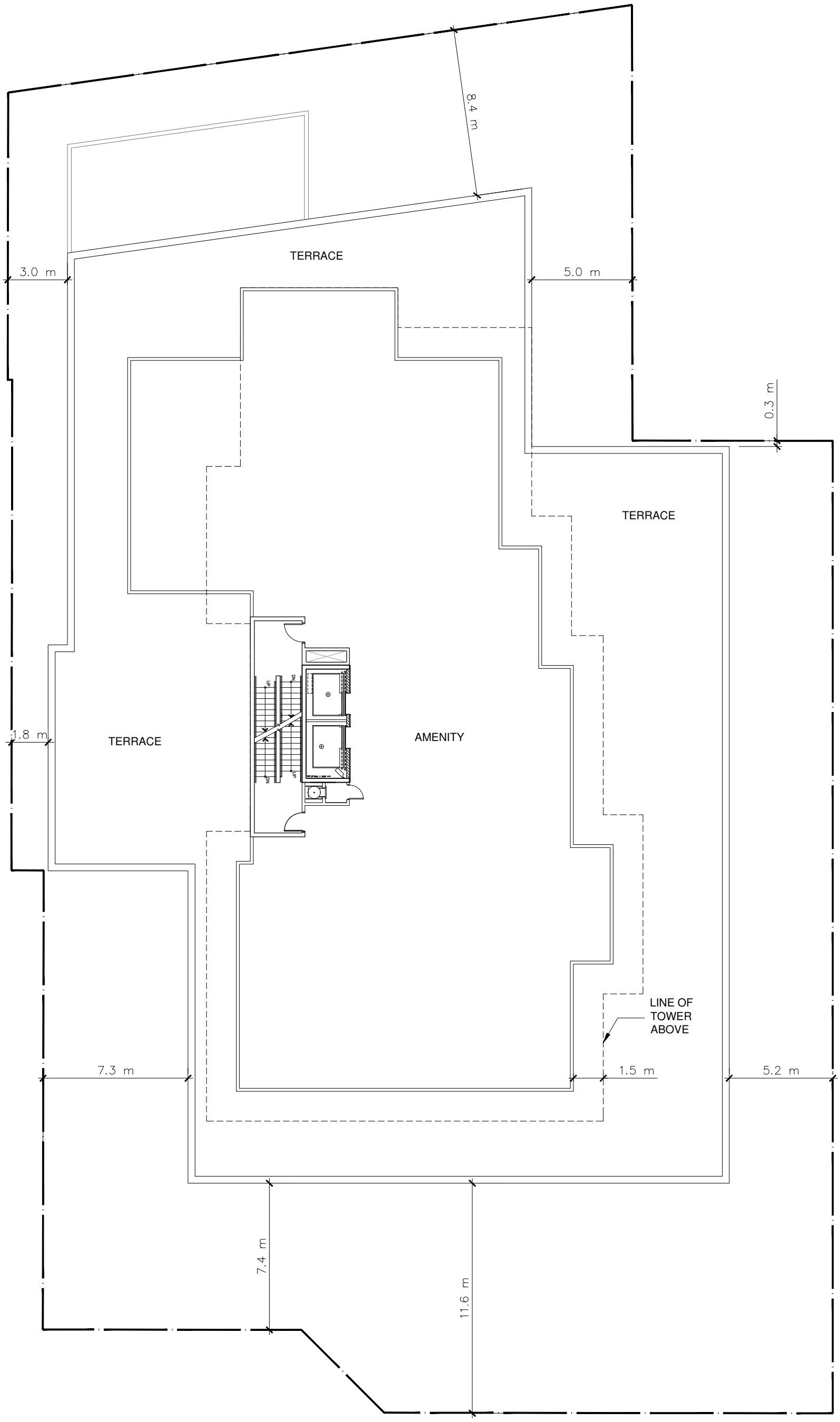
1546 SCOTT STREET
OTTAWA

F1

SCALE: 1:250

DATE: APRIL 20, 2021



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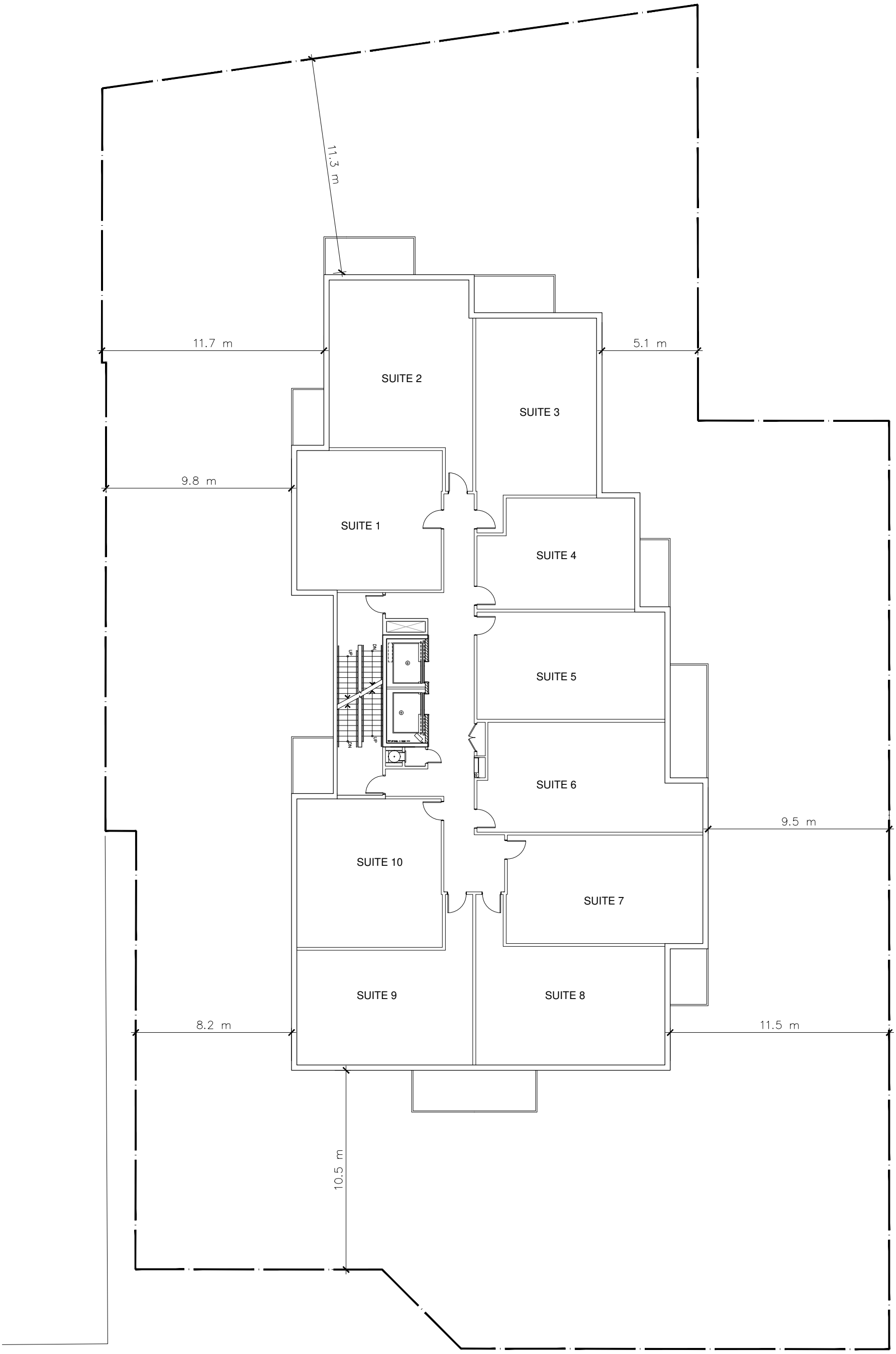
1546 SCOTT STREET
OTTAWA

F2

SCALE: 1:200

DATE: APRIL 20, 2021



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647-352-3350

1546 SCOTT STREET
OTTAWA

F3-F25 PLAN

SCALE: 1:200

DATE: APRIL 20, 2021

Sample Glass Parapets for Rooftop Terrace in Mississauga

HGC ENGINEERING

Howe Gastmeier Chapnik Limited
2000 Argentia Road, Plaza One, Suite 203
Mississauga, Ontario, Canada L5N 1P7
t: 905.826.4044

December 22, 2021

Agile Response Consulting Limited (ARC)
on behalf of Reid's Heritage Properties
85 Bathurst Street, Unit D,
Waterloo, ON N2V 1Z5

Re: Vibration Feasibility Study, Proposed Mixed-Use Development, 1546 Scott Street, Ottawa, Ontario

Dear Cameron,

Introduction

Howe Gastmeier Chapnik Limited (HGC Engineering) was retained by Agile Response Consulting Limited (ARC) to conduct a vibration feasibility study due to the nearby LRT to determine its impact on a proposed mixed-use development located at 1546 Scott Street in Ottawa, Ontario. The development site is at the south side of Scott Street, east of Holland Ave and west of Parkdale Ave and north of Bullman Street, specifically at 1546 Scott Street. The analysis includes an assessment of the effect of vibration due to the nearby LRT on the proposed development in accordance with the Ministry of the Environment, Conservation and Parks (MECP) and the City of Ottawa guidelines. The study is required by the City of Ottawa as part of the planning and approvals process. This letter is an addendum to our latest noise report entitled, "Noise Feasibility Study, Proposed Mixed-Use Development, 1546 Scott Street, Ottawa, Ontario" dated October 27, 2021.

Rail induced ground-borne vibration was measured at the approximate location of the future mixed-use building at one location, during several LRT pass-by events. The measured ground-borne vibration levels did not exceed the guidelines at the location of the closest façade, approximately 53 m from the LRT right-of-way. Further details are presented below.

Description of the Site

A key plan is provided in Figure 1. The site is at the south side of Scott Street, east of Holland Ave and west of Parkdale Ave and north of Bullman Street, specifically at 1546 Scott Street. The proposed development will include one 25-storey residential building, three levels of underground parking, a ground level commercial use, third floor amenity, with residential uses from levels 3 to 25 and a rooftop mechanical penthouse.

Immediately north of the site is Scott Street which is a five lane roadway, two lanes eastbound and three lanes westbound. To the north of Scott Street is a sidewalk and the LRT tracks which are in a

cut of approximately 6 – 7 m.

The LRT line is operated by OC Transpo. The LRT line terminates at Tunney's Pasture station located to the northwest of Holland Avenue and Scott Street. The proposed mixed-use/residential building is located within 75 m of the LRT right of way. HGC Engineering personnel visited the site on December 15, 2021 in order to conduct ground-borne vibration measurements.

Ground-borne Vibration from LRT Traffic

The City of Ottawa requested the assessment of vibration due to the LRT as per their proximity guidelines.

Vibration is typically measured in terms of oscillatory velocity or acceleration. The railway guidelines typically recommend that ground-borne vibration be limited to a vibratory velocity of 0.14 mm/s (-17 dB) between 4 and 200 Hz. The railway limits are also presented as a curve of maximum allowable vibratory acceleration versus frequency. The railway criteria have been overlaid on the graph of the measured vibration for easy reference.

Vibration Impact

The railways require an assessment of ground-borne vibration through measurement if building foundations are to be located within 75 metres of a railway right-of-way.

Measurements of ground-borne vibration due to the LRT were conducted at one location, approximately 53 m from the LRT right-of-way. A Svantek 977 Sound Level Meter with a Wilcoxon Research type 793V velocity transducer was used. The graphical results are attached. Levels of each LRT passbys were not above the vibration levels of the area due to traffic, such as cars and trucks.

Vibration levels are below the railway limit of 0.14 mm/s at the closest façade of the mixed-use building, approximately 53 m from the LRT railway right-of-way. Thus, vibration mitigation measures are not required for the proposed development.

We trust this information is sufficient for your present purposes. Please do not hesitate to contact us if you have any questions or concerns.

Yours truly,
Howe Gastmeier Chapnik Limited

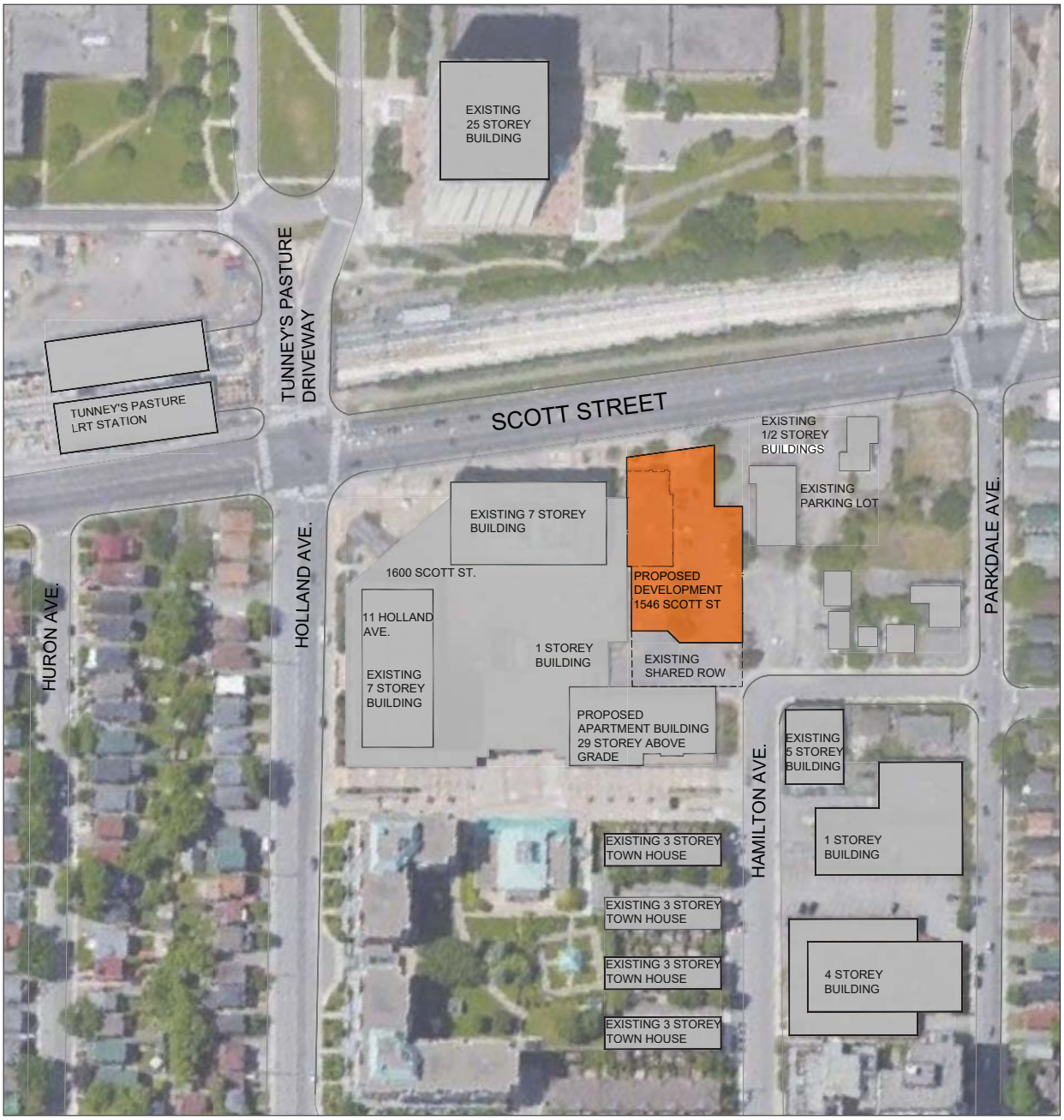
LICENSED PROFESSIONAL ENGINEER
S. PAUL
PROVINCE OF ONTARIO

Sheeba Paul, MEng, PEng

PARKING	
LEVEL	PARKING SPACES
F1	12
P1	29
P2	57
P3	57
TOTAL	155

AREAS			
LOT AREA	2,525 m²		
FSI	6.02		
LEVEL	AREA	SELLABLE	GFA
P1	2,254 m²	0	0
P2	2,254 m²	0	0
P3	1,110 m²	0	0
F1	846 m²	261 m²	261 m²
F2	1,411 m²	0	0
TOWER LEVELS	750 m²	650 m²	650 m²
SUITES AVG	10/FLOOR	65 m²/SUITE	230 SUITES
F3-F25	17,250 m²	14,950 m²	14,950 m²
TOTAL	25,124 m²	15,211 m²	15,211 m²

SITE INFORMATION



CONTEXT PLAN

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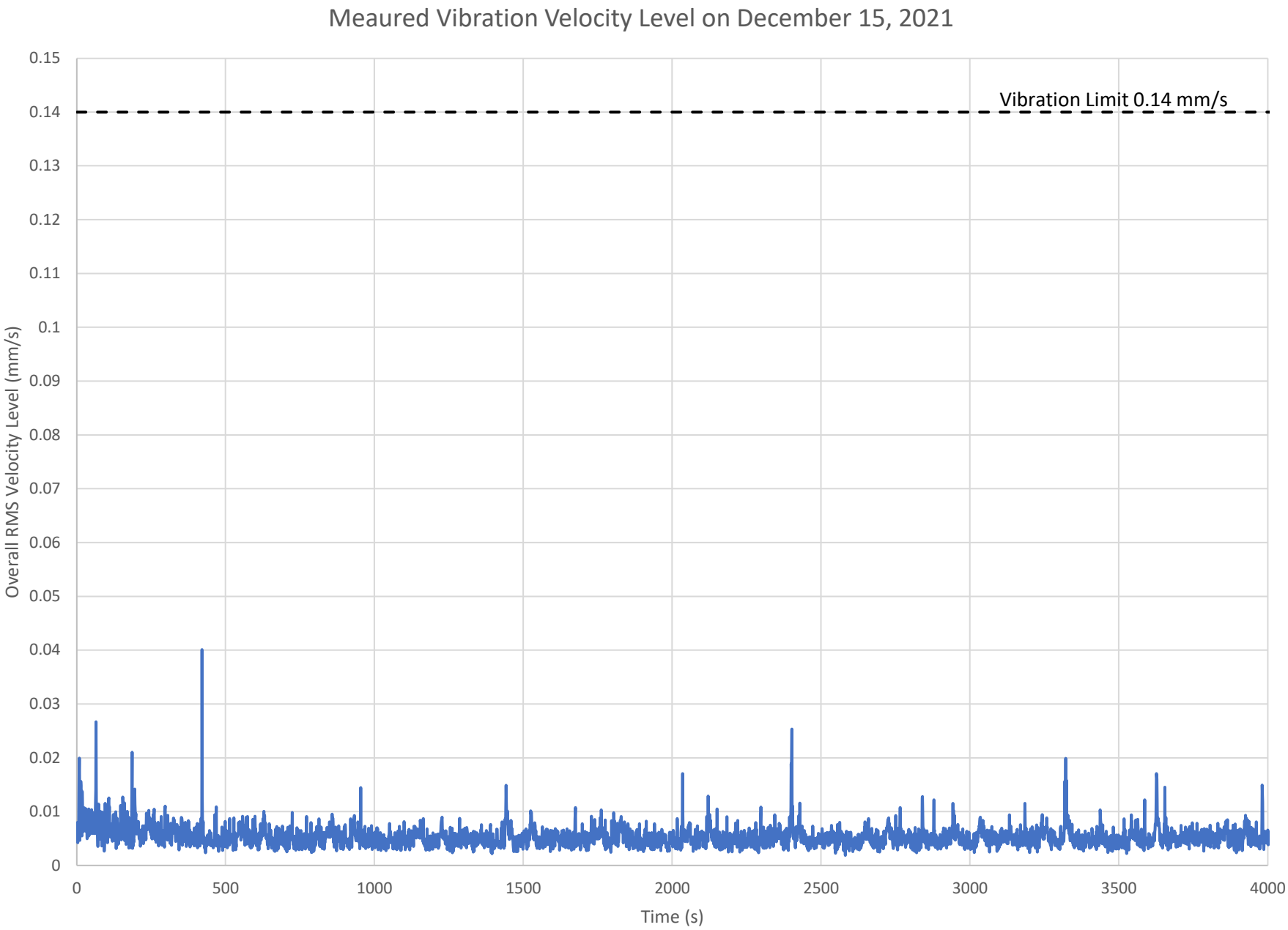
647-352-3350

1546 SCOTT STREET
OTTAWA

CONTEXT PLAN
SCALE: 1:1500
DATE: APRIL 20, 2021

Figure 1 - Context Plan

Figure 2:


Meaured Vibration Velocity Level on December 15, 2021
Vibration Limit 0.14 mm/s
Overall RMS Velocity Level (mm/s)
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
500
1000
1500
2000
2500
3000
3500
4000
Time (s)

APPENDIX B

Geotechnical Investigation

Prepared By Yuri Mendez Engineering

Report Number 47-CEI-R2[1] Dated May 10, 2022

Subsurface Investigation Report

1546 Scott St., Ottawa, ON, K1Y 4S8

Abstract

This report presents the findings of a Subsurface Investigation completed at the 1546 Scott St. parcel, in the City of Ottawa, ON, K1Y 4S8, and issue recommendations for a proposed Highrise Building with 3 to 4 Levels of Underground Parking development. It provides technical information about the subsurface conditions at 14 borehole locations compiled from field sampling and testing and a subsequent laboratory testing program of soils. The majority of the site was found to be of shallow bedrock conditions. Moderately hard to hard limestone bedrock was cored to a 13.4 m depth at 2 borehole locations. The borehole locations are shown in figure 2 in page 11. The information reviewed also includes readily available geologic information from the Geological Survey of Canada (GSC) and local climate data from Environment Canada.

Yuri Mendez M. Eng., P. Eng.

For:
Evoke Developments Ottawa GP Corp.

Report number: 47-CEI-R2[1]
May 10, 2022

Yuri Mendez
Engineering

196 Britannia Road
Ottawa, On. K2B 5W9

PO Box 74087
RPO Beechwood
Ottawa, ON, K1M 2H9

Phone: 613-899-0834
e-mail: yuri@ymendez.ca

[1]For the account of Evoke Developments Ottawa GP Corp. (EDO) and subject to the user agreement in page 25

Report 47-CEI-R2
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Contents

1 Executive Summary

Yuri Mendez Engineering was retained by COLESTAR Environmental Inc. acting on behalf of Starbank Developments 2000 Corp. to conduct a geotechnical site investigation of the site located at 1546 Scott Street in Ottawa, Ontario. The geotechnical site investigation was carried out to establish geotechnical related design parameters for the construction of a high rise building (25 to 30 stories) complete with a three to four level underground parking garage.

The investigation found that the three to four levels of underground parking will be advanced through 1.1 to 2.9 m of overburden soils and limestone bedrock to the approximate founding depth. The bedrock was found to be moderately hard to hard, slowly permeable and of fair to excellent quality. Water level measurements also completed as part of the investigation suggest that the permanent water table is at approximately 8.7 m depth.

The investigation findings are indicative that the proposed high rise building can be founded on spread and/or strip footings placed on undisturbed bedrock, that water proofing will be required and that rock excavations could be advanced through nearly vertical rock cuts using heavy ripping equipment or blasting.

2 Introduction

This document reports the findings of a subsurface investigation completed at 1546 Scott St., in the City of Ottawa, ON, K1Y 4S8, located just west from downtown Ottawa, ON as shown in the key plan in fig.1 in page 8 and having extents and geometry shown in figure 2 in page 11. The geotechnical materials in Ottawa and the surrounding areas are largely influenced by a history of glaciation, glacio-fluvial activity and the Champlain Sea. Common overburden materials include clay, very sensitive silty clay, till, boulder till, clean sand and silty sand overlying sedimentary rocks. Igneous and metamorphic rocks are also present. Organic materials have also influenced numerous soil deposits.

The investigation was carried out by advancing 12 boreholes through overburden soils and bedrock and using other exploration techniques for characterization of bedrock for engineering purposes. The information compiled from the exploration and sampling and testing completed in the boreholes and a subsequent laboratory testing program of soils and rock is to assist in the design and construction of a proposed Highrise Building with 3 to 4 Levels of Underground Parking development. The information reviewed also includes readily available geologic information from the Geological Survey of Canada (GSC), and local climate data from Environment Canada.

3 Report Organization

The body of this report and its appendices constitute the entire report. The discussion presented under sections in the body may refer to further information

Figure 1: Key Plan

and/or background and/or details in the appendices. The reader is responsible of reviewing the information in the appendices. Other references may be presented as footnotes.

Future revisions to this report will be referred to as "47-CEI-R#", where # is the consecutive number of the revision. Additions and/or alterations and/or inclusions to the information provided in this report at the request of any institution and/or body with authority to request the additions and/or alterations and/or inclusion will be provided in a separate "Response to " (RT) section at the end of the report, before the appendices. The RT section shall state the section that is added and/or altered, the name of the person making the request and the reason. The section altered and or portions added will be provided in full as a subsection of the RT section. Any subsection added under the RT section will be considered a replacement to the original section.

Part I
Investigation

4 Sampling and Testing

The field and laboratory program set out in our proposal dated August 11, 2020, is guided by the following standards and documents:

- ASTM D 420-98 Standard Guide to Site Characterization for Engineering Design and Construction Purposes,
- ASTM D5434 - 12 Standard Guide for Field Logging of Subsurface Explorations of Soil and Rock,
- ASTM D1586 - 11 Standard Test Method for Standard Penetration Test

(SPT) and Split-Barrel Sampling of Soils,

- ASTM D2113 - 14 Standard Practice for Rock Core Drilling and Sampling of Rock for Site Exploration;

- United States. Soil Conservation Service., United States. Department of Agriculture. (1985). Chapter 4: Engineering Classification of Rock Materials. In National engineering handbook. Washington, D.C.: U.S. Dept. of Agriculture, Soil Conservation Service .

- Method C of ASTM D7012-14 Standard Test Methods for Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying States of Stress and Temperatures.

The investigation was carried out by advancing 12 testholes on July, 02, 03 and 09. Two holes were existing for a total of 14 holes. The test hole locations are shown in the test-hole location plan in figure 2 in page 11. The laboratory testing, soil sampling and field testing at each location are shown in the soil profile testing and sampling logs (BH) in the appendices.

Twelve of the 14 holes at this site, namely, Monitoring Wells 1 to 6 (MWs 1 to 6), MWs 9 to 11 and Boreholes 12 to 14 (BHs 12 to 14) were completed in coordination with Colestar Environmental Inc. to meet geotechnical and environmental purposes. It is understood that O-MW-8 and O-MW-9 were completed previously at the site for environmental purposes. Water level measurements in O-MW-8 and O-MW-9 are used in this report for groundwater assessments.

For bedrock properties and for proving bedrock depth, 2 of the 12 holes, namely, MW-3 and 9 were cored to a 13.4 m depth, 7 of the 12 holes, namely MWs 1, 2, 4, 5, 6, 10 and 11 were advanced to auger refusal and further advanced using a truck mounted compressed air percussion hammer for installation of monitoring wells which were checked for hammer resistance and speed of advance to confirm bedrock. Bedrock depth proving at BHs 12 to 14 is by auger refusals. Other engineering assessments for rock were performed on hand samples using a hammer with pick end and a pocket knife.

The ASTM D1586 tests were completed using an “auto safety” hammer rated at 60% energy.

The program also included an elevation survey referenced to an elevation of 100 m assigned arbitrarily to the catch basin located on the east side of the existing building (TBM) shown in the Test Hole Locations Plan in fig. 2 in page 11.

The program included in addition a laboratory review of samples recovered from the field and one sample submitted to a local laboratory to investigate soluble ions concentration, PH and resistivity.

Note that all references to elevations in this report are with respect to the TBM.

Part II
Findings

5 Physical Settings, Strata and Topography

The site is to the west of downtown Ottawa, ON as shown in Fig.1 in page 8. As can be seen in fig. 2 in page 11 the site is presently occupied by a one storey building of slab on grade construction and its parking areas. The site and its surrounding areas are relatively flat. A one storey portion and one level of underground parking of the building to the west abut the west boundary line. Rough field measurements suggest an approximately 2.2 m founding depth for this underground parking as measured from the top of the sidewalks on the perimeter of the existing Beer Store building. The reminder boundaries are surrounded by parking areas and access lanes.

The geology data base by Belanger J. R. 1998 suggests 2 to 5 m of overburden soils underlain by Limestone bedrock at this site.

6 Surface and Subsurface Materials

The site is underlain by shallow bedrock at depths ranging from 1.1 to 2.9 m depth. Approximately 10 cms of asphalt cover overburden materials consisting on the pavement base of granular materials and fill. The fill mostly consists of *dense* mixed sand, silty sand and gravel overlying rock or glacial till. *Dense* glacial till consisting of silty sand with gravel was encountered in 3 boreholes ranging in thickness of 0.5 to 1 m between overburden fill and shallow bedrock.

6.1 Bedrock

6.1.1 Rock Material Properties

The following properties are confirmed within the framework of the referenced chapter 4 from the field program.

6.1.1.1 Rock Type

The field program confirmed the sedimentary Limestone bedrock reported by the geology data base.

6.1.1.2 Hardness

The Unconfined Compressive Strength (UCS) represents the hardness range which may assist assessments for design and construction. The details of six UCS tests completed in samples extracted during the field program are shown in appendix C.1. The UCS of rock often exhibit significant scatter. Averaging schemes at comparable depths appear best suited in many instances, as similar

Figure 2: Test hole Locations Plan

depths may represent similarity in terms of weathering processes such as exposure to oxygen and the chemistry of water, overburden pressure, etc. In other instances assessments under discontinuities in section 6.1.2 may also influence the averaging scheme. The averaging scheme per depth below along with other assessments appear feasible for the conditions of the bedrock encountered.

1. At approximately 2 m depth at MW3, 39 MPa UCS was measured. A suitable UCS sample at similar depth could not be obtained at MW-9. The bedrock is thus of the *"moderately hard"* hardness class. Refer to subsection 6.1.2 "Jointing" for further comments.

2. At depth ± 6.5 m UCS values were 19.9, 44.0, 101.0 at MW-3 RC4 and MW-9 RC4 and RC5 respectively for an average of 55 MPa. The bedrock is thus of the *"hard"* hardness class. Refer to subsection 6.1.2 "Jointing" for further comments.

3. At depth ± 13.1 m UCS values were 51.7 and 91.2 at MW-3 RC8 and MW-9 RC8 respectively for an average of 71 MPa. The bedrock is thus of the *" hard"* hardness class. Refer to subsection 6.1.2 "Jointing" for further comments.

From the results, the general hardness class range is *"moderately hard to hard"* and it appears to be increasing with depth.

6.1.1.3 Density

Density of $2,870 kg/m^3$ was determined within the framework of UCS tests.

6.1.1.4 Weathering

In this terminology moderately weathered is rock recognizable as such through the mass but with portions that have lost the original mechanical properties. Weathering is thus in connection with jointing only in the sense that jointing may have favor more exposure to weathering processes but jointed bedrock is not necessarily highly weathered. Within the highly jointed and fractured top 0.25 m of the first core run the rock is *moderately weathered* in both holes cored. The bedrock is otherwise jointed and fresh beneath this depth. The UCS at 39 MPa at MW3 located at approximately 0.6 m below the top of the bedrock confirm jointed unweathered rock at that depth.

6.1.1.5 Color

The bedrock is dark gray in color as seen in fresh breaks. The rock has light gray to gray appearance when exposed due to the action of the drill.

6.1.2 Rock Mass Structural Discontinuities (Jointing and Fractures)

Jointing visible in rock cores would be those that could intercept the vertical shaft formed by the cores. Near vertical joints will not be properly detected by

the cores. The dip orientation on a horizontal plane. cannot be determined on rock cores, however, they can provide a rough idea of their inclination.

6.1.2.1 Jointing, Joint Orientation and Joint Density

Systematic near horizontal bedding plane partings type of joints were found through the rock cores. Their joint spacing category varies from *close* within 0.3 m of the top of the cores to *wide* near the bottom of the cores. Joint spacing beneath the 0.3 m weathered portion increase rapidly as reveled by Rock Quality Designations (RQDs) within the 50 to 75 *fair* rock quality found on the first 2 core runs (RC1 and RC2) in both holes cored. Generally, Joint spacing between 50 to 80 mm could be found within 2.5 m of the top of the bedrock but it is in general at 100 to 600 mm spacing within that 2.5 m portion and wider at greater depths. The rock quality thus varies between *fair to excellent* from the top to the bottom of the coring depth under the RQD scheme.

Aperture Width: The aperture width less than 2 mm in width found is of the *extremely narrow* aperture category class for the majority of the profile.

Infilling: Infilling in the form of clay or other materials does not appear present from the rock cores.

6.1.2.2 Comments on Structural Discontinuities

Limestone bedrock in Ottawa often exhibit a tendency to break in nearly horizontal planes. These planes are not visible. The near horizontal jointing that is also found in limestone in Ottawa and at this site as well is thought to be related to the presence of these nearly horizontal weak planes. Applied blows with the pick end of a hammer produced near horizontal fractures on hand samples which confirms this tendency for the bedrock at this site.

6.1.3 Additional Rock Properties

Additional rock properties include seismic velocity, joint face weathering and primary or secondary cavities. Cavities were not present in the hand or core samples.

6.1.3.1 Seismic Velocity

The shear wave velocity is estimated to be within the range of 2,000 to 2,300 m/sec as judged from seismic refraction tests completed in rocks of similar properties in Ottawa. The seismic velocity of the bedrock is correlated to the excavatability of bedrock and has a direct impact in earthquake design accelerations when measured directly with seismic tests.

6.1.3.2 Joint Face Weathering

Joint faces are fresh, unweathered.

6.1.4 Comments on Bedrock Properties

Rock materials are suitable for a multitude of engineering purposes, including bearing to support structures. The physical and mechanical properties of bedrock and other properties of bedrock described in this section are intended to serve the purposes of engineering and construction. Of particular interest for design and construction are: the excavatability, the rock mass stability, the permeability and its construction quality for different applications such as rockfill, aggregates, etc.

6.2 Groundwater and Moisture

The water level was measured on July 09 and 20, 2020 in wells installed in all of the holes at depths ranging from 4.05 and 11.3 m and shown in the borehole logs. Ground water measurements in well installations often require numerous assessments in combination with borehole data.

In the borehole logs, a 91.44 m elevation of the water table is presented as interpreted from measurements. This value is an overall estimation of the elevation for the relatively flat site and lead to an average depth of 8.76 m measured from the holes surface. For its estimation, the depths measured at MWs 4 and 6 were filtered out and is more influence by the measurements of July 20, 2020.

The overburden soils are relatively dry. Perched water in overburden soils does not appear present at the site.

6.3 Freezing Index, Frost Depth and Frost Susceptibility

It is generally assumed that the frost depth for the 1,000 degree Celsius-days freezing index applicable to Ottawa will reach no deeper than 1.8 m on bare ground (snow free) or pavement. It is also assumed that frost depth will reach no deeper than 1.5 m on snow covered ground.

The native soil materials encountered at this site are frost susceptible and thus will heave upon exposure to freezing temperatures. Heaving destroys the mechanical properties of soils so that any soil which has been frozen is considered disturbed.

The limestone bedrock encountered at this site is not frost susceptible. It will not loose its properties upon exposure to freezing temperatures.

Part III
Recommendations

The following set of the recommendations result from sampling and testing outlined in section 4 and from geotechnical engineering evaluation and assessments.

It is understood that the proposed development will consist of a Highrise Building with 3 to 4 Levels of Underground Parking.

7 Foundations General

This investigation findings indicate that the underground parking of the proposed Highrise Building with 3 to 4 Levels of Underground Parking will be advanced through bedrock. The proposed OBC part 4 building can thus be founded on spread footings placed on the bedrock encountered at the proposed founding depth.

7.1 Load and Resistance Factors

For the purpose of computations related to the service (SLS) and strength limits (ULS) note:

- A resistance factor is applied to the computed or estimated (nominal) bearing resistance from field or lab tests to obtain the strength limit for factored loads (ULS). The value of the resistance factor is stated for each option.
- An average load factor of 1.5 is assumed to compute the service limit (SLS).

7.2 Bearing Capacity of Strip and/or Pad Footings

For the properties and assessments of bedrock cores set forth under section 6.1.1, RQDs and UCS shown in the borehole logs, the service limit (SLS) bearing capacity below represent a fraction of 0.14 of the allowable bearing capacity suggested by Peck[2] et al. (1974) which can be used for design of the proposed spread footings placed on the bedrock encountered at the proposed founding depth. An average load factor of 1.5 is assumed for the bearing capacity for factored loads (ULS).

- 4.4 MPa at service limit (SLS).
- 6.6 MPa for factored loads (ULS).

For canopies or other structures which may be required on the perimeter of the building, pad footings up to 2 m wide or strip footings up to 0.9 m wide placed on an undisturbed near surface jointed un-weathered bedrock surface the bearing capacities below can be considered.

- 200 KPa at service limit (SLS).
- 300 kPa for factored loads (ULS).

[2]Peck, Ralph B. & Hanson, Walter Edmund. & Thornburn, Thomas Hampton. (1974). Foundation engineering. New York : Wiley

For canopies or other structures which may be required on the perimeter of the building, pad footings up to 2 m or strip footings up to 0.9 m wide placed on an undisturbed glacial till surface the bearing capacities below can be considered.

- 150 KPa at service limit (SLS).
- 225 kPa for factored loads (ULS).

7.3 Settlements

For the bearing capacities provided above settlement of foundations on bedrock will be 1.5 to 2.5 mm.

7.4 Frost Protection for Foundations

Shallow foundations on frost susceptible which may be required on the perimeter of the building for canopies or other structures are considered to be frost protected when placed at sufficient depth to prevent supporting soils from freezing. Foundations in the perimeter of heated buildings where snow is not cleared are considered frost protected at 1.5 m depth (as having a soil cover of 1.5 m). Foundations away from heated buildings or in areas where snow is cleared, need to be at about 1.8 m depth to be frost protected. On the alternative frost protection can be provided by using foundation insulation for shallower foundations.

7.5 Foundation Insulation

To meet the required frost protection in section 7.4 for foundations for canopies or other structures in the perimeter of the building and in unheated areas in otherwise heated buildings 50 mm of extruded polystyrene insulation (XPS) type V, VI or VII meet foundation insulation requirements for the freezing index in the Ottawa area.

7.6 Basement Waterproofing

For the subsurface conditions encountered hydrostatic pressure will build up along the perimeter of the underground parking of the building. Waterproofing is thus required.

The waterproofing system should be such to seal the building envelope by:

- grouting bedrock joints along the perimeter of the building to a height 2 m above the ground water table;
- providing a blind side waterproofing (or tanking) system such as Preprufe Plus® or similar as specified by the manufacturer;
- providing waterproof concrete;
- providing one or more sealed sumps and pumps inside the building and drainage to catch any water which may breach the waterproofing system.

8 Site Class for Seismic Design

The Shear Wave Velocity ($Vs_{(30)}$) 30 m beneath the proposed founding depth will exceed 360 m/s. As such, site class C is assigned under the provisions in section 4.1.8.4 of the Ontario Building Code 2012 (OBC 2012) for seismic design.

Site classes A or B will be applicable for buildings founded on the rock encountered, however OBC 2012 requires confirmation of the seismic velocity via a seismic test for assignment of classes A or B. The site class along with the natural period of buildings will define the magnitude of the sideways acceleration induced by earthquakes and it varies substantially in different regions of Canada. This confirmation is highly recommended before structural design.

It is hence recommended to refer to the following information in appendix B.1:

1. The 2010 National Building Code Seismic Hazard Calculation for the *reference site* in page 44.

2. Figure 3 in page 43 showing the design spectral accelerations.

9 Bedrock

Assessment of the properties outlined in section 6.1.1 under the framework of chapter 4 referenced in section 4 lead to the following recommendations.

9.1 Excavatability of Rock

As stated in the referenced guide the *excavatability class* is based on rock properties and the 12^{th} edition of Caterpillar's handbook of ripping (CH). The equipment flywheel horse power FWHP considered under the guide is often less than the equipment FWHP rating in the CH cited in the guide which appear related to the fact that the guide indicates the minimum FWHP, however, it is noted here that there is a portion below the point in which the material is non rippaable for the equipment in which performance is only marginal. The selection here is thus to minimize the marginal portion for the equipment selected and not the minimum non-rippable-marginally rippable.

By hardness, seismic velocity and strength the bedrock is of the *" hard ripping to blasting"* class. Excavation can thus be completed via adequate equipment an/or line drilling and blasting.

Adequate equipment is defined as heavy ripping equipment with a rear-mounted, heavy duty, single-tooth, ripping attachment mounted on a track type tractor having a power rating of at least 400 FWHP.

The use of hoe rammers is also feasible depending on the scale and quantities of rock excavation. Rock excavation based solely in hoe rammers are not generally an option for large quantities of rock.

The presence of jointing and weaker bedding plane partings of nearly horizontal orientation noted under section 6.1.2 will be a consideration for excabatability. In rock with nearly horizontal bedding, the bedding planes will favor break along those planes, however, ripping equipment will offer no control of the location of breaks along vertical planes. In tight urban environments, control of the location of the vertical planes of breakage will need to be implemented by other means if ripping equipment is considered.

Refer to the construction recommendations in section 16 for other recommendations for rock excavations.

9.2 Rock Mass Stability

For the strength, hardness, jointing and RQD the bedrock is of the *"stable"* class. Nearly vertical cuts are thus technically feasible.

9.3 Permeability of Rock

For the *extremely narrow* rock mass discontinuities and *wide* joint spacing class below the estimated water table elevation the rock is of the *"slowly permeable"* class. The permeability is thus estimated in the proximity of $5x10^{-}8m/s$

9.4 Construction Quality of Rock

For the 19.9 and 101 MPa UCS range *"moderately hard to hard"* hardness class and 2,870 kg/m^3 unit weight the rock is of the *"medium to high grade"* construction quality class. "Rock material is suitable for high-stress aggregate, filter and drain material, riprap, and other applications."

10 Roadbed Soils and Pavement Structure

Generally, for low volume roads, the pavement structure to be placed on native soils or engineered roadbed at this site may consist of 400 mm of OPSS granular B, 150 mm of OPSS Granular A and up to 75 mm of asphalt.

For parking lots, pavement structure to be placed on native soils or engineered roadbed at this site may consist of 300 mm of OPSS granular B, 150 mm of OPSS Granular A and 50 mm of asphalt. This thicknesses will vary depending on expected traffic at different locations.

Additional information regarding pavements will be provided as part of this report if required.

11 Excavations, Open Cuts, Trenches and Safety

Typically, the main concern when excavating soils or rock is the stability of the sides of excavations. The stability of the sides is achieved by either cutting the

sides to safe slopes or by providing shoring. It is also an issue of safety because of imminent hazards to the safety of workers and to property. As such, excavations are governed by the provisions in the Occupational Health and Safety Act of Ontario (O. Reg. 213/91). The application of O. Reg. 213/91 requires a classification of soils in one or several of four types (type I to type IV). At this site for all excavations to the depth of the top of the bedrock, soils can be considered type II under O. Reg. 213/91 and type 1 for excavations through the bedrock. As such, the following key aspects of O. Reg. 213/91 are applicable to this site:

1. For excavations up to depth of the top of the bedrock (soil types II):
    - Safe open cut is 1 vertical to 1 horizontal.
    - Within 1.2 m of the bottom of open cut areas or trenches, the soil can be cut vertical.
2. For excavations through the bedrock (soil types I):
    - Safe open cut is vertical.
3. Where the safe open cut in item 1 is not provided, either the shoring systems described in O. Reg. 213/91 or engineered shoring systems need be used.

Information regarding physical and mechanical properties of subsurface materials which will be required for shoring design are provided in this report.

11.1 Conditions Requiring Engineered Shoring

O. Reg. 213/91 describe the conditions in which engineered shoring systems are required. Some key aspects of O.Reg. 213/91 regarding the conditions in which an engineered shoring system is required are:

- Where soils are type I to III and the prescribed safe open cuts are not provided and
    - The excavation is not a trench or
    - The excavation is a trench either deeper than 6 m or wider than 3.6 m or both
- For trench excavations or open cut, where soils are type IV and the safe open cuts are not provided.

Note that along with the descriptions in O. Reg. 213/91 for soils type IV, any difficult soil having significant seepage and/or strength loss upon excavation such as caving soils can be rendered as type IV.

Note also that since excavation and safety are usually in control of the contractor, *shoring design and construction is done by the contractor.*

11.2 Construction and Excavation Along Adjacent Structures and Property Boundaries

Significant concerns regarding safety and property damage result from excavations along adjacent structures. O. Reg. 213/91 under "*Protection of Adjacent Structures*" establishes the following for excavations near adjacent structures:

- 229. (1) If an excavation may affect the stability of an adjacent building or structure, the constructor shall take precautions to prevent damage to the adjacent building or structure. O. Reg. 213/91, s. 229 (1).
- 229. (2) A professional engineer shall specify in writing the precautions required under subsection (1). O. Reg. 213/91, s. 229 (2).
- 229 (3) Such precautions as the professional engineer specifies shall be taken. O. Reg. 213/91, s. 229 (3).
- any comment and/or precaution and/o recommendation in this report is followed.

This section establishes the precautions required under O. Reg. 213/91 section 229 (2) above.

Excavation depths below the founding depth of adjacent structures will not take place, unless:

- Lateral support is provided to soils by cutting the slope to 1 horizontal to 1 vertical or
- lateral support is provided by shoring.
- any comment and/or precaution and/o recommendation in this report is followed.

It is also recommended that the edge of the 1 horizontal to 1 vertical slope providing lateral support be offset 0.3 m away from the edge of the foundation.

11.3 Comments on Excavations and Protection of Adjacent Structures

It is to be noted that since excavations and safety are controlled by the contractor, the design of shoring and structures to protect neighboring buildings are done by the contractors. This report is to provide recommendations for the excavations and information which will assist in the design of those structures.

The investigation findings suggests that there will be 0.8 to 2.9 m of overburden soils which will need to be cut to acceptable slopes or shored up. The bedrock could be cut vertical according to the findings in the boreholes.

Abutting the west boundary line, there is one level of underground parking and one storey above which appears to extend along the entire length of that boundary line according to rough measurements completed inside the said

underground parking. The following scenarios could be considered for the conditions along the west boundary line subject to confirmations which will be completed at a later time:

1. that the building is founded on the bedrock;
2. that the building is founded on soils.

For scenario 1, the uncertainty remains about the capacity of the bedrock to bear the loads along the edge of the potential rock cut to be completed. To overcome this uncertainty, the installation of rock dowels prior to rock excavations or any other type of reinforcement can be considered to ensure safety for this structure. Dowels should be such to intercept any potential failure planes. Dowels that are inclined downward to the west at 25 degrees and that extend 4.5 m in length are thought to be capable of intercepting failure planes from what is found in this investigation. Assumptions for the design of dowels could be such to consider conservatively *smooth* failure planes. The properties reported here, along with the assumption of smooth planes appear to meet the requirements of the relationship in Spang and Egger (1990)[3] for rock dowels design.

For scenario 2, the soils will need to shored up and the bedrock will have to be provided with similar reinforcement.

12 Water Inflow Within Excavations and Water Takings

Water inflow within excavations in soils is influenced by the depth of excavations relative to the water table and flow behavior of water in soils as controlled by the permeability of soils. Because of the assessments under sections 6 and 6.2 and information seen in the borehole logs, water inflow is expected to be low and controllable by pumping from open sumps.

12.1 Water Takings and Permits

Water takings from the environment, including groundwater in excavations, are regulated under Ontario Water Resources Act, R.S.O. 1990, c. O.40. (OWRA). The OWRA is enforced by the Ministry of Environment (MOE). Under the OWRA. a Permit to Take Water (PTTW) is required for pumping from excavations exceeding 400 cubic meters per day. Along with the consideration of ground water from excavations, PTTW applications require in addition the consideration of precipitation. The excavations at this site are subject to OWRA and this section is intended to provide criteria indicative of whether a PTTW may be required or not.

Given the size (area) of the proposed excavations, precipitation data in Ottawa and the soil conditions assessed under sections 6 and 6.2 pumping from

[3]Spang, K. and Egger, P. (1990) Action of fully-grouted bolts in joined rock for fractured ground. J. Rock Mech. Rock Engng., 23, 21099.

excavations is not expected to exceed the threshold of 400 cubic meters per day so that *the requirement of a PTTW may not apply to the proposed development.*

Metered outlets must be maintained and recorded as proof for confirmation in case that OWRA requires it. Note that PTTWs are issued after months of the first filing of documents.

13 Underground Corrosion

For the resistivity, PH and soluble ions concentrations found at this site and shown in the Paracel Laboratories certificate of analysis in appendix C.1, the soils are corrosive. Resistivity, PH and soluble ions testing was completed in a representative sample at 1.8 m depth in MW9. After Romanoff (1957)[4], the following corrosion rates can be used:

1. For carbon steel:
    - 11 μm/year for the first 2 years,
    - 8 μm/year, thereafter.
2. For galvanized metal:
    - 3.6 μm/year for the first 2 years,
    - 2.25 μm/year until depletion of zinc,
    - 8 μm/year for carbon steel.

14 Potential of Sulphate Attack to Concrete

For the sulphate content less than 0.1% in soil encountered at this site, there are no restrictions to the cement type which can be used for underground structures. This refers to restrictions associated with sulphate attack only.

15 Special Issues or Concerns

Our investigation did not reveal special concerns for the proposed development, such as slope stability, liquefaction, organic materials, etc.

[4]Romanoff's work for the U. S. National Bureau of Standards is authoritative in underground corrosion

16 Stripping, Excavation to Undisturbed Soils and rock, Earth and Rock Fill Placement. Asphalt Placement and Compaction

Appendix D presents recommended geotechnical specifications and guidelines for stripping, earth and rock excavation to undisturbed surfaces, earth and rock fill placement, asphalt placement, compacted lifts thicknesses for equipment type and compaction for different placements.

17 Additional Geotechnical Services

The geotechnical services outlined in appendix E may be required during design and construction.

18 Responses to Comments from the City of Ottawa

This section provides information to amend this report in response to requests made by the City of Ottawa (C of O).

18.1 Impacts to Other Buildings During and After Construction

This section addresses the second item under "Subsurface Investigation Report" in City of Ottawa comments "1st Submission Comments - 1546 Scott Street - Zoning By-law Amendment - D02-02-21-0148" dated February 28, 2022. For the ease of reference the second item reads: "Indicate that a pre and post construction survey is required."

Pre and post construction surveys emerge within the context of open cut discussed under sections 11.2 and 11.3 at this site. The following sections further discuss impacts not specifically addressed under the Occupational Health and Safety Act.

18.1.1 Impacts During Construction

The following impacts are foreseeable from the gotechnical stand point:

1. water table draw-down
2. blasting induced vibrations.

With regards to item 1, this investigation found conditions that are not indicative of soils sensitive to water draw-down to a scale capable of inducing damage to the building on the west site or to other areas along the perimeter of the site.

Element	Frequency (Hz)	PPV (mm/s)
Structures and Pipelines	<=40	20
Structures and Pipelines	>40	50
Concrete < 72 hours from placement	N/A	10

Table 1: OPSS>MUNI 120 table 1 showing threshold vibration limits.

With regards to item 2, buildings are protected from vibrations damage by setting limits to the Peak Particle Velocities (PPV) measured using seismographs placed on the perimeter of the building. PPV is in units of mm/s. Research provided under the US Bureau of Mines in Report of Investigation RI 8507 (1989)A indicates a threshold limit PPV of 19mm/s at 40 Hz or less frequencies to adequately protect buildings. This reference value is not intended to overwrite the numerous regulations and/or bylaws the blasting contractor needs to abide to for blasting operations.

It is understood that at this time that the PPV thresholds applicable at this time in Ottawa are those set in table 1 under Ontario regulation OPSS.MUNI 120 copied in this report for ease of reference. Many other requirements under OPSS.MUNI 120 and other regulations apply.

18.1.2 Pre and Post Construction Surveys and Other requirements

As stated by the City of Ottawa "Pre-construction surveys are conducted to create a formal record of the condition of homes and buildings that can be referenced for claims purposes, should an issue arise during or after construction." The pre-construction survey establish a benchmark to assess any changes or damage which could be revealed by a post construction condition survey. Additional other steps may need to take place prior to construction such as a public pre-construction consultation with all property owners and occupants and/or vibration monitoring. Many Municipalities have adopted City of Toronto By-Law No. 514-2008 to guide these requirements.

18.1.3 Impacts After Construction

The building will be water proof. Pumping of ground water is limited to water that could breach the water proofing system. It is thus expected that the impact of the building to ground water conditions will be minimal.

From the geotechnical stand point, Impacts other than the potential impact to ground water levels are not expected.

User Agreement

Acknowledgment of Duties

In this 47-CEI-R2 report, Yuri Mendez Engineering (YME) has pursued to fulfill every aspect of the obligations of professional engineers. As a part of those duties, from field work, operations, testing, analyses, application of knowledge and report, YME has ensured that it meats a high standard of Geotechnical engineering practice and care in the province of Ontario. Obligations under R.R.O. 1990, Reg. 941: Professional Engineers Act, R.S.O. 1990, c. P.28, further referred to as Reg. 941 which are of immediate interest to this service are:

"77. 7. A practitioner shall,

i. act towards other practitioners with courtesy and good faith,

ii. not accept an engagement to review the work of another practitioner for the same employer except with the knowledge of the other practitioner or except where the connection of the other practitioner with the work has been terminated,

iii. not maliciously injure the reputation or business of another practitioner,

8. A practitioner shall maintain the honour and integrity of the practitioners profession and without fear or favour expose before the proper tribunals unprofessional, dishonest or unethical conduct by any other practitioner."

Communications

47-CEI-R2 is to be used solely in connection with the Highrise Building with 3 to 4 Levels of Underground Parking by Evoke Developments Ottawa GP Corp. (EDO) and thus subject of communications amongst other professionals (OP), government bodies and authorities, and EDO for that purpose. YME demands great care in precluding damage to the integrity of this professional work which may arise from careless communications from engineers of Canada. OP and EDO acknowledge understanding that where any such communication occur in connection with this report, they are bound by this agreement as an extension to the standard of care embodied in R.R.O. 1990, Reg. 941 and thus accept that any correspondence from OP or the public seen to add any bad connotations to the breadth, depth, typesetting, typography, formal semantics and scope of this report or otherwise diminish the breadth of services and knowledge delivered in this report which in any way raise concerns or insecurities to the qualities and/or the *reasonable completeness* delivered to EDO in this report will be forwarded to YME.

Reasonable Completeness

OP and Evoke Developments Ottawa GP Corp. acknowledge understanding that said care and said standard has been applied equality to the reasonable completeness of this report relative to the information available from the field program and acknowledge understanding that is neither feasible nor possible to convey geotechnical information in this report that would cover for every possible consideration by OP and/or EDO and that upon issuance it will be subject to reviews which may trigger the need to add information which at the discretion of YME will be added when considered within the practice obligations under Reg. 941. The geotechnical information here provided is thus envisioned as to cover for the scope and breadth of design figures and assessments generally foreseeable as needed by other designers at the time of issuance and which could be amended as needed within the context of services provided by other designers. YME agrees to issue revised versions of this 47-CEI-R2 report by adding R# to each revision where # is the number of the revision. OP covenant to conduct all communications in connection with these reviews following great care to preclude the suggestion of a breach to the reasonable completeness acknowledged herein. Written communications which may trigger reviews under this agreement will be acknowledged as requests for "review under the 47-CEI-R2 report user agreement". This reasonable completeness is also relative to the scope of services generally accepted in geotechnical engineering work in Ontario

Errors

Where errors are found during reviews under the 47-CEI-R2 report user agreement, OP covenant great care in communications to preclude the suggestion of a breach to the duties acknowledge herein which could induce damages to YME. Communications triggered by errors or any such communication which would render the person doing the request in a position of technical authority above the author implies an unauthorized review and constitute a serious breach of the code of ethics under Reg. 941 and damages to YME and so subject to disciplinary measures and/or liability for damages to YME. EDO is thus acquainted that correction of errors will be made and acknowledged by YME as they may arise in any professional work but in no way OP will purport or render such corrections as omissions departing away from the correction of errors set forth in this agreement. Where communications in connection with the correction of errors process set forth in this agreement raise concerns or insecurities to the qualities and/or the reasonable completeness delivered to EDO in this report occur, EDO covenants to inform YME. EDO is acquainted that such corrections are part of the natural processes associated with the applied sciences nature of this report and so typified explicitly in this agreement to protect YME from inappropriate manipulation of those processes by OP and others.

Disclaimer

EDO and OP understand that soils and groundwater information in this report has been collected in boreholes guided by standards and practice guidelines generally accepted for engineering characterization of ground conditions in Ontario and in no case borehole data and their interpretation warrant understanding of conditions away from the borehole locations. EDO accepts that as development will have spread away from the boreholes other designers will need the best opinion from the geotechnical consultant based on the findings of the investigation so that any statements which could be implicitly or explicitly depart from the conditions at borehole may be given to fulfill this need in good faith as best available opinion with the information available at the time without any warranties.

Part IV
Appendices

A Borehole Logs

Report 47-CEI-R2
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Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: MW1 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 100.02	Lithology and color	Material Description	Samples or Blows/Ft	Water	Elevation (m) 100.02	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Rock Quality RQD %	Laboratory Tests: Other Lab Tests
0	100		Asphalt	73		100	0				
0.25							0.25				
0.5	99.5		Granular fill: Sand and gravel, brown and dry			99.5	0.5				
0.75							0.75				
1	99		Fill: Medium sand, trace silt and weathered bedrock, Brown and dry.			99	1				
1.25							1.25				
1.5	98.5					98.5	1.5				
1.75				48			1.75				
2	98					98	2				
2.25			Bedrock by Percussion Hammer				2.25				
2.5	97.5					97.5	2.5				
2.75							2.75				
3	97					97	3				
3.25							3.25				
3.5	96.5					96.5	3.5				
3.75							3.75				
4	96					96	4				
4.25							4.25				
4.5	95.5					95.5	4.5				
4.75							4.75				
5	95					95	5				
5.25							5.25				
5.5	94.5					94.5	5.5				
5.75							5.75				
6	94					94	6				
6.25							6.25				
6.5	93.5					93.5	6.5				
6.75							6.75				
7	93					93	7				
7.25							7.25				
7.5	92.5					92.5	7.5				
7.75							7.75				
8	92					92	8				
8.25							8.25				
8.5	91.5				▼	91.5	8.5				
8.75							8.75				
9	91					91	9				
9.25							9.25				
9.5	90.5					90.5	9.5				
9.75							9.75				
10	90		Water Level: Meassured on July 09 and 20, 2020 at 11.18 and 9.75 m depth respectively.			90	10				
10.25							10.25				
10.5	89.5					89.5	10.5				
10.75							10.75				
11	89					89	11				
11.25							11.25				
11.5	88.5					88.5	11.5				

S = Sample for lab review and moisture content

▼ Interpreted water level

Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: MW2 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 100.31	Lithology and color	Material Description (Yuri Mendez Engineering)	Samples or Blows/Ft	Water	Elevation (m) 100.31	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Rock Quality RQD %	Laboratory Tests: Other Lab Tests
0 to 10	100 to 90.5		Asphalt Granular fill: sand and gravel. Brown and dry Fill: silty sand, trace gravel and weathered bedrock. Brown and dry. Bedrock by Percussion Hammer Water Level: Meassured on July 09 and 20, 2020 at 8.2 and 8.05 m depth respectively.	**28**	▼	100 to 90.5	0 to 10				

S = Sample for lab review and moisture content

▼ Interpreted water level

Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: MW3 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 99.37	Lithology and color	Material Description (Yuri Mendez Engineering)	Samples or Blows/Ft	Water	Elevation (m) 99.37	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Rock Quality RQD %	Laboratory Tests: Other Lab Tests
0	99		Asphalt	26		99	0				
0.25							0.25				
0.5			Granular fill				0.5				
0.75	98.5		Fill: fine sand	56		98.5	0.75				
1							1				
1.25	98					98	1.25				
1.5			Weathered Limestone				1.5				
1.75	97.5		Limestone Bedrock: unweathered with near horizontal moderately wide jointing (20 to 50 cms spacing) at 3.0 m depth. UCS @ 2 and 6 m depth of 39.0 and 19.9 MPa respectively.			97.5	1.75				
2							2			69	
2.25							2.25				
2.5	97					97	2.5				
2.75							2.75				
3	96.5					96.5	3				
3.25							3.25			74	
3.5							3.5				
3.75	96					96	3.75				
4							4				
4.25	95.5					95.5	4.25				
4.5							4.5				
4.75	95					95	4.75				
5							5			91	
5.25	94.5					94.5	5.25				
5.5							5.5				
5.75	94					94	5.75				
6							6				
6.25	93.5					93.5	6.25				
6.5							6.5			100	
6.75	93					93	6.75				
7							7				
7.25	92.5					92.5	7.25				
7.5			Water Level: Meassured on July 09 and 20, 2020 at 7.24 and 7.08 m depth respectively. UCS @ 13 m depth of 55.7 MPa.				7.5				
7.75	92					92	7.75			100	
8							8				
8.25	91.5				▼	91.5	8.25				
8.5							8.5				
8.75	91					91	8.75				
9							9				
9.25	90.5		Limestone Bedrock: As above with wide jointing (Greater than 60 cms pacing).			90.5	9.25			97	
9.5							9.5				
9.75	90					90	9.75				
10							10				
10.25	89.5					89.5	10.25				
10.5							10.5				
10.75	89					89	10.75			94	
11							11				
11.25	88.5					88.5	11.25				
11.5							11.5				
11.75	88					88	11.75				
12							12				
12.25	87.5					87.5	12.25			98	
12.5							12.5				
12.75	87					87	12.75				
13	86.5					86.5	13				

S = Sample for lab review and moisture content

▼ Interpreted water level

Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: MW4 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 100.36	Lithology and color	Material Description	Samples or Blows/Ft	Water	Elevation (m) 100.36	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Rock Quality RQD %	Laboratory Tests: Other Lab Tests
0 to 9.5	100 to 91		Asphalt Fill: Sand and gravel. Brown and dry. Bedrock by Percussion Hammer Water Level: Meassured on July 09 and 20, 2020 at 4.32 and 4.05 m depth respectively.	22 >100	▼ at 91.5	100 to 91	0 to 9.5				

S = Sample for lab review and moisture content

▼ Interpreted water level

Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: MW5 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 100.23	Lithology and color	Material Description (Yuri Mendez Engineering)	Samples or Blows/Ft	Water	Elevation (m) 100.23	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Rock Quality RQD %	Laboratory Tests: Other Lab Tests
0	100		Asphalt	34		100	0				
0.25			Granular fill				0.25				
0.5	99.5		Fill: sand and gravel	>100		99.5	0.5				
0.75							0.75				
1	99					99	1				
1.25			Bedrock by Percussion Hammer				1.25				
1.5	98.5					98.5	1.5				
1.75							1.75				
2	98					98	2				
2.25							2.25				
2.5	97.5					97.5	2.5				
2.75							2.75				
3	97					97	3				
3.25							3.25				
3.5	96.5					96.5	3.5				
3.75							3.75				
4	96					96	4				
4.25							4.25				
4.5	95.5					95.5	4.5				
4.75							4.75				
5	95					95	5				
5.25							5.25				
5.5	94.5					94.5	5.5				
5.75							5.75				
6	94					94	6				
6.25							6.25				
6.5	93.5					93.5	6.5				
6.75							6.75				
7	93					93	7				
7.25							7.25				
7.5	92.5					92.5	7.5				
7.75							7.75				
8	92		Water Level: Meassured on July 09 and 20, 2020 at 8.11 and 8.0 m depth respectively.		▼	92	8				
8.25							8.25				
8.5	91.5					91.5	8.5				
8.75							8.75				
9	91					91	9				
9.25							9.25				
9.5	90.5					90.5	9.5				
9.75							9.75				
10	90					90	10				
10.25							10.25				
10.5	89.5					89.5	10.5				
10.75							10.75				
11	89					89	11				
11.25							11.25				

S = Sample for lab review and moisture content

▼ Interpreted water level

Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: MW6 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 100.15	Lithology and color	Material Description (Yuri Mendez Engineering)	Samples or Blows/Ft	Water	Elevation (m) 100.15	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Rock Quality RQD %	Laboratory Tests: Other Lab Tests
0 to 11.5	100 to 89		Asphalt Fill: sand and gravel. Brown and dry. Bedrock by Percussion Hammer Water Level: Meassured on July 09 and 20, 2020 at 10.08 and 4.40 m depth respectively.	28 78	▼ at 91.5	100 to 89	0 to 11.5				

S = Sample for lab review and moisture content

▼ Interpreted water level

Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: O-MW7 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 100.18	Lithology and color	Material Description (Yuri Mendez Engineering)	Samples or Blows/Ft	Water	Elevation (m) 100.18	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Rock Quality RQD %	Laboratory Tests: Other Lab Tests
0 to 9 (0.25, 0.5, 0.75, 1, 1.25, 1.5, 1.75, 2, 2.25, 2.5, 2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 8, 8.25, 8.5, 8.75)	100, 99.5, 99, 98.5, 98, 97.5, 97, 96.5, 96, 95.5, 95, 94.5, 94, 93.5, 93, 92.5, 92, 91.5		Overburden not loged during previous drilling: profile inferred similar to MW5 and MW6			100, 99.5, 99, 98.5, 98, 97.5, 97, 96.5, 96, 95.5, 95, 94.5, 94, 93.5, 93, 92.5, 92, 91.5	0 to 9 (0.25, 0.5, 0.75, 1, 1.25, 1.5, 1.75, 2, 2.25, 2.5, 2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 8, 8.25, 8.5, 8.75)				
	91.5		Water Level: Meassured on July 09 and 20, 2020 at 8.49 and 8.35 m depth respectively.		▼						

S = Sample for lab review and moisture content

▼ Interpreted water level

Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: O-MW8 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 100.29	Lithology and color	Material Description (Yuri Mendez Engineering)	Samples or Blows/Ft	Water	Elevation (m) 100.29	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Rock Quality RQD %	Laboratory Tests: Other Lab Tests
0 to 12 (0.25, 0.5, 0.75, 1, 1.25, 1.5, 1.75, 2, 2.25, 2.5, 2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12)	100, 99.5, 99, 98.5, 98, 97.5, 97, 96.5, 96, 95.5, 95, 94.5, 94, 93.5, 93, 92.5, 92, 91.5, 91, 90.5, 90, 89.5, 89, 88.5		Overburden not loged during previous drilling: profile inferred similar to MW9 Water Level: Meassured on July 09 and 20, 2020 at 8.97 and 8.9 m depth respectively.		▼ at 91.5	100, 99.5, 99, 98.5, 98, 97.5, 97, 96.5, 96, 95.5, 95, 94.5, 94, 93.5, 93, 92.5, 92, 91.5, 91, 90.5, 90, 89.5, 89, 88.5	0 to 12 (0.25, 0.5, 0.75, 1, 1.25, 1.5, 1.75, 2, 2.25, 2.5, 2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12)			

S = Sample for lab review and moisture content

▼ Interpreted water level

Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: MW9 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 100.32	Lithology and color	Material Description (Yuri Mendez Engineering)	Samples or Blows/Ft	Water	Elevation (m) 100.32	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Rock Quality RQD %	Laboratory Tests: Other Lab Tests
0 to 13	100 to 87.5		Asphalt Granular fill	34							
			Fill: fine sand	18							
			Till: Brownish silty sand and gravel. Trace clay. Moist	>100						75	
			Weathered Limestone Limestone Bedrock with White Vertical Narrow Portions: unweathered with near horizontal moderately wide jointing (20 to 60 cms spacing) at 3.5 m depth.							67	
			Limestone Bedrock: unweathered with moderately wide near horizontal jointing (20 to 60 cms spacing). Two UCS @ 6.7 m depth of 44.0 and 101.0 MPa.							84	
										100	
			Water Level: Meassured on July 09 and 20, 2020 at 8.2 and 8.08 m depth respectively. UCS @ 13 m depth of 91.2 MPa.		▼					95	
										100	
										89	
										95	

S = Sample for lab review and moisture content

▼ Interpreted water level

Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: MW10 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 100.55	Lithology and color	Material Description (Yuri Mendez Engineering)	Samples or Blows/Ft	Water	Elevation (m) 100.55	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Rock Quality RQD %	Laboratory Tests: Other Lab Tests
0	100.5		Asphalt	46		100.5	0				
0.25			Granular fill				0.25				
0.5	100					100	0.5				
0.75			Fill: silty sand, trace gravel, trace rock fragments. Brown and dry.	55			0.75				
1	99.5					99.5	1				
1.25							1.25				
1.5	99		Bedrock by Percussion Hammer			99	1.5				
1.75							1.75				
2	98.5					98.5	2				
2.25							2.25				
2.5	98					98	2.5				
2.75							2.75				
3	97.5					97.5	3				
3.25							3.25				
3.5	97					97	3.5				
3.75							3.75				
4	96.5					96.5	4				
4.25							4.25				
4.5	96					96	4.5				
4.75							4.75				
5	95.5					95.5	5				
5.25							5.25				
5.5	95					95	5.5				
5.75							5.75				
6	94.5					94.5	6				
6.25							6.25				
6.5	94					94	6.5				
6.75							6.75				
7	93.5					93.5	7				
7.25							7.25				
7.5	93					93	7.5				
7.75							7.75				
8	92.5					92.5	8				
8.25							8.25				
8.5	92					92	8.5				
8.75							8.75				
9	91.5				▼	91.5	9				
9.25							9.25				
9.5	91		Water Level: Meassured on July 09 and 20, 2020 at 9.7 and 9.50 m depth respectively.			91	9.5				
9.75							9.75				
10	90.5					90.5	10				
10.25							10.25				
10.5	90					90	10.5				
10.75							10.75				
11	89.5					89.5	11				
11.25							11.25				
11.5	89					89	11.5				

S = Sample for lab review and moisture content

▼ Interpreted water level

Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: MW11 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 100.5	Lithology and color	Material Description (Yuri Mendez Engineering)	Samples or Blows/Ft	Water	Elevation (m) 100.5	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Rock Quality RQD %	Other Lab Tests
0 to 11.5	100.5 to 89		Interlock Pavers Granular fill Fill: silty sand, trace gravel. Brown and moist to wet. Bedrock by Percussion Hammer Water Level: Meassured on July 09 and 20, 2020 at 11.3 and 11.1 m depth respectively.	7 18	▼ at 91.5	100.5 to 89	0 to 11.5				

S = Sample for lab review and moisture content

▼ Interpreted water level

Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: BH12 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 99.74	Lithology and color	Material Description (Yuri Mendez Engineering)	Samples or Blows/Ft	Water	Elevation (m) 99.74	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Rock Quality RQD %	Laboratory Tests: Other Lab Tests
0			Asphalt				0				
0.25	99.5		Granular fill	23		99.5	0.25				
0.5							0.5				
0.75	99		Till: Brownish silty sand and gravel. Trace clay. Moist			99	0.75				
1				>100			1				
			Auger Refusal								

S = Sample for lab review and moisture content

▼ Interpreted water level

Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: BH13 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 100.27	Lithology and color	Material Description (Yuri Mendez Engineering)	Samples or Blows/Ft	Water	Elevation (m) 100.27	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Rock Quality RQD %	Laboratory Tests: Other Lab Tests
0	100.1		Asphalt			100.1	0				
0.25			Granular fill	47			0.25				
0.5	99.6		Till: Brownish silty sand and gravel. Trace clay. Moist			99.6	0.5				
0.75							0.75				
1	99.1			>100		99.1	1				
1.25							1.25				
1.5			Auger Refusal				1.5				

S = Sample for lab review and moisture content

▼ Interpreted water level

Project: **Proposed Highrise Building with 3 to 4 levels of Underground Parking**		YME Yuri Mendez Engineering.
Location: **1546 Scott St.**	Client: **Starbank Developments 2000**	**Test Hole No.: BH14 of 14**
Job No.: **47-CEI-1546Scott**	Test Hole Type: **7" OD Auger.**	Date: **July 02, 03 and 09, 2020**
Casing and 61 mm diameter cores	SPT Hammer Type: **Auto Safety**	Logged By: **Yuri Mendez**

Depth (m)	Elevation (m) 100.39	Lithology and color	Material Description (Yuri Mendez Engineering)	Samples or Blows/Ft	Water	Elevation (m) 100.39	Depth (m)	Shear Strength (kPa)	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Rock Quality RQD %	Laboratory Tests: Other Lab Tests
0			Asphalt				0				
0.25			Granular fill				0.25				
0.5	99.9					99.9	0.5				
0.75							0.75				
1	99.4		Fill: Medium sand with trace gravel. Brown and dry.	23		99.4	1				
1.25							1.25				
1.5	98.9					98.9	1.5				
1.75				17			1.75				
2	98.4					98.4	2				
2.25			Till: Brownish silty sand and gravel. Trace clay. Moist				2.25				
2.5	97.9			8		97.9	2.5				
2.75							2.75				
			Auger Refusal								

S = Sample for lab review and moisture content

▼ Interpreted water level

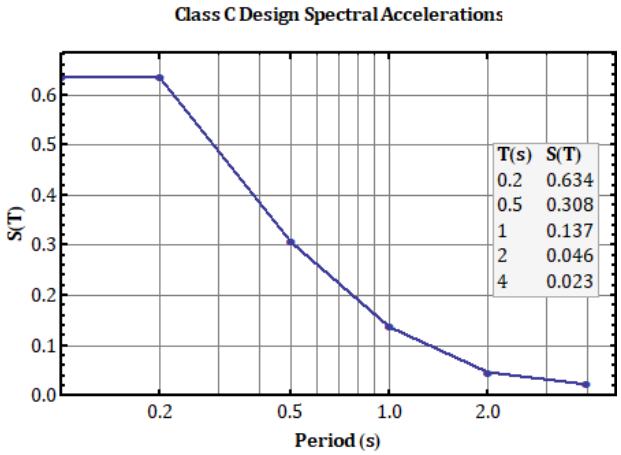

Figure 3:

Appendix

B Geotechnical Site Class Assignment

The ground motion transfered from earthquakes to buildings depend largely on ground conditions. Current seismic provisions in building codes recognize seismic waves as oscillations and buildings as oscillators having natural periods and damping. The role of soils engineering is to assign a site class which defines the interpolations prescribed under the code to obtain a spectrum of period versus damped accelerations using a base *reference site* for design of buildings at a given site. The soils information required to do this site class assignment is the velocity at which a seismic shear wave travels upward 30 meters (or downward) in a given site (Vs(30)). The Vs(30) is estimated based on standard geotechnical testing along with experience and available local data bases. Seismic tests can also be completed to determine the Vs(30) with greater accuracy.

B.1 Reference Site and Design Spectral Accelerations

Details of the *reference site* spectral and peak seismic hazard values applicable to this site are presented in the 2010 National Building Code Seismic Hazard Calculation in page 44 of this appendix. Figure 3 in page 43 presents the design spectral accelerations computed under section 4.1.8.4 of the Ontario Building Code 2012 (OBC 2012) for the site class C assigned to this site.

2010 National Building Code Seismic Hazard Calculation

INFORMATION: Eastern Canada English (613) 995-5548 français (613) 995-0600 Facsimile (613) 992-8836
Western Canada English (250) 363-6500 Facsimile (250) 363-6565

Site: 45.404N 75.733W **User File Reference:** 1546 Scott St. 2020-07-28 01:31 UT

Requested by: Yuri Mendez

Probability of exceedance per annum	0.000404	0.001	0.0021	0.01
Probability of exceedance in 50 years	2 %	5 %	10 %	40 %
Sa (0.2)	0.634	0.385	0.248	0.089
Sa (0.5)	0.308	0.186	0.122	0.043
Sa (1.0)	0.137	0.087	0.056	0.017
Sa (2.0)	0.046	0.028	0.018	0.006
PGA (g)	0.323	0.201	0.122	0.038

Notes: Spectral (Sa(T), where T is the period in seconds) and peak ground acceleration (PGA) values are given in units of g (9.81 m/s^2). Peak ground velocity is given in m/s. Values are for "firm ground" (NBCC2015 Site Class C, average shear wave velocity 450 m/s). NBCC2015 and CSAS6-14 values are highlighted in yellow. Three additional periods are provided - their use is discussed in the NBCC2015 Commentary. Only 2 significant figures are to be used. **These values have been interpolated from a 10-km-spaced grid of points. Depending on the gradient of the nearby points, values at this location calculated directly from the hazard program may vary. More than 95 percent of interpolated values are within 2 percent of the directly calculated values.**

References

National Building Code of Canada 2015 NRCC no. 56190; Appendix C: Table C-3, Seismic Design Data for Selected Locations in Canada

Structural Commentaries (User's Guide - NBC 2015: Part 4 of Division B)
Commentary J: Design for Seismic Effects

Geological Survey of Canada Open File 7893 Fifth Generation Seismic Hazard Model for Canada: Grid values of mean hazard to be used with the 2015 National Building Code of Canada

See the websites www.EarthquakesCanada.ca and www.nationalcodes.ca for more information

Appendix

C Resistivity, PH and Soluble Salts Test and Unconfined Compressive Strength Tests

Certificate of Analysis

Client: Geoseismic

Client PO:

Report Date: 13-Jul-2020

Order Date: 8-Jul-2020

Project Description: 1546 Scott St.

	Client ID:	MW9 SS3	-	-	-
	Sample Date:	03-Jul-20 09:00	-	-	-
	Sample ID:	2028266-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	91.0	-	-	-
General Inorganics					
pH	0.05 pH Units	7.68	-	-	-
Resistivity	0.10 Ohm.m	10.7	-	-	-
Anions					
Chloride	5 ug/g dry	509	-	-	-
Sulphate	5 ug/g dry	239	-	-	-

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ROCK CORE COMPRESSIVE STRENGTH ASTM D7012-14 METHOD C

CLIENT:	**Yuri Mendez Engineering**	FILE No.:	**PM7869**
PROJECT:	Lab Testing	REPORT No.:	4
STRUCTURE TYPE & LOCATION:	**1546 Scott Street**	DATE REPT'D:	6-Jul-20

SAMPLE INFORAMTION			
LAB NO.:	**17478**	**17478**	**17478**
SAMPLE NO.:	RC5 - MW9	RC8 - MW9	RC1 - MW3
LOCATION:	24'3" - 24'8"	42'7" - 43'.0"	6'4" - 6'9"
SAMPLE DATES			
DATE CAST	-	-	-
DATE CORED	-	-	-
DATE RECEIVED	3-Jul-20	3-Jul-20	3-Jul-20
DATE TESTED	6-Jul-20	6-Jul-20	6-Jul-20
SAMPLE DIMENSIONS			
(D) AVERAGE DIAMETER (mm)	61.00	61.00	61.00
(H) HEIGHT (mm)	122.00	122.00	122.00
(W) WEIGHT (g)	1020	1000	1040
(A) AREA = $\pi D2 / 4$ (mm^2)	2922	2922	2922
(V) VOLUME = A X H ÷ 1000 (cm^3)	357	357	357
UNIT WEIGHT = W / V X 1000 (kg/m^3)	**2861**	**2805**	**2917**
TEST RESULTS			
H / D RATIO	2.00	2.00	2.00
CORRECTION FACTOR	1.000	1.000	1.000
LOAD (lbs)	66400	59900	25600
GROSS Mpa = L X 4.448222 / A	101.1	91.2	39.0
MPa CORRECTED	**101.1**	**91.2**	**39.0**
FORM OF BREAK	**-**	**-**	**-**
DIRECTION OF LOADING	Parallel	Parallel	Parallel
CURING CONDITIONS	SITE→→→→→→→→→→→→→→→→→→→→→→→→→→→→→→→→→		

COMMENTS:

Rock Cores Vairous Depths and Locations

TECHNICIAN:	**OM**	APPROVED BY:	C. Beadow

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ROCK CORE COMPRESSIVE STRENGTH ASTM D7012-14 METHOD C

CLIENT:	**Yuri Mendez Engineering**	FILE No.:	**PM7869**
PROJECT:	Lab Testing	REPORT No.:	2
STRUCTURE TYPE & LOCATION:	**1546 Scott Street**	DATE REPT'D:	6-Jul-20

SAMPLE INFORAMTION			
LAB NO.:	**17478**	**17478**	**17478**
SAMPLE NO.:	RC4 - MW3	RC8 - MW3	RC4 - MW9
LOCATION:	19'9" - 20'1"	42'.0" - 42'.5"	21'0" - 21'5"
SAMPLE DATES			
DATE CAST	-	-	-
DATE CORED	-	-	-
DATE RECEIVED	3-Jul-20	3-Jul-20	3-Jul-20
DATE TESTED	6-Jul-20	6-Jul-20	6-Jul-20
SAMPLE DIMENSIONS			
(D) AVERAGE DIAMETER (mm)	61.00	61.00	61.00
(H) HEIGHT (mm)	122.00	122.00	119.40
(W) WEIGHT (g)	1020	1040	1000
(A) AREA = $\pi D2 / 4$ (mm^2)	2922	2922	2922
(V) VOLUME = A X H ÷ 1000 (cm^3)	357	357	349
UNIT WEIGHT = W / V X 1000 (kg/m^3)	**2861**	**2917**	**2866**
TEST RESULTS			
H / D RATIO	2.00	2.00	1.96
CORRECTION FACTOR	1.000	1.000	0.996
LOAD (lbs)	13100	36600	29100
GROSS Mpa = L X 4.448222 / A	19.9	55.7	44.3
MPa CORRECTED	**19.9**	**55.7**	**44.1**
FORM OF BREAK	**-**	**-**	**-**
DIRECTION OF LOADING	Parallel	Parallel	Parallel
CURING CONDITIONS	SITE→→→→→→→→→→→→→→→→→→→→→→→→→→→→→→		

COMMENTS:

Rock Cores Vairous Depths and Locations

TECHNICIAN:	**OM**	APPROVED BY:	C. Beadow

Appendix

D Construction Recommendations for Stripping, Earth and Rock Excavation to Undisturbed Soils, Earth and Rock Fill Placement, Asphalt Placement and Compaction

In the event that any of the following recommendations conflict with municipal and or provincial specifications, the most restrictive applies. For the case when products involving ground conditions are used, the manufacturer's specifications take precedence.

The contractor shall be prepared to proceed as directed by the geotechnical consultant within the framework of these recommendations. Construction methods will abide to these recommendations and/or be discussed and agreed upon with the consultant on site in real time or as expressed in writing.

D.1 Removal of Water

Removal and diversion of surface water and ground water will be planed prior to all earthwork within the scope of these recommendations. All surfaces in which to commence construction will be maintained dry and free of muddy conditions.

D.2 Earth Excavation

Earth excavations are subject to the provisions in O. Reg. 213/91: Construction Projects under Occupational Health and Safety Act. Refer to section 11 for key aspect of O. Reg. 213/91 applicable to the findings in testholes at this site.

For the purpose of these recommendations earth materials will be refer to as one or more of the general material classes: topsoil and organic soils, non engineered fill, granular fill, native soils and rock. Topsoil and organic soils and non engineered fill are the subject of striping in subsection D.2.3.

D.2.1 Suitability of Earth Materials

The suitability of material for specific purposes is determined by the geotechnical engineer. To the extent they are needed, suitable material from the excavations can be used in the construction of required permanent earthfill or rockfill.

D.2.2 Stockpiling and Sorting

Stockpiling is not an acceptable mean to build up the subgrade beneath the perimeter of structures of any kind. For stock piling, with the exception of

native soils, material will be sorted in piles belonging exclusively to each material class. For native soils, sorting will be as determined by the geotechnical engineer. Mixed materials will be rendered unusable for uses other than the buildup of the subgrade in landscaped areas.

D.2.3 Striping

Topsoil and/or organic soils and/or existing fill must be removed from the perimeter of all proposed structures, including retaining wall, buildings, pavement, parking areas and earth or fill banks for grading.

D.2.4 Excavation to Undisturbed Soil Surface

All soil surfaces in which to commence construction for all structures are to be preserved in undisturbed condition (Undisturbed Soil Surface (USS)). Native soil surfaces exposed to the weather for a period exceeding 72 hours are considered disturbed. Where rainy weather and/or equipment operation and/or labor make impractical or difficult the preservation of USS a working-leveling granular pad may be used. Use the compaction requirements and materials in Table 2.

Except as otherwise indicated for select earthfill materials (subsection D.8) at this site, reinstatement of excavated soil is not allowed. When excavation exceeds the depth of the proposed USS, a granular pad using the compaction requirements and materials in Table 2.

It can be assumed that it is impractical to conduct excavations to an even USS. In such case a granular pad not less than 150mm thick must be used to remedy for irregularities caused by the operation of equipment.

D.3 Foundations Placement

Native soil surfaces exposed to the weather for a period exceeding 72 hours are considered disturbed. Place foundations on a OPSS.MUNI 1010 granular B type 2 granular pad that is at least 150 mm thick placed on undisturbed soils.

D.4 Retaining Wall Foundations

Retaining wall foundations are to be placed on a OPSS.MUNI 1010 granular B type 2 granular pad that is at least 150 mm thick.

D.5 Imported Materials

Materials to be imported are subject to prior approval by the geotechnical engineer. The exceptions are granular materials having 12 % or less fines including clean sands. Fines are materials passing the # 200 sieve (70 μm).

D.6 Rock Excavation

For the *"hard ripping to blasting"* rock excavatability class at this site, adequate equipment is defined as heavy ripping equipment with a rear-mounted, heavy duty, single-tooth, ripping attachment mounted on a track type tractor having a power rating of at least 400 flywheel horsepower.

D.6.1 Bedrock Preparation

Footings will be placed on a clean sound bedrock surface. Final cleaning of bedrock surfaces for footings placement with compressed air is required.

D.7 Overexcavation

Excavation in rock beyond the specified lines and grades shall be corrected by filling the resulting voids with portland cement concrete which will be cured by spraying water twice a day for 7 days. Excavation in earth beyond the specified lines and grades shall be corrected by filling the resulting voids with approved, compacted earthfill.

D.8 Earthfill

The type of Earthfill materials will be as indicated in plans and specifications. Suitability of materials for uses not explicitly specified in plans will be determined by the geotechnical engineer.

Earthfill materials shall contain no frozen soil, sod, brush, roots, or other perishable material. Rock particles larger than 2/3 of the maximum approved lift thickness shall be removed prior to compaction of the fill.

For the purpose of this subsection all suitable materials will belong to one of the following two classes: *granular earthfill* and *select earthfill*. Granular eathfill will be any natural or crushed earth materials containing 12% or less passing the #200 sieve (70 μm). Select earthfill will be materials for which more than 12% passes the #200 sieve *and* have water content close to the optimum *and* have been rendered as suitable by the geotechnical engineer.

D.8.1 Granular Earthfill Placement

D.8.1.1 Moisture for Granular Earthfill

For granular earthfill it is to be assumed that moisture will be added for placement. Compaction in wet of optimum condition is preferred for granulars.

D.8.1.2 Compacted Lifts Thicknesses Equipment and Passes for Granular Eathfill

Compacted lifts will not exceed 250 mm. Subject to test trials a maximum compacted lift of 300 mm may be accepted provided vibratory compaction equipment rated at 60,000 lb-f (27,300 kg-f) of dynamic force is used.

For road construction passes are to overlap by 300 mm for full coverage.

Where non vibratory pneumatic compactors with ballast an tire pressure of 100 psi (7 kg/cm2) are used (9 or 13 ply) the compacted lift thicknesses will not exceed 150 mm for granular.

For services and culvert trenches, when using rammers and light vibratory plates weighing less than 115 kg (250 lbs) the compacted lift thicknesses will not exceed 100 and 125 mm respectively. For heavier trench equipment the compacted lifts will not exceed 250 mm.

No heavy equipment will be operated above the crown of pipes or culverts unless 1.2 m of fill has been placed or the subgrade elevation has been reached.

For all trenches below the water table, trench foundation not less than 200 mm will be provided as per materials and specification in Table 2 in page 55.

Materials lift placement beneath foundations, slabs or any placement not specified above must abide to the above specifications as they relate to the equipment being used.

D.8.2 Select Earthfill Placement

It is to be assumed that suitable select fill will be materials that will be excavated from the bank to be put directly on hauling equipment transported and dumped directly for spreading in lifts by push tractors, be added water and compacted. Stockpiling at the source or on site is not acceptable.

D.8.2.1 Moisture for Select Earthfill

It is to be assumed that moisture will be added for placement.

D.8.2.2 Compacted Lifts Thicknesses Equipment and Passes for Select Earthfill

Compacted lifts will not exceed 200 mm for heavy sheep foot rollers. Suitability of smooth vibratory rollers for the materials will be determined by the geotechnical engineer.

For road construction passes are to overlap by 300 mm for full coverage.

Where non vibratory pneumatic compactors with ballast an tire pressure of 100 psi (7 kg/cm2) are used (9 or 13 ply) the compacted lift thicknesses will not exceed 150 mm.

For services and culvert trenches, when using rammers and light vibratory plates weighing less than 115 kg (250 lbs) the compacted lift thicknesses will not exceed 100 and 125 mm respectively. For heavier trench equipment the compacted lifts will not exceed 200 mm.

No heavy equipment will be operated above the crown of pipes or culverts unless 1.2 m of fill has been placed or the subgrade elevation has been reached.

For all trenches below the water table, trench foundation not less than 200 mm will be provided as per materials and specification in Table 2 in page 55.

Materials lift placement beneath foundations, slabs or any placement not specified above must abide to the above specifications as they relate to the equipment being used.

D.8.2.3 Re-working and/or Re-stripping for Select Earthfill

Re-stripping of 75 mm for select fill surfaces expose to rain or the environment for more than 24 hours is required. Areas of water ponding shall be stripped-off and backfilled.

D.8.3 Compaction Guide for Passes and Level of Compaction

The contents of this section are provided as guidelines for construction. The resulting compaction densities and compacted lift thicknesses can only be verified by actual testing and field trials respectively.

For equipment passes the contractor may consider not less than 4, 5 or 6 passes for 95, 98 or 100 % Proctor Standard compaction.

For granular materials loose lifts may be approximately 150, 175 and 235 mm for compacted lift thicknesses 125, 150 and 200 mm respectively.

For select earthfill materials loose lifts may be approximately 125 and 190 mm for compacted lift thicknesses 100 and 150 mm respectively.

D.9 Rockfill

Rockfill material shall be excavated, selected, processed, and handled as necessary to conform to the specified gradation (grain size) requirements.

D.9.1 Rockfill Placement

For rockfill it is to be assumed that moisture will be added for placement.

For rockfill, use the number of passes of equipment as for granular earthfill.

D.9.1.1 Compacted Lifts Thicknesses Equipment and Passes for Rockfill

Compacted lifts will not exceed 400 mm. Subject to test trials a maximum compacted lift of 550 mm may be accepted provided vibratory compaction equipment rated at 60,000 lb-f (27,300 kg-f) of dynamic force is used.

For road construction passes are to overlap by 300 mm for full coverage.

D.10 Compaction General

It is to be assumed that water will be added for compaction and that the required maximum grain size shall be 3/4 of the compacted lift thickness.

Obtain the approximate loose lift thickness by dividing the compacted lift by 0.88. Compacted lifts are approximately 12% less than the loose lift thickness.

Each lift shall be compacted by the specified number of passes of the approved type and weight of roller or other equipment.

Table 2 in page 55 presents Proctor Standard (PS) compaction requirements for specified placement and materials.

D.11 Compaction Specific

D.11.1 Compaction Along Basement Walls, Retaining Walls and Structures

No heavy compaction equipment is to be operated within 0.9 m of any structure. The consolidation zone is defined as the zone within 0.9 m of the exterior edge of basements or the interior edge of retaining walls or any structure. Only light to very light compaction is to be applied along the consolidation zone with no more than 2 passes of light vibratory equipment.

D.11.2 Self Compacting Materials

There are no self compacting materials. Total fill thickness of 200 mm of granular materials consisting of more than 90% of one nominal size referred to as crushed stone are acceptable without compaction under concrete slabs.

D.11.3 Settlement Allowance and Overfill

The settlement (consolidation) of lightly compacted earthfill can be excessive. Overfill to compensate for settlement allowance will be discussed with the geotechnical engineer.

D.11.4 Compaction Quality Control

Provide moisture density relationships for Standard Proctor compaction for the proposed materials and source. Conduct one in situ test at randomly selected locations per 60 m3 of fill. This is approximately one test, each 300 m2 of lift in place. Nuclear or non-nuclear density probes testing can be used. Density probes will only measure the density within 0.12 m depth at the point of the measurement.

D.12 Asphalt Pavement

Place asphalt mix only when base course, or previous course is dry and air temperature is 7 degrees C and increasing.

Asphalt pavement mix temperatures at the time of placement will be within the range of 120 to 160 degrees C.

Do not place asphalt on a surface which is wet or covered by snow or ice or if the ground is frozen.

Material Placement	Material Description	% PS
Base	OPSS.MUNI 1010 Granular A	100
Subbase	OPSS.MUNI 1010 Granular B Type II	100
Subgrade	Granular earthfill (with 12 % or less fines) and 100% passing 106 mm sieve	95
	Select earthfill	95
Backfill for trenches under pavement	Granular earthfill (with 12 % or less fines) and 100% passing 106 mm sieve.	95
	Select earthfill	95
Under sidewalks top 200 mm	Any OPSS.MUNI 1010 Granular specification for which 100% passes the 26.5 mm sieve	95
Under foundations	OPSS.MUNI 1010 Granular B type 2 with 12% or less fines and for which 100% passes the 106 mm sieve	98
Backfill under slabs on grade	Cohesionless (with 12 % or less fines) and 100% passing 106 mm sieve.	100
	Select earthfill	100
Top 100 mm under slabs	Crushed stone 9.5 to 19 mm (use one or several sizes).	90
Pipe bedding and cover (150 mm for bedding to 150 mm above the crown)	Any OPSS.MUNI 1010 Granular specification for which 100% passes the 26.5 mm sieve	95
Trench foundation (stabilization minimum 200 mm)	Any OPSS 1010.MUNI Granular specification for which 100% passes the 106 mm sieve except Granular B Type I	95
Backfill for non building, non traffic and/or non parking areas	Granular (with 12 % or less fines) and 100% passing 106 mm sieve	90
	Select earthfill	90
Placement not specified above	Granular (with 12% or less fines) and 100% passing 106 mm sieve	95
	Select earthfill	95

Table 2: Proctor Standard (PS) compaction requirements for specified placement and materials.

D.12.1 Surface Preparation for Asphalt Pavement

It is to be assumed that rough grading and fine grading shall take place before asphalt placement. Rough grading will be completed to within ± 25 mm of the underside of asphalt and tested to meet the specified density. Fine grading and rolling will completed by the paving contractor. The granular material for fine grading will meet OPSS.MUNI 1010 Granular M.

D.12.2 Proof Rolling Prior to Asphalt Pavement

Conduct proof rolling using a single pass of a tandem-axle dump truck or a tri-axle dump truck with the third axle raised loaded to a minimum gross vehicle weight of 26 metric tons at walking speed. Rutting in excess of 25 mm is considered failure. Where proof rolling reveals areas of defective subgrade, Remove base, Sub-base and subgrade material to depth and extent and width that will allow reconstruction using the available equipment or as directed by the Consultant.

D.12.3 Asphalt compaction

The compacted lifts are accepted to be 80% of the loose lift thickness (the loose lift reduces thickness by 20% when compacted). Divide the compacted lift thickness by 0.8 to obtain the thickness of the loose lift.

Compaction will consist on at least three passes at approximately walking speed (5.4 km/hr) as follows: *break down rolling* using a vibratory steel drum roller, *intermediate rolling* with a static (non-vibrating) roller or a pneumatic roller and *finish rolling* with a smooth static roller.

Appendix

E Recommended Geotechnical Services During Design and Construction

It is recommended that geotechnical services be retained in order to insure that the recommendations in this report are implemented in the final design and construction.

E.1 Design Phase Supplemental Geotechnical Services for the Proposed Development

Geotechnical services are expected to consist in additional design and plan reviews once draft plans defining details concerning grading, services, pavements and foundation dimensions, elevations, depth and loads become available. The design services may be requested in advance by other designers and depend on design decisions and/or plans differing from the assumptions in this report. The geotechnical designer is to produce at this stage technical letters and/or drawings supporting analyses and final design decisions.

E.2 Construction Phase Supplemental Geotechnical Consultant Services for the Proposed Development

The geotechnical consultant services for construction will consist on inspections and testing for quality control. The inspections may be visual examination only or in conjunction with testing. Inspection and quality control testing programs are tailored to include but not limited to:

- Confirmation of findings of the geotechnical investigation.
- Monitor the performance of temporary geotechnical structures in time.
- Satisfy the consultant that the physical and mechanical properties of existing and newly placed geotechnical materials meet the requirements in this report.
- Inspect temporary soil cut for signs of distress.
- Satisfy the consultant that manufacturer specifications involving systems and materials interacting with ground conditions and ground water are being met
- Satisfy the consultant that performance measures and tolerances of geotechnical structures are being met (piles, anchors, etc.)

Supplemental geotechnical services in this stage may include shop drawings review for contractor designed geotechnical structures (typically shoring, temporary soil cut and anchors)

E.3 Contractor Designed Temporary Geotechnical Structures

Since excavations are recognized as a hazardous construction operation and contractors have control of the construction operations and safety, temporary slope cut stability and temporary shoring design are typically done by the contractor. The anchoring systems to shoring, dewatering systems and other applications are also done by the contractor except specified otherwise. In particularly sensitive ground water conditions dewatering systems may need to be designed by the geotechnical consultant.

Temporary soil cut and shoring must be designed to meet O. Reg. 213/91. The general design requirement is that the risks to workers and the public be kept to acceptable levels and that adjacent properties and existing structures are not damaged.

The consultant role is to conduct reviews of shop drawings defining details of temporary geotechnical structure designed by the contractor. It is expected that this investigation report be sufficient to supply the data required for temporary slope cut and shoring design.

APPENDIX C

Proximity Assessment PG6510-MEMO.01 dated January 30, 2023

PATERSON GROUP

memorandum

re: **Proximity Assessment**
Proposed High-Rise Building
1546 Scott Street – Ottawa, Ontario

to: Reid's Heritage Properties – **Ms. Melissa MacGregor** – mmacgregor@reidsproperties.com

date: January 30, 2023

file: PG6510-MEMO.02

Further to your request and authorization, Paterson Group (Paterson) prepared the current letter report to summarize construction issues which could occur due to the proximity of the proposed development with respect to the subject alignment of the LRT Confederation Line and associated infrastructure located approximately 41 m north of the site boundary. The following letter should be read in conjunction with the Paterson Group Report PG6510-1 dated January 30, 2023.

1.0 Background Information

The subject site is a relatively flat area of approximately 2,500 square meters, bounded by Scott Street to the north and commercial properties on all other sides. The site is currently home to a single-story commercial building in the northwest corner, with the rest of the area covered by access lanes, parking areas, and landscaped margins. The site is located at an elevation of about 62 meters, and the Confederation Line LRT is situated approximately 38 meters north of the site

2.0 Subsurface Conditions

Based on existing geotechnical information, the subsurface conditions in the immediate area of the subject site and subject LRT Confederation Line alignment consist of the following:

- Existing surface grade is at an elevation of approximately 62 m in the location of the proposed building, where as the rail for the LRT Confederation Line is located in a recessed trench at approximate geodetic elevation 56 m.
- The overburden thickness is approximately 1.5m to 2 m.
- Bedrock surface elevation is at an approximate geodetic elevation of 59.75 to 61.25 m.
- The bedrock underlying the site consists of limestone which is generally of good to excellent quality. Unconfined compressive strengths of similar limestone bedrock formations typically exceed 20 MPa.

LRT Confederation Line Location

Available information indicates that the LRT Confederation Line is located approximately 41 m from the north property line of the subject site. Tunney's Pasture Station is located along the northwest side of the rail line approximately 95 m from the north west property line of the subject site. The top of rail (TOR) is anticipated to be located at approximate elevation 52 m (geodetic) in this area. The founding elevation of the proposed high rise building adjacent to the rail line and station will extend below the elevation of the rail and station. However, the LRT Confederation railway is not located within the building's lateral support zone and will not be adversely affected. Further, the proposed high rise building is not located within the rail line's lateral support zone and will therefore not impact the founding support of the LRT Confederation Rail line.

3.0 Construction Precautions and Recommendations

Influence of Proposed Development on LRT Confederation Line

Based on existing soils information and building design details, the footings of the proposed building will be founded on good quality bedrock. Further, based on the approximate distances of 41 m between the proposed building and the LRT confederation Line railway and 95 m between the proposed building and Tunney's Pasture station, no lateral loads from the proposed building will be transferred to the railway and the LRT Confederation Line and Tunney's Pasture Station will not be undermined.

Excavation and Temporary Shoring

The overburden along the perimeter of the proposed building footprint will need to be sloped or shored in order to complete the construction of the underground parking levels. Bedrock removal is also anticipated, which will be completed by line drilling, blasting and/or hoe ramming. The blasting and hoe ramming will be carried out by a contractor specializing in bedrock removal.

Where required, it is anticipated that the temporary shoring system will consist of soldier piles and lagging or steel sheet piles.

The geotechnical engineer will review the stability of the rock face underlying the overburden. Following the review of the rock face, the geotechnical engineer will determine if rock reinforcement is required, and if so, the extent to which rock reinforcement is required. This determination will include consideration for the LRT confederation Line.

A seismograph would be installed on the adjacent LRT Confederation Lines rail to monitor vibrations during the bedrock removal program. A program detailing trigger levels and action levels is provided in PG6510-MEMO.01 dated November 10, 2022

Pre-Construction Survey

As part of the proposed construction project, a pre-construction survey will be required for the LRT Confederation Line. Any existing structures in the immediate area of the proposed building will also undergo a preconstruction survey as per standard construction practices, where bedrock blasting will be required.

Groundwater Control

Groundwater observations during the recent geotechnical investigation indicated groundwater levels at an approximate depth of 4 to 11 m below the existing ground surface and located within the bedrock substrate. The design of the temporary shoring system and dewatering plans for the site will take into consideration the adjacent LRT confederation railway infrastructure. These plans will be forwarded once they are available.

4.0 Conclusions and Recommendations

Based on the currently available information for the subject alignment of the proposed building and the existing subsurface information, the proposed building will not negatively impact the existing LRT confederation Line. It should be noted that the information submitted as part of the current Proximity Study will be supplemented with construction plans issued for construction, dewatering and discharge plans, and field monitoring program as described in the application conditions.

We trust that this information satisfies your immediate request.

Best Regards,

Paterson Group Inc.

Scott S, Dennis P.Eng.

PATERSON GROUP

memorandum

re: **Blasting Impact Assessment**
Proposed High-Rise Building
1546 Scott Street – Ottawa, Ontario

to: Reid's Heritage Properties – **Ms. Melissa MacGregor** – mmacgregor@reidsproperties.com

date: November 10, 2022

file: PG6510-MEMO.01

Further to your request, Paterson Group (Paterson) prepared this memorandum to document the blasting impact assessment associated with the proposed development at the aforementioned site, as it relates to the LRT Confederation Line which is located in proximity to the site. It is understood that this has been requested by the City of Ottawa as part of the Site Plan Application process.

Existing Site Conditions

The existing site has an approximate area of 2,500 m^2, and is bordered by Scott Street to the north, and commercial properties to the east, west, and south. The site is currently occupied by a single-storey commercial structure in the northwest corner of the site, with the remainder of the site being occupied by asphalt-paved access lanes and parking areas with landscaped margins. The site relatively level at approximate geodetic elevation 62 m.

The LRT Confederation Line is located approximately 38 m north of the subject site.

Proposed Development

Based on the available drawings, the proposed development consists of a high-rise building with 4 levels of underground parking, which will occupy the entire footprint of the subject site.

Subsurface Conditions

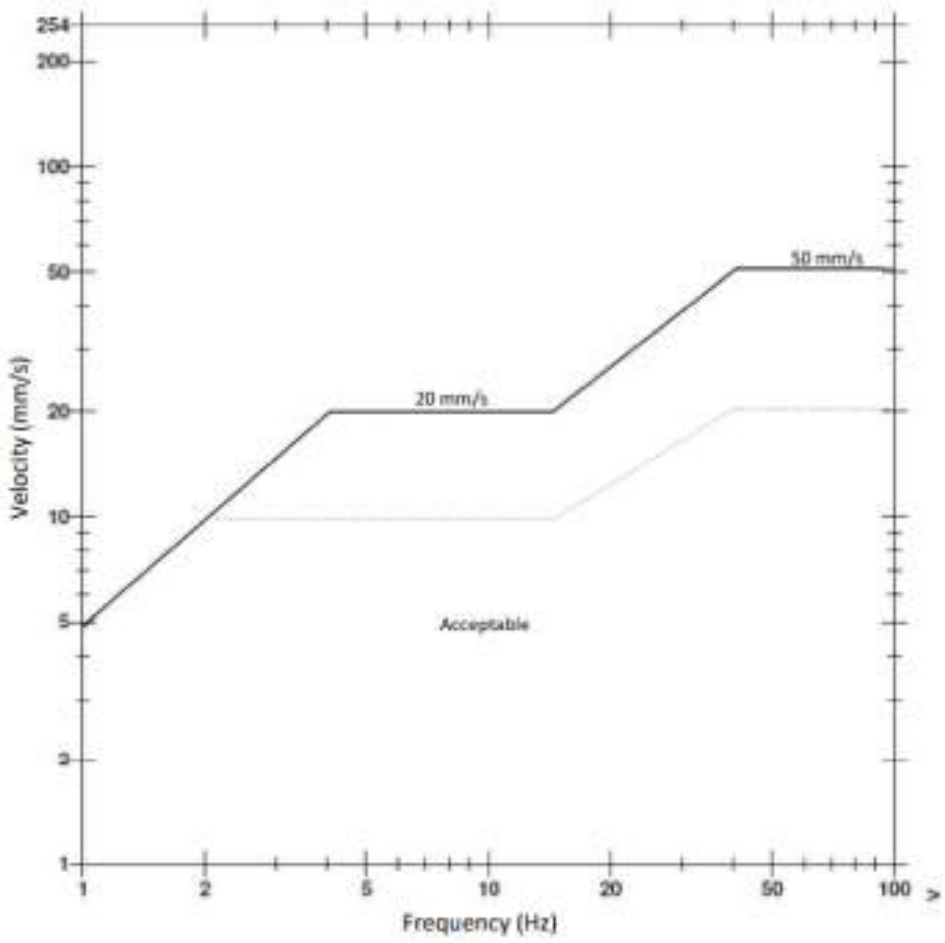
The Subsurface Investigation Report, prepared by others, indicates that the subsurface conditions at the site consist of approximately 0.8 to 2.9 m of overburden overlain by limestone bedrock.

Blasting Impact Assessment on LRT Confederation Line

As the proposed development will extend approximately 13 to 14 m below existing site grades, bedrock removal will be required. Given the volume of bedrock to be removed for this proposed development, it is expected that blasting will be required. The main consideration for blasting, as it relates to the LRT Confederation Line, is blasting-induced vibrations which could potentially impact this existing structure.

Accordingly, the recommended vibration limits for the LRT Confederation Line are provided below in Figure 1.

Figure 1 - Proposed Vibration Limits at the LRT Confederation Line



Based on the approximate distance of 38 m between the subject site and the LRT Confederation Line, it is feasible that proposed blasting and other construction operations remain within the vibration criteria provided in Figure 1.

It is, however, recommended that a vibration monitoring program be implemented for the duration of the blasting and excavation to ensure vibration levels remain within the recommended limits.

The vibration monitoring program will incorporate real time results at the LRT Confederation Line corridor, which is located in proximity to the subject site. The monitoring equipment should consist of a tri-axial seismograph, capable of measuring vibration intensities up to 254 mm/s at a frequency response of 2 to 250 Hz. The vibration monitor is to be placed at the southern boundary of the LRT Confederation Line, which is nearest to the subject site.

Monitoring Data

The monitoring protocol will include the following information:

Warning Level Event (indicated by the light blue line on Figure 1)

- ❑ Paterson will review all vibrations over the established warning level, and;
- ❑ Paterson will notify the contractor if any vibrations occur due to construction activities and are close to exceedance level.

Exceedance Level Event (indicated by the black line on Figure 1)

- ❑ Paterson will notify all the relevant stakeholders via email
- ❑ Ensure monitors are functioning
- ❑ Issue the vibration exceedance result

The data collected will include the following:

- ❑ Measured vibration levels
- ❑ Distance from the construction activity to monitoring location
- ❑ Vibration type

Monitoring should be compliant with all related regulations. The contractor should implement mitigation measures for future excavation or foundation construction activities as necessary and provide updates on the effectiveness of the improvement. Response actions should be pre-determined prior to excavation, depending on the approach provided to protect elements. Processes and procedures should be in-place prior to completing any vibrations to identify issues and react in a quick manner in the event of an exceedance.

Incident / Exceedance Reporting

In case an incident/exceedance occurs from construction activities, the Senior Project Management and any relevant personnel should be notified immediately. Whenever two exceedances in a row are recorded, or a single exceedance of over 30 mm/s, blasting should cease and a report should be completed which contains the following:

- ❑ Identify the location of vibration exceedance
- ❑ The date, time and nature of the exceedance/incident
- ❑ Purpose of the exceeded monitor and current vibration criteria
- ❑ Identify the likely cause of the exceedance/incident
- ❑ Describe the response action that has been completed to-date
- ❑ Describe the proposed measures to address the exceedance/incident.

Before blasting can re-commence, a revision of the blasting program should be completed by the blasting engineer, taking into consideration rock quality, blast pattern configurations and the previously recorded vibrational data. Once the blast engineer, the blast monitoring consultant, and the site supervisor are satisfied that the revised blasting program will reduce the vibrations on neighbouring structures to acceptable levels, blasting can then commence.

Final Remarks

As noted above, based on the approximate distance of 38 m between the subject site and the LRT Confederation Line, it is feasible that proposed blasting and other construction operations remain within acceptable vibration criteria, such that impacts to the LRT Confederation Line will not occur.

We trust that this Information satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

Stephanie Boisvenue, P.Eng.

Scott S. Dennis, P.Eng.