

**Noise Assessment Report - 13
Monk Street**

Project # 160401462



Prepared for:
Art Construction

Prepared by:
Stantec Consulting Ltd.

Revision 2

June 3, 2019

NOISE ASSESSMENT REPORT - 13 MONK STREET

Introduction
June 3, 2019

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1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

Stantec Consulting Ltd. has been retained by Art Construction to prepare an environmental noise assessment for the proposed 3 storey building at 13 Monk Street, located in the City of Ottawa. A site plan control application is being prepared and a Noise Assessment Study is required to address City policies regarding residential development adjacent to an arterial and collector road.

The purpose of this report is to:

- outline the Ministry's guidelines and criteria for noise levels and residential land use;
- apply the noise level standards of the Ontario Ministry of the Environment, Conservation and Parks NPC-300 to the site in conjunction with the City of Ottawa document "Environmental Noise Control Guidelines" dated January 2016;
- determine the extent to which noise levels will be of concern to future residents/institutional users of the proposed development, using the computerized version (STAMSON 5.03) of the MECP's noise model;
- outline recommendations for noise attenuation, as necessary, to achieve acceptable noise levels for future residents of the proposed development.

1.2 LOCATION

The proposed development consists of 8 units and the site is located at the northeast corner of the Monk Street and Thornton Avenue. The proposed site is illustrated in **Figure 1**. This report will focus on the rooms with exposure to Bank Street and Fifth Avenue.

Surrounding land uses are as follows:

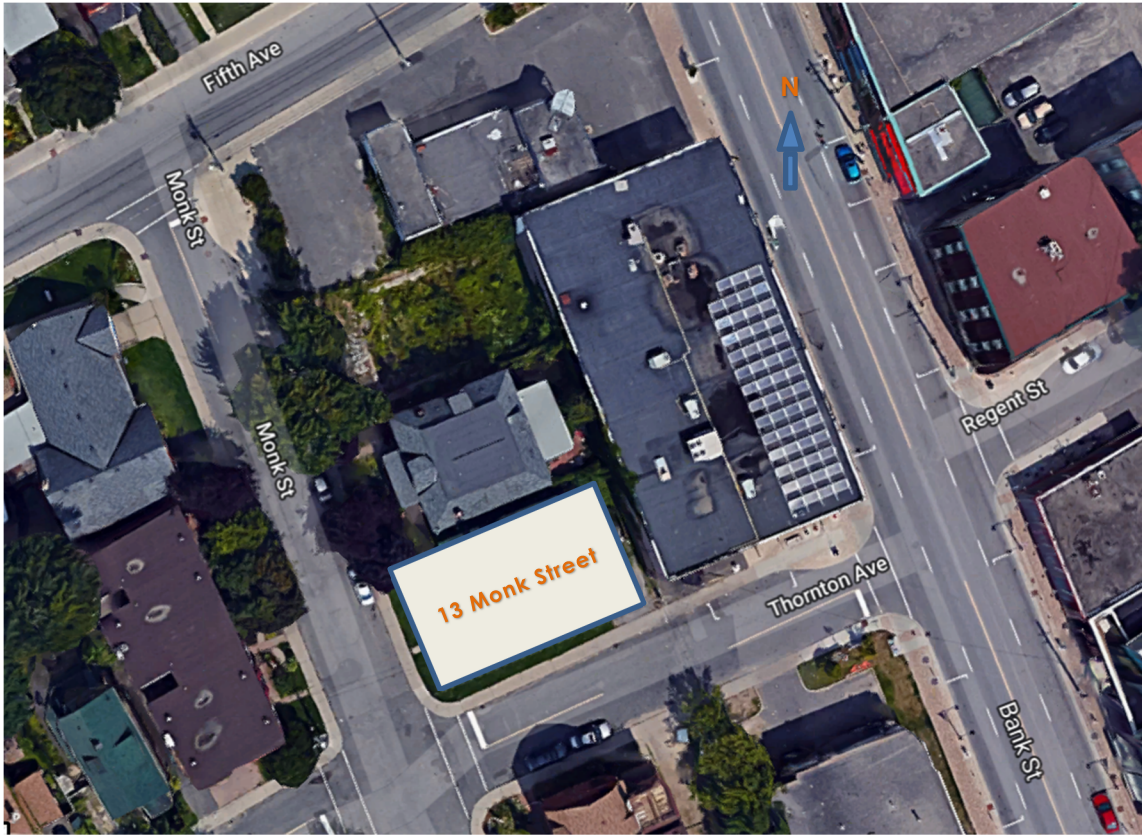
- north – existing residential;
- east – existing commercial;
- south – existing residential;
- west – existing residential.

The main potential noise source that may impact the subject site is vehicular traffic along Bank Street and Fifth Avenue. The traffic volumes for these roadways are based on the City of Ottawa document "Environmental Noise Control Guidelines" (2016).

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Figure 1 – 13 Monk Street Development



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Noise Level Criteria
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2.0 NOISE LEVEL CRITERIA

2.1 GUIDELINES

The Ontario Ministry of Environment Conservation and Parks (MECP) has produced guidelines for noise levels for use in noise assessment and land use planning. Noise level criteria for residential land use are summarized in **Table 1** below. Noise levels in excess of the guidelines presented are acceptable under certain conditions and with certain provisions.

Table 1 Noise Criteria for Residential Land Use

Location	7 a.m. - 11 p.m.	11 p.m. - 7 a.m.
Outdoor Living Areas	55 dBA	N/A
Indoor Living Areas	45 dBA	40 dBA

Table 2 and **Table 3** set out noise levels in excess of the criteria and the required provisions to allow residential activity in locations where noise level criteria are expected.

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**Table 2 Combination of Road and Rail Noise
Day-Time Outdoor, Ventilation and Warning Clause Requirements**

Location	Leq (16 hr) (dBA)	Ventilation Requirements	Outdoor Control Measures	Warning Clause
Outdoor Living Area	Leq16hr less than or equal to 55 dBA	N/A	None required	Not required
	Leq16hr greater than 55 dBA to less than or equal to 60 dBA	N/A	Control measures (barriers) may not be required but should be considered	Required if resultant Leq exceeds 55 dBA Extensive mitigation of outdoor amenity area clause
	Leq16hr greater than 60 dBA	N/A	Control measures (barriers) required to reduce the Leq to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible	Required if resultant Leq exceeds 55 dBA Extensive mitigation of outdoor amenity area clause
Plane of Living Room Window	Leq16hr less than or equal to 55 dBA	None required	N/A	Not required
	Leq16hr greater than 55 dBA to less than or equal to 65 dBA	Provision for central air conditioning	N/A	Required Generic mitigation of indoor area clause
	Leq16hr greater than 65 dBA	Supplied central air conditioning	N/A	Required Extensive mitigation of indoor clause (Supplied Central Air Conditioning)

(Source: Ministry of the Environment, Noise Assessment Criteria in Land Use Planning: Requirements, Procedures and Implementation, October 1997 and City of Ottawa, Environmental Noise Control Guidelines, January 2016)

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**Table 3 Combination of Road and Rail Noise,
Night-Time Ventilation and Warning Clause Requirements**

Location	Leq (8 hr) (dBA)	Ventilation Requirements	Outdoor Control Measures	Warning Clause
Plane of Bedroom Window	Leq8hr greater than 50 dBA to less or equal to 60 dBA	Provision for central air conditioning	N/A	Required Generic mitigation of indoor area clause
	Leq8hr greater than 60 dBA	Supplied central air conditioning	N/A	Required Extensive mitigation of indoor area clause (Supplied Central Air Conditioning)

(Source: Ministry of the Environment, Noise Assessment Criteria in Land Use Planning: Requirements, Procedures and Implementation, October 1997 and City of Ottawa, Environmental Noise Control Guidelines, January 2016)

The MECP also specifies building component requirements when indoor noise levels exceed the criteria by certain levels. These requirements are summarized in **Table 4**.

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Table 4 Road and Rail Noise – Building Component Requirements

Location		Leq (16 hr) (dBA)	Building Component Requirements
Plane of Living Room Window – Daytime	Road	Less than or equal to 65 dBA	Building compliant with the Ontario Building Code
		Greater than 65 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	Rail	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
		Greater than 60 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria

Location		Leq (8 hr) (dBA)	Building Component Requirements
Plane of Bedroom Window - Nighttime	Road	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
		Greater than 60 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	Rail	Less than or equal to 55 dBA	Building compliant with the Ontario Building Code
		Greater than 55 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria

(Source: Ministry of the Environment, Noise Assessment Criteria in Land Use Planning: Requirements, Procedures and Implementation, October 1997 and City of Ottawa, Environmental Noise Control Guidelines, January 2016)

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Observations and Calculations
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3.0 OBSERVATIONS AND CALCULATIONS

3.1 NOISE LEVEL PREDICTIONS

Noise predictions in this report were completed using the computerized version (STAMSON 5.03) of the MECP noise model ORNAMENT to calculate noise levels from various sources. The program accepts variables related to noise sources and receivers, road traffic volumes, and the nature and extent of noise mitigation features, if required.

3.2 ROAD TRAFFIC VOLUMES

Traffic volume data for Bank Street was provided by the City of Ottawa document "Environmental Noise Control Guidelines". The document indicates that the average annual daily traffic volume for Bank Street will be 30,000 vehicles per day for a 4-lane urban arterial-undivided roadway and Fifth Avenue will be 8,000 vehicles per day for a 2-lane urban collector. Additional information regarding applicable assumptions and ratios for day/night traffic and car/ truck traffic is summarized as follows:

- heavy truck traffic for this segment is estimated to be 5% of total traffic volume;
- medium truck traffic for this segment is estimated to be 7% of total traffic volume; the rest is assumed to be car traffic;
- daytime (7 am – 11 pm) traffic is assumed to be 92%, with the remaining 8% at night (11 pm – 7 am); and
- the speed limit for Bank Street and Fifth Avenue is 40 km/h

Table 5 summarizes the traffic volumes used for calculations in this report.

Table 5 Traffic Volumes – Bank Street, 4-Lane Urban Arterial - Undivided

	Day	Night	Total
Car	24,288	2,112	26,400
Medium Truck	1,932	168	2,100
Heavy Truck	3,373	293	1,500
TOTAL	27,600	2,400	30,000
Speed Limit	40 km/h		
Gradient	1%		
Surface	Asphalt		

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Table 6 Traffic Volumes – Fifth Avenue, 2-Lane Urban Collector

	Day	Night	Total
Car	6,477	563	7,040
Medium Truck	515	168	560
Heavy Truck	368	32	400
TOTAL	7,360	640	8,000
Speed Limit	40 km/h		
Gradient	1%		
Surface	Asphalt		

3.3 PROJECTED NOISE LEVELS

Using the MECP noise model ORNAMENT, noise levels were calculated for daytime and nighttime conditions at the point representing the anticipated building location based on the site plan prepared by architect Susan D. Smith. The resulting receiver sites are illustrated in **Figure 2**.

The receiver heights for indoor, daytime, and nighttime noise level calculations for the proposed buildings were assessed at the mid-height of each floor. Building elevation drawings are provided in **Appendix B** as well as the floor plans indicating the receiver locations.

Upon assessing the development's noise exposure to Bank Street and Fifth Avenue it was found that the adjacent building heights restrict the exposure angles of the development up to the second floor. Upon assessment of the third floor receiver on the east facing wall, it was determined that noise levels would be reduced by the adjacent 2 storey building acting as a noise wall. The adjacent building was therefore reflected in the predicted noise level simulation as a 6m high noise wall, affecting 90 of the total 180 degree noise exposure angle from traffic along Bank Street. The subsequent noise level impact based on the influence of the adjacent buildings is reflected in **Table 7**.

It was determined that the unit balconies do not meet the required size minimum to be considered an outdoor amenity space based on City of Ottawa criteria. Therefore, there was no noise sensitivity analysis conducted for outdoor living areas.

The unattenuated indoor receiver noise levels have been summarized in **Table 7**, and noise level calculations are provided in **Appendix A** for sound levels at daytime and nighttime building face.

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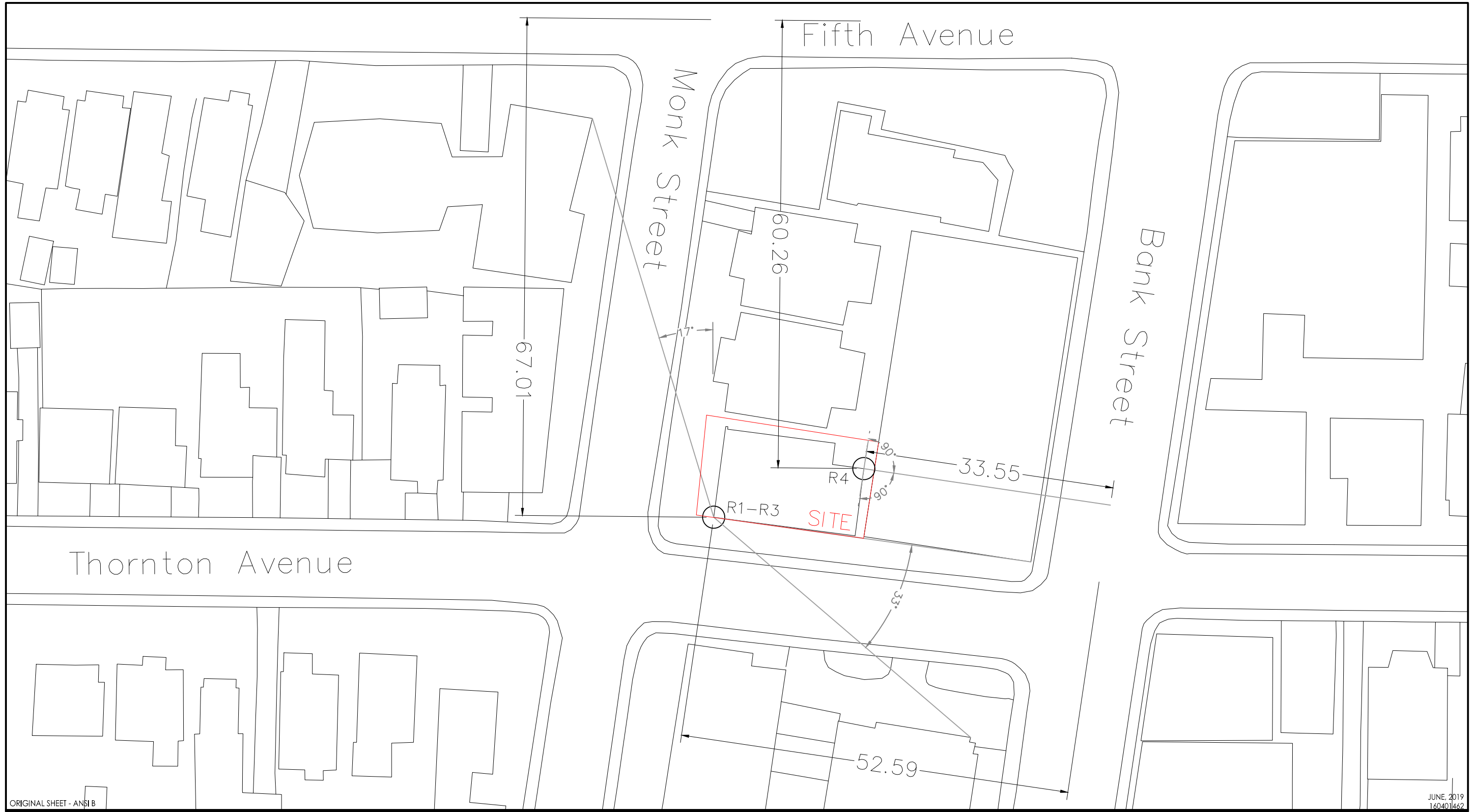
Observations and Calculations

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Table 7 Summary of Projected Unattenuated Noise Levels

Receiver Site	Location	Elevation (m)	Daytime-Building Face (dBA)	Nighttime-Building Face (dBA)
R1	West Building Face – Basement Floor	0.1	57.32	49.72
R2	West Building Face - 1st Floor	2.9	57.32	49.72
R3	West Building Face - 2nd Floor	5.8	57.32	49.72
R4	East Building Face - 3rd Floor	8.7	61.93	54.33

V:\01-604\active\160401462\design\report\Noise\Drawings\160401462-NA-2019-06-03.dwg
2019/06/03 3:01 PM By: Odarn, Carleton



4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 OUTDOOR NOISE IMPACTS

Predicted outdoor noise levels were not assessed for the development given all unit balconies are not large enough to be considered an outdoor living area based on the City of Ottawa criteria.

4.2 INDOOR NOISE IMPACTS

Predicted noise levels are above City of Ottawa and MECP criteria at the daytime building face and the nighttime building face for the proposed units with exposure to Bank Street and Fifth Avenue.

The following summarizes the measures required by the City of Ottawa and MECP criteria for the development to occur within accepted standards:

- Based on the predicted noise levels all proposed units within 13 Monk Street fall under the noise warning clause Generic Indoor Noise Mitigation (GI) that requires the provision for adding central air conditioning.

Noise warning clauses are provided in **Appendix C**.

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Conclusions and Recommendations

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The inclusion of these measures will allow the residential development to proceed in accordance with MECP criteria with respect to environmental noise.

Respectfully submitted by:



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Engineering Intern



Dustin Thiffault, P.Eng.,
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Appendix A Noise Level Calculations
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Appendix A NOISE LEVEL CALCULATIONS

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Appendix A Noise Level Calculations
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A.1 INDOOR RECEIVER STAMSON REPORTS

Filename: R1.te Time Period: Day/Night 16/8 hours
 Description: Indoor Receiver 1 - Basement Floor

Road data, segment # 1: Bank Street (day/night)

 Car traffic volume : 24288/2112 veh/TimePeriod *
 Medium truck volume : 1932/168 veh/TimePeriod *
 Heavy truck volume : 1380/120 veh/TimePeriod *
 Posted speed limit : 40 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT) : 30000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 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: Bank Street (day/night)

 Angle1 Angle2 : 0.00 deg 33.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 52.60 / 52.60 m
 Receiver height : 0.10 / 0.10 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 2: Fifth Avenue (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 : 1 %
 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 : 0.00
 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: Fifth Avenue (day/night)

Angle1 Angle2 : 0.00 deg 17.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 67.00 / 67.00 m
 Receiver height : 0.10 / 0.10 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Bank Street (day)

Source height = 1.50 m

ROAD (0.00 + 56.88 + 0.00) = 56.88 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

--- 0 33 0.00 69.70 0.00 -5.45 -7.37 0.00 0.00 0.00
 56.88

Segment Leg : 56.88 dBA

Results segment # 2: Fifth Avenue (day)

Source height = 1.50 m

ROAD (0.00 + 47.21 + 0.00) = 47.21 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

--- 0 17 0.00 63.96 0.00 -6.50 -10.25 0.00 0.00 0.00
 47.21

Segment Leg : 47.21 dBA

Total Leg All Segments: 57.32 dBA

Filename: R2.te Time Period: Day/Night 16/8 hours
 Description: Indoor Receiver 2 - First Floor

Road data, segment # 1: Bank Street (day/night)

 Car traffic volume : 24288/2112 veh/TimePeriod *
 Medium truck volume : 1932/168 veh/TimePeriod *
 Heavy truck volume : 1380/120 veh/TimePeriod *
 Posted speed limit : 40 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT) : 30000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 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: Bank Street (day/night)

 Angle1 Angle2 : 0.00 deg 33.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 52.60 / 52.60 m
 Receiver height : 2.90 / 2.90 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 2: Fifth Avenue (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 : 1 %
 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 : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Results segment # 1: Bank Street (night)

 Source height = 1.50 m
 ROAD (0.00 + 49.28 + 0.00) = 49.28 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

 0 33 0.00 62.10 0.00 -5.45 -7.37 0.00 0.00 0.00 0.00
 49.28

 Segment Leq : 49.28 dBA

Results segment # 2: Fifth Avenue (night)

 Source height = 1.50 m
 ROAD (0.00 + 39.61 + 0.00) = 39.61 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

 0 17 0.00 56.36 0.00 -6.50 -10.25 0.00 0.00 0.00 0.00
 39.61

 Segment Leq : 39.61 dBA
 Total Leq All Segments: 49.72 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 57.32
 (NIGHT) : 49.72

Results segment # 1: Bank Street (night)

Source height = 1.50 m
 ROAD (0.00 + 49.28 + 0.00) = 49.28 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

 0 33 0.00 62.10 0.00 -5.45 -7.37 0.00 0.00 0.00
 49.28

Segment Leq : 49.28 dBA

Results segment # 2: Fifth Avenue (night)

Source height = 1.50 m
 ROAD (0.00 + 39.61 + 0.00) = 39.61 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

 0 17 0.00 56.36 0.00 -6.50 -10.25 0.00 0.00 0.00
 39.61

Segment Leq : 39.61 dBA

Total Leq All Segments: 49.72 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 57.32
 (NIGHT) : 49.72

Data for Segment # 2: Fifth Avenue (day/night)

Angle1 Angle2 : 0.00 deg 17.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 67.00 / 67.00 m
 Receiver height : 2.90 / 2.90 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Bank Street (day)

Source height = 1.50 m

ROAD (0.00 + 56.88 + 0.00) = 56.88 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

 0 33 0.00 69.70 0.00 -5.45 -7.37 0.00 0.00 0.00
 56.88

Segment Leq : 56.88 dBA

Results segment # 2: Fifth Avenue (day)

Source height = 1.50 m
 ROAD (0.00 + 47.21 + 0.00) = 47.21 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

 0 17 0.00 63.96 0.00 -6.50 -10.25 0.00 0.00 0.00
 47.21

Segment Leq : 47.21 dBA

Total Leq All Segments: 57.32 dBA

Filename: r3.te Time Period: Day/Night 16/8 hours
 Description: Indoor Receiver 3 - Second Floor

Road data, segment # 1: Bank Street (day/night)

 Car traffic volume : 24288/2112 veh/TimePeriod *
 Medium truck volume : 1932/168 veh/TimePeriod *
 Heavy truck volume : 1380/120 veh/TimePeriod *
 Posted speed limit : 40 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT) : 30000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 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: Bank Street (day/night)

 Angle1 Angle2 : 0.00 deg 33.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 52.60 / 52.60 m
 Receiver height : 5.80 / 5.80 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 2: Fifth Avenue (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 : 1 %
 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 : 0.00
 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: Fifth Avenue (day/night)

Angle1 Angle2 : 0.00 deg 17.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 67.00 / 67.00 m
 Receiver height : 5.80 / 5.80 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Bank Street (day)

Source height = 1.50 m

ROAD (0.00 + 56.88 + 0.00) = 56.88 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

--- 0 33 0.00 69.70 0.00 -5.45 -7.37 0.00 0.00 0.00
 56.88

Segment Leq : 56.88 dBA

Results segment # 2: Fifth Avenue (day)

Source height = 1.50 m

ROAD (0.00 + 47.21 + 0.00) = 47.21 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

--- 0 17 0.00 63.96 0.00 -6.50 -10.25 0.00 0.00 0.00
 47.21

Segment Leq : 47.21 dBA

Total Leq All Segments: 57.32 dBA

Filename: r4.te Time Period: Day/Night 16/8 hours
 Description: Indoor Receiver 4

Road data, segment # 1: Bank Street (day/night)

 Car traffic volume : 24288/2112 veh/TimePeriod *
 Medium truck volume : 1932/168 veh/TimePeriod *
 Heavy truck volume : 1380/120 veh/TimePeriod *
 Posted speed limit : 40 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT) : 30000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 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: Bank Street (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 33.50 / 33.50 m
 Receiver height : 8.70 / 8.70 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -90.00 deg Angle2 : 0.00 deg
 Barrier height : 6.00 m
 Barrier receiver distance : 24.10 / 24.10 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

Road data, segment # 2: Fifth Avenue (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 : 1 %
 Road pavement : 1 (Typical asphalt or concrete)

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

Results segment # 1: Bank Street (night)

 Source height = 1.50 m
 ROAD (0.00 + 49.28 + 0.00) = 49.28 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

 0 33 0.00 62.10 0.00 -5.45 -7.37 0.00 0.00 0.00 0.00
 49.28

 Segment Leq : 49.28 dBA

Results segment # 2: Fifth Avenue (night)

 Source height = 1.50 m
 ROAD (0.00 + 39.61 + 0.00) = 39.61 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

 0 17 0.00 56.36 0.00 -6.50 -10.25 0.00 0.00 0.00 0.00
 39.61

 Segment Leq : 39.61 dBA
 Total Leq All Segments: 49.72 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 57.32
 (NIGHT) : 49.72

24 hr Traffic Volume (AADT or SADD) : 8000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 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: Fifth Avenue (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 60.26 / 60.26 m
 Receiver height : 8.70 / 8.70 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Bank Street (day)

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 ! 8.70 ! 3.52 ! 3.52

ROAD (0.00 + 51.88 + 60.58) = 61.13 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq
 -90 0 0.08 69.70 0.00 -3.78 -3.25 0.00 0.00 0.00
 51.88
 0 90 0.44 69.70 0.00 -5.04 -4.08 0.00 0.00 0.00
 60.58

Segment Leq : 61.13 dBA

Results segment # 2: Fifth Avenue (day)

Source height = 1.50 m
 ROAD (0.00 + 54.17 + 0.00) = 54.17 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq
 -90 90 0.44 63.96 0.00 -8.72 -1.07 0.00 0.00 0.00
 54.17

Segment Leq : 54.17 dBA

Total Leq All Segments: 61.93 dBA

Results segment # 1: Bank Street (night)

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 ! 8.70 ! 3.52 ! 3.52

ROAD (0.00 + 44.28 + 52.98) = 53.53 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq
 -90 0 0.08 62.10 0.00 -3.78 -3.25 0.00 0.00 -10.79
 44.28
 0 90 0.44 62.10 0.00 -5.04 -4.08 0.00 0.00 0.00
 52.98

Segment Leq : 53.53 dBA

Results segment # 2: Fifth Avenue (night)

Source height = 1.50 m
 ROAD (0.00 + 46.57 + 0.00) = 46.57 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

-90 90 0.44 56.36 0.00 -8.72 -1.07 0.00 0.00 0.00
46.57

Segment Leq : 46.57 dBA

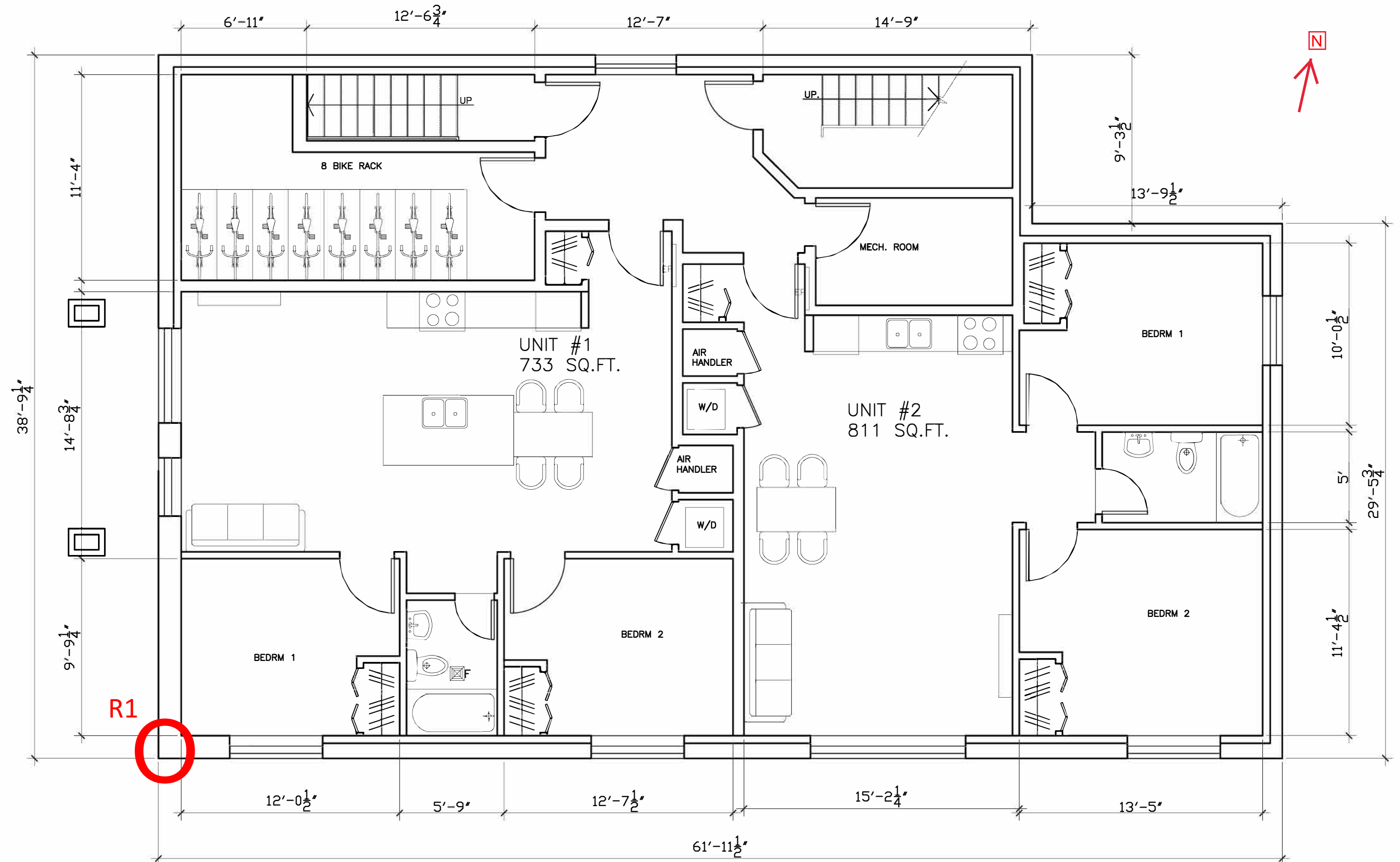
Total Leq All Segments: 54.33 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 61.93
(NIGHT) : 54.33

NOISE ASSESSMENT REPORT - 13 MONK STREET

Appendix B Floor Plans and Elevation Drawings
June 3, 2019

Appendix B FLOOR PLANS AND ELEVATION DRAWINGS



**PROPOSED 4 STOREY
APARTMENT BUILDING**
9/13 MONK ST
OTTAWA, ONT.

CLIENT:



SUSAN D. SMITH ARCHITECT
1114 Gladstone Avenue
Ottawa, Ontario
K1Z 8L2
613-722-5327
sds@magma.ca

BASEMENT PLAN

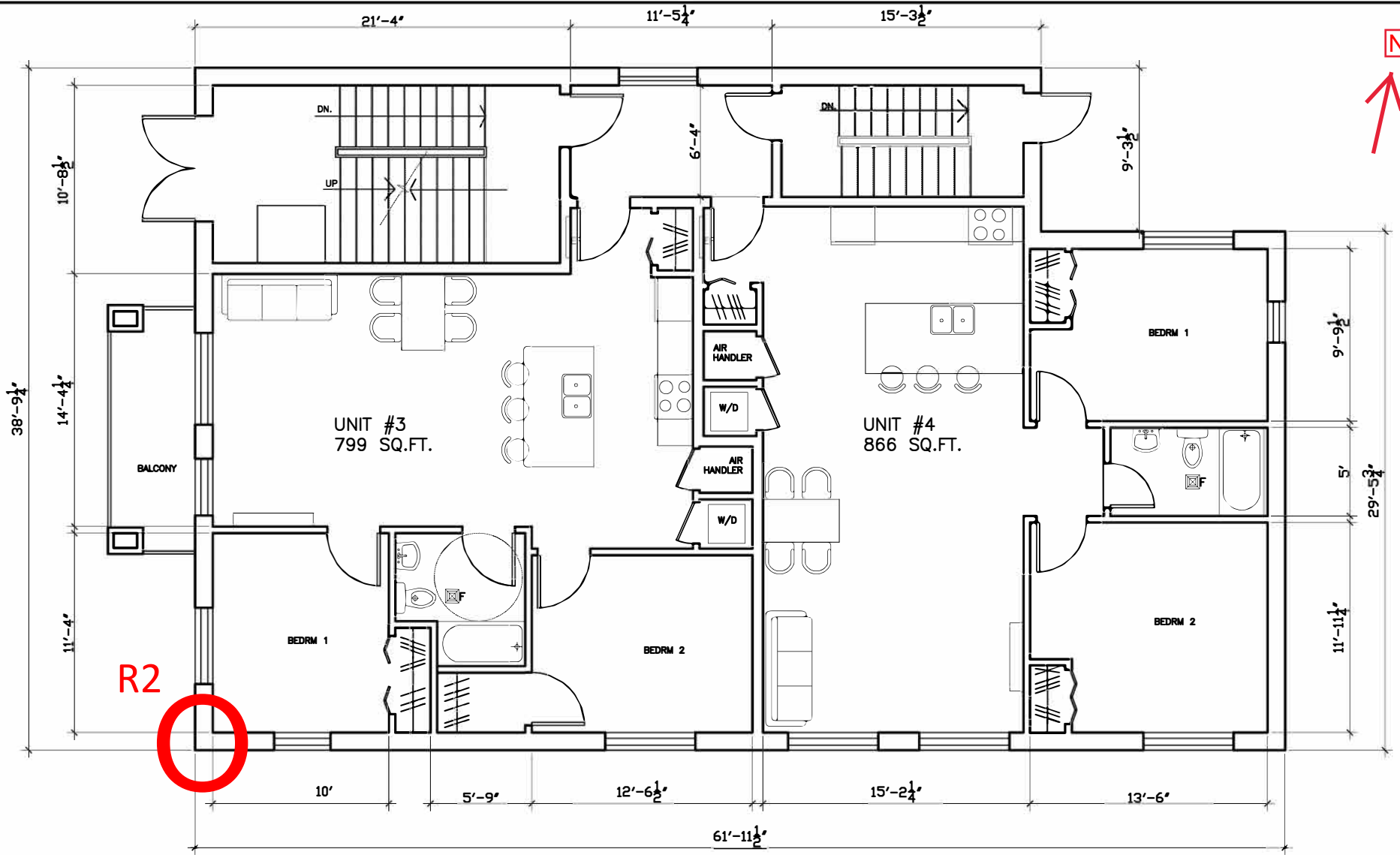
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No.	REVISION DATE

DRAWN BY: T.D.

JOB # 1843

DATE OCT/18

A1



**PROPOSED 4 STOREY
APARTMENT BUILDING
9/13 MONK ST
OTTAWA, ONT.**

CLIENT:



SUSAN D. SMITH ARCHITECT
1114 Gladstone Avenue
Ottawa, Ontario
K1Z 8L2
613-722-5327
sds@magma.ca

1ST. FLOOR PLAN

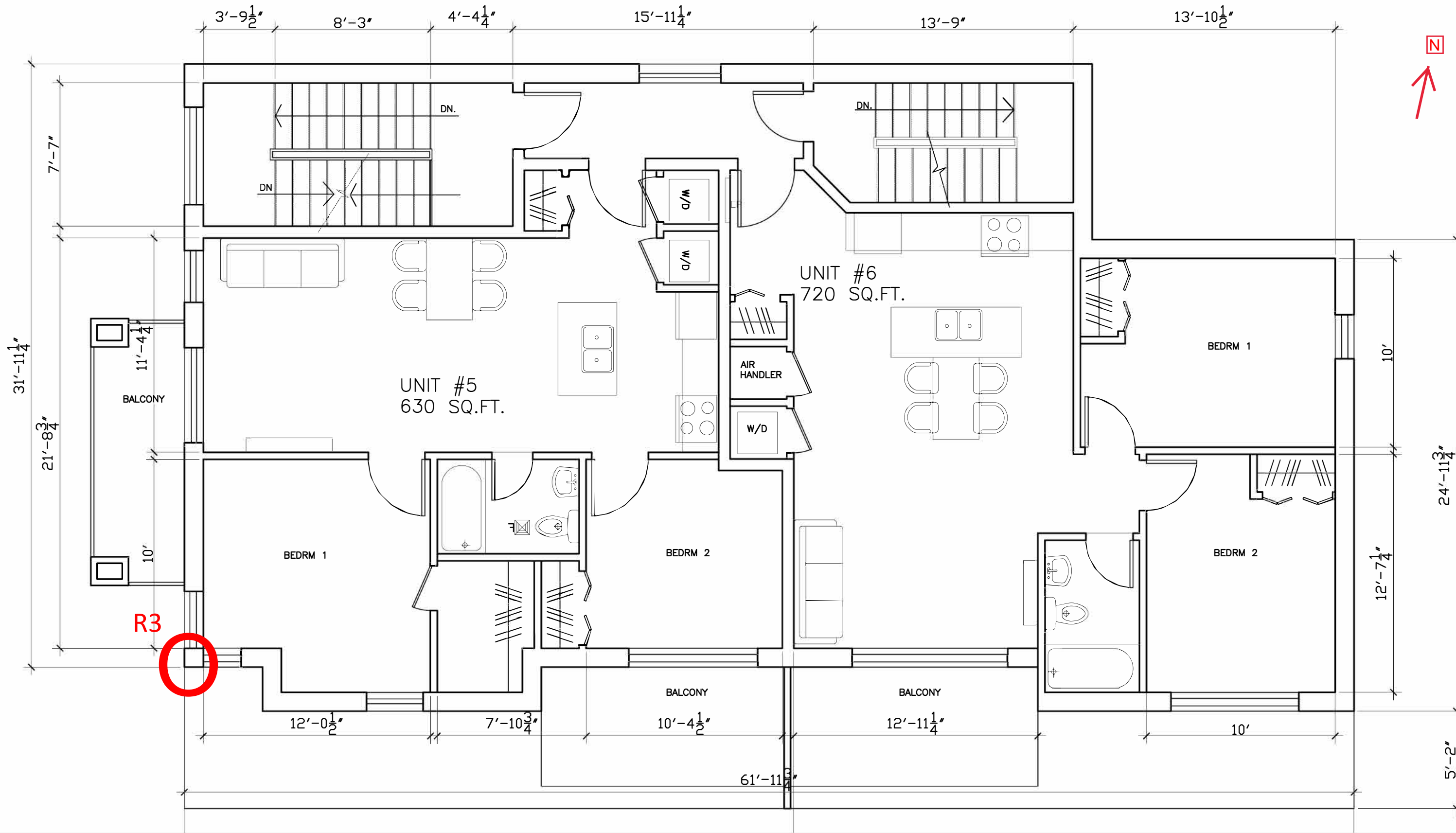
ISSUED FOR REVIEW	13/12/2018
REVISION	DATE

DRAWN BY: T.D.

JOB # 1843

DATE OCT/18

A2



**PROPOSED 4 STOREY
APARTMENT BUILDING
11 MONK ST
OTTAWA, ONT.**

CLIENT:



SUSAN D. SMITH ARCHITECT
1114 Gladstone Avenue
Ottawa, Ontario
K1Z 8L2
613-722-5327
sds@magma.ca

2ND. FLOOR PLAN

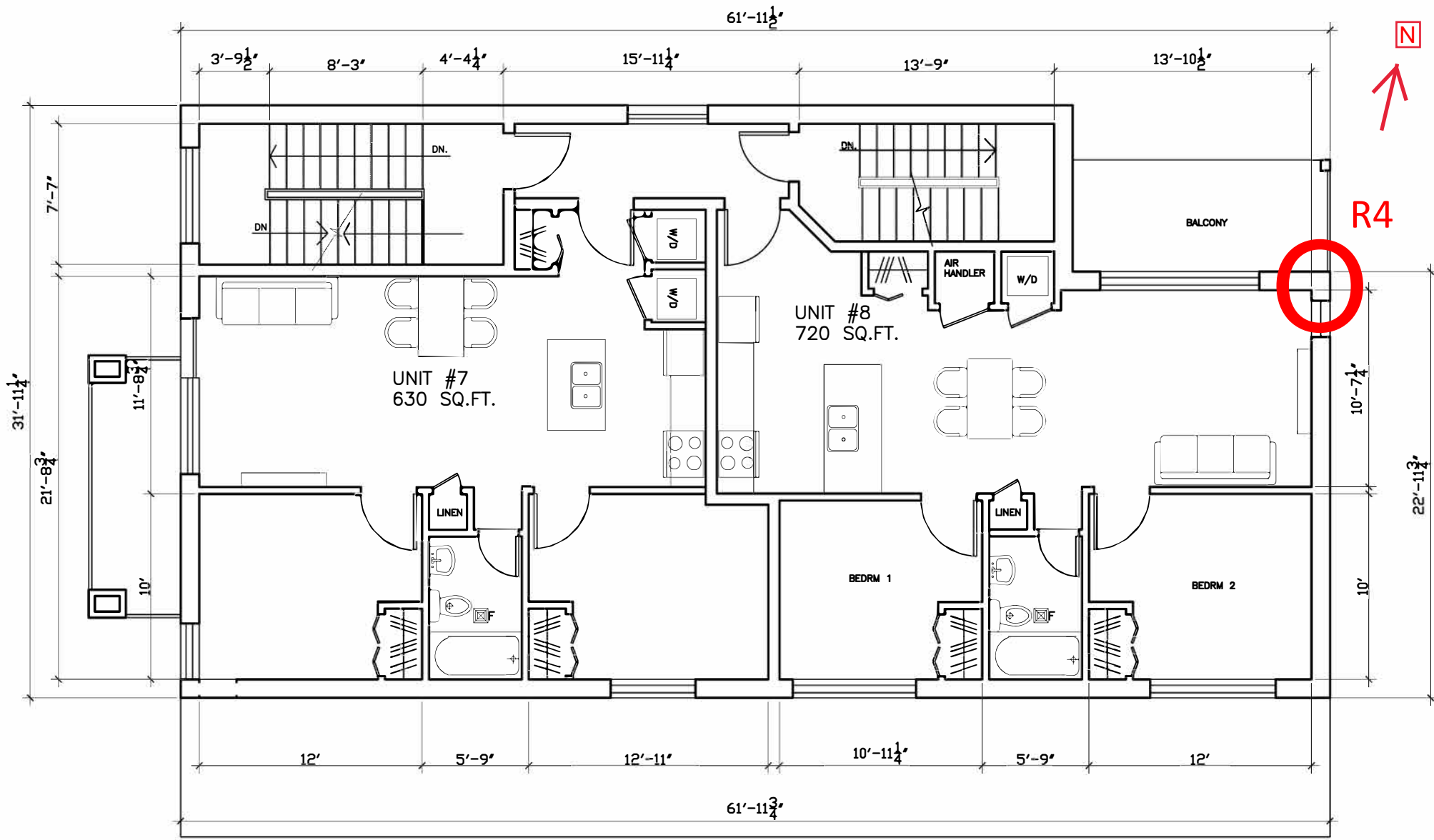
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No.	REVISION	DATE

DRAWN BY: T.D.

JOB # 1843

DATE OCT/18

A3



**PROPOSED 4 STOREY
APARTMENT BUILDING
11 MONK ST
OTTAWA, ONT.**

CLIENT:



SUSAN D. SMITH ARCHITECT
1114 Gladstone Avenue
Ottawa, Ontario
K1Z 8L2
613-722-5327
sds@magma.ca

3RD. FLOOR PLAN

0	ISSUED FOR REVIEW	13/12/2018
No.	REVISION	DATE

DRAWN BY: T.D.

JOB # 1843

DATE OCT/18

A4

NEW APARTMENT BUILDING
13-15 MONK ST.
OTTAWA, ONTARIO
K1S 3Y5

CLIENT:



CIVIL ENGINEER AND LANDSCAPE ARCHITECT

STANTEC
 400 - 1331 Clyde Avenue
 Ottawa ON K2C 3G4
 Phone: (613) 724-4337
 Cell: (613) 297-0571
 Fax: (613) 722-2799

GEOTECHNICAL

HOULE CHEVRIER ENGINEERING LTD.
 180 WESCAR LANE
 OTTAWA, ONTARIO
 KOA 1L0
 613-836-1422

SURVEYOR

ANNIS, O'SULLIVAN, VOLLEBEKK Ltd.
 14 Concourse Gate, Suite 500
 Nepean, Ont. K2E 7S6
 Phone: (613) 727-0850
 Fax: (613) 727-1079

SUSAN D. SMITH ARCHITECT

1114 GLADSTONE AVE
 OTTAWA, ONTARIO
 K1Y 3H5
 613-722-5327
 sds@gamma.ca

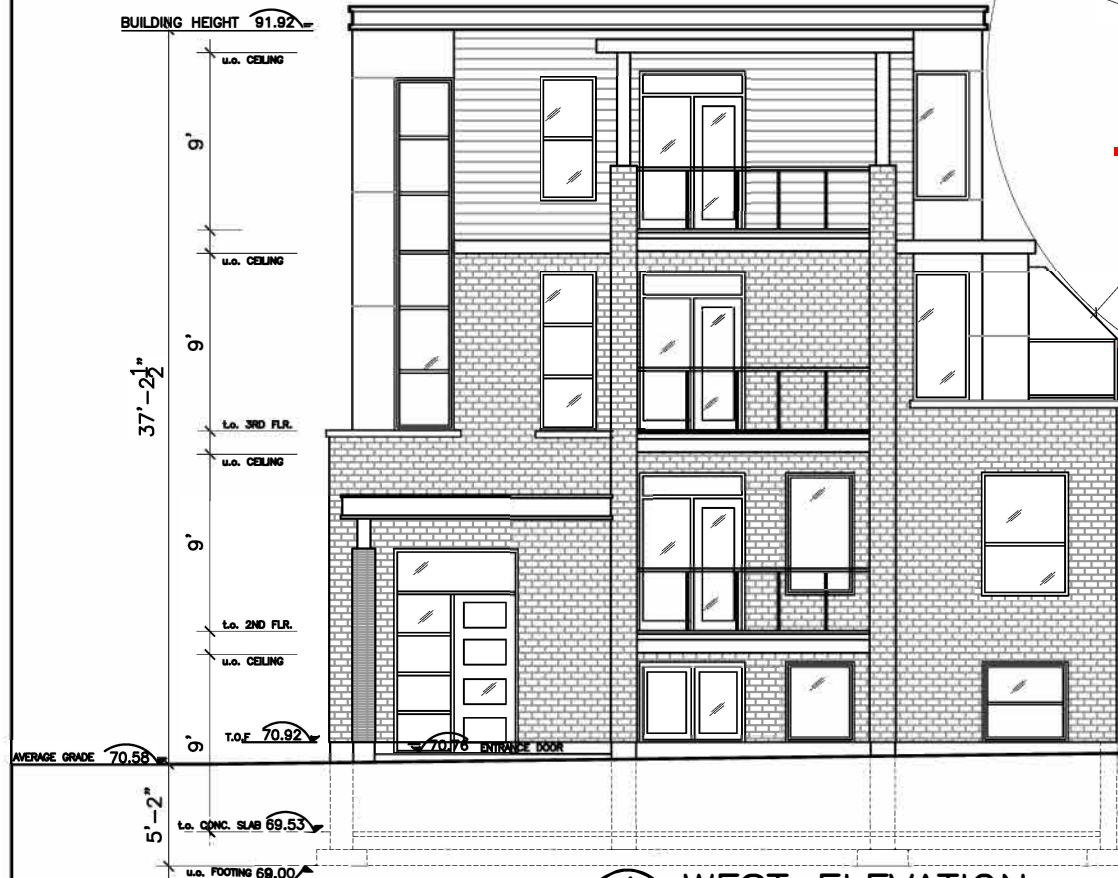
3		
2		
1		
0	ISSUED FOR REVIEW	OCT. 19/2018
No.	REVISION	DATE

NOTES:
 1. All dimensions are to be checked on site. Discrepancies or ambiguities should be reported prior to work on site or ordering of materials.
 2. All work to be in accordance with the Ontario Building Code, latest edition.

ELEVATIONS

Scale	AS NOTES
Drawn	TD
Checked	SDS
Date	OCT/2018
Job #	1843

EL

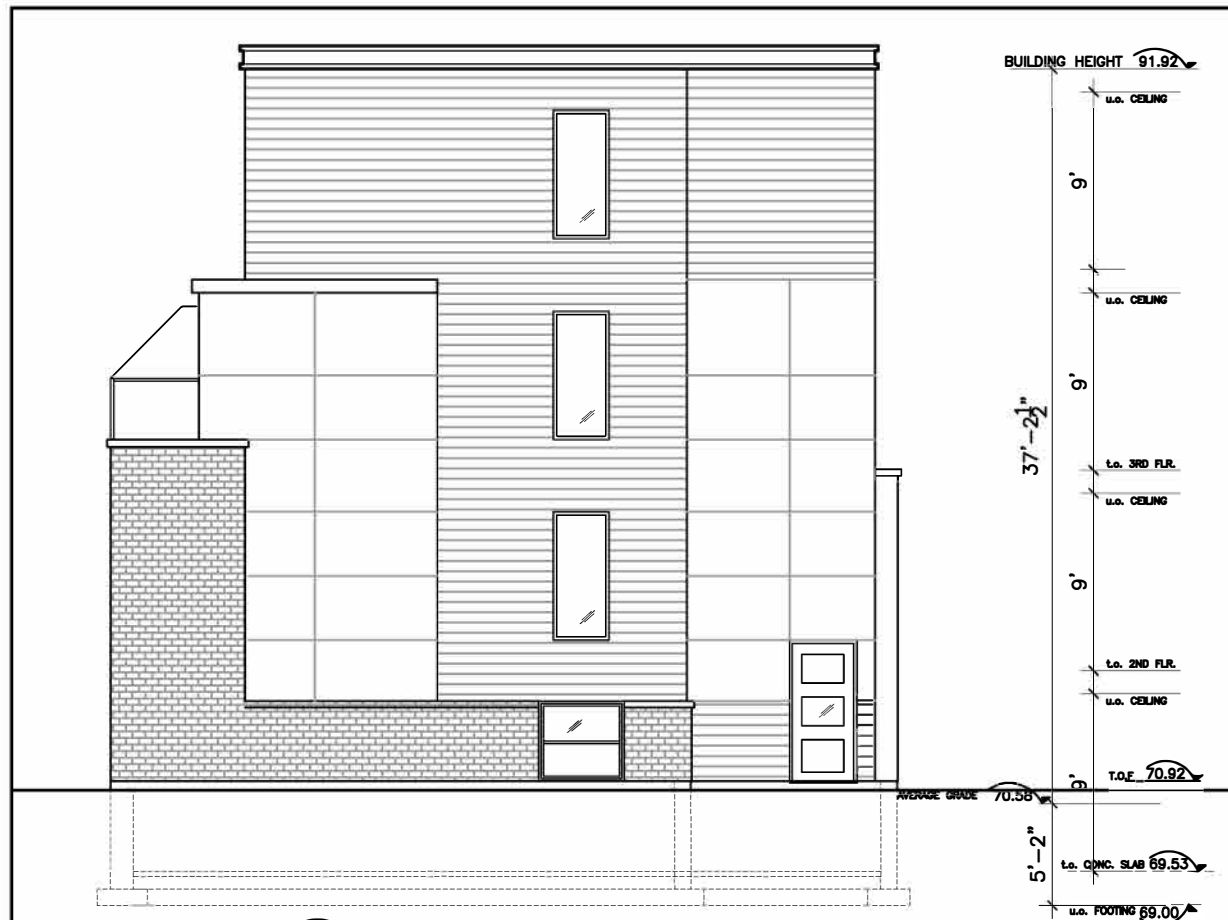


1 WEST ELEVATION
 EL SCALE: 1/150

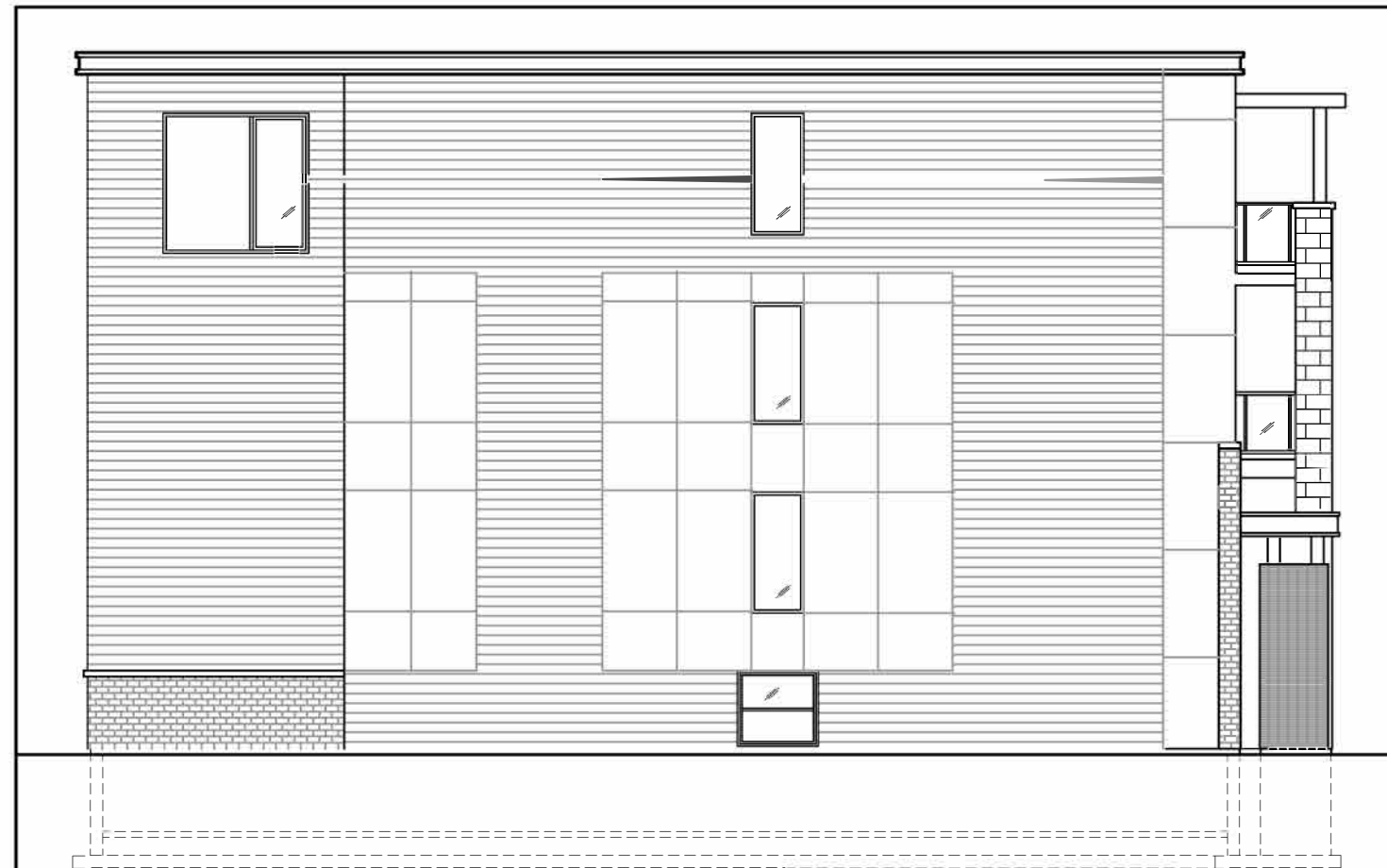
R4 (height 8.7m)
 R3 (height 5.8m)
 R2 (height 2.9m)
 R1 (height 0.1m)



2 SOUTH ELEVATION
 EL SCALE: 1/150



3 EAST ELEVATION
 EL SCALE: 1/150



4 NORTH ELEVATION
 EL SCALE: 1/150

NOISE ASSESSMENT REPORT - 13 MONK STREET

Appendix C Noise Warning Clauses
June 3, 2019

Appendix C NOISE WARNING CLAUSES

NOISE ASSESSMENT REPORT - 13 MONK STREET

Appendix C Noise Warning Clauses
June 3, 2019

WARNING CLAUSES

The following warning clauses may be used individually or in combination:

Generic Mitigation of Indoor Area (GI):

Indoor environment - $L_{eq}(16)$ greater than 55 dBA and less than or equal to 65 dBA or ($L_{eq}(8)$) greater than 50dBA and less than or equal to 60 dBA

To help address the need for sound attenuation this development has been designed so as to provide an indoor environment that is within provincial guidelines. Measures for sound attenuation include:

- the provision for adding central air conditioning at the occupant's discretion.

To be included in all offers of purchase:

"Installation of central air conditioning by the homeowner will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City of Ottawa and the Ministry of the Environment Conservation and Parks."

Extensive Mitigation of Indoor Area (MI):

Indoor environment - $L_{eq}(16)$ greater than 65 dBA or ($L_{eq}(8)$) greater than 60dBA

To help address the need for sound attenuation this development has been designed so as to provide an indoor environment that is within provincial guidelines. Measures for sound attenuation include:

- multi-pane glass;
- exterior wall insulation;
- a forced central air conditioning system.

To ensure that provincial sound level limits are not exceeded, it is important to maintain these sound attenuation features.

To be included in all offers of purchase:

"This dwelling unit has been supplied with a forced central air conditioning system and other measures which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City of Ottawa and the Ministry of the Environment Conservation and Parks."

NOISE ASSESSMENT REPORT - 13 MONK STREET

Appendix C Noise Warning Clauses
June 3, 2019

Extensive Mitigation of Outdoor Amenity Area (MO):

Outdoor amenity areas- $L_{eq}(16)$ in the OLA greater than 55 dBA.

To help address the need for outdoor sound attenuation this development is to include outdoor noise attenuation with the use of:

- an acoustic barrier.

To be included in all offers of purchase:

“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 may, on occasion, interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City of Ottawa and the Ministry of the Environment Conservation and Parks.”

Source: City of Ottawa - Environmental Noise Control Guidelines, January 2016 and Ontario Ministry of the Environment, Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning Publication NPC-300, Queen's Printer for Ontario, 2013