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Mattino Developments Inc.
255 Mountshannon Drive – Block 2

Noise Impact Assessment

Noise Impact Assessment

Mattino Developments Inc.
255 Mountshannon Drive – Block 2

175 Claridge Drive
Ottawa, ON
K2J 5V8

Prepared by:

NOVATECH
240 Michael Cowpland Drive, Suite 200
Ottawa, Ontario, K2M 1P6

January 4, 2019

Ref: R-2019-003
Novatech File No. 112021-05

January 4, 2019

BY COURIER

City of Ottawa
Planning and Growth Management Department
110 Laurier Avenue West, 4th Floor
Ottawa, ON K1P 1J1

Attention: Melanie Gervais, Planner II

Reference: 255 Mountshannon Drive – Block 2
Noise Impact Assessment
Our File No.: 112021-05

Please find enclosed three (3) copies of the 'Noise Impact Assessment' for 255 Mountshannon Drive – Block 2 development.

Please contact the undersigned with any questions, or if you require additional information.

Sincerely,

NOVATECH

Lucas Wilson, P.Eng.
Project Coordinator

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICIES

1.0 INTRODUCTION

The subject site is located within the Longfields Community, in the Barrhaven ward at 255 Mountshannon Drive. The site is approximately 0.19ha and is bounded by existing residential to the north, the Longfields Central subdivision to the west and south and Mountshannon Drive to the east. A key plan of the area is presented as **Figure 1-1**.

Figure 1-1 Key Plan

The proposed development will consist of a 3-storey residential stacked townhome structure fronting onto Via Mattino Way with 16 units. The proposed site plan is shown below in **Figure 1-2**.

This report assesses potential noise sources that could affect the development, analyses the sound levels and outlines any necessary noise attenuation requirements for compliance with the City of Ottawa Environmental Noise Control Guidelines (ENCG) and the MOE Environmental Noise Guidelines (MOE Publication NPC-300).

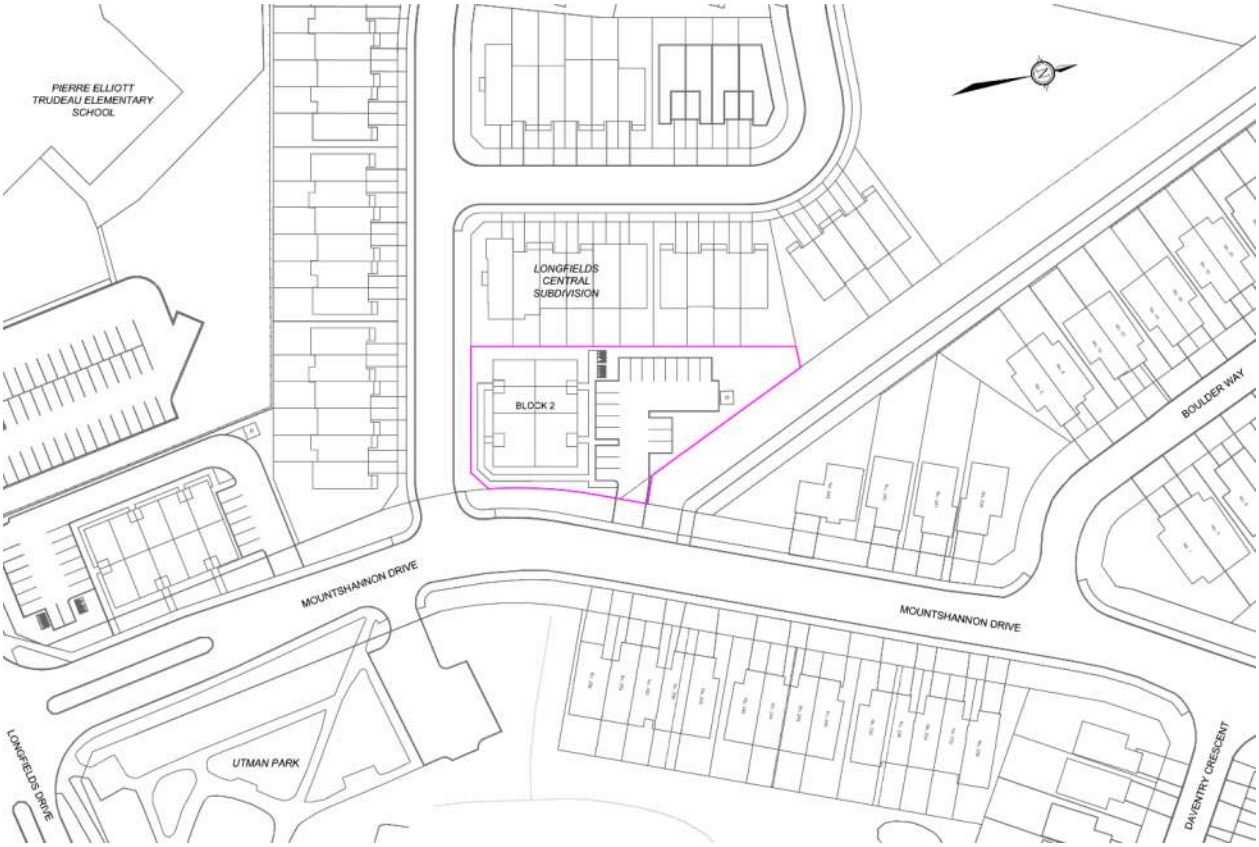


Figure 1-2 Site Plan

2.0 CITY OF OTTAWA ENVIRONMENTAL NOISE CONTROL GUIDELINES

2.1 Sound Level Criteria

The City of Ottawa is concerned with noise from aircraft, roads, railways and transitways as expressed in the City of Ottawa Official Plan (May 2003). These policies are supported by the Environmental Noise Control Guidelines (ENCG) which is a technical document that outlines the specific sound level criteria. The City of Ottawa's *Environmental Noise Control Guidelines (ENCG)*, January, 2016 and the Ministry of Environment's *Environmental Noise Guidelines, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300* have been used for the purpose of this report. As per Section 2.2 of the City of Ottawa Noise Control Guidelines (2016), unless otherwise noted, developments should be consistent with NPC-300 (MOE publication, 2013).

The areas that must be assessed for acoustic protection include the Outdoor Living Area (OLA) and the Outdoor Plane of Window (POW).

These locations are defined as:

- **Outdoor Living Area (OLA):** The Outdoor Living Area is defined as that part of the outdoor amenity area provided for the quiet enjoyment of the outdoor environment during the daytime period. These amenity areas are typically backyards, gardens, terraces, patios and common outdoor living areas. The OLA noise target for traffic and rail noise sources is 55 dBA. The OLA for aircrafts must be analysed separately from surface transportation sources, with a noise target of 30 NEF/NEP (approximately Leq_{24hr} 61-64 dBA). This criterion may be exceeded by an amount not greater than 5 dBA, subject to justification and the use of a Warning Clause. OLA noise levels are analysed at 3.0m from the building façade, 1.5m above grade.

- **Plane of Window (POW):** The plane of window is defined as the indoor living space where the sound levels will affect the living room area during daytime hours and bedrooms during night time hours. The residential Plane of Window noise target for traffic and rail noise sources is 55 dBA during the day and 50 dBA at night. If this criterion is exceeded, the property may be subject to building component analysis and warning clauses. The indoor noise impact for rail, road, and aircraft noise must be assessed separately and the sound criterion is broadly summarized in **Table 2-1, Table 2-2, Table 2-3** and **Table 2-4.** POW noise levels are analysed 1.5m above grade for the first storey, 4.5m above grade for the second storey and 7.5m above grade for the third storey.

Table 2-1 City of Ottawa Outdoor Plane of Window Sound Level Criteria

TIME PERIOD	RECEIVER LOCATION	SOUND LEVEL CRITERIA
Daytime (07:00 - 23:00 hrs)	Plane of Living Room Window	55 dBA
Night time (23:00 - 07:00 hrs)	Plane of Bedroom Window	50 dBA

Compliance with the outdoor sound level criteria generally ensures compliance with the indoor sound level criteria which is summarized below in **Table 2-2**.

Table 2-2 Indoor Sound Level Criteria Surface Transportation

TIME PERIOD	RECEIVER LOCATION	SOUND LEVEL CRITERIA	
		Roadways, Transitways and LRT	Rail (diesel engines/ locomotives)
Daytime (07:00 - 23:00 hrs)	**Living/Dining Rooms of residential dwelling units**, hospitals, schools, nursing homes, day-care centres, theatres, places of worship, individual or semiprivate offices, conference rooms etc.	45 dBA	40 dBA
Night Time (23:00 - 07:00 hrs)	**Sleeping quarters of residential units**, hospitals, nursing homes, senior citizen homes, etc.	40 dBA	35 dBA

Table 2-3 City of Ottawa Façade Material Requirements for Rail Noise Only

ASSESSMENT LOCATION	DISTANCE TO RAILWAY (m)	SOUND LEVEL	FAÇADE MATERIAL REQUIREMENT
PLANE OF BEDROOM WINDOW	Less than 100m	Leq $_{24hr}$ Less than or equal to 60 dBA	No additional requirement
		Leq $_{24hr}$ greater than 60 dBA	Brick veneer or acoustically equivalent
	Greater than 100m	Leq $_{24hr}$ less than or equal to 60 dBA	No additional requirement
		Leq $_{24hr}$ greater than 60 dBA	No additional requirement

Table 2-4 Indoor Aircraft Sound Level Criteria

RECEIVER LOCATION	INDOOR NEF/NEP
Living/Dining areas of residences, sleeping quarters of hotels/motels, theatres, libraries, schools, day-care centres, places of worship, etc.	5 (Approx. Leq$_{24hr}$ 36-39 dBA)
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	0 (Approx. Leq$_{24hr}$ 31-34 dBA)

2.2 Noise Attenuation Requirements

When sound levels are predicted to be less than the specified criteria for daytime and night time conditions, no attenuation measures are required on the part of the proponent. As the noise criteria are exceeded, a combination of attenuation measures is recommended by the City of Ottawa and the MOE to modify the development environment.

These attenuation measures may include any or all of the following:

- Distance setback with soft ground;
- Insertion of noise insensitive land uses between the source and sensitive receptor;
- Orientation of building to provide sheltered zone;
- Construction of a noise barrier wall and/or berm;
- Installation of a forced air ventilation system with provision for central air;
- Installation of central air;
- Acoustically selected building façade components

2.2.1 *Noise Barrier*

Noise barriers should only be used when other noise control measures have been considered, and there is no other alternative. For the purpose of this study, when noise levels exceed 60 dBA in the Outdoor Living Area, control measures (barriers) are required to reduce the Leq to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible.

The noise barriers are to be compliant with the City standards for noise barriers and have the following characteristics.

- Minimum height of 2.2m;
- Maximum height of 2.5m (unless approved by the City of Ottawa);
- Situated 0.30m inside the private property;
- A surface mass density not less than 20kg/sq.m; and
- No holes or gaps.

2.2.2 *Ventilation Requirements*

A forced air heating system with provision for a central air conditioning system is required if the daytime surface transportation noise levels are between 55 dBA and 60 dBA and/or night time surface transportation noise levels are between 50 dBA and 60 dBA. For aircraft noise, a forced air heating system with provision for a central air conditioning system is required if at any location on the property the noise level is between NEF 25 and NEF 30.

The installation of a central air conditioning system is required when the daytime noise level exceeds 65 dBA and/or night time noise levels exceed 60 dBA for surface transportation noise sources and greater than NEF 30 for aircraft noise sources.

2.2.3 *Building Component Assessment*

When noise levels exceed 65 dBA (daytime) or 60 dBA (night time) for surface transportation noise sources or NEF 25 for aircraft noise sources the exterior cladding system of the building envelope must be acoustically assessed to ensure the indoor sound criteria is achieved. This includes analysis of the exterior wall, door, and/or glazing system specifications as appropriate.

The NRC research *Acoustic Insulation Factor: A Rating for the Insulation of Buildings against Noise (*June 1980, JD Quirt) is used to assess the building components and the required acoustic insulation factor (AIF). This method is recognized by the City of Ottawa.

The required AIF is based on the Outside L_{eq}, Indoor L_{eq} required, and the number of exterior façade components.

Minimum Required AIF = Outside L_{eq} – Indoor L_{eq} + $\log_{10}$ (Number of Components) + 2dB

Where, N = Number of components (walls, windows and roof);
L = Sound Level expressed on a common decibel scale.

2.2.4 *Warning Clauses*

When predicted noise levels exceed the specified criteria, the City of Ottawa and the MOE recommend warning clauses be registered as a notice on title and incorporated into the sales agreements to warn potential purchaser/buyers/tenants of the possible elevated noise levels.

The following typical warning clauses are extracted from Section C8.1 of the MOE NPC-300 document.

Warning Clause Type A
"Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the City's and the Ministry of the Environment's noise criteria."

Warning Clause Type B
"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 City's and the Ministry of the Environment's noise criteria."

Warning Clause Type C
"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria."

Warning Clause Type D
"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 City's and the Ministry of the Environment's noise criteria."

2.2.5 *Summary of Noise Attenuation Measure Requirements*

Table 2-5 and **Table 2-6** summarizes the noise attenuation measure requirements and warning clauses should sound criteria be exceeded.

Table 2-5 Outdoor, Ventilation and Warning Clause Requirements (NPC-300)

Assessment Location	L_{eq} (dBA)	Outdoor Control Measures	Indoor Control Measures		Warning Clause
			Ventilation Requirements	Building Components	
Outdoor Living Area (OLA)	Less than 55	None required	N/A	N/A	None required
	Between 55 and 60	Control measures (barriers) may not be required but should be considered	N/A	N/A	Required if resultant L_{eq} exceeds 55 dBA Type A
	More than 60	Barriers required	N/A	N/A	Required if resultant L_{eq} exceeds 55 dBA Type B
Plane of Living Room Window (POW)	Less than 55	N/A	None Required	None Required	None Required
	Between55 and 65	N/A	Forced air heating with provision for central air conditioning	None Required	Required Type C
	More Than 65	N/A	Central Air Conditioning	Acoustical performance of the windows and walls should be specified	Required Type D
Plane of Bedroom Window (POW)	Less than 50	N/A	None Required	None Required	None Required
	Between50 and 60	N/A	Forced air heating with provision for central air conditioning	None Required	Required Type C
	More than 60	N/A	Central Air Conditioning	Acoustical performance of the windows and walls should be specified	Required Type D

Table 2-6 Indoor Noise Control Requirements for Aircraft Noise

Assessment Location	NEF or NEP	Ventilation Requirements	Noise Control Requirements	Warning Clause
Any Location on Property or Lot	Less than NEF 25	None Required	Building compliant with the Ontario Building Code	Not Required
	Greater or equal to NEF 25 to less than NEF 30	Provision for central air conditioning	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria	Required Type C
	Greater than NEF 30	Central air conditioning	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria	Required Type B and D

3.0 NOISE SOURCES

The City of Ottawa Official Plan and Environmental Noise Control Guidelines (ENCG) stipulate that a noise impact assessment is required when a noise sensitive development is within proximity to a surface transportation (road or rail), stationary and aircraft noise sources.

The following criteria are applicable to the subject site:

- Within 100m from the right-of-way of an existing/proposed arterial/collector;
- Within 300m from the right-pf-way of an existing/proposed rail corridor;
- Within the limits of the Ottawa Airport Vicinity Development Zone (OAVDZ)

Figure 3-1 shows the noise sources that have an impact on this development. Mountshannon Drive (Collector) is located within 100m of the development and the Smiths Falls Rail Corridor is located within 300m of the development. The site is also located within the boundary of the 25 NEF/NEP contour.

3.1 Mountshannon Drive (Collector)

Mountshannon Drive is classified as a 2-Lane Urban Collector (2-UCU) Roadway in the 2013 Transportation Master Plan. An Annual Average Daily Traffic (AADT) value of 8,000 is specified for this type of road.

As per Table B1 of Appendix B of the ENCG, **Table 3-1** outlines the traffic parameters used to calculate the sound levels for the development.

Table 3-1 Mountshannon Drive Noise Parameters

Roadway Classification	2-Lane Urban Arterial
Annual Average Daily Traffic (AADT)	8,000 veh/day
Day/Night Split (%)	92/8
Heavy Trucks (%)	5
Medium Trucks (%)	7
Posted Speed Limit	40 km/hr
Road Gradient	1.0%

3.2 VIA Rail (Smiths Falls Rail Corridor)

A VIA Rail Line is located approximately 260m west of the site. Railway noise modelling parameters were acquired from VIA Rail through an Access to Information Request, **Appendix A**, and are summarized below.

Table 3-2 Railway Noise Parameters

	Engine Type	Welded Track	Speed	Train Frequency per Day	Projected 2031 Rail Volume	Cars per Train	Locomotives per Train
VIA	Diesel	No	100 mph	12/2 (day/night)	18/3 (day/night)	4	1
Freight	Diesel	No	60 mph	2 (day)	3 (day/night)	6	2

Existing daily rail traffic data was acquired from VIA Rail, with VIA operating 12 daytime passenger trains and 2 night-time passenger trains. There are also 2 freight trains during the daytime operating along the rail line. A growth rate of 2.5% per year was applied and extrapolated to the City's TMP horizon year of 2031; the table above summarizes the AADT values for the rail traffic considered in the assessment. The train speed is variable along this corridor; however we have modelled the railway noise based on current train speeds gathered from VIA Rail of 150km/hr for VIA trains and 100km/hr for freight trains.

3.3 Aircraft

The ENCG provides sound level criteria for aircraft noise based on location within the Ottawa Airport Vicinity Development Zone (OAVDZ). The boundary of the OAVDZ has been defined to coincide with physical features such as roads, creeks, rail lines, and lot lines where possible. Noise levels which would impact sensitive areas are determined by the NEF/NEP contours. These contours include noise levels from aircraft flight, take-off, and ground operations to specific urban areas. Figure 3-4 shows the development location in reference to the Ottawa Airport Operating Influence Zone.

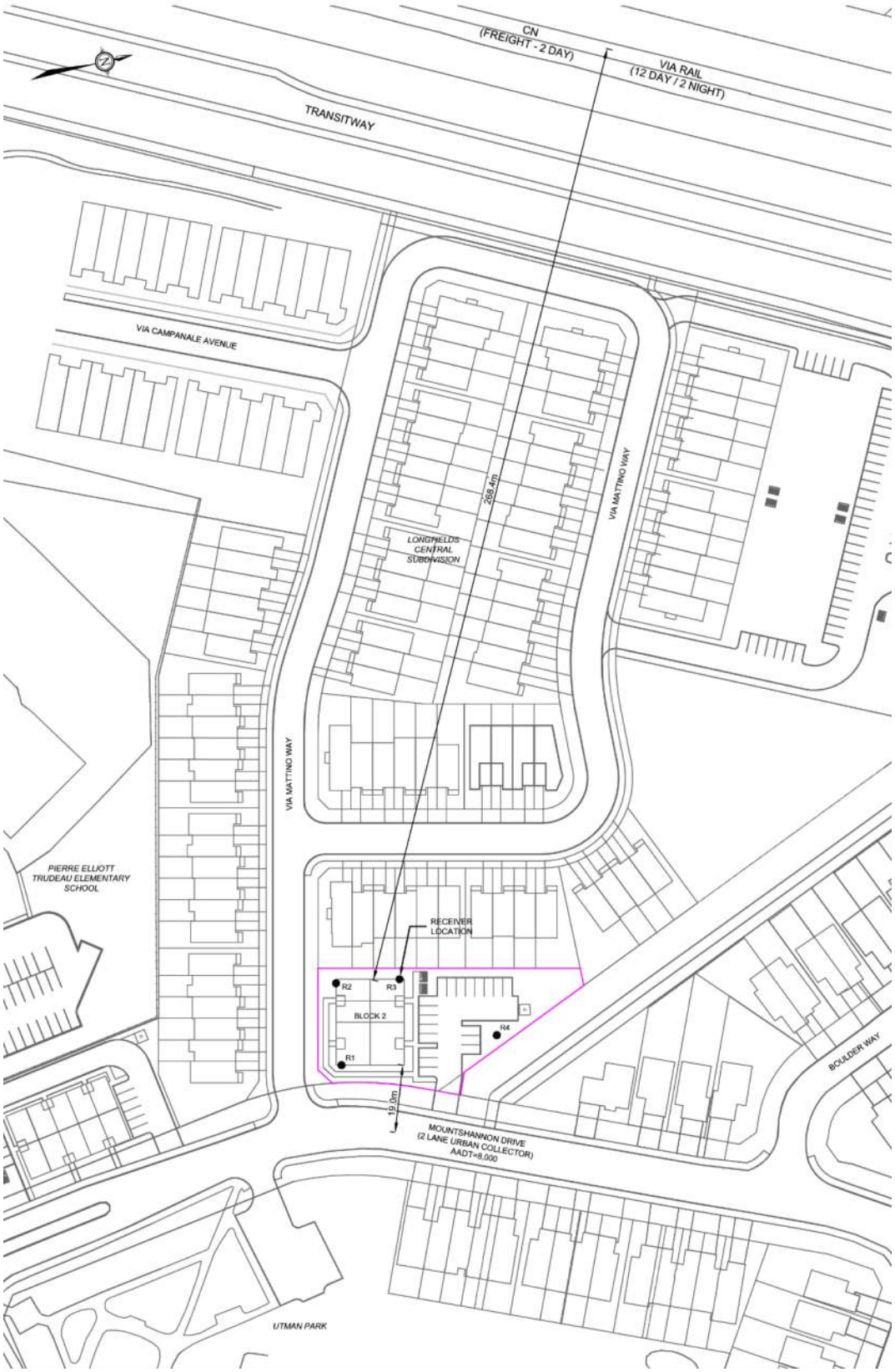


Figure 3-1 Noise Sources

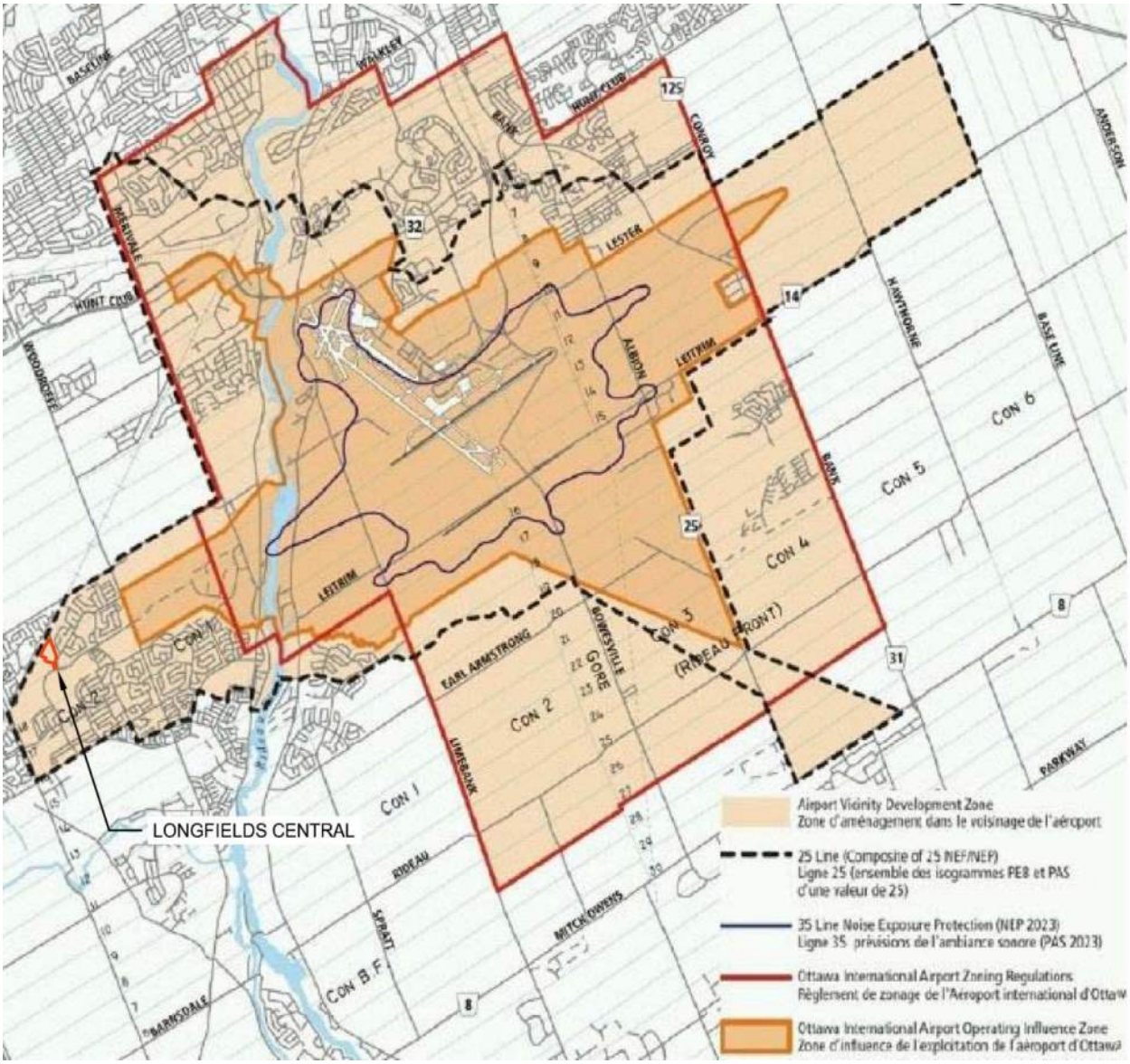


Figure 3-2 Ottawa Airport Operating Influence Zone

4.0 NOISE LEVEL PREDICTIONS

4.1 Modelling

Noise levels are calculated using the STAMSON computer program, version 5.03. Road data is input into the program as applicable, whereupon the program calculates an A-weighted 16 hour L_{eq} noise level for the daytime and an 8 hour L_{eq} noise level for the night time. The results of these computer calculations are presented in **Appendix B** and summarized in **Table 4-1** and **Table 4-2**.

Table 4-1 OLA Noise Level Summary

LOCATION	OUTDOOR LIVING AREA NOISE LEVEL – L_{eq} - (dBA)
R4	56.74

Table 4-2 POW Noise Level Summary

LOCATION	PLANE OF WINDOW (POW) NOISE LEVEL – L_{eq} - (dBA)	
	DAYTIME	NIGHT TIME
R1 (1st to 3rd Floors)	63.21	55.64
R2 (1st to 3rd Floors)	56.64	49.52
R3 (1st Floor)	47.54	44.54
R3 (2nd and 3rd Floors)	47.68 (3rd)	44.79 (2nd)

4.2 Outdoor Control Measures

The development consists of a shared amenity area located north of the parking area with a calculated noise level of 56.74 dBA that is marginally above the minimum of 55 dBA, though below 60 dBA. We recommend placing a warning clause (Type A) on title without adding a physical noise barrier, providing a quality space that outweighs the benefits of an incremental decrease to decibel levels in the OLA.

Typical wording for Type A warning clause:

“Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the City’s and the Ministry of the Environment’s noise criteria.”

4.3 Indoor Control Measures

Warning clauses are required on title relating to the requirement of forced air heating with provision for central air conditioning.

Due to the site being located within the 25 NEF boundary, all units will require forced air heating with provision for central air conditioning and associated amended warning clause Type C.

Typical wording for amended Type C warning clause:

““Purchasers/building occupants are forewarned that this property/dwelling unit is located in a noise sensitive area due to its proximity to Ottawa Macdonald-Cartier International Airport. In order to reduce the impact of aircraft noise in the indoor spaces, the unit has been designed and built to meet provincial standards for noise control by the use of components and building systems that provide sound attenuation. In addition to the building components (ie. walls, windows, doors, ceiling-roof), since the benefit of sound attenuation is lost when windows or doors are left open, this unit has been fitted with a forced air heating system, all components of which are sized to accommodate the future installation of central air conditioning-by the owner/occupant.”

“Despite the inclusion of noise control features within the dwelling unit, noise due to aircraft operations may continue to interfere with some indoor activities and with outdoor activities, particularly during the summer months. The purchaser/building occupant is further advised that the Airport is open and operates 24 hours a day, and that changes to operations or expansion of the airport facilities, including the construction of new runways, may affect the living environment of the residents of this property area.”

“The Ottawa Macdonald-Cartier International Airport Authority, its acoustical consultants and the municipality are not responsible if, regardless of the implementation of noise control features, the purchaser/occupant of this dwelling finds that the indoor noise levels due to aircraft operations continue to be of concern or are offensive.”

4.4 Building Component Assessment

The sound level due to surface transportation sources at every unit within the proposed development is below 65 dBA (daytime) and 60 dBA (night time). Therefore, as long as the building is compliant with the Ontario Building Code, they will be compliant with the City of Ottawa’s indoor noise criteria for road noise.

Since the proposed development is located within the 25 NEF boundary, an analysis of the cladding system is warranted. To comply with the ENCG policies, the building envelope will require a minimum AIF rating to provide the indoor noise levels as shown above in **Table 2-3**. The 25 NEF was converted into an equivalent Leq $_{24hr}$ using an equation from the IBANA-CALC User’s Manual:

$$L_{eq\ 24hr} = NEF + 32$$
$$L_{eq\ 24hr} = 25 + 32 = 57\ dBA$$

IBANA-CALC is a software package developed by the National Research Council of Canada that calculates indoor noise levels for standard roof, wall, and window construction details for appropriate aircraft noise source spectra.

The required AIF is based based on the outside L_{eq}, indoor L_{eq} required, and the number of exterior façade components.

Required AIF = Outside L_{eq} – Indoor L_{eq} + $\log_{10}$ (Number of Components) + 2 dB

Where, N = Number of Components;
L = Sound Level expressed on a common decibel scale.

The acoustical insulation factor for residential bedrooms is calculated as follows:

Three Building Components: AIF = 57 dBA – 34 dBA + 10log(3) dBA + 2 dBA = 30

To comply with the ENCG policies, the buildings will require a minimum AIF rating of 30 to provide the appropriate indoor noise levels. Presented below are recommended building materials that provide the required AIF rating. These building materials are only suggestions and can be substituted with equivalent building materials that meet or exceed the AIF rating.

The highest percentage of exterior wall to interior floor area in a bedroom is 100%. A wall with type EW1 composition (refer to **Appendix C** for applicable worksheets) has an AIF of 31 with an exterior wall to interior floor area of 100%; this exceeds the minimum requirements for 3 components. The highest percentage of window to floor area ratio in a bedroom is 25%. A standard residential window section employs 6mm glazing x 13mm air space x 6mm glazing, which has an AIF of 32 if located in a room with a window to floor area ratio of 25%. This exceeds the minimum requirements, and as such the exterior building envelope is shown to comply with the ENCG policy if the minimum ratios are met.

All units must meet the minimum building component requirements as outlined in "Part 6: Prescribed Measures for Aircraft Noise" of the ENCG, shown in the tables below.

Table 4-3 Prescribed Measures – Building Components (Exterior Walls)

Wall Components	Percentage of Exterior Wall Area to Total Floor Area of Room (% maximum)
• 12.7mm gypsum board; • Vapour barrier; • 38mm x 139mm studs at 400mm o.c.; • Batt/blown insulation in the inter-stud cavities; • 7.9mm exterior sheathing; • Building paper; • Wood siding; vinyl siding; or metal siding with fibre backer board; or 20mm stucco.	Bedrooms (110%) Living/Dining (150%)

Table 4-4 Prescribed Measures – Building Components (Windows and Patio Doors)

Windows and Patio Door Components	Percentage of Window Area to Total Floor Area of Room (% maximum)
Double-glazed, well-fitted, weatherstripped units with dimensions to fit 25mm [ie. 4 (16) 4; 6 (13) 6]	Bedrooms (16%)
4 (16) 4 = 4mm glass, 16mm space, 4mm glass.	Living/Dining (40%)
Double-glazed, well-fitted, weatherstripped units with dimensions to fit 25mm [ie. 3 (16) 6].	Bedrooms (20%) Living/Dining (50%)

5.0 CONCLUSIONS AND RECOMMENDATIONS

To meet the requirements for compliance with the City of Ottawa Environmental Noise Control Guidelines and the MOE Environmental Noise Guideline the following measures are required.

Outdoor Control Measures

All units require a warning clause Type A due to sound levels exceeding 55 dBA in the shared amenity space.

Indoor Control Measures

All units will require warning clause Type C, presented in **Figure 5-1**.

Building Component Assessment

All building faces will comply with the ENCG indoor noise policy employing EW1 wall components and standard residential window sections 6mm glazing x 13mm air space x 6mm glazing.

Warning Clauses

Warning clauses are to be placed on title and in the purchase and sale agreements as indicated above and in **Figure 5-1**. The following typical warning clause is extracted from Section C8.1 of the MOE NPC-300 document and amended for the purpose of this report.

Warning Clause Type 'A'
"Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the City's and the Ministry of the Environment's noise criteria."

Warning Clause Type 'C'
"Purchasers/building occupants are forewarned that this property/dwelling unit is located in a noise sensitive area due to its proximity to Ottawa Macdonald-Cartier International Airport. In order to reduce the impact of aircraft noise in the indoor spaces, the unit has been designed and built to meet provincial standards for noise control by the use of components and building systems that provide sound attenuation. In addition to the building components (ie. walls, windows, doors, ceiling-roof), since the benefit of sound attenuation is lost when windows or doors are left open, this unit has been fitted with a forced air heating system, all components of which are sized to accommodate the future installation of central air conditioning-by the owner/occupant."

"Despite the inclusion of noise control features within the dwelling unit, noise due to aircraft operations may continue to interfere with some indoor activities and with outdoor activities, particularly during the summer months. The purchaser/building occupant is further advised that the Airport is open and operates 24 hours a day, and that changes to operations or expansion of the airport facilities, including the construction of new runways, may affect the living environment of the residents of this property area."

"The Ottawa Macdonald-Cartier International Airport Authority, its acoustical consultants and the municipality are not responsible if, regardless of the implementation of noise control features, the purchaser/occupant of this dwelling finds that the indoor noise levels due to aircraft operations continue to be of concern or are offensive."

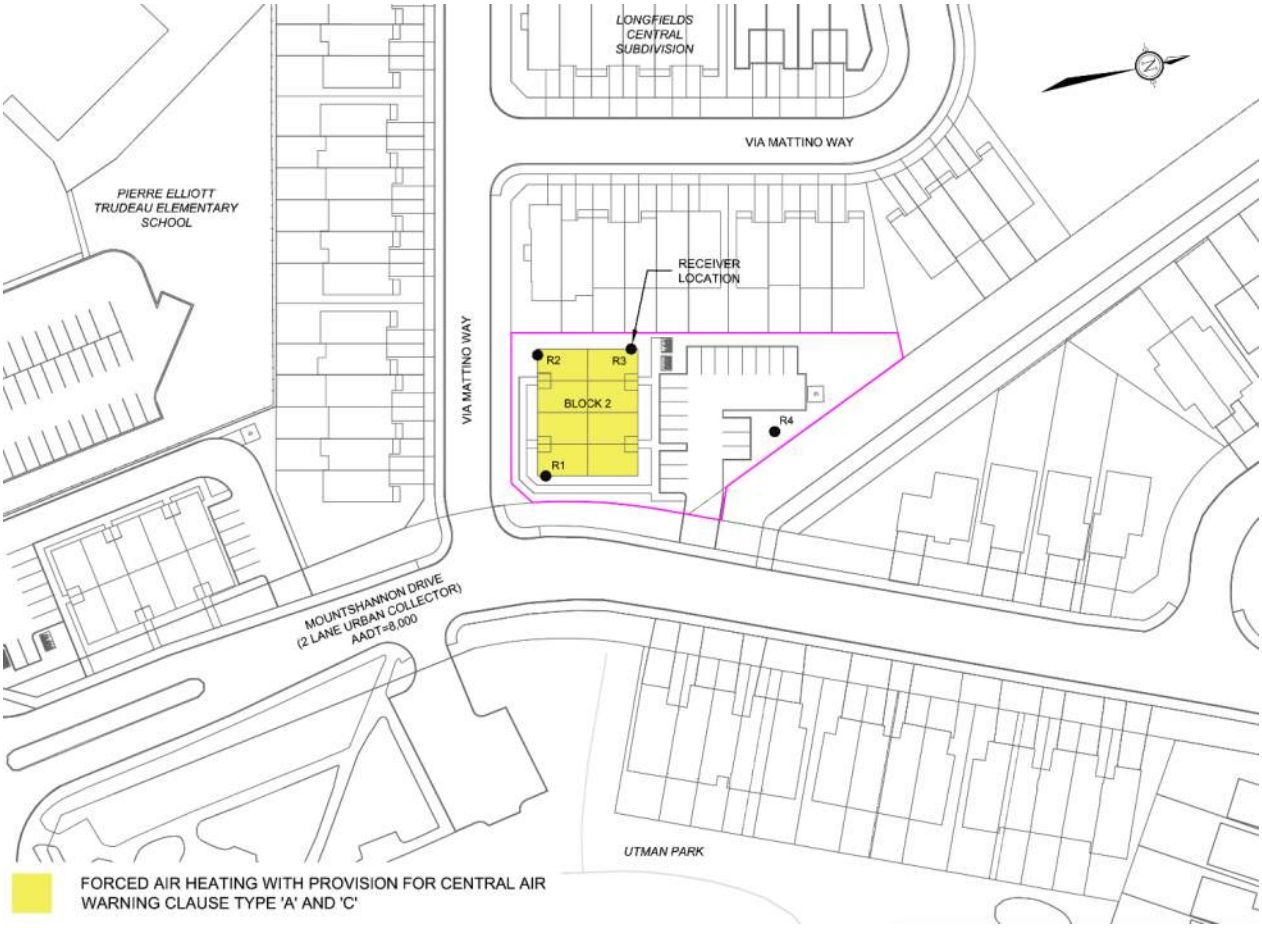


Figure 5-1 Construction Requirements and Warning Clauses

If you have any questions or comments with regards to this report, please do not hesitate to contact the undersigned.

Respectfully issued,

NOVATECH

Prepared By:

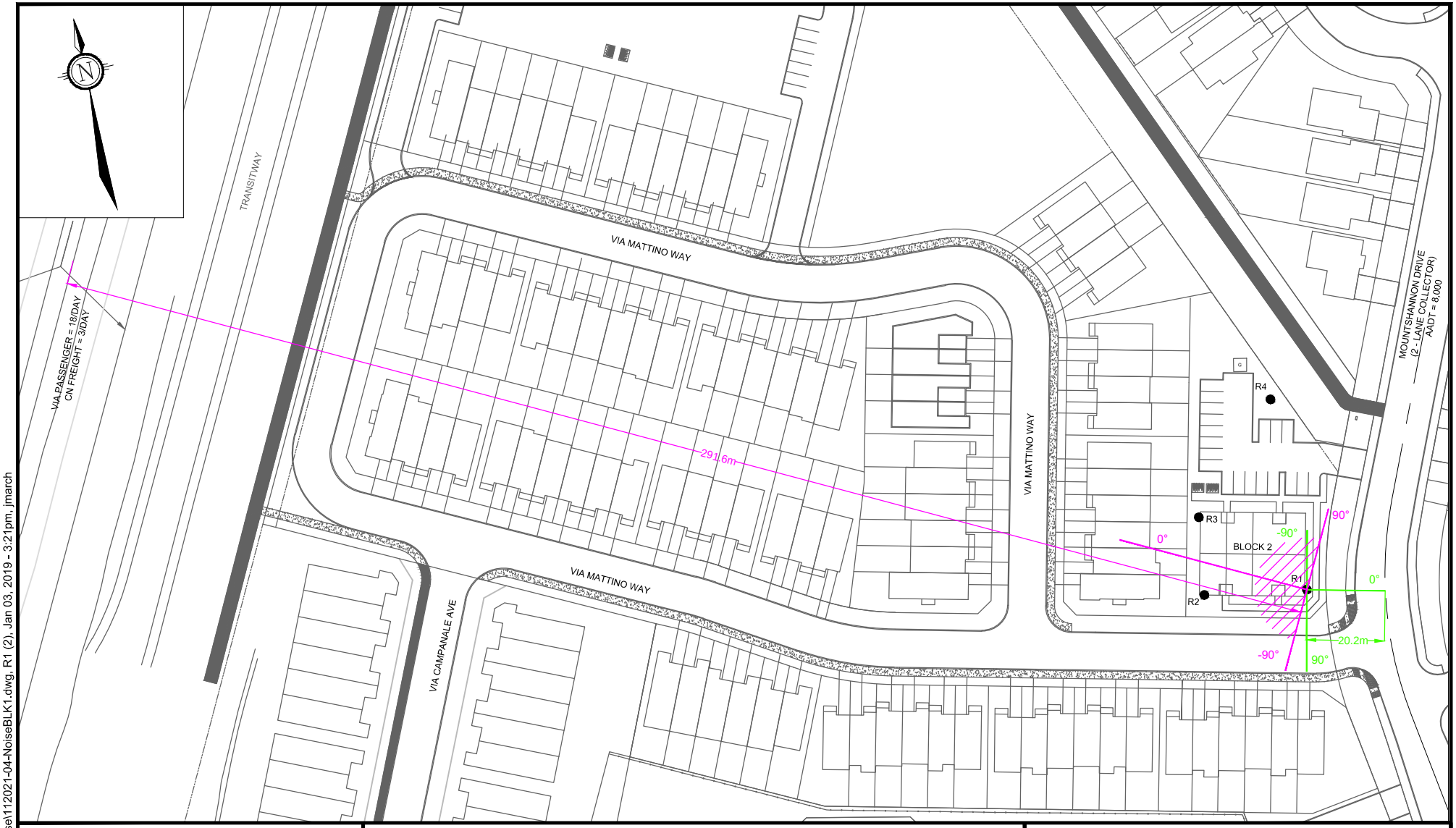
Lucas Wilson, P.Eng.
Project Coordinator

Reviewed By:

Mark Bissett, P.Eng.
Senior Project Manager

APPENDIX A

Receiver Location Figures
Stamson Model Output



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Facsimile (613) 254-5867
Website www.novatech-eng.com

VIA/CN Freight Rail Noise Angle

Mountshannon Drive Noise Angle

VIA/CN Freight Rail Barrier Angle

Reciever Location

255 MOUNTSHANNON DRIVE BLOCK 2

RECEIVER LOCATION R1

SCALE 1 : 1250 (0 10 20 30 40 50)

DATE JAN 2019 | JOB 112021-05 | FIGURE FIG - 1

SHT8X11.DWG - 216mmx279mm

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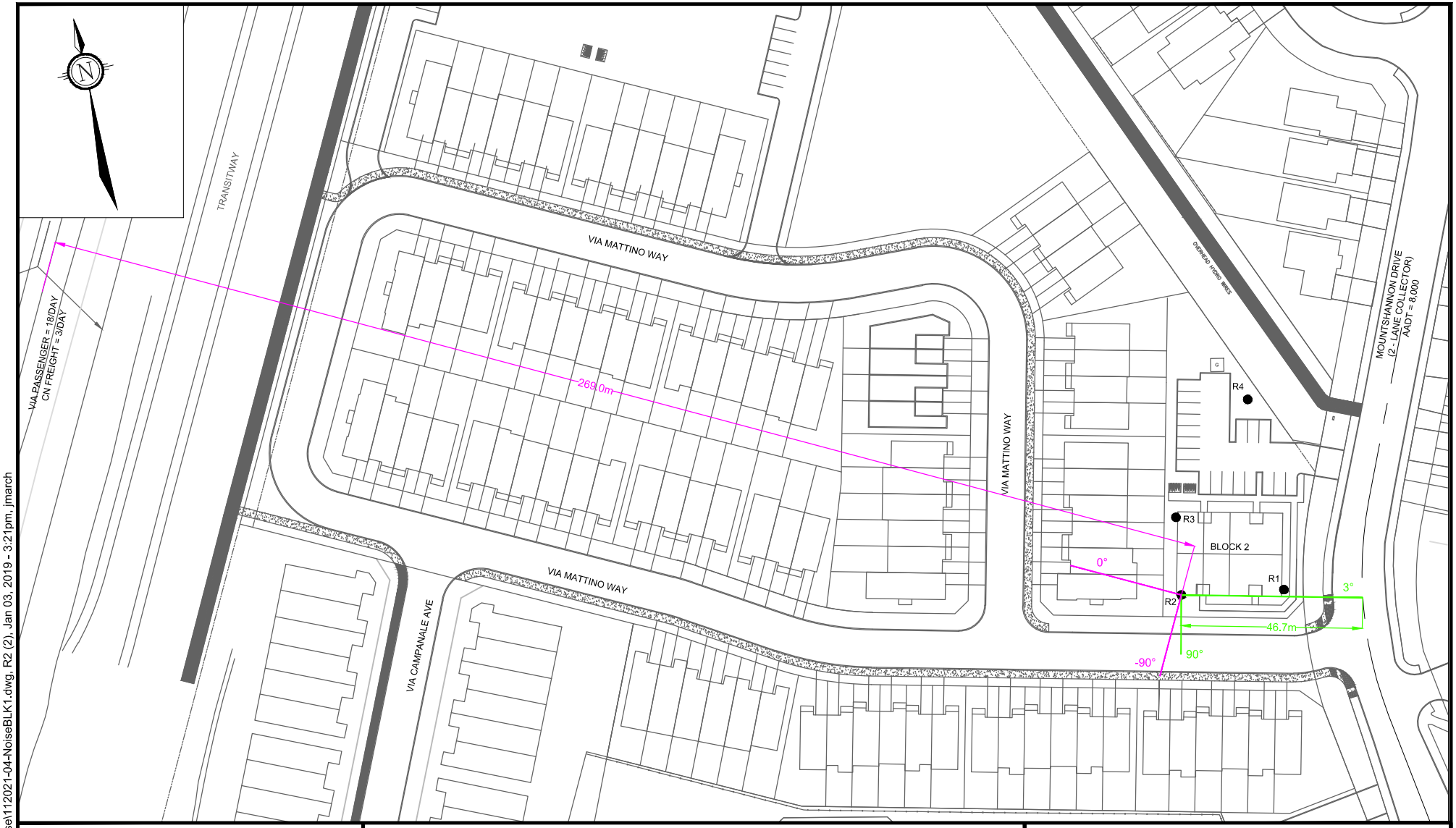

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VIA/CN Freight Rail Noise Angle

Mountshannon Drive Noise Angle

Reciever Location

255 MOUNTSHANNON DRIVE BLOCK 2

RECEIVER LOCATION R2

SCALE 1 : 1250 (0 10 20 30 40 50)

DATE	JOB	FIGURE
JAN 2019	112021-05	FIG - 2

SHT8X11.DWG - 216mmx279mm

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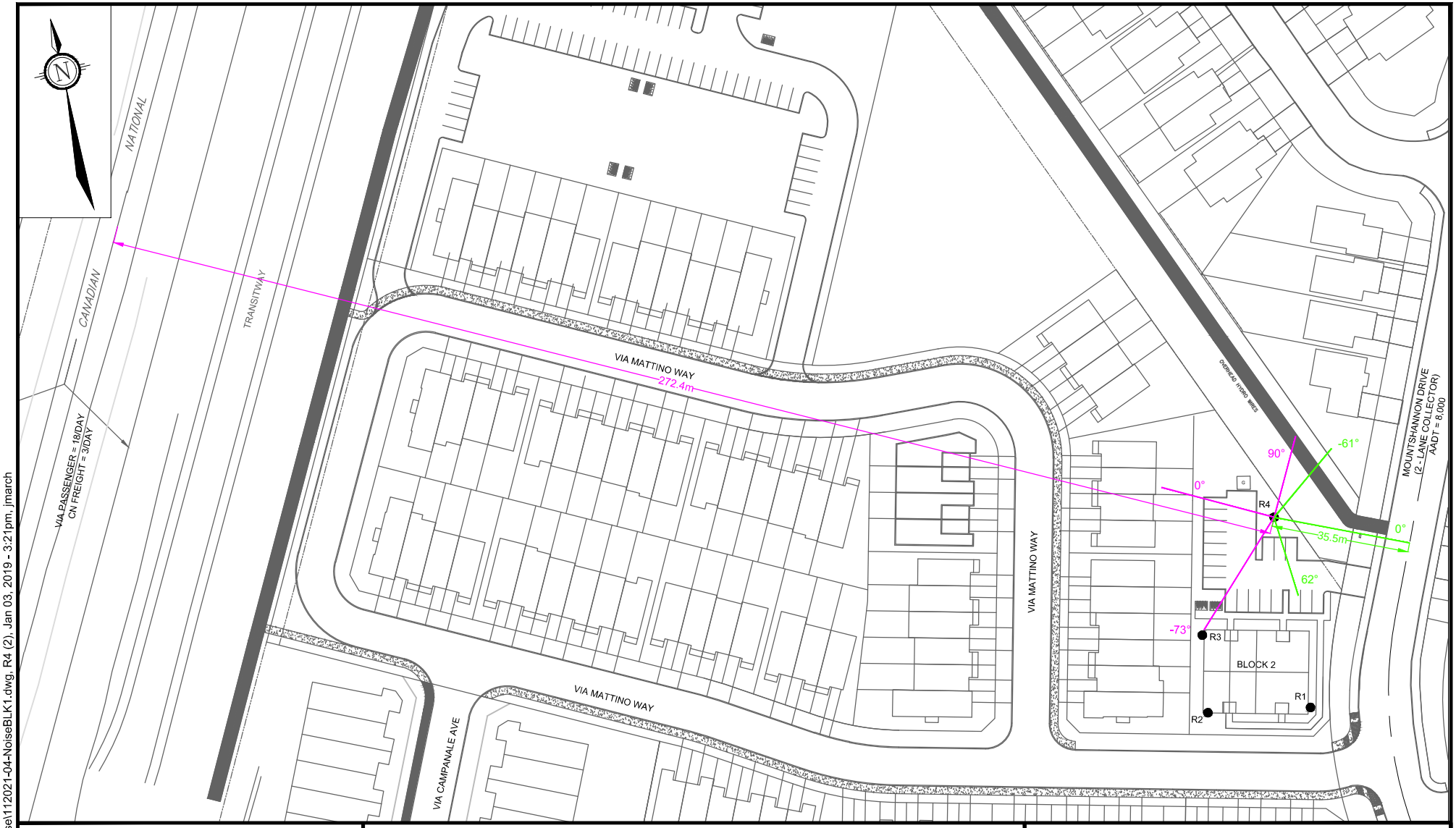

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VIA/CN Freight Rail Noise Angle

Mountshannon Drive Noise Angle

Reciever Location

255 MOUNTSHANNON DRIVE BLOCK 2

RECEIVER LOCATION R4

SCALE 1 : 1250 (0 10 20 30 40 50)

DATE JAN 2019 | JOB 112021-05 | FIGURE FIG - 3

SHT8X11.DWG - 216mmx279mm

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STAMSON 5.0 NORMAL REPORT Date: 21-12-2018 10:57:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r1.te Time Period: Day/Night 16/8 hours
Description: R1 (POW - 1st to 4th Floors)

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1.	18.0/3.0	150.0	1.0	4.0	Diesel	No

Data for Segment # 1: VIA (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      5 / 5
House density             :     80 %
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 276.00 / 276.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  10.00 m
Barrier receiver distance :   1.00 / 1.00   m
Source elevation          :  93.55 m
Receiver elevation        :  92.73 m
Barrier elevation         :  92.73 m
Reference angle           :   0.00
```

Rail data, segment # 2: Freight (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1.	3.0/3.0	100.0	2.0	6.0	Diesel	No

Data for Segment # 2: Freight (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      5 / 5
House density             :     80 %
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 276.00 / 276.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  10.00 m
Barrier receiver distance :   1.00 / 1.00   m
Source elevation          :  93.55 m
Receiver elevation        :  92.73 m
Barrier elevation         :  92.73 m
Reference angle           :   0.00
```

Results segment # 1: VIA (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	1.51	94.24
0.50	1.50	1.50	94.23

LOCOMOTIVE (0.00 + 37.35 + 0.00) = 37.35 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	68.49	-12.65	0.00	0.00	-11.23	0.00	44.62
-90	90	0.00	68.49	-12.65	0.00	0.00	0.00	-18.49	37.35

WHEEL (0.00 + 30.41 + 0.00) = 30.41 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	61.57	-12.65	0.00	0.00	-11.23	0.00	37.69
-90	90	0.00	61.57	-12.65	0.00	0.00	0.00	-18.51	30.41

Segment Leq : 38.15 dBA

Results segment # 2: Freight (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	1.51	94.24
0.50	1.50	1.50	94.23

LOCOMOTIVE (0.00 + 30.06 + 0.00) = 30.06 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	61.19	-12.65	0.00	0.00	-11.23	0.00	37.32
-90	90	0.00	61.19	-12.65	0.00	0.00	0.00	-18.49	30.06

WHEEL (0.00 + 21.91 + 0.00) = 21.91 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	53.06	-12.65	0.00	0.00	-11.23	0.00	29.19
-90	90	0.00	53.06	-12.65	0.00	0.00	0.00	-18.51	21.91

Segment Leq : 30.68 dBA

Total Leq All Segments: 38.87 dBA

Results segment # 1: VIA (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	1.51	94.24
0.50	1.50	1.50	94.23

LOCOMOTIVE (0.00 + 32.58 + 0.00) = 32.58 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.72	-12.65	0.00	0.00	-11.23	0.00	39.85
-90	90	0.00	63.72	-12.65	0.00	0.00	0.00	-18.49	32.58

WHEEL (0.00 + 25.64 + 0.00) = 25.64 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.80	-12.65	0.00	0.00	-11.23	0.00	32.92
-90	90	0.00	56.80	-12.65	0.00	0.00	0.00	-18.51	25.64

Segment Leq : 33.38 dBA

Results segment # 2: Freight (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	1.51	94.24
0.50	1.50	1.50	94.23

LOCOMOTIVE (0.00 + 33.07 + 0.00) = 33.07 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	64.20	-12.65	0.00	0.00	-11.23	0.00	40.33
-90	90	0.00	64.20	-12.65	0.00	0.00	0.00	-18.49	33.07

WHEEL (0.00 + 24.92 + 0.00) = 24.92 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.07	-12.65	0.00	0.00	-11.23	0.00	32.20
-90	90	0.00	56.07	-12.65	0.00	0.00	0.00	-18.51	24.92

Segment Leq : 33.69 dBA

Total Leq All Segments: 36.55 dBA

Road data, segment # 1: MountShannon (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 : 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: MountShannon (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 : 17.90 / 17.90 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: MountShannon (day)

Source height = 1.50 m

ROAD (0.00 + 63.19 + 0.00) = 63.19 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	-0.77	0.00	0.00	0.00	0.00	63.19

Segment Leq : 63.19 dBA

Total Leq All Segments: 63.19 dBA

Results segment # 1: MountShannon (night)

Source height = 1.50 m

ROAD (0.00 + 55.59 + 0.00) = 55.59 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	-0.77	0.00	0.00	0.00	0.00	55.59

Segment Leq : 55.59 dBA

Total Leq All Segments: 55.59 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.21
(NIGHT): 55.64

STAMSON 5.0 NORMAL REPORT Date: 21-12-2018 10:57:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2.te Time Period: Day/Night 16/8 hours
Description: R2 (POW - 1st to 4th Floors)

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	Cars /Train	Eng type	Cont weld
1.	18.0/3.0	150.0	1.0	4.0	Diesel	No

Data for Segment # 1: VIA (day/night)

Angle1 Angle2	-90.00 deg	0.00 deg
Wood depth	0	(No woods.)
No of house rows	5 / 5	
House density	80 %	
Surface	2	(Reflective ground surface)
Receiver source distance	253.90 / 253.90 m	
Receiver height	1.50 / 1.50 m	
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Rail data, segment # 2: Freight (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	Cars /Train	Eng type	Cont weld
1.	3.0/3.0	100.0	2.0	6.0	Diesel	No

Data for Segment # 2: Freight (day/night)

Angle1 Angle2	-90.00 deg	0.00 deg
Wood depth	0	(No woods.)
No of house rows	5 / 5	
House density	80 %	
Surface	2	(Reflective ground surface)
Receiver source distance	253.90 / 253.90 m	
Receiver height	1.50 / 1.50 m	
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 41.92 + 0.00) = 41.92 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	68.49	-12.29	-3.01	0.00	-11.27	0.00	41.92

WHEEL (0.00 + 35.00 + 0.00) = 35.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	61.57	-12.29	-3.01	0.00	-11.27	0.00	35.00

Segment Leq : 42.72 dBA

Results segment # 2: Freight (day)

LOCOMOTIVE (0.00 + 34.63 + 0.00) = 34.63 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	61.19	-12.29	-3.01	0.00	-11.27	0.00	34.63

WHEEL (0.00 + 26.50 + 0.00) = 26.50 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	53.06	-12.29	-3.01	0.00	-11.27	0.00	26.50

Segment Leq : 35.25 dBA

Total Leq All Segments: 43.44 dBA

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 37.15 + 0.00) = 37.15 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	63.72	-12.29	-3.01	0.00	-11.27	0.00	37.15

WHEEL (0.00 + 30.23 + 0.00) = 30.23 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	56.80	-12.29	-3.01	0.00	-11.27	0.00	30.23

Segment Leq : 37.95 dBA

Results segment # 2: Freight (night)

LOCOMOTIVE (0.00 + 37.64 + 0.00) = 37.64 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	64.20	-12.29	-3.01	0.00	-11.27	0.00	37.64

WHEEL (0.00 + 29.51 + 0.00) = 29.51 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	56.07	-12.29	-3.01	0.00	-11.27	0.00	29.51

Segment Leq : 38.26 dBA

Total Leq All Segments: 41.12 dBA

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

Angle1 Angle2 : 3.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 41.02 / 41.02 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: MountShannon (day)

Source height = 1.50 m

ROAD (0.00 + 56.43 + 0.00) = 56.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
3	90	0.00	63.96	0.00	-4.37	-3.16	0.00	0.00	0.00	56.43

Segment Leq : 56.43 dBA

Total Leq All Segments: 56.43 dBA

Results segment # 1: MountShannon (night)

Source height = 1.50 m

ROAD (0.00 + 48.84 + 0.00) = 48.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
3	90	0.00	56.36	0.00	-4.37	-3.16	0.00	0.00	0.00	48.84

Segment Leq : 48.84 dBA

Total Leq All Segments: 48.84 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.64
(NIGHT): 49.52

STAMSON 5.0 NORMAL REPORT Date: 21-12-2018 10:58:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3.te Time Period: Day/Night 16/8 hours
Description: R3 (POW - 1st and 2nd Floors)

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	Cars /Train	Eng type	Cont weld
1.	18.0/3.0	150.0	1.0	4.0	Diesel	No

Data for Segment # 1: VIA (day/night)

Angle1 Angle2	-90.00 deg	90.00 deg
Wood depth	0	(No woods.)
No of house rows	5 / 5	
House density	80 %	
Surface	2	(Reflective ground surface)
Receiver source distance	248.10 / 248.10 m	
Receiver height	1.50 / 1.50 m	
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Rail data, segment # 2: Freight (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	Cars /Train	Eng type	Cont weld
1.	3.0/3.0	100.0	2.0	6.0	Diesel	No

Data for Segment # 2: Freight (day/night)

Angle1 Angle2	-90.00 deg	90.00 deg
Wood depth	0	(No woods.)
No of house rows	5 / 5	
House density	80 %	
Surface	2	(Reflective ground surface)
Receiver source distance	248.10 / 248.10 m	
Receiver height	1.50 / 1.50 m	
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 45.02 + 0.00) = 45.02 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	68.49	-12.19	0.00	0.00	-11.28	0.00	45.02

WHEEL (0.00 + 38.10 + 0.00) = 38.10 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	61.57	-12.19	0.00	0.00	-11.28	0.00	38.10

Segment Leq : 45.82 dBA

Results segment # 2: Freight (day)

LOCOMOTIVE (0.00 + 37.72 + 0.00) = 37.72 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	61.19	-12.19	0.00	0.00	-11.28	0.00	37.72

WHEEL (0.00 + 29.59 + 0.00) = 29.59 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	53.06	-12.19	0.00	0.00	-11.28	0.00	29.59

Segment Leq : 38.34 dBA

Total Leq All Segments: 46.53 dBA

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 40.25 + 0.00) = 40.25 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.72	-12.19	0.00	0.00	-11.28	0.00	40.25

WHEEL (0.00 + 33.33 + 0.00) = 33.33 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.80	-12.19	0.00	0.00	-11.28	0.00	33.33

Segment Leq : 41.05 dBA

Results segment # 2: Freight (night)

LOCOMOTIVE (0.00 + 40.73 + 0.00) = 40.73 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	64.20	-12.19	0.00	0.00	-11.28	0.00	40.73

WHEEL (0.00 + 32.60 + 0.00) = 32.60 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.07	-12.19	0.00	0.00	-11.28	0.00	32.60

Segment Leq : 41.35 dBA

Total Leq All Segments: 44.21 dBA

Road data, segment # 1: MountShannon (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 : 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: MountShannon (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 : 43.10 / 43.10 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 1.00 / 1.00 m
Source elevation : 91.85 m
Receiver elevation : 92.73 m
Barrier elevation : 92.73 m
Reference angle : 0.00

Results segment # 1: MountShannon (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.48	94.21

ROAD (0.00 + 40.73 + 0.00) = 40.73 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	-4.58	0.00	0.00	0.00	-18.64	40.73

Segment Leq : 40.73 dBA

Total Leq All Segments: 40.73 dBA

Results segment # 1: MountShannon (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.48	94.21

ROAD (0.00 + 33.14 + 0.00) = 33.14 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	-4.58	0.00	0.00	0.00	-18.64	33.14

Segment Leq : 33.14 dBA

Total Leq All Segments: 33.14 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 47.55
(NIGHT): 44.54

STAMSON 5.0 NORMAL REPORT Date: 21-12-2018 10:58:49
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rt3.te Time Period: Day/Night 16/8 hours
Description: R3 (POW - 3rd and 4th Floors)

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	Cars /Train	Eng type	Cont weld
1.	18.0/3.0	150.0	1.0	4.0	Diesel	No

Data for Segment # 1: VIA (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      5 / 5
House density             :     80 %
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 248.10 / 248.10 m
Receiver height           :   4.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00
```

Rail data, segment # 2: Freight (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	Cars /Train	Eng type	Cont weld
1.	3.0/3.0	100.0	2.0	6.0	Diesel	No

Data for Segment # 2: Freight (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      5 / 5
House density             :     80 %
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 248.10 / 248.10 m
Receiver height           :   4.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00
```

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 45.02 + 0.00) = 45.02 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	68.49	-12.19	0.00	0.00	-11.28	0.00	45.02

WHEEL (0.00 + 38.10 + 0.00) = 38.10 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	61.57	-12.19	0.00	0.00	-11.28	0.00	38.10

Segment Leq : 45.82 dBA

Results segment # 2: Freight (day)

LOCOMOTIVE (0.00 + 37.72 + 0.00) = 37.72 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	61.19	-12.19	0.00	0.00	-11.28	0.00	37.72

WHEEL (0.00 + 29.59 + 0.00) = 29.59 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	53.06	-12.19	0.00	0.00	-11.28	0.00	29.59

Segment Leq : 38.34 dBA

Total Leq All Segments: 46.53 dBA

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 40.25 + 0.00) = 40.25 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.72	-12.19	0.00	0.00	-11.28	0.00	40.25

WHEEL (0.00 + 33.33 + 0.00) = 33.33 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.80	-12.19	0.00	0.00	-11.28	0.00	33.33

Segment Leq : 41.05 dBA

Results segment # 2: Freight (night)

LOCOMOTIVE (0.00 + 40.73 + 0.00) = 40.73 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	64.20	-12.19	0.00	0.00	-11.28	0.00	40.73

WHEEL (0.00 + 32.60 + 0.00) = 32.60 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.07	-12.19	0.00	0.00	-11.28	0.00	32.60

Segment Leq : 41.35 dBA

Total Leq All Segments: 44.21 dBA

Road data, segment # 1: MountShannon (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 : 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: MountShannon (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 : 43.10 / 43.10 m
Receiver height : 4.50 / 7.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 1.00 / 1.00 m
Source elevation : 91.85 m
Receiver elevation : 92.73 m
Barrier elevation : 92.73 m
Reference angle : 0.00

Results segment # 1: MountShannon (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	4.41	97.14

ROAD (0.00 + 41.36 + 0.00) = 41.36 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	-4.58	0.00	0.00	0.00	-18.01	41.36

Segment Leq : 41.36 dBA

Total Leq All Segments: 41.36 dBA

Results segment # 1: MountShannon (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	7.50	7.34	100.07

ROAD (0.00 + 35.72 + 0.00) = 35.72 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	-4.58	0.00	0.00	0.00	-16.06	35.72

Segment Leq : 35.72 dBA

Total Leq All Segments: 35.72 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 47.69
(NIGHT): 44.79

STAMSON 5.0 NORMAL REPORT Date: 21-12-2018 10:59:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4.te Time Period: Day/Night 16/8 hours
Description: R4 (OLA)

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	Cars /Train	Eng type	Cont weld
1.	18.0/3.0	150.0	1.0	4.0	Diesel	No

Data for Segment # 1: VIA (day/night)

Angle1 Angle2	-73.00 deg	90.00 deg
Wood depth	0	(No woods.)
No of house rows	5 / 5	
House density	80 %	
Surface	2	(Reflective ground surface)
Receiver source distance	257.00 / 257.00 m	
Receiver height	1.50 / 1.50 m	
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Rail data, segment # 2: Freight (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	Cars /Train	Eng type	Cont weld
1.	3.0/3.0	100.0	2.0	6.0	Diesel	No

Data for Segment # 2: Fright (day/night)

Angle1 Angle2	-73.00 deg	90.00 deg
Wood depth	0	(No woods.)
No of house rows	5 / 5	
House density	80 %	
Surface	2	(Reflective ground surface)
Receiver source distance	257.00 / 257.00 m	
Receiver height	1.50 / 1.50 m	
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 44.46 + 0.00) = 44.46 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-73	90	0.00	68.49	-12.34	-0.43	0.00	-11.26	0.00	44.46

WHEEL (0.00 + 37.53 + 0.00) = 37.53 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-73	90	0.00	61.57	-12.34	-0.43	0.00	-11.26	0.00	37.53

Segment Leq : 45.26 dBA

Results segment # 2: Freight (day)

LOCOMOTIVE (0.00 + 37.16 + 0.00) = 37.16 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-73	90	0.00	61.19	-12.34	-0.43	0.00	-11.26	0.00	37.16

WHEEL (0.00 + 29.03 + 0.00) = 29.03 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-73	90	0.00	53.06	-12.34	-0.43	0.00	-11.26	0.00	29.03

Segment Leq : 37.78 dBA

Total Leq All Segments: 45.97 dBA

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

Angle1 Angle2 : -61.00 deg 62.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 31.50 / 31.50 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: MountShannon (day)

Source height = 1.50 m

ROAD (0.00 + 56.36 + 0.00) = 56.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-61	62	0.66	63.96	0.00	-5.35	-2.25	0.00	0.00	0.00	56.36

Segment Leq : 56.36 dBA

Total Leq All Segments: 56.36 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.74

APPENDIX B

Building Component Assessment
VIA Rail Access to Information Letter

TABLE 5: Acoustic Insulation Factor for Various Types of Windows

Window area as a percentage of total floor area of room[1]													
4	5	6	8	10	13	16	20	25	32	40	50	63	80
Acoustic Insulation Factor (AIF)[2]													
35	34	33	32	31	30	29	28	27	26	25	24	23	22
36	35	34	33	32	31	30	29	28	27	26	25	24	23
37	36	35	34	33	32	31	30	29	28	27	26	25	24
38	37	36	35	34	33	32	31	30	29	28	27	26	25
39	38	37	36	35	34	33	32	31	30	29	28	27	26
40	39	38	37	36	35	34	33	32	31	30	29	28	27
41	40	39	38	37	36	35	34	33	32	31	30	29	28
42	41	40	39	38	37	36	35	34	33	32	31	30	29
43	42	41	40	39	38	37	36	35	34	33	32	31	30
44	43	42	41	40	39	38	37	36	35	34	33	32	31
45	44	43	42	41	40	39	38	37	36	35	34	33	32
46	45	44	43	42	41	40	39	38	37	36	35	34	33
47	46	45	44	43	42	41	40	39	38	37	36	35	34
48	47	46	45	44	43	42	41	40	39	38	37	36	35
49	48	47	46	45	44	43	42	41	40	39	38	37	36
50	49	48	47	46	45	44	43	42	41	40	39	38	37

Single glazing	Double glazing of indicated glass thickness					Triple Glazing	
	2mm and 2mm glass	3mm and 3mm glass	4mm and 4mm glass	3mm and 6mm glass	6mm and 6mm glass	3mm, 3mm and 3mm glass	3mm, 3mm and 6mm glass
Thickness	Interpane spacing in mm[3]					Interpane spacings in mm[5]	
3mm	6						
	13						
3mm	19	6					
4mm, 6mm	18	13	6				
	22	16	13	6	6	6,6	
9mm[4]	28	20	16	13	13	6,10	6,6
	35	25	20	16	16	6,15	6,10
12mm[4]	42	32	25	20	20	6,20	6,15
	50	40	32	25	24	6,30	6,20
	63	50	40	32	30	6,40	6,30
	80	63	50	40	37	6,50	6,40
	100	80	63	55	50	6,65	6,50
	125	100	80	75	70	6,80	6,65
	130	125	100	95	90	6,100	6,80
		150	125	110	100		6,100
			150	135	125		

Source: National Research Council, Division of Building Research, June 1980.

Explanatory Notes:

1) Where the calculated percentage window area is not presented as a column heading, the nearest percentage column in the table values should be used.
2) AIF data listed in the table are for well-fitted weatherstripped units that can be opened. The AIF values apply only when the windows are closed. For windows fixed and sealed to the frame, add three (3) to the AIF given in the table.
3) If the interpane spacing or glass thickness for a specific double glazed window is not listed in the table, the nearest listed values should be used.
4) The AIF ratings for 9mm and 12mm glass are for laminated glass only; for solid glass subtract two (2) from the AIF values listed in the table.
5) If the interpane spacings for a specific triple-glazed window are not listed in the table, use the listed case whose combined spacings are nearest the actual combined spacing.
6) The AIF data listed in the table are for typical windows, but details of glass mounting, window seals, etc. may result in slightly different performance for some manufacturers' products. If laboratory sound transmission loss data (conforming to ASTM test method E-90) are available, these should be used to calculate the AIF.

Table 6.3 - Acoustic Insulation Factor for Various Types of Exterior Wall

Percentage of exterior wall area to total floor area of room											Type of Exterior Wall
	16	20	25	32	40	50	63	80	100	125	160	
Acoustic Insulation Factor	39	38	37	36	35	34	33	32	31	30	29	EW1
	41	40	39	38	37	36	35	34	33	32	31	EW2
	44	43	42	41	40	39	38	37	36	35	34	EW3
	47	46	45	44	43	42	41	40	39	38	37	EW4
	48	47	46	45	44	43	42	41	40	39	38	EW1R
	49	48	47	46	45	44	43	42	41	40	39	EW2R
	50	49	48	47	46	45	44	43	42	41	40	EW3R
	55	54	53	52	51	50	49	48	47	46	45	EW5
	56	55	54	53	52	51	50	49	48	47	46	EW4R
	58	57	56	55	54	53	52	51	50	49	48	EW6
	59	58	57	56	55	54	53	52	51	50	49	EW7 or EW5R
	63	62	61	60	59	58	57	56	55	54	53	EW8

Source : National Research Council, Division of Building Research, December 1980.

Explanatory Notes :

1) Where the calculated percentage wall area is not presented as a column heading, the nearest percentage column in the table should be used.
2) The common structure of walls EW1 to EW5 is composed of 12.7 mm gypsum board, vapour barrier, and 38 x 89 mm studs with 50 mm (or thicker) mineral wool or glass fibre batts in inter-stud cavities
3) EW1 denotes exterior wall as in Note 2), plus sheathing, plus wood siding or metal siding and fibre backer board.
EW2 denotes exterior wall as in Note 2), plus rigid insulation (25-30 mm), and wood siding or metal siding and fibre backer board.
EW3 denotes simulated mansard with structure as in Note 2), plus sheathing, 28 x 89 mm framing, sheathing, and asphalt roofing material.
EW4 denotes exterior wall as in Note 2), plus sheathing and 20 mm stucco.
EW5 denotes exterior wall as in Note 2), plus sheathing, 25 mm air space, 100 mm brick veneer.
EW6 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50 mm), 100 mm back-up block, 100 mm face brick.
EW7 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50 mm), 140 mm back-up block, 100 mm face brick.
EW8 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50 mm), 200 mm concrete.
4) R signifies the mounting of the interior gypsum board on resilient clips.
5) An exterior wall conforming to rainscreen design principles and composed of 12.7 mm gypsum board, 100 mm concrete block, rigid insulation (25-50 mm), 25 mm air space, and 100 mm brick veneer has the same AIF as EW6.
6) An exterior wall described in EW1 with the addition of rigid insulation (25-50 mm) between the sheathing and the external finish has the same AIF as EW2.

VIA Rail Canada

Montréal, August 15, 2014

BY REGULAR POST
(by email: l.wilson@novatech-eng.com)

Mr. Lucas Wilson
Novatech Engineering Consultants Ltd.
240 Michael Cowpland Drive, Suite 200
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K2M 1P6

Legal and Corporate Affairs
3 Place Ville-Marie, Suite 500
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Fax: 514-874-0661
gabrielle_caron@viarail.ca

Gabrielle Caron
514-871-6215

RE: Access to Information Request # 14-1435 AI(D)

Dear Mr. Wilson,

We write further to your request for information under the *Access to Information Act* ("*ATIA*") received by VIA Rail Canada Inc. ("VIA Rail") on August 8th, 2014, for the following records:

> **"Site Location: 591 Longfields Drive, Barrhaven, Ontario, South of Fallowfield VIA station between Fallowfield and Strandherd Drive. We require verification on present train volumes, based on website, current volumes are 12/2 daytime/night-time trains. We are also looking for projected growth for train volumes to year 2031. Other required information includes train speeds through this location, whistle locations, average number of cars per train and number of locomotives per train."**

You will find enclosed a copy of the documents requested. However, you will note that part of the information has been removed ("whited out") and protected in accordance with section 18.1 (1) d) of the *ATIA*, which is enclosed for your ease of reference, as it constitutes commercial information that belongs to and has consistently been treated confidentially by VIA Rail Canada Inc.

Filing a complaint

Please be advised that you may file a complaint regarding the handling of your access to information request with the Information Commissioner of Canada, in accordance with the requirements of section 31 of the *ATIA*, which reads as follows:

> *"31. A complaint under this Act shall be made to the Information Commissioner in writing unless the Commissioner authorizes otherwise. If the complaint relates to a request by a person for access to a record, it shall be made within sixty days after the day in which the person receives a notice of a refusal under section 7, is given to access to all or part of the record or, in any other case, becomes aware that grounds for the complaint exist."*

Notice of complaints should be addressed to the following address:

Office of the Information Commissioner of Canada
30 Victoria Street
Gatineau, Québec
K1A 1H3
E-mail: general@oic-ci.gc.ca

Before submitting a complaint pursuant to the *ATIA* to the Information Commissioner of Canada, you may contact the undersigned to obtain more information regarding the handling of your access to information request.

Best regards,

Gabrielle Caron
Analyst, Access to information and Privacy
VIA Rail Canada

Enclosed Section 18.1 (1) d) of the *ATIA* and the requested documents

Access to Information Act

Economic interests of certain government institutions

18.1 (1) The head of a government institution may refuse to disclose a record requested under this Act that contains trade secrets or financial, commercial, scientific or technical information that belongs to, and has consistently been treated as confidential by,

(*d*) VIA Rail Canada Inc.

From: Derek Tardif
Sent: Monday, August 11, 2014 5:12 PM
To: Gabrielle Caron
Subject: RE: Demande d'accès à l'information - 14-1435 AI (D)

Gabrielle,

Ci-joint les informations pour cette requête.

Frequencies
VIA passenger train is currently running 14 trains a day between 0600 to 2230 and there is also a freight train running 2 trains a day during either daytime or nighttime.

Speeds
Current Freight speed is 60MPH
Current VIA Passenger speed is 100MPH

ATIA 18.1 (1) d)

Whistle locations
Whistle signs are normally installed at ¼ mile prior to the crossing.

We have anti-whistle by-law at most crossings in Barrhaven. The sounding of whistle is prohibited at the following crossings at grade:

- Mile 3.88 - Fallowfield Road
- Mile 5.10 - Greenbank Road (note that this crossing will be eliminated as it will be a grade separation as of 2015)
- Mile 5.73 - Jockvale Road
- Mile 6.81 - Strandherd Road

Average number of cars per train
Currently, we have an average of 4 cars per passenger train with some exceptions as for special trains and other circumstances. This number could change in the future years based on commercial strategies/demand, etc.
For the freight train, they have up to 6 cars.

Number of locomotives per train
Currently, VIA put only 1 locomotive but could happen for cycling purpose to have 2 locomotives with only one running.
For freight, they normally have 1 or 2 locomotives.

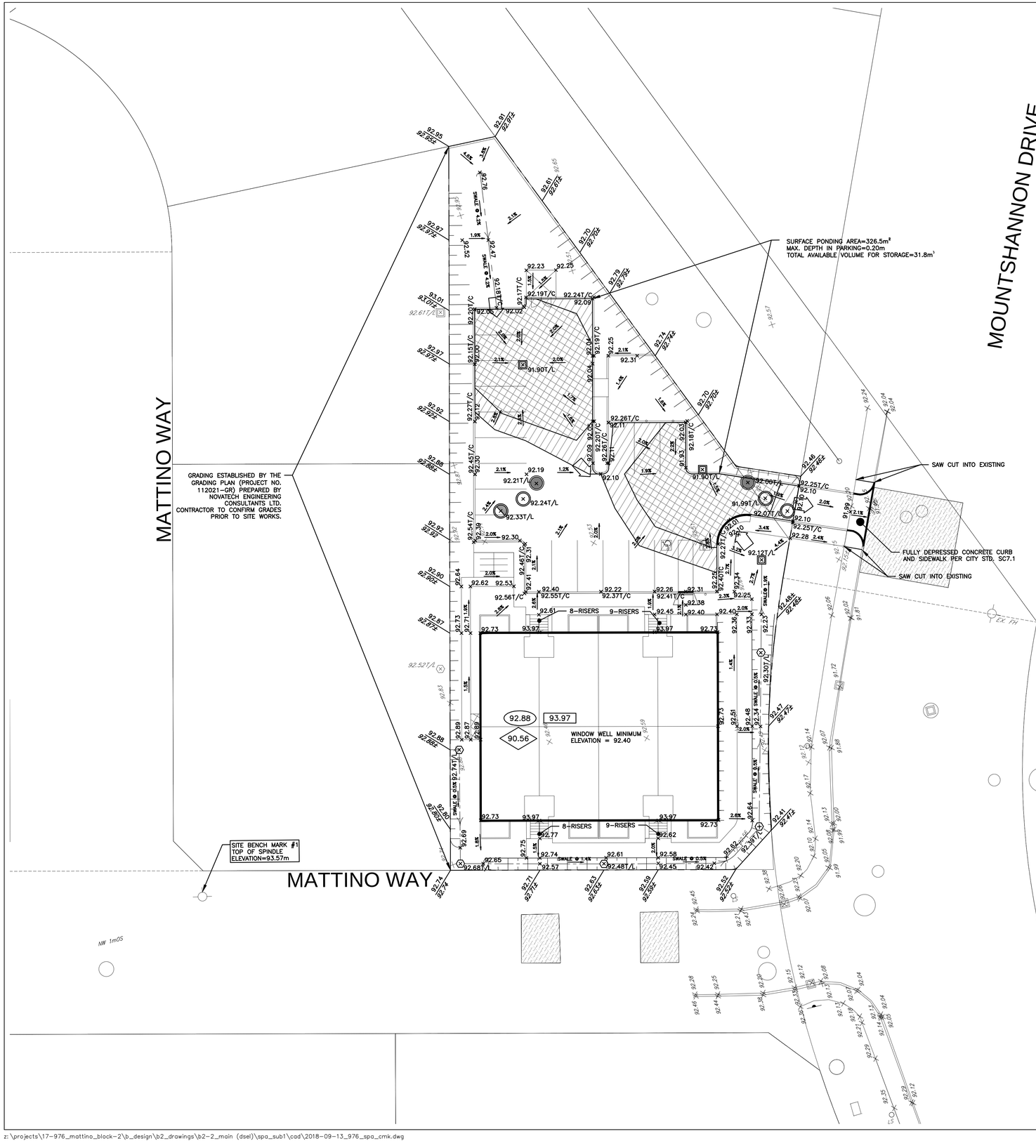
Salutations,

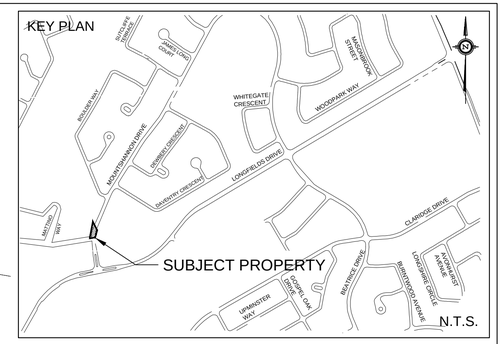
Derek Tardif, ing.
Ingénieur Principal-Infrastructure, Exploitation Réseau
Senior Infrastructure Engineer, Network Operation

//
VIA Rail Canada Inc.

APPENDIX C

Grading Plan
Site Plan
Elevation Plans





LEGEND

- PROPERTY LINE
- PROPOSED SWALE
- PROPOSED PERFORATED SUBDRAIN
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- PROPOSED TOP OF CURB ELEVATION
- PROPOSED TOP OF LID ELEVATION
- EXISTING GRADE AND DIRECTION
- PROPOSED GRADE AND DIRECTION
- PROPOSED 3:1 TERRACING
- PROPOSED/EXISTING SPOT ELEVATION
- INTERPOLATED GRADE, CONTRACTOR TO CONFIRM PRIOR TO SITE WORKS
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED CB 'T' OR CB 'L'
- EMERGENCY FLOW ROUTE
- SURFACE PONDING AREA (MAX PONDING / INTERMEDIATE PONDING)
- PROPOSED FOUNDATION MANHOLE
- FINISHED FLOOR ELEVATION
- TOP OF FOUNDATION
- SLAB ELEVATION
- ROAD REINSTATEMENT PER CITY STD. R10
- ASPHALT OVERLAY

NOT FOR CONSTRUCTION

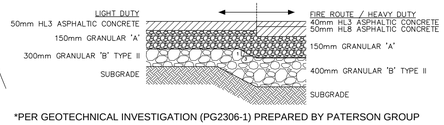
GENERAL NOTES

1. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISION OF THE STANDARDS AND SPECIFICATIONS FOR THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), WHERE APPLICABLE. LOCAL UTILITY STANDARDS AND MINISTRY OF TRANSPORTATION STANDARDS WILL APPLY WHERE REQUIRED.
2. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION, TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
3. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER, LOST TIME DUE TO FAILURE OF THE CONTRACTOR TO CONFIRM UTILITY LOCATIONS AND NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT THE CONTRACTORS EXPENSE.
4. ANY AREAS BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
5. RELOCATION OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR DIRECTED BY THE ENGINEER AT THE EXPENSE OF THE DEVELOPER.
6. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 'OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.' THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE 'CONSTRUCTOR' AS DEFINED IN THE ACT.
7. ALL CONSTRUCTION SIGNAGE MUST CONFORM TO THE MINISTRY OF TRANSPORTATION OF ONTARIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PER LATEST AMENDMENT.
8. THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE PERIOD OF THIS CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES TO PREVENT CONFLICTS.
9. ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
10. THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL IS RECEIVED FROM THE ENGINEER.
11. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.
12. FOR DETAILS RELATING TO STORMWATER MANAGEMENT AND ROOF DRAINAGE REFER TO THE SITE SERVICING AND STORMWATER MANAGEMENT REPORT.
13. ALL SEWERS CONSTRUCTED WITH GRADES LESS THAN 1.0% SHALL BE INSTALLED USING LASER ALIGNMENT AND CHECKED WITH LEVEL INSTRUMENT PRIOR TO BACKFILLING.
14. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND TO BEAR THE COST OF THE SAME.
15. THE CONTRACTOR WILL BE RESPONSIBLE FOR ADDITIONAL BEDDING, OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH AS SPECIFIED BY OPSD IS EXCEEDED.
16. ALL PIPE / CULVERT SECTION SIZES REFER TO INSIDE DIMENSIONS.
17. SHOULD DEEPLY BURIED ARCHAEOLOGICAL REMAINS BE FOUND ON THE PROPERTY DURING CONSTRUCTION ACTIVITIES, THE HERITAGE OPERATIONS UNIT OF THE ONTARIO MINISTRY OF CULTURE MUST BE NOTIFIED IMMEDIATELY.
18. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH CONTRACT ADMINISTRATOR AND THE CITY OF OTTAWA PRIOR TO ANY TREE CUTTING / REMOVAL.
19. DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL SITE PLAN.
20. THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER ONE SET OF AS CONSTRUCTED SITE SERVICING AND GRADING DRAWINGS.
21. BENCHMARKS: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE SITE BENCHMARK(S) HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION DEPICTED ON THIS PLAN.

SITE GRADING NOTES

1. PRIOR TO THE COMMENCEMENT OF THE SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL PER EROSION CONTROL PLAN.
2. ALL GRANULAR AND PAVEMENT FOR ROADS/PARKING AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
3. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD AND PARKING AREAS ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
4. CONCRETE CURB SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. SC1.1. PROVISION SHALL BE MADE FOR CURB DEPRESSIONS AS INDICATED ON ARCHITECTURAL SITE PLAN. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD SC1.4. ALL CURBS, CONCRETE ISLANDS, AND SIDEWALKS SHOWN ON THIS DRAWING ARE TO BE PRICED IN THE SITEWORKS PORTION OF THE CONTRACT.
5. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. R10 AND OPSD 509.010, AND OPSS 310.
6. GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 300mm AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.
7. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 300mm LIFTS.
8. ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR TO BACKFILLING.
9. CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE, IF REQUIRED BY THE MUNICIPALITY.
10. ALL PAVEMENT MARKING FEATURES AND SITE SIGNAGE SHALL BE PLACED PER ARCHITECTURAL SITE PLAN. LINE PAINTING AND DIRECTIONAL SYMBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT PAINT.
11. REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.
12. STEP JOINTS ARE TO BE USED WHERE PROPOSED ASPHALT MEETS EXISTING ASPHALT. ALL JOINTS MUST BE SEALED.
13. SIDEWALKS TO BE 15mm & BEVELED AT 2:1 OR 6mm WITH NO BEVEL REQUIRED BELOW THE FINISHED FLOOR SLAB ELEVATION AT ENTRANCES REQUIRED TO BE BARRIER-FREE, UNLESS OTHERWISE NOTED. ALL IN ACCORDANCE WITH OBC 3.8.1.3. & OTTAWA ACCESSIBILITY DESIGN STANDARDS.
14. WHERE APPLICABLE THE CONTRACTOR IS TO SUBMIT SHOP DRAWINGS FOR RETAINING WALL (INCLUDE RAILINGS IF APPLICABLE) TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. SHOP DRAWINGS MUST BE SITE SPECIFIC, SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER. THE CONTRACTOR WILL ALSO BE REQUIRED TO SUPPLY STRUCTURAL AND GEOTECHNICAL CERTIFICATION OF THE AS-CONSTRUCTED RETAINING WALL TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE.

PAVEMENT STRUCTURE



*PER GEOTECHNICAL INVESTIGATION (PG2306-1) PREPARED BY PATERSON GROUP

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY STANTEC
PROJ. NO. 161613770-111
DATED APRIL 23, 2018

SITE PLAN INFORMATION

SITE PLAN PROVIDED BY PIERRE J. TABET ARCHITECT
PROJ. NO.
DATED JULY 26, 2018

GEOTECHNICAL STUDY

GEOTECHNICAL RECOMMENDATIONS PROVIDED BY PATERSON GROUP
PROJ. NO. PG2306-1
DATED JANUARY 31, 2013

SITE SERVICING AND STORMWATER MANAGEMENT STUDY

SERVICING AND STORMWATER MANAGEMENT RECOMMENDATIONS PROVIDED BY DSEL
PROJ. NO. 17-976
DATED SEPTEMBER 2018

BENCH MARK

TOP OF SPINDLE 1 LOCATED ACROSS FROM THE SOUTHWEST CORNER OF THE SITE
ELEV=93.57

No.	BY	YY.MM.DD	DESCRIPTION
No.	A.J.G.	18.09.13	ISSUED FOR MUNICIPAL REVIEW
No.	BY	YY.MM.DD	DESCRIPTION

PROJECT No. 17-976

LICENSED PROFESSIONAL ENGINEER
A. D. FOBERT
100090526
2018-09-13
PROVINCE OF ONTARIO

REVIEWED BY

GRADING PLAN
255 MOUNTSHANNON DRIVE - BLOCK 2

MATTINO DEVELOPMENT INC.
545 Via Mattino Way
Ottawa, Ontario, K2J 6B7
Tel. (613) 880-9393

DSEL
david schaeffer engineering ltd
SMART SUBDIVISIONS™
120 Iber Road Unit 103
Stittsville, Ontario, K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY:	C.M.K.	CHECKED BY:	R.D.F.	DRAWING NO.	SHEET NO.
DESIGNED BY:	C.M.K.	CHECKED BY:	A.D.F.	GP-1	2 of 4
SCALE:	1:200	DATE:	SEPTEMBER 2018		

D07-12-XX-XXXX

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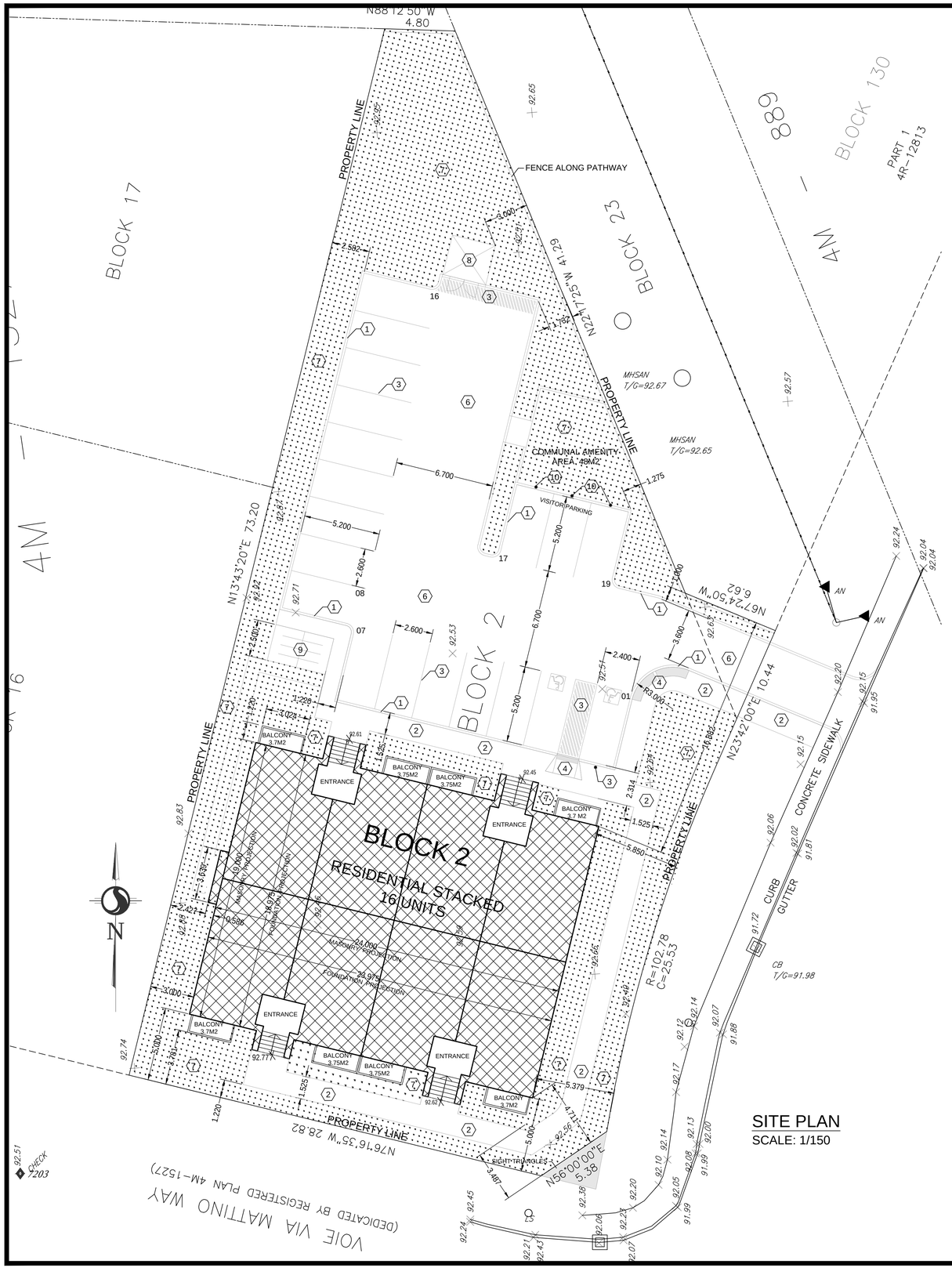


SITE PLAN
SCALE: 1/150

CURRENT ZONING BY LAW

DESCRIPTION	PROPOSED	REQUIRED
LOT AREA	1894,6 m²	660
LOT FRONTAGE	32 m	22 m
LOT DEPTH	72,7m	N/A
MAX. NUMBER OF DWELLING UNITS	16	16 R4A[2162]
FRONT SET BACK	5 m	3 m
CORNER SIDE YARD SETBACK	4,9 m	2 m
INTERIOR SIDE YARD SETBACK	3,06 m	3 m
REAR SET BACK	16,9 m	7,5 m
REAR SET BACK BETWEEN UNITS	0	0
BUILDING AREA	456m²	-
GROSS FLOOR AREA	1824 m²	-
BUILDING HEIGHT	10,97 m	11m
AMENITY AREA	-	0
MIN. LANDSCAPING BUFFER	3	3
PARKING SPACE	16	0.5 /UNIT-Rapid Transit
MIN. VISITOR PARKING	3	0.1 /UNIT-Rapid Transit
AMENITY AREA	48m²+60m²	96m²
SOFT & HARD LANDSCAPED AREA	800 m²	30% OF LOT AREA

BUILDING CODE ANALYSIS

- 3 STOREYS RESEDENTIAL USE BUILDING WITH BASEMENT
  16 STACKED DWELLING UNITS
- FACING 2 STREETS
- BUILDING AREA: 456m²
- GROSS FLOOR AREA : 1824 m².
- USE: GROUP GROUP "C".
- CLASSIFICATION: 9.10.8.1
- PARTS 9 OF OBC 2012.
- COMBUSTIBLE CONSTRUCTION.
- SECOND FLOOR FIRE SEPARATION: 3/4HR REQUIRED CW VERTICAL STRUCTURAL COMPONENTS
- UPPER DWELLING STAIRWAY ENTRANCE/EXIT ENCLOSURES FIRE SEPARATION: 3/4HR REQUIRED CW VERTICAL STRUCTURAL COMPONENTS
- FIRE RESISTANCE FOR ROOF: NOT REQUIRED
- PLUMBING EQUIPMENTS:
  . 1 WASHROOM PER UNIT REQUIRED
  . 10% NATURAL LIGHTNING REQUIRED FOR LIVING ROOMS & DINNING ROOMS
  . 5% NATURAL LIGHTNING REQUIRED FOR BEDROOMS
- BARRIER FREE PATH OF TRAVEL NOT REQUIRED ACCORDING.

LEGENDE

1. CONCRETE CURB
2. SIDEWALK
3. PAINT MARKS
4. DEPRESSED SIDEWALK.
5. ACCESSIBLE PARKING VERTICAL SIGNAGE
6. ASPHALT
7. GRASS
8. TRASH ENCLOSURE, SCREENED FROM VIEW BY AN OPAQUE SCREEN WITH TWO METRES HEIGHT.
9. BICYCLE PARKING SPACE ON CONCRETE SLAB SURFACE
10. VISITOR PARKING VERTICAL SIGNAGE

GRADE SCHEDULE

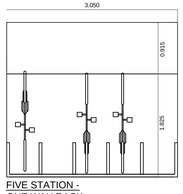
AVERAGE GRADE: 92.730.
T.O.FOUNDATION: 92.880/ 100 000
T.O.FIRST FLOOR: 93.966 T.O.BASEMENT: 90.967
T.O.SECOND FLOOR: 97.109, T.O.THIRD FLOOR: 100.183.
T.O.ROOF PLATE :102.653, T.O.MID-ROOF: 104.460.

MINOR VARIANCE:
-To permit a building height of 12m whereas the zoning requirement allow 11m.

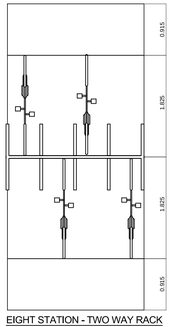
Bike-Up
Bicycle Parking Systems

BIKE-UP BICYCLE PARKING SYSTEMS INC.
6 ANTARES DRIVE, PHASE II, UNIT #10 B
NEPEAN, ONTARIO, CANADA K2E 8A9
PHONE: (613) 226-6452
FAX: (613) 228-3539
1-800-661-3506
www.bikeup.com

NOTES:
1. INSTALLATION TO BE COMPLETD IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS
2. DO NOT SCALE DRAWINGS
3. WHEN CALCULATING SPACING, ADD 12" TO BOTH ENDS OF THE RACK TO ALLOW FOR HANDLE BAR CLEARANCE.
4. USE 2" U-CLAMPS TO INSTALL ALL RACKS
   EXCEPTION:
   A. PRMANENT INSTALLATION - USE ANCHOR BOLTS AND SECURITY CAPS
   B. SEASONAL INSTALLATIONS - USE ANCHOR SLEEVES AND LAG BOLTS
5. RUNNERS ARE 1.9"00 - 1/8" WALL PIPE STATIONS ARE 5/8" STEEL ROD.
6. WELDED CONSTRUCTION, HOT-DIPPED GALVANIZED AFTER FABRICATION. PAINTING AVAILABLE.
7. WEIGHTS:
APPROXIMATIVELY 14 LBS PER STATION.
8. CONTRACTORS NOTE: FOR PRODUCT AND PURCHASING INFORMATION, VISIT www.PROJECTmarketsite.com, REFERENCE NUMBER 317-002



FIVE STATION -
ONE WAY RACK



EIGHT STATION - TWO WAY RACK

Pierre J. Tabet *architect*

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E-Mail : pierre.tabet@hotmail.com

Revision	By	Appd.	YY.MM.DD
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1 SITE PLAN CONTROL	A.A.	P.T.	18.11.07

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ONTARIO ASSOCIATION OF ARCHITECTS
PIERRE J. TABET
LICENCE
5217

Project

MATTINO HOMES
16 CONDO UNITS BUILDING
BLOCK 2
255 MOUNTSHANNON DRIVE,
OTTAWA,ON

Title

SITE PLAN

Project #	Scale	Date
	1:150	2018-11-07
Revision	Sheet	Drawing #
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SOUTH ELEVATION
SCALE: 1/8' = 1'-0"

Pierre J. Tabet *architect*

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Revision	By	Appd.	YY.MM.DD
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Project

MATTINO HOMES
16 CONDO UNITS BUILDING
255 MOUNTSHANNON,
OTTAWA,ON

Title

SOUTH ELEVATION

Project #	Scale	Date
	1/8" - 1'-0"	2018-07-11
Revision	Sheet	Drawing #
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WEST ELEVATION
SCALE: 1/8" = 1'-0"

Pierre J. Tabet *architect*

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Project

MATTINO HOMES
16 CONDO UNITS BUILDING
255 MOUNTSHANNON,
OTTAWA,ON

Title

WEST ELEVATION

Project #	Scale	Date
	1/8" - 1'-0"	2018-07-11
Revision	Sheet	Drawing #
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EAST ELEVATION
SCALE: 1/8" = 1'-0"

Pierre J. Tabet *architect*

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Project

MATTINO HOMES
16 CONDO UNITS BUILDING
255 MOUNTSHANNON,
OTTAWA,ON

Title

EAST ELEVATION

Project #	Scale	Date
	1/8" - 1'-0"	2018-07-11
Revision	Sheet	Drawing #
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NORTH ELEVATION
SCALE: 1/8" = 1'-0"

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PIERRE J. TABET
LICENCE 6537

Project

MATTINO HOMES

16 CONDO UNITS BUILDING
255 MOUNTSHANNON,
OTTAWA,ON

Title

NORTH ELEVATION

Project #	Scale	Date
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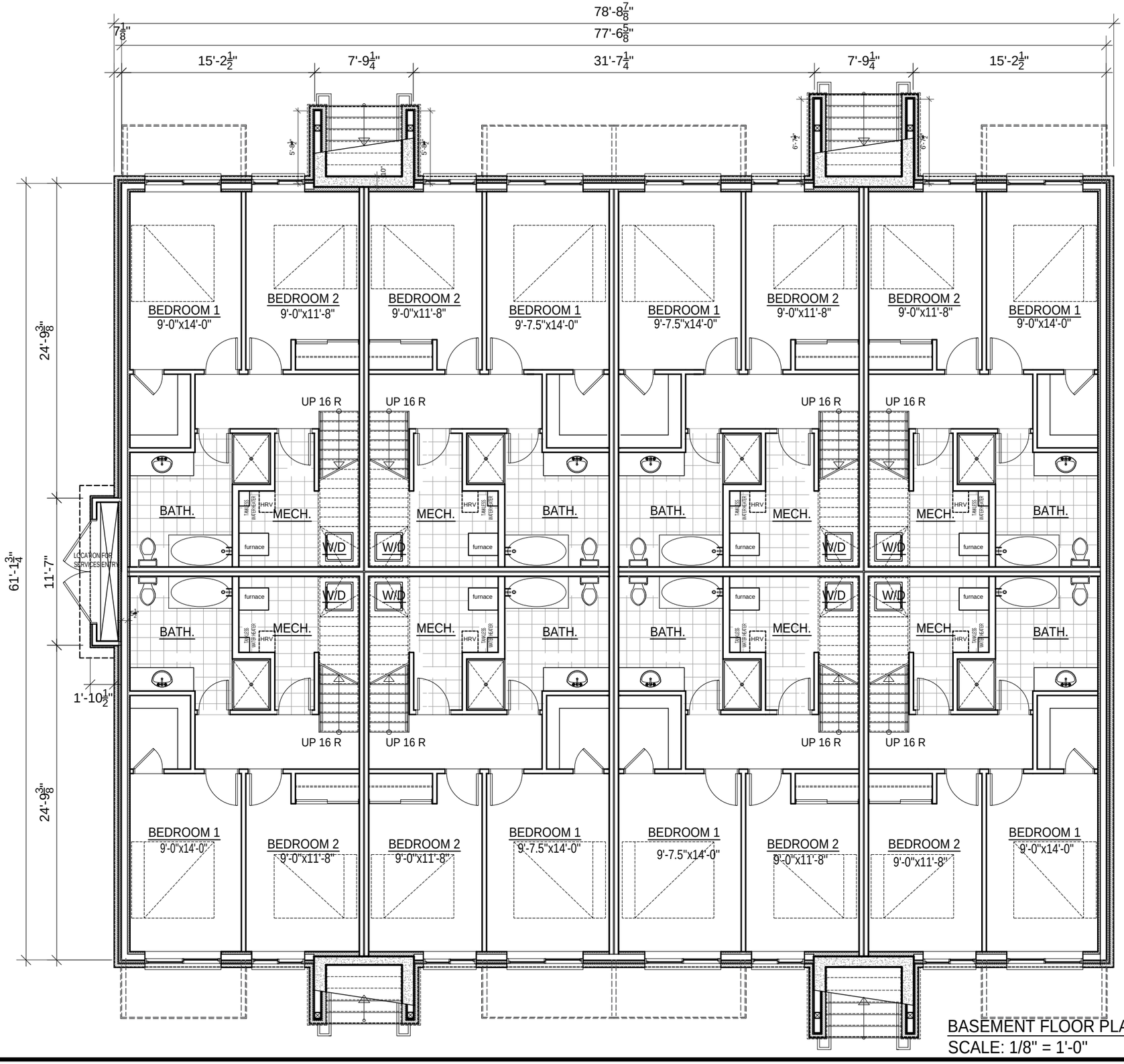

BASEMENT FLOOR PLAN
SCALE: 1/8" = 1'-0"

Pierre J. Tabet *architect*

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LICENCE
0078

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MATTINO HOMES
16 CONDO UNITS BUILDING
255 MOUNTSHANNON,
OTTAWA,ON

Title

BASEMENT FLOOR PLAN

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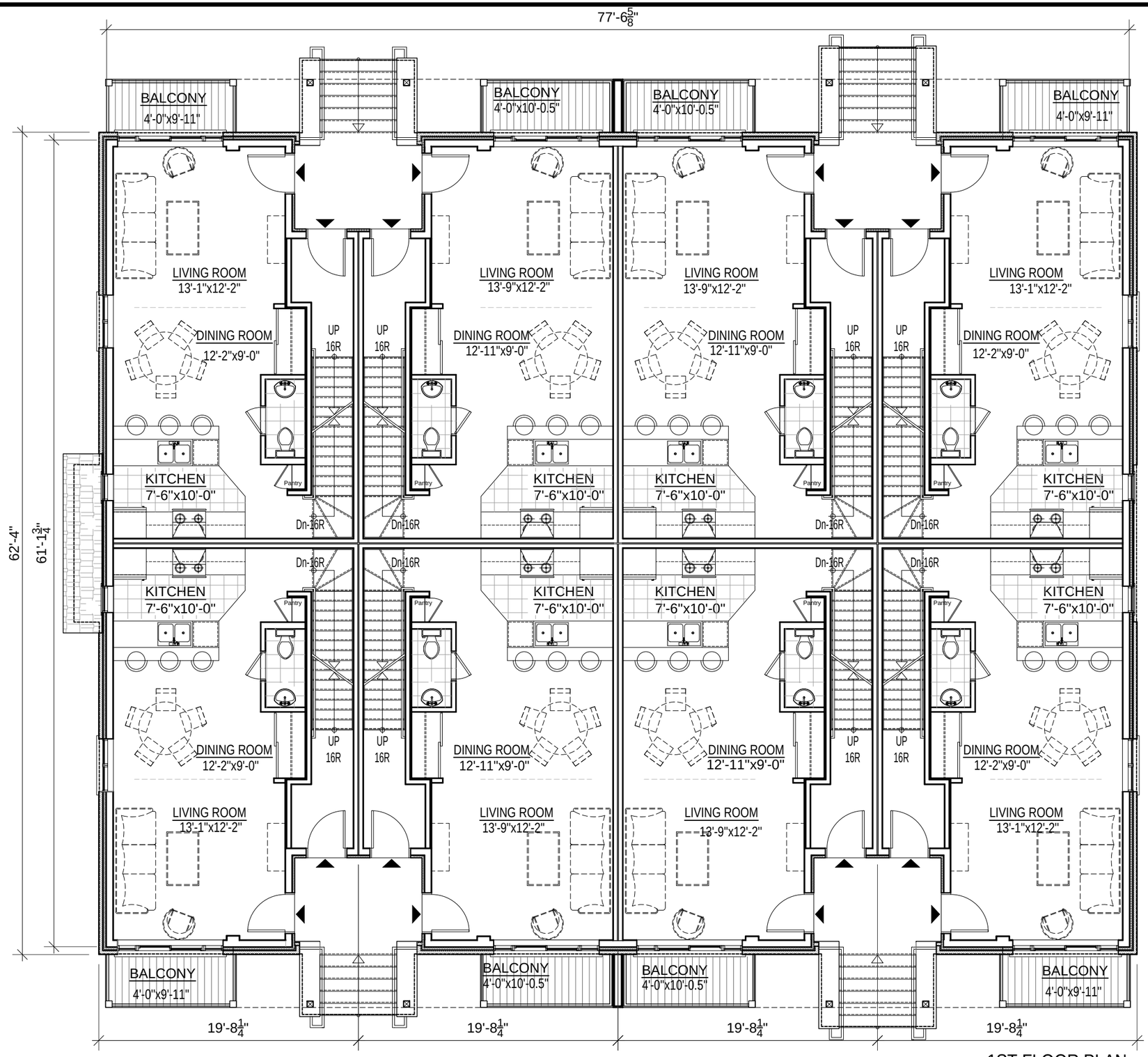

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Project

MATTINO HOMES
16 CONDO UNITS BUILDING
255 MOUNTSHANNON,
OTTAWA,ON

Title

FIRST FLOOR PLAN

Project #	Scale	Date
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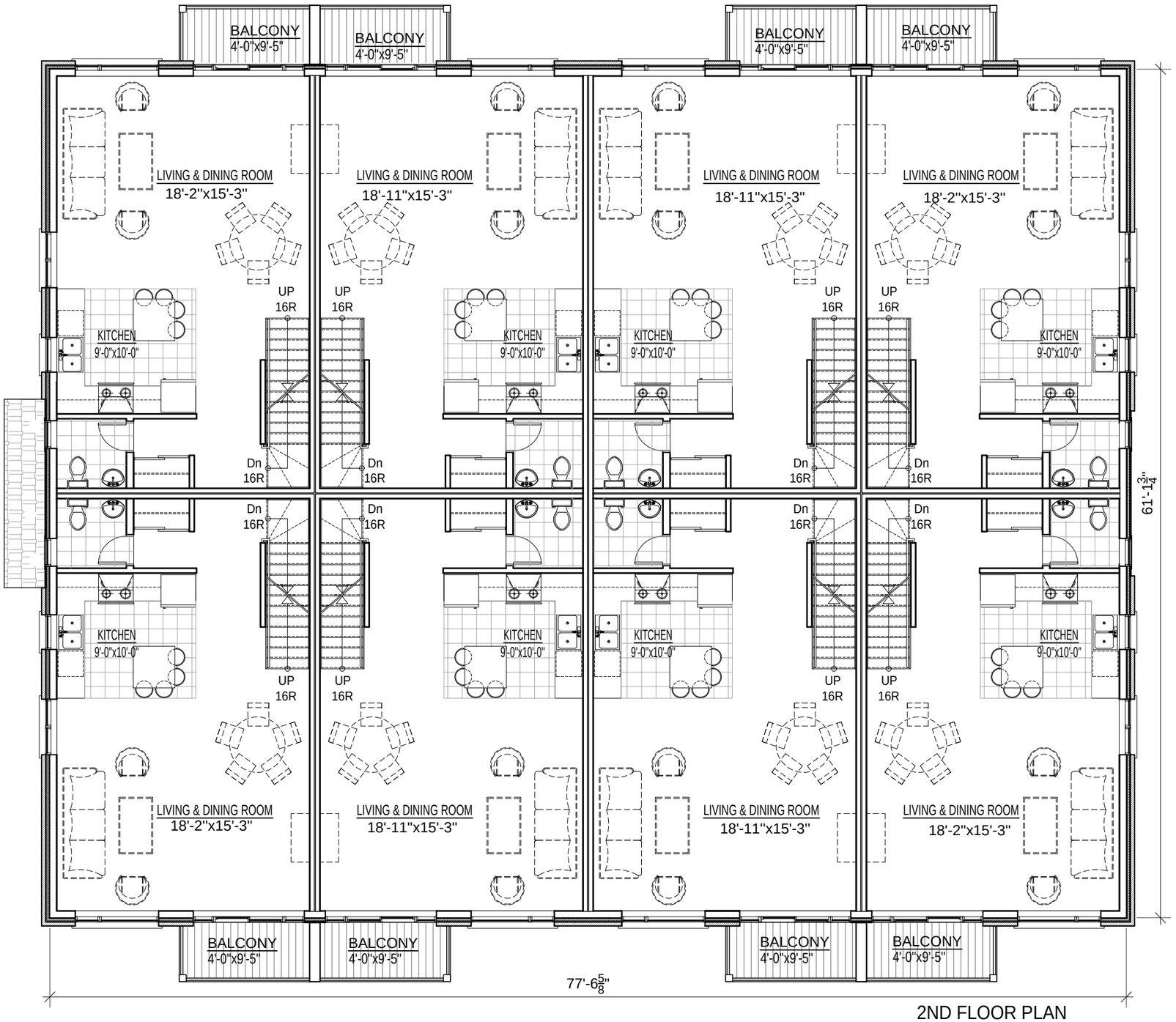

2ND FLOOR PLAN

SCALE: 1/8" = 1'-0"

Pierre J. Tabet *architect*

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ONTARIO ASSOCIATION OF ARCHITECTS
PIERRE J. TABET
LICENCE
0287

Project

MATTINO HOMES

16 CONDO UNITS BUILDING
255 MOUNTSHANNON,
OTTAWA,ON

Title

SECOND FLOOR PLAN

Project #	Scale	Date
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Revision	Sheet	Drawing #
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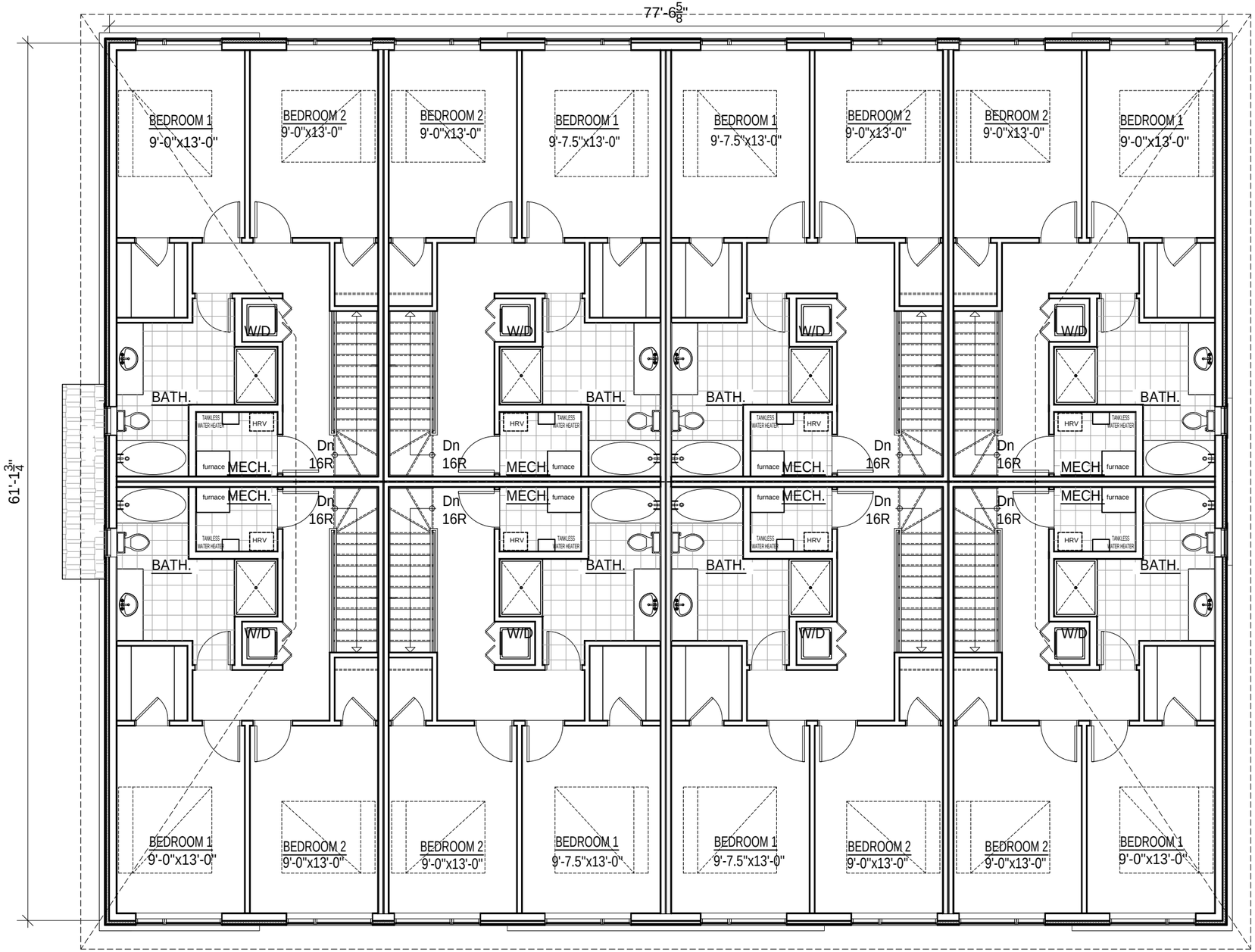

3RD FLOOR PLAN

SCALE: 1/8" = 1'-0"

Pierre J. Tabet *architect*

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ONTARIO ASSOCIATION OF ARCHITECTS

Project

MATTINO HOMES

16 CONDO UNITS BUILDING
255 MOUNTSHANNON,
OTTAWA,ON

Title

THIRD FLOOR PLAN

Project #	Scale	Date
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Revision	Sheet	Drawing #
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