

**Mattino Developments Inc.
Block 21, Mattino Way**

Noise Impact Assessment

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**Mattino Developments Inc.
Block 21, Mattino Way**



515 Via Mattino Way
Ottawa, ON
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Prepared by:

NOVATECH

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October 25, 2019

Ref: R-2019-183
Novatech File No. 112021-10

October 25, 2019

BY COURIER

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

Attention: Kelby Lodoen Unseth, Planner II

**Reference: Mattino Developments Inc.
Block 21, Mattino Way
Noise Impact Assessment
Our File No.: 112021-10**

Please find enclosed three (3) copies of the 'Noise Impact Assessment' for Block 21 development.

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

Sincerely,

NOVATECH



Lucas Wilson, P.Eng.
Project Coordinator

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1.0 INTRODUCTION

The subject site is located within the Longfields Community, in the Barrhaven ward. The site is approximately 1.04 ha and is bounded by existing residential to the north, the Longfields Central subdivision to the east and south and a rail corridor and transitway to the west. A key plan of the area is presented as **Figure 1-1**.



Figure 1-1 Key Plan

The proposed development will consist of five 3-storey residential apartment buildings with three 16 unit structures and two 20 unit structures. 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).

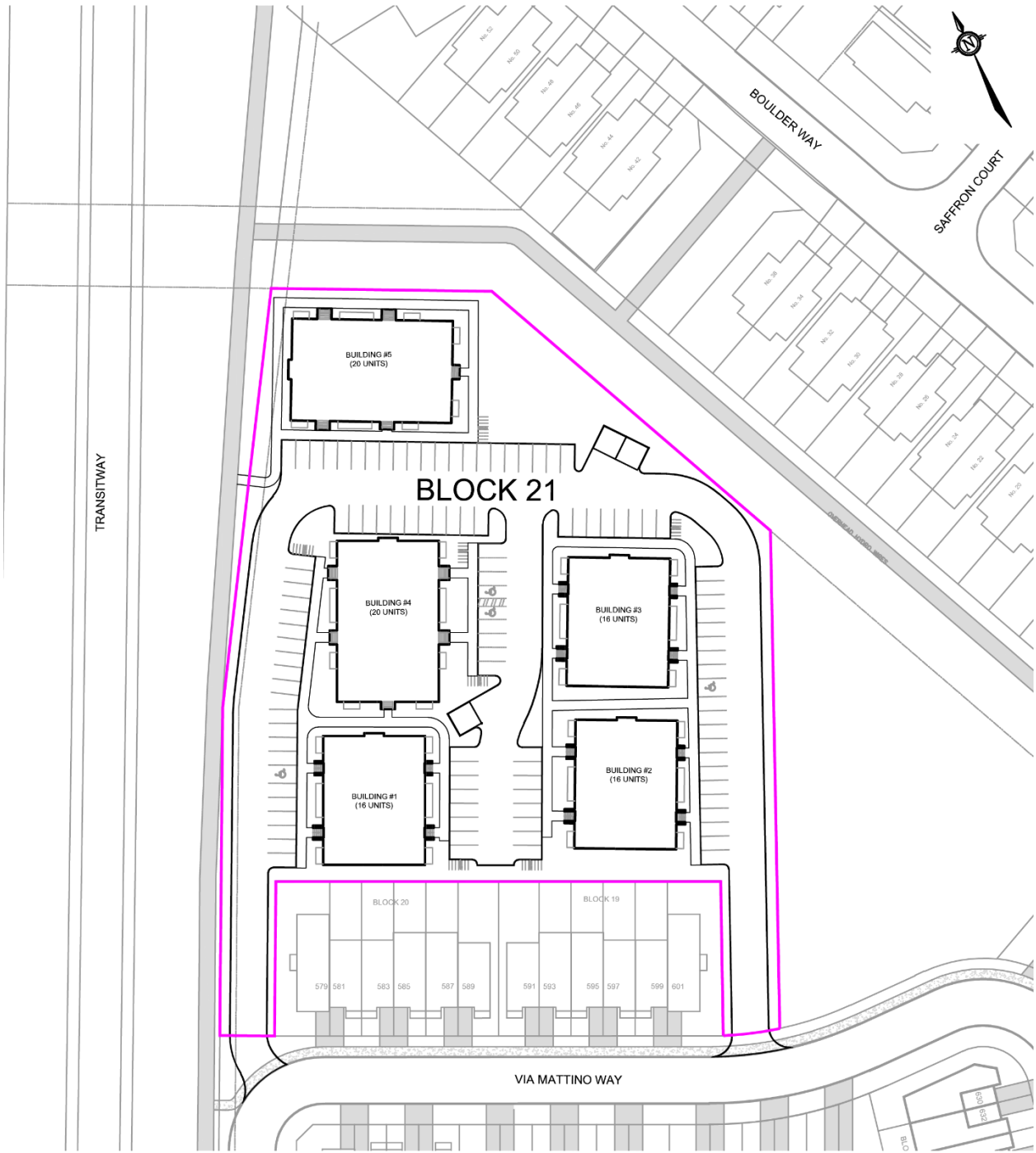


Figure 1-2 Site Plan

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	Leq (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 Leq exceeds 55 dBA Type A
	More than 60	Barriers required	N/A	N/A	Required if resultant Leq exceeds 55 dBA Type B
Plane of Living Room Window (POW)	Less than 55	N/A	None Required	None Required	None Required
	Between 55 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
	Between 50 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 transitway;
- Within 300m from the right-of-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. A transitway 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 VIA Rail (Smiths Falls Rail Corridor)

A VIA Rail Line is located approximately 57m 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 3-1 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.

3.2 Transitway

A Transitway is located along the west side of the proposed development. Existing daily traffic data was acquired from OC Transpo, **Appendix B**, with an AADT of 317. A growth rate of 2% per year was applied and extrapolated to the City's TMP horizon year of 2031, which yielded an AADT of 444 with a Day/Night Split of 85/15 (day/night split based on the bus schedule through Longfields Station located on the OC Transpo website). The posted speed limit is 80 km/hr in the area of the proposed development. The Transitway noise parameters are summarized below in **Table 3-3**.

Table 3-2 Transitway Noise Parameters

Roadway Classification	Transitway
Annual Average Daily Traffic (AADT)	444 veh/day
Day/Night Split (%)	85/15
Posted Speed Limit	80 km/hr
Road Gradient	1.0%

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

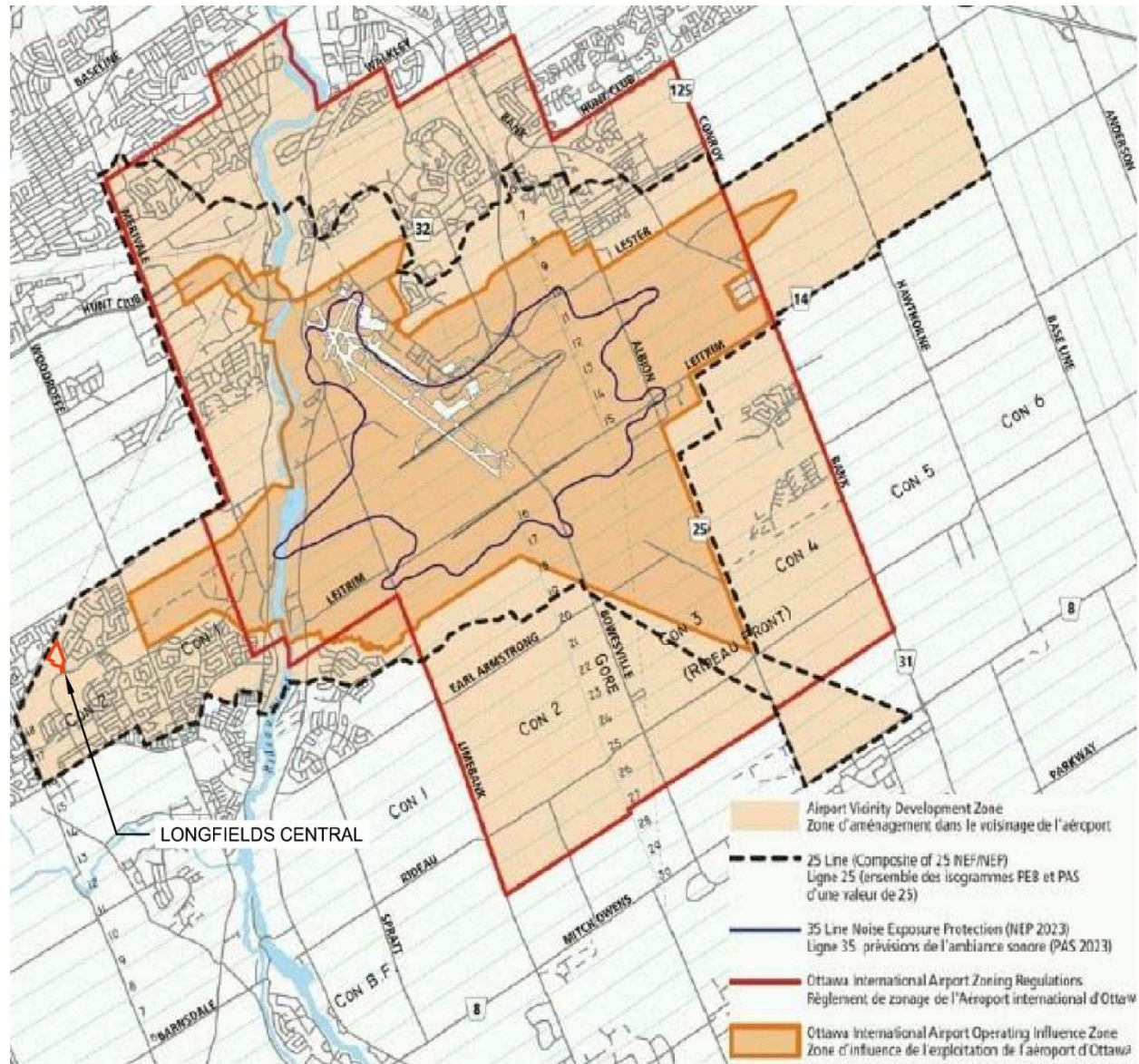


Figure 3-2 Ottawa Airport Operating Influence Zone

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)
R14	57.40

Table 4-2 POW Noise Level Summary

LOCATION	PLANE OF WINDOW (POW) NOISE LEVEL – L_{eq} - (dBA)	
	DAYTIME	NIGHT TIME
R1 (3 rd Floor)	60.35	57.44
R2 (1 st to 3 rd Floors)	64.04	61.30
R3 (1 st to 3 rd Floors)	64.19	61.44
R4 (1 st to 3 rd Floors)	57.52	54.82
R5 (3 rd Floor)	55.26	52.53
R6 (3 rd Floor)	54.75	52.04
R7 (1 st to 3 rd Floors)	45.11	42.42
R8 (1 st to 3 rd Floors)	54.86	52.15
R9 (1 st to 3 rd Floors)	56.58	53.90
R10 (1 st to 3 rd Floors)	57.39	54.93
R11 (1 st to 3 rd Floors)	56.92	54.26
R12 (1 st to 3 rd Floors)	56.70	54.05
R13 (1 st to 3 rd Floors)	52.94	50.32

4.2 Outdoor Control Measures

The development consists of a shared amenity area located east of building 5 with a calculated noise level of 57.40 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 the daytime requirement of 65 dBA. The night-time noise levels at R2 and R3 are above the minimum requirement of 60 dBA and as such, 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 2.2**. Compliance at the worst-case receiver point will demonstrate compliance for all locations.

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

Three Building Components: $AIF = 61.43 \text{ dBA} - 40 \text{ dBA} + 10\log(3) \text{ dBA} + 2 \text{ dBA} = 28$

The resultant AIF values due to transportation noise will be compared with the AIF due to aircraft noise (calculated below), with the largest AIF value being used to design the cladding system.

Since the proposed development is located within the 25 NEF boundary, an analysis of the cladding system is warranted for aircraft noise. 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 $L_{eq\ 24hr}$ using an equation from the IBANA-CALC User's Manual:

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

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

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

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

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:

$$\text{Three Building Components: AIF} = 57\text{ dBA} - 34\text{ dBA} + 10\log(3)\text{ dBA} + 2\text{ dBA} = 30$$

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)
<ul style="list-style-type: none"> • 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:

Reviewed By:



Lucas Wilson, P.Eng.
Project Coordinator



Mark Bissett, P.Eng.
Senior Project Manager

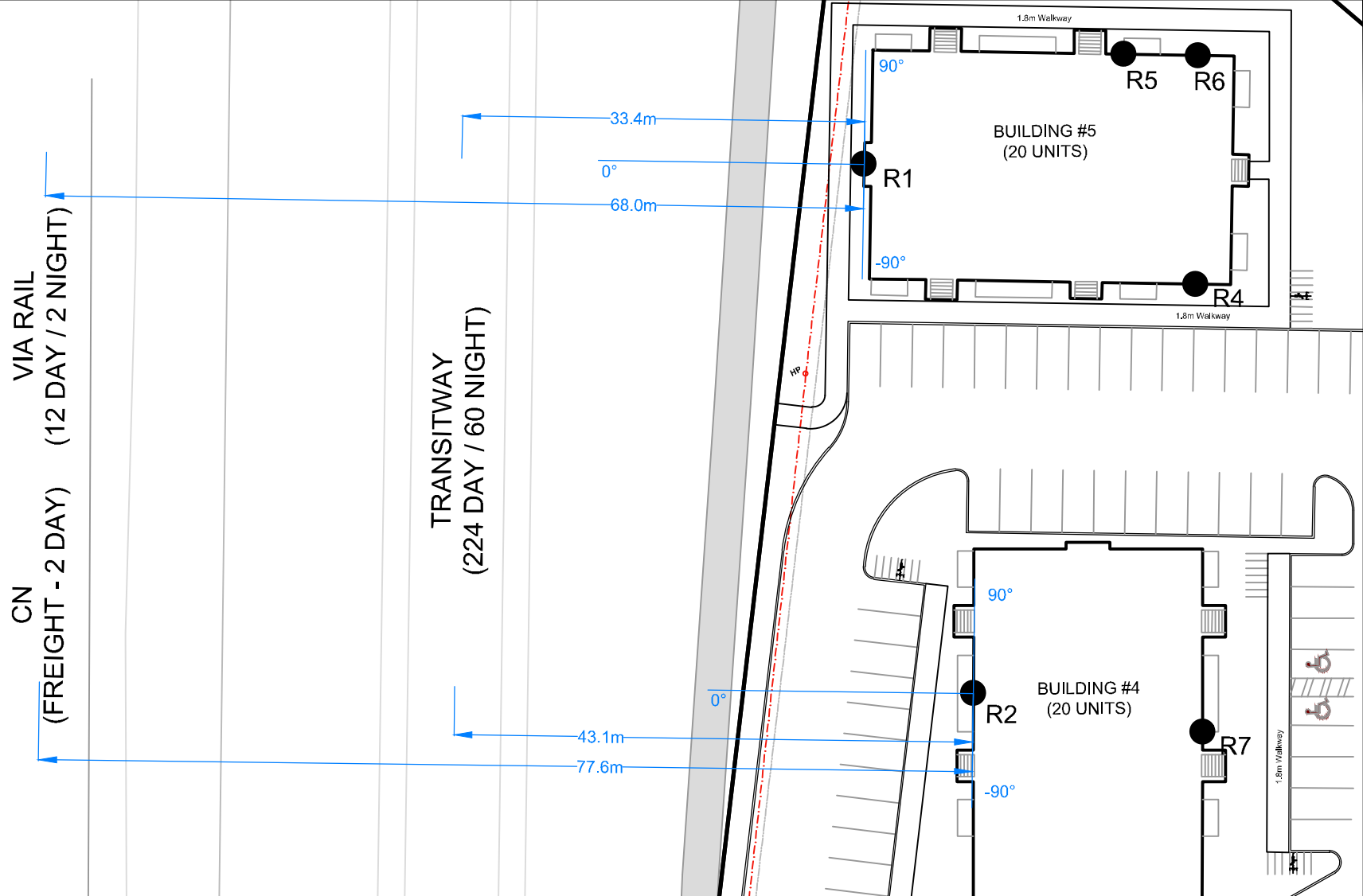
APPENDIX A
Receiver Location Figures
Stamson Model Output

CN
(FREIGHT - 2 DAY)

VIA RAIL

(12 DAY / 2 NIGHT)

TRANSITWAY
(224 DAY / 60 NIGHT)



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

● RECEIVER LOCATION

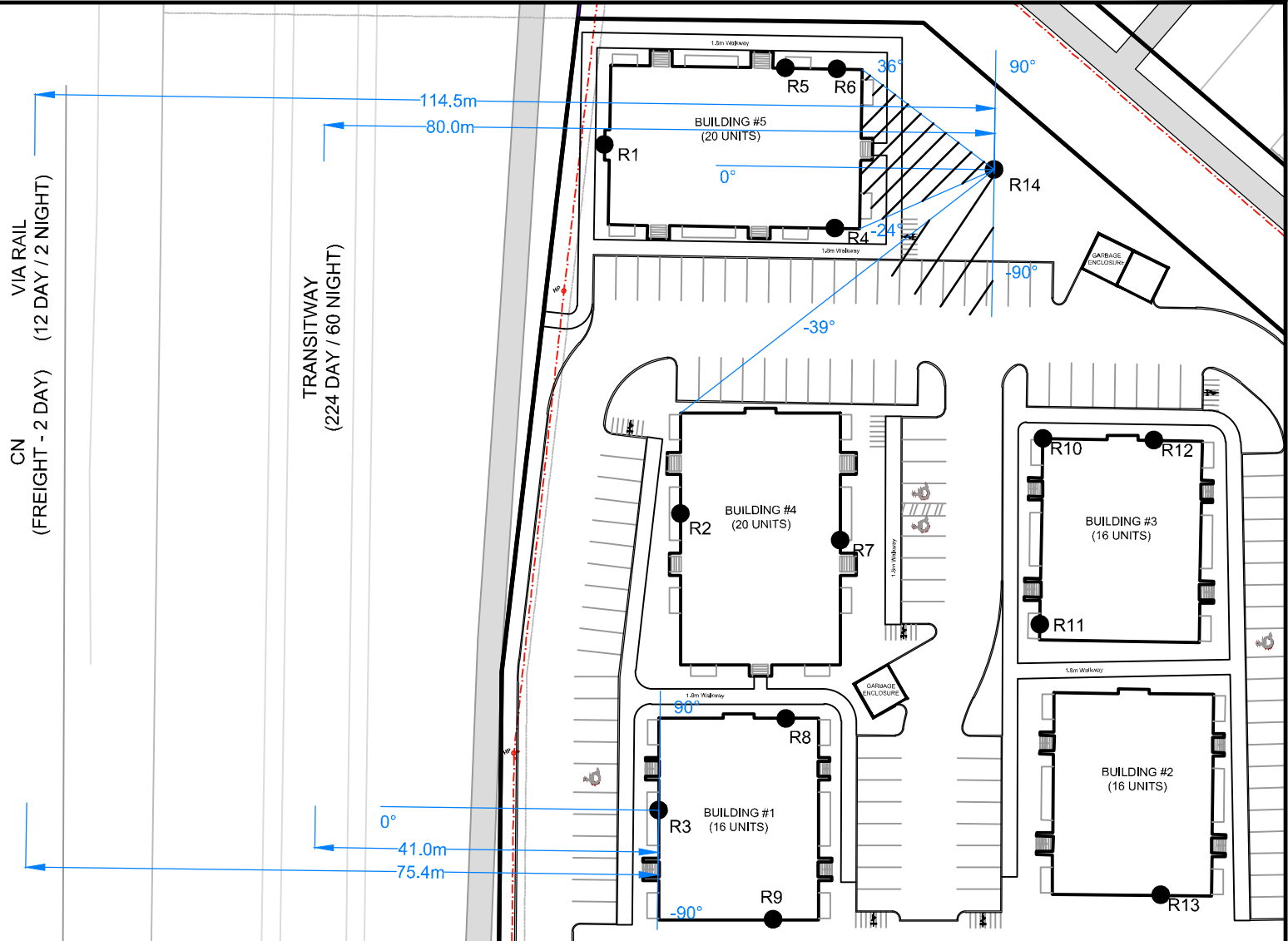
CITY OF OTTAWA
591 LONGFIELDS DRIVE - BLOCK 21

RECEIVER LOCATIONS R1 & R2

SCALE 1 : 500

DATE OCT 2019 JOB 112021-10 FIGURE FIG-1

Ms:20121112021\12021\12021\12021-Noise\Noise\112021-Noise\BLK21 (09.20.2019).dwg, R3 & R14, Oct 08, 2019 - 10:21am, cboehmer



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- RECEIVER LOCATION
- ▨ BARRIER ANGLE

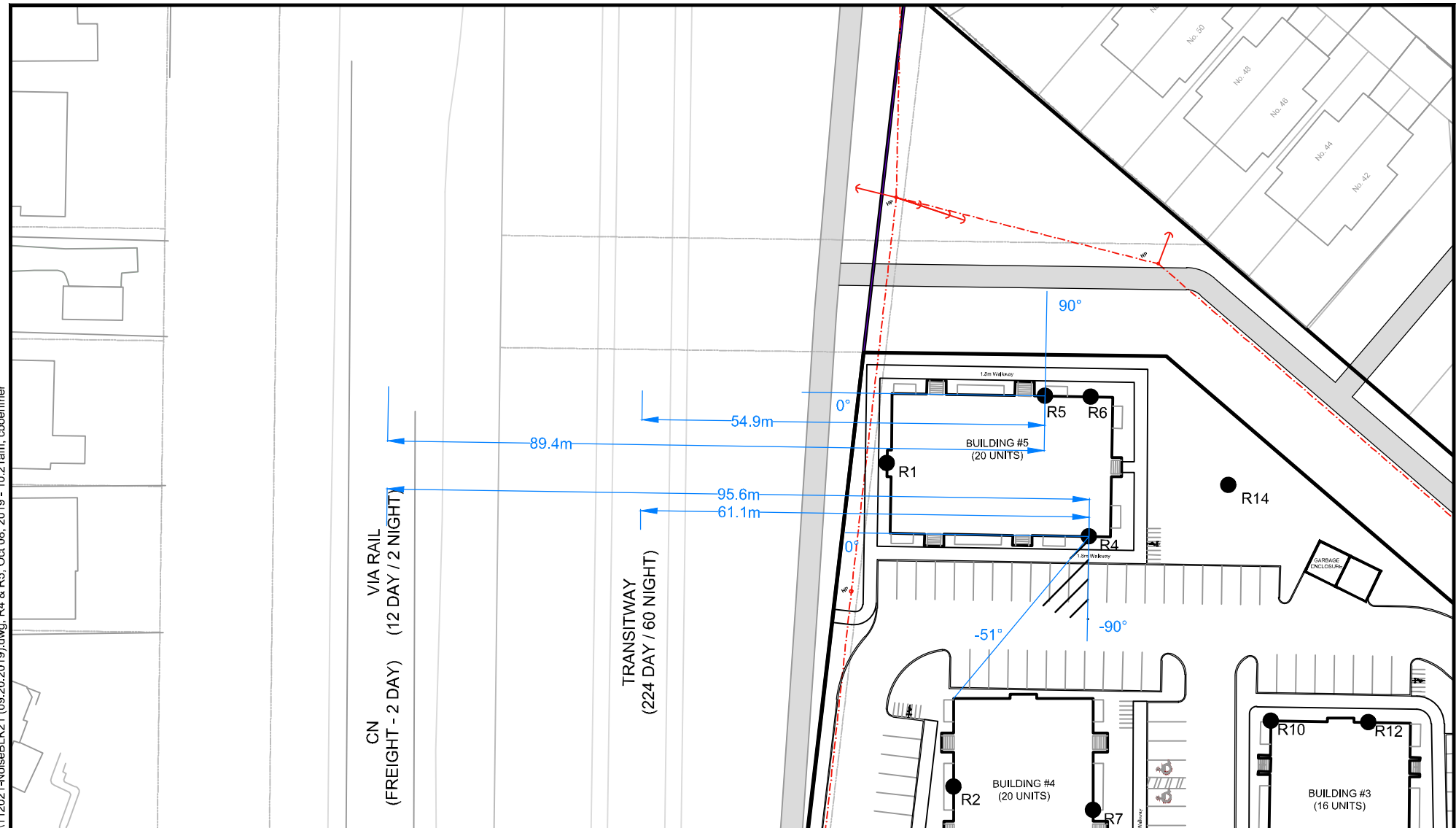
CITY OF OTTAWA
591 LONGFIELDS DRIVE - BLOCK 21

RECEIVER LOCATION R3 & R14

SCALE 1 : 750

DATE	JOB	FIGURE
OCT 2019	112021-10	FIG-2

M:\2012\112021\Block 21\DATA\Calculations\Noise\112021-NoiseBLK21 (09.20.2019).dwg, R4 & R5, Oct 08, 2019 - 10:21am, cboehmer



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- RECEIVER LOCATION
- ▨ BARRIER ANGLE

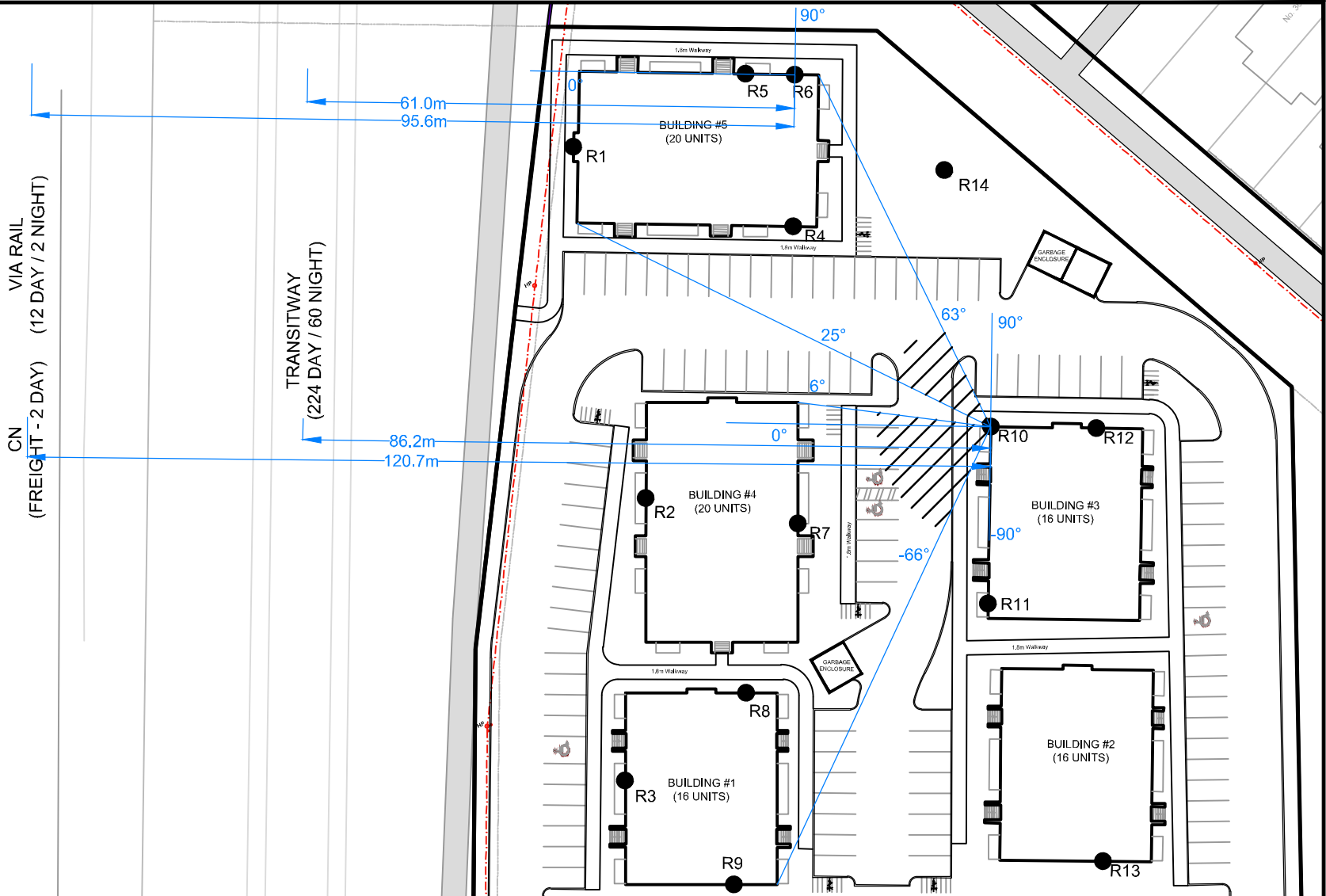
CITY OF OTTAWA
 591 LONGFIELDS DRIVE - BLOCK 21

RECEIVER LOCATIONS R4 & R5

SCALE 1 : 750

DATE OCT 2019 JOB 112021-10 FIGURE FIG-3

M:\2012\112021\12021\12021\12021-Noise\112021-Noise\BLK21 (09.20.2019).dwg, R6 & R10, Oct 08, 2019 - 10:21am, cboehmer



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- RECEIVER LOCATION
- ▨ BARRIER ANGLE

CITY OF OTTAWA
 591 LONGFIELDS DRIVE - BLOCK 21

RECEIVER LOCATIONS R6 & R10

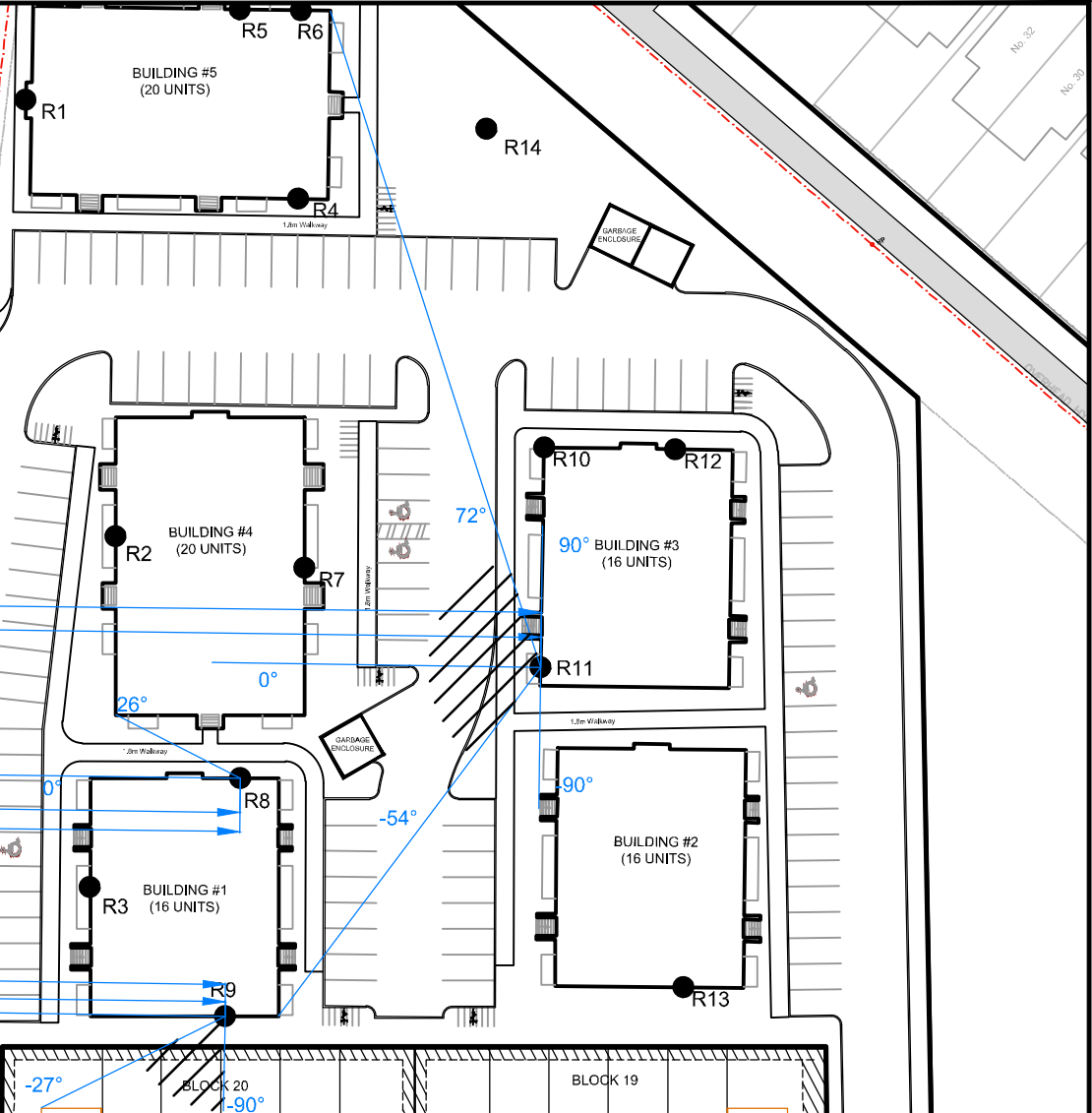
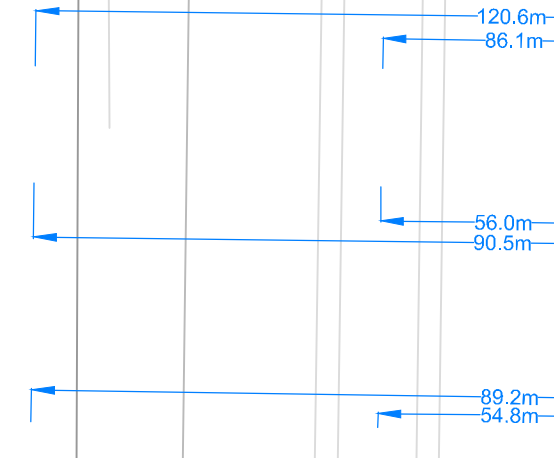


DATE OCT 2019 JOB 112021-10 FIGURE FIG-4

M:\2012\112021\12021\12021\12021\12021-Noise\BLK21 (09.20.2019).dwg, R8 & R9 & R11, Oct 08, 2019 - 10:21am, cboehmer

VIA RAIL
CN
(FREIGHT - 2 DAY) (12 DAY / 2 NIGHT)

TRANSITWAY
(224 DAY / 60 NIGHT)



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- RECEIVER LOCATION
- ▨ BARRIER ANGLE

CITY OF OTTAWA
591 LONGFIELDS DRIVE - BLOCK 21

RECEIVER LOCATIONS
R8, R9 & R11

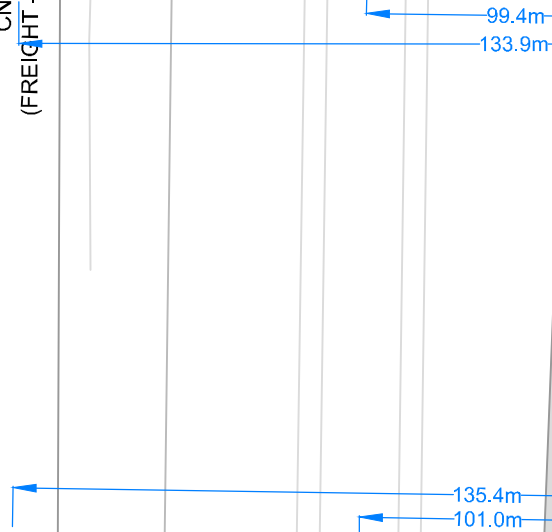


DATE OCT 2019	JOB 112021-10	FIGURE FIG-5
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M:\2012\112021\12021\12021\12021-Noise\K21 (05.20.2019).dwg, R12 & R13, Oct 08, 2019 - 10:21am, cboehmer

VIA RAIL
CN
(FREIGHT - 2 DAY) (12 DAY / 2 NIGHT)

TRANSITWAY
(224 DAY / 60 NIGHT)



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

- RECEIVER LOCATION
- ▨ BARRIER ANGLE

CITY OF OTTAWA
591 LONGFIELDS DRIVE - BLOCK 21

RECEIVER LOCATIONS
R12 & R13



DATE OCT 2019	JOB 112021-10	FIGURE FIG-6
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Filename: r1.te Time Period: Day/Night 16/8 hours
 Description: R1 POW (Building 5)

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 : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 70.60 / 70.60 m
 Receiver height : 4.50 / 4.50 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 : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 70.60 / 70.60 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 57.27 + 0.00) = 57.27 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	68.49	-10.06	-1.17	0.00	0.00	0.00	57.27

WHEEL (0.00 + 49.45 + 0.00) = 49.45 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	61.57	-10.76	-1.35	0.00	0.00	0.00	49.45

Segment Leq : 57.93 dBA

Results segment # 2: Freight (day)

LOCOMOTIVE (0.00 + 49.97 + 0.00) = 49.97 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	61.19	-10.06	-1.17	0.00	0.00	0.00	49.97

WHEEL (0.00 + 40.94 + 0.00) = 40.94 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	53.06	-10.76	-1.35	0.00	0.00	0.00	40.94

Segment Leq : 50.48 dBA

Total Leq All Segments: 58.65 dBA

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 52.50 + 0.00) = 52.50 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	63.72	-10.06	-1.17	0.00	0.00	0.00	52.50

WHEEL (0.00 + 44.68 + 0.00) = 44.68 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	56.80	-10.76	-1.35	0.00	0.00	0.00	44.68

Segment Leq : 53.16 dBA

Results segment # 2: Freight (night)

LOCOMOTIVE (0.00 + 52.98 + 0.00) = 52.98 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	64.20	-10.06	-1.17	0.00	0.00	0.00	52.98

WHEEL (0.00 + 43.96 + 0.00) = 43.96 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	56.07	-10.76	-1.35	0.00	0.00	0.00	43.96

Segment Leq : 53.49 dBA

Total Leq All Segments: 56.34 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:
Traffic volume : 377/67 veh/TimePeriod
Speed : 80 km/h

Data for Segment # 1: Transitway (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 : 33.40 / 33.40 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 55.45 + 0.00) = 55.45 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	62.37	-5.56	-1.35	0.00	0.00	0.00	55.45

Segment Leq : 55.45 dBA

Total Leq All Segments: 55.45 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 50.96 + 0.00) = 50.96 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	57.87	-5.56	-1.35	0.00	0.00	0.00	50.96

Segment Leq : 50.96 dBA

Total Leq All Segments: 50.96 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.35
(NIGHT): 57.44

Filename: r2.te Time Period: Day/Night 16/8 hours
 Description: R2 POW (Building 4)

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 : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 77.60 / 77.60 m
 Receiver height : 4.50 / 4.50 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 : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 77.60 / 77.60 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 61.35 + 0.00) = 61.35 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	68.49	-7.14	0.00	0.00	0.00	0.00	61.35

WHEEL (0.00 + 54.43 + 0.00) = 54.43 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	61.57	-7.14	0.00	0.00	0.00	0.00	54.43

Segment Leq : 62.15 dBA

Results segment # 2: Freight (day)

LOCOMOTIVE (0.00 + 54.05 + 0.00) = 54.05 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	61.19	-7.14	0.00	0.00	0.00	0.00	54.05

WHEEL (0.00 + 45.93 + 0.00) = 45.93 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	53.06	-7.14	0.00	0.00	0.00	0.00	45.93

Segment Leq : 54.67 dBA

Total Leq All Segments: 62.86 dBA

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 56.58 + 0.00) = 56.58 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.72	-7.14	0.00	0.00	0.00	0.00	56.58

WHEEL (0.00 + 49.66 + 0.00) = 49.66 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.80	-7.14	0.00	0.00	0.00	0.00	49.66

Segment Leq : 57.38 dBA

Results segment # 2: Freight (night)

LOCOMOTIVE (0.00 + 57.07 + 0.00) = 57.07 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	64.20	-7.14	0.00	0.00	0.00	0.00	57.07

WHEEL (0.00 + 48.94 + 0.00) = 48.94 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.07	-7.14	0.00	0.00	0.00	0.00	48.94

Segment Leq : 57.69 dBA

Total Leq All Segments: 60.55 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:
Traffic volume : 377/67 veh/TimePeriod
Speed : 80 km/h

Data for Segment # 1: Transitway (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 : 43.00 / 43.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 57.79 + 0.00) = 57.79 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.37	-4.57	0.00	0.00	0.00	0.00	57.79

Segment Leq : 57.79 dBA

Total Leq All Segments: 57.79 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 53.30 + 0.00) = 53.30 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	57.87	-4.57	0.00	0.00	0.00	0.00	53.30

Segment Leq : 53.30 dBA

Total Leq All Segments: 53.30 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.04
(NIGHT): 61.30

Filename: r3.te Time Period: Day/Night 16/8 hours
 Description: R3 POW (Building 1)

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 : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 75.40 / 75.40 m
 Receiver height : 4.50 / 4.50 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 : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 75.40 / 75.40 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 61.48 + 0.00) = 61.48 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	68.49	-7.01	0.00	0.00	0.00	0.00	61.48

WHEEL (0.00 + 54.56 + 0.00) = 54.56 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	61.57	-7.01	0.00	0.00	0.00	0.00	54.56

Segment Leq : 62.28 dBA

Results segment # 2: Freight (day)

LOCOMOTIVE (0.00 + 54.18 + 0.00) = 54.18 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	61.19	-7.01	0.00	0.00	0.00	0.00	54.18

WHEEL (0.00 + 46.05 + 0.00) = 46.05 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	53.06	-7.01	0.00	0.00	0.00	0.00	46.05

Segment Leq : 54.80 dBA

Total Leq All Segments: 62.99 dBA

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 56.71 + 0.00) = 56.71 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.72	-7.01	0.00	0.00	0.00	0.00	56.71

WHEEL (0.00 + 49.78 + 0.00) = 49.78 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.80	-7.01	0.00	0.00	0.00	0.00	49.78

Segment Leq : 57.51 dBA

Results segment # 2: Freight (night)

LOCOMOTIVE (0.00 + 57.19 + 0.00) = 57.19 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	64.20	-7.01	0.00	0.00	0.00	0.00	57.19

WHEEL (0.00 + 49.06 + 0.00) = 49.06 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.07	-7.01	0.00	0.00	0.00	0.00	49.06

Segment Leq : 57.81 dBA

Total Leq All Segments: 60.67 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:
Traffic volume : 377/67 veh/TimePeriod
Speed : 80 km/h

Data for Segment # 1: Transitway (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 : 41.00 / 41.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 58.00 + 0.00) = 58.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.37	-4.37	0.00	0.00	0.00	0.00	58.00

Segment Leq : 58.00 dBA

Total Leq All Segments: 58.00 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 53.51 + 0.00) = 53.51 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	57.87	-4.37	0.00	0.00	0.00	0.00	53.51

Segment Leq : 53.51 dBA

Total Leq All Segments: 53.51 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.19
(NIGHT): 61.44

Filename: r4.te Time Period: Day/Night 16/8 hours
 Description: R4 POW (Building 5)

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 : -51.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 95.60 / 95.60 m
 Receiver height : 4.50 / 4.50 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 : -51.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 95.60 / 95.60 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 54.97 + 0.00) = 54.97 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	0	0.00	68.49	-8.04	-5.48	0.00	0.00	0.00	54.97

WHEEL (0.00 + 48.05 + 0.00) = 48.05 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	0	0.00	61.57	-8.04	-5.48	0.00	0.00	0.00	48.05

Segment Leq : 55.77 dBA

Results segment # 2: Freight (day)

LOCOMOTIVE (0.00 + 47.67 + 0.00) = 47.67 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	0	0.00	61.19	-8.04	-5.48	0.00	0.00	0.00	47.67

WHEEL (0.00 + 39.54 + 0.00) = 39.54 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	0	0.00	53.06	-8.04	-5.48	0.00	0.00	0.00	39.54

Segment Leq : 48.29 dBA

Total Leq All Segments: 56.48 dBA

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 50.20 + 0.00) = 50.20 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	0	0.00	63.72	-8.04	-5.48	0.00	0.00	0.00	50.20

WHEEL (0.00 + 43.28 + 0.00) = 43.28 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	0	0.00	56.80	-8.04	-5.48	0.00	0.00	0.00	43.28

Segment Leq : 51.00 dBA

Results segment # 2: Freight (night)

LOCOMOTIVE (0.00 + 50.68 + 0.00) = 50.68 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	0	0.00	64.20	-8.04	-5.48	0.00	0.00	0.00	50.68

WHEEL (0.00 + 42.55 + 0.00) = 42.55 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	0	0.00	56.07	-8.04	-5.48	0.00	0.00	0.00	42.55

Segment Leq : 51.30 dBA

Total Leq All Segments: 54.16 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:
Traffic volume : 377/67 veh/TimePeriod
Speed : 80 km/h

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

Angle1 Angle2 : -51.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 61.00 / 61.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 50.80 + 0.00) = 50.80 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	0	0.00	62.37	-6.09	-5.48	0.00	0.00	0.00	50.80

Segment Leq : 50.80 dBA

Total Leq All Segments: 50.80 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 46.31 + 0.00) = 46.31 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	0	0.00	57.87	-6.09	-5.48	0.00	0.00	0.00	46.31

Segment Leq : 46.31 dBA

Total Leq All Segments: 46.31 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.52
(NIGHT): 54.82

Filename: r5.te Time Period: Day/Night 16/8 hours
 Description: R5 POW (Building 5)

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 : 0.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 89.40 / 89.40 m
 Receiver height : 4.50 / 4.50 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 : 0.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 89.40 / 89.40 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 52.72 + 0.00) = 52.72 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.50	68.49	-11.59	-4.18	0.00	0.00	0.00	52.72

WHEEL (0.00 + 44.80 + 0.00) = 44.80 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.60	61.57	-12.40	-4.37	0.00	0.00	0.00	44.80

Segment Leq : 53.37 dBA

Results segment # 2: Freight (day)

LOCOMOTIVE (0.00 + 45.43 + 0.00) = 45.43 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.50	61.19	-11.59	-4.18	0.00	0.00	0.00	45.43

WHEEL (0.00 + 36.29 + 0.00) = 36.29 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.60	53.06	-12.40	-4.37	0.00	0.00	0.00	36.29

Segment Leq : 45.93 dBA

Total Leq All Segments: 54.09 dBA

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 47.95 + 0.00) = 47.95 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.50	63.72	-11.59	-4.18	0.00	0.00	0.00	47.95

WHEEL (0.00 + 40.03 + 0.00) = 40.03 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.60	56.80	-12.40	-4.37	0.00	0.00	0.00	40.03

Segment Leq : 48.60 dBA

Results segment # 2: Freight (night)

LOCOMOTIVE (0.00 + 48.44 + 0.00) = 48.44 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.50	64.20	-11.59	-4.18	0.00	0.00	0.00	48.44

WHEEL (0.00 + 39.30 + 0.00) = 39.30 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.60	56.07	-12.40	-4.37	0.00	0.00	0.00	39.30

Segment Leq : 48.94 dBA

Total Leq All Segments: 51.78 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:

Traffic volume : 377/67 veh/TimePeriod
Speed : 80 km/h

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

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 54.90 / 54.90 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 48.99 + 0.00) = 48.99 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.60	62.37	-9.02	-4.37	0.00	0.00	0.00	48.99

Segment Leq : 48.99 dBA

Total Leq All Segments: 48.99 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 44.49 + 0.00) = 44.49 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.60	57.87	-9.02	-4.37	0.00	0.00	0.00	44.49

Segment Leq : 44.49 dBA

Total Leq All Segments: 44.49 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.26
(NIGHT): 52.53

Filename: r6.te Time Period: Day/Night 16/8 hours
 Description: R6 POW (Building 5)

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 : 0.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 95.60 / 95.60 m
 Receiver height : 4.50 / 4.50 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 : 0.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 95.60 / 95.60 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 52.29 + 0.00) = 52.29 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.50	68.49	-12.03	-4.18	0.00	0.00	0.00	52.29

WHEEL (0.00 + 44.33 + 0.00) = 44.33 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.60	61.57	-12.87	-4.37	0.00	0.00	0.00	44.33

Segment Leq : 52.93 dBA

Results segment # 2: Freight (day)

LOCOMOTIVE (0.00 + 44.99 + 0.00) = 44.99 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.50	61.19	-12.03	-4.18	0.00	0.00	0.00	44.99

WHEEL (0.00 + 35.83 + 0.00) = 35.83 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.60	53.06	-12.87	-4.37	0.00	0.00	0.00	35.83

Segment Leq : 45.49 dBA

Total Leq All Segments: 53.65 dBA

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 47.52 + 0.00) = 47.52 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.50	63.72	-12.03	-4.18	0.00	0.00	0.00	47.52

WHEEL (0.00 + 39.56 + 0.00) = 39.56 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.60	56.80	-12.87	-4.37	0.00	0.00	0.00	39.56

Segment Leq : 48.16 dBA

Results segment # 2: Freight (night)

LOCOMOTIVE (0.00 + 48.00 + 0.00) = 48.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.50	64.20	-12.03	-4.18	0.00	0.00	0.00	48.00

WHEEL (0.00 + 38.84 + 0.00) = 38.84 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.60	56.07	-12.87	-4.37	0.00	0.00	0.00	38.84

Segment Leq : 48.50 dBA

Total Leq All Segments: 51.34 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:

Traffic volume : 377/67 veh/TimePeriod
Speed : 80 km/h

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

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 61.00 / 61.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 48.25 + 0.00) = 48.25 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.60	62.37	-9.75	-4.37	0.00	0.00	0.00	48.25

Segment Leq : 48.25 dBA

Total Leq All Segments: 48.25 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 43.76 + 0.00) = 43.76 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.60	57.87	-9.75	-4.37	0.00	0.00	0.00	43.76

Segment Leq : 43.76 dBA

Total Leq All Segments: 43.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.75
(NIGHT): 52.04

Filename: r7.te Time Period: Day/Night 16/8 hours
 Description: R7 POW (Building 4)

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !            ! (km/h) !/Train!/Train! type !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 :           0 / 0
Surface         :           2   (Reflective ground surface)
Receiver source distance : 96.70 / 96.70 m
Receiver height :    4.50 / 4.50 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 :    93.64 m
Receiver elevation :    93.47 m
Barrier elevation :    93.47 m
Reference angle :           0.00
  
```

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !            ! (km/h) !/Train!/Train! type !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 :           0 / 0
Surface         :           2   (Reflective ground surface)
Receiver source distance : 96.70 / 96.70 m
Receiver height :    4.50 / 4.50 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 :    93.64 m
Receiver elevation :    93.47 m
Barrier elevation :    93.47 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	4.50	4.50	97.97
0.50	4.50	4.46	97.93

LOCOMOTIVE (0.00 + 42.61 + 0.00) = 42.61 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	68.49	-8.09	0.00	0.00	0.00	-17.79	42.61

WHEEL (0.00 + 35.61 + 0.00) = 35.61 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	61.57	-8.09	0.00	0.00	0.00	-17.86	35.61

Segment Leq : 43.40 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	4.50	4.50	97.97
0.50	4.50	4.46	97.93

LOCOMOTIVE (0.00 + 35.31 + 0.00) = 35.31 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	61.19	-8.09	0.00	0.00	0.00	-17.79	35.31

WHEEL (0.00 + 27.11 + 0.00) = 27.11 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	53.06	-8.09	0.00	0.00	0.00	-17.86	27.11

Segment Leq : 35.92 dBA

Total Leq All Segments: 44.11 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	4.50	4.50	97.97
0.50	4.50	4.46	97.93

LOCOMOTIVE (0.00 + 37.84 + 0.00) = 37.84 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.72	-8.09	0.00	0.00	0.00	-17.79	37.84

WHEEL (0.00 + 30.84 + 0.00) = 30.84 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.80	-8.09	0.00	0.00	0.00	-17.86	30.84

Segment Leq : 38.63 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	4.50	4.50	97.97
0.50	4.50	4.46	97.93

LOCOMOTIVE (0.00 + 38.32 + 0.00) = 38.32 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	64.20	-8.09	0.00	0.00	0.00	-17.79	38.32

WHEEL (0.00 + 30.12 + 0.00) = 30.12 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.07	-8.09	0.00	0.00	0.00	-17.86	30.12

Segment Leq : 38.93 dBA

Total Leq All Segments: 41.79 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:
Traffic volume : 377/67 veh/TimePeriod
Speed : 80 km/h

Data for Segment # 1: Transitway (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 : 62.20 / 62.20 m
Receiver height : 4.50 / 4.50 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 : 92.63 m
Receiver elevation : 93.47 m
Barrier elevation : 93.47 m
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
0.50 ! 4.50 ! 4.42 ! 97.89

RT/Custom (0.00 + 38.23 + 0.00) = 38.23 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.00 62.37 -6.18 0.00 0.00 0.00 -17.96 38.23

Segment Leq : 38.23 dBA

Total Leq All Segments: 38.23 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source	! Receiver	! Barrier	! Elevation of			
Height (m)	! Height (m)	! Height (m)	Barrier Top (m)			
0.50	!	4.50	!	4.42	!	97.89

RT/Custom (0.00 + 33.74 + 0.00) = 33.74 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	57.87	-6.18	0.00	0.00	0.00	-17.96	33.74

Segment Leq : 33.74 dBA

Total Leq All Segments: 33.74 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 45.11
(NIGHT): 42.42

Filename: r8.te Time Period: Day/Night 16/8 hours
 Description: R8 POW (Building 1)

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 : 0.00 deg 26.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 90.50 / 90.50 m
 Receiver height : 4.50 / 4.50 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 : 0.00 deg 26.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 90.50 / 90.50 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 52.28 + 0.00) = 52.28 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	26	0.00	68.49	-7.81	-8.40	0.00	0.00	0.00	52.28

WHEEL (0.00 + 45.36 + 0.00) = 45.36 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	26	0.00	61.57	-7.81	-8.40	0.00	0.00	0.00	45.36

Segment Leq : 53.08 dBA

Results segment # 2: Freight (day)

LOCOMOTIVE (0.00 + 44.98 + 0.00) = 44.98 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	26	0.00	61.19	-7.81	-8.40	0.00	0.00	0.00	44.98

WHEEL (0.00 + 36.85 + 0.00) = 36.85 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	26	0.00	53.06	-7.81	-8.40	0.00	0.00	0.00	36.85

Segment Leq : 45.60 dBA

Total Leq All Segments: 53.79 dBA

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 47.51 + 0.00) = 47.51 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	26	0.00	63.72	-7.81	-8.40	0.00	0.00	0.00	47.51

WHEEL (0.00 + 40.59 + 0.00) = 40.59 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	26	0.00	56.80	-7.81	-8.40	0.00	0.00	0.00	40.59

Segment Leq : 48.31 dBA

Results segment # 2: Freight (night)

LOCOMOTIVE (0.00 + 47.99 + 0.00) = 47.99 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	26	0.00	64.20	-7.81	-8.40	0.00	0.00	0.00	47.99

WHEEL (0.00 + 39.86 + 0.00) = 39.86 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	26	0.00	56.07	-7.81	-8.40	0.00	0.00	0.00	39.86

Segment Leq : 48.61 dBA

Total Leq All Segments: 51.47 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:

Traffic volume : 377/67 veh/TimePeriod
Speed : 80 km/h

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

Angle1 Angle2 : 0.00 deg 26.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 56.00 / 56.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 48.24 + 0.00) = 48.24 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	26	0.00	62.37	-5.72	-8.40	0.00	0.00	0.00	48.24

Segment Leq : 48.24 dBA

Total Leq All Segments: 48.24 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 43.75 + 0.00) = 43.75 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	26	0.00	57.87	-5.72	-8.40	0.00	0.00	0.00	43.75

Segment Leq : 43.75 dBA

Total Leq All Segments: 43.75 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.86
(NIGHT): 52.15

Filename: r9.te Time Period: Day/Night 16/8 hours
 Description: R9 POW (Building 1)

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !            ! (km/h) !/Train!/Train! type !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 :          0 / 0
Surface         :          2  (Reflective ground surface)
Receiver source distance : 89.20 / 89.20 m
Receiver height :  4.50 / 4.50 m
Topography     :          2  (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1 : -90.00 deg  Angle2 : -27.00 deg
Barrier height :   6.00 m
Barrier receiver distance : 12.00 / 12.00 m
Source elevation : 93.64 m
Receiver elevation : 93.43 m
Barrier elevation : 93.40 m
Reference angle :   0.00
  
```

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !            ! (km/h) !/Train!/Train! type !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 :          0 / 0
Surface         :          2  (Reflective ground surface)
Receiver source distance : 89.20 / 89.20 m
Receiver height :  4.50 / 4.50 m
Topography     :          2  (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1 : -90.00 deg  Angle2 : -27.00 deg
Barrier height :   6.00 m
Barrier receiver distance : 12.00 / 12.00 m
Source elevation : 93.64 m
Receiver elevation : 93.43 m
Barrier elevation : 93.40 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	4.50	4.49	97.89
0.50	4.50	4.02	97.42

LOCOMOTIVE (0.00 + 49.07 + 52.51) = 54.13 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-27	0.00	68.49	-7.74	-4.56	0.00	0.00	-7.12	49.07
-27	0	0.00	68.49	-7.74	-8.24	0.00	0.00	0.00	52.51

WHEEL (0.00 + 41.15 + 45.59) = 46.92 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-27	0.00	61.57	-7.74	-4.56	0.00	0.00	-8.12	41.15
-27	0	0.00	61.57	-7.74	-8.24	0.00	0.00	0.00	45.59

Segment Leq : 54.89 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	4.50	4.49	97.89
0.50	4.50	4.02	97.42

LOCOMOTIVE (0.00 + 41.77 + 45.21) = 46.83 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-27	0.00	61.19	-7.74	-4.56	0.00	0.00	-7.12	41.77
-27	0	0.00	61.19	-7.74	-8.24	0.00	0.00	0.00	45.21

WHEEL (0.00 + 32.64 + 37.08) = 38.42 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-27	0.00	53.06	-7.74	-4.56	0.00	0.00	-8.12	32.64
-27	0	0.00	53.06	-7.74	-8.24	0.00	0.00	0.00	37.08

Segment Leq : 47.42 dBA

Total Leq All Segments: 55.61 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	4.50	4.49	97.89
0.50	4.50	4.02	97.42

LOCOMOTIVE (0.00 + 44.30 + 47.74) = 49.36 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-27	0.00	63.72	-7.74	-4.56	0.00	0.00	-7.12	44.30
-27	0	0.00	63.72	-7.74	-8.24	0.00	0.00	0.00	47.74

WHEEL (0.00 + 36.37 + 40.81) = 42.15 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-27	0.00	56.80	-7.74	-4.56	0.00	0.00	-8.12	36.37
-27	0	0.00	56.80	-7.74	-8.24	0.00	0.00	0.00	40.81

Segment Leq : 50.12 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	4.50	4.49	97.89
0.50	4.50	4.02	97.42

LOCOMOTIVE (0.00 + 44.78 + 48.22) = 49.84 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-27	0.00	64.20	-7.74	-4.56	0.00	0.00	-7.12	44.78
-27	0	0.00	64.20	-7.74	-8.24	0.00	0.00	0.00	48.22

WHEEL (0.00 + 35.65 + 40.09) = 41.43 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-27	0.00	56.07	-7.74	-4.56	0.00	0.00	-8.12	35.65
-27	0	0.00	56.07	-7.74	-8.24	0.00	0.00	0.00	40.09

Segment Leq : 50.43 dBA

Total Leq All Segments: 53.29 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:
Traffic volume : 377/67 veh/TimePeriod
Speed : 80 km/h

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

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 54.80 / 54.80 m
Receiver height : 4.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -27.00 deg
Barrier height : 6.00 m
Barrier receiver distance : 12.00 / 12.00 m
Source elevation : 93.64 m
Receiver elevation : 93.43 m
Barrier elevation : 93.40 m
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
0.50 ! 4.50 ! 3.70 ! 97.10

RT/Custom (0.00 + 43.16 + 48.50) = 49.62 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 -27 0.00 62.37 -5.63 -4.56 0.00 0.00 -9.02 43.16

-27 0 0.00 62.37 -5.63 -8.24 0.00 0.00 0.00 48.50

Segment Leq : 49.62 dBA

Total Leq All Segments: 49.62 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
0.50 ! 4.50 ! 3.70 ! 97.10

RT/Custom (0.00 + 38.67 + 44.01) = 45.12 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-27	0.00	57.87	-5.63	-4.56	0.00	0.00	-9.02	38.67
-27	0	0.00	57.87	-5.63	-8.24	0.00	0.00	0.00	44.01

Segment Leq : 45.12 dBA

Total Leq All Segments: 45.12 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.58
(NIGHT): 53.90

Filename: r10.te Time Period: Day/Night 16/8 hours
 Description: R10 POW (Building 3)

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !            ! (km/h) !/Train!/Train! type !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   6.00 deg
Wood depth      :          0   (No woods.)
No of house rows :          0 / 0
Surface         :          2   (Reflective ground surface)
Receiver source distance : 120.70 / 120.70 m
Receiver height :    4.50 / 4.50 m
Topography     :          2   (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1  : -66.00 deg   Angle2 : 6.00 deg
Barrier height  :    10.00 m
Barrier receiver distance : 24.20 / 24.20 m
Source elevation :    93.64 m
Receiver elevation :    93.41 m
Barrier elevation :    93.45 m
Reference angle :     0.00
  
```

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !            ! (km/h) !/Train!/Train! type !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   6.00 deg
Wood depth      :          0   (No woods.)
No of house rows :          0 / 0
Surface         :          2   (Reflective ground surface)
Receiver source distance : 120.70 / 120.70 m
Receiver height :    4.50 / 4.50 m
Topography     :          2   (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1  : -66.00 deg   Angle2 : 6.00 deg
Barrier height  :    10.00 m
Barrier receiver distance : 24.20 / 24.20 m
Source elevation :    93.64 m
Receiver elevation :    93.41 m
Barrier elevation :    93.45 m
Reference angle :     0.00
  
```

Rail data, segment # 3: VIA (day/night)

```

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

Data for Segment # 3: VIA (day/night)

```

-----
Angle1  Angle2      :  6.00 deg  90.00 deg
Wood depth      :  0          (No woods.)
No of house rows :  0 / 0
Surface         :  2          (Reflective ground surface)
Receiver source distance : 120.70 / 120.70 m
Receiver height :  4.50 / 4.50 m
Topography     :  2          (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1 : 25.00 deg  Angle2 : 63.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 24.20 / 24.20 m
Source elevation : 93.64 m
Receiver elevation : 93.41 m
Barrier elevation : 93.45 m
Reference angle :  0.00
  
```

Rail data, segment # 4: Freight (day/night)

```

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

Data for Segment # 4: Freight (day/night)

```

-----
Angle1  Angle2      :  6.00 deg  90.00 deg
Wood depth      :  0          (No woods.)
No of house rows :  0 / 0
Surface         :  2          (Reflective ground surface)
Receiver source distance : 120.70 / 120.70 m
Receiver height :  4.50 / 4.50 m
Topography     :  2          (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1 : 25.00 deg  Angle2 : 63.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 24.20 / 24.20 m
Source elevation : 93.64 m
Receiver elevation : 93.41 m
Barrier elevation : 93.45 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	4.50	4.41	97.86
0.50	4.50	3.70	97.15

LOCOMOTIVE (50.68 + 39.95 + 0.00) = 51.04 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	68.49	-9.06	-8.75	0.00	0.00	0.00	50.68
-66	6	0.00	68.49	-9.06	-3.98	0.00	0.00	-15.50	39.95

WHEEL (43.76 + 32.01 + 0.00) = 44.04 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	61.57	-9.06	-8.75	0.00	0.00	0.00	43.76
-66	6	0.00	61.57	-9.06	-3.98	0.00	0.00	-16.52	32.01

Segment Leq : 51.83 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	4.50	4.41	97.86
0.50	4.50	3.70	97.15

LOCOMOTIVE (43.39 + 32.65 + 0.00) = 43.74 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	61.19	-9.06	-8.75	0.00	0.00	0.00	43.39
-66	6	0.00	61.19	-9.06	-3.98	0.00	0.00	-15.50	32.65

WHEEL (35.26 + 23.51 + 0.00) = 35.54 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	53.06	-9.06	-8.75	0.00	0.00	0.00	35.26
-66	6	0.00	53.06	-9.06	-3.98	0.00	0.00	-16.52	23.51

Segment Leq : 44.35 dBA

Results segment # 3: VIA (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	4.50	4.41	97.86
0.50	4.50	3.70	97.15

LOCOMOTIVE (49.67 + 37.66 + 51.20) = 53.62 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
6	25	0.00	68.49	-9.06	-9.77	0.00	0.00	0.00	49.67
25	63	0.00	68.49	-9.06	-6.75	0.00	0.00	-15.02	37.66
63	90	0.00	68.49	-9.06	-8.24	0.00	0.00	0.00	51.20

WHEEL (42.75 + 29.72 + 44.27) = 46.68 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
6	25	0.00	61.57	-9.06	-9.77	0.00	0.00	0.00	42.75
25	63	0.00	61.57	-9.06	-6.75	0.00	0.00	-16.04	29.72
63	90	0.00	61.57	-9.06	-8.24	0.00	0.00	0.00	44.27

Segment Leq : 54.42 dBA

Results segment # 4: Freight (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	4.50	4.41	97.86
0.50	4.50	3.70	97.15

LOCOMOTIVE (42.37 + 30.36 + 43.90) = 46.32 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
6	25	0.00	61.19	-9.06	-9.77	0.00	0.00	0.00	42.37
25	63	0.00	61.19	-9.06	-6.75	0.00	0.00	-15.02	30.36
63	90	0.00	61.19	-9.06	-8.24	0.00	0.00	0.00	43.90

WHEEL (34.24 + 21.22 + 35.77) = 38.17 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
6	25	0.00	53.06	-9.06	-9.77	0.00	0.00	0.00	34.24
25	63	0.00	53.06	-9.06	-6.75	0.00	0.00	-16.04	21.22
63	90	0.00	53.06	-9.06	-8.24	0.00	0.00	0.00	35.77

Segment Leq : 46.94 dBA

Total Leq All Segments: 57.04 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	4.50	4.41	97.86
0.50	4.50	3.70	97.15

LOCOMOTIVE (45.91 + 35.18 + 0.00) = 46.27 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	63.72	-9.06	-8.75	0.00	0.00	0.00	45.91
-66	6	0.00	63.72	-9.06	-3.98	0.00	0.00	-15.50	35.18

WHEEL (38.99 + 27.24 + 0.00) = 39.27 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	56.80	-9.06	-8.75	0.00	0.00	0.00	38.99
-66	6	0.00	56.80	-9.06	-3.98	0.00	0.00	-16.52	27.24

Segment Leq : 47.06 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	4.50	4.41	97.86
0.50	4.50	3.70	97.15

LOCOMOTIVE (46.40 + 35.66 + 0.00) = 46.75 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	64.20	-9.06	-8.75	0.00	0.00	0.00	46.40
-66	6	0.00	64.20	-9.06	-3.98	0.00	0.00	-15.50	35.66

WHEEL (38.27 + 26.52 + 0.00) = 38.55 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	56.07	-9.06	-8.75	0.00	0.00	0.00	38.27
-66	6	0.00	56.07	-9.06	-3.98	0.00	0.00	-16.52	26.52

Segment Leq : 47.36 dBA

Results segment # 3: VIA (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	4.50	4.41	97.86
0.50	4.50	3.70	97.15

LOCOMOTIVE (44.90 + 32.89 + 46.42) = 48.85 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
6	25	0.00	63.72	-9.06	-9.77	0.00	0.00	0.00	44.90
25	63	0.00	63.72	-9.06	-6.75	0.00	0.00	-15.02	32.89
63	90	0.00	63.72	-9.06	-8.24	0.00	0.00	0.00	46.42

WHEEL (37.98 + 24.95 + 39.50) = 41.90 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
6	25	0.00	56.80	-9.06	-9.77	0.00	0.00	0.00	37.98
25	63	0.00	56.80	-9.06	-6.75	0.00	0.00	-16.04	24.95
63	90	0.00	56.80	-9.06	-8.24	0.00	0.00	0.00	39.50

Segment Leq : 49.65 dBA

Results segment # 4: Freight (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	4.50	4.41	97.86
0.50	4.50	3.70	97.15

LOCOMOTIVE (45.38 + 33.37 + 46.91) = 49.33 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
6	25	0.00	64.20	-9.06	-9.77	0.00	0.00	0.00	45.38
25	63	0.00	64.20	-9.06	-6.75	0.00	0.00	-15.02	33.37
63	90	0.00	64.20	-9.06	-8.24	0.00	0.00	0.00	46.91

WHEEL (37.25 + 24.23 + 38.78) = 41.18 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
6	25	0.00	56.07	-9.06	-9.77	0.00	0.00	0.00	37.25
25	63	0.00	56.07	-9.06	-6.75	0.00	0.00	-16.04	24.23
63	90	0.00	56.07	-9.06	-8.24	0.00	0.00	0.00	38.78

Segment Leq : 49.95 dBA

Total Leq All Segments: 54.72 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:

Traffic volume : 377/67 veh/TimePeriod
Speed : 80 km/h

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

Angle1 Angle2 : -90.00 deg 6.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 86.20 / 86.20 m
Receiver height : 4.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -66.00 deg Angle2 : 6.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 24.20 / 24.20 m
Source elevation : 93.64 m
Receiver elevation : 93.43 m
Barrier elevation : 93.40 m
Reference angle : 0.00

RT/Custom data, segment # 2: Transitway (day/night)

1 - Bus:

Traffic volume : 0/0 veh/TimePeriod
Speed : 50 km/h

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

Angle1 Angle2 : 6.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 86.20 / 86.20 m
Receiver height : 4.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 25.00 deg Angle2 : 63.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 24.20 / 24.20 m
Source elevation : 93.64 m
Receiver elevation : 93.41 m
Barrier elevation : 93.45 m
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	4.50	3.47	96.87

RT/Custom (46.02 + 33.50 + 0.00) = 46.26 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	62.37	-7.59	-8.75	0.00	0.00	0.00	46.02
-66	6	0.00	62.37	-7.59	-3.98	0.00	0.00	-17.29	33.50

Segment Leq : 46.26 dBA

Results segment # 2: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	4.50	3.40	96.85

RT/Custom (-17.36 + -31.24 + -15.83) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
6	25	0.00	0.00	-7.59	-9.77	0.00	0.00	0.00	-17.36
25	63	0.00	0.00	-7.59	-6.75	0.00	0.00	-16.89	-31.24
63	90	0.00	0.00	-7.59	-8.24	0.00	0.00	0.00	-15.83

Segment Leq : 0.00 dBA

Total Leq All Segments: 46.26 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	4.50	3.47	96.87

RT/Custom (41.53 + 29.01 + 0.00) = 41.77 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	57.87	-7.59	-8.75	0.00	0.00	0.00	41.53
-66	6	0.00	57.87	-7.59	-3.98	0.00	0.00	-17.29	29.01

Segment Leq : 41.77 dBA

Results segment # 2: Transitway (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	4.50	3.40	96.85

RT/Custom (-17.36 + -31.24 + -15.83) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
6	25	0.00	0.00	-7.59	-9.77	0.00	0.00	0.00	-17.36
25	63	0.00	0.00	-7.59	-6.75	0.00	0.00	-16.89	-31.24
63	90	0.00	0.00	-7.59	-8.24	0.00	0.00	0.00	-15.83

Segment Leq : 0.00 dBA

Total Leq All Segments: 41.77 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.39
(NIGHT): 54.93

Filename: r11.te Time Period: Day/Night 16/8 hours
 Description: R11 POW (Building 3)

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !            ! (km/h) !/Train!/Train! type !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 :          0 / 0
Surface         :          2   (Reflective ground surface)
Receiver source distance : 120.70 / 120.70 m
Receiver height :    4.50 / 4.50 m
Topography     :          2   (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1 : -54.00 deg   Angle2 : 72.00 deg
Barrier height :    10.00 m
Barrier receiver distance : 24.20 / 24.20 m
Source elevation :    93.64 m
Receiver elevation :    93.41 m
Barrier elevation :    93.45 m
Reference angle :          0.00
  
```

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !            ! (km/h) !/Train!/Train! type !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 :          0 / 0
Surface         :          2   (Reflective ground surface)
Receiver source distance : 120.70 / 120.70 m
Receiver height :    4.50 / 4.50 m
Topography     :          2   (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1 : -54.00 deg   Angle2 : 72.00 deg
Barrier height :    10.00 m
Barrier receiver distance : 24.20 / 24.20 m
Source elevation :    93.64 m
Receiver elevation :    93.41 m
Barrier elevation :    93.45 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	4.50	4.41	97.86
0.50	4.50	3.70	97.15

LOCOMOTIVE (52.45 + 42.48 + 49.43) = 54.49 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-54	0.00	68.49	-9.06	-6.99	0.00	0.00	0.00	52.45
-54	72	0.00	68.49	-9.06	-1.55	0.00	0.00	-15.41	42.48
72	90	0.00	68.49	-9.06	-10.00	0.00	0.00	0.00	49.43

WHEEL (45.52 + 34.55 + 42.51) = 47.51 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-54	0.00	61.57	-9.06	-6.99	0.00	0.00	0.00	45.52
-54	72	0.00	61.57	-9.06	-1.55	0.00	0.00	-16.42	34.55
72	90	0.00	61.57	-9.06	-10.00	0.00	0.00	0.00	42.51

Segment Leq : 55.28 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	4.50	4.41	97.86
0.50	4.50	3.70	97.15

LOCOMOTIVE (45.15 + 35.18 + 42.14) = 47.19 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-54	0.00	61.19	-9.06	-6.99	0.00	0.00	0.00	45.15
-54	72	0.00	61.19	-9.06	-1.55	0.00	0.00	-15.41	35.18
72	90	0.00	61.19	-9.06	-10.00	0.00	0.00	0.00	42.14

WHEEL (37.02 + 26.04 + 34.01) = 39.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-54	0.00	53.06	-9.06	-6.99	0.00	0.00	0.00	37.02
-54	72	0.00	53.06	-9.06	-1.55	0.00	0.00	-16.42	26.04
72	90	0.00	53.06	-9.06	-10.00	0.00	0.00	0.00	34.01

Segment Leq : 47.80 dBA

Total Leq All Segments: 55.99 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	4.50	4.41	97.86
0.50	4.50	3.70	97.15

LOCOMOTIVE (47.67 + 37.71 + 44.66) = 49.72 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-54	0.00	63.72	-9.06	-6.99	0.00	0.00	0.00	47.67
-54	72	0.00	63.72	-9.06	-1.55	0.00	0.00	-15.41	37.71
72	90	0.00	63.72	-9.06	-10.00	0.00	0.00	0.00	44.66

WHEEL (40.75 + 29.78 + 37.74) = 42.74 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-54	0.00	56.80	-9.06	-6.99	0.00	0.00	0.00	40.75
-54	72	0.00	56.80	-9.06	-1.55	0.00	0.00	-16.42	29.78
72	90	0.00	56.80	-9.06	-10.00	0.00	0.00	0.00	37.74

Segment Leq : 50.51 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	4.50	4.41	97.86
0.50	4.50	3.70	97.15

LOCOMOTIVE (48.16 + 38.19 + 45.15) = 50.20 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-54	0.00	64.20	-9.06	-6.99	0.00	0.00	0.00	48.16
-54	72	0.00	64.20	-9.06	-1.55	0.00	0.00	-15.41	38.19
72	90	0.00	64.20	-9.06	-10.00	0.00	0.00	0.00	45.15

WHEEL (40.03 + 29.05 + 37.02) = 42.01 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-54	0.00	56.07	-9.06	-6.99	0.00	0.00	0.00	40.03

-54	72	0.00	56.07	-9.06	-1.55	0.00	0.00	-16.42	29.05
72	90	0.00	56.07	-9.06	-10.00	0.00	0.00	0.00	37.02

Segment Leq : 50.81 dBA

Total Leq All Segments: 53.67 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:
 Traffic volume : 377/67 veh/TimePeriod
 Speed : 80 km/h

Data for Segment # 1: Transitway (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 : 86.20 / 86.20 m
 Receiver height : 4.50 / 4.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -54.00 deg Angle2 : 72.00 deg
 Barrier height : 10.00 m
 Barrier receiver distance : 24.20 / 24.20 m
 Source elevation : 93.64 m
 Receiver elevation : 93.43 m
 Barrier elevation : 93.40 m
 Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	4.50	3.47	96.87

RT/Custom (47.78 + 36.04 + 44.77) = 49.73 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-54	0.00	62.37	-7.59	-6.99	0.00	0.00	0.00	47.78
-54	72	0.00	62.37	-7.59	-1.55	0.00	0.00	-17.19	36.04
72	90	0.00	62.37	-7.59	-10.00	0.00	0.00	0.00	44.77

Segment Leq : 49.73 dBA

Total Leq All Segments: 49.73 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
0.50 ! 4.50 ! 3.47 ! 96.87

RT/Custom (43.29 + 31.55 + 40.28) = 45.24 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-54	0.00	57.87	-7.59	-6.99	0.00	0.00	0.00	43.29
-54	72	0.00	57.87	-7.59	-1.55	0.00	0.00	-17.19	31.55
72	90	0.00	57.87	-7.59	-10.00	0.00	0.00	0.00	40.28

Segment Leq : 45.24 dBA

Total Leq All Segments: 45.24 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.92
(NIGHT): 54.26

Filename: r12.te Time Period: Day/Night 16/8 hours
 Description: R12 POW (Building 3)

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

```

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

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

```

-----
Angle1  Angle2      : 0.00 deg  90.00 deg
Wood depth      : 0         (No woods.)
No of house rows : 0 / 0
Surface         : 2         (Reflective ground surface)
Receiver source distance : 133.90 / 133.90 m
Receiver height  : 4.50 / 4.50 m
Topography      : 2         (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1   : 21.00 deg  Angle2 : 51.00 deg
Barrier height   : 10.00 m
Barrier receiver distance : 35.40 / 35.40 m
Source elevation : 93.64 m
Receiver elevation : 93.22 m
Barrier elevation : 93.56 m
Reference angle  : 0.00
  
```

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

```

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

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

```

-----
Angle1  Angle2      : 0.00 deg  90.00 deg
Wood depth      : 0         (No woods.)
No of house rows : 0 / 0
Surface         : 2         (Reflective ground surface)
Receiver source distance : 133.90 / 133.90 m
Receiver height  : 4.50 / 4.50 m
Topography      : 2         (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1   : 21.00 deg  Angle2 : 51.00 deg
Barrier height   : 10.00 m
Barrier receiver distance : 35.40 / 35.40 m
Source elevation : 93.64 m
Receiver elevation : 93.22 m
Barrier elevation : 93.56 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	4.50	4.14	97.70
0.50	4.50	3.21	96.77

LOCOMOTIVE (49.65 + 36.39 + 52.34) = 54.28 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	21	0.00	68.49	-9.51	-9.33	0.00	0.00	0.00	49.65
21	51	0.00	68.49	-9.51	-7.78	0.00	0.00	-14.81	36.39
51	90	0.00	68.49	-9.51	-6.64	0.00	0.00	0.00	52.34

WHEEL (42.73 + 28.22 + 45.42) = 47.34 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	21	0.00	61.57	-9.51	-9.33	0.00	0.00	0.00	42.73
21	51	0.00	61.57	-9.51	-7.78	0.00	0.00	-16.06	28.22
51	90	0.00	61.57	-9.51	-6.64	0.00	0.00	0.00	45.42

Segment Leq : 55.08 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	4.50	4.14	97.70
0.50	4.50	3.21	96.77

LOCOMOTIVE (42.35 + 29.09 + 45.04) = 46.99 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	21	0.00	61.19	-9.51	-9.33	0.00	0.00	0.00	42.35
21	51	0.00	61.19	-9.51	-7.78	0.00	0.00	-14.81	29.09
51	90	0.00	61.19	-9.51	-6.64	0.00	0.00	0.00	45.04

WHEEL (34.23 + 19.71 + 36.91) = 38.84 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	21	0.00	53.06	-9.51	-9.33	0.00	0.00	0.00	34.23
21	51	0.00	53.06	-9.51	-7.78	0.00	0.00	-16.06	19.71
51	90	0.00	53.06	-9.51	-6.64	0.00	0.00	0.00	36.91

Segment Leq : 47.61 dBA

Total Leq All Segments: 55.80 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	4.50	4.14	97.70
0.50	4.50	3.21	96.77

LOCOMOTIVE (44.88 + 31.62 + 47.57) = 49.51 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	21	0.00	63.72	-9.51	-9.33	0.00	0.00	0.00	44.88
21	51	0.00	63.72	-9.51	-7.78	0.00	0.00	-14.81	31.62
51	90	0.00	63.72	-9.51	-6.64	0.00	0.00	0.00	47.57

WHEEL (37.96 + 23.45 + 40.65) = 42.57 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	21	0.00	56.80	-9.51	-9.33	0.00	0.00	0.00	37.96
21	51	0.00	56.80	-9.51	-7.78	0.00	0.00	-16.06	23.45
51	90	0.00	56.80	-9.51	-6.64	0.00	0.00	0.00	40.65

Segment Leq : 50.31 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	4.50	4.14	97.70
0.50	4.50	3.21	96.77

LOCOMOTIVE (45.37 + 32.10 + 48.05) = 50.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	21	0.00	64.20	-9.51	-9.33	0.00	0.00	0.00	45.37
21	51	0.00	64.20	-9.51	-7.78	0.00	0.00	-14.81	32.10
51	90	0.00	64.20	-9.51	-6.64	0.00	0.00	0.00	48.05

WHEEL (37.24 + 22.72 + 39.92) = 41.85 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	21	0.00	56.07	-9.51	-9.33	0.00	0.00	0.00	37.24

21	51	0.00	56.07	-9.51	-7.78	0.00	0.00	-16.06	22.72
51	90	0.00	56.07	-9.51	-6.64	0.00	0.00	0.00	39.92

Segment Leq : 50.62 dBA

Total Leq All Segments: 53.48 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:
 Traffic volume : 377/67 veh/TimePeriod
 Speed : 80 km/h

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

Angle1 Angle2 : 0.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 99.40 / 99.40 m
 Receiver height : 4.50 / 4.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : 21.00 deg Angle2 : 51.00 deg
 Barrier height : 10.00 m
 Barrier receiver distance : 35.40 / 35.40 m
 Source elevation : 93.64 m
 Receiver elevation : 93.41 m
 Barrier elevation : 93.45 m
 Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	4.50	3.12	96.57

RT/Custom (44.82 + 29.62 + 47.51) = 49.43 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	21	0.00	62.37	-8.21	-9.33	0.00	0.00	0.00	44.82
21	51	0.00	62.37	-8.21	-7.78	0.00	0.00	-16.75	29.62
51	90	0.00	62.37	-8.21	-6.64	0.00	0.00	0.00	47.51

Segment Leq : 49.43 dBA

Total Leq All Segments: 49.43 dBA

Results segment # 1: Transitway (night)

 Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	4.50	3.12	96.57

RT/Custom (40.33 + 25.13 + 43.02) = 44.94 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	21	0.00	57.87	-8.21	-9.33	0.00	0.00	0.00	40.33
21	51	0.00	57.87	-8.21	-7.78	0.00	0.00	-16.75	25.13
51	90	0.00	57.87	-8.21	-6.64	0.00	0.00	0.00	43.02

Segment Leq : 44.94 dBA

Total Leq All Segments: 44.94 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.70
 (NIGHT): 54.05

Filename: r13.te Time Period: Day/Night 16/8 hours
 Description: R13 POW (Building 2)

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !            ! (km/h) !/Train!/Train! type !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 :          0 / 0
Surface         :          2   (Reflective ground surface)
Receiver source distance : 135.40 / 135.40 m
Receiver height :    4.50 / 4.50 m
Topography      :          2   (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1  : -90.00 deg   Angle2 : -12.00 deg
Barrier height  :    6.00 m
Barrier receiver distance : 17.00 / 17.00 m
Source elevation :   93.64 m
Receiver elevation :   93.23 m
Barrier elevation :   93.40 m
Reference angle :    0.00
  
```

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !            ! (km/h) !/Train!/Train! type !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 :          0 / 0
Surface         :          2   (Reflective ground surface)
Receiver source distance : 135.40 / 135.40 m
Receiver height :    4.50 / 4.50 m
Topography      :          2   (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1  : -90.00 deg   Angle2 : -12.00 deg
Barrier height  :    6.00 m
Barrier receiver distance : 17.00 / 17.00 m
Source elevation :   93.64 m
Receiver elevation :   93.23 m
Barrier elevation :   93.40 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	4.50	4.32	97.72
0.50	4.50	3.88	97.28

LOCOMOTIVE (0.00 + 48.14 + 47.17) = 50.69 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-12	0.00	68.49	-9.56	-3.63	0.00	0.00	-7.16	48.14
-12	0	0.00	68.49	-9.56	-11.76	0.00	0.00	0.00	47.17

WHEEL (0.00 + 40.36 + 40.25) = 43.31 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-12	0.00	61.57	-9.56	-3.63	0.00	0.00	-8.02	40.36
-12	0	0.00	61.57	-9.56	-11.76	0.00	0.00	0.00	40.25

Segment Leq : 51.42 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	4.50	4.32	97.72
0.50	4.50	3.88	97.28

LOCOMOTIVE (0.00 + 40.84 + 39.88) = 43.40 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-12	0.00	61.19	-9.56	-3.63	0.00	0.00	-7.16	40.84
-12	0	0.00	61.19	-9.56	-11.76	0.00	0.00	0.00	39.88

WHEEL (0.00 + 31.85 + 31.75) = 34.81 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-12	0.00	53.06	-9.56	-3.63	0.00	0.00	-8.02	31.85
-12	0	0.00	53.06	-9.56	-11.76	0.00	0.00	0.00	31.75

Segment Leq : 43.96 dBA

Total Leq All Segments: 52.14 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	4.50	4.32	97.72
0.50	4.50	3.88	97.28

LOCOMOTIVE (0.00 + 43.37 + 42.40) = 45.92 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-12	0.00	63.72	-9.56	-3.63	0.00	0.00	-7.16	43.37
-12	0	0.00	63.72	-9.56	-11.76	0.00	0.00	0.00	42.40

WHEEL (0.00 + 35.59 + 35.48) = 38.54 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-12	0.00	56.80	-9.56	-3.63	0.00	0.00	-8.02	35.59
-12	0	0.00	56.80	-9.56	-11.76	0.00	0.00	0.00	35.48

Segment Leq : 46.65 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	4.50	4.32	97.72
0.50	4.50	3.88	97.28

LOCOMOTIVE (0.00 + 43.85 + 42.89) = 46.41 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-12	0.00	64.20	-9.56	-3.63	0.00	0.00	-7.16	43.85
-12	0	0.00	64.20	-9.56	-11.76	0.00	0.00	0.00	42.89

WHEEL (0.00 + 34.86 + 34.76) = 37.82 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-12	0.00	56.07	-9.56	-3.63	0.00	0.00	-8.02	34.86
-12	0	0.00	56.07	-9.56	-11.76	0.00	0.00	0.00	34.76

Segment Leq : 46.97 dBA

Total Leq All Segments: 49.82 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:
Traffic volume : 377/67 veh/TimePeriod
Speed : 80 km/h

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

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 101.00 / 101.00 m
Receiver height : 4.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -12.00 deg
Barrier height : 6.00 m
Barrier receiver distance : 17.00 / 17.00 m
Source elevation : 93.64 m
Receiver elevation : 93.23 m
Barrier elevation : 93.40 m
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
0.50 ! 4.50 ! 3.73 ! 97.13

RT/Custom (0.00 + 42.02 + 42.32) = 45.19 dBA

Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 -12 0.00 62.37 -8.28 -3.63 0.00 0.00 -8.43 42.02

-12 0 0.00 62.37 -8.28 -11.76 0.00 0.00 0.00 42.32

Segment Leq : 45.19 dBA

Total Leq All Segments: 45.19 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
0.50 ! 4.50 ! 3.73 ! 97.13

RT/Custom (0.00 + 37.53 + 37.83) = 40.69 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-12	0.00	57.87	-8.28	-3.63	0.00	0.00	-8.43	37.53
-12	0	0.00	57.87	-8.28	-11.76	0.00	0.00	0.00	37.83

Segment Leq : 40.69 dBA

Total Leq All Segments: 40.69 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.94
(NIGHT): 50.32

Filename: r14.te Time Period: Day/Night 16/8 hours
 Description: R14 OLA

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

```

-----
Train      ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type      !            ! (km/h) !/Train!/Train! type !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  -24.00 deg
Wood depth      :          0  (No woods.)
No of house rows :          0 / 0
Surface         :          2  (Reflective ground surface)
Receiver source distance : 114.50 / 114.50 m
Receiver height  :          1.50 / 1.50 m
Topography      :          2  (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1   : -90.00 deg  Angle2 : -39.00 deg
Barrier height   :          10.00 m
Barrier receiver distance : 16.00 / 16.00 m
Source elevation :          93.64 m
Receiver elevation :          93.33 m
Barrier elevation :          93.57 m
Reference angle  :          0.00
    
```

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

```

-----
Train      ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type      !            ! (km/h) !/Train!/Train! type !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  -24.00 deg
Wood depth      :          0  (No woods.)
No of house rows :          0 / 0
Surface         :          2  (Reflective ground surface)
Receiver source distance : 114.50 / 114.50 m
Receiver height  :          1.50 / 1.50 m
Topography      :          2  (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1   : -90.00 deg  Angle2 : -39.00 deg
Barrier height   :          10.00 m
Barrier receiver distance : 16.00 / 16.00 m
Source elevation :          93.64 m
Receiver elevation :          93.33 m
Barrier elevation :          93.57 m
Reference angle  :          0.00
    
```

Rail data, segment # 3: VIA (day/night)

```

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

Data for Segment # 3: VIA (day/night)

```

-----
Angle1  Angle2      : -24.00 deg   90.00 deg
Wood depth      :          0   (No woods.)
No of house rows :          0 / 0
Surface         :          2   (Reflective ground surface)
Receiver source distance : 114.50 / 114.50 m
Receiver height :    1.50 / 4.50 m
Topography     :          2   (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1  : -24.00 deg   Angle2 : 36.00 deg
Barrier height  :    10.00 m
Barrier receiver distance : 16.00 / 16.00 m
Source elevation :    93.64 m
Receiver elevation :    93.33 m
Barrier elevation :    93.56 m
Reference angle :     0.00
  
```

Rail data, segment # 4: Freight (day/night)

```

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

Data for Segment # 4: Freight (day/night)

```

-----
Angle1  Angle2      : -24.00 deg   90.00 deg
Wood depth      :          0   (No woods.)
No of house rows :          0 / 0
Surface         :          2   (Reflective ground surface)
Receiver source distance : 114.50 / 114.50 m
Receiver height :    1.50 / 1.50 m
Topography     :          2   (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1  : -24.00 deg   Angle2 : 36.00 deg
Barrier height  :    10.00 m
Barrier receiver distance : 16.00 / 16.00 m
Source elevation :    93.64 m
Receiver elevation :    93.33 m
Barrier elevation :    93.56 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	1.65	95.22
0.50	1.50	1.16	94.73

LOCOMOTIVE (0.00 + 39.48 + 48.87) = 49.34 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-39	0.00	68.49	-8.83	-5.48	0.00	0.00	-14.71	39.48
-39	-24	0.00	68.49	-8.83	-10.79	0.00	0.00	0.00	48.87

WHEEL (0.00 + 32.18 + 41.95) = 42.38 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-39	0.00	61.57	-8.83	-5.48	0.00	0.00	-15.08	32.18
-39	-24	0.00	61.57	-8.83	-10.79	0.00	0.00	0.00	41.95

Segment Leq : 50.14 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	1.65	95.22
0.50	1.50	1.16	94.73

LOCOMOTIVE (0.00 + 32.18 + 41.57) = 42.05 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-39	0.00	61.19	-8.83	-5.48	0.00	0.00	-14.71	32.18
-39	-24	0.00	61.19	-8.83	-10.79	0.00	0.00	0.00	41.57

WHEEL (0.00 + 23.68 + 33.44) = 33.88 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-39	0.00	53.06	-8.83	-5.48	0.00	0.00	-15.08	23.68
-39	-24	0.00	53.06	-8.83	-10.79	0.00	0.00	0.00	33.44

Segment Leq : 42.67 dBA

Results segment # 3: 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	1.66	95.22
0.50	1.50	1.17	94.73

LOCOMOTIVE (0.00 + 34.89 + 54.43) = 54.48 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-24	36	0.00	68.49	-8.83	-4.77	0.00	0.00	-20.00	34.89
36	90	0.00	68.49	-8.83	-5.23	0.00	0.00	0.00	54.43

WHEEL (0.00 + 27.97 + 47.51) = 47.56 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-24	36	0.00	61.57	-8.83	-4.77	0.00	0.00	-20.00	27.97
36	90	0.00	61.57	-8.83	-5.23	0.00	0.00	0.00	47.51

Segment Leq : 55.28 dBA

Results segment # 4: 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	1.66	95.22
0.50	1.50	1.17	94.73

LOCOMOTIVE (0.00 + 27.59 + 47.14) = 47.18 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-24	36	0.00	61.19	-8.83	-4.77	0.00	0.00	-20.00	27.59
36	90	0.00	61.19	-8.83	-5.23	0.00	0.00	0.00	47.14

WHEEL (0.00 + 19.46 + 39.01) = 39.06 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-24	36	0.00	53.06	-8.83	-4.77	0.00	0.00	-20.00	19.46
36	90	0.00	53.06	-8.83	-5.23	0.00	0.00	0.00	39.01

Segment Leq : 47.80 dBA

Total Leq All Segments: 57.15 dBA

RT/Custom data, segment # 1: Transitway (day/night)

1 - Bus:
Traffic volume : 377/67 veh/TimePeriod
Speed : 80 km/h

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

Angle1 Angle2 : -90.00 deg -24.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 79.90 / 79.90 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -39.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 16.00 / 16.00 m
Source elevation : 93.64 m
Receiver elevation : 93.33 m
Barrier elevation : 93.56 m
Reference angle : 0.00

RT/Custom data, segment # 2: Transitway (day/night)

1 - Bus:
Traffic volume : 0/0 veh/TimePeriod
Speed : 50 km/h

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

Angle1 Angle2 : -24.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 79.90 / 79.90 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -24.00 deg Angle2 : 36.00 deg
Barrier height : 10.00 m
Barrier receiver distance : 16.00 / 16.00 m
Source elevation : 93.64 m
Receiver elevation : 93.33 m
Barrier elevation : 93.56 m
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	1.50	1.13	94.69

RT/Custom (0.00 + 34.29 + 44.31) = 44.72 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-39	0.00	62.37	-7.26	-5.48	0.00	0.00	-15.33	34.29
-39	-24	0.00	62.37	-7.26	-10.79	0.00	0.00	0.00	44.31

Segment Leq : 44.72 dBA

Results segment # 2: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	1.50	1.13	94.69

RT/Custom (0.00 + -32.04 + -12.49) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-24	36	0.00	0.00	-7.26	-4.77	0.00	0.00	-20.00	-32.04
36	90	0.00	0.00	-7.26	-5.23	0.00	0.00	0.00	-12.49

Segment Leq : 0.00 dBA

Total Leq All Segments: 44.72 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.40

APPENDIX B

VIA Rail Access to Information Letter

RECEIVED AUG 21 2014



VIA Rail Canada

Montréal, August 15, 2014

BY REGULAR POST

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

Legal and Corporate Affairs
3 Place Ville-Marie, Suite 500
Montréal (Québec)
H3B 2C9
Fax: 514-874-0661
gabrielle_caron@viarail.ca

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

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.

Lucas Wilson

From: Leroux, Mikael <Mikael.Leroux@transpo.ottawa.on.ca>
Sent: March-07-13 1:07 PM
To: Lucas Wilson
Subject: Barrhaven Transitway Bus Volumes

Mr.Wilson,

Please find below the information requested

Longfields Station:

	Time Period					
	03:01-06:30	06:31-09:30	09:31-15:30	15:31-18:30	18:31-03:00	ALL DAY
	-----	-----	-----	-----	-----	-----
Scheduled Trips	22	80	72	82	61	317

If you need more information don't hesitate to contact me

Thanks

Mikael Leroux, M.Sc

Team Lead, Measurement and Reporting
OC Transpo / City of Ottawa Transit Services Department
mikael.leroux@ottawa.ca
613 842-3636 ext 2184

From: Lucas Wilson [<mailto:l.wilson@novatech-eng.com>]
Sent: March 07, 2013 9:47 AM
To: Connelly, Colleen
Subject: Barrhaven Transitway Bus Volumes

Hello Colleen,

I am working on a site plan around the intersection of Longfields and Mount Shannon in Barrhaven, and for the noise study I need to account for volumes along the SW transitway behind the site. I was hoping you might have information for this area? I have attached an aerial shot showing the site. Any information would be appreciated.

Thanks,
Lucas Wilson, B.Eng.
EIT

Novatech Engineering Consultants Ltd
200-240 Michael Cowpland Drive
Ottawa . Ontario . Canada . K2M 1P6

Office: 613-254-9643

Fax: 613-254-5867

Email: l.wilson@novatech-eng.com

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APPENDIX C
Grading Plan
Elevation Plans

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

- 137'-11 7/8" BUILDING HEIGHT
- 132'-0 3/4" TOP OF PLATE
- 123'-11 1/2" TOP OF 3RD FLOOR WOOD DECK
- 122'-11" TOP OF PLATE
- 113'-10 1/2" TOP OF 2ND FLOOR CONCRETE PAD
- 112'-8 1/2" TOP OF PLATE
- 103'-6 3/4" TOP OF 1ST FLOOR WOOD DECK
- 102'-6 1/4" TOP OF PLATE
- 100'-0" TOP OF FOUNDATION
- AVERAGE GRADE
- 93'-7 7/8" TOP OF BASEMENT SLAB

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Project
MATTINO HOMES
 20 CONDO UNITS BUILDING
 285 MOUNTSHANNON,
 OTTAWA, ON

Title
WEST ELEVATION

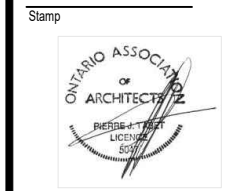
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Revision	Sheet	Drawing #
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NORTH ELEVATION
 SCALE: 1/8" = 1'-0"

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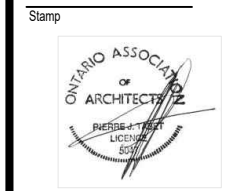
Title
NORTH ELEVATION

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Project
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 20 CONDO UNITS BUILDING
 285 MOUNTSHANNON,
 OTTAWA, ON

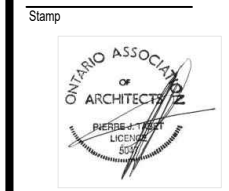
Title
SOUTH ELEVATION

Project #	Scale	Date
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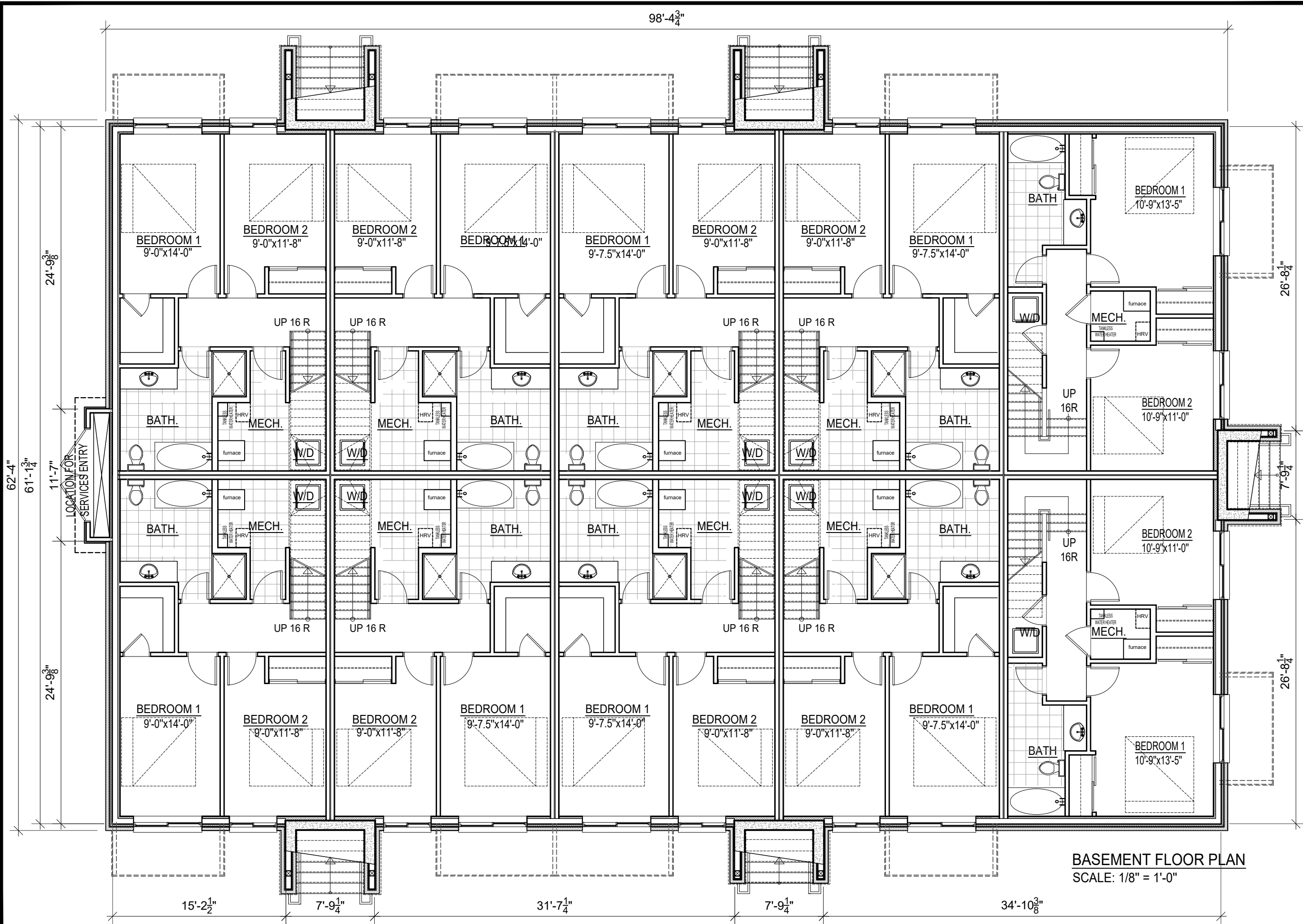


Project
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 20 CONDO UNITS BUILDING
 285 MOUNTSHANNON,
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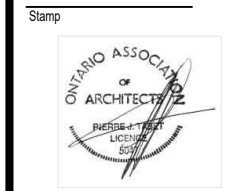
Title
EAST ELEVATION

Project #	Scale	Date
Revision	1/8" - 1'-0"	2018-07-11
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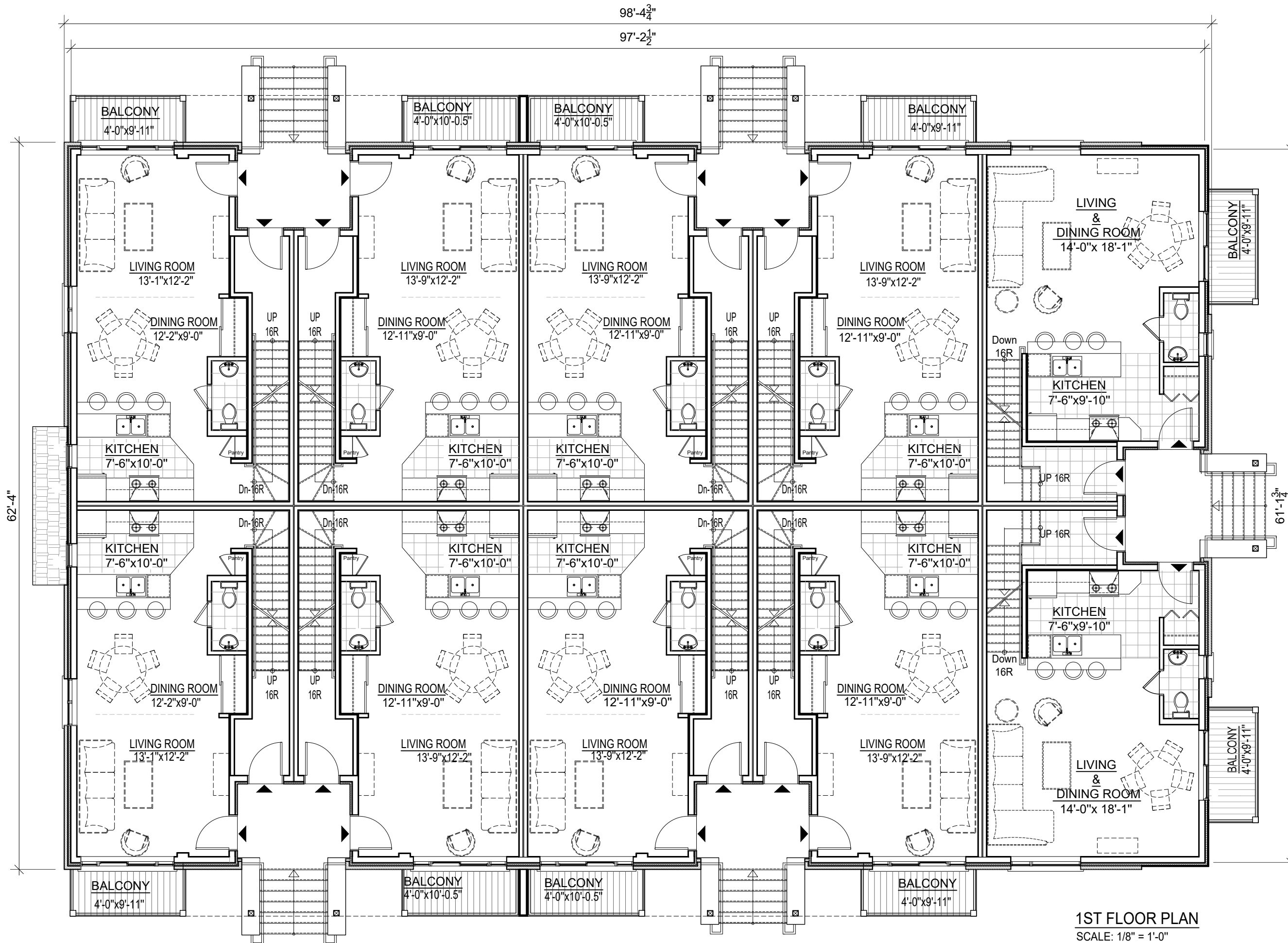
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MATTINO HOMES
 20 CONDO UNITS BUILDING
 285 MOUNTSHANNON,
 OTTAWA, ON

Title
BASEMENT FLOOR PLAN

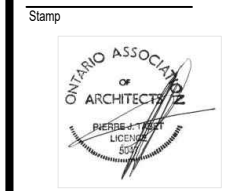
BASEMENT FLOOR PLAN
 SCALE: 1/8" = 1'-0"

Project #	Scale	Date
Revision	1/8" - 1'-0"	2018-07-11
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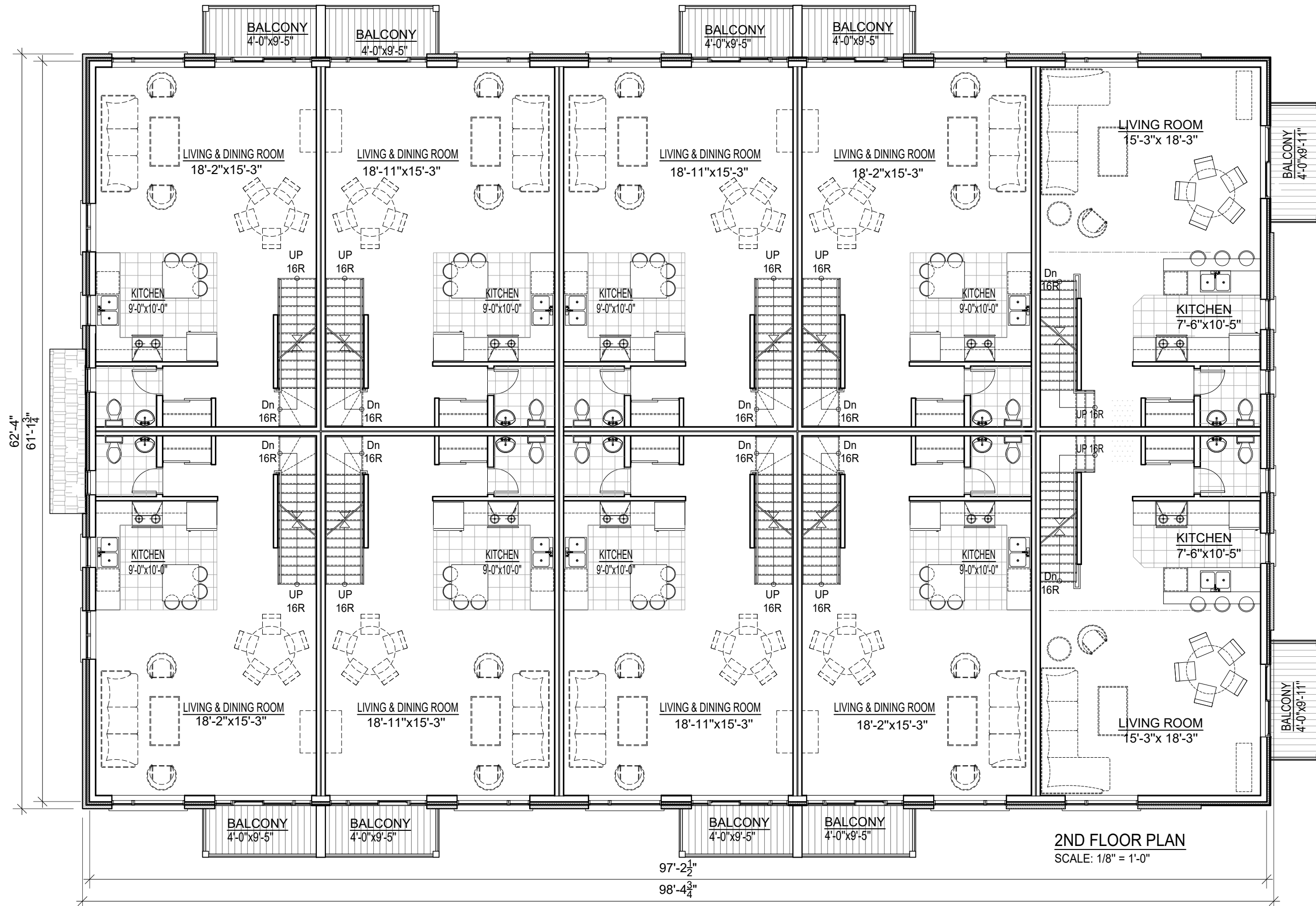
Project
MATTINO HOMES
 20 CONDO UNITS BUILDING
 285 MOUNTSHANNON,
 OTTAWA, ON

Title
FIRST FLOOR PLAN

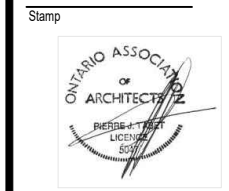
Project #	Scale	Date
Revision	1/8" = 1'-0"	2018-07-11
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1ST FLOOR PLAN
 SCALE: 1/8" = 1'-0"

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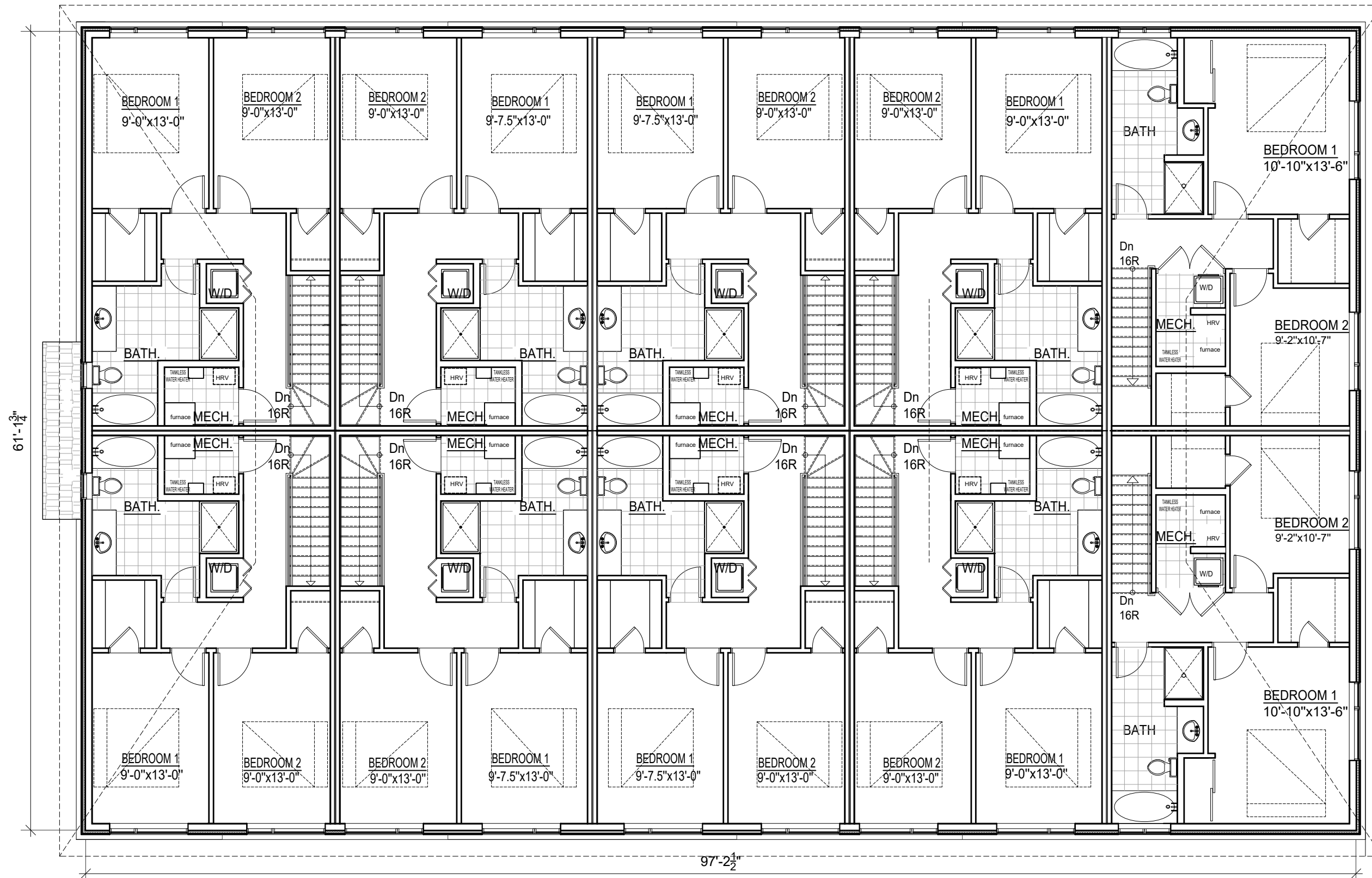


Project
MATTINO HOMES
 20 CONDO UNITS BUILDING
 285 MOUNTSHANNON,
 OTTAWA, ON

Title
SECOND FLOOR PLAN

Project #	Scale	Date
Revision	Sheet	Drawing #
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3RD FLOOR PLAN
 SCALE: 1/8" = 1'-0"

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Project
MATTINO HOMES
 20 CONDO UNITS BUILDING
 285 MOUNTSHANNON,
 OTTAWA, ON

Title
THIRD FLOOR PLAN

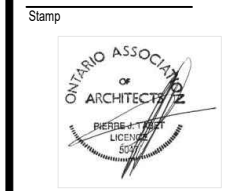
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SOUTH ELEVATION
 SCALE: 1/8" = 1'-0"

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

Title
SOUTH ELEVATION

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

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

Title
WEST ELEVATION

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

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

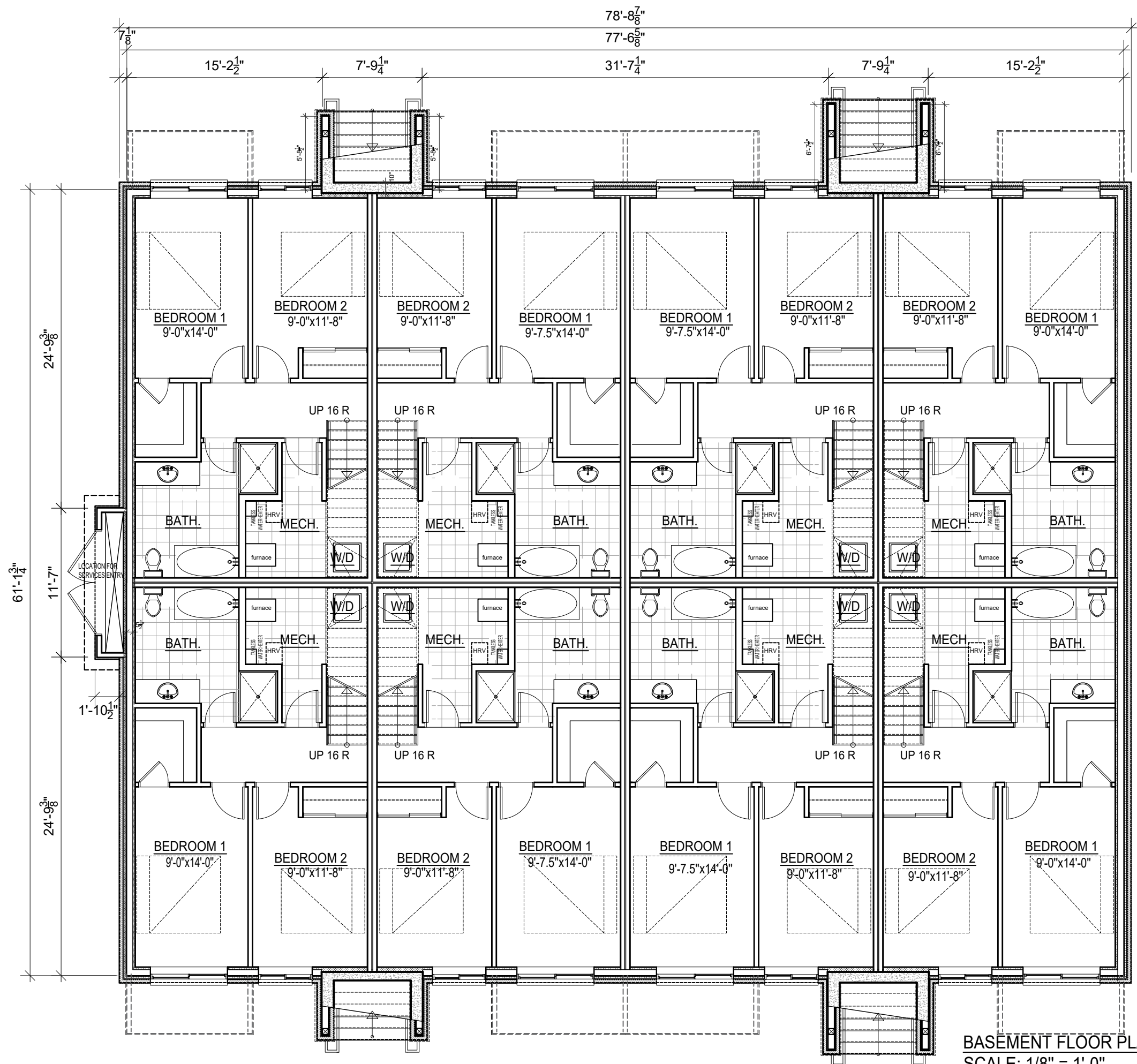
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Project
MATTINO HOMES
 16 CONDO UNITS BUILDING
 255 MOUNTSHANNON,
 OTTAWA, ON

Title
NORTH ELEVATION

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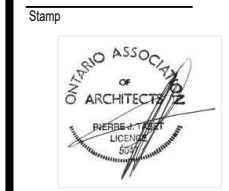
BASEMENT FLOOR PLAN
 SCALE: 1/8" = 1'-0"

Pierre J. Tabet architect
 167 Rue De Roquebrune, Gatineau Qc J8T 7Y6
 Tel. : 819-568-3994 / 613-797-5375 Fax : 819-246 4312
 E-Mail : pierre.tabet@hotmail.com

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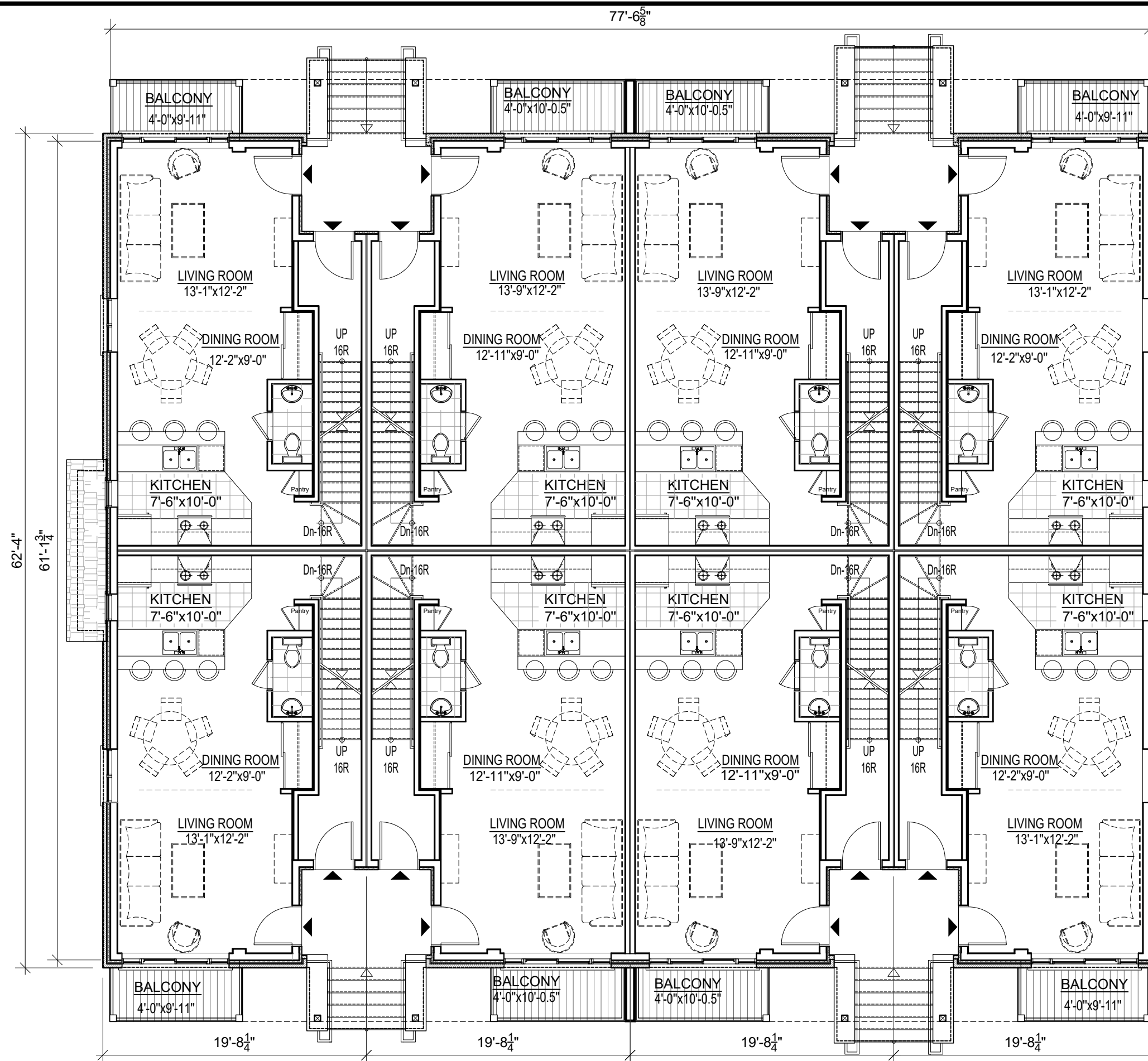
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Project
MATTINO HOMES
 16 CONDO UNITS BUILDING
 255 MOUNTSHANNON,
 OTTAWA, ON

Title
BASEMENT FLOOR PLAN

Project #	Scale	Date
Revision	Sheet	Drawing #
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1ST FLOOR PLAN
SCALE: 1/8" = 1'-0"

Pierre J. Tabet architect
167 Rue De Roquebrune, Gatineau Qc J8T 7Y6
Tel. : 819-568-3994 / 613-797-5375 Fax : 819-246 4312
E-Mail : pierre.tabet@hotmail.com

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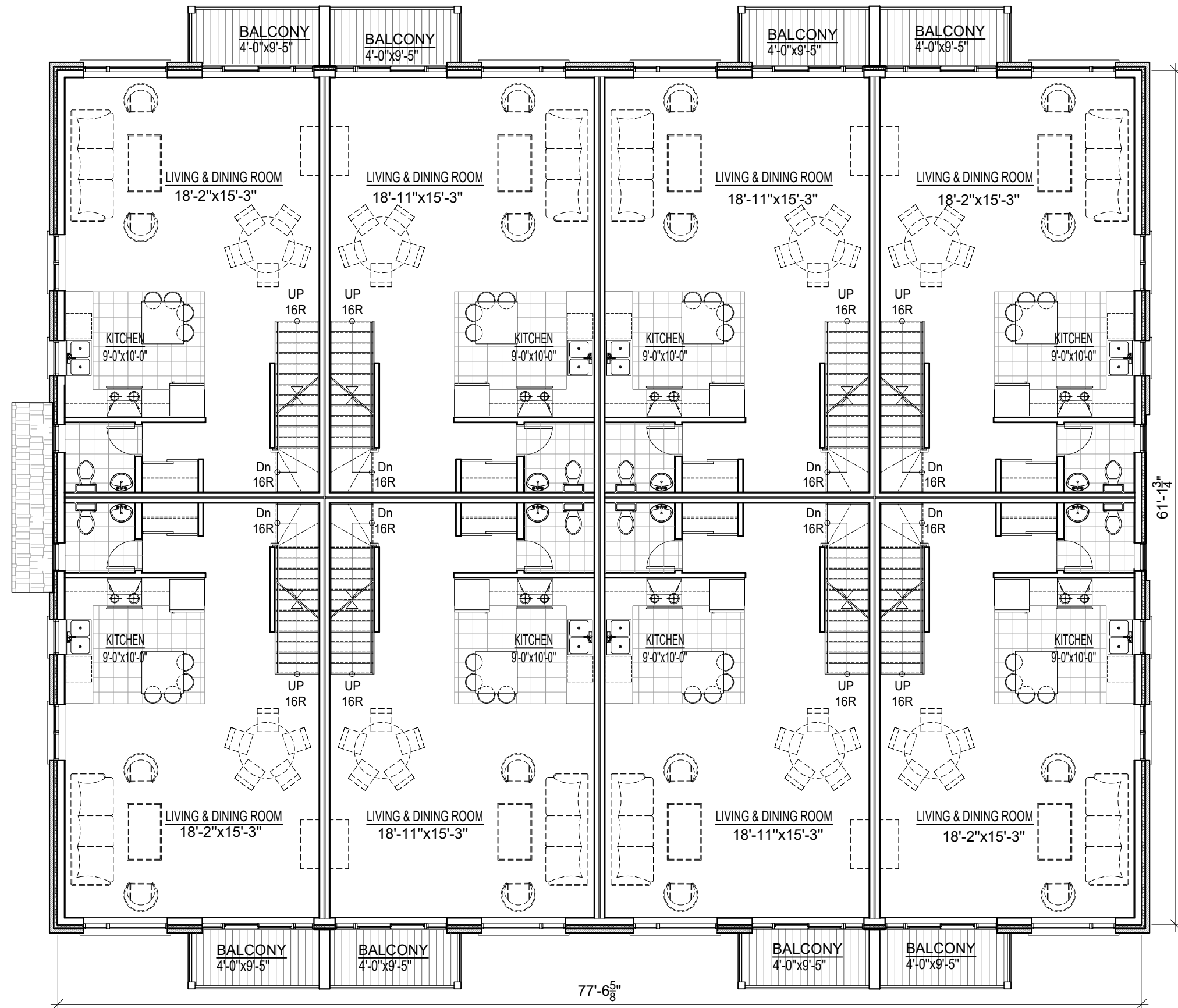


Project
MATTINO HOMES
16 CONDO UNITS BUILDING
255 MOUNTSHANNON,
OTTAWA, ON

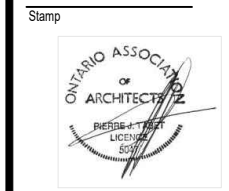
Title
FIRST FLOOR PLAN

Project #	Scale	Date
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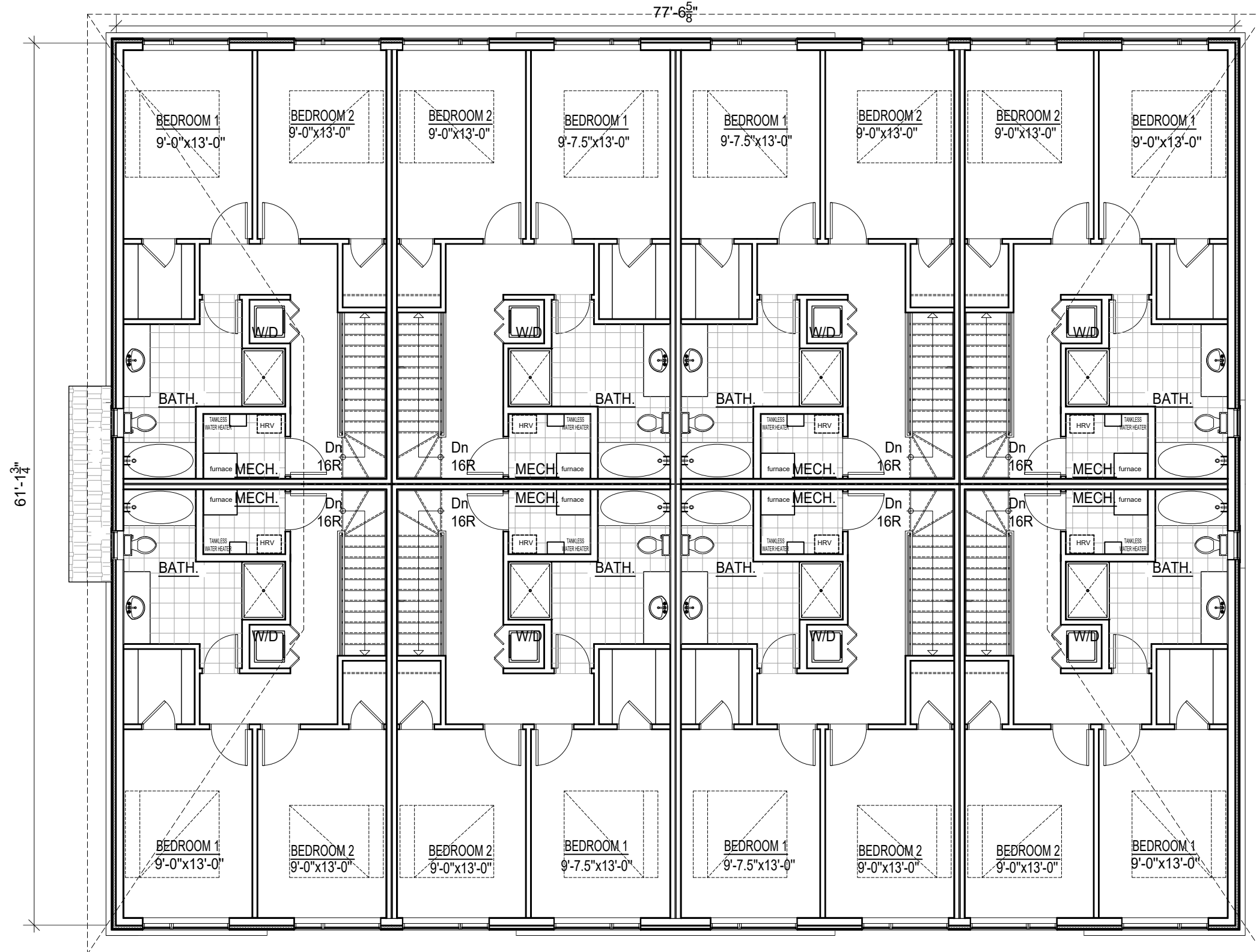
Project
MATTINO HOMES
 16 CONDO UNITS BUILDING
 255 MOUNTSHANNON,
 OTTAWA, ON

Title
SECOND FLOOR PLAN

2ND FLOOR PLAN
 SCALE: 1/8" = 1'-0"

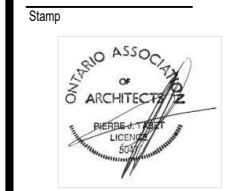
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3RD FLOOR PLAN
 SCALE: 1/8" = 1'-0"

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Project
MATTINO HOMES
 16 CONDO UNITS BUILDING
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 OTTAWA, ON

Title
THIRD FLOOR PLAN

Project #	Scale	Date
Revision	Sheet	Drawing #
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