

NOISE IMPACT STUDY

Response to Comments on 1st Submission

Proposed Housing Development,
6301 Campeau Drive
Kanata (Ottawa), ON

May 2021

Prepared for
Bayview Hospitality Holdings Ltd.

c/o
Momentum Planning and
Communications



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May 6, 2021

Bayview Hospitality Holdings Ltd.
108 Chestnut Street
Toronto, ON M5G 1R3

Re: Proposed Residential Development, 6301 Campeau Drive, Kanata (Ottawa), ON – Noise Consulting Services

TRANS-PLAN is pleased to submit this Noise Impact Study support of the proposed housing development to be located at 6301 Campeau Drive, Kanata, ON. The proposed development consists of two parcels, including 184 units of townhouses and three 10-storey apartment buildings with 614 units and a total GFA of 430.6 m² ground floor commercial. The top units of each townhouse block have rooftop patios and there are also outdoor amenity spaces on the south side of building B in Parcel 1 and the north side of Building C in Parcel 2.

The sound levels from transportation sources in the vicinity of the site (Campeau Drive, Kanata Avenue, Cordillera Street, Canadian Shield Avenue and Highway 417 (the Queensway)) were predicted and assessed against the applicable Ministry of the Environment, Conservation and Parks (MECP) noise guidelines. No stationary sources were existing or planned to be in the vicinity of the site.

The following mitigation measures are required to ensure the applicable MECP noise guideline requirements can be met and a suitable acoustic environment can be provided for the dwelling occupants:

- Mandatory central air conditioning for Buildings A, B and C,
- Upgraded wall (STC 54) and window (STC 33) construction for Building C,
- Upgraded wall (STC 54) and window (STC 31) construction for Buildings A and B,
- Provision for air conditioning for Townhouse Blocks 1 to 7 inclusive and Block 9,
- 1.1 m parapet walls to act as sound barriers for all townhouse block rooftop patios,
- Warning clauses included on the occupancy agreements.

With the appropriate design and recommendations outlined in this report, the proposed residential development is considered feasible.

Sincerely,



Anil Seegobin, P.Eng.
Partner, Engineer



Joseph Doran
Transportation &
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Trans-Plan Transportation Inc.
Transportation Consultants

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Transmittal Letter

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1. INTRODUCTION

Trans-Plan was retained by Bayview Hospitality Holdings Ltd. to complete a Noise Impact Study for the proposed mixed use development located at 6301 Campeau Drive in the Kanata suburb of the City of Ottawa as part of the Site Plan Application for the City of Ottawa.

The Noise Impact Study includes the following:

- Review and assessment of the future sound level from nearby transportation sources and their anticipated traffic growth,
- Review and assessment of any stationary sources currently operating in the vicinity of the site and any planned facilities likely to impact the site in the future.
- Necessary mitigation in order to meet the requirements of the Ministry of the Environment, Conservation and Parks (MECP) and the City of Ottawa (the City).

2. RESPONSE TO COMMENTS ON 1ST SUBMISSION

A Noise Impact Assessment report prepared by Trans-Plan was submitted in December 2, 2021. This response to comments has been conducted to address the comments on the 1st submission, received from the City of Ottawa, Transportation Engineering Services and Development Review, dated March 11, 2021. The comments and our responses are summarized below:

Transportation Comments (Paudel, Neeti neeti.paudel@ottawa.ca)

Comment 1: Please provide a scale plan identifying location of noise sources, receptor locations distance and angles between receptors.

Response: After confirmed with the City Staff, a scaled site plan noting the sources and receptors is provided in Figure 4.

Comment 2: Section 7.3- Table 5 does not match the wording of the paragraph below the table. Please correct. 0.7m height is required to meet the 60 dBA sound level.

Response: The wording has been corrected to match the table.

Comment 3: Local roads are not assessed in the noise study. Confirm if this changes the results.

Response: Although local roads are not required to be accessed, assessing the local roads will not change any results for the development.

3. SITE LOCATION

The site is located at 6301 Campeau Drive on the south side of Campeau Drive, west of Cordillera Street and is currently vacant. The site is bounded by:

- Campeau Drive with single family residential dwellings and the Kanata Golf and Country Club beyond to the north,
- Cordillera Street with condominium and hotel residences beyond to the east,
- Vacant forested land with Kanata Avenue and commercial buildings beyond to the south, and,

- Forest Hill Retirement residences, some condominium buildings and forested land beyond to the west.

The Key Plan is provided as Figure 1.

4. PROPOSED DEVELOPMENT

The proposed development, according to the site plan prepared by Fabiani Architect Ltd. is split into two parcels. Parcel 1 to the west has five stacked and back to back townhouse blocks containing a total of 104 units and two 10-storey buildings comprising 174 units each and connected by a single storey lobby and amenity building. Parcel 2 to the east has four stacked and back to back townhouse blocks containing a total of 80 units and one 10-storey building containing 266 units, a ground floor amenity space and 430.6 m² of commercial space. The top units of each townhouse block have rooftop patios and there are also outdoor amenity spaces on the south side of building B in Parcel 1 and the north side of Building C in Parcel 2. Parking is provided in surface lots and underground parking levels.

The Site Plans for each parcel are provided as Figure 2 and Figure 3. Additional drawings of the floor layouts and elevations are included in Appendix A.

5. NOISE SOURCES

5.1 Transportation Sources

The major transportation noise sources in the vicinity of the site include road traffic on Campeau Drive, Cordillera Street, Canadian Shield Avenue, Kanata Avenue and Highway 417 (the Queensway).

5.1.1 Road Traffic Sources

Campeau Drive and Kanata Avenue are both 2 lane urban arterial roads, Canadian Shield Avenue is a 2 lane urban collector road and Cordillera Street is a local road, all of which are under the jurisdiction of the City of Ottawa. Ultimate road traffic data was taken from the City of Ottawa Environmental Noise Control Guidelines for all roads except Cordillera Street for which turning movement count data, collected by Trans-Plan for the Traffic Impact Assessment, was used. Volume data for Cordillera Street were projected to the year 2030.

Highway 417 (the Queensway) is a 400 series highway under the jurisdiction of the Ministry of Transport for Ontario. Again, ultimate road traffic data was taken from the City of Ottawa Environmental Noise Control Guidelines.

Traffic volumes on other nearby roadways are anticipated to be minor and are not considered further in our analysis. Table 1 below summarizes the traffic data with the raw data included in Appendix B.

Table 1 – Road Traffic Data

Roadway	AADT ¹	Year	No. of Lanes	% Trucks		Posted Speed Limit (km/h)	Day/Night Split	% Grade
				Medium	Heavy			
Campeau Drive	15000	Ultimate	2	7	5	50	92% / 8%	0
Canadian Shield Avenue	8000	Ultimate	2	7	5	40	92% / 8%	0
Cordillera Street	1000	2020	2	7	5	40	92% / 8%	2
Kanata Avenue	15000	Ultimate	2	7	5	40	92% / 8%	0
Highway 417	146664 ²	Ultimate	8	7	5	100	92% / 8%	0

Notes: 1. Annual Average Daily Traffic – Sourced from City of Ottawa Environmental Noise Control Guidelines except for Cordillera Street
 2. Split into two sources, 4 lanes eastbound and 4 lanes westbound

5.2 Stationary Sources

There are no existing commercial or industrial land uses in the vicinity of the site, confirmed during a site visit on 22 September, 2020.

A review of the City’s current development applications shows only residential single-family dwellings or townhouse developments planned in the vicinity of the site.

6. NOISE CRITERIA

6.1 Ministry of the Environment, Conservation and Parks

Noise criteria for the stationary and transportation sources are outlined within the MECP publication NPC-300 “Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning. The applicable criteria for this project are summarized in Table 2 with more information available in Appendix B. These criteria are the normally allowable maximum limits, beyond which mitigation or control measures are required. These measures take the form of ventilation requirements, building component construction, and/or sound barriers. A complete summary of the MECP noise guidelines is included in Appendix C.

Table 2 – Applicable Noise Criteria Summary

Point of Reception	Time Period ¹	L _{eq} (dBA) from Road Sources	Control Measures
Plane of Window	Day	>65	Central Air Conditioning Mandatory
		55 - 65	Provision for installation of Air Conditioning at occupant's discretion
	Night	>60	Central Air Conditioning Mandatory
		50 - 60	Provision for installation of Air Conditioning at occupant's discretion
Indoor Living Areas	Day	45	Building Construction / Architectural Design
	Night	45	
Indoor Sleeping Quarters	Day	45	
	Night	40	
Outdoor Living Area	Day	55 ²	Sound Barrier

Notes: 1. 16-hour Daytime Period runs from 07:00 – 23:00. 8-hour Nighttime Period runs from 23:00 – 07:00.
 2. Up to 5dB excess above the criteria is allowed if noise control measures are not feasible for technical, economic or administrative reasons with appropriate Warning Clauses included.

6.2 City of Ottawa

The City of Ottawa defers to the MECP guidelines for noise impact analysis.

7. NOISE IMPACT ASSESSMENT

The daytime and nighttime equivalent sound energy levels (L_{eq Day} – 16-hour energy equivalent continuous sound level and L_{eq Night} – 8-hour energy equivalent continuous sound level) were predicted using STAMSON 5.04, the computerized road and rail traffic noise prediction software of the MECP. STAMSON implements transportation noise prediction model, Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT). Inherent screening of the building due to its orientation to the noise source was accounted for. To be conservative screening from existing buildings in the vicinity of the site was not included. Sample calculations are included in Appendix D.

7.1 Sound Level at the Building Façades

The plane of window assessment points were calculated at the height of the top floor bedroom windows (30.5 m for the towers and 8.4 m for the townhouse blocks), representing the worst-case locations. The highest unmitigated daytime and nighttime sound level of 71 dBA and 63 dBA are predicted to occur at the south façade of Building C facing Highway 417. A summary of the results is included in Table 3. a marked-up version of the “to scale” site plan noting the sources and receptors is provided in Figure 4.

Table 3 – Predicted Unmitigated Sound Levels at the Façades

Location	Source	Distance (m)	L _{eq Day} (dBA)	L _{eq Night} (dBA)
Building C 10 th Floor East Façade	Campeau Drive	138	56	48
	Canadian Shield Avenue	16	61	53
	Cordillera Street	15	57	49
	Highway 417 Westbound	387	64	57
	Highway 417 Eastbound	423	64	56
	TOTAL	-	69	61
Building C 10 th Floor South Façade	Canadian Shield Avenue	16	64	56
	Kanata Avenue	15	54	46
	Highway 417 Westbound	387	67	60
	Highway 417 Eastbound	423	67	59
	TOTAL	-	71	63
Building B 10 th Floor South Façade	Canadian Shield Avenue	152	51	43
	Kanata Avenue	220	55	48
	Highway 417 Westbound	484	65	57
	Highway 417 Eastbound	520	65	57
	TOTAL	-	68	61
Building A 10 th Floor South Façade	Canadian Shield Avenue	256	49	41
	Kanata Avenue	232	56	48
	Highway 417 Westbound	557	64	57
	Highway 417 Eastbound	593	64	57
	TOTAL	-	68	60
Block 1 3 rd Floor North Façade	Campeau Drive	30	63	55
Block 8 3 rd Floor North Façade	Campeau Drive	55	54	45
Block 7 3 rd Floor North Façade	Campeau Drive	31	63	55
	Cordillera Street	17	51	43
	TOTAL	-	63	55
Block 7 3 rd Floor East Façade	Campeau Drive	31	60	52
	Canadian Shield Avenue	122	52	44
	Cordillera Street	17	55	48
	Highway 417 Westbound	491	53	45

	Highway 417 Eastbound	527	52	45
	TOTAL	-	63	55
Roadway Block 9 3 rd Floor South Façade	Canadian Shield Avenue	65	50	42
	Cordillera Street	22	53	45
	Highway 417 Westbound	437	56	48
	Highway 417 Eastbound	473	55	48
	TOTAL	-	60	53

7.2 Sound Level at the Outdoor Living Areas

The outdoor living area (OLA) assessment points were calculated at a height of 1.5 m above the floor at the assumed centre of the townhouse blocks rooftop terraces and in the assumed centre of the shared ground floor outdoor amenity at Building B. According to NPC-300, a balcony or terrace is considered an OLA if it is elevated, the only OLA for the occupant and is 4 m in depth or greater. At present, no floor plans detailing the patio dimensions are available. As such, the recommendations outlined hereafter should be reviewed once more detailed plans become available. The highest unmitigated daytime sound level of 63 dBA is predicted to occur at the rooftop terrace on the east side of the Block 7. A summary of the results is included in Table 4.

Table 4 – Predicted Unmitigated Sound Levels at the Outdoor Living Areas

Location	Source	Distance (m)	L _{eq Day} (dBA)
Block 7 Rooftop Terrace	Campeau Drive	33	63
	Cordillera Street	20	54
	TOTAL	-	63
Block 5 Rooftop Terrace	Campeau Drive	33	63
Building B Outdoor Amenity	Canadian Shield Avenue	171	42
	Cordillera Street	220	47
	Highway 417 Westbound	498	51
	Highway 417 Eastbound	534	51
	TOTAL	-	55

8. NOISE CONTROL REQUIREMENTS

8.1 Ventilation Requirements

The maximum predicted sound levels at the façade of Building C is 71 dBA in the daytime and 63 dBA in the nighttime, at the façade of Building B is 68 dBA in the daytime and 60 dBA in the nighttime, and at the façade of Building A is 68 dBA in the daytime and 60 dBA in the nighttime, These levels are all greater than the plane of window guideline limits of NPC-300. Thus, central air conditioning will be required throughout the buildings to allow windows to remain closed for noise control purposes.

The maximum predicted sound levels at the façade of Townhouse Blocks 1 through 7 is 63 dBA in the daytime and 55 dBA in the nighttime. These levels fall within the lower ranges of the NPC-300 plane of window noise criteria. Therefore, provision for the installation of air conditioning is required. The maximum predicted sound levels at the façade of Townhouse Block 9 is 60 dBA in the daytime and 53 dBA in the nighttime. The daytime level falls within the lower range of the NPC-300 plane of window noise criteria. Therefore, provision for the installation of air conditioning is required. The maximum predicted sound levels at the façade of Townhouse Block 8 is 54 dBA in the daytime and 45 dBA in the nighttime. These levels fall out of the lower range of the NPC-300 plane of window noise criteria and therefore, do not require air conditioning for noise control purposes.

8.2 Architectural Design / Building Components

The indoor noise guidelines of NPC-300 can be achieved using appropriate construction for exterior walls, windows and doors. As the building is still at the preliminary conceptual design stage, typical assumptions have been used to determine building components. As such, the final noise control requirements should be reviewed when architectural plans are developed. Construction of walls and windows should also be reviewed to ensure that they will meet the required sound isolation performance. This is typically required at the building permit application stage.

To assess the building construction requirements for the 10-storey buildings, a worst-case corner bedroom exposed to the highest sound levels predicted and assumed to have window and wall areas of 80% and 30% of the associated floor area respectively. Wall construction was assumed to have a Sound Transmission Class (STC) rating of STC 54, typical for concrete wall construction and window STC requirements were ascertained using the method outlined in the National Research Council of Canada Building Practice Note 56 (BPN 56). The maximum window STC requirements of STC 33 are recommended throughout building C, while Buildings A and B require STC 31 windows.

To assess the building construction requirements for the townhouse blocks, a worst-case corner bedroom exposed to the highest sound levels predicted and assumed to have window and wall areas of 50% and 50% of the associated floor area respectively. Wall construction was assumed to have a Sound Transmission Class (STC) rating of STC 37, typical for the minimum construction standards of the Ontario Building Code (OBC) and window STC requirements were ascertained using the method outlined in the National Research Council of Canada Building Practice Note 56 (BPN 56). The minimum window construction standards of the OBC (typically STC 25) are sufficient throughout all townhouse blocks.

Any sliding glass walkout doors should be fully weather stripped and considered as windows and be included in the percentage of glazing.

8.3 Outdoor Living Area Requirements

The rooftop terraces throughout the townhouse blocks are predicted to get daytime sound levels up to 63 dBA. Thus, sound barriers are required to protect these spaces. Table 5 below summarizes the height requirements of the parapet walls.

Table 5 – Barrier Height Requirements at the Outdoor Living Areas

Location	L _{eq} Day (dBA)	Height of Barrier required to meet 60 dBA (m)	Height of Barrier required to meet 55 dBA (m)
Block 7 Rooftop Terrace	63	0.7	1.6
Block 5 Rooftop Terrace	63	0.7	1.5
Building B Outdoor Amenity	55	-	-

As shown above, a 1.6 m parapet wall would be required to meet the 55 dBA limit at the rooftop patio of block 7. However, this is not preferable as it would completely block the windows of the residences. A 0.7 m wall is required to meet the MECP maximum limit of 60 dBA.

Similarly, a 1.5 m parapet wall would be required the rooftop patio of block 5 to meet the 55 dBA limit, which would still block the windows. A 0.7 m parapet is required to meet the 60 dBA maximum limit.

Since the minimum height for a terrace safety barrier is 1.1 m, this is recommended throughout all townhouse blocks to maintain consistency throughout the site with Warning Clauses included on title where necessary.

The outdoor amenity space by building B is expected to have a daytime level of 55 dBA. This meets the limit of NPC-300 thus no barriers are required for this amenity space.

The parapet walls must be designed to function as sound barriers in that they must be of solid construction with no gaps, cracks or holes (except for those necessary for drainage) and must have a minimum surface density of 20 kg/m². Many materials are suitable including concrete, masonry, glass, wood or composite materials.

8.4 Warning Clauses

Warning clauses are a tool to inform residents of potential annoyance due to an existing source of noise or to warn of excesses above the sound level limits of NPC-300. These clauses should be included in the Occupancy agreements and/or Offers of Purchase and Sale.

The following warning clauses should be included for all units in this building

- A “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 sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.”
- B “This dwelling unit has been designed with the provision for adding central air conditioning at the occupant’s discretion. Installation of central air conditioning in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.”
- C “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 occasions interfere with some activities of the dwelling occupants as the sound levels exceed the

sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.”

8.5 Noise Control Summary

The complete summary of Noise Control features for the building are included in Table 6 below and shown in Figure 5 and Figure 6.

Table 6 – Minimum Noise Abatement Measures

Location	Ventilation ¹	Exterior Wall ²	Exterior Window ²	Sound Barrier Height ³	Warning Clauses
Building C	A/C Mandatory	STC 54	STC 33	N/A	A + C
Buildings A & B	A/C Mandatory	STC 54	STC 31	N/A	A + C
Townhouse Blocks 1 to 7 and 9	Provision for A/C	Minimum OBC Construction (STC 37)	Minimum OBC Construction (STC 25)	1.1	B + C
Townhouse Block 8	No requirement	Minimum OBC Construction (STC 37)	Minimum OBC Construction (STC 25)	1.1	C

Notes: 1. To allow windows to remain closed for noise control purposes
2. Sound Transmission Class (STC) Rating is based on assumed percentages of wall and window area to associated floor area and should be checked once building plans are finalized. (Reference ASTM-E413)
3. Sound barriers must be of solid construction with a minimum face density of 20 kg/m² with no cracks, gaps or holes (except those required for drainage).

The final sound isolation requirements including the wall and window construction should be reviewed when full architectural plans are developed. This is typically required by the city at the building permit application.

9. SUMMARY AND RECOMMENDATIONS

Our Noise Impact Study for the proposed residential development at 6301 Campeau Drive in the City of Ottawa is summarized as follows:

9.1 Summary of Noise Impact Study

The sound levels from transportation sources in the vicinity of the site (Campeau Drive, Kanata Avenue, Cordillera Street, Canadian Shield Avenue and Highway 417) were predicted according to ORNAMENT using STAMSON 5.04 and assessed against the applicable noise guidelines from NPC-300.

No stationary sources were existing or planned to be in the vicinity of the site.

9.2 Recommendations

The following mitigation measures are required to ensure the applicable MECP noise guideline requirements can be met and a suitable acoustic environment can be provided for the dwelling occupants:

- Mandatory central air conditioning for Buildings A, B and C,
- Upgraded wall (STC 54) and window (STC 33) construction for Building C,
- Upgraded wall (STC 54) and window (STC 31) construction for Buildings A and B,

- Provision for air conditioning for Townhouse Blocks 1 to 7 inclusive and Block 9,
- 1.1 m parapet walls to act as sound barriers for all townhouse block rooftop patios,
- Warning clauses included on the occupancy agreements.


The measures are also shown in Table 6, Figure 5 and Figure 6.

With the appropriate design and recommendations outlined in this report, the proposed residential development is considered feasible.

Respectfully submitted,



Anil Seegobin, P.Eng.
Partner, Engineer



Joseph Doran
Transportation &
Acoustics E.I.T.

Trans-Plan Transportation Inc.
Transportation Consultants

Figure 1 – Key Plan



Source: Google Maps

APPENDICES

Appendix A – Floor Plans and Elevations

Appendix B – Road Traffic Data

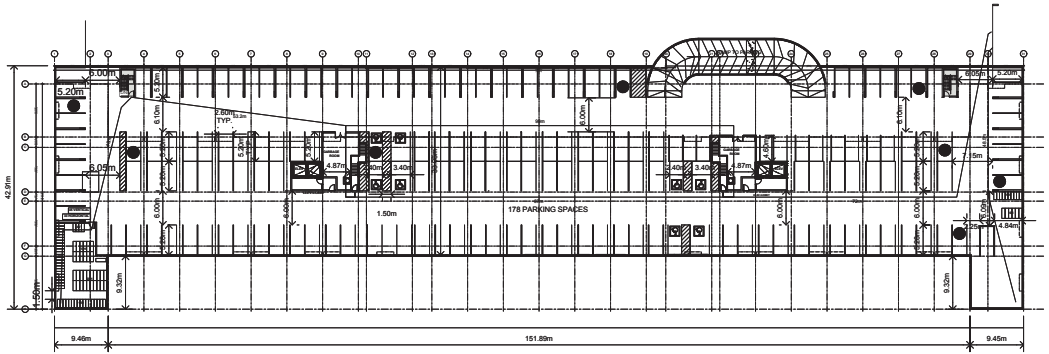
Appendix C – MECP Environmental Noise Guidelines

Appendix D – Sample Calculations

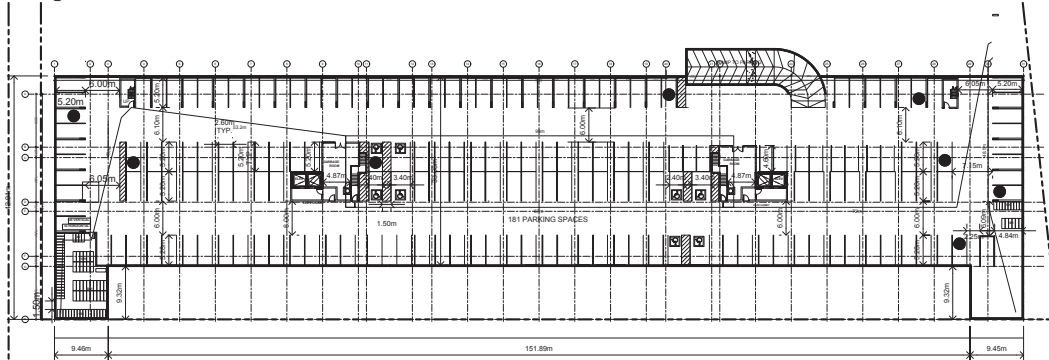


APPENDIX A


Floor Plans and Elevations




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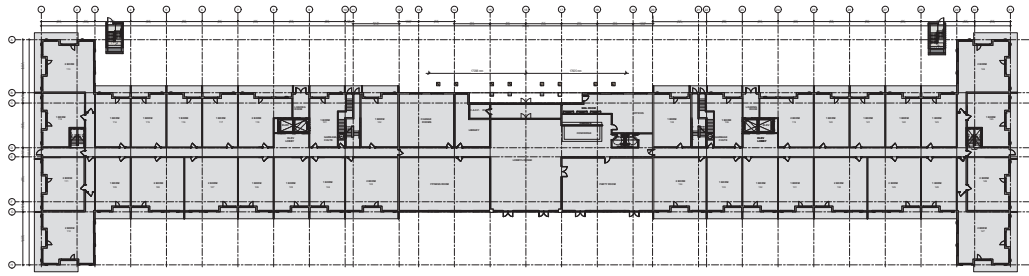
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 DRAWING NO: A-200A
 DATE: 19-04-2019
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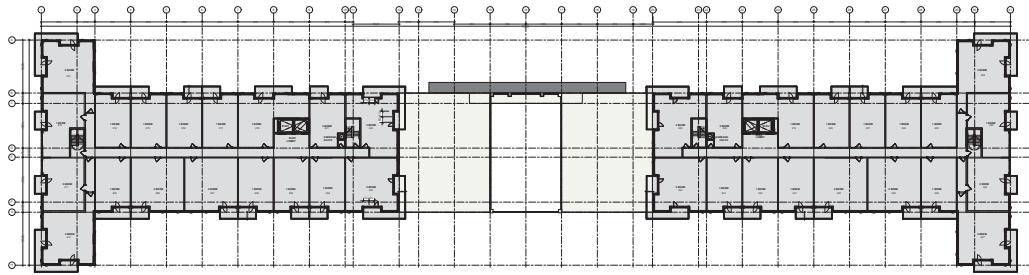
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 FABIANI ARCHITECT LTD.
 REGISTERED ARCHITECTS
 REGISTERED CONTRACTORS
 REGISTERED ENGINEERS
 REGISTERED PLUMBERS
 REGISTERED ELECTRICIANS
 REGISTERED MECHANICAL ENGINEERS
 REGISTERED TOWN PLANNERS
 REGISTERED SURVEYORS
 REGISTERED STRUCTURAL ENGINEERS
 REGISTERED CIVIL ENGINEERS
 REGISTERED AERONAUTICAL ENGINEERS
 REGISTERED AGRICULTURAL ENGINEERS
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 REGISTERED FOOD ENGINEERS
 REGISTERED INDUSTRIAL ENGINEERS
 REGISTERED MARINE ENGINEERS
 REGISTERED METALLURGICAL ENGINEERS
 REGISTERED MECHANICAL ENGINEERS
 REGISTERED MINING ENGINEERS
 REGISTERED NUCLEAR ENGINEERS
 REGISTERED OIL ENGINEERS
 REGISTERED PETROLEUM ENGINEERS
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 REGISTERED ROCKET ENGINEERS
 REGISTERED SAFETY ENGINEERS
 REGISTERED SHIPPING ENGINEERS
 REGISTERED SPORTS ENGINEERS
 REGISTERED SURVEYORS
 REGISTERED TOWN PLANNERS
 REGISTERED TRANSPORT ENGINEERS
 REGISTERED WATER ENGINEERS
 REGISTERED WIND ENGINEERS
 REGISTERED WOOD ENGINEERS
 REGISTERED ZOOLOGICAL ENGINEERS


KANTAKRANDEUSE RESIDENTIAL PROJECT
 APARTMENT A+B FLOOR PLANS
 7/2019 1/250 1/250




1 T/O GROUND FLOOR
1:250



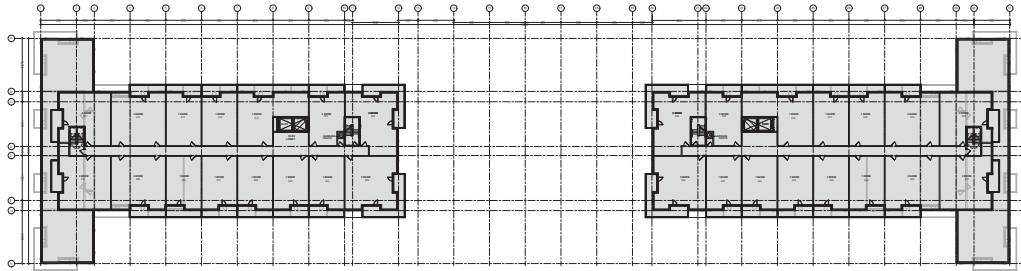
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 DRAWING NO: A-201A
 DATE: 19-04-2019
 SCALE: 1:250
 SHEET NO: 1
A-201A

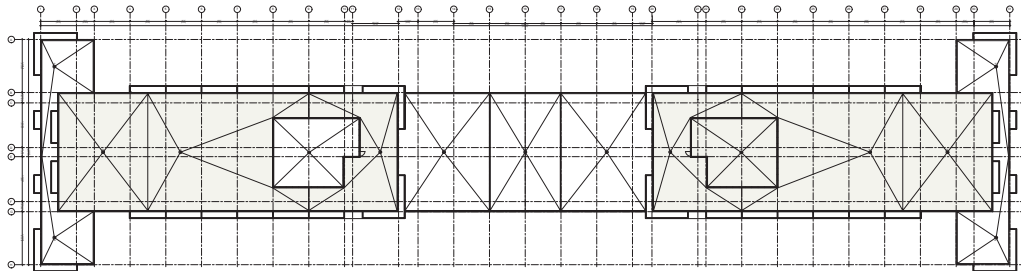
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KANTAKRANDEUSE RESIDENTIAL PROJECT
 APARTMENT A+B FLOOR PLANS
 7/2019 1/250 1/250

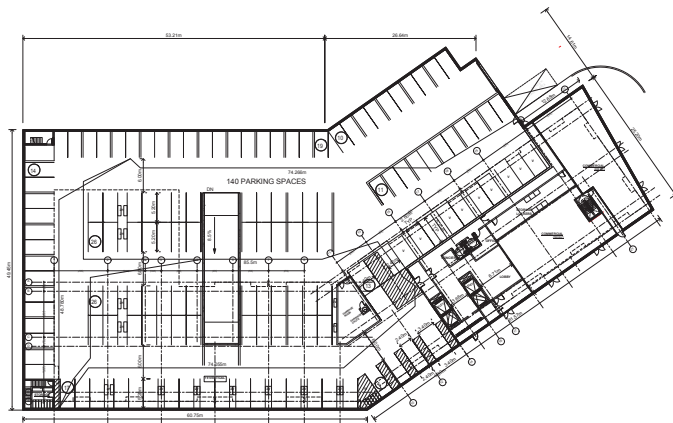


9TH-10TH FLOOR PLAN
1:200

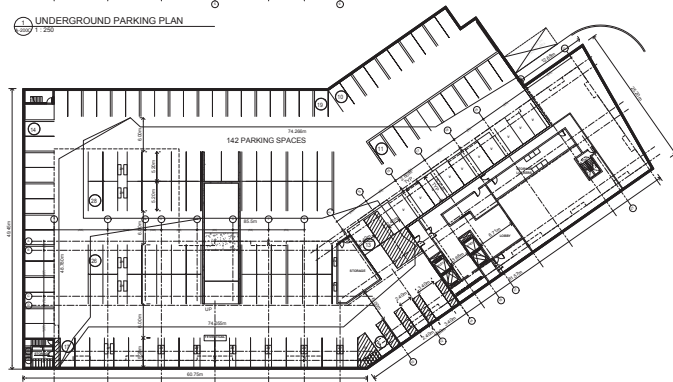


ROOF PLAN
1:200

<p>APPROVED FOR CONSTRUCTION</p>	
<p>DATE: 15/05/2024</p>	
<p>PROJECT: KANTAWER USE RESIDENTIAL PROJECT</p>	
<p>APARTMENT A&B FLOOR PLANS</p>	
<p>1:200</p>	
<p>19-048</p>	
<p>A-202A</p>	

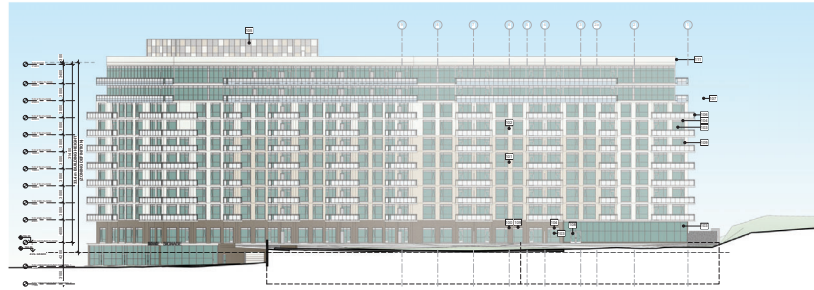


UNDERGROUND PARKING PLAN
1:200

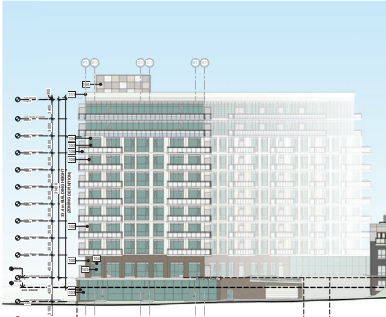


T/O UNDERGROUND PARKING 2
1:200

<p>APPROVED FOR CONSTRUCTION</p>	
<p>DATE: 15/05/2024</p>	
<p>PROJECT: KANTAWER USE RESIDENTIAL PROJECT</p>	
<p>APARTMENT C UNDERGROUND PLAN</p>	
<p>1:200</p>	
<p>19-048</p>	
<p>A-200C 1</p>	



North Elevation
1:250

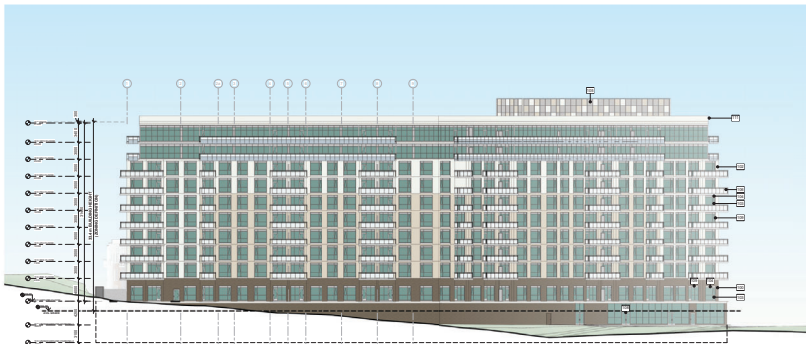


East Elevation
1:250

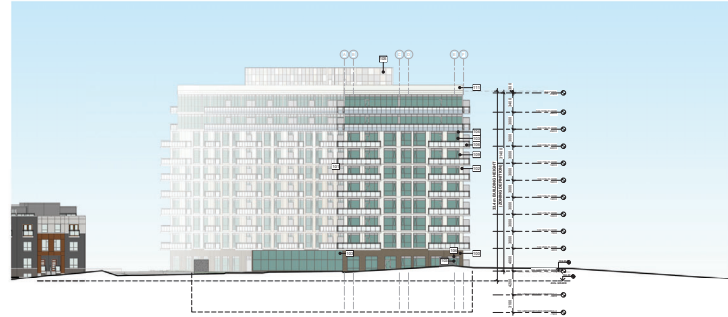
EXTERIOR ELEVATION LEGEND

- 100. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 101. PREFABRICATED WALLS AND PREFABRICATED STONE CLADDING - COLOUR: LIGHT GREY (TO MATCH EXISTING)
- 102. PREFABRICATED WALLS AND PREFABRICATED STONE CLADDING - COLOUR: LIGHT GREY (TO MATCH EXISTING)
- 103. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 104. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 105. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 106. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 107. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 108. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 109. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 110. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 111. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)

<p>APPROVED FOR CONSTRUCTION</p>	
<p>DATE: 15/08/2019</p>	
<p>PROJECT: KANTAKRUPA RESIDENTIAL PROJECT</p>	
<p>CLIENT: KANTAKRUPA DEVELOPERS</p>	
<p>ARCHITECT: FABIANI ARCHITECT LTD</p>	
<p>ENGINEER: KANTAKRUPA ENGINEERS</p>	
<p>CONTRACTOR: KANTAKRUPA CONSTRUCTION</p>	
<p>PROJECT NO: A-310C</p>	
<p>DATE: 15/08/2019</p>	
<p>SCALE: 1:250</p>	
<p>PROJECT NO: A-310C</p>	
<p>DATE: 15/08/2019</p>	
<p>SCALE: 1:250</p>	
<p>PROJECT NO: A-310C</p>	
<p>DATE: 15/08/2019</p>	
<p>SCALE: 1:250</p>	



South Elevation
1:250



West Elevation
1:250

EXTERIOR ELEVATION LEGEND

- 100. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 101. PREFABRICATED WALLS AND PREFABRICATED STONE CLADDING - COLOUR: LIGHT GREY (TO MATCH EXISTING)
- 102. PREFABRICATED WALLS AND PREFABRICATED STONE CLADDING - COLOUR: LIGHT GREY (TO MATCH EXISTING)
- 103. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 104. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 105. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 106. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 107. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 108. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 109. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 110. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)
- 111. UNPAINTED STEEL SHEETPIPER - COLOUR: BROWN/BLACKENED (NOT TO BE SEEN BY BUILDERS/WORKERS)

<p>APPROVED FOR CONSTRUCTION</p>	
<p>DATE: 15/08/2019</p>	
<p>PROJECT: KANTAKRUPA RESIDENTIAL PROJECT</p>	
<p>CLIENT: KANTAKRUPA DEVELOPERS</p>	
<p>ARCHITECT: FABIANI ARCHITECT LTD</p>	
<p>ENGINEER: KANTAKRUPA ENGINEERS</p>	
<p>CONTRACTOR: KANTAKRUPA CONSTRUCTION</p>	
<p>PROJECT NO: A-311C</p>	
<p>DATE: 15/08/2019</p>	
<p>SCALE: 1:250</p>	
<p>PROJECT NO: A-311C</p>	
<p>DATE: 15/08/2019</p>	
<p>SCALE: 1:250</p>	



APPENDIX B

Road Traffic Data

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

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

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

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

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



Turning Movement Count Diagram

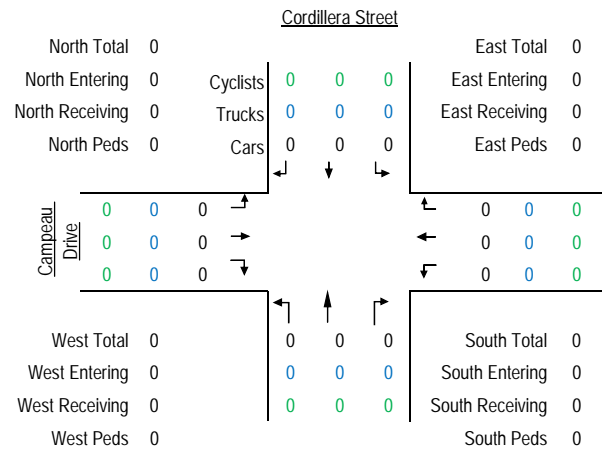
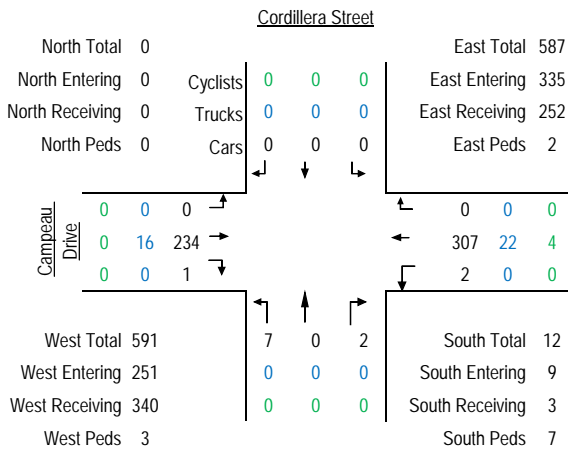
Intersection: Campeau Dr at Cordillera St
Municipality: Kanata, Ontario

Intersection ID:

Date: Tuesday September 22, 2020

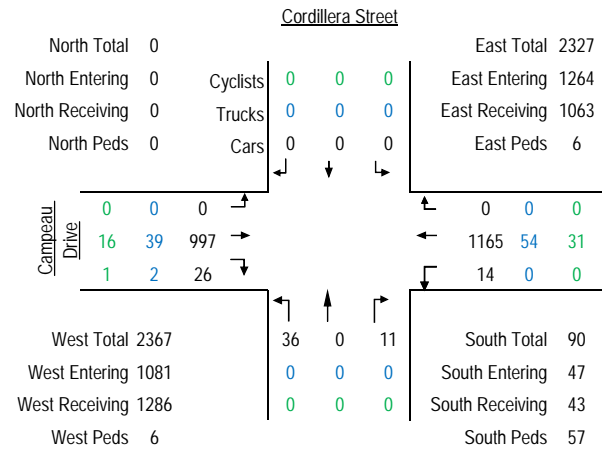
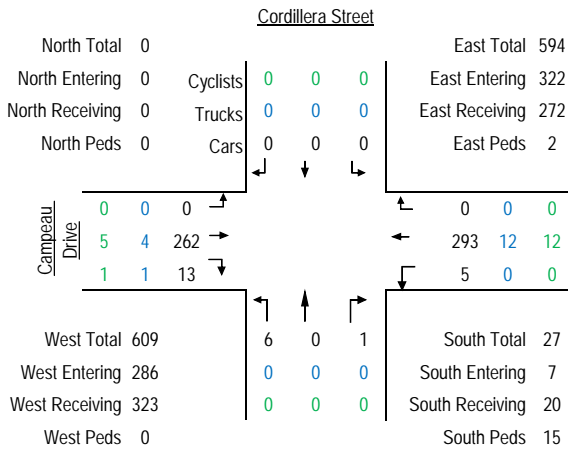
AM Peak Hour: 8:00 to 9:00

MD Peak Hour: - to -



PM Peak Hour: 16:00 to 17:00

Total 5-Hour Count





APPENDIX C

MECP Environmental Noise Guidelines

Ministry of the Environment, Conservation and Parks (MECP) Guideline Limits

Table 1 – Transportation Noise Criteria Summary

Space	Time Period	Criteria		
		Road ($L_{eq} - dBA$) ¹	Rail ($L_{eq} - dBA$) ¹	Aircraft (NEF/NEP) ²
General offices, reception areas, retail stores, etc.	07:00 – 23:00	50	45	15
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, libraries, theatres, places of worship etc.	07:00 – 23:00	45	40	5
	23:00 – 07:00 ³	45	40	
Individual or semi-private offices, conference rooms, etc.	07:00 – 23:00	45	40	10
Sleeping Quarters of residences, hospitals, nursing/retirement homes, etc.	07:00 – 23:00	45	40	0
	23:00 – 07:00	40	35	
Sleeping Quarters of hotels/motels	23:00 – 07:00	45	40	5
Outdoor Living Area	07:00 – 23:00	55 ⁴		30

- Notes:
1. L_{eq} – Energy equivalent continuous sound level over the specified time period.
 2. NEF – Noise Exposure Forecast and NEP – Noise Exposure Projection contours are determined by methods approved by Transport Canada and apply over the full 24-hour period. Indoor values are representative of the indoor sound levels and are used as assessment criteria for the evaluation of acoustic insulation requirements.
 3. Schools, daycare centres, libraries, theatres and places of worship have no criteria during in the nighttime time period.
 4. Up to 5dB excess above the criteria is allowed if noise control measures are not feasible for technical, economic or administrative reasons with appropriate Warning Clauses included on occupancy agreements.

Source: Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, publication NPC-300, August 2013



APPENDIX D

Sample Calculations

Filename: 10fsecef.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15000
Percentage of Annual Growth : 2.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Campeau (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 : 137.50 / 137.50 m
Receiver height : 30.50 / 30.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: C. Shield (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 2.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: C. Shield (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 : 16.00 / 16.00 m
Receiver height : 30.50 / 30.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Cordillera (day/night)

Car traffic volume : 987/86 veh/TimePeriod *
Medium truck volume : 79/7 veh/TimePeriod *
Heavy truck volume : 56/5 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 2 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 1000
Percentage of Annual Growth : 2.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Cordillera (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 : 14.70 / 14.70 m
Receiver height : 30.50 / 30.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 4: 417 WB (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 2.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 4: 417 WB (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 387.30 / 387.30 m
Receiver height : 30.50 / 30.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 5: 417 EB (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 2.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 5: 417 EB (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 422.80 / 422.80 m
Receiver height : 30.50 / 30.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Campeau (day)

Source height = 1.50 m

ROAD (0.00 + 55.85 + 0.00) = 55.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	68.48	0.00	-9.62	-3.01	0.00	0.00	0.00	55.85

Segment Leq : 55.85 dBA

Results segment # 2: C. Shield (day)

Source height = 1.50 m

ROAD (0.00 + 60.66 + 0.00) = 60.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	63.96	0.00	-0.28	-3.01	0.00	0.00	0.00	60.66

Segment Leq : 60.66 dBA

Results segment # 3: Cordillera (day)

Source height = 1.49 m

ROAD (0.00 + 56.55 + 0.00) = 56.55 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.46	0.00	0.09	0.00	0.00	0.00	0.00	56.55

Segment Leq : 56.55 dBA

Results segment # 4: 417 WB (day)

Source height = 1.50 m

ROAD (0.00 + 64.27 + 0.00) = 64.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	81.40	0.00	-14.12	-3.01	0.00	0.00	0.00	64.27

Segment Leq : 64.27 dBA

Results segment # 5: 417 EB (day)

Source height = 1.50 m

ROAD (0.00 + 63.89 + 0.00) = 63.89 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	81.40	0.00	-14.50	-3.01	0.00	0.00	0.00	63.89

Segment Leq : 63.89 dBA

Total Leq All Segments: 68.53 dBA

Results segment # 1: Campeau (night)

Source height = 1.50 m

ROAD (0.00 + 48.25 + 0.00) = 48.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	60.88	0.00	-9.62	-3.01	0.00	0.00	0.00	48.25

Segment Leq : 48.25 dBA

Results segment # 2: C. Shield (night)

Source height = 1.50 m

ROAD (0.00 + 53.07 + 0.00) = 53.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	56.36	0.00	-0.28	-3.01	0.00	0.00	0.00	53.07

Segment Leq : 53.07 dBA

Results segment # 3: Cordillera (night)

Source height = 1.50 m

ROAD (0.00 + 49.05 + 0.00) = 49.05 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	48.97	0.00	0.09	0.00	0.00	0.00	0.00	49.05

Segment Leq : 49.05 dBA

Results segment # 4: 417 WB (night)

Source height = 1.49 m

ROAD (0.00 + 56.67 + 0.00) = 56.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	73.80	0.00	-14.12	-3.01	0.00	0.00	0.00	56.67

Segment Leq : 56.67 dBA

Results segment # 5: 417 EB (night)

Source height = 1.49 m

ROAD (0.00 + 56.29 + 0.00) = 56.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	73.80	0.00	-14.50	-3.01	0.00	0.00	0.00	56.29

Segment Leq : 56.29 dBA

Total Leq All Segments: 60.93 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.53
(NIGHT): 60.93

Filename: 10fsecsf.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: C. Shield (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 2.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: C. Shield (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 : 16.00 / 16.00 m
Receiver height : 30.50 / 30.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Kanata (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15000
Percentage of Annual Growth : 2.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Kanata (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 : 234.50 / 234.50 m
Receiver height : 30.50 / 30.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: 417 WB (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 2.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: 417 WB (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 : 387.30 / 387.30 m
Receiver height : 30.50 / 30.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 4: 417 EB (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 2.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 4: 417 EB (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 : 422.80 / 422.80 m
Receiver height : 30.50 / 30.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: C. Shield (day)

Source height = 1.50 m

ROAD (0.00 + 63.68 + 0.00) = 63.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.96	0.00	-0.28	0.00	0.00	0.00	0.00	63.68

Segment Leq : 63.68 dBA

Results segment # 2: Kanata (day)

Source height = 1.50 m

ROAD (0.00 + 53.53 + 0.00) = 53.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	68.48	0.00	-11.94	-3.01	0.00	0.00	0.00	53.53

Segment Leq : 53.53 dBA

Results segment # 3: 417 WB (day)

Source height = 1.50 m

ROAD (0.00 + 67.28 + 0.00) = 67.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	81.40	0.00	-14.12	0.00	0.00	0.00	0.00	67.28

Segment Leq : 67.28 dBA

Results segment # 4: 417 EB (day)

Source height = 1.50 m

ROAD (0.00 + 66.90 + 0.00) = 66.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	81.40	0.00	-14.50	0.00	0.00	0.00	0.00	66.90

Segment Leq : 66.90 dBA

Total Leq All Segments: 71.07 dBA

Results segment # 1: C. Shield (night)

Source height = 1.50 m

ROAD (0.00 + 56.08 + 0.00) = 56.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.36	0.00	-0.28	0.00	0.00	0.00	0.00	56.08

Segment Leq : 56.08 dBA

Results segment # 2: Kanata (night)

Source height = 1.50 m

ROAD (0.00 + 45.93 + 0.00) = 45.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	60.88	0.00	-11.94	-3.01	0.00	0.00	0.00	45.93

Segment Leq : 45.93 dBA

Results segment # 3: 417 WB (night)

Source height = 1.49 m

ROAD (0.00 + 59.68 + 0.00) = 59.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	73.80	0.00	-14.12	0.00	0.00	0.00	0.00	59.68

Segment Leq : 59.68 dBA

Results segment # 4: 417 EB (night)

Source height = 1.49 m

ROAD (0.00 + 59.30 + 0.00) = 59.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	73.80	0.00	-14.50	0.00	0.00	0.00	0.00	59.30

Segment Leq : 59.30 dBA

Total Leq All Segments: 63.47 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 71.07
(NIGHT): 63.47

Filename: b7neola.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15000
Percentage of Annual Growth : 2.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Campeau (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 : 32.70 / 32.70 m
Receiver height : 1.50 / 11.30 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 1.60 m
Elevation : 9.80 m
Barrier receiver distance : 3.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 9.80 m
Barrier elevation : 9.80 m
Reference angle : 0.00

Road data, segment # 2: Cordillera (day/night)

Car traffic volume : 987/86 veh/TimePeriod *
Medium truck volume : 79/7 veh/TimePeriod *
Heavy truck volume : 56/5 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 1000
Percentage of Annual Growth : 2.00

Number of Years of Growth : 10.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

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

```

-----
Angle1 Angle2 : -60.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 19.70 / 19.70 m
Receiver height : 1.50 / 4.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -60.00 deg Angle2 : 90.00 deg
Barrier height : 1.50 m
Elevation : 9.80 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 0.00 m
Receiver elevation : 9.80 m
Barrier elevation : 9.80 m
Reference angle : 0.00
  
```

Results segment # 1: Campeau (day)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.50 ! 1.50 ! 0.60 ! 10.40
  
```

ROAD (0.00 + 54.96 + 0.00) = 54.96 dBA

```

-----
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
-90 90 0.27 68.48 0.00 -4.30 -0.70 0.00 0.00 -8.52 54.96
-----
  
```

Segment Leq : 54.96 dBA

Results segment # 2: Cordillera (day)

Source height = 1.49 m

Barrier height for grazing incidence

```

-----
Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.49 ! 1.50 ! 0.01 ! 9.81
  
```

ROAD (0.00 + 42.69 + 0.00) = 42.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-60	90	0.00	55.79	0.00	-1.18	-0.79	0.00	0.00	-11.12	42.69

Segment Leq : 42.69 dBA

Total Leq All Segments: 55.21 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.21