

May 26, 2020

Mattamy Homes
50 Hines Road, Suite 100
Ottawa, Ontario
K2K 2M5

Attention: Jillian Normand
Jillian.Normand@mattamycorp.com

VIA E-MAIL

**Re: Addendum #1 to the Transportation Noise Assessment
Wateridge Village – Phase 1B
Block 22
Ottawa, Ontario
VCL File: 117-0363-030**

Dear Ms. Normand:

1.0 INTRODUCTION

Valcoustics Canada Ltd. (VCL) previously prepared a Transportation Noise Assessment report (herein referred to as the “Noise Report”), dated December 14, 2017, for Blocks 15, 22 and 24 in Wateridge Village – Phase 1B. This Addendum has been prepared to update the analysis using the revised Site Plan for Block 22.

From an acoustical perspective, the changes to the Site Plan are minor. The changes with an impact on the Noise Report are:

- The townhouse blocks have been shifted a small distance (approximately 1 m) relative to the roadways;
- The numbering for Blocks 3 and 4 has been reversed. In the current plan, Blocks 3 and 4 are at the southeast and southwest corners of the site, respectively; and
- The townhouse block at the southeast corner of the site (Townhouse Block 3 in the current Site Plan) has been changed from back-to-back units to rear-lane units.

The analysis is based on the Block 22 Site Plan, prepared by Korsiak Urban Planning, last revised May 4, 2020. The Site Plan is included as Figure 1.

2.0 ASSESSMENT

2.1 NOISE SOURCES

The main road traffic noise sources with the potential for impact at the subject site at Block 22 are

Montreal Road, Hemlock Road, Codds Road, Burma Road and Mikinak Road. The ultimate traffic data for these roadways remains unchanged from the previous Noise Report. The data is summarized in Table 1 below.

2.2 NOISE IMPACT ASSESSMENT

Using the road traffic data in Table 1, the sound levels, in terms of $L_{eq\ Day}$ and $L_{eq\ Night}$, were determined using STAMSON V5.04 – ORNAMENT, the computerized road traffic noise prediction model of the Ministry of the Environment, Conservation and Parks (MECP).

The receptor heights remain unchanged from the Noise Report. The sound levels at the rear lane townhouses (Townhouse Blocks 1, 2, and 3) were assessed at a height of 12.9 m above grade. The sound levels at the back-to-back townhouses (Block 4) were assessed at a height of 12.7 m above grade.

Inherent screening of each building face due to its orientation to the noise sources was taken into account. To be consistent with the previous analysis, screening from the proposed dwellings at Blocks 15 and 24 was also taken into account. However, screening from other development blocks within Wateridge Village was not included in the assessment.

The highest daytime and nighttime sound levels of 67 dBA and 60 dBA, respectively, are predicted to occur at the north façades of Townhouse Blocks 1 and 2.

Table 2 summarizes the predicted sound levels outdoors at specific locations. Note that Table 2 shows the contributions from each of the roadways as well as the total sound level at each location. The sound level calculations are presented in Appendix A.

3.0 NOISE ABATEMENT REQUIREMENTS

The noise control measures can generally be classified into two categories which are interrelated, but which the designer can treat separately for the most part:

- (a) Architectural elements to achieve acceptable indoor noise guidelines;
- (b) Design features to protect the OLA's.

Noise abatement requirements are summarized in Table 3 and the notes to Table 3.

3.1 INDOORS

The indoor noise exposure guidelines can be achieved by using appropriate construction for exterior walls, windows and doors. The specific STC requirements of these building components will depend on the wall and window areas relative to the floor areas of the associated rooms. Since building plans have not yet been established for this development, it is not possible to calculate the specific STC requirements at this time. However, based on the predicted sound levels, upgraded exterior window construction is anticipated at all dwellings adjacent to Hemlock Road. Specific STC requirements for walls and windows should be determined once block/lot-

specific architectural plans are available. This would likely be a condition of site plan approval or a condition of building permit.

To assess the feasibility of meeting the indoor noise criteria, a sample calculation was done at a worst-case location (Townhouse Block 1, Unit 1) adjacent to Hemlock Road. The daytime sound level at the north facade of this unit is predicted to be 67 dBA. The daytime sound level at the west facade is predicted to be 64 dBA.

A typical corner bedroom with windows on both the northwest and northeast facades could be expected to have wall and window areas that are 80% and 30%, respectively, of the associated floor area, on each façade. Using the analysis procedures outlined in Building Practice Note BPN 56, “Controlling Sound Transmission Into Buildings”, as well as the assumed bedroom dimensions, the STC requirements for elements of the building envelope were assessed. To meet the indoor noise criteria, exterior wall construction meeting STC 37 (typical construction meeting the non-acoustical requirements of the Ontario Building Code) and exterior windows meeting STC 27 can be used. If wall constructions exceeding STC 37 are used (for example masonry), window STC requirements may be reduced. It is noted that windows with higher STC ratings may be required if the wall and window dimensions are greater than those used in this sample calculation. It is anticipated that dwellings farther setback from the roadways would have lower STC requirements due to the lower sound levels at the building facades. Calculation details are shown in Appendix B.

As outlined in NPC-300, where the sound level on the outside of a window is greater than 60 dBA during the night or 65 dBA during the day, ventilation provisions must be made to permit the windows to remain closed. A commonly used technique is to provide central air conditioning. As Townhouse Blocks 1 and 2 exceed 65 dBA, air conditioning is mandatory at these dwellings.

Where the nighttime sound levels are between 51 dBA and 60 dBA (or the daytime sound level is between 56 dBA and 65 dBA), the provision for the addition of air conditioning at the occupant’s discretion is required. In practice, this means forced air heating with adequately sized ductwork. The provision for adding air conditioning is required at Blocks 3 and 4.

3.2 OUTDOORS

There are no grade-level outdoor amenity areas associated with the dwellings.

All balconies and terraces are expected to be less than 4 m in depth and therefore do not qualify as OLA’s under the noise guidelines. Thus, sound barriers are not required at these locations for noise control purposes.

3.3 WARNING CLAUSES

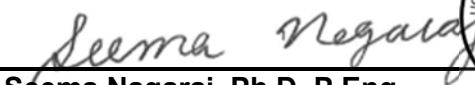

Where the sound level guidelines are exceeded, appropriate warning clauses should be registered on title and included on Offers of Purchase and Sale to make future occupants aware of the potential noise situation. Lots requiring warning clauses and the wording for the City of Ottawa warning clauses are given in Table 3 and the notes to Table 3. Note, warning clauses in the ENCG have ventilation and sound barrier requirements grouped together. The ventilation and sound barrier requirements have been separated for use in Table 3 but the wording has been



maintained.

If you have any questions, please let us know.

Yours truly,

VALCOUSTICS CANADA LTD.

Per:   May 25, 2020
Seema Nagaraj, Ph.D, P.Eng.

Per:   May 25, 2020
Ian Matthew, M.Sc., P.Eng.

SNILM

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Enclosures

TABLE 1: ROAD TRAFFIC DATA

Roadway	Classification	Ultimate AADT	% Trucks		Speed Limit (kph)	Day / Night Split (%)
			Medium	Heavy		
Hemlock Road	2-UMCU	12 000	7	5	50	92/8
Codd's Road	2-UMCU	12 000	7	5	50	92/8
Burma Road	2-UMCU	12 000	7	5	50	92/8
Mikinak Road	2-UCU	8 000	7	5	50	92/8

Notes:

- (1) As per Appendix B of the City of Ottawa "Environmental Noise Control Guidelines" dated January 2018.

TABLE 2: PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS

Location ⁽¹⁾	Source	Leq Day (dBA) ⁽²⁾	Leq Night (dBA) ⁽²⁾
Block 1 – Unit 1 (North Façade)	Hemlock Road	67	60
	Burma Road	47	39
	Codd's Road	47	40
	TOTAL	67	60
Block 2 – Unit 6 67(North Façade)	16	67	60
	302	48	40
	332	46	38
	TOTAL	67	60
Block 3 – Unit 1 (East Façade)	43	57	50
	113	51	44
	TOTAL	58	51
Block 4 – Units 1A/1B (West Façade)	41	60	53
	115	50	43
	272	50	42
	TOTAL	61	53

Notes:

- (1) See Figure 1.
- (2) Daytime and nighttime sound levels at Blocks 1 to 3 were assessed at a top floor height of 12.9 m above grade. Daytime and nighttime sound levels at Block 4 were assessed at a top floor height of 12.7 m above grade.

TABLE 3: NOISE ABATEMENT MEASURES

Location	Air Conditioning ⁽¹⁾	Exterior Wall and Window ⁽²⁾	Sound Barrier ⁽³⁾	Warning Clauses ⁽⁴⁾
Townhouse Blocks 1 and 2	Mandatory	Upgraded window construction is expected	None	A + C + D
Townhouse Blocks 3 and 4	Provision for adding	Upgraded construction may be required	None	A + B + D

Notes:

- (1) Where means must be provided to allow windows to remain closed for noise control purposes, a commonly used technique is that of central air conditioning. Where possible, air cooled condenser units, if any, should be located in a noise insensitive area.
- Provision for air conditioning would correspond to a ducted, forced air heating system, which would allow the addition of central air conditioning at a later date by the occupant.
- (2) STC - Sound Transmission Class Rating (Reference ASTM-E413). Values are based on the elevation and floor plan drawings, prepared by Q4 Architects, dated 02/01/2019.
- (3) Sound barriers must be of solid construction having a minimum face density of 20 kg/m² with no gaps or cracks. Earthen berms, solid fences or combinations of berms/fences are acceptable.
- (4) Warning clauses to be registered on title and be included in Offers of Purchase and Sale for designated lots:
- A. "The Transferee, for himself, his heirs, executors, administrators, successors and assigns acknowledge being advised that despite the inclusion of noise control features in the development and/or within the building unit sound levels due to increasing road traffic may occasionally interfere with some indoor and/or outdoor activities of the dwelling occupants as the sound levels may at times exceed the sound level limits of the City of Ottawa and the Ministry of the Environment and Climate Change noise criteria."
- "This development includes a number of measures to help reduce noise impacts, listed below. To ensure that provincial and municipal sound level limits are not exceeded and/or to keep sound levels as low as possible it is important to maintain the sound attenuation features provided."
- "This development includes building and street orientation to help increase setback distances to major noise sources and shield some rear yards from excessive noise levels."
- 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 by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment."
- "The building components of this dwelling unit (walls, windows and exterior doors) have been designed to provide acoustic insulation so that, when windows and exterior doors are closed, the indoor sound levels are within the sound level limits of the City of Ottawa and the Ministry of Environment and Climate Change. The details of this building component design are available by contacting the builder of this unit."
- C. "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 City and the Ministry of the Environment."
- "The building components of this dwelling unit (walls, windows and exterior doors) have been designed to provide acoustic insulation so that, when windows and exterior doors are closed, the indoor sound levels are within the sound level limits of the City of Ottawa and the Ministry of Environment and Climate Change. The details of this building component design are available by contacting the builder of this unit."

- D. "The Transferee, for himself, his heirs, executors, administrators, successors and assigns acknowledge being additionally advised that due to the proximity of the Rockcliffe Airport, sound levels from the airport may at times be audible"
- (6) Conventional ventilated attic roof construction meeting OBC requirements is satisfactory.
- (7) All exterior doors shall be fully weatherstripped.

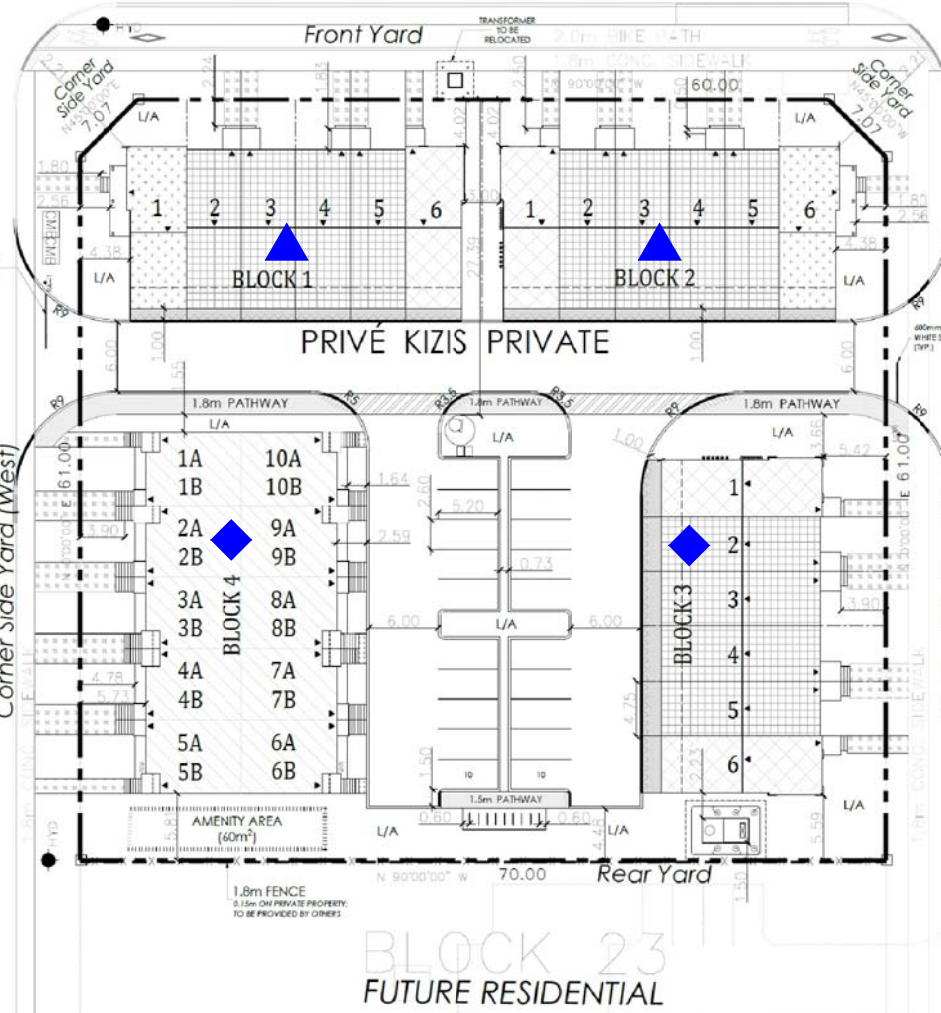
LEGEND

- ▲ Mandatory Air Conditioning
- ◆ Provision for Adding Air Conditioning

FUTURE RESIDENTIAL

MICHAEL STOQUA STREET 20m

Corner Side Yard (West)



Corner Side Yard (East)

MOSES TENNISCO STREET 20m

FUTURE RESIDENTIAL

BASE DRAWING BY KORSIAK URBAN PLANNING

No.	Revision/Issue	Date



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Title	Block 22 Site Plan and Noise Mitigation Requirements
Project Name	Wateridge Village - Phase 1B - Block 15

Project No.	117-0363-030
Scale	N.T.S.

Date	May 7, 2020
Figure	1

APPENDIX A

SOUND LEVEL CALCULATIONS

Filename: bl_1_nf.te Time Period: Day/Night 16/8 hours
Description: Block 1, Unit 1 - North Facade

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 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): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Hemlock (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 : 12.90 / 12.90 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 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): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg 25.00 deg


```
-----
-90      25      0.32  67.51    0.00 -18.19  -2.58   0.00   0.00   0.00  46.74
-----
```

Segment Leq : 46.74 dBA

Results segment # 3: Cods (day)

Source height = 1.50 m

```
ROAD (0.00 + 47.14 + 0.00) = 47.14 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj  SubLeq
-----
      0      90      0.32  67.51    0.00 -16.55  -3.82   0.00   0.00   0.00  47.14
-----
```

Segment Leq : 47.14 dBA

Total Leq All Segments: 67.31 dBA

Results segment # 1: Hemlock (night)

Source height = 1.50 m

```
ROAD (0.00 + 59.63 + 0.00) = 59.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj  SubLeq
-----
     -90      90      0.00  59.91    0.00  -0.28   0.00   0.00   0.00   0.00  59.63
-----
```

Segment Leq : 59.63 dBA

Results segment # 2: Burma (night)

Source height = 1.50 m

```
ROAD (0.00 + 39.14 + 0.00) = 39.14 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj  SubLeq
-----
     -90      25      0.32  59.91    0.00 -18.19  -2.58   0.00   0.00   0.00  39.14
-----
```

Segment Leq : 39.14 dBA

Results segment # 3: Cods (night)

Source height = 1.50 m

```
ROAD (0.00 + 39.55 + 0.00) = 39.55 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj  SubLeq
-----
      0      90      0.32  59.91    0.00 -16.55  -3.82   0.00   0.00   0.00  39.55
-----
```

Segment Leq : 39.55 dBA

Total Leq All Segments: 59.71 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.31
(NIGHT): 59.71

Filename: b2_6_nf.te Time Period: Day/Night 16/8 hours
Description: Block 2, Unit 6 - North Facade

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 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): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Hemlock (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 : 12.90 / 12.90 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 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): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg 25.00 deg

Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 302.00 / 302.00 m
 Receiver height : 12.90 / 12.90 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

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

 Car traffic volume : 9715/845 veh/TimePeriod *
 Medium truck volume : 773/67 veh/TimePeriod *
 Heavy truck volume : 552/48 veh/TimePeriod *
 Posted speed limit : 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): 12000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Codsds (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 : 332.00 / 332.00 m
 Receiver height : 12.90 / 12.90 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Hemlock (day)

 Source height = 1.50 m

ROAD (0.00 + 67.23 + 0.00) = 67.23 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.51	0.00	-0.28	0.00	0.00	0.00	0.00	67.23

Segment Leq : 67.23 dBA

Results segment # 2: Burma (day)

 Source height = 1.50 m

ROAD (0.00 + 47.75 + 0.00) = 47.75 dBA

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

-90 25 0.32 67.51 0.00 -17.19 -2.58 0.00 0.00 0.00 47.75

Segment Leq : 47.75 dBA

Results segment # 3: Coods (day)

Source height = 1.50 m

ROAD (0.00 + 45.96 + 0.00) = 45.96 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 0 90 0.32 67.51 0.00 -17.73 -3.82 0.00 0.00 0.00 45.96

Segment Leq : 45.96 dBA

Total Leq All Segments: 67.31 dBA

Results segment # 1: Hemlock (night)

Source height = 1.50 m

ROAD (0.00 + 59.63 + 0.00) = 59.63 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 -90 90 0.00 59.91 0.00 -0.28 0.00 0.00 0.00 0.00 59.63

Segment Leq : 59.63 dBA

Results segment # 2: Burma (night)

Source height = 1.50 m

ROAD (0.00 + 40.15 + 0.00) = 40.15 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 -90 25 0.32 59.91 0.00 -17.19 -2.58 0.00 0.00 0.00 40.15

Segment Leq : 40.15 dBA

Results segment # 3: Coods (night)

Source height = 1.50 m

ROAD (0.00 + 38.36 + 0.00) = 38.36 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 0 90 0.32 59.91 0.00 -17.73 -3.82 0.00 0.00 0.00 38.36

Segment Leq : 38.36 dBA

Total Leq All Segments: 59.71 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.31
(NIGHT): 59.71

Filename: b3_1_ef.te Time Period: Day/Night 16/8 hours
Description: Block 3, Unit 1 - East Facade

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 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): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 0.00 deg 50.00 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 : 12.90 / 12.90 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Mikinak (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 : 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): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -20.00 deg 90.00 deg

Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 113.00 / 113.00 m
 Receiver height : 12.90 / 12.90 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Hemlock (day)

Source height = 1.50 m

ROAD (0.00 + 57.37 + 0.00) = 57.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.00	67.51	0.00	-4.57	-5.56	0.00	0.00	0.00	57.37

Segment Leq : 57.37 dBA

Results segment # 2: Mikinak (day)

Source height = 1.50 m

ROAD (0.00 + 51.39 + 0.00) = 51.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	90	0.32	65.75	0.00	-11.56	-2.80	0.00	0.00	0.00	51.39

Segment Leq : 51.39 dBA

Total Leq All Segments: 58.35 dBA

Results segment # 1: Hemlock (night)

Source height = 1.50 m

ROAD (0.00 + 49.78 + 0.00) = 49.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.00	59.91	0.00	-4.57	-5.56	0.00	0.00	0.00	49.78

Segment Leq : 49.78 dBA

Results segment # 2: Mikinak (night)

Source height = 1.50 m

ROAD (0.00 + 43.80 + 0.00) = 43.80 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.00	59.91	0.00	-4.57	-5.56	0.00	0.00	0.00	43.80

-20 90 0.32 58.16 0.00 -11.56 -2.80 0.00 0.00 0.00 43.80

Segment Leq : 43.80 dBA

Total Leq All Segments: 50.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.35
(NIGHT): 50.76

Filename: b4_la_wf.te Time Period: Day/Night 16/8 hours
Description: Block 4, Unit 1A/1B - West Facade

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 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): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Hemlock (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 : 41.00 / 41.00 m
Receiver height : 12.70 / 12.70 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Mikinak (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 : 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): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Mikinak (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 : 115.00 / 115.00 m
 Receiver height : 12.70 / 12.70 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

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

 Car traffic volume : 9715/845 veh/TimePeriod *
 Medium truck volume : 773/67 veh/TimePeriod *
 Heavy truck volume : 552/48 veh/TimePeriod *
 Posted speed limit : 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): 12000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Codsds (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 : 272.00 / 272.00 m
 Receiver height : 12.70 / 12.70 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Hemlock (day)

 Source height = 1.50 m

ROAD (0.00 + 60.13 + 0.00) = 60.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	67.51	0.00	-4.37	-3.01	0.00	0.00	0.00	60.13

Segment Leq : 60.13 dBA

Results segment # 2: Mikinak (day)

 Source height = 1.50 m

ROAD (0.00 + 50.20 + 0.00) = 50.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	67.51	0.00	-4.37	-3.01	0.00	0.00	0.00	60.13

```
-----
      0      90      0.32  65.75      0.00 -11.71  -3.83      0.00      0.00      0.00  50.20
-----
```

Segment Leq : 50.20 dBA

Results segment # 3: Codds (day)

Source height = 1.50 m

```
ROAD (0.00 + 50.03 + 0.00) = 50.03 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----
     -90      90      0.32  67.51      0.00 -16.66  -0.82      0.00      0.00      0.00  50.03
-----
```

Segment Leq : 50.03 dBA

Total Leq All Segments: 60.92 dBA

Results segment # 1: Hemlock (night)

Source height = 1.50 m

```
ROAD (0.00 + 52.53 + 0.00) = 52.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----
     -90       0      0.00  59.91      0.00  -4.37  -3.01      0.00      0.00      0.00  52.53
-----
```

Segment Leq : 52.53 dBA

Results segment # 2: Mikinak (night)

Source height = 1.50 m

```
ROAD (0.00 + 42.61 + 0.00) = 42.61 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----
       0      90      0.32  58.16      0.00 -11.71  -3.83      0.00      0.00      0.00  42.61
-----
```

Segment Leq : 42.61 dBA

Results segment # 3: Cods (night)

Source height = 1.50 m

```
ROAD (0.00 + 42.43 + 0.00) = 42.43 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----
     -90      90      0.32  59.91      0.00 -16.66  -0.82      0.00      0.00      0.00  42.43
-----
```


Segment Leq : 42.43 dBA

Total Leq All Segments: 53.32 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.92
(NIGHT): 53.32

APPENDIX B

STC CALCULATION

Find/Change Required STC for Components

07-May-20

File # 17-0363-030

Indoor Sound Level 45 dB(A)
 Room Absorption Category Intermediate
 Outdoor Sound Level 67 dB(A) +3dB = 70 dB(A) (plus 0 dB from Table 2 to for 0 to 90 Degrees) for surface 1 (North)
 64 dB(A) +3dB = 67 dB(A) (plus 0 dB from Table 2 to for 0 to 90 Degrees) for surface 2 (West)
 Spectrum D (Mixed Road Traffic, or Distant Aircraft)
 Calc Location Block 1 Unit 1

Components:	Surf.	After Step 2	From Table 3 (% Energy)	From Table 4 (% floor area)	From Table 5 (spectrum)	STC	Calc
1 North (8 , Exterior Wall)	1	25	5.0 (32 %)	0.0 (80 %)	7.0	37	By STC
2 West (8 , Exterior Wall)	2	22	8.0 (16 %)	0.0 (80 %)	7.0	37	By STC
3 North (4 , Window, openable thin, dou)	1	25	4.7 (34 %)	-4.3 (30 %)	2.0	27	By Energy
4 West (4 , Window, openable thin, dou)	2	22	7.3 (19 %)	-4.3 (30 %)	2.0	27	By STC