



REPORT
PROJECT: 137175-6.04-01

ENVIRONMENTAL NOISE IMPACT ASSESSMENT 4840 BANK STREET



Prepared for Regional Group
by IBI Group

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Table of Contents

1	Introduction.....	1
2	Background.....	2
2.1	Noise Sources.....	2
2.1.1	Transportation (Dynamic) Noise	2
2.1.2	Stationary Noise.....	2
2.2	Sound Level Limits for Road & Rail Traffic.....	2
2.2.1	Indoor sound level criterion – ventilation and warning clause requirements	3
2.2.2	Outdoor sound level criterion	3
2.2.3	Indoor Sound Level Criterion – Building Components.....	3
2.3	Sound Level Limits for Aircraft Noise.....	4
2.4	Sound Level Limits for Stationary Noise.....	4
3	Roadway Noise	5
3.1	Road & Rail Traffic Data	5
3.2	Traffic Noise Calculation Methods	5
3.3	Stationary Noise Calculation Methods.....	7
3.3.1	On-Site Stationary Noise	7
3.3.2	Off-Site Stationary Noise	7
4	Abatement Measures	8
4.1	Indoor Sound Levels	8
4.2	Outdoor Living Area (OLA)	8
4.3	Building Components.....	9
4.4	Aircraft Sound Levels.....	9
4.5	Stationary Noise Sound Levels.....	10
4.5.1	Physical Mitigation	10
4.5.2	Class 4 Designation	10
5	Summary of Attenuation Measures	11
5.1	Warning Clauses.....	11
5.2	Ventilation Requirements and Building Components	12
5.3	Noise Barrier	12
6	Conclusion	12
7	Professional Authorization	12

List of Tables

Table 1 – MECP Stationary Noise Level Criteria.....	4
Table 2 – Traffic & Road Data Summary.....	5
Table 3 – Unattenuated Noise Levels at Building Face.....	6
Table 4 – Unattenuated Noise Levels at OLA	6
Table 5 – Unattenuated Noise Levels from On-site Stationary Sources Daytime (dBA)	7
Table 6 – Unattenuated Noise Levels from On-site Stationary Sources Nighttime (dBA) ..	7
Table 7 – Unattenuated Noise Levels from Off-site Stationary Sources Daytime (dBA)	8
Table 8 – Unattenuated Noise Levels from Off-site Stationary Sources Nighttime (dBA) ..	8
Table 9 – Sound Transmission Class (STC) Ratings	9
Table 10 – Attenuated Noise Levels from Off-site Stationary Sources Daytime (dBA).....	10
Table 11 – Attenuated Noise Levels from Off-site Stationary Sources Nighttime (dBA)...	10
Table 12 – Warning Clause Summary	11

List of Appendices

Appendix A – Noise Calculations
Appendix B – Architectural Drawings
Appendix C – STC Calculations
Appendix D – Data Sheets

List of Figures & Drawings

Figure 1 – Site Location
Figure 2 – Unattenuated On-Site Stationary Noise
Figure 3 – Unattenuated Off-Site Stationary Noise
Figure 4 – Attenuated Off-Site Stationary Noise
Noise Plan – 137175-N1

1 Introduction

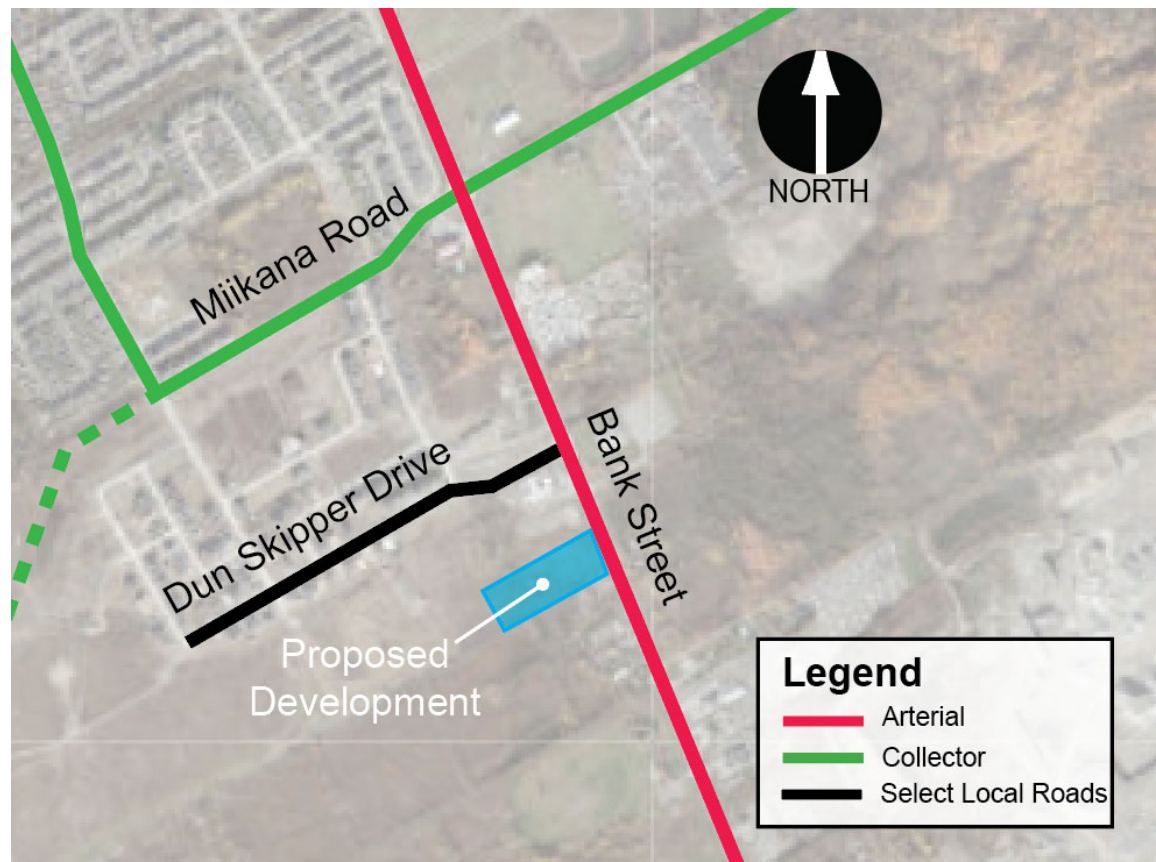
This Environmental Noise Impact Assessment has been prepared in support of a Site Plan Control application for a proposed high-rise residential development at 4840 Bank Street within the Leitrim community of Ottawa. This study evaluated the expected noise levels from transportation (dynamic) noise sources from the adjacent road network, as well as on- and off-site stationary noise sources. The results of the noise analysis conducted for this study helped to inform recommendations regarding appropriate warning clauses and associated noise abatement measures to include in the Tenancy Agreement for each dwelling unit.

The proposed development consists of three, four-storey residential buildings, with a total of 180 dwelling units, divided evenly amongst the three buildings. Buildings 'A' and 'B' are proposed to flank Bank Street and will receive the highest level of noise exposure from this major arterial roadway within the City of Ottawa.

The subject property is approximately 1.5 hectares in size, and is bound by Bank Street to the east, the 4836 Bank Street commercial development to the north, as well as undeveloped greenfield lands and low- to mid-rise residential uses which are currently under construction to the west. The southern property line coincides with the City's current Urban Boundary.

The site location and its surrounding context are shown in **Figure 1** below.

Figure 1 – Site Location



2 Background

2.1 Noise Sources

2.1.1 Transportation (Dynamic) Noise

The study area is primarily subjected to roadway noise from Bank Street which abuts the site to the east. There are no other collector or higher-order roadways within close enough proximity to generate on-site noise sources of any significance.

The subject property is entirely located within the Airport Vicinity Development Zone (AVDZ), as shown on Schedule C14 of the 2021 Draft Official Plan. As such, consideration will be given to aircraft noise in this study.

In accordance with the City of Ottawa Environmental Noise Control (ENC) Guidelines (January 2016), rail lines within 500 metres of the site must be taken into consideration in the noise analysis. A review of the study area did not identify any freight or passenger lines and therefore no further consideration of rail noise was required in this study.

2.1.2 Stationary Noise

Cadna A v2022, produced by DataKustik, was employed for the stationary noise assessment for this study. This software is recognized in the industry for noise modeling and utilizes ISO 9613-2.

On-Site

Proposed on-site rooftop HVAC equipment will create new stationary noise sources. The following on-site noise sources and noise levels from the equipment were identified:

- **Building 'A':** One (20) 10-Ton AC Units at with a sound power level of 91.3 dBA (based on sound pressure level of 65 dBA @ 7m);
- **Building 'B':** One (20) 10-Ton AC Units at with a sound power level of 91.3 dBA (based on sound pressure level of 65 dBA @ 7m); and
- **Building 'C':** One (20) 10-Ton AC Units at with a sound power level of 91.3 dBA (based on sound pressure level of 65 dBA @ 7m).

The AC units are assumed to operate 45 minutes per hour during daytime hours and 30 minutes per hour during nighttime hours. Equipment data sheets are included in **Appendix D**.

Note that other on-site HVAC equipment will be contained within an enclosed mechanical penthouse structure on each rooftop, and are therefore not considered stationary noise sources.

Off-Site

The off-site stationary noise sources include a recently-constructed commercial plaza to the north of the property. The noise sources are summarized in the 4836 Bank Street Ottawa, Ontario Acoustical Report (IBI Group, May 10, 2019).

Other potential stationary noise sources to the south and east are located a significant distance of at least 150 metres from the subject property and therefore are not considered in this analysis.

2.2 Sound Level Limits for Road & Rail Traffic

Sound level criteria for road traffic were extracted from the ENC Guidelines. Noise levels are expressed in the form Leq (T) which refers to a weighted level of a steady sound carrying the same total energy in the time period T (in hours) as the observed fluctuation sound.

2.2.1 Indoor sound level criterion – ventilation and warning clause requirements

The recommended indoor sound level criteria from Table 2.2b of the ENC Guidelines are as follows:

- Bedrooms – 23:00 to 07:00 – 40 dBA Leq (8 hours)
- Living Room – 07:00 to 23:00 – 45 dBA Leq (16 hours)

The sound levels are based on the windows and doors to an indoor space being closed.

As discussed previously, the proposed development consists of three, four-story residential buildings. For the purpose of assessing the most significant indoor noise in this study, receptor locations were observed at 11.5 metres above the ground for the plane of the living room and bedroom windows to assess daytime and nighttime noise. This receiver height was determined by reviewing the living room and bedroom windows locations from architectural drawings provided by the proponent, and were analysed to determine noise impacts with respect the adjacent transportation network.

As per NPC-300 C7.1.3, if the daytime outdoor sound levels exceed 65 dBA at the living room window or if the nighttime sound levels exceed 60 dBA at the bedroom window, then the building must be compliant with the Ontario Building Code. Should the outdoor sound levels exceed this criteria, then the Building Component (walls, windows, etc.) must be designed to achieve indoor sound level criteria.

As per NPC-300 C7.1.2.1 and C7.1.2.2, when the outdoor noise levels are greater than 55 dBA and less than or equal to 65 dBA at the living room window and/or greater than 50 dBA and less than or equal to 60 dBA at the bedroom window, then a warning clause is compulsory. This warning clause specifies that forced air heating with a provision for central air conditioning is required. Should the outdoor sound levels exceed the criteria, central air conditioning is mandatory, and a warning clause is required.

2.2.2 Outdoor sound level criterion

As per Table 2.2a of the ENC Guidelines, the sound level criterion for the outdoor living area (OLA) for the daytime period between 07:00 and 23:00 hours is 55 dBA Leq (16). Sound levels for the OLA are calculated within the centre of the Communal Amenity Space, as indicated on the Noise Plan – 137175-N1, at a height of 1.5 metres above the ground.

If the Leq sound level is less than or equal to 55 dBA (daytime), no further action is required by the proponent. In the event that the sound level exceeds the criteria by less than 5 dBA, a warning clause may be provided to prospective tenants or the proponent may install physical attenuation. For sound levels greater than 5 dBA above the criteria (i.e. greater than 60 dBA), control measures are required to reduce the noise levels as close to 55 dBA as technically, economically and administratively possible. Should the sound levels with the barrier in place exceed 55 dBA, a warning clause is also required.

2.2.3 Indoor Sound Level Criterion – Building Components

As per NPC-300 C7.1.3, when the outdoor sound levels are less than or equal to 65 dBA at the living room window and/or less than or equal to 60 dBA at the bedroom level, then the building must be compliant with the Ontario Building Code. Should the outdoor sound levels exceed this criteria then the Building Components, including windows, walls and doors must be designed to achieve indoor sound level criteria described previously and extracted from Table 2.2b of the ENC Guidelines.

2.3 Sound Level Limits for Aircraft Noise

An aircraft noise impact assessment is based on the Noise Exposure Forecast (NEF) and Noise Exposure Projection (NEP) methods approved by Transport Canada. The noise contours were used to define the Airport Operating Influence Zone (AOIZ) and Airport Vicinity Development Zone (AVDZ) which is shown on Schedule C14 of the 2021 Draft Official Plan.

No new noise sensitive developments are permitted within the AOIZ. Noise sensitive development is permitted within the AVDZ and outside of the AOIZ, subject to a noise study, or under the Prescribed Measures for Aircraft Noise in Part 6 of the ENC Guidelines. Indoor and outdoor sound level limits for aircraft noise is included in Table 4.2a of the ENC Guidelines.

2.4 Sound Level Limits for Stationary Noise

Given the subject site and environs are located in an acoustical environment typical of a major population center, it is assumed that the area is classified as a "Class 1" area (urban) as defined by the MECP. In a Class 1 area the ambient or background sound level is dominated by the urban hum.

The MECP has established stationary noise level criteria for new residential development and this is documented in NPC-300 Section B6 and B7. **Table 1** below summarizes the noise criteria for the MECP area classifications and time periods.

Table 1 – MECP Stationary Noise Level Criteria

TIME PERIOD	LOCATION	CLASS 1	CLASS 2	CLASS 3	CLASS 4
0700 – 1900	Outdoor Living Area	50 dBA	50 dBA	45 dBA	55 dBA
1900 – 2300	Outdoor Living Area	50 dBA	45 dBA	40 dBA	55 dBA
0700 – 1900	Plane of Window	50 dBA	50 dBA	45 dBA	60 dBA
1900 – 2300	Plane of Window	50 dBA	50 dBA	40 dBA	60 dBA
2300 – 0700	Plane of Window	45 dBA	45 dBA	40 dBA	55 dBA

If the Class 1 exclusion limits in **Table 1** cannot be met for off-site noise sources, the use of a Class 4 designation should be considered.

As per Section 'A' of NPC-300, a Class 4 area is defined as an area or specific site that would otherwise be defined as Class 1 or 2 in which:

- is an area intended for development with new noise sensitive land uses that are not built yet;
- is in proximity to existing, lawfully established stationary sources; and
- has formal confirmation from the land use planning authority with Class 4 area classification which is determined during the land use planning process.

It should be noted that Section B7.1 of NPC-300 assumes that in Class 4 areas the windows are to remain closed.

3 Roadway Noise

3.1 Road & Rail Traffic Data

Based on the configuration of the road transportation network in relation to the proposed development, it is assumed that the major sources of transportation noise impacting the site will originate externally from Bank Street, as described below:

Bank Street is currently a two-lane, undivided rural roadway with a posted speed limit of 80 km/h adjacent to the site. Ultimately, this segment of Bank Street will be reconstructed as a four-lane urban arterial divided (4-UAD) roadway. The noise analysis conducted for this study has been conservatively based on Bank Street with its ultimate, four-lane configuration and a posted speed limit of 70 km/h.

Table 2 below summarizes the traffic and road parameters used in this report. These parameters were extracted from Appendix B: Table B1 of the ENC Guidelines, and are conservatively based on roadway capacity with its ultimate configuration.

Table 2 – Traffic & Road Data Summary

NOISE PARAMETERS	BANK STREET (4-UAD)
Annual Average Daily Traffic (AADT)	35,000
Posted Speed Limit (km/h)	70
% Medium Trucks	7%
% Heavy Trucks	5%
% Daytime Traffic	92%

All other collector or higher-order roads are separated from the subject property by a significant distance which is well in excess of the 100-metre threshold specified in the ENC Guidelines, including Kelly Farm Drive and Miikana Road and therefore the transportation-related noise impacts from these roads were not considered explicitly in the analysis for this study.

3.2 Traffic Noise Calculation Methods

Roadway noise was calculated using the STAMSON 5.04 computer program, an industry-standard program which applies the ORNAMENT methodology developed by the Ontario Ministry of the Environment, Conservation and Parks (MECP).

Unattenuated daytime and nighttime noise levels at the building face, calculated to determine indoor sound levels, are presented in **Table 3** below. Parameters applied to determine the noise levels, including the perpendicular distance from source to receiver and the roadway segment angles, are also indicated. Since Bank Street is modelled with its ultimate configuration as an arterial, four-lane divided road, the noise levels are calculated separately for the northbound and southbound lanes and then combined.

STAMSON noise calculations conducted for this study are included in **Appendix A**.

Table 3 – Unattenuated Noise Levels at Building Face

LOCATION		ROADWAY	SOURCE - RECEIVER DISTANCE (m)	SEGMENT ANGLES		INDOOR NOISE LEVELS (dBA)	
BUILDING	UNITS			LEFT	RIGHT	DAYTIME	NIGHTTIME
Building 'A'	Units 1 to 4	Bank Street	98.5/86.5	-90	-5	60.06	52.46
Building 'A'	Units 21 to 24	Bank Street	38.5/50.5	-90	-10	64.15	56.55
Building 'A'	Units 25 to 27	Bank Street	32.0/44.0	-90	-10	65.13	57.54
Building 'A'	Units 28 to 30	Bank Street	33.5/21.5	-90	90	70.85	63.25
Building 'A'	Units 31 to 34	Bank Street	96.0/84.0	-10	15	55.85	48.26
Building 'A'	Units 51 to 54	Bank Street	49.0/37.0	-5	70	64.69	57.09
Building 'A'	Units 55 to 57	Bank Street	41.0/29.0	-5	85	66.49	58.89
Building 'A'	Units 58 to 60	Bank Street	31.0/19.0	-90	90	71.49	63.89
Building 'B'	Units 1 to 4	Bank Street	93.0/81.0	-30	-10	54.99	47.40
Building 'B'	Units 5 to 8	Bank Street	84.0/72.0	-30	-10	55.65	48.05
Building 'B'	Units 25 to 27	Bank Street	48.0/36.0	-60	-10	63.11	55.51
Building 'B'	Units 28 to 30	Bank Street	37.5/25.5	-90	90	69.97	62.38
Building 'B'	Units 47 to 50	Bank Street	60.5/48.5	-10	90	64.10	56.51
Building 'B'	Units 51 to 54	Bank Street	51.5/39.5	-10	90	65.21	57.61
Building 'B'	Units 55 to 57	Bank Street	45.0/33.0	-10	90	66.16	58.57
Building 'B'	Units 58 to 60	Bank Street	33.5/21.5	-90	90	70.85	63.25
Building 'C'	Units 31 to 34	Bank Street	190.5/178.5	-5	90	56.55	48.96
Building 'C'	Units 58 to 60	Bank Street	125.0/113.0	-10	90	59.43	51.83

As indicated in **Table 3** above, there are numerous locations which exceed the noise criteria at the building face. Since the dwelling units directly facing Bank Street are consistently above the 65 dBA threshold, a review of Building Components has been conducted and presented in Section 4.3.

Noise Plan – 137175-N1 identifies one outdoor living area (OLA), which is proposed between Buildings 'B' and 'C'. An analysis has been conducted of this OLA, and is presented in **Table 4** below.

Table 4 – Unattenuated Noise Levels at OLA

LOCATION	ROADWAY	SOURCE - RECEIVER DISTANCE (m)	SEGMENT ANGLES		OUTDOOR NOISE LEVELS (dBA)
			LEFT	RIGHT	
Shared Amenity Space – P1	Bank Street	112.5/100.5	10	90	55.69
Shared Amenity Space – P2	Bank Street	112.5/100.5	20	90	54.83

As identified in **Table 4** above, the noise levels in the Outdoor Living Area slightly exceed the 55 dBA at its southernmost mid-point but remain well below 60 dBA, the threshold at which physical attenuation is typically recommended. It should be noted as well that the OLA has been strategically located between Buildings 'B' and 'C' to help screen this amenity area from traffic noise on Bank Street.

The screening of the OLA from the proposed buildings is expected to help maintain noise levels below the 55 dBA across the vast majority of the OLA. As such, no physical attenuation measures were considered as part of this study.

3.3 Stationary Noise Calculation Methods

3.3.1 On-Site Stationary Noise

For stationary noise modeling, Cadna A v2022 was employed for the stationary noise assessment. This software is recognized in the industry for noise modeling and utilizes ISO 9613-2.

The results are summarized in **Table 5** and **Table 6** and illustrated in **Figure 2** for unattenuated daytime and nighttime noise levels, respectively, as experienced at on-site and off-site receivers produced by on-site stationary sources. The results of the Cadna A output for all receiver locations are provided in **Appendix D**.

Table 5 – Unattenuated Noise Levels from On-site Stationary Sources Daytime (dBA)

RECEIVER	FLOOR			
	1	2	3	4
Receiver A	34.0	34.9	36.5	39.3
Receiver B	34.5	36.3	38.3	40.3
Receiver C	33.0	34.4	35.8	37.6
Receiver D	39.3	40.6	-	-
Receiver E	31.6	32.9	-	-
OLA1	37.4	-	-	-

As shown in **Table 5**, the noise levels produced by the on-site HVAC equipment remained below 50 dBA during daytime hours, and accordingly, additional mitigation measures are not required.

Table 6 – Unattenuated Noise Levels from On-site Stationary Sources Nighttime (dBA)

RECEIVER	FLOOR			
	1	2	3	4
Receiver A	32.2	33.2	34.7	37.6
Receiver B	32.8	34.6	36.6	38.6
Receiver C	31.2	32.7	34.0	35.8
Receiver D	37.6	38.9	-	-
Receiver E	29.8	31.2	-	-

As shown in **Table 6**, the noise levels produced by the on-site HVAC equipment are not above 45 dBA during nighttime hours, and accordingly additional mitigation measures are not required.

3.3.2 Off-Site Stationary Noise

Cadna A was used to predict the noise levels produced by the existing off-site stationary noise sources. The off-site noise source data were obtained from the 4836 Bank Street Noise Report (May 2019, IBI). The results are summarized in **Table 7** and **Table 8** and **Figure 3** for unattenuated daytime and nighttime noise levels, respectively, as experienced at on-site receivers produced by off-site stationary sources. The results of the Cadna A output for all receiver locations are provided in **Appendix D**.

Table 7 – Unattenuated Noise Levels from Off-site Stationary Sources Daytime (dBA)

RECEIVER	FLOOR			
	1	2	3	4
Receiver A	52.2	54.6	54.6	54.5
Receiver B	38.7	41.2	41.3	41.4
Receiver C	39.6	42.4	44.0	44.0
OLA1	38.5	-	-	-

As shown in **Table 7**, the noise levels produced by the off-site stationary noise sources are shown to remain below 50 dBA during daytime hours at Receivers B and C, and accordingly, additional mitigation measures are not required. Noise levels at Receiver A are marginally above 50 dBA during daytime hours, therefore mitigation measures will need to be considered at this location.

Table 8 – Unattenuated Noise Levels from Off-site Stationary Sources Nighttime (dBA)

RECEIVER	FLOOR			
	1	2	3	4
Receiver A	50.5	52.9	52.9	52.8
Receiver B	37.0	39.5	39.5	39.6
Receiver C	38.1	40.7	42.4	42.4

As shown in **Table 8**, the noise levels produced by the off-site stationary noise sources are not above 45 dBA during nighttime hours Receivers B and C, and accordingly additional mitigation measures are not required. Noise levels at Receiver A are above 45 dBA during nighttime hours and, as such, mitigation measures will need to be considered at this location.

Refer to **Section 4.5** for the discussion of proposed mitigation measures.

4 Abatement Measures

4.1 Indoor Sound Levels

Dwelling units identified previously in **Table 3** on the east façade of either Buildings 'A' or 'B' have the highest exposure to traffic noise on Bank Street and are therefore expected to exceed the 65 dBA and 60 dBA thresholds under daytime and nighttime conditions, respectively. Consequently, mandatory central air conditioning, a review of Building Components, a Type 'D' warning clause on the Tenancy Agreement are required for each east-facing unit, as well as select north and south-facing units.

For the majority of dwelling units on the north or south facades of either Buildings 'A' or 'B' and only the southern façade of Building 'C', which will be indirectly exposed to Bank Street traffic noise, daytime noise levels were determined to be less than 65 dBA but still are still expected to exceed 55 dBA (daytime) or 50 dBA (nighttime). As such, an alternative means of ventilation is required, as well as a Type 'C' warning clause in the Tenancy Agreement for these units. Alternative means of ventilation usually consists of a forced air heating system with ducts sized for future installation of central air conditioning.

4.2 Outdoor Living Area (OLA)

As per **Table 4** in Section 3.2, the Shared Amenity Space exceeds the noise criteria of 55 dBA but remains below 60 dBA, therefore warning clause Type 'A' is proposed in lieu of a noise barrier.

The Type 'A' warning clause will apply to the Tenancy Agreement for all dwelling units within the proposed development, given that this OLA is intended for use by all residents.

4.3 Building Components

An analysis of the required Building Components is typically required when noise levels at the building face either exceed the 65 dBA (daytime) or 60 dBA (nighttime) thresholds. In this circumstance, the results presented in **Table 3** above indicate that both the daytime and nighttime noise level criteria will be exceeded. As such, an assessment of Building Components was conducted under both daytime and nighttime conditions. This method was developed by the National Research Council (NRC) and involves a review of architectural plan and profile drawings for the proposed development to determine appropriate design assumptions (i.e. window/floor area ratios) in order to calculate the STC rating for windows and glazed doors. The analysis was based on the '2 Bedroom Unit Type '2B'', the largest end unit type which would be expected to receive maximum exposure from Bank Street traffic noise.

Exterior walls were assumed to have an STC rating of 50, which is a conservative value for a pre-cast concrete wall designed to accommodate Ottawa winters from the Ontario Building Code. With the exterior walls in place, the amount of sound energy absorbed by the windows is calculated in order to determine the STC rating required to meet the sound criteria. All rooms were assumed to have an intermediate, absorptive interior rather than a hard or very absorptive interior, as would be expected for a residential unit. The 'living room' floor area included the kitchen, as there were no interior walls separating these living spaces indicated on the architectural drawings. As indicated in **Table 9** below, the maximum required STC rating for the largest east-facing windows was calculated to be 28. This rating was conservatively based on the expected noise levels for the top-floor units with the highest exposure to the Bank Street.

Preliminary plan and profile architectural drawings are provided in **Appendix B**, while STC calculations for the proposed development are included in **Appendix C**.

Table 9 – Sound Transmission Class (STC) Ratings

DWELLING UNIT	LEVEL	ROOM TYPE	REQUIRED STC RATING FOR WINDOWS & GLAZED DOORS
Buildings 'A' and 'B' East Façade	4 th Floor	Living Room	28
	4 th Floor	Bedroom	28

4.4 Aircraft Sound Levels

As stated in Section 2.1, the subject site is entirely located within the Airport Vicinity Development Zone (AVDZ). The site is, however, outside of the 25 NEF/NEP contour line and therefore the Building Components and ventilation requirements, presented in Part 6: Prescribed Measures for Aircraft Noise of the ENC Guidelines, do not apply. A warning clause is required for the residential units inside the AVDZ, which in this case applies to all dwelling units proposed within the 4840 Bank Street development.

The warning clause for aircraft noise is as follows:

"Tenants are advised that due to the proximity of the Ottawa Macdonald-Cartier International Airport, noise from the airport and individual aircraft may at times interfere with outdoor or indoor activities".

4.5 Stationary Noise Sound Levels

As summarized in Section 3.3, noise levels from off-site stationary sources at Receiver A are marginally above MECP exclusion limits for a Class 1 designation, therefore mitigation measures have been considered.

4.5.1 Physical Mitigation

The daytime and nighttime noise levels produced by the off-site stationary noise sources can be mitigated using rooftop noise barriers for the two rooftop HVAC units on the building on the southeast part of the adjacent site to the north (hardware store). The barrier heights would need to be 2.2m and break the line of sight with Building 'A', with a minimum density of 20 kg/m², without any holes or gaps.

The attenuated noise levels from off-site sources during the daytime are summarized in **Table 10** and illustrated in **Figure 4**.

Table 10 – Attenuated Noise Levels from Off-site Stationary Sources Daytime (dBA)

RECEIVER	FLOOR			
	1	2	3	4
Receiver A	42.5	44.8	47.1	47.5
Receiver B	38.7	41.2	41.2	41.3
Receiver C	38.9	41.9	43.7	43.7
OLA1	38.4	-	-	-

As shown in **Table 10** above, the daytime noise levels produced by the off-site HVAC can be mitigated using rooftop noise barriers for the two rooftop HVAC units on the building on the southeast part of the adjacent site.

The attenuated noise levels from off-site sources during the nighttime are summarized in **Table 11** and illustrated in **Figure 4**.

Table 11 – Attenuated Noise Levels from Off-site Stationary Sources Nighttime (dBA)

RECEIVER	FLOOR			
	1	2	3	4
Receiver A	40.8	43.4	45.5	45.9
Receiver B	36.9	39.4	39.5	39.6
Receiver C	37.4	40.3	42.0	42.0

As shown in **Table 11** above, the daytime noise levels produced by the off-site HVAC can be mitigated using rooftop noise barriers for the two rooftop HVAC units on the building on the southeast part of the adjacent site.

The rooftop barrier locations are shown in **Appendix D**.

4.5.2 Class 4 Designation

Since it may not be feasible to install rooftop barriers on an existing building, a Class 4 designation could be applied to the 4840 Bank Street property to allow for higher stationary noise exclusion limits (60 dBA daytime and 55 dBA nighttime). The unattenuated noise levels from off-site sources at Receiver A would meet the Class 4 exclusion limits.

A Type E warning clause referenced from Section C8.2 of NPC-300 Guidelines must also be included on the Tenancy Agreement for each impacted dwelling unit.

5 Summary of Attenuation Measures

5.1 Warning Clauses

A noise warning clause must appear on the Tenancy Agreement for all dwelling units indicated on the **Noise Plan - 137175-N1** and listed in **Table 12** below.

Table 12 – Warning Clause Summary

WARNING CLAUSE	LOCATION	APPLICABLE BUILDING/FAÇADE/UNITS
Type 'A'	Shared Amenity Space	All Dwelling Units
Type 'C'	Building 'A'	Units 1 to 24, 31 to 54
	Building 'B'	Units 5 to 27, 31 to 50
	Building 'C'	Units 31 to 60
Type 'D'	Building 'A'	Units 25 to 30, 55 to 60
	Building 'B'	Units 28 to 30, 51 to 60
	Building 'C'	None
Type 'E' *	Building 'A'	Units 28 to 30
Aircraft Warning Clause	Buildings 'A', 'B' & 'C'	All Dwelling Units

* If physical mitigation for off-site stationary noise sources is not provided.

The following warning clauses are taken from Section C8.1 and C8.2 of NPC-300 Guidelines.

Type 'A'	"Purchasers/tenants are advised that sound levels due to increasing Bank Street 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."
Type 'C'	"This dwelling unit has been fitted with a forced air heating system and the ducting, etc. was sized to accommodate central air conditioning. 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. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MECP Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property."
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."
Type 'E' *	"Purchasers/tenants are advised that due to the proximity of the adjacent commercial buildings, noise from the buildings' HVAC equipment may at times be audible."

* If physical mitigation for off-site stationary noise sources is not provided.

The aircraft warning clause was provided previously in Section 4.4.

5.2 Ventilation Requirements and Building Components

All dwelling units with a Type 'C' warning clause listed in Section 5.1 require a forced air heating system sized to accommodate a central air conditioning system. Any dwelling units requiring a Type 'D' warning clause must have central air conditioning installed, as well as an acoustical review of Building Components.

5.3 Noise Barrier

Based on the foregoing analysis results, it is not anticipated that any noise barriers will be required to accommodate the proposed development.

6 Conclusion

This Environmental Noise Impact Assessment was conducted in support of a Site Plan Control application for a proposed residential development at 4840 Bank Street, within the Leirrim community of Ottawa. The impacts of traffic noise within the proposed development were evaluated and, based on this analysis conducted for this study, it is expected that noise levels will remain within the standards established by the City of Ottawa and Ministry of the Environment, Conservation and Parks (MECP), with the exception of select units identified on **Noise Plan – 137175-N1**. For these dwelling units, appropriate warning clauses and associated noise abatement measures must be provided on the Tenancy Agreement for each dwelling unit. As the Communal Amenity Area is shared between all units and is expected to receive noise exposure slightly above 55 dBA, a warning clause Type 'A' should be applied to each unit within the propose development. A review of Building Components conducted as part of this study indicated that, for windows and glazed doors with the highest exposure to Bank Street, the required Sound Transmission Class (STC) rating is 28. Since the subject site is located entirely within the Airport Vicinity Development Zone (AVDZ), an aircraft warning clause will be required for each dwelling unit as well. Off-site attenuation or a Class 4 designation would be required to attenuate noise levels from off-site stationary noise sources.

7 Professional Authorization

Prepared by:



Ben Pascolo-Neveu, P. Eng.



Andy Kroess, M.Eng., P.Eng.

137175 Pathways South Block 204 - Internal Documents\6.0_Technical\6.04_Civil\01_Brief\Noise

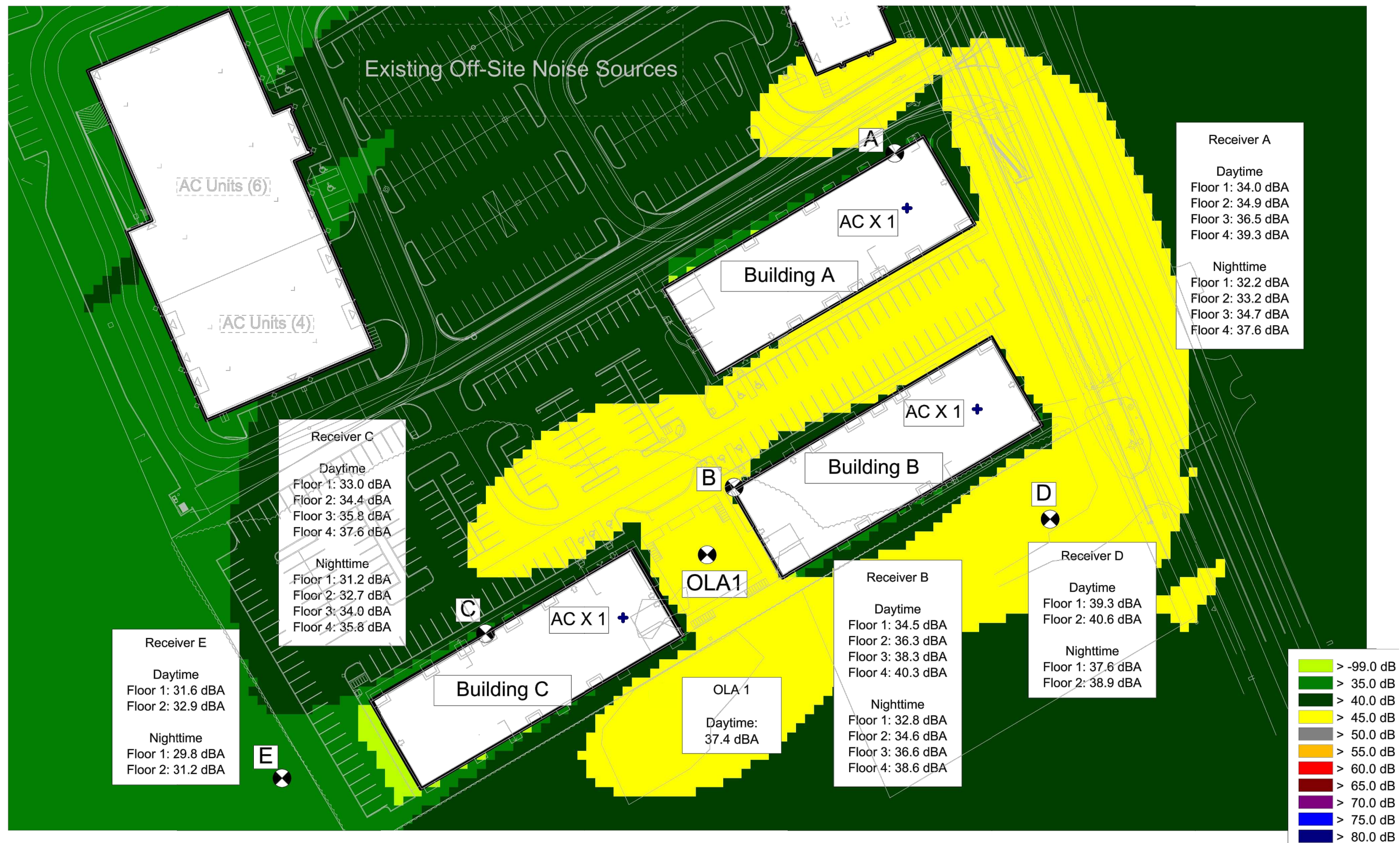


Figure 2 - Unattenuated On-Site Stationary Noise

CLIENT 4840 BANK STREET INC. (IDONE LANDS)		PROJECT NAME 4840 BANK STREET 4840 BANK ST, OTTAWA, ON		IBI IBI GROUP 400 - 333 Preston Street Ottawa ON K1S 5N4 Canada tel 613 225 1311 fax 613 225 9868 ibigroup.com	
SCALE: N.T.S.	DATE: 2022-07-26	FIGURE NAME ON-SITE STATIONARY NOISE		FIGURE NO. 2	REVISION 0
PROJECT MGR: A.K.	DRAWN BY: I.A.				
CHECKED BY: A.K.	APPROVED BY: A.K.				
PROJECT NO: 137175					



Figure 3 - Unattenuated Off-Site Stationary Noise

CLIENT 4840 BANK STREET INC. (IDONE LANDS)		PROJECT NAME 4048 BANK STREET 4048 BANK ST, OTTAWA, ON		IBI IBI GROUP 400 – 333 Preston Street Ottawa ON K1S 5N4 Canada tel 613 225 1311 fax 613 225 9868 ibigroup.com	
SCALE: N.T.S.	DATE: 2022-07-26	FIGURE NAME OFF-SITE STATIONARY NOISE		FIGURE NO. 3	REVISION 0
PROJECT MGR: A.K.	DRAWN BY: I.A.				
CHECKED BY: A.K.	APPROVED BY: A.K.				
PROJECT NO: 137175					



CLIENT

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ISSUES		
No.	DESCRIPTION	DATE
1	SUBMISSION NO. 1 FOR CITY REVIEW	2022-06-03
2		
3		
4		
5		
6		
7		
8		

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN

SITE LOCATION

CONSULTANTS

LEGEND:

▲ OUTDOOR LIVING AREA (OLA) NOISE RECEPTOR

● INDOOR NOISE RECEPTOR

A

C

D

 WARNING CLAUSE

1:300

0 3 9 15m

0 3 9 15m

SEAL

IBI GROUP

400 - 333 Preston Street
Ottawa ON K1S 9N4 Canada
tel 613 225-1311 fax 613 225-5868
ibigroup.com

PROJECT

4840 BANK STREET

PROJECT NO:

137175

DRAWN BY:

D.P.S.

CHECKED BY:

J.I.M.

PROJECT MGR:

J.I.M.

APPROVED BY:

J.I.M.

SHEET TITLE

NOISE PLAN

SHEET NUMBER

N-1

ISSUE

1

CITY FILE No. D07-xx-xx-xxxx

CITY PLAN No. xxxxx

BLOCK 203

FILE LOCATION: \\137175_Pathways_Sou7_0_Production7.03_Design04_Civil\Sheets\NOISE.dwg Last Saved: May 30, 2022 4:19:46 PM by Marian Milne

Appendix A – STAMSON Noise Calculations

Indoor Noise at Building Face

```

1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 38:03:22
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: banw.te          Time Period: Day/Night 16/8 hours
5  Description: building 'a' units 1 to 4 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19 24 hr Traffic Volume (AADT or SADT): 17500
20 Percentage of Annual Growth         : 0.00
21 Number of Years of Growth          : 0.00
22 Medium Truck % of Total Volume      : 7.00
23 Heavy Truck % of Total Volume       : 5.00
24 Day (16 hrs) % of Total Volume     : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1  Angle2        : -90.00 deg  -5.00 deg
29 Wood depth              : 0          (No woods.)
30 No of house rows       : 0 / 0
31 Surface                 : 1          (Absorptive ground surface)
32 Receiver source distance : 98.50 / 98.50 m
33 Receiver height        : 11.50 / 11.50 m
34 Topography              : 1          (Flat/gentle slope; no barrier)
35 Reference angle         : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49 24 hr Traffic Volume (AADT or SADT): 17500
50 Percentage of Annual Growth         : 0.00
51 Number of Years of Growth          : 0.00
52 Medium Truck % of Total Volume      : 7.00
53 Heavy Truck % of Total Volume       : 5.00
54 Day (16 hrs) % of Total Volume     : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1  Angle2        : -90.00 deg  -5.00 deg
59 Wood depth              : 0          (No woods.)
60 No of house rows       : 0 / 0
61 Surface                 : 1          (Absorptive ground surface)
62 Receiver source distance : 86.50 / 86.50 m
63 Receiver height        : 11.50 / 11.50 m
64 Topography              : 1          (Flat/gentle slope; no barrier)
65 Reference angle         : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

```

```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 56.65 + 0.00) = 56.65 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -90 -5 0.36 71.98 0.00 -11.12 -4.22 0.00 0.00 0.00 56.65
77 -----
78
79 Segment Leq : 56.65 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 57.42 + 0.00) = 57.42 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -90 -5 0.36 71.98 0.00 -10.35 -4.22 0.00 0.00 0.00 57.42
91 -----
92
93 Segment Leq : 57.42 dBA
94
95 Total Leq All Segments: 60.06 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 49.05 + 0.00) = 49.05 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -90 -5 0.36 64.39 0.00 -11.12 -4.22 0.00 0.00 0.00 49.05
107 -----
108
109 Segment Leq : 49.05 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 49.82 + 0.00) = 49.82 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -90 -5 0.36 64.39 0.00 -10.35 -4.22 0.00 0.00 0.00 49.82
121 -----
122
123 Segment Leq : 49.82 dBA
124
125 Total Leq All Segments: 52.46 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 60.06
132 (NIGHT): 52.46
133 FF
134 FF
135

```

```

1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 46:01:18
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: bau2124.te          Time Period: Day/Night 16/8 hours
5  Description: building 'a' units 21 ot 24 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19 24 hr Traffic Volume (AADT or SADT): 17500
20 Percentage of Annual Growth         : 0.00
21 Number of Years of Growth          : 0.00
22 Medium Truck % of Total Volume      : 7.00
23 Heavy Truck % of Total Volume       : 5.00
24 Day (16 hrs) % of Total Volume     : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1  Angle2       : -90.00 deg  -10.00 deg
29 Wood depth           : 0          (No woods.)
30 No of house rows     : 0 / 0
31 Surface              : 1          (Absorptive ground surface)
32 Receiver source distance : 50.50 / 50.50 m
33 Receiver height      : 11.50 / 11.50 m
34 Topography           : 1          (Flat/gentle slope; no barrier)
35 Reference angle      : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49 24 hr Traffic Volume (AADT or SADT): 17500
50 Percentage of Annual Growth         : 0.00
51 Number of Years of Growth          : 0.00
52 Medium Truck % of Total Volume      : 7.00
53 Heavy Truck % of Total Volume       : 5.00
54 Day (16 hrs) % of Total Volume     : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1  Angle2       : -90.00 deg  -10.00 deg
59 Wood depth           : 0          (No woods.)
60 No of house rows     : 0 / 0
61 Surface              : 1          (Absorptive ground surface)
62 Receiver source distance : 38.50 / 38.50 m
63 Receiver height      : 11.50 / 11.50 m
64 Topography           : 1          (Flat/gentle slope; no barrier)
65 Reference angle      : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

```

```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 60.27 + 0.00) = 60.27 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -90 -10 0.36 71.98 0.00 -7.17 -4.55 0.00 0.00 0.00 60.27
77 -----
78
79 Segment Leq : 60.27 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 61.87 + 0.00) = 61.87 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -90 -10 0.36 71.98 0.00 -5.57 -4.55 0.00 0.00 0.00 61.87
91 -----
92
93 Segment Leq : 61.87 dBA
94
95 Total Leq All Segments: 64.15 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 52.67 + 0.00) = 52.67 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -90 -10 0.36 64.39 0.00 -7.17 -4.55 0.00 0.00 0.00 52.67
107 -----
108
109 Segment Leq : 52.67 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 54.27 + 0.00) = 54.27 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -90 -10 0.36 64.39 0.00 -5.57 -4.55 0.00 0.00 0.00 54.27
121 -----
122
123 Segment Leq : 54.27 dBA
124
125 Total Leq All Segments: 56.55 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 64.15
132 (NIGHT): 56.55
133 FF
134 FF
135

```

```

1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 41:45:28
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: bau2527.te          Time Period: Day/Night 16/8 hours
5  Description: building 'a' units 25 to 27 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19     24 hr Traffic Volume (AADT or SADT): 17500
20     Percentage of Annual Growth         : 0.00
21     Number of Years of Growth          : 0.00
22     Medium Truck % of Total Volume      : 7.00
23     Heavy Truck % of Total Volume       : 5.00
24     Day (16 hrs) % of Total Volume     : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1   Angle2      : -90.00 deg   -10.00 deg
29 Wood depth          : 0             (No woods.)
30 No of house rows    : 0 / 0
31 Surface             : 1             (Absorptive ground surface)
32 Receiver source distance : 44.00 / 44.00 m
33 Receiver height     : 11.50 / 11.50 m
34 Topography          : 1             (Flat/gentle slope; no barrier)
35 Reference angle     : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49     24 hr Traffic Volume (AADT or SADT): 17500
50     Percentage of Annual Growth         : 0.00
51     Number of Years of Growth          : 0.00
52     Medium Truck % of Total Volume      : 7.00
53     Heavy Truck % of Total Volume       : 5.00
54     Day (16 hrs) % of Total Volume     : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1   Angle2      : -90.00 deg   -10.00 deg
59 Wood depth          : 0             (No woods.)
60 No of house rows    : 0 / 0
61 Surface             : 1             (Absorptive ground surface)
62 Receiver source distance : 32.00 / 32.00 m
63 Receiver height     : 11.50 / 11.50 m
64 Topography          : 1             (Flat/gentle slope; no barrier)
65 Reference angle     : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

```

```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 61.08 + 0.00) = 61.08 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -90 -10 0.36 71.98 0.00 -6.36 -4.55 0.00 0.00 0.00 61.08
77 -----
78
79 Segment Leq : 61.08 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 62.96 + 0.00) = 62.96 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -90 -10 0.36 71.98 0.00 -4.48 -4.55 0.00 0.00 0.00 62.96
91 -----
92
93 Segment Leq : 62.96 dBA
94
95 Total Leq All Segments: 65.13 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 53.48 + 0.00) = 53.48 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -90 -10 0.36 64.39 0.00 -6.36 -4.55 0.00 0.00 0.00 53.48
107 -----
108
109 Segment Leq : 53.48 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 55.37 + 0.00) = 55.37 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -90 -10 0.36 64.39 0.00 -4.48 -4.55 0.00 0.00 0.00 55.37
121 -----
122
123 Segment Leq : 55.37 dBA
124
125 Total Leq All Segments: 57.54 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 65.13
132 (NIGHT): 57.54
133 FF
134 FF
135

```

```

1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 38:13:46
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: bane.te          Time Period: Day/Night 16/8 hours
5  Description: building 'a' units 28 to 30 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19 24 hr Traffic Volume (AADT or SADT): 17500
20 Percentage of Annual Growth         : 0.00
21 Number of Years of Growth           : 0.00
22 Medium Truck % of Total Volume      : 7.00
23 Heavy Truck % of Total Volume       : 5.00
24 Day (16 hrs) % of Total Volume     : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1  Angle2        : -90.00 deg   90.00 deg
29 Wood depth              : 0           (No woods.)
30 No of house rows        : 0 / 0
31 Surface                 : 1           (Absorptive ground surface)
32 Receiver source distance : 33.50 / 33.50 m
33 Receiver height         : 11.50 / 11.50 m
34 Topography              : 1           (Flat/gentle slope; no barrier)
35 Reference angle         : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49 24 hr Traffic Volume (AADT or SADT): 17500
50 Percentage of Annual Growth         : 0.00
51 Number of Years of Growth           : 0.00
52 Medium Truck % of Total Volume      : 7.00
53 Heavy Truck % of Total Volume       : 5.00
54 Day (16 hrs) % of Total Volume     : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1  Angle2        : -90.00 deg   90.00 deg
59 Wood depth              : 0           (No woods.)
60 No of house rows        : 0 / 0
61 Surface                 : 1           (Absorptive ground surface)
62 Receiver source distance : 21.50 / 21.50 m
63 Receiver height         : 11.50 / 11.50 m
64 Topography              : 1           (Flat/gentle slope; no barrier)
65 Reference angle         : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

```

```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 66.34 + 0.00) = 66.34 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -90 90 0.36 71.98 0.00 -4.75 -0.90 0.00 0.00 0.00 66.34
77 -----
78
79 Segment Leq : 66.34 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 68.96 + 0.00) = 68.96 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -90 90 0.36 71.98 0.00 -2.13 -0.90 0.00 0.00 0.00 68.96
91 -----
92
93 Segment Leq : 68.96 dBA
94
95 Total Leq All Segments: 70.85 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 58.74 + 0.00) = 58.74 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -90 90 0.36 64.39 0.00 -4.75 -0.90 0.00 0.00 0.00 58.74
107 -----
108
109 Segment Leq : 58.74 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 61.36 + 0.00) = 61.36 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -90 90 0.36 64.39 0.00 -2.13 -0.90 0.00 0.00 0.00 61.36
121 -----
122
123 Segment Leq : 61.36 dBA
124
125 Total Leq All Segments: 63.25 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 70.85
132 (NIGHT): 63.25
133 FF
134 FF
135

```

```

1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 38:23:18
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: basw.te          Time Period: Day/Night 16/8 hours
5  Description: building 'a' units 31 to 34 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19 24 hr Traffic Volume (AADT or SADT): 17500
20 Percentage of Annual Growth         : 0.00
21 Number of Years of Growth          : 0.00
22 Medium Truck % of Total Volume      : 7.00
23 Heavy Truck % of Total Volume       : 5.00
24 Day (16 hrs) % of Total Volume     : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1  Angle2       : -10.00 deg  15.00 deg
29 Wood depth           : 0          (No woods.)
30 No of house rows     : 0 / 0
31 Surface              : 1          (Absorptive ground surface)
32 Receiver source distance : 96.00 / 96.00 m
33 Receiver height      : 11.50 / 11.50 m
34 Topography           : 1          (Flat/gentle slope; no barrier)
35 Reference angle      : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49 24 hr Traffic Volume (AADT or SADT): 17500
50 Percentage of Annual Growth         : 0.00
51 Number of Years of Growth          : 0.00
52 Medium Truck % of Total Volume      : 7.00
53 Heavy Truck % of Total Volume       : 5.00
54 Day (16 hrs) % of Total Volume     : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1  Angle2       : -10.00 deg  15.00 deg
59 Wood depth           : 0          (No woods.)
60 No of house rows     : 0 / 0
61 Surface              : 1          (Absorptive ground surface)
62 Receiver source distance : 84.00 / 84.00 m
63 Receiver height      : 11.50 / 11.50 m
64 Topography           : 1          (Flat/gentle slope; no barrier)
65 Reference angle      : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

```

```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 52.43 + 0.00) = 52.43 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -10 15 0.36 71.98 0.00 -10.97 -8.59 0.00 0.00 0.00 52.43
77 -----
78
79 Segment Leq : 52.43 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 53.22 + 0.00) = 53.22 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -10 15 0.36 71.98 0.00 -10.18 -8.59 0.00 0.00 0.00 53.22
91 -----
92
93 Segment Leq : 53.22 dBA
94
95 Total Leq All Segments: 55.85 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 44.84 + 0.00) = 44.84 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -10 15 0.36 64.39 0.00 -10.97 -8.59 0.00 0.00 0.00 44.84
107 -----
108
109 Segment Leq : 44.84 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 45.62 + 0.00) = 45.62 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -10 15 0.36 64.39 0.00 -10.18 -8.59 0.00 0.00 0.00 45.62
121 -----
122
123 Segment Leq : 45.62 dBA
124
125 Total Leq All Segments: 48.26 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 55.85
132 (NIGHT): 48.26
133 FF
134 FF
135

```

```

1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 46:18:34
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: bau5154.te          Time Period: Day/Night 16/8 hours
5  Description: building 'a' units 51 to 54 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19 24 hr Traffic Volume (AADT or SADT): 17500
20 Percentage of Annual Growth         : 0.00
21 Number of Years of Growth           : 0.00
22 Medium Truck % of Total Volume      : 7.00
23 Heavy Truck % of Total Volume       : 5.00
24 Day (16 hrs) % of Total Volume     : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1  Angle2       : -5.00 deg   70.00 deg
29 Wood depth           : 0           (No woods.)
30 No of house rows     : 0 / 0
31 Surface              : 1           (Absorptive ground surface)
32 Receiver source distance : 49.00 / 49.00 m
33 Receiver height      : 11.50 / 11.50 m
34 Topography           : 1           (Flat/gentle slope; no barrier)
35 Reference angle      : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49 24 hr Traffic Volume (AADT or SADT): 17500
50 Percentage of Annual Growth         : 0.00
51 Number of Years of Growth           : 0.00
52 Medium Truck % of Total Volume      : 7.00
53 Heavy Truck % of Total Volume       : 5.00
54 Day (16 hrs) % of Total Volume     : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1  Angle2       : -5.00 deg   70.00 deg
59 Wood depth           : 0           (No woods.)
60 No of house rows     : 0 / 0
61 Surface              : 1           (Absorptive ground surface)
62 Receiver source distance : 37.00 / 37.00 m
63 Receiver height      : 11.50 / 11.50 m
64 Topography           : 1           (Flat/gentle slope; no barrier)
65 Reference angle      : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

```

```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 60.77 + 0.00) = 60.77 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -5 70 0.36 71.98 0.00 -6.99 -4.22 0.00 0.00 0.00 60.77
77 -----
78
79 Segment Leq : 60.77 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 62.43 + 0.00) = 62.43 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -5 70 0.36 71.98 0.00 -5.33 -4.22 0.00 0.00 0.00 62.43
91 -----
92
93 Segment Leq : 62.43 dBA
94
95 Total Leq All Segments: 64.69 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 53.18 + 0.00) = 53.18 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -5 70 0.36 64.39 0.00 -6.99 -4.22 0.00 0.00 0.00 53.18
107 -----
108
109 Segment Leq : 53.18 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 54.83 + 0.00) = 54.83 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -5 70 0.36 64.39 0.00 -5.33 -4.22 0.00 0.00 0.00 54.83
121 -----
122
123 Segment Leq : 54.83 dBA
124
125 Total Leq All Segments: 57.09 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 64.69
132 (NIGHT): 57.09
133 FF
134 FF
135

```

```

1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 46:06:11
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: bau5557.te          Time Period: Day/Night 16/8 hours
5  Description: buiding 'a' units 55 to 57 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19 24 hr Traffic Volume (AADT or SADT): 17500
20 Percentage of Annual Growth         : 0.00
21 Number of Years of Growth           : 0.00
22 Medium Truck % of Total Volume      : 7.00
23 Heavy Truck % of Total Volume       : 5.00
24 Day (16 hrs) % of Total Volume     : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1  Angle2       : -5.00 deg   85.00 deg
29 Wood depth           : 0           (No woods.)
30 No of house rows     : 0 / 0
31 Surface              : 1           (Absorptive ground surface)
32 Receiver source distance : 41.00 / 41.00 m
33 Receiver height      : 11.50 / 11.50 m
34 Topography           : 1           (Flat/gentle slope; no barrier)
35 Reference angle      : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49 24 hr Traffic Volume (AADT or SADT): 17500
50 Percentage of Annual Growth         : 0.00
51 Number of Years of Growth           : 0.00
52 Medium Truck % of Total Volume      : 7.00
53 Heavy Truck % of Total Volume       : 5.00
54 Day (16 hrs) % of Total Volume     : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1  Angle2       : -5.00 deg   85.00 deg
59 Wood depth           : 0           (No woods.)
60 No of house rows     : 0 / 0
61 Surface              : 1           (Absorptive ground surface)
62 Receiver source distance : 29.00 / 29.00 m
63 Receiver height      : 11.50 / 11.50 m
64 Topography           : 1           (Flat/gentle slope; no barrier)
65 Reference angle      : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

```

```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 62.34 + 0.00) = 62.34 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -5 85 0.36 71.98 0.00 -5.94 -3.71 0.00 0.00 0.00 62.34
77 -----
78
79 Segment Leq : 62.34 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 64.38 + 0.00) = 64.38 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -5 85 0.36 71.98 0.00 -3.89 -3.71 0.00 0.00 0.00 64.38
91 -----
92
93 Segment Leq : 64.38 dBA
94
95 Total Leq All Segments: 66.49 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 54.74 + 0.00) = 54.74 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -5 85 0.36 64.39 0.00 -5.94 -3.71 0.00 0.00 0.00 54.74
107 -----
108
109 Segment Leq : 54.74 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 56.78 + 0.00) = 56.78 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -5 85 0.36 64.39 0.00 -3.89 -3.71 0.00 0.00 0.00 56.78
121 -----
122
123 Segment Leq : 56.78 dBA
124
125 Total Leq All Segments: 58.89 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 66.49
132 (NIGHT): 58.89
133 FF
134 FF
135

```

```

1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 38:18:33
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: base.te          Time Period: Day/Night 16/8 hours
5  Description: building 'a' units 58 to 60 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19 24 hr Traffic Volume (AADT or SADT): 17500
20 Percentage of Annual Growth         : 0.00
21 Number of Years of Growth           : 0.00
22 Medium Truck % of Total Volume      : 7.00
23 Heavy Truck % of Total Volume       : 5.00
24 Day (16 hrs) % of Total Volume     : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1  Angle2        : -90.00 deg  90.00 deg
29 Wood depth              : 0          (No woods.)
30 No of house rows        : 0 / 0
31 Surface                 : 1          (Absorptive ground surface)
32 Receiver source distance : 31.00 / 31.00 m
33 Receiver height         : 11.50 / 11.50 m
34 Topography              : 1          (Flat/gentle slope; no barrier)
35 Reference angle         : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49 24 hr Traffic Volume (AADT or SADT): 17500
50 Percentage of Annual Growth         : 0.00
51 Number of Years of Growth           : 0.00
52 Medium Truck % of Total Volume      : 7.00
53 Heavy Truck % of Total Volume       : 5.00
54 Day (16 hrs) % of Total Volume     : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1  Angle2        : -90.00 deg  90.00 deg
59 Wood depth              : 0          (No woods.)
60 No of house rows        : 0 / 0
61 Surface                 : 1          (Absorptive ground surface)
62 Receiver source distance : 19.00 / 19.00 m
63 Receiver height         : 11.50 / 11.50 m
64 Topography              : 1          (Flat/gentle slope; no barrier)
65 Reference angle         : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

```

```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 66.80 + 0.00) = 66.80 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -90 90 0.36 71.98 0.00 -4.29 -0.90 0.00 0.00 0.00 66.80
77 -----
78
79 Segment Leq : 66.80 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 69.69 + 0.00) = 69.69 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -90 90 0.36 71.98 0.00 -1.40 -0.90 0.00 0.00 0.00 69.69
91 -----
92
93 Segment Leq : 69.69 dBA
94
95 Total Leq All Segments: 71.49 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 59.20 + 0.00) = 59.20 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -90 90 0.36 64.39 0.00 -4.29 -0.90 0.00 0.00 0.00 59.20
107 -----
108
109 Segment Leq : 59.20 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 62.09 + 0.00) = 62.09 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -90 90 0.36 64.39 0.00 -1.40 -0.90 0.00 0.00 0.00 62.09
121 -----
122
123 Segment Leq : 62.09 dBA
124
125 Total Leq All Segments: 63.89 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 71.49
132 (NIGHT): 63.89
133 FF
134 FF
135

```

```

1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 46:41:08
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: bbul4.te          Time Period: Day/Night 16/8 hours
5  Description: building 'b' units 1 to 4 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19     24 hr Traffic Volume (AADT or SADT): 17500
20     Percentage of Annual Growth         : 0.00
21     Number of Years of Growth          : 0.00
22     Medium Truck % of Total Volume      : 7.00
23     Heavy Truck % of Total Volume       : 5.00
24     Day (16 hrs) % of Total Volume     : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1  Angle2       : -30.00 deg  -10.00 deg
29 Wood depth           : 0          (No woods.)
30 No of house rows     : 0 / 0
31 Surface              : 1          (Absorptive ground surface)
32 Receiver source distance : 93.00 / 93.00 m
33 Receiver height       : 11.50 / 11.50 m
34 Topography           : 1          (Flat/gentle slope; no barrier)
35 Reference angle      : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49     24 hr Traffic Volume (AADT or SADT): 17500
50     Percentage of Annual Growth         : 0.00
51     Number of Years of Growth          : 0.00
52     Medium Truck % of Total Volume      : 7.00
53     Heavy Truck % of Total Volume       : 5.00
54     Day (16 hrs) % of Total Volume     : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1  Angle2       : -30.00 deg  -10.00 deg
59 Wood depth           : 0          (No woods.)
60 No of house rows     : 0 / 0
61 Surface              : 1          (Absorptive ground surface)
62 Receiver source distance : 81.00 / 81.00 m
63 Receiver height       : 11.50 / 11.50 m
64 Topography           : 1          (Flat/gentle slope; no barrier)
65 Reference angle      : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

```

```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 51.56 + 0.00) = 51.56 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -30 -10 0.36 71.98 0.00 -10.78 -9.65 0.00 0.00 0.00 51.56
77 -----
78
79 Segment Leq : 51.56 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 52.37 + 0.00) = 52.37 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -30 -10 0.36 71.98 0.00 -9.96 -9.65 0.00 0.00 0.00 52.37
91 -----
92
93 Segment Leq : 52.37 dBA
94
95 Total Leq All Segments: 54.99 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 43.96 + 0.00) = 43.96 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -30 -10 0.36 64.39 0.00 -10.78 -9.65 0.00 0.00 0.00 43.96
107 -----
108
109 Segment Leq : 43.96 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 44.78 + 0.00) = 44.78 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -30 -10 0.36 64.39 0.00 -9.96 -9.65 0.00 0.00 0.00 44.78
121 -----
122
123 Segment Leq : 44.78 dBA
124
125 Total Leq All Segments: 47.40 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 54.99
132 (NIGHT): 47.40
133 FF
134 FF
135

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```

1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 47:45:16
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: bbu58.te          Time Period: Day/Night 16/8 hours
5  Description: building 'b' units 5 to 8 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19     24 hr Traffic Volume (AADT or SADT): 17500
20     Percentage of Annual Growth         : 0.00
21     Number of Years of Growth          : 0.00
22     Medium Truck % of Total Volume      : 7.00
23     Heavy Truck % of Total Volume       : 5.00
24     Day (16 hrs) % of Total Volume      : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1   Angle2       : -30.00 deg   -10.00 deg
29 Wood depth          : 0              (No woods.)
30 No of house rows    : 0 / 0
31 Surface             : 1              (Absorptive ground surface)
32 Receiver source distance : 84.00 / 84.00 m
33 Receiver height      : 11.50 / 11.50 m
34 Topography          : 1              (Flat/gentle slope; no barrier)
35 Reference angle      : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49     24 hr Traffic Volume (AADT or SADT): 17500
50     Percentage of Annual Growth         : 0.00
51     Number of Years of Growth          : 0.00
52     Medium Truck % of Total Volume      : 7.00
53     Heavy Truck % of Total Volume       : 5.00
54     Day (16 hrs) % of Total Volume      : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1   Angle2       : -30.00 deg   -10.00 deg
59 Wood depth          : 0              (No woods.)
60 No of house rows    : 0 / 0
61 Surface             : 1              (Absorptive ground surface)
62 Receiver source distance : 72.00 / 72.00 m
63 Receiver height      : 11.50 / 11.50 m
64 Topography          : 1              (Flat/gentle slope; no barrier)
65 Reference angle      : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

```

```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 52.16 + 0.00) = 52.16 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -30 -10 0.36 71.98 0.00 -10.18 -9.65 0.00 0.00 0.00 52.16
77 -----
78
79 Segment Leq : 52.16 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 53.07 + 0.00) = 53.07 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -30 -10 0.36 71.98 0.00 -9.27 -9.65 0.00 0.00 0.00 53.07
91 -----
92
93 Segment Leq : 53.07 dBA
94
95 Total Leq All Segments: 55.65 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 44.56 + 0.00) = 44.56 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -30 -10 0.36 64.39 0.00 -10.18 -9.65 0.00 0.00 0.00 44.56
107 -----
108
109 Segment Leq : 44.56 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 45.47 + 0.00) = 45.47 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -30 -10 0.36 64.39 0.00 -9.27 -9.65 0.00 0.00 0.00 45.47
121 -----
122
123 Segment Leq : 45.47 dBA
124
125 Total Leq All Segments: 48.05 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 55.65
132 (NIGHT): 48.05
133 FF
134 FF
135

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1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 46:36:35
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: bbu2527.te          Time Period: Day/Night 16/8 hours
5  Description: building 'b' units 25 to 27 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19     24 hr Traffic Volume (AADT or SADT): 17500
20     Percentage of Annual Growth         : 0.00
21     Number of Years of Growth          : 0.00
22     Medium Truck % of Total Volume      : 7.00
23     Heavy Truck % of Total Volume       : 5.00
24     Day (16 hrs) % of Total Volume     : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1   Angle2      : -60.00 deg   -10.00 deg
29 Wood depth      : 0 (No woods.)
30 No of house rows : 0 / 0
31 Surface        : 1 (Absorptive ground surface)
32 Receiver source distance : 48.00 / 48.00 m
33 Receiver height  : 11.50 / 11.50 m
34 Topography      : 1 (Flat/gentle slope; no barrier)
35 Reference angle  : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49     24 hr Traffic Volume (AADT or SADT): 17500
50     Percentage of Annual Growth         : 0.00
51     Number of Years of Growth          : 0.00
52     Medium Truck % of Total Volume      : 7.00
53     Heavy Truck % of Total Volume       : 5.00
54     Day (16 hrs) % of Total Volume     : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1   Angle2      : -60.00 deg   -10.00 deg
59 Wood depth      : 0 (No woods.)
60 No of house rows : 0 / 0
61 Surface        : 1 (Absorptive ground surface)
62 Receiver source distance : 36.00 / 36.00 m
63 Receiver height  : 11.50 / 11.50 m
64 Topography      : 1 (Flat/gentle slope; no barrier)
65 Reference angle  : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

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```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 59.17 + 0.00) = 59.17 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -60 -10 0.36 71.98 0.00 -6.87 -5.94 0.00 0.00 0.00 59.17
77 -----
78
79 Segment Leq : 59.17 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 60.87 + 0.00) = 60.87 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -60 -10 0.36 71.98 0.00 -5.17 -5.94 0.00 0.00 0.00 60.87
91 -----
92
93 Segment Leq : 60.87 dBA
94
95 Total Leq All Segments: 63.11 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 51.57 + 0.00) = 51.57 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -60 -10 0.36 64.39 0.00 -6.87 -5.94 0.00 0.00 0.00 51.57
107 -----
108
109 Segment Leq : 51.57 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 53.27 + 0.00) = 53.27 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -60 -10 0.36 64.39 0.00 -5.17 -5.94 0.00 0.00 0.00 53.27
121 -----
122
123 Segment Leq : 53.27 dBA
124
125 Total Leq All Segments: 55.51 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 63.11
132 (NIGHT): 55.51
133 FF
134 FF
135

```

Filename: bbu2830.te Time Period: Day/Night 16/8 hours
Description: building 'b' units 28 to 30 indoor

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Bank St N (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 : 37.50 / 37.50 m
Receiver height : 11.50 / 11.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00



Road data, segment # 2: Bank St S (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Bank St S (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 : 25.50 / 25.50 m
Receiver height : 11.50 / 11.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

FF

Results segment # 1: Bank St N (day)

Source height = 1.50 m

ROAD (0.00 + 65.67 + 0.00) = 65.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.36	71.98	0.00	-5.41	-0.90	0.00	0.00	0.00	65.67

Segment Leq : 65.67 dBA

FF

Results segment # 2: Bank St S (day)

Source height = 1.50 m

ROAD (0.00 + 67.95 + 0.00) = 67.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.36	71.98	0.00	-3.13	-0.90	0.00	0.00	0.00	67.95

Segment Leq : 67.95 dBA

Total Leq All Segments: 69.97 dBA

FF

Results segment # 1: Bank St N (night)

Source height = 1.50 m

ROAD (0.00 + 58.08 + 0.00) = 58.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.36	64.39	0.00	-5.41	-0.90	0.00	0.00	0.00	58.08

Segment Leq : 58.08 dBA

FF

Results segment # 2: Bank St S (night)

Source height = 1.50 m

ROAD (0.00 + 60.36 + 0.00) = 60.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.36	64.39	0.00	-3.13	-0.90	0.00	0.00	0.00	60.36

Segment Leq : 60.36 dBA

Total Leq All Segments: 62.38 dBA

FF

TOTAL Leq FROM ALL SOURCES (DAY): 69.97
(NIGHT): 62.38

```

1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 46:56:04
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: bbu4750.te          Time Period: Day/Night 16/8 hours
5  Description: building 'b' units 47 to 50 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19 24 hr Traffic Volume (AADT or SADT): 17500
20 Percentage of Annual Growth         : 0.00
21 Number of Years of Growth          : 0.00
22 Medium Truck % of Total Volume      : 7.00
23 Heavy Truck % of Total Volume       : 5.00
24 Day (16 hrs) % of Total Volume     : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1  Angle2       : -10.00 deg   90.00 deg
29 Wood depth           : 0             (No woods.)
30 No of house rows     : 0 / 0
31 Surface              : 1             (Absorptive ground surface)
32 Receiver source distance : 60.50 / 60.50 m
33 Receiver height      : 11.50 / 11.50 m
34 Topography           : 1             (Flat/gentle slope; no barrier)
35 Reference angle      : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49 24 hr Traffic Volume (AADT or SADT): 17500
50 Percentage of Annual Growth         : 0.00
51 Number of Years of Growth          : 0.00
52 Medium Truck % of Total Volume      : 7.00
53 Heavy Truck % of Total Volume       : 5.00
54 Day (16 hrs) % of Total Volume     : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1  Angle2       : -10.00 deg   90.00 deg
59 Wood depth           : 0             (No woods.)
60 No of house rows     : 0 / 0
61 Surface              : 1             (Absorptive ground surface)
62 Receiver source distance : 48.50 / 48.50 m
63 Receiver height      : 11.50 / 11.50 m
64 Topography           : 1             (Flat/gentle slope; no barrier)
65 Reference angle      : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

```

```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 60.39 + 0.00) = 60.39 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -10 90 0.36 71.98 0.00 -8.24 -3.35 0.00 0.00 0.00 60.39
77 -----
78
79 Segment Leq : 60.39 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 61.70 + 0.00) = 61.70 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -10 90 0.36 71.98 0.00 -6.93 -3.35 0.00 0.00 0.00 61.70
91 -----
92
93 Segment Leq : 61.70 dBA
94
95 Total Leq All Segments: 64.10 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 52.80 + 0.00) = 52.80 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -10 90 0.36 64.39 0.00 -8.24 -3.35 0.00 0.00 0.00 52.80
107 -----
108
109 Segment Leq : 52.80 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 54.10 + 0.00) = 54.10 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -10 90 0.36 64.39 0.00 -6.93 -3.35 0.00 0.00 0.00 54.10
121 -----
122
123 Segment Leq : 54.10 dBA
124
125 Total Leq All Segments: 56.51 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 64.10
132 (NIGHT): 56.51
133 FF
134 FF
135

```

```

1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 46:53:55
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: bbu5154.te          Time Period: Day/Night 16/8 hours
5  Description: building 'b' units 51 to 54 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19 24 hr Traffic Volume (AADT or SADT): 17500
20 Percentage of Annual Growth         : 0.00
21 Number of Years of Growth          : 0.00
22 Medium Truck % of Total Volume      : 7.00
23 Heavy Truck % of Total Volume       : 5.00
24 Day (16 hrs) % of Total Volume     : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1  Angle2       : -10.00 deg   90.00 deg
29 Wood depth           : 0             (No woods.)
30 No of house rows     : 0 / 0
31 Surface              : 1             (Absorptive ground surface)
32 Receiver source distance : 51.50 / 51.50 m
33 Receiver height      : 11.50 / 11.50 m
34 Topography           : 1             (Flat/gentle slope; no barrier)
35 Reference angle      : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49 24 hr Traffic Volume (AADT or SADT): 17500
50 Percentage of Annual Growth         : 0.00
51 Number of Years of Growth          : 0.00
52 Medium Truck % of Total Volume      : 7.00
53 Heavy Truck % of Total Volume       : 5.00
54 Day (16 hrs) % of Total Volume     : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1  Angle2       : -10.00 deg   90.00 deg
59 Wood depth           : 0             (No woods.)
60 No of house rows     : 0 / 0
61 Surface              : 1             (Absorptive ground surface)
62 Receiver source distance : 39.50 / 39.50 m
63 Receiver height      : 11.50 / 11.50 m
64 Topography           : 1             (Flat/gentle slope; no barrier)
65 Reference angle      : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

```

```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 61.34 + 0.00) = 61.34 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -10 90 0.36 71.98 0.00 -7.29 -3.35 0.00 0.00 0.00 61.34
77 -----
78
79 Segment Leq : 61.34 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 62.91 + 0.00) = 62.91 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -10 90 0.36 71.98 0.00 -5.72 -3.35 0.00 0.00 0.00 62.91
91 -----
92
93 Segment Leq : 62.91 dBA
94
95 Total Leq All Segments: 65.21 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 53.75 + 0.00) = 53.75 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -10 90 0.36 64.39 0.00 -7.29 -3.35 0.00 0.00 0.00 53.75
107 -----
108
109 Segment Leq : 53.75 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 55.31 + 0.00) = 55.31 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -10 90 0.36 64.39 0.00 -5.72 -3.35 0.00 0.00 0.00 55.31
121 -----
122
123 Segment Leq : 55.31 dBA
124
125 Total Leq All Segments: 57.61 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 65.21
132 (NIGHT): 57.61
133 FF
134 FF
135

```

```

1  STAMSON 5.0          NORMAL REPORT          Date: 30-05-2022 46:51:53
2  MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
3
4  Filename: bbu5557.te          Time Period: Day/Night 16/8 hours
5  Description: building 'b' units 55 to 57 indoor
6
7
8  Road data, segment # 1: Bank St N (day/night)
9  -----
10 Car traffic volume   : 14168/1232   veh/TimePeriod  *
11 Medium truck volume  : 1127/98      veh/TimePeriod  *
12 Heavy truck volume   : 805/70       veh/TimePeriod  *
13 Posted speed limit   : 70 km/h
14 Road gradient        : 1 %
15 Road pavement        : 1 (Typical asphalt or concrete)
16
17 * Refers to calculated road volumes based on the following input:
18
19 24 hr Traffic Volume (AADT or SADT): 17500
20 Percentage of Annual Growth         : 0.00
21 Number of Years of Growth           : 0.00
22 Medium Truck % of Total Volume      : 7.00
23 Heavy Truck % of Total Volume       : 5.00
24 Day (16 hrs) % of Total Volume     : 92.00
25
26 Data for Segment # 1: Bank St N (day/night)
27 -----
28 Angle1  Angle2       : -10.00 deg   90.00 deg
29 Wood depth           : 0             (No woods.)
30 No of house rows     : 0 / 0
31 Surface              : 1             (Absorptive ground surface)
32 Receiver source distance : 45.00 / 45.00 m
33 Receiver height      : 11.50 / 11.50 m
34 Topography           : 1             (Flat/gentle slope; no barrier)
35 Reference angle      : 0.00
36
37 FF
38 Road data, segment # 2: Bank St S (day/night)
39 -----
40 Car traffic volume   : 14168/1232   veh/TimePeriod  *
41 Medium truck volume  : 1127/98      veh/TimePeriod  *
42 Heavy truck volume   : 805/70       veh/TimePeriod  *
43 Posted speed limit   : 70 km/h
44 Road gradient        : 1 %
45 Road pavement        : 1 (Typical asphalt or concrete)
46
47 * Refers to calculated road volumes based on the following input:
48
49 24 hr Traffic Volume (AADT or SADT): 17500
50 Percentage of Annual Growth         : 0.00
51 Number of Years of Growth           : 0.00
52 Medium Truck % of Total Volume      : 7.00
53 Heavy Truck % of Total Volume       : 5.00
54 Day (16 hrs) % of Total Volume     : 92.00
55
56 Data for Segment # 2: Bank St S (day/night)
57 -----
58 Angle1  Angle2       : -10.00 deg   90.00 deg
59 Wood depth           : 0             (No woods.)
60 No of house rows     : 0 / 0
61 Surface              : 1             (Absorptive ground surface)
62 Receiver source distance : 33.00 / 33.00 m
63 Receiver height      : 11.50 / 11.50 m
64 Topography           : 1             (Flat/gentle slope; no barrier)
65 Reference angle      : 0.00
66
67 FF
68 Results segment # 1: Bank St N (day)
69 -----

```

```

70
71 Source height = 1.50 m
72
73 ROAD (0.00 + 62.14 + 0.00) = 62.14 dBA
74 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
75 -----
76 -10 90 0.36 71.98 0.00 -6.49 -3.35 0.00 0.00 0.00 62.14
77 -----
78
79 Segment Leq : 62.14 dBA
80
81 FF
82 Results segment # 2: Bank St S (day)
83 -----
84
85 Source height = 1.50 m
86
87 ROAD (0.00 + 63.97 + 0.00) = 63.97 dBA
88 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
89 -----
90 -10 90 0.36 71.98 0.00 -4.66 -3.35 0.00 0.00 0.00 63.97
91 -----
92
93 Segment Leq : 63.97 dBA
94
95 Total Leq All Segments: 66.16 dBA
96
97 FF
98 Results segment # 1: Bank St N (night)
99 -----
100
101 Source height = 1.50 m
102
103 ROAD (0.00 + 54.54 + 0.00) = 54.54 dBA
104 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
105 -----
106 -10 90 0.36 64.39 0.00 -6.49 -3.35 0.00 0.00 0.00 54.54
107 -----
108
109 Segment Leq : 54.54 dBA
110
111 FF
112 Results segment # 2: Bank St S (night)
113 -----
114
115 Source height = 1.50 m
116
117 ROAD (0.00 + 56.38 + 0.00) = 56.38 dBA
118 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
119 -----
120 -10 90 0.36 64.39 0.00 -4.66 -3.35 0.00 0.00 0.00 56.38
121 -----
122
123 Segment Leq : 56.38 dBA
124
125 Total Leq All Segments: 58.57 dBA
126
127 FF
128
129
130
131 TOTAL Leq FROM ALL SOURCES (DAY): 66.16
132 (NIGHT): 58.57
133 FF
134 FF
135

```

Filename: bbu5860.te Time Period: Day/Night 16/8 hours
Description: building 'b' units 58 to 60 indoor

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Bank St N (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 33.50 / 33.50 m
Receiver height : 11.50 / 11.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00



Road data, segment # 2: Bank St S (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Bank St S (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 : 21.50 / 21.50 m
Receiver height : 11.50 / 11.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

FF

Results segment # 1: Bank St N (day)

Source height = 1.50 m

ROAD (0.00 + 66.34 + 0.00) = 66.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.36	71.98	0.00	-4.75	-0.90	0.00	0.00	0.00	66.34

Segment Leq : 66.34 dBA

FF

Results segment # 2: Bank St S (day)

Source height = 1.50 m

ROAD (0.00 + 68.96 + 0.00) = 68.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.36	71.98	0.00	-2.13	-0.90	0.00	0.00	0.00	68.96

Segment Leq : 68.96 dBA

Total Leq All Segments: 70.85 dBA

FF

Results segment # 1: Bank St N (night)

Source height = 1.50 m

ROAD (0.00 + 58.74 + 0.00) = 58.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.36	64.39	0.00	-4.75	-0.90	0.00	0.00	0.00	58.74

Segment Leq : 58.74 dBA

FF

Results segment # 2: Bank St S (night)

Source height = 1.50 m

ROAD (0.00 + 61.36 + 0.00) = 61.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.36	64.39	0.00	-2.13	-0.90	0.00	0.00	0.00	61.36

Segment Leq : 61.36 dBA

Total Leq All Segments: 63.25 dBA

FF

TOTAL Leq FROM ALL SOURCES (DAY): 70.85
(NIGHT): 63.25

Filename: bcsw.te Time Period: Day/Night 16/8 hours
Description: building 'c' units 31 to 34 indoor

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Bank St N (day/night)

Angle1 Angle2 : -5.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 190.50 / 190.50 m
Receiver height : 11.50 / 11.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00



Road data, segment # 2: Bank St S (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Bank St S (day/night)

Angle1 Angle2 : -5.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 178.50 / 178.50 m
Receiver height : 11.50 / 11.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

FF

Results segment # 1: Bank St N (day)

Source height = 1.50 m

ROAD (0.00 + 53.35 + 0.00) = 53.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-5	90	0.36	71.98	0.00	-15.01	-3.62	0.00	0.00	0.00	53.35

Segment Leq : 53.35 dBA

FF

Results segment # 2: Bank St S (day)

Source height = 1.50 m

ROAD (0.00 + 53.73 + 0.00) = 53.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-5	90	0.36	71.98	0.00	-14.63	-3.62	0.00	0.00	0.00	53.73

Segment Leq : 53.73 dBA

Total Leq All Segments: 56.55 dBA

FF

Results segment # 1: Bank St N (night)

Source height = 1.50 m

ROAD (0.00 + 45.75 + 0.00) = 45.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-5	90	0.36	64.39	0.00	-15.01	-3.62	0.00	0.00	0.00	45.75

Segment Leq : 45.75 dBA

FF

Results segment # 2: Bank St S (night)

Source height = 1.50 m

ROAD (0.00 + 46.14 + 0.00) = 46.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-5	90	0.36	64.39	0.00	-14.63	-3.62	0.00	0.00	0.00	46.14

Segment Leq : 46.14 dBA

Total Leq All Segments: 48.96 dBA

FF

TOTAL Leq FROM ALL SOURCES (DAY): 56.55
(NIGHT): 48.96

Filename: bcse.te Time Period: Day/Night 16/8 hours
Description: building 'c' units 58 to 60 indoor

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Bank St N (day/night)

Angle1 Angle2 : -10.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 125.00 / 125.00 m
Receiver height : 11.50 / 11.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00



Road data, segment # 2: Bank St S (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Bank St S (day/night)

Angle1 Angle2 : -10.00 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 : 11.50 / 11.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

FF

Results segment # 1: Bank St N (day)

Source height = 1.50 m

ROAD (0.00 + 56.11 + 0.00) = 56.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	90	0.36	71.98	0.00	-12.52	-3.35	0.00	0.00	0.00	56.11

Segment Leq : 56.11 dBA

FF

Results segment # 2: Bank St S (day)

Source height = 1.50 m

ROAD (0.00 + 56.70 + 0.00) = 56.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	90	0.36	71.98	0.00	-11.93	-3.35	0.00	0.00	0.00	56.70

Segment Leq : 56.70 dBA

Total Leq All Segments: 59.43 dBA

FF

Results segment # 1: Bank St N (night)

Source height = 1.50 m

ROAD (0.00 + 48.51 + 0.00) = 48.51 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	90	0.36	64.39	0.00	-12.52	-3.35	0.00	0.00	0.00	48.51

Segment Leq : 48.51 dBA

FF

Results segment # 2: Bank St S (night)

Source height = 1.50 m

ROAD (0.00 + 49.11 + 0.00) = 49.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	90	0.36	64.39	0.00	-11.93	-3.35	0.00	0.00	0.00	49.11

Segment Leq : 49.11 dBA

Total Leq All Segments: 51.83 dBA

FF

TOTAL Leq FROM ALL SOURCES (DAY): 59.43
(NIGHT): 51.83

Outdoor Living Area (OLA)

Filename: ola.te Time Period: Day/Night 16/8 hours
Description: shared amenity space - p1

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Bank St N (day/night)

Angle1 Angle2 : 10.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 112.50 / 112.50 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00



Road data, segment # 2: Bank St S (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Bank St S (day/night)

Angle1 Angle2 : 10.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 100.50 / 100.50 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

FF

Results segment # 1: Bank St N (day)

Source height = 1.50 m

ROAD (0.00 + 52.26 + 0.00) = 52.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
10	90	0.66	71.98	0.00	-14.53	-5.20	0.00	0.00	0.00	52.26

Segment Leq : 52.26 dBA

FF

Results segment # 2: Bank St S (day)

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
10	90	0.66	71.98	0.00	-13.71	-5.20	0.00	0.00	0.00	53.07

Segment Leq : 53.07 dBA

Total Leq All Segments: 55.69 dBA

FF

Results segment # 1: Bank St N (night)

Source height = 1.50 m

ROAD (0.00 + 45.63 + 0.00) = 45.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
10	90	0.57	64.39	0.00	-13.74	-5.02	0.00	0.00	0.00	45.63

Segment Leq : 45.63 dBA

FF

Results segment # 2: Bank St S (night)

Source height = 1.50 m

ROAD (0.00 + 46.40 + 0.00) = 46.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
10	90	0.57	64.39	0.00	-12.97	-5.02	0.00	0.00	0.00	46.40

Segment Leq : 46.40 dBA

Total Leq All Segments: 49.04 dBA

FF

TOTAL Leq FROM ALL SOURCES (DAY) : 55.69
(NIGHT) : 49.04

Filename: olap2.te Time Period: Day/Night 16/8 hours
Description: ola p2

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Bank St N (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 : 112.50 / 112.50 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00



Road data, segment # 2: Bank St S (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17500
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: Bank St S (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 : 100.50 / 100.50 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

FF

Results segment # 1: Bank St N (day)

Source height = 1.50 m

ROAD (0.00 + 51.40 + 0.00) = 51.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
20	90	0.66	71.98	0.00	-14.53	-6.06	0.00	0.00	0.00	51.40

Segment Leq : 51.40 dBA

FF

Results segment # 2: Bank St S (day)

Source height = 1.50 m

ROAD (0.00 + 52.21 + 0.00) = 52.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
20	90	0.66	71.98	0.00	-13.71	-6.06	0.00	0.00	0.00	52.21

Segment Leq : 52.21 dBA

Total Leq All Segments: 54.83 dBA

FF

Results segment # 1: Bank St N (night)

Source height = 1.50 m

ROAD (0.00 + 44.81 + 0.00) = 44.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
20	90	0.57	64.39	0.00	-13.74	-5.84	0.00	0.00	0.00	44.81

Segment Leq : 44.81 dBA

FF

Results segment # 2: Bank St S (night)

Source height = 1.50 m

ROAD (0.00 + 45.58 + 0.00) = 45.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
20	90	0.57	64.39	0.00	-12.97	-5.84	0.00	0.00	0.00	45.58

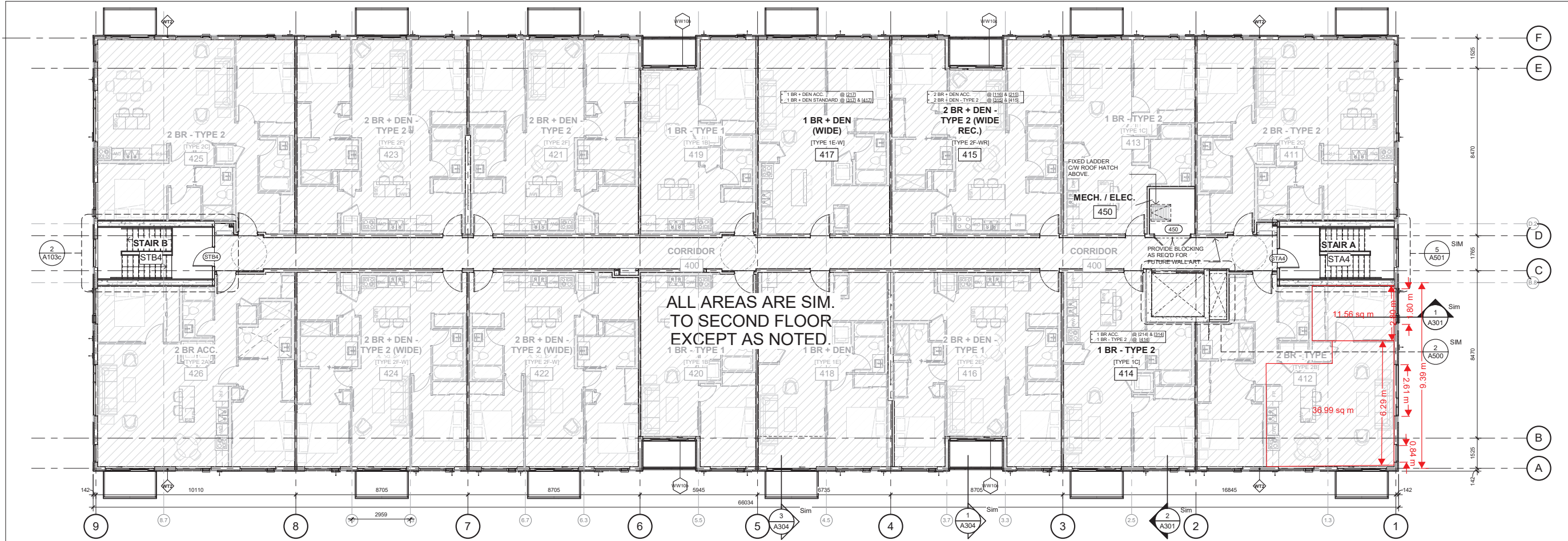
Segment Leq : 45.58 dBA

Total Leq All Segments: 48.22 dBA

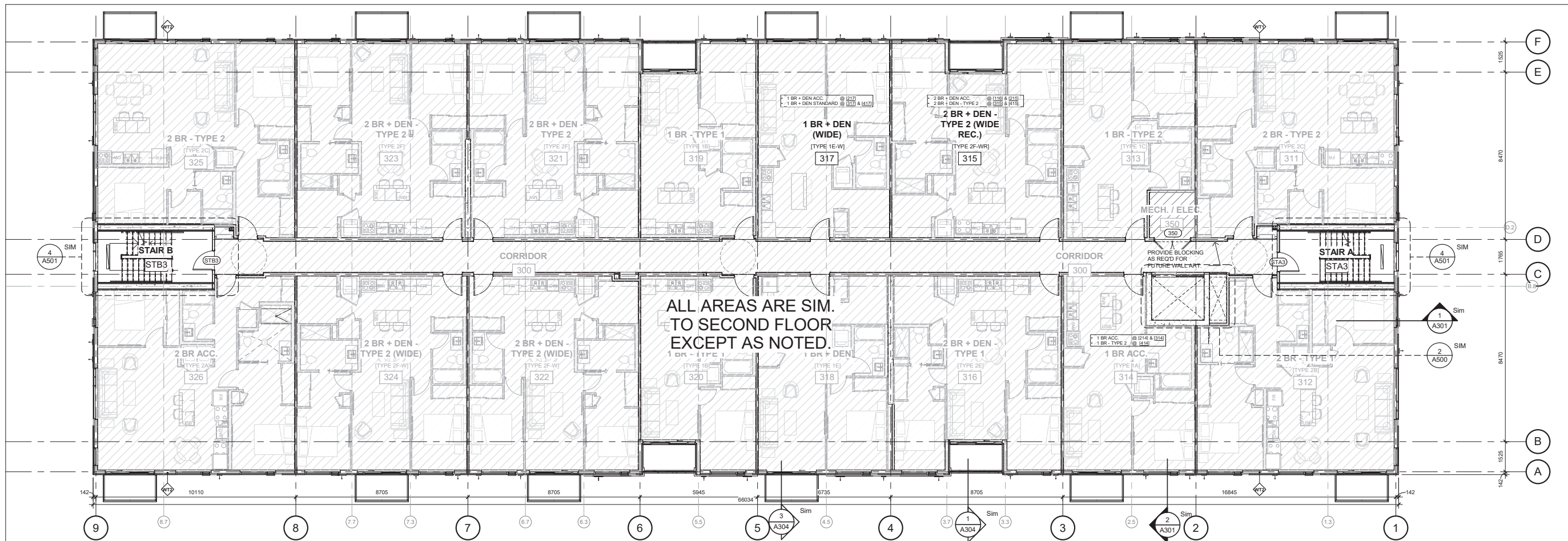
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TOTAL Leq FROM ALL SOURCES (DAY): 54.83
(NIGHT): 48.22

Appendix B – Architectural Drawings



2 BUILDING A - FOURTH FLOOR PLAN
1:100



1 BUILDING A - THIRD FLOOR PLAN
1:100

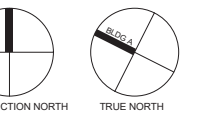
NO.	ISSUED	DATE
1	ISSUED FOR PERMIT	MARCH 31, 2022

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SEAL



BUILDING A

PROVENCE
APARTMENTS
ORLEANS



A - 2045 PORTOBELLO BLVD.

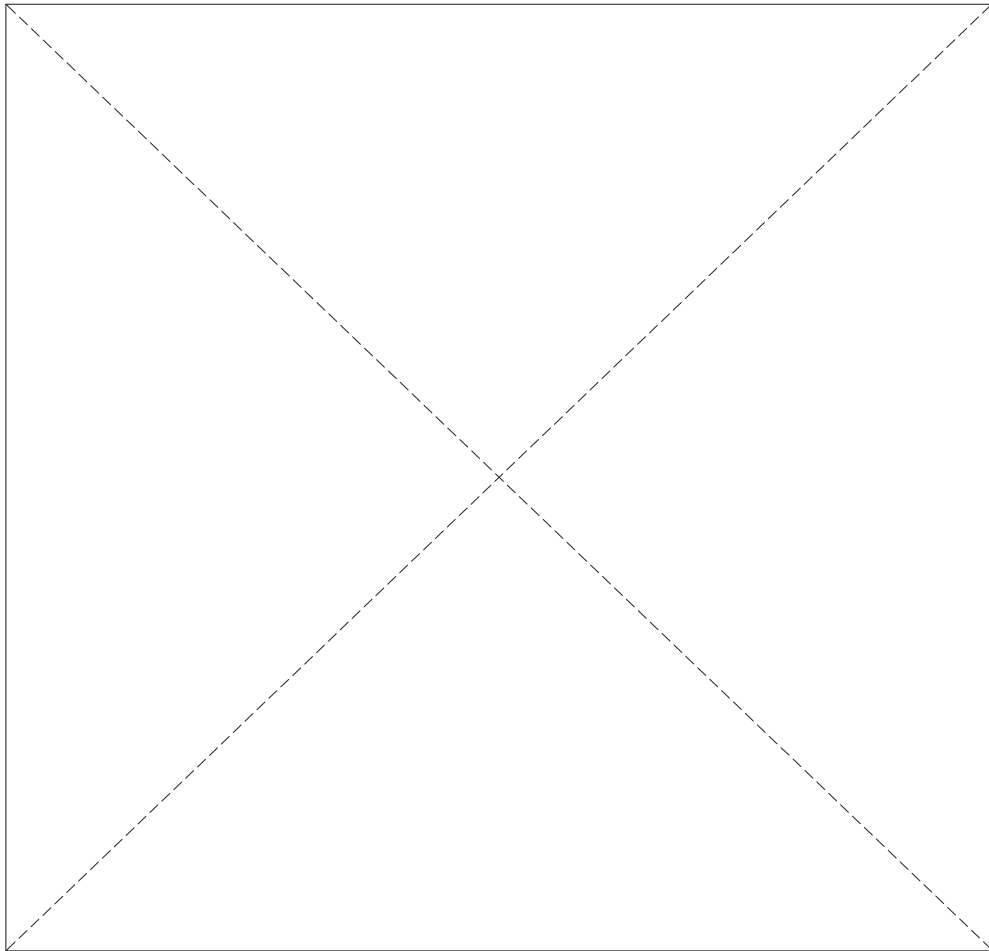
OTTAWA, ONTARIO

SHEET NAME

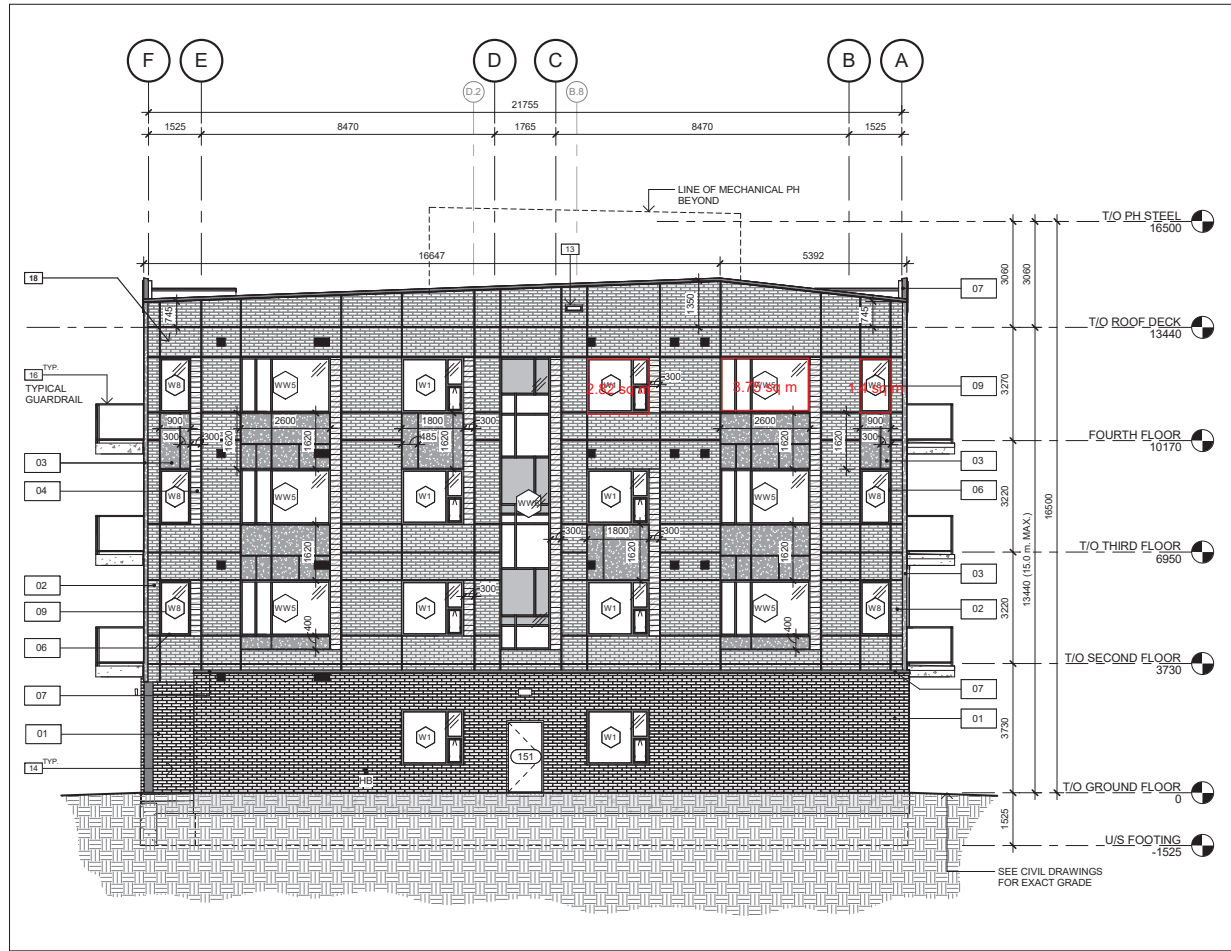
BLDG A - THIRD
AND FOURTH
FLOOR PLAN

START DATE	AUG 31, 2020
DRAWN BY	MC
CHECKED BY	LC
SCALE	1 : 100
PROJECT NO.	120024
DRAWING	

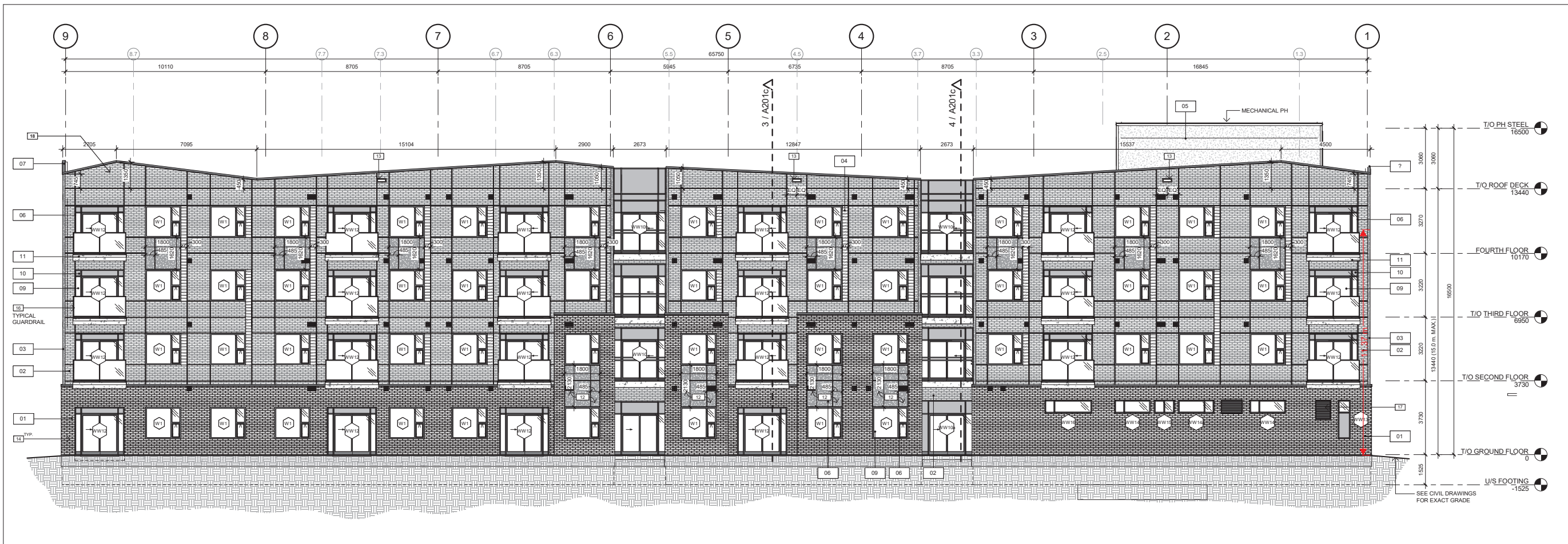
A103a



FINISH LEGEND	
	01 EXTERIOR INSULATION FINISH SYSTEM (EIFS) PANEL - BRICK PATTERN, RED
	02 EXTERIOR INSULATION FINISH SYSTEM (EIFS) PANEL - BRICK PATTERN, WHITE
	03 EXTERIOR INSULATION FINISH SYSTEM (EIFS) PANEL - BLACK / CHARCOAL
	04 EXTERIOR INSULATION FINISH SYSTEM (EIFS) PANEL - WOOD PATTERN, BROWN
	05 EXTERIOR INSULATION FINISH SYSTEM (EIFS) PANEL - WHITE, TO MATCH EIFS BRICK
	07 PREFINISHED METAL - BLACK
	07 PREFINISHED METAL - BLACK / CHARCOAL TO MATCH ADJACENT EIFS
	08 PREFINISHED METAL - WHITE TO MATCH ADJACENT EIFS
	09 ALUMINUM DOUBLE GLAZED THERMALLY BROKEN WINDOW
	10 WINDOW SPANDREL PANEL, EXACT COLOUR TBD
	11 EXPOSED CONCRETE BALCONY
12 EIFS PANEL INFILL BETWEEN L1 & L2 WINDOWS. SEE ELEVATION.	
13 SCUPPER TO BE LOCATED 150mm ABOVE ROOF, EQUALLY SPACED AT 30m O.C. ALONG FACE OF WALL. FINISH TO MATCH ADJACENT. ROOF MEMBRANE TO LAP INTO OPENING. SEE TYPICAL DETAIL.	
14 ALL EIFS PANEL AT GROUND FLOOR, AND ADJACENT TO PATIOS / BALCONIES TO BE C/W "HIGH IMPACT" MESH. SEE PRODUCT SPECIFICATIONS.	
15 JULIETTE BALCONY (AT SUITE 211 ONLY). GUARDRAIL TO EXTEND TO MIN 1100 A.F.F., AND SECURED TO ADJACENT WALL. POSTS AND RAILS TO BE PREFINISHED ALUMINUM (BLACK). PANEL TO BE GLASS. GUARDRAIL TO BE ENGINEERED TO MEET LOAD REQUIREMENTS AS PER OBC 4.1.5.15.	
16 BALCONY GUARDRAIL TO EXTEND TO MIN 1100 ABOVE FINISHED BALCONY, AND SECURED TO BALCONY FLOOR. POSTS AND RAILS TO BE PREFINISHED ALUMINUM (BLACK). PANEL TO BE GLASS. GUARDRAIL TO BE ENGINEERED TO MEET LOAD REQUIREMENTS AS PER OBC 4.1.5.15.	



2 BUILDING A - SIDE ELEVATION 2 (WEST)
A202a 1 : 100



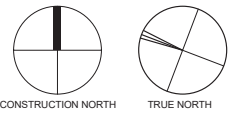
1 BUILDING A - REAR ELEVATION (SOUTH)
A202a 1 : 100



Chamberlain Architect Services Limited
4671 Palladium Way (Unit 1)
Burlington, Ontario L7M 0W9
CANADA
Phone: 905.631.7777
www.chamberlainPD.com

NO.	ISSUED	DATE
1	ISSUED FOR PERMIT	MARCH 31, 2022

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BUILDING A

PROVENCE
APARTMENTS
ORLEANS



A - 2045 PORTOBELLO BLVD.

OTTAWA, ONTARIO

SHEET NAME

BLDG A -
EXTERIOR
ELEVATIONS II

START DATE	AUG 31, 2020
DRAWN BY	MC
CHECKED BY	LC
SCALE	1 : 100
PROJECT NO.	120024
DRAWING	

A202a

Appendix C –
Sound Transmission Class (STC)
Calculations

2 Bedroom - Type 2B Apartment

Reverse Evaluation of Sound Transmission Class (STC) for Building Components

1.0	Free field sound level	<u>71.49</u> dBA	Noise source
	Correction for reflections	<u>3</u> dBA	Road ▼
	Outdoor sound level	<u>74.49</u> dBA	Indoor Quarters
	Indoor sound level (Daytime)	<u>45</u> dBA	Living ▼
	Required Noise Reduction (NR)	<u>29.49</u> dB	Subtract indoor from outdoor sound level
2.0	Sound angle of incidence	<u>0 to 90 degrees</u> ▼	C ₁ Correction from Table 7.7 <u>0</u> dB
			Sum <u>29.49</u> dB

	Component:	Wall ▼	STC <u>50</u> dB
3.0	Noise spectrum type	D - Mixed Road Traffic, Distant Aircraft ▼	C ₄ from Table 7.10 <u>7</u> dB
	Component category	d. Sealed thick window, or exterior wall, or roof/ceiling ▼	Correction <u>-7</u> dB
4.0	Room floor area	<u>37</u> m ²	40.54054 % of floor area
	Component Area	<u>15</u> m ²	
	Room absorption category	Intermediate ▼	C ₃ from Table 7.9 <u>-8</u> dB
			Correction <u>8</u> dB
5.0	Noise reduction if only this component transmits sound		<u>51</u> dB
6.0	Required noise reduction (from Step 1)		<u>29</u> dB
7.0	Term C ₂ : Subtract the Required NR from the Noise Reduction for this component		<u>22</u> dB
8.0	Determine from Table 7.8 the corresponding value of total transmitted sound energy		<u>5</u> %

	Component:	Window ▼	After step 2 <u>29.49</u> dB
9.0	Transmits	95 % of total sound energy	C ₂ from Table 7.8 <u>0</u> dB
10.0	Room floor area	<u>37</u> m ²	14.05405 % of floor area
	Component Area	<u>5.2</u> m ²	
	Room absorption category	Intermediate ▼	C ₃ from Table 7.9 <u>-8</u> dB
11.0	Noise spectrum type	D - Mixed Road Traffic, Distant Aircraft ▼	C ₄ from Table 7.10 <u>7</u> dB
	Component category	d. Sealed thick window, or exterior wall, or roof/ceiling ▼	
	STC=NR+C ₁ +C ₂ +C ₃ +C ₄		Required STC <u>28</u>

Tables from Environmental Noise Assessment in Land Use Planning, dated 1999, published by the MOE

2 Bedroom - Type 2B

Reverse Evaluation of Sound Transmission Class (STC) for Building Components

1.0	Free field sound level	63.89 dBA	Noise source
	Correction for reflections	<u>3</u> dBA	Road ▼
	Outdoor sound level	66.89 dBA	Indoor Quarters
	Indoor sound level (Night time)	<u>40</u> dBA	Sleeping ▼
	Required Noise Reduction (NR)	<u>26.89</u> dB	Subtract indoor from outdoor sound level
2.0	Sound angle of incidence	0 to 90 degrees ▼	C ₁ Correction from Table 7.7 <u>0</u> dB
			Sum <u>26.89</u> dB

	Component:	Wall ▼	STC 50 dB
3.0	Noise spectrum type	D - Mixed Road Traffic, Distant Aircraft ▼	C ₄ from Table 7.10 <u>7</u> dB
	Component category	d. Sealed thick window, or exterior wall, or roof/ceiling ▼	Correction <u>-7</u> dB
4.0	Room floor area	11.7 m ²	55.21368 % of floor area
	Component Area	6.46 m ²	
	Room absorption category	Intermediate ▼	C ₃ from Table 7.9 <u>-6</u> dB
			Correction <u>6</u> dB
5.0	Noise reduction if only this component transmits sound		<u>49</u> dB
6.0	Required noise reduction (from Step 1)		<u>27</u> dB
7.0	Term C ₂ : Subtract the Required NR from the Noise Reduction for this component		<u>22</u> dB
8.0	Determine from Table 7.8 the corresponding value of total transmitted sound energy		<u>5</u> %

	Component:	Window ▼	After step 2 <u>26.89</u> dB
9.0	Transmits	95 % of total sound energy	C ₂ from Table 7.8 <u>0</u> dB
10.0	Room floor area	11.7 m ²	24.10256 % of floor area
	Component Area	2.82 m ²	
	Room absorption category	Intermediate ▼	C ₃ from Table 7.9 <u>-6</u> dB
11.0	Noise spectrum type	D - Mixed Road Traffic, Distant Aircraft ▼	C ₄ from Table 7.10 <u>7</u> dB
	Component category	d. Sealed thick window, or exterior wall, or roof/ceiling ▼	
	STC=NR+C ₁ +C ₂ +C ₃ +C ₄		Required STC <u>28</u>

Tables from Environmental Noise Assessment in Land Use Planning, dated 1999, published by the MOE

Appendix D – Material Data Sheets

Job Name/Location:

Tag #:

Date:

For: ☐ File ☐ Resubmit

PO No.:

☐ Approval ☐ Other _____

Architect:

GC:

Engr:

Mech:

Rep:

(Company)

(Project Manager)

ARUM241CTE5

Multi V™ 5 Single Frame 575V

20.0 Ton Outdoor Unit for Heat Pump and Heat Recovery

**Performance:****Cooling Mode:**

Nominal Capacity (Btu/h)	233,100
Power Input ¹ (kW)	16.80

Heating Mode:

Nominal Capacity (Btu/h)	243,000
Power Input ¹ (kW)	17.75

Nominal Capacity is outside the scope of AHRI Standard 1230 and based on the following conditions:

Indoor: 80°F DB / 67°F WB

Indoor: 70°F DB

Outdoor: 95°F DB

Outdoor: 47°F DB / 43°F WB

Electrical:

Power Supply (V/Hz/Ø)	575/60/3
MOP (A)	58.3
MCA (A)	41.4
Rated Amps (A)	37.2
Compressor A (A)	16.9
Compressor B (A)	15.3
Fan (A)	5.0

Piping:

Refrigerant Charge (lbs)	37.5
Liquid Line (in, OD)	5/8 Braze
Low Pressure Vapor Line (in,	1-3/8 Braze
High Pressure Vapor Line (in, OD) (HR Only)	1-1/8 Braze

Standard Features:

- Advanced Smart Load Control
- Intelligent Heating
- HiPDR (high pressure oil return)
- Smart Oil Control
- Night Quiet Operation
- Fault Detection and Diagnosis
- Active Refrigerant Control
- Variable Path Heat Exchanger
- Subcooling and Vapor Injection Control
- Liquid Cooled Inverter Controller

Optional Accessories:

- ☐ Air Guide - ZAGDKA52A (1 required)
- ☐ Low Ambient Baffle Kit - ZLABKA52A (1), Control Kit - PRVC2 (1 per system)
- ☐ Hail Guard Kit - ZHGDKA52A (1 Required)

****Cooling operating range is extended to -9.9 to 122°F if the optional low ambient baffle kit and low ambient control kit are installed.**

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Operating Range:

Cooling (°F DB)**	5-122
Heating (°F WB)	-22 - 61
Synchronous Operation - Cooling Based	14 - 81
Synchronous Operation - Heating Based	14 - 61

Unit Data:

Refrigerant Type	R410A
Refrigerant Control	EEV
Max Number of Indoor Units ²	39
Sound Pressure ³ dB(A)	65.0
Net Unit Weight (lbs)	681
Shipping Weight (lbs)	709
Communication Cable ⁴ (No x AWG)	2 x 18
Heat Exchanger Coating	Black Coated Fin™

Compressor:

Type	HSS DC Scroll
Quantity	2
Oil/Type	PVE/FVC68D

Fan:

Type	Propeller
Quantity	2
Motor/Drive	Brushless Digitally Controlled/Direct
Air Flow Rate (CFM)	11,300

Notes:

- For AHRI ratings, refer to the AHRI website <http://www.ahridirectory.org>.
- The combination ratio must be between 50 – 130%.
- Sound Pressure levels are tested in an anechoic chamber under ISO Standard 3745.
- Communication cable between ODU and IDU(s) must be 2-conductor, 18 AWG, twisted, stranded, and shielded. Ensure the communication cable shield is properly grounded to the Master ODU chassis only. Do not ground the communication cable at any other point. Wiring must comply with all applicable local and national codes.
- Nominal data is rated 0 ft above sea level, with 25 ft of refrigerant line per indoor unit and a 0 ft level difference between outdoor and indoor units.
- All capacities are net with a combination ratio between 95-105%.
- Power wiring cable size must comply with the applicable local and national code.
- The voltage tolerance is +/- 10%.



ARUM241CTE5

Multi V™ 5 Single Frame 575V

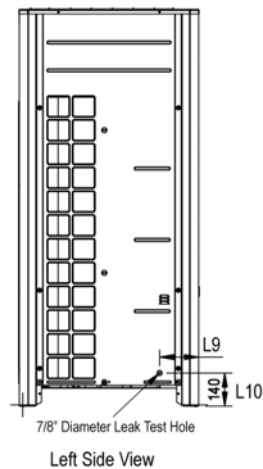
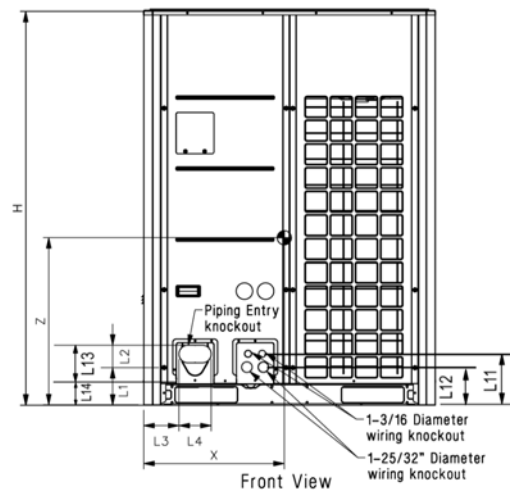
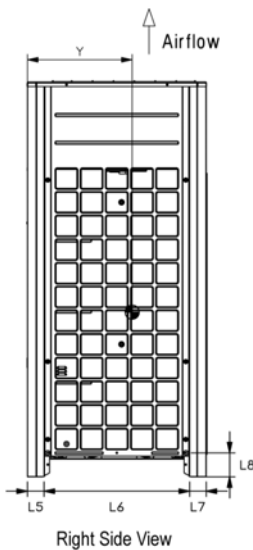
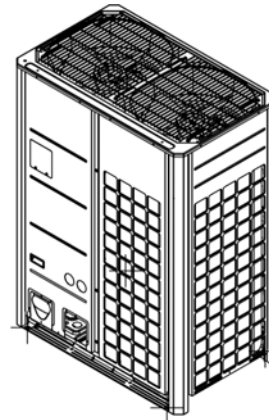
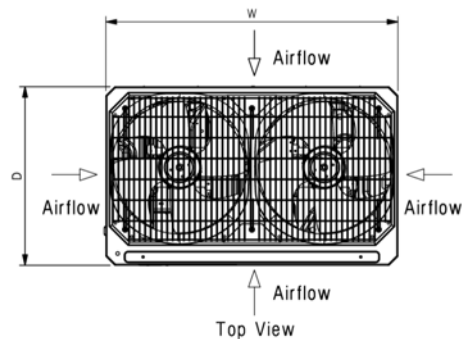
20.0 Ton Outdoor Unit for Heat Pump and Heat Recovery



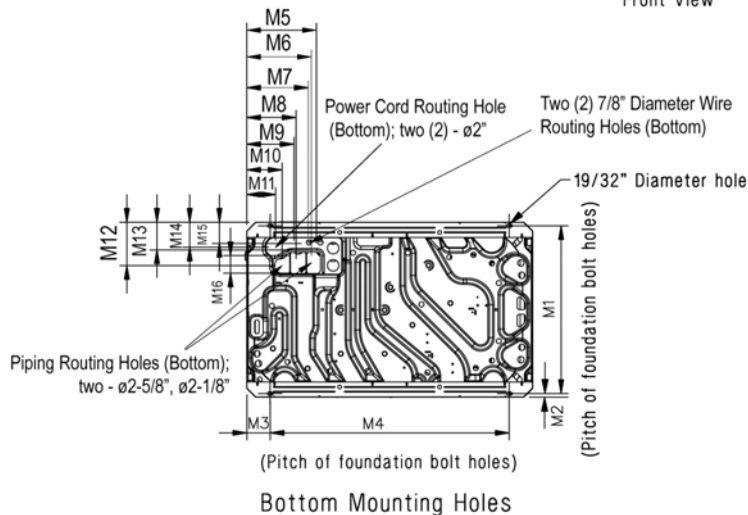
Tag #:

Date:

PO No.:



W	48-13/16"
H	66-17/32"
D	29-29/32"
L1	6-5/16"
L2	3-3/4"
L3	5-29/32"
L4	5-13/32"
L5	2-25/32"
L6	24-9/32"
L7	2-25/32"
L8	4-1/32"
L9	6-1/2"
L10	5-9/16"
L11	8-5/8"
L12	6-7/16"
L13	9-15/16"
L14	3-5/8"



M1	28-25/32"
M2	5/8"
M3	3-15/16"
M4	40-15/16"
M5	11-15/16"
M6	11-1/16"
M7	10-1/2"
M8	8-7/16"
M9	8-1/8"
M10	6-1/16"
M11	4-15/16"
M12	7-1/2"
M13	4-13/16"
M14	4-5/16"
M15	3-5/8"
M16	3"

Center of Gravity

X	23-7/32"
Y	15-5/8"
Z	25-9/16"

All dimensions have a tolerance of ± 0.25 in.
[Unit: inch]

= Center of Gravity