



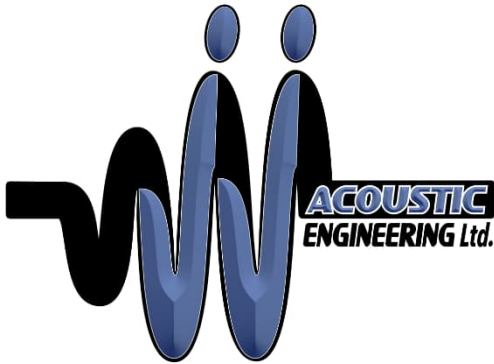
## Road Traffic and Stationary Noise Impact Study

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143 Columbia Street West, Waterloo, Ontario

JJ-00366 NIS1





November 17, 2021

Reference No. JJ-00366-NIS1

Ahasar Syed  
Urban Planner Co-op  
PRiCA Global Enterprise Inc.  
156 Columbia St W  
Waterloo, ON N2L 3L3

Dear Mr. Syed:

**Re: Road Traffic and Stationary Noise Impact Study  
143 Columbia Street West, Waterloo, Ontario**

## **1. Introduction**

JJ Acoustic Engineering Ltd. (JJAE) was retained to complete a Road Traffic and Stationary Noise Impact Study (Study) for the residential/commercial development located at 143 Columbia Street West in Waterloo, Ontario (Site). The Site will be developed into three 25-storey mix-use building. JJAE has provided a copy of the most up-to-date Site Plan in Attachment A.

The Study was prepared consistent with Ontario Ministry of the Environment, Conservation and Park (MOECP) NPC 300, "Environmental Noise Guideline, Stationary and Transportation Sources—Approval and Planning" dated August 2013.

This Study has determined that the potential environmental noise impact from road traffic and stationary noise is significant. The proposed development will need the following: a requirement for central air-conditioning and noise warning clauses. Road traffic noise control requirements for the Site were determined based on road traffic volumes provided by the Region of Waterloo (Region) and forecasted to 10 years from the date of this study.

JJ Acoustic Engineering Ltd.  
[joey@jjae.ca](mailto:joey@jjae.ca)  
226-346-6473

The following attachments were included with this Study:

- Attachment A – Site Plan
- Attachment B – Traffic Data Summary Table & Sample Stamson Traffic Model Outputs
- Attachment C – Stationary Noise Impact Figures
- Attachment D – Stationary Noise Impact Source Table
- Attachment E – Owners Statement
- Attachment F – Consultant’s Declaration

## **2. Road Traffic Analysis**

### **2.1 Road Traffic Noise Modeling Methodology**

The road traffic noise impact was conducted using STAMSON, the MOECP’s computerized model of ORNAMENT. The Application of the model for the site was consistent with the ORNAMENT technical documents. The computer model input parameters include, among other data, the number of road segments, number of house rows, the positional relationship of the receptor to a noise source or barrier in terms of distance, elevation and angle of exposure to the source, the basic site topography, the ground surface type, traffic volumes, traffic composition and speed limit.

The predicted sound level is based on the 1-hour equivalent sound level, designated as Leq, and is adjusted by the STAMSON program to the 16-hour daytime and the 8-hour nighttime equivalent sound level. The applicable noise criteria for noise sensitive spaces are specified in terms of the 16-hour daytime period (7:00 a.m. to 11:00 p.m.) and 8-hour nighttime period (11:00 p.m. to 7:00 a.m.) enabling a direct comparison between the STAMSON model output and the noise limits.

### **2.2 Road Traffic Model Input Parameters**

This section describes the STAMSON model input parameters used to predict road traffic noise impact for the Site.

The Site has three significant roadways in the vicinity of the development: Columbia Street West approximately 25 meters to the North from building #1, Phillip Street approximately 95 meters to the West of building #3 and Lester Street approximately 40 meters to the East of building #3. Where there are intervening and off-site structures that provide line-of-sight obstruction to the roads, JJAЕ did not include line-of-sight obstruction in our analysis as to calculate worst-case noise impact.

### **2.2.1 Road Traffic Parameters**

The traffic data provided by the Region has been summarized below:

#### ***Columbia Street West:***

- Current AADT (2021): 23,000
- Forecast AADT (2031): 25,200
- Commercial Vehicle Rates: 1% medium trucks and 2% heavy trucks
- Posted Speed Limit: 50 km/h
- Day Night Splits: 90% day and 10% night

#### ***Phillip Street:***

- Current AADT (2021): 8,000
- Forecast AADT (2031): 9,000
- Commercial Vehicle Rates: 2% medium trucks and 1% heavy trucks
- Posted Speed Limit: 50 km/h
- Day Night Splits: 90% day and 10% night

#### ***Lester Street:***

- Current AADT (2021): 3,100
- Forecast AADT (2031): 3,400
- Commercial Vehicle Rates: 2% medium trucks and 1% heavy trucks
- Posted Speed Limit: 50 km/h
- Day Night Splits: 90% day and 10% night

The traffic data is the foundation of this analysis and the Study will be updated if the values change. Traffic data was supplied by the Region. The Region's AADT report for this Noise Studies report has been supplied in Attachment B.

### **2.3 Road Traffic Noise Modeling Results**

JJAE calculated the Plane of Window (POW) noise exposure for each floor at the Site for the separate daytime and nighttime periods.

The STAMSON road traffic model outputs are provided in Attachment B.

## 2.4 Road Traffic Modeling Discussion

Noise control requirements will be defined based on NPC 300.

### *Daytime Outdoor Living Area Assessment (NPC 300, Section C7.1.1)*

NPC 300 section A5 (pages 13-14) defines an Outdoor Living Area (OLA). As part of this definition, a balcony or terrace is considered an OLA if it has a minimum depth of 4 meters. All balconies are less than 4 m in depth and therefore will not be considered as OLAs.

The Site does not have any feasible location for an OLA and thus, JJAEE has not provided any calculations for an OLA at the Site.

### *Plane of a Window – Ventilation Requirements (NPC 300, Section C7.1.2)*

The predicted daytime and nighttime Plane of Window (POW) noise impact assumes a worst-case and direct line of sight noise exposure to both roads, unless the building itself blocks line-of-sight (full or partial).

JJAEE has used the following criteria, which is a summary of NPC 300 requirements, to evaluate the Site noise impacts from road traffic noise:

| Daytime Level (dBA) | Nighttime Level (dBA) | Ventilation Requirements and Warning Clauses | Special Building Components |
|---------------------|-----------------------|----------------------------------------------|-----------------------------|
| 55                  | 50                    | Not Required                                 | Not Required                |
| 55 – 65             | 50 – 60               | Yes, with Type C Warning Clause              | Not Required                |
| 66 or more          | 60 or more            | Yes, with Type D Warning Clause              | Yes                         |

Table B.1 summarizes the predicted worst-case sound levels and the requirements for the units. The following warning clause is required:

**Warning Clause C:** "This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

### *Indoor Living Areas – Building Components (NPC 300, Section C7.1.3)*

At minimum, the building must be constructed to standard Ontario Building Code requirements.

### 3. Stationary Noise Impact Analysis

#### 3.1 Stationary Noise Impact Sound Level Criteria

The general criteria for stationary noise sources are defined by NPC 300. The criteria defined in Table C-5 and C-6, "Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA) Outdoor Points of Reception" and "Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA) Plane of Window of Noise Sensitive Spaces" are used to evaluate the noise impact at the proposed development.

The criteria for a Class 1 area have been summarized below:

| Receiver Category         | Time Period           | Stationary Noise Criteria |
|---------------------------|-----------------------|---------------------------|
| Outdoor Living Area (OLA) | Day = 7:00 to 23:00   | Leq = 50 dBA              |
| Plane of Window (POW)     | Day = 7:00 to 23:00   | Leq = 50 dBA              |
|                           | Night = 23:00 to 7:00 | Leq = 45 dBA              |

#### 3.2 Modelling Methodology

The stationary noise impact was evaluated using the CADNA A acoustic modelling software that is based on the ISO 9613-2 standard. The data for all potential stationary noise sources was summarized in Attachment D.

### 3.3 Site-Specific Noise Limit Justification

The area has elevated traffic noise levels from surrounding roadways. To determine the level for the Site-Specific Noise Limits for each of buildings, JJAЕ has used a calculation method provided by the Region. The method uses the current AADT values and assumes the worst case 1 hour traffic amount for the daytime is approximately 8% of the current AADT. Furthermore, the nighttime value can be calculated by using 2% of the current AADT. JJAЕ was provided with the Current AADT values from the Region and has been supplied in Attachment B. Using these values for the current AADT as well as the % of medium and heavy trucks, JJAЕ was able to provide the quantity of cars, medium trucks and heavy trucks to complete our calculation. A summary of our calculation has been provided in Attachment B. JJAЕ has used the MOECP's STAMSON program to calculate the 1-hour Leq noise level for the daytime and nighttime for the South façade. JJAЕ has calculated the noise limits for buildings 1 & 2 to be 53 dBA during the daytime and 48 dBA during the nighttime. JJAЕ has calculated building 3 to be 54 dBA during the daytime and 48 dBA during the nighttime. A summary of our calculation has been provided in Attachment B. The table below has provided a summary of the proposed site-specific noise limits for this building. A summary of our calculation has been provided in Attachment B.

#### **Building #1 & #2**

| <b>Receiver Category</b>  | <b>Time Period</b>    | <b>Site-Specific Stationary Noise Criteria</b> |
|---------------------------|-----------------------|------------------------------------------------|
| Outdoor Living Area (OLA) | Day = 7:00 to 23:00   | Leq = 50 dBA                                   |
| Plane of Window (POW)     | Day = 7:00 to 23:00   | Leq = 53 dBA                                   |
|                           | Night = 23:00 to 7:00 | Leq = 48 dBA                                   |

#### **Building #3**

| <b>Receiver Category</b>  | <b>Time Period</b>    | <b>Site-Specific Stationary Noise Criteria</b> |
|---------------------------|-----------------------|------------------------------------------------|
| Outdoor Living Area (OLA) | Day = 7:00 to 23:00   | Leq = 50 dBA                                   |
| Plane of Window (POW)     | Day = 7:00 to 23:00   | Leq = 53 dBA                                   |
|                           | Night = 23:00 to 7:00 | Leq = 48 dBA                                   |

## 4. Noise Impact Summary – From Site

The noise from the Site to the neighboring buildings could not be accounted for because the site has not undergone mechanical design yet. An addendum to this report should be completed once a mechanical design is done to account for noise from the Site to the neighboring building.

## 5. Noise Impact Summary – From Environment to Site

There are several buildings near the site. JJAЕ has identified several potential stationary noise sources including:

- Medium HVAC Units
- Representative MUA
- Cooling Tower
- Generator
- HVAC 2 Fan
- Small HVAC
- HVAC 4 Fan

A summary of the noise sources used in our modelling is provided in Attachment D.

JJAЕ modelled the noise impact from all significant noise sources to the Site. The results are summarized in the table below and illustrated on Figure 1.

| <b>Building #1</b> | <b>Worst Case Daytime Sound Level (dBA)</b> | <b>Daytime Noise Limit (dBA)</b> | <b>Worst Case Nighttime Sound Level (dBA)</b> | <b>Nighttime Noise Limit (dBA)</b> | <b>Limits met</b> |
|--------------------|---------------------------------------------|----------------------------------|-----------------------------------------------|------------------------------------|-------------------|
| North              | 50                                          | 53                               | 47                                            | 48                                 | Yes               |
| East               | 43                                          | 53                               | 42                                            | 48                                 | Yes               |
| South              | 45                                          | 53                               | 42                                            | 48                                 | Yes               |
| West               | 51                                          | 53                               | 48                                            | 48                                 | Yes               |

| <b>Building #2</b> | <b>Worst Case Daytime Sound Level (dBA)</b> | <b>Daytime Noise Limit (dBA)</b> | <b>Worst Case Nighttime Sound Level (dBA)</b> | <b>Nighttime Noise Limit (dBA)</b> | <b>Limits met</b> |
|--------------------|---------------------------------------------|----------------------------------|-----------------------------------------------|------------------------------------|-------------------|
| North              | 47                                          | 53                               | 44                                            | 48                                 | Yes               |
| East               | 43                                          | 53                               | 42                                            | 48                                 | Yes               |
| South              | 45                                          | 53                               | 42                                            | 48                                 | Yes               |
| West               | 50                                          | 53                               | 47                                            | 48                                 | Yes               |

| <b>Building #3</b> | <b>Worst Case Daytime Sound Level (dBA)</b> | <b>Daytime Site-Specific Noise Limit (dBA)</b> | <b>Worst Case Nighttime Sound Level (dBA)</b> | <b>Nighttime Site-Specific Noise Limit (dBA)</b> | <b>Limits met</b> |
|--------------------|---------------------------------------------|------------------------------------------------|-----------------------------------------------|--------------------------------------------------|-------------------|
| North              | 48                                          | 54                                             | 45                                            | 48                                               | Yes               |
| East               | 45                                          | 54                                             | 42                                            | 48                                               | Yes               |
| South              | 50                                          | 54                                             | 47                                            | 48                                               | Yes               |
| West               | 51                                          | 54                                             | 48                                            | 48                                               | Yes               |

JJAE modelled the noise impact of emergency generator with no mitigation measures illustrated in Figure 2.

| <b>Buildings</b> | <b>Worst Case Emergency Sound Level (dBA)</b> | <b>Emergency Noise Limit (dBA)</b> | <b>Limits met</b> |
|------------------|-----------------------------------------------|------------------------------------|-------------------|
| Building #1      | 60                                            | 55                                 | No                |
| Building #2      | 60                                            | 55                                 | No                |
| Building #3      | 47                                            | 55                                 | Yes               |

JJAE modelled the noise impact of emergency generator with mitigation measures illustrated in Figure 3.

| <b>Buildings</b> | <b>Worst Case Emergency Sound Level (dBA)</b> | <b>Emergency Noise Limit (dBA)</b> | <b>Limits met</b> |
|------------------|-----------------------------------------------|------------------------------------|-------------------|
| Building #1      | 53                                            | 55                                 | Yes               |
| Building #2      | 54                                            | 55                                 | Yes               |
| Building #3      | 47                                            | 55                                 | Yes               |

## 6. Recommendations

The road traffic noise impacts were above the NPC 300 requirements. Noise mitigation measures include:

### **Building #1:**

- Warning Clause Type C for all façades.
- Requirement for Air Conditioning for the entire building.
- A minimum of STC 28 is required for all exterior glazing for all facades.

### **Building #2:**

- Warning Clause Type C for all façades.
- Requirement for Air Conditioning for the entire building.
- A minimum of STC 28 is required for all exterior glazing for all facades.

### **Building #3:**

- Warning Clause Type C for all façades.
- Requirement for Air Conditioning for the entire building.
- A minimum of STC 28 is required for all exterior glazing for all facades.

These have been summarized in Attachment B under Table B1.

The stationary noise impacts from the site were evaluated and the sound level predictions were determined to be above the emergency noise limits for buildings #1 and #2. These generators are located west of the Site on the rooftops of 145 Columbia Street West building C and building D and have a direct line and sight with no shielding to the Site. JJAЕ has designed a rooftop acoustic barrier that must be installed on the neighboring rooftops, which must be a minimum of 20 kg/m<sup>2</sup> surface density and have no holes, gaps, or cracks. Any gaps at the bottom of the wall required for drainage must be minimal. The dimension for the rooftop barrier must be 6 meters in length with a minimum setback distance of 1.6 meters from center of the generator with a minimum height of 3 meters.

## 7. Conclusions

The results of this Study indicate that the potential environmental impact from road traffic and stationary noise sources are significant. Mitigation measures will be required including ventilation requirements and noise warning clauses for each unit and a rooftop barrier installed in front of neighboring building generators.

Should you have any questions on the above, please do not hesitate to contact us.

Yours truly,

Written by:

Reviewed by:

Nov. 17, 2021



Emmanuel Ghiorghis,  
Acoustic Technician



Joey Jraige, P.Eng., B.A.Sc.  
President

## ATTACHMENT A

COLUMBIA STREET WEST

# SITE PLAN

A-SP1 SCALE: 1:225

## GENERAL NOTES

- LEGAL DESCRIPTION: PART OF LOT 6, MUNICIPAL COMPILED PLAN OF SUBDIVISION OF LOT 13, GERMAN COMPANY TRACT, CITY OF WATERLOO, TAKEN FROM SURVEY PREPARED BY GUNTHER RUES SURVEYING LIMITED, JUNE 18, 2016.
- TREE PROTECTION WILL REMAIN ON SITE FOR THE DURATION OF CONSTRUCTION.
- PARKING AND SITE LIGHTING FIXTURES WILL BE FULL CUT-OF DIRECTED AWAY FROM ADJUTING PROPERTIES WITH NO GLARE.
- SNOW STORAGE TO BE LOCATED ON SITE. EXCESS SNOW WILL BE TRUCKED AWAY FROM THE SITE.
- ALL UNDERGROUND AND ABOVEGROUND (I.E. SIDEWALKS, CURBS, SOD, ROADS) WORKS IN MUNICIPAL P.O.W. TO BE UPGRADED AT 100% OWNER'S COST.
- HANDICAP ACCESSIBLE ENTRANCE TO BE LOCATED AT THE FRONT ENTRANCE AND UNDERGROUND PARKING GARAGE ACCESS DOOR.
- BICYCLE STORAGE AREA WILL BE PROVIDED INSIDE THE BUILDING AND OUTDOOR.
- PARKING CEILING AND INTERIOR PARKING WALL WILL BE PAINTED LIGHT COLOR.
- ALL LEVELS ARE BARRIER FREE ACCESSIBLE.
- SITE PLAN, SITE GRADING AND LANDSCAPE PLANS HAVE BEEN COORDINATED.
- ALL MECHANICAL EQUIPMENT TO BE FULLY SCREENED FROM PUBLIC VIEW. ROOF TOP UNITS SHALL NOT BE VISIBLE FROM PUBLIC REALM OR RESIDENTIAL PROPERTIES AND ALL VENTING EQUIPMENT SHALL BE ARCHITECTURALLY INTEGRATED INTO BUILDING FACADE WITH NO EXTERNAL UNITS LOCATED ON BUILDING WALLS.
- GARBAGE WILL BE STORED INTERNALLY. GARBAGE WILL BE COLLECTED BY PRIVATE SERVICE AT THE SOLE EXPENSE OF THE OWNER.
- 200' TOTAL COMMERCIAL SPACE WILL BE PROVIDED.
- MIN. 20% HABITABLE SPACE PROVIDED AT THE FRONT OF THE BUILDING.
- EXTERIOR WALKS THAT FORM PART OF A BARRIER-FREE PATH OF TRAVEL SHALL HAVE A PERMANENT, FIRM AND SLIP-RESISTANT SURFACE AND A TACTILE ATTENTION INDICATOR THAT IS LOCATED TO IDENTIFY AN ENTRY INTO A VEHICULAR ROUTE OR AREA WHERE NO CURBS OR ANY OTHER ELEMENT SEPARATE THE VEHICULAR ROUTE OR AREA FROM A PEDESTRIAN ROUTE.
- THE EXISTING MUNICIPAL SIDEWALKS FRONTING THE DEVELOPMENT ARE TO REMAIN TO PROVIDE SAFE ACCESS DURING CONSTRUCTION, AND ONLY REMOVED ONCE CONTRACTOR IS READY TO CONSTRUCTED NEW SIDEWALK. A SAFE PEDESTRIAN WALKWAY SHALL BE PROVIDED AT ALL TIMES.

## SITE LEGEND & NOTES

### SITE PLAN LEGEND

- PROPERTY BOUNDARIES
- PRINCIPAL FIRE FIGHTERS ENTRANCE
- MAN DOOR LOCATION
- FIRE ROUTE
- FIRE HYDRANT
- FIRE DEPARTMENT CONNECTION
- REQUIRED PROPERTY SETBACKS
- LIGHT STANDARD
- BOLLARD
- LED BOLLARD
- CATCH BASIN
- BIKE RACK (POST AND HOOP)
- WATER METER ROOM
- GARBAGE ROOM
- MECHANICAL ROOM
- ELECTRICAL ROOM

| GFA & SUITE-DATA CHART |          |           |                                     |            |                                                  |           |                                             |            |                                     |
|------------------------|----------|-----------|-------------------------------------|------------|--------------------------------------------------|-----------|---------------------------------------------|------------|-------------------------------------|
| Level                  | # SUITES | #BEDROOMS | GROSS AREA<br>AREA(m <sup>2</sup> ) | AREA (SF)  | COMMON SPACE DEDUCTIONS<br>AREA(m <sup>2</sup> ) | AREA (SF) | NET LEASEABLE AREA<br>AREA(m <sup>2</sup> ) | AREA (SF)  | FLOOR AREA<br>AREA(m <sup>2</sup> ) |
| Level 1 UPPER          | 0        | 0         | 1,086 m <sup>2</sup>                | 11,714 SF  | 749 m <sup>2</sup>                               | 8,065 SF  | 340 m <sup>2</sup>                          | 3,655 SF   | 8,066 m <sup>2</sup>                |
| Level 2                | 23       | 23        | 1,884 m <sup>2</sup>                | 20,282 SF  | 312 m <sup>2</sup>                               | 3,361 SF  | 1,572 m <sup>2</sup>                        | 16,922 SF  | 17,771 m <sup>2</sup>               |
| Level 3                | 28       | 28        | 2,083 m <sup>2</sup>                | 22,417 SF  | 227 m <sup>2</sup>                               | 2,444 SF  | 1,856 m <sup>2</sup>                        | 19,973 SF  | 19,973 m <sup>2</sup>               |
| Level 4                | 28       | 28        | 2,083 m <sup>2</sup>                | 22,417 SF  | 227 m <sup>2</sup>                               | 2,444 SF  | 1,856 m <sup>2</sup>                        | 19,973 SF  | 19,973 m <sup>2</sup>               |
| Level 5                | 28       | 28        | 2,083 m <sup>2</sup>                | 22,417 SF  | 227 m <sup>2</sup>                               | 2,444 SF  | 1,856 m <sup>2</sup>                        | 19,973 SF  | 19,973 m <sup>2</sup>               |
| Level 6                | 28       | 28        | 2,083 m <sup>2</sup>                | 22,417 SF  | 227 m <sup>2</sup>                               | 2,444 SF  | 1,856 m <sup>2</sup>                        | 19,973 SF  | 19,973 m <sup>2</sup>               |
| Level 7                | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 8                | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 9                | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 10               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 11               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 12               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 13               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 14               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 15               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 16               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 17               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 18               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 19               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 20               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 21               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 22               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 23               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 24               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| Level 25               | 24       | 24        | 1,636 m <sup>2</sup>                | 17,612 SF  | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 15,231 m <sup>2</sup>               |
| MECHANICAL PENTHOUSE   | 0        | 0         | 281 m <sup>2</sup>                  | 3,025 SF   | 221 m <sup>2</sup>                               | 2,381 SF  | 1,415 m <sup>2</sup>                        | 15,231 SF  | 178 m <sup>2</sup>                  |
| TOTAL                  | 591      | 591       | 42,070 m <sup>2</sup>               | 458,301 SF | 6,451 m <sup>2</sup>                             | 69,442 SF | 36,219 m <sup>2</sup>                       | 389,859 SF | 427,720 SF                          |

| AMENITY AREAS |                        |          |
|---------------|------------------------|----------|
| NAME          | AREA (m <sup>2</sup> ) | AREA(SF) |
| AMENITY       | 59 m <sup>2</sup>      | 639 SF   |
| TOTAL         | 59 m <sup>2</sup>      | 639 SF   |

| COMMERCIAL AREA |                        |           |
|-----------------|------------------------|-----------|
| NAME            | AREA (m <sup>2</sup> ) | AREA (SF) |
| 18-143 COLUMBIA | 340 m <sup>2</sup>     | 3,655 SF  |
| TOTAL           | 340 m <sup>2</sup>     | 3,655 SF  |

| COVERED PARKING     |                        |           |
|---------------------|------------------------|-----------|
| NAME                | AREA (m <sup>2</sup> ) | AREA (SF) |
| UNDERGROUND PARKING | 1,540 m <sup>2</sup>   | 16,589 SF |
| COVERED PARKING     | 286 m <sup>2</sup>     | 3,084 SF  |
| COVERED PARKING     | 215 m <sup>2</sup>     | 2,315 SF  |
| COVERED PARKING     | 1,296 m <sup>2</sup>   | 13,984 SF |
| COVERED PARKING     | 1,290 m <sup>2</sup>   | 13,900 SF |

## DETAILS OF DEVELOPMENT :

LEGAL ADDRESS: 143 COLUMBIA ST W  
ZONING: (H)RN-25 RESIDENTIAL NORTHDAL  
TWENTY FIVE

STREET FRONTAGE: CONVERTIBLE FRONTAGE

(H)RN-25  
RESIDENTIAL NORTHDAL  
TWENTY FIVE

SITE REGULATIONS

REQUIRED PROVIDED

MIN. LOT FRONTAGE 20m 35 m

MIN. LOT AREA 1,000m<sup>2</sup> 8,009 m<sup>2</sup>

GROSS LOT AREA: (INCLUDES PUBLIC WALKWAY) 8,009 m<sup>2</sup>

ROAD WIDENING & ROW: 126,389 m<sup>2</sup>

NET LOT AREA: 7,882,611 m<sup>2</sup>

BUILDING AREA: 3538 m<sup>2</sup>

BUILDING COVERAGE 44.8%

TOTAL NUMBER OF BEDS: min. 150bed/Ha 120 max. 750bed/Ha 591

TOTAL NUMBER OF UNITS: N/A 591

GENERAL INFORMATION

MIN. LOT FRONTAGE 20m 35 m

MIN. LOT AREA 1,000m<sup>2</sup> 8,009 m<sup>2</sup>

GROSS LOT AREA: (INCLUDES PUBLIC WALKWAY) 8,009 m<sup>2</sup>

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## ATTACHMENT B

### Region of Waterloo AADT Forecast for Noise Studies

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |           |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|
| <b>1. Development/Location</b>     | 143 Columbia St W, Waterloo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |           |
| <b>2. Current AADT (2021)</b>      | Columbia St W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Phillip St | Lester St |
|                                    | 23,000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 8,000      | 3,100     |
| <b>3. Forecast AADT (2031)</b>     | Columbia St W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Phillip St | Lester St |
|                                    | 25,200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 9,000      | 3,400     |
| <b>4. Commercial Vehicle Rates</b> | Columbia St W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Phillip St | Lester St |
|                                    | % Medium Trucks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1%         | 2%        |
|                                    | % Heavy Trucks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2%         | 1%        |
| <b>5. Posted Speed Limit</b>       | Columbia St W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Phillip St | Lester St |
|                                    | 50 km/h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 50 km/h    | 50 km/h   |
| <b>6. Day/Night Splits</b>         | Regional Standard 90/10 Day/Night Split                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |           |
| <b>7. Expiry</b>                   | Dec 31 2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |           |
| <b>8. Notes</b>                    | <p>This forecast is intended for the purpose of carrying out a noise study for 143 Columbia St W, Waterloo, only. The above AADTs represent the traffic volumes on Columbia Street West, between Phillip Street and Lester Street, for Phillip Street, south of Columbia Street West, and for Lester Street, south of Columbia Street West. This forecast remains valid up to the date indicated above. Since Columbia Avenue West, Phillip Street, and Lester Street all fall under the jurisdiction of the City of Waterloo, confirmation of the above forecast should be provided by staff from the City of Waterloo. The Region of Waterloo should be contacted for an updated forecast if there are plans to use this forecast beyond the above validity period.</p> |            |           |

**Table B1**

**Road Traffic Noise Levels and Mitigation Measures Summary**  
143 Columbia Street West, Waterloo, Ontario  
Building #1

| Point of Reception       | Road Sound Level<br>Daytime (dBA) | Road Sound Level<br>Nighttime (dBA) | Ventilation Requirements NPC 300 | Warning Clauses<br>From NPC 300 | Special Building Components           |
|--------------------------|-----------------------------------|-------------------------------------|----------------------------------|---------------------------------|---------------------------------------|
| <b>North Façade</b>      |                                   |                                     |                                  |                                 |                                       |
| Plane of Window Level 1  | 65 (dBA)                          | 59 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 2  | 65 (dBA)                          | 59 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 3  | 65 (dBA)                          | 59 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 4  | 65 (dBA)                          | 58 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 5  | 65 (dBA)                          | 58 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 6  | 65 (dBA)                          | 58 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 7  | 64 (dBA)                          | 58 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 8  | 64 (dBA)                          | 58 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 9  | 64 (dBA)                          | 57 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 10 | 64 (dBA)                          | 57 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 11 | 63 (dBA)                          | 57 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 12 | 63 (dBA)                          | 57 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 13 | 63 (dBA)                          | 56 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 14 | 63 (dBA)                          | 56 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 15 | 62 (dBA)                          | 56 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 16 | 62 (dBA)                          | 56 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 17 | 62 (dBA)                          | 56 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 18 | 62 (dBA)                          | 55 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 19 | 62 (dBA)                          | 55 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 20 | 62 (dBA)                          | 55 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 21 | 61 (dBA)                          | 55 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 22 | 61 (dBA)                          | 55 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 23 | 61 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 24 | 61 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 25 | 61 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| <b>East Façade</b>       |                                   |                                     |                                  |                                 |                                       |
| Plane of Window Level 1  | 63 (dBA)                          | 56 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 2  | 63 (dBA)                          | 56 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 3  | 62 (dBA)                          | 56 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 4  | 62 (dBA)                          | 56 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 5  | 62 (dBA)                          | 56 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 6  | 62 (dBA)                          | 55 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 7  | 62 (dBA)                          | 55 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |

|                          |          |          |                                  |        |                                       |
|--------------------------|----------|----------|----------------------------------|--------|---------------------------------------|
| Plane of Window Level 8  | 61 (dBA) | 55 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 9  | 61 (dBA) | 55 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 10 | 61 (dBA) | 54 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 11 | 61 (dBA) | 54 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 12 | 60 (dBA) | 54 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 13 | 60 (dBA) | 54 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 14 | 60 (dBA) | 53 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 15 | 60 (dBA) | 53 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 16 | 60 (dBA) | 53 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 17 | 59 (dBA) | 53 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 18 | 59 (dBA) | 53 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 19 | 59 (dBA) | 52 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 20 | 59 (dBA) | 52 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 21 | 59 (dBA) | 52 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 22 | 58 (dBA) | 52 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 23 | 58 (dBA) | 52 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 24 | 58 (dBA) | 52 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 25 | 58 (dBA) | 51 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |

### South Façade

[illegible]

[illegible]

Table B1

**Road Traffic Noise Levels and Mitigation Measures Summary**  
143 Columbia Street West, Waterloo, Ontario  
Building #2

| Point of Reception       | Road Sound Level<br>Daytime (dBA) | Road Sound Level<br>Nighttime (dBA) | Ventilation Requirements NPC 300 | Warning Clauses<br>From NPC 300 | Special Building Components           |
|--------------------------|-----------------------------------|-------------------------------------|----------------------------------|---------------------------------|---------------------------------------|
| <b>North Façade</b>      |                                   |                                     |                                  |                                 |                                       |
| Plane of Window Level 1  | 61 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 2  | 61 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 3  | 61 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 4  | 61 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 5  | 61 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 6  | 61 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 7  | 61 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 8  | 61 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 9  | 60 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 10 | 60 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 11 | 60 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 12 | 60 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 13 | 60 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 14 | 60 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 15 | 60 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 16 | 60 (dBA)                          | 54 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 17 | 60 (dBA)                          | 53 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 18 | 60 (dBA)                          | 53 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 19 | 60 (dBA)                          | 53 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 20 | 60 (dBA)                          | 53 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 21 | 60 (dBA)                          | 53 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 22 | 60 (dBA)                          | 53 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 23 | 60 (dBA)                          | 53 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 24 | 59 (dBA)                          | 53 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 25 | 59 (dBA)                          | 53 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| <b>East Façade</b>       |                                   |                                     |                                  |                                 |                                       |
| Plane of Window Level 1  | 59 (dBA)                          | 52 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 2  | 59 (dBA)                          | 52 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 3  | 59 (dBA)                          | 52 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 4  | 59 (dBA)                          | 52 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 5  | 59 (dBA)                          | 52 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 6  | 59 (dBA)                          | 52 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 7  | 58 (dBA)                          | 52 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |

|                          |          |          |                                  |        |                                       |
|--------------------------|----------|----------|----------------------------------|--------|---------------------------------------|
| Plane of Window Level 8  | 58 (dBA) | 52 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 9  | 58 (dBA) | 52 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 10 | 58 (dBA) | 52 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 11 | 58 (dBA) | 52 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 12 | 58 (dBA) | 52 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 13 | 58 (dBA) | 51 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 14 | 58 (dBA) | 51 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 15 | 58 (dBA) | 51 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 16 | 58 (dBA) | 51 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 17 | 58 (dBA) | 51 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 18 | 58 (dBA) | 51 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 19 | 57 (dBA) | 51 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 20 | 57 (dBA) | 51 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 21 | 57 (dBA) | 51 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 22 | 57 (dBA) | 51 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 23 | 57 (dBA) | 51 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 24 | 57 (dBA) | 50 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 25 | 57 (dBA) | 50 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |

### South Façade

[illegible]

[illegible]

**Table B1**

**Road Traffic Noise Levels and Mitigation Measures Summary**  
143 Columbia Street West, Waterloo, Ontario  
Building #3

| Point of Reception       | Road Sound Level<br>Daytime (dBA) | Road Sound Level<br>Nighttime (dBA) | Ventilation Requirements NPC 300 | Warning Clauses<br>From NPC 300 | Special Building Components           |
|--------------------------|-----------------------------------|-------------------------------------|----------------------------------|---------------------------------|---------------------------------------|
| <b>North Façade</b>      |                                   |                                     |                                  |                                 |                                       |
| Plane of Window Level 1  | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 2  | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 3  | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 4  | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 5  | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 6  | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 7  | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 8  | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 9  | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 10 | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 11 | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 12 | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 13 | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 14 | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 15 | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 16 | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 17 | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 18 | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 19 | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 20 | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 21 | 58 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 22 | 57 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 23 | 57 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 24 | 57 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 25 | 57 (dBA)                          | 51 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| <b>East Façade</b>       |                                   |                                     |                                  |                                 |                                       |
| Plane of Window Level 1  | 57 (dBA)                          | 50 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 2  | 57 (dBA)                          | 50 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 3  | 57 (dBA)                          | 50 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 4  | 57 (dBA)                          | 50 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 5  | 57 (dBA)                          | 50 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 6  | 57 (dBA)                          | 50 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |
| Plane of Window Level 7  | 57 (dBA)                          | 50 (dBA)                            | Requirement for Air Conditioning | Type C                          | Compliance with Ontario Building Code |

|                          |          |          |                                  |        |                                       |
|--------------------------|----------|----------|----------------------------------|--------|---------------------------------------|
| Plane of Window Level 8  | 57 (dBA) | 50 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 9  | 57 (dBA) | 50 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 10 | 57 (dBA) | 50 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 11 | 56 (dBA) | 50 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 12 | 56 (dBA) | 50 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 13 | 56 (dBA) | 50 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 14 | 56 (dBA) | 50 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 15 | 56 (dBA) | 50 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 16 | 56 (dBA) | 50 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 17 | 56 (dBA) | 50 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 18 | 56 (dBA) | 49 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 19 | 56 (dBA) | 49 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 20 | 56 (dBA) | 49 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 21 | 56 (dBA) | 49 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 22 | 56 (dBA) | 49 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 23 | 56 (dBA) | 49 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 24 | 56 (dBA) | 49 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |
| Plane of Window Level 25 | 56 (dBA) | 49 (dBA) | Requirement for Air Conditioning | Type C | Compliance with Ontario Building Code |

### South Façade

[illegible]

[illegible]

### Attachment B JJA E Single Hour AADT Traffic Calculator

|                       |               |
|-----------------------|---------------|
| <b>Project Name</b>   | 143 Columbia  |
| <b>Project Number</b> | JJ-00366      |
| <b>Street Name</b>    | Lester Street |

|                        |      |
|------------------------|------|
| <b>Current AADT</b>    | 3100 |
| <b>% Medium Trucks</b> | 2    |
| <b>% Heavy Trucks</b>  | 1    |

|                    |   |
|--------------------|---|
| <b>Daytime %</b>   | 8 |
| <b>Nighttime %</b> | 2 |

|                             |     |
|-----------------------------|-----|
| <b>Daytime 1 Hour Total</b> | 248 |
| <b>Cars</b>                 | 241 |
| <b>Medium Trucks</b>        | 5   |
| <b>Heavy Trucks</b>         | 2   |

|                               |    |
|-------------------------------|----|
| <b>Nighttime 1 Hour Total</b> | 62 |
| <b>Cars</b>                   | 60 |
| <b>Medium Trucks</b>          | 1  |
| <b>Heavy Trucks</b>           | 1  |

### Attachment B JJA E Single Hour AADT Traffic Calculator

|                       |                |
|-----------------------|----------------|
| <b>Project Name</b>   | 143 Columbia   |
| <b>Project Number</b> | JJ-00366       |
| <b>Street Name</b>    | Phillip Street |

|                        |      |
|------------------------|------|
| <b>Current AADT</b>    | 8000 |
| <b>% Medium Trucks</b> | 2    |
| <b>% Heavy Trucks</b>  | 1    |

|                    |   |
|--------------------|---|
| <b>Daytime %</b>   | 8 |
| <b>Nighttime %</b> | 2 |

|                             |     |
|-----------------------------|-----|
| <b>Daytime 1 Hour Total</b> | 640 |
| <b>Cars</b>                 | 621 |
| <b>Medium Trucks</b>        | 13  |
| <b>Heavy Trucks</b>         | 6   |

|                               |     |
|-------------------------------|-----|
| <b>Nighttime 1 Hour Total</b> | 160 |
| <b>Cars</b>                   | 155 |
| <b>Medium Trucks</b>          | 3   |
| <b>Heavy Trucks</b>           | 2   |

Filename: b1north.te                      Time Period: Day/Night 16/8 hours  
Description: Building #1 North Facade Floor 1

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

-----  
Car traffic volume : 22000/2444    veh/TimePeriod    \*  
Medium truck volume : 227/25    veh/TimePeriod    \*  
Heavy truck volume : 454/50    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 25200  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 1.00  
Heavy Truck % of Total Volume : 2.00  
Day (16 hrs) % of Total Volume : 90.00

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

-----  
Angle1    Angle2 : -90.00 deg    90.00 deg  
Wood depth : 0    (No woods.)  
No of house rows : 0 / 0  
Surface : 2    (Reflective ground surface)  
Receiver source distance : 25.00 / 25.00    m  
Receiver height : 2.00 / 2.00    m  
Topography : 1    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

▲

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

-----  
Car traffic volume : 7857/873    veh/TimePeriod    \*  
Medium truck volume : 162/18    veh/TimePeriod    \*  
Heavy truck volume : 81/9    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 9000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00

Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Phillip St (day/night)

-----  
Angle1 Angle2 : -90.00 deg 0.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 125.00 / 125.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

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

-----  
Car traffic volume : 2968/330 veh/TimePeriod \*  
Medium truck volume : 61/7 veh/TimePeriod \*  
Heavy truck volume : 31/3 veh/TimePeriod \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 3400  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00  
Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 3: Lester St (day/night)

-----  
Angle1 Angle2 : 0.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 50.00 / 50.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

Results segment # 1: Columbia St (day)

-----  
Source height = 1.19 m

ROAD (0.00 + 65.15 + 0.00) = 65.15 dBA

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

|     |    |      |       |      |       |      |      |      |      |       |
|-----|----|------|-------|------|-------|------|------|------|------|-------|
| -90 | 90 | 0.00 | 67.36 | 0.00 | -2.22 | 0.00 | 0.00 | 0.00 | 0.00 | 65.15 |
|-----|----|------|-------|------|-------|------|------|------|------|-------|

Segment Leq : 65.15 dBA

Results segment # 2: Phillip St (day)

Source height = 1.00 m

ROAD (0.00 + 49.69 + 0.00) = 49.69 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 61.91  | 0.00  | -9.21 | -3.01 | 0.00  | 0.00  | 0.00  | 49.69  |

Segment Leq : 49.69 dBA

Results segment # 3: Lester St (day)

Source height = 1.00 m

ROAD (0.00 + 49.46 + 0.00) = 49.46 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 57.70  | 0.00  | -5.23 | -3.01 | 0.00  | 0.00  | 0.00  | 49.46  |

Segment Leq : 49.46 dBA

Total Leq All Segments: 65.38 dBA

Results segment # 1: Columbia St (night)

Source height = 1.19 m

ROAD (0.00 + 58.59 + 0.00) = 58.59 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.00  | 60.81  | 0.00  | -2.22 | 0.00  | 0.00  | 0.00  | 0.00  | 58.59  |

Segment Leq : 58.59 dBA

Results segment # 2: Phillip St (night)

$$\text{ROAD } (0.00 + 43.16 + 0.00) = 43.16 \text{ dBA}$$

Segment Leq : 43.16 dBA

$$\text{ROAD } (0.00 + 42.76 + 0.00) = 42.76 \text{ dBA}$$

Segment Leq : 42.76 dBA



Filename: b1eastf1.te                      Time Period: Day/Night 16/8 hours  
Description: Building #1 East Facade Floor 1

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

-----  
Car traffic volume : 2968/330    veh/TimePeriod    \*  
Medium truck volume : 61/7    veh/TimePeriod    \*  
Heavy truck volume : 31/3    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 3400  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00  
Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

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

-----  
Angle1    Angle2 : -90.00 deg    90.00 deg  
Wood depth : 0    (No woods.)  
No of house rows : 0 / 0  
Surface : 2    (Reflective ground surface)  
Receiver source distance : 45.00 / 45.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

▲

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

-----  
Car traffic volume : 22000/2444    veh/TimePeriod    \*  
Medium truck volume : 227/25    veh/TimePeriod    \*  
Heavy truck volume : 454/50    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 25200  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 1.00

Heavy Truck % of Total Volume : 2.00  
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Columbia St (day/night)

-----  
 Angle1 Angle2 : -90.00 deg 0.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 2 (Reflective ground surface)  
 Receiver source distance : 25.00 / 25.00 m  
 Receiver height : 2.00 / 2.00 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

↑  
 Results segment # 1: Lester St (day)

Source height = 1.00 m

ROAD (0.00 + 52.93 + 0.00) = 52.93 dBA  

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.00  | 57.70  | 0.00  | -4.77 | 0.00  | 0.00  | 0.00  | 0.00  | 52.93  |

 -----

Segment Leq : 52.93 dBA

↑  
 Results segment # 2: Columbia St (day)

Source height = 1.19 m

ROAD (0.00 + 62.13 + 0.00) = 62.13 dBA  

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 67.36  | 0.00  | -2.22 | -3.01 | 0.00  | 0.00  | 0.00  | 62.13  |

 -----

Segment Leq : 62.13 dBA

Total Leq All Segments: 62.62 dBA

↑  
 Results segment # 1: Lester St (night)

Source height = 0.97 m

ROAD (0.00 + 46.23 + 0.00) = 46.23 dBA  

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 46.23  | 0.00  | -2.22 | -3.01 | 0.00  | 0.00  | 0.00  | 46.23  |

 -----

|     |    |      |       |      |       |      |      |      |      |       |
|-----|----|------|-------|------|-------|------|------|------|------|-------|
| -90 | 90 | 0.00 | 51.00 | 0.00 | -4.77 | 0.00 | 0.00 | 0.00 | 0.00 | 46.23 |
|-----|----|------|-------|------|-------|------|------|------|------|-------|

Segment Leq : 46.23 dBA

Results segment # 2: Columbia St (night)

Source height = 1.19 m

ROAD (0.00 + 55.58 + 0.00) = 55.58 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 60.81  | 0.00  | -2.22 | -3.01 | 0.00  | 0.00  | 0.00  | 55.58  |

Segment Leq : 55.58 dBA

Total Leq All Segments: 56.06 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.62  
(NIGHT): 56.06

Filename: b1south.te                      Time Period: Day/Night 16/8 hours  
Description: Building #1 South Facade Floor 1

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

-----  
Car traffic volume : 2968/330    veh/TimePeriod    \*  
Medium truck volume : 61/7    veh/TimePeriod    \*  
Heavy truck volume : 31/3    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 3400  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00  
Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

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

-----  
Angle1    Angle2 : -90.00 deg    0.00 deg  
Wood depth : 0    (No woods.)  
No of house rows : 0 / 0  
Surface : 2    (Reflective ground surface)  
Receiver source distance : 45.00 / 45.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

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

-----  
Car traffic volume : 7857/873    veh/TimePeriod    \*  
Medium truck volume : 162/18    veh/TimePeriod    \*  
Heavy truck volume : 81/9    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 9000  
Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 2.00  
 Heavy Truck % of Total Volume : 1.00  
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Phillip St (day/night)

-----  
 Angle1 Angle2 : 0.00 deg 90.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 2 (Reflective ground surface)  
 Receiver source distance : 145.00 / 145.00 m  
 Receiver height : 2.00 / 2.00 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00



Results segment # 1: Lester St (day)

-----  
 Source height = 1.00 m

ROAD (0.00 + 49.92 + 0.00) = 49.92 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 57.70  | 0.00  | -4.77 | -3.01 | 0.00  | 0.00  | 0.00  | 49.92  |

-----

Segment Leq : 49.92 dBA



Results segment # 2: Phillip St (day)

-----  
 Source height = 1.00 m

ROAD (0.00 + 49.05 + 0.00) = 49.05 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 61.91  | 0.00  | -9.85 | -3.01 | 0.00  | 0.00  | 0.00  | 49.05  |

-----

Segment Leq : 49.05 dBA

Total Leq All Segments: 52.52 dBA



Results segment # 1: Lester St (night)

-----

Source height = 0.97 m

ROAD (0.00 + 43.22 + 0.00) = 43.22 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 51.00  | 0.00  | -4.77 | -3.01 | 0.00  | 0.00  | 0.00  | 43.22  |

Segment Leq : 43.22 dBA

↑

Results segment # 2: Phillip St (night)

Source height = 1.00 m

ROAD (0.00 + 42.51 + 0.00) = 42.51 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 55.38  | 0.00  | -9.85 | -3.01 | 0.00  | 0.00  | 0.00  | 42.51  |

Segment Leq : 42.51 dBA

Total Leq All Segments: 45.89 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 52.52  
(NIGHT): 45.89

↑

↑

STAMSON 5.0                      NORMAL REPORT                      Date: 26-11-2021 19:10:09  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b1west.te                      Time Period: Day/Night 16/8 hours  
Description: Building #1 West Facade Floor 1

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

-----  
Car traffic volume : 22000/2444    veh/TimePeriod    \*  
Medium truck volume : 227/25    veh/TimePeriod    \*  
Heavy truck volume : 454/50    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 25200  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 1.00  
Heavy Truck % of Total Volume : 2.00  
Day (16 hrs) % of Total Volume : 90.00

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

-----  
Angle1    Angle2 : 0.00 deg    90.00 deg  
Wood depth : 0    (No woods.)  
No of house rows : 0 / 0  
Surface : 2    (Reflective ground surface)  
Receiver source distance : 55.00 / 55.00    m  
Receiver height : 2.00 / 2.00    m  
Topography : 1    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

▲

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

-----  
Car traffic volume : 7857/873    veh/TimePeriod    \*  
Medium truck volume : 162/18    veh/TimePeriod    \*  
Heavy truck volume : 81/9    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 9000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00

Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Phillip St (day/night)

-----  
Angle1 Angle2 : -90.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 125.00 / 125.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



Results segment # 1: Columbia St (day)

-----

Source height = 1.19 m

ROAD (0.00 + 58.71 + 0.00) = 58.71 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 67.36  | 0.00  | -5.64 | -3.01 | 0.00  | 0.00  | 0.00  | 58.71  |

Segment Leq : 58.71 dBA



Results segment # 2: Phillip St (day)

-----

Source height = 1.00 m

ROAD (0.00 + 52.70 + 0.00) = 52.70 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.00  | 61.91  | 0.00  | -9.21 | 0.00  | 0.00  | 0.00  | 0.00  | 52.70  |

Segment Leq : 52.70 dBA

Total Leq All Segments: 59.68 dBA



Results segment # 1: Columbia St (night)

-----

Source height = 1.19 m

ROAD (0.00 + 52.16 + 0.00) = 52.16 dBA

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

|   |    |      |       |      |       |       |      |      |      |       |
|---|----|------|-------|------|-------|-------|------|------|------|-------|
| 0 | 90 | 0.00 | 60.81 | 0.00 | -5.64 | -3.01 | 0.00 | 0.00 | 0.00 | 52.16 |
|---|----|------|-------|------|-------|-------|------|------|------|-------|

Segment Leq : 52.16 dBA

Results segment # 2: Phillip St (night)

Source height = 1.00 m

ROAD (0.00 + 46.17 + 0.00) = 46.17 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.00  | 55.38  | 0.00  | -9.21 | 0.00  | 0.00  | 0.00  | 0.00  | 46.17  |

Segment Leq : 46.17 dBA

Total Leq All Segments: 53.14 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.68  
(NIGHT): 53.14

STAMSON 5.0            NORMAL REPORT            Date: 24-12-2021 09:13:51  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b1day1hr.te            Time Period: 1 hours  
Description: Building #1 Daytime 1 hour

Road data, segment # 1: Lester St

-----  
Car traffic volume : 241 veh/TimePeriod  
Medium truck volume : 5 veh/TimePeriod  
Heavy truck volume : 2 veh/TimePeriod  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Lester St

-----  
Angle1    Angle2            : -90.00 deg    0.00 deg  
Wood depth                : 0            (No woods.)  
No of house rows         : 0  
Surface                   : 2            (Reflective ground surface)  
Receiver source distance : 45.00 m  
Receiver height          : 2.00 m  
Topography               : 1            (Flat/gentle slope; no barrier)  
Reference angle          : 0.00

↑

Road data, segment # 2: Phillip St

-----  
Car traffic volume : 621 veh/TimePeriod  
Medium truck volume : 13 veh/TimePeriod  
Heavy truck volume : 6 veh/TimePeriod  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Phillip St

-----  
Angle1    Angle2            : 0.00 deg    90.00 deg  
Wood depth                : 0            (No woods.)  
No of house rows         : 0  
Surface                   : 2            (Reflective ground surface)  
Receiver source distance : 145.00 m  
Receiver height          : 2.00 m  
Topography               : 1            (Flat/gentle slope; no barrier)  
Reference angle          : 0.00

↑

Results segment # 1: Lester St

-----  
Source height = 0.95 m

ROAD (0.00 + 50.75 + 0.00) = 50.75 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 58.53  | 0.00  | -4.77 | -3.01 | 0.00  | 0.00  | 0.00  | 50.75  |

-----

Segment Leq : 50.75 dBA

↑

Results segment # 2: Phillip St

-----  
Source height = 0.98 m

ROAD (0.00 + 49.98 + 0.00) = 49.98 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 62.85  | 0.00  | -9.85 | -3.01 | 0.00  | 0.00  | 0.00  | 49.98  |

-----

Segment Leq : 49.98 dBA

Total Leq All Segments: 53.39 dBA

↑

TOTAL Leq FROM ALL SOURCES: 53.39

↑

↑

STAMSON 5.0            NORMAL REPORT            Date: 24-12-2021 09:15:30  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b1night.te            Time Period: 1 hours  
Description: Building #1 Night time 1 hour

Road data, segment # 1: Lester St

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

Data for Segment # 1: Lester St

-----  
Angle1    Angle2 : -90.00 deg    0.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 45.00 m  
Receiver height : 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

Road data, segment # 2: Phillip St

-----  
Car traffic volume : 155 veh/TimePeriod  
Medium truck volume : 3 veh/TimePeriod  
Heavy truck volume : 2 veh/TimePeriod  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Phillip St

-----  
Angle1    Angle2 : 0.00 deg    90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 145.00 m  
Receiver height : 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

Results segment # 1: Lester St

-----  
Source height = 1.13 m

ROAD (0.00 + 45.70 + 0.00) = 45.70 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 53.48  | 0.00  | -4.77 | -3.01 | 0.00  | 0.00  | 0.00  | 45.70  |

-----

Segment Leq : 45.70 dBA

↑

Results segment # 2: Phillip St

-----  
Source height = 1.06 m

ROAD (0.00 + 44.35 + 0.00) = 44.35 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 57.21  | 0.00  | -9.85 | -3.01 | 0.00  | 0.00  | 0.00  | 44.35  |

-----

Segment Leq : 44.35 dBA

Total Leq All Segments: 48.09 dBA

↑

TOTAL Leq FROM ALL SOURCES: 48.09

↑

↑

Filename: b2north.te                      Time Period: Day/Night 16/8 hours  
Description: Building #2 North Facade Floor 1

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

-----  
Car traffic volume : 22000/2444    veh/TimePeriod    \*  
Medium truck volume : 227/25    veh/TimePeriod    \*  
Heavy truck volume : 454/50    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 25200  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 1.00  
Heavy Truck % of Total Volume : 2.00  
Day (16 hrs) % of Total Volume : 90.00

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

-----  
Angle1    Angle2 : -90.00 deg    90.00 deg  
Wood depth : 0    (No woods.)  
No of house rows : 0 / 0  
Surface : 2    (Reflective ground surface)  
Receiver source distance : 80.00 / 80.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

▲

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

-----  
Car traffic volume : 7857/873    veh/TimePeriod    \*  
Medium truck volume : 162/18    veh/TimePeriod    \*  
Heavy truck volume : 81/9    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 9000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00

Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Phillip St (day/night)

-----  
Angle1 Angle2 : -90.00 deg 0.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 125.00 / 125.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

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

-----  
Car traffic volume : 2968/330 veh/TimePeriod \*  
Medium truck volume : 61/7 veh/TimePeriod \*  
Heavy truck volume : 31/3 veh/TimePeriod \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 3400  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00  
Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 3: Lester St (day/night)

-----  
Angle1 Angle2 : 0.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 75.00 / 75.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

Results segment # 1: Columbia St (day)

-----  
Source height = 1.19 m

ROAD (0.00 + 60.09 + 0.00) = 60.09 dBA

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

|     |    |      |       |      |       |      |      |      |      |       |
|-----|----|------|-------|------|-------|------|------|------|------|-------|
| -90 | 90 | 0.00 | 67.36 | 0.00 | -7.27 | 0.00 | 0.00 | 0.00 | 0.00 | 60.09 |
|-----|----|------|-------|------|-------|------|------|------|------|-------|

Segment Leq : 60.09 dBA

↑  
Results segment # 2: Phillip St (day)

Source height = 1.00 m

ROAD (0.00 + 49.69 + 0.00) = 49.69 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 61.91  | 0.00  | -9.21 | -3.01 | 0.00  | 0.00  | 0.00  | 49.69  |

Segment Leq : 49.69 dBA

↑  
Results segment # 3: Lester St (day)

Source height = 1.00 m

ROAD (0.00 + 47.70 + 0.00) = 47.70 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 57.70  | 0.00  | -6.99 | -3.01 | 0.00  | 0.00  | 0.00  | 47.70  |

Segment Leq : 47.70 dBA

Total Leq All Segments: 60.69 dBA

↑  
Results segment # 1: Columbia St (night)

Source height = 1.19 m

ROAD (0.00 + 53.54 + 0.00) = 53.54 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.00  | 60.81  | 0.00  | -7.27 | 0.00  | 0.00  | 0.00  | 0.00  | 53.54  |

Segment Leq : 53.54 dBA

↑  
Results segment # 2: Phillip St (night)

-----  
Source height = 1.00 m

ROAD (0.00 + 43.16 + 0.00) = 43.16 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 55.38  | 0.00  | -9.21 | -3.01 | 0.00  | 0.00  | 0.00  | 43.16  |

-----

Segment Leq : 43.16 dBA

↑

Results segment # 3: Lester St (night)

-----

Source height = 0.97 m

ROAD (0.00 + 41.00 + 0.00) = 41.00 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 51.00  | 0.00  | -6.99 | -3.01 | 0.00  | 0.00  | 0.00  | 41.00  |

-----

Segment Leq : 41.00 dBA

Total Leq All Segments: 54.14 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 60.69  
(NIGHT): 54.14

↑

↑

Filename: b2eastf1.te                      Time Period: Day/Night 16/8 hours  
Description: Building #2 East Facade Floor 1

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

-----  
Car traffic volume : 2968/330    veh/TimePeriod    \*  
Medium truck volume : 61/7    veh/TimePeriod    \*  
Heavy truck volume : 31/3    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 3400  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00  
Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

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

-----  
Angle1    Angle2 : -90.00 deg    90.00 deg  
Wood depth : 0    (No woods.)  
No of house rows : 0 / 0  
Surface : 2    (Reflective ground surface)  
Receiver source distance : 45.00 / 45.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

▲

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

-----  
Car traffic volume : 22000/2444    veh/TimePeriod    \*  
Medium truck volume : 227/25    veh/TimePeriod    \*  
Heavy truck volume : 454/50    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 25200  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 1.00

Heavy Truck % of Total Volume : 2.00  
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Columbia St (day/night)

-----  
 Angle1 Angle2 : -90.00 deg 0.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 2 (Reflective ground surface)  
 Receiver source distance : 75.00 / 75.00 m  
 Receiver height : 2.00 / 2.00 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

↑  
 Results segment # 1: Lester St (day)

Source height = 1.00 m

ROAD (0.00 + 52.93 + 0.00) = 52.93 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.00  | 57.70  | 0.00  | -4.77 | 0.00  | 0.00  | 0.00  | 0.00  | 52.93  |

Segment Leq : 52.93 dBA

↑  
 Results segment # 2: Columbia St (day)

Source height = 1.19 m

ROAD (0.00 + 57.36 + 0.00) = 57.36 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 67.36  | 0.00  | -6.99 | -3.01 | 0.00  | 0.00  | 0.00  | 57.36  |

Segment Leq : 57.36 dBA

Total Leq All Segments: 58.70 dBA

↑  
 Results segment # 1: Lester St (night)

Source height = 0.97 m

ROAD (0.00 + 46.23 + 0.00) = 46.23 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 67.36  | 0.00  | -6.99 | -3.01 | 0.00  | 0.00  | 0.00  | 57.36  |

|     |    |      |       |      |       |      |      |      |      |       |
|-----|----|------|-------|------|-------|------|------|------|------|-------|
| -90 | 90 | 0.00 | 51.00 | 0.00 | -4.77 | 0.00 | 0.00 | 0.00 | 0.00 | 46.23 |
|-----|----|------|-------|------|-------|------|------|------|------|-------|

Segment Leq : 46.23 dBA

Results segment # 2: Columbia St (night)

Source height = 1.19 m

ROAD (0.00 + 50.81 + 0.00) = 50.81 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 60.81  | 0.00  | -6.99 | -3.01 | 0.00  | 0.00  | 0.00  | 50.81  |

Segment Leq : 50.81 dBA

Total Leq All Segments: 52.11 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.70  
(NIGHT): 52.11

STAMSON 5.0                      NORMAL REPORT                      Date: 26-11-2021 19:11:06  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b2south.te                      Time Period: Day/Night 16/8 hours  
Description: Building #2 South Facade Floor 1

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

-----  
Car traffic volume : 2968/330    veh/TimePeriod    \*  
Medium truck volume : 61/7    veh/TimePeriod    \*  
Heavy truck volume : 31/3    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 3400  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00  
Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

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

-----  
Angle1    Angle2                      : -90.00 deg    0.00 deg  
Wood depth : 0    (No woods.)  
No of house rows : 0 / 0  
Surface : 2    (Reflective ground surface)  
Receiver source distance : 45.00 / 45.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑  
Results segment # 1: Lester St (day)

-----  
Source height = 1.00 m

ROAD (0.00 + 49.92 + 0.00) = 49.92 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 57.70  | 0.00  | -4.77 | -3.01 | 0.00  | 0.00  | 0.00  | 49.92  |

-----

Segment Leq : 49.92 dBA

Total Leq All Segments: 49.92 dBA



Results segment # 1: Lester St (night)

-----

Source height = 0.97 m

ROAD (0.00 + 43.22 + 0.00) = 43.22 dBA

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

|     |   |      |       |      |       |       |      |      |      |       |
|-----|---|------|-------|------|-------|-------|------|------|------|-------|
| -90 | 0 | 0.00 | 51.00 | 0.00 | -4.77 | -3.01 | 0.00 | 0.00 | 0.00 | 43.22 |
|-----|---|------|-------|------|-------|-------|------|------|------|-------|

-----

Segment Leq : 43.22 dBA

Total Leq All Segments: 43.22 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 49.92  
(NIGHT): 43.22



Filename: b2west.te                      Time Period: Day/Night 16/8 hours  
Description: Building #2 West Facade Floor 1

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

-----  
Car traffic volume : 22000/2444    veh/TimePeriod    \*  
Medium truck volume : 227/25    veh/TimePeriod    \*  
Heavy truck volume : 454/50    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 25200  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 1.00  
Heavy Truck % of Total Volume : 2.00  
Day (16 hrs) % of Total Volume : 90.00

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

-----  
Angle1    Angle2 : 0.00 deg    90.00 deg  
Wood depth : 0    (No woods.)  
No of house rows : 0 / 0  
Surface : 2    (Reflective ground surface)  
Receiver source distance : 125.00 / 125.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

▲

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

-----  
Car traffic volume : 7857/873    veh/TimePeriod    \*  
Medium truck volume : 162/18    veh/TimePeriod    \*  
Heavy truck volume : 81/9    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 9000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00

|              |                   |   |       |
|--------------|-------------------|---|-------|
| Heavy Truck  | % of Total Volume | : | 1.00  |
| Day (16 hrs) | % of Total Volume | : | 90.00 |

Data for Segment # 2: Phillip St (day/night)

```

Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth      :           0           (No woods.)
No of house rows :           0 / 0
Surface         :           2           (Reflective ground surface)
Receiver source distance : 125.00 / 125.00 m
Receiver height  :           2.00 / 2.00 m
Topography      :           1           (Flat/gentle slope; no barrier)
Reference angle  :           0.00

```

Results segment # 1: Columbia St (day)

Source height = 1.19 m

$$\text{ROAD } (0.00 + 55.15 + 0.00) = 55.15 \text{ dBA}$$

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 67.36  | 0.00  | -9.21 | -3.01 | 0.00  | 0.00  | 0.00  | 55.15  |

Segment Leq : 55.15 dBA

Results segment # 2: Phillip St (day)

Source height = 1.00 m

$$\text{ROAD } (0.00 + 52.70 + 0.00) = 52.70 \text{ dBA}$$

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.00  | 61.91  | 0.00  | -9.21 | 0.00  | 0.00  | 0.00  | 0.00  | 52.70  |

Segment Leq : 52.70 dBA

Total Leg All Segments: 57.11 dBA

Results segment # 1: Columbia St (night)

Source height = 1.19 m

$$\text{ROAD } (0.00 + 48.59 + 0.00) = 48.59 \text{ dBA}$$

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

|   |    |      |       |      |       |       |      |      |      |       |
|---|----|------|-------|------|-------|-------|------|------|------|-------|
| 0 | 90 | 0.00 | 60.81 | 0.00 | -9.21 | -3.01 | 0.00 | 0.00 | 0.00 | 48.59 |
|---|----|------|-------|------|-------|-------|------|------|------|-------|

Segment Leq : 48.59 dBA

Results segment # 2: Phillip St (night)

Source height = 1.00 m

ROAD (0.00 + 46.17 + 0.00) = 46.17 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.00  | 55.38  | 0.00  | -9.21 | 0.00  | 0.00  | 0.00  | 0.00  | 46.17  |

Segment Leq : 46.17 dBA

Total Leq All Segments: 50.56 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.11  
(NIGHT): 50.56

STAMSON 5.0            NORMAL REPORT            Date: 24-12-2021 09:23:06  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b2day1hr.te            Time Period: 1 hours  
Description: Building #2 Daytime 1 hour

Road data, segment # 1: Lester St

-----  
Car traffic volume : 241 veh/TimePeriod  
Medium truck volume : 5 veh/TimePeriod  
Heavy truck volume : 2 veh/TimePeriod  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Lester St

-----  
Angle1    Angle2 : -90.00 deg    0.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 45.00 m  
Receiver height : 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

Road data, segment # 2: Phillip St

-----  
Car traffic volume : 621 veh/TimePeriod  
Medium truck volume : 13 veh/TimePeriod  
Heavy truck volume : 6 veh/TimePeriod  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Phillip St

-----  
Angle1    Angle2 : 0.00 deg    90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 145.00 m  
Receiver height : 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

Results segment # 1: Lester St

-----  
Source height = 0.95 m

ROAD (0.00 + 50.75 + 0.00) = 50.75 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 58.53  | 0.00  | -4.77 | -3.01 | 0.00  | 0.00  | 0.00  | 50.75  |

Segment Leq : 50.75 dBA

↑

Results segment # 2: Phillip St

-----  
Source height = 0.98 m

ROAD (0.00 + 49.98 + 0.00) = 49.98 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 62.85  | 0.00  | -9.85 | -3.01 | 0.00  | 0.00  | 0.00  | 49.98  |

Segment Leq : 49.98 dBA

Total Leq All Segments: 53.39 dBA

↑

TOTAL Leq FROM ALL SOURCES: 53.39

↑

↑

STAMSON 5.0            NORMAL REPORT            Date: 24-12-2021 09:23:31  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b2night.te            Time Period: 1 hours  
Description: Building #2 Nighttime 1 hour

Road data, segment # 1: Lester St

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

Data for Segment # 1: Lester St

-----  
Angle1    Angle2 : -90.00 deg    0.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 45.00 m  
Receiver height : 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

Road data, segment # 2: Phillip St

-----  
Car traffic volume : 155 veh/TimePeriod  
Medium truck volume : 3 veh/TimePeriod  
Heavy truck volume : 2 veh/TimePeriod  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Phillip St

-----  
Angle1    Angle2 : 0.00 deg    90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 145.00 m  
Receiver height : 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

Results segment # 1: Lester St

-----  
Source height = 1.13 m

ROAD (0.00 + 45.70 + 0.00) = 45.70 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 53.48  | 0.00  | -4.77 | -3.01 | 0.00  | 0.00  | 0.00  | 45.70  |

-----

Segment Leq : 45.70 dBA

↑

Results segment # 2: Phillip St

-----  
Source height = 1.06 m

ROAD (0.00 + 44.35 + 0.00) = 44.35 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 57.21  | 0.00  | -9.85 | -3.01 | 0.00  | 0.00  | 0.00  | 44.35  |

-----

Segment Leq : 44.35 dBA

Total Leq All Segments: 48.09 dBA

↑

TOTAL Leq FROM ALL SOURCES: 48.09

↑

↑

Filename: b3north.te                      Time Period: Day/Night 16/8 hours  
Description: Building #3 North Facade Floor 1

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

-----  
Car traffic volume : 22000/2444    veh/TimePeriod    \*  
Medium truck volume : 227/25    veh/TimePeriod    \*  
Heavy truck volume : 454/50    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 25200  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 1.00  
Heavy Truck % of Total Volume : 2.00  
Day (16 hrs) % of Total Volume : 90.00

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

-----  
Angle1    Angle2 : -90.00 deg    90.00 deg  
Wood depth : 0    (No woods.)  
No of house rows : 0 / 0  
Surface : 2    (Reflective ground surface)  
Receiver source distance : 145.00 / 145.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

▲

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

-----  
Car traffic volume : 7857/873    veh/TimePeriod    \*  
Medium truck volume : 162/18    veh/TimePeriod    \*  
Heavy truck volume : 81/9    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 9000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00

Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Phillip St (day/night)

-----  
Angle1 Angle2 : -90.00 deg 0.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 120.00 / 120.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

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

-----  
Car traffic volume : 2968/330 veh/TimePeriod \*  
Medium truck volume : 61/7 veh/TimePeriod \*  
Heavy truck volume : 31/3 veh/TimePeriod \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 3400  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00  
Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 3: Lester St (day/night)

-----  
Angle1 Angle2 : 0.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 75.00 / 75.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

Results segment # 1: Columbia St (day)

-----  
Source height = 1.19 m

ROAD (0.00 + 57.51 + 0.00) = 57.51 dBA

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

|     |    |      |       |      |       |      |      |      |      |       |
|-----|----|------|-------|------|-------|------|------|------|------|-------|
| -90 | 90 | 0.00 | 67.36 | 0.00 | -9.85 | 0.00 | 0.00 | 0.00 | 0.00 | 57.51 |
|-----|----|------|-------|------|-------|------|------|------|------|-------|

Segment Leq : 57.51 dBA

↑  
Results segment # 2: Phillip St (day)

Source height = 1.00 m

ROAD (0.00 + 49.87 + 0.00) = 49.87 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 61.91  | 0.00  | -9.03 | -3.01 | 0.00  | 0.00  | 0.00  | 49.87  |

Segment Leq : 49.87 dBA

↑  
Results segment # 3: Lester St (day)

Source height = 1.00 m

ROAD (0.00 + 47.70 + 0.00) = 47.70 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 57.70  | 0.00  | -6.99 | -3.01 | 0.00  | 0.00  | 0.00  | 47.70  |

Segment Leq : 47.70 dBA

Total Leq All Segments: 58.57 dBA

↑  
Results segment # 1: Columbia St (night)

Source height = 1.19 m

ROAD (0.00 + 50.96 + 0.00) = 50.96 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.00  | 60.81  | 0.00  | -9.85 | 0.00  | 0.00  | 0.00  | 0.00  | 50.96  |

Segment Leq : 50.96 dBA

↑  
Results segment # 2: Phillip St (night)

-----  
Source height = 1.00 m

ROAD (0.00 + 43.33 + 0.00) = 43.33 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 55.38  | 0.00  | -9.03 | -3.01 | 0.00  | 0.00  | 0.00  | 43.33  |

-----

Segment Leq : 43.33 dBA

↑  
Results segment # 3: Lester St (night)  
-----

Source height = 0.97 m

ROAD (0.00 + 41.00 + 0.00) = 41.00 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 51.00  | 0.00  | -6.99 | -3.01 | 0.00  | 0.00  | 0.00  | 41.00  |

-----

Segment Leq : 41.00 dBA

Total Leq All Segments: 52.01 dBA

↑  
  
TOTAL Leq FROM ALL SOURCES (DAY): 58.57  
                                          (NIGHT): 52.01

↑  
↑

Filename: b3eastf1.te                      Time Period: Day/Night 16/8 hours  
Description: Building #3 East Facade Floor 1

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

-----  
Car traffic volume : 2968/330    veh/TimePeriod    \*  
Medium truck volume : 61/7    veh/TimePeriod    \*  
Heavy truck volume : 31/3    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 3400  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00  
Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

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

-----  
Angle1    Angle2 : -90.00 deg    90.00 deg  
Wood depth : 0    (No woods.)  
No of house rows : 0 / 0  
Surface : 2    (Reflective ground surface)  
Receiver source distance : 40.00 / 40.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

▲

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

-----  
Car traffic volume : 22000/2444    veh/TimePeriod    \*  
Medium truck volume : 227/25    veh/TimePeriod    \*  
Heavy truck volume : 454/50    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 25200  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 1.00

Heavy Truck % of Total Volume : 2.00  
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Columbia St (day/night)

-----  
Angle1 Angle2 : -90.00 deg 0.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 145.00 / 145.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



Results segment # 1: Lester St (day)

-----

Source height = 1.00 m

ROAD (0.00 + 53.44 + 0.00) = 53.44 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.00  | 57.70  | 0.00  | -4.26 | 0.00  | 0.00  | 0.00  | 0.00  | 53.44  |

Segment Leq : 53.44 dBA



Results segment # 2: Columbia St (day)

-----

Source height = 1.19 m

ROAD (0.00 + 54.50 + 0.00) = 54.50 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 67.36  | 0.00  | -9.85 | -3.01 | 0.00  | 0.00  | 0.00  | 54.50  |

Segment Leq : 54.50 dBA

Total Leq All Segments: 57.01 dBA



Results segment # 1: Lester St (night)

-----

Source height = 0.97 m

ROAD (0.00 + 46.74 + 0.00) = 46.74 dBA

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

|     |    |      |       |      |       |      |      |      |      |       |
|-----|----|------|-------|------|-------|------|------|------|------|-------|
| -90 | 90 | 0.00 | 51.00 | 0.00 | -4.26 | 0.00 | 0.00 | 0.00 | 0.00 | 46.74 |
|-----|----|------|-------|------|-------|------|------|------|------|-------|

Segment Leq : 46.74 dBA

Results segment # 2: Columbia St (night)

Source height = 1.19 m

ROAD (0.00 + 47.95 + 0.00) = 47.95 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 60.81  | 0.00  | -9.85 | -3.01 | 0.00  | 0.00  | 0.00  | 47.95  |

Segment Leq : 47.95 dBA

Total Leq All Segments: 50.40 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.01  
(NIGHT): 50.40

STAMSON 5.0                      NORMAL REPORT                      Date: 26-11-2021 19:12:11  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b3south.te                      Time Period: Day/Night 16/8 hours  
Description: Building #3 South Facade Floor 1

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

-----  
Car traffic volume : 2968/330    veh/TimePeriod    \*  
Medium truck volume : 61/7    veh/TimePeriod    \*  
Heavy truck volume : 31/3    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 3400  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00  
Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

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

-----  
Angle1    Angle2                      : -90.00 deg    0.00 deg  
Wood depth : 0    (No woods.)  
No of house rows : 0 / 0  
Surface : 2    (Reflective ground surface)  
Receiver source distance : 40.00 / 40.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑  
Results segment # 1: Lester St (day)

-----  
Source height = 1.00 m

ROAD (0.00 + 50.43 + 0.00) = 50.43 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 57.70  | 0.00  | -4.26 | -3.01 | 0.00  | 0.00  | 0.00  | 50.43  |

-----

Segment Leq : 50.43 dBA

Total Leq All Segments: 50.43 dBA

↑

Results segment # 1: Lester St (night)

-----

Source height = 0.97 m

ROAD (0.00 + 43.73 + 0.00) = 43.73 dBA

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

|     |   |      |       |      |       |       |      |      |      |       |
|-----|---|------|-------|------|-------|-------|------|------|------|-------|
| -90 | 0 | 0.00 | 51.00 | 0.00 | -4.26 | -3.01 | 0.00 | 0.00 | 0.00 | 43.73 |
|-----|---|------|-------|------|-------|-------|------|------|------|-------|

-----

Segment Leq : 43.73 dBA

Total Leq All Segments: 43.73 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 50.43  
(NIGHT): 43.73

↑

↑

Filename: b3west.te                      Time Period: Day/Night 16/8 hours  
Description: Building #3 West Facade Floor 1

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

-----  
Car traffic volume : 22000/2444    veh/TimePeriod    \*  
Medium truck volume : 227/25    veh/TimePeriod    \*  
Heavy truck volume : 454/50    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 25200  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 1.00  
Heavy Truck % of Total Volume : 2.00  
Day (16 hrs) % of Total Volume : 90.00

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

-----  
Angle1    Angle2 : 0.00 deg    90.00 deg  
Wood depth : 0    (No woods.)  
No of house rows : 0 / 0  
Surface : 2    (Reflective ground surface)  
Receiver source distance : 150.00 / 150.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

▲

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

-----  
Car traffic volume : 7857/873    veh/TimePeriod    \*  
Medium truck volume : 162/18    veh/TimePeriod    \*  
Heavy truck volume : 81/9    veh/TimePeriod    \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 9000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 2.00

Heavy Truck % of Total Volume : 1.00  
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Phillip St (day/night)

-----  
Angle1 Angle2 : -90.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 95.00 / 95.00 m  
Receiver height : 2.00 / 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑  
Results segment # 1: Columbia St (day)

-----  
Source height = 1.19 m

ROAD (0.00 + 54.35 + 0.00) = 54.35 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 67.36  | 0.00  | -10.00 | -3.01 | 0.00  | 0.00  | 0.00  | 54.35  |

-----  
Segment Leq : 54.35 dBA

↑  
Results segment # 2: Phillip St (day)

-----  
Source height = 1.00 m

ROAD (0.00 + 53.89 + 0.00) = 53.89 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.00  | 61.91  | 0.00  | -8.02 | 0.00  | 0.00  | 0.00  | 0.00  | 53.89  |

-----  
Segment Leq : 53.89 dBA

Total Leq All Segments: 57.14 dBA

↑  
Results segment # 1: Columbia St (night)

-----  
Source height = 1.19 m

ROAD (0.00 + 47.80 + 0.00) = 47.80 dBA

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

|   |    |      |       |      |        |       |      |      |      |       |
|---|----|------|-------|------|--------|-------|------|------|------|-------|
| 0 | 90 | 0.00 | 60.81 | 0.00 | -10.00 | -3.01 | 0.00 | 0.00 | 0.00 | 47.80 |
|---|----|------|-------|------|--------|-------|------|------|------|-------|

Segment Leq : 47.80 dBA

Results segment # 2: Phillip St (night)

Source height = 1.00 m

ROAD (0.00 + 47.36 + 0.00) = 47.36 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.00  | 55.38  | 0.00  | -8.02 | 0.00  | 0.00  | 0.00  | 0.00  | 47.36  |

Segment Leq : 47.36 dBA

Total Leq All Segments: 50.60 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.14  
(NIGHT): 50.60

STAMSON 5.0            NORMAL REPORT            Date: 24-12-2021 09:19:04  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b3day1hr.te            Time Period: 1 hours  
Description: Building #3 Daytime 1 hour

Road data, segment # 1: Lester St

-----  
Car traffic volume : 241 veh/TimePeriod  
Medium truck volume : 5 veh/TimePeriod  
Heavy truck volume : 2 veh/TimePeriod  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Lester St

-----  
Angle1    Angle2            : -90.00 deg    0.00 deg  
Wood depth                : 0            (No woods.)  
No of house rows         : 0  
Surface                   : 2            (Reflective ground surface)  
Receiver source distance : 40.00 m  
Receiver height          : 2.00 m  
Topography               : 1            (Flat/gentle slope; no barrier)  
Reference angle          : 0.00

↑

Road data, segment # 2: Phillip St

-----  
Car traffic volume : 621 veh/TimePeriod  
Medium truck volume : 13 veh/TimePeriod  
Heavy truck volume : 6 veh/TimePeriod  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Phillip St

-----  
Angle1    Angle2            : 0.00 deg    90.00 deg  
Wood depth                : 0            (No woods.)  
No of house rows         : 0  
Surface                   : 2            (Reflective ground surface)  
Receiver source distance : 150.00 m  
Receiver height          : 2.00 m  
Topography               : 1            (Flat/gentle slope; no barrier)  
Reference angle          : 0.00

↑

Results segment # 1: Lester St

-----  
Source height = 0.95 m

ROAD (0.00 + 51.26 + 0.00) = 51.26 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 58.53  | 0.00  | -4.26 | -3.01 | 0.00  | 0.00  | 0.00  | 51.26  |

-----

Segment Leq : 51.26 dBA

↑

Results segment # 2: Phillip St

-----  
Source height = 0.98 m

ROAD (0.00 + 49.84 + 0.00) = 49.84 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 62.85  | 0.00  | -10.00 | -3.01 | 0.00  | 0.00  | 0.00  | 49.84  |

-----

Segment Leq : 49.84 dBA

Total Leq All Segments: 53.62 dBA

↑

TOTAL Leq FROM ALL SOURCES: 53.62

↑

↑

STAMSON 5.0            NORMAL REPORT            Date: 24-12-2021 09:20:17  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b3night.te            Time Period: 1 hours  
Description: Building #3 Nighttime 1 hour

Road data, segment # 1: Lester St

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

Data for Segment # 1: Lester St

-----  
Angle1    Angle2 : -90.00 deg    0.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 40.00 m  
Receiver height : 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

Road data, segment # 2: Phillip

-----  
Car traffic volume : 155 veh/TimePeriod  
Medium truck volume : 3 veh/TimePeriod  
Heavy truck volume : 2 veh/TimePeriod  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Phillip

-----  
Angle1    Angle2 : 0.00 deg    90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 150.00 m  
Receiver height : 2.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑

Results segment # 1: Lester St

-----  
Source height = 1.13 m

ROAD (0.00 + 46.21 + 0.00) = 46.21 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 53.48  | 0.00  | -4.26 | -3.01 | 0.00  | 0.00  | 0.00  | 46.21  |

Segment Leq : 46.21 dBA

↑

Results segment # 2: Phillip

-----  
Source height = 1.06 m

ROAD (0.00 + 44.20 + 0.00) = 44.20 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| 0      | 90     | 0.00  | 57.21  | 0.00  | -10.00 | -3.01 | 0.00  | 0.00  | 0.00  | 44.20  |

Segment Leq : 44.20 dBA

Total Leq All Segments: 48.33 dBA

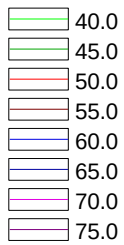
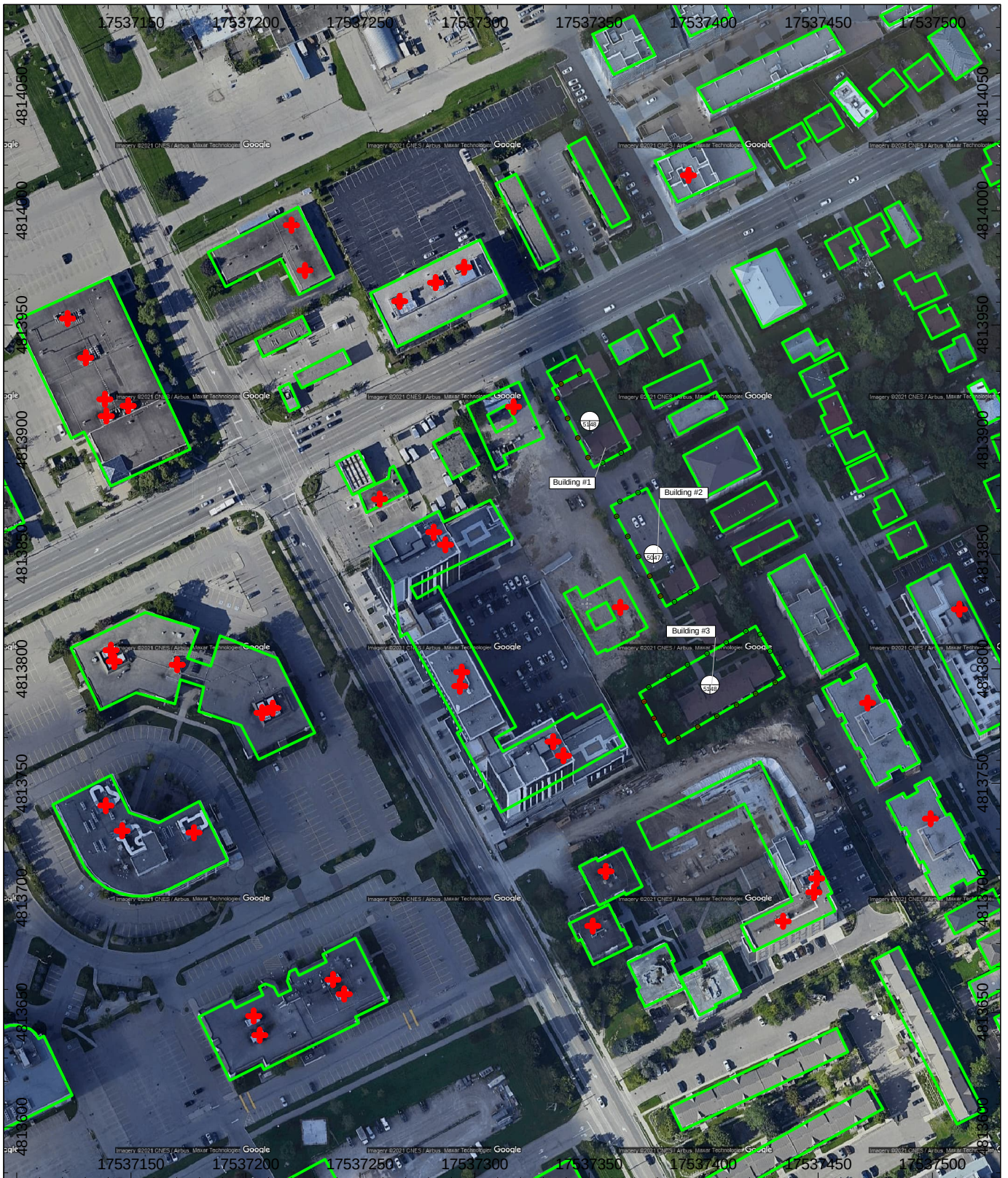
↑

TOTAL Leq FROM ALL SOURCES: 48.33

↑

↑

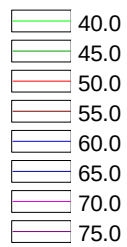
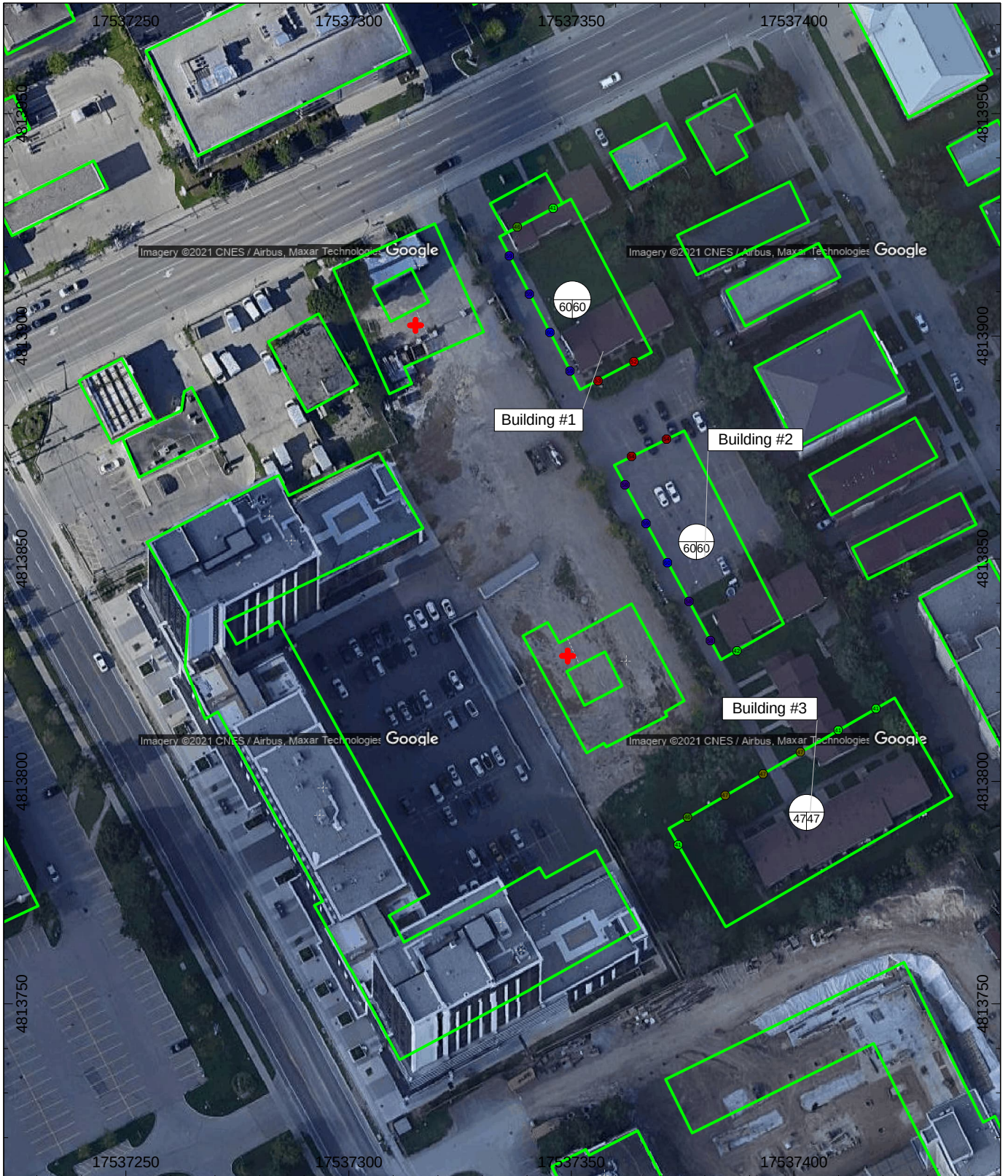
## ATTACHMENT C



- + Point Source
- Building
- Building Evaluation

STATIONARY NOISE IMPACT STUDY  
143 COLUMBIA STREET WEST, WATERLOO, ONTARIO

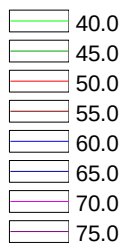
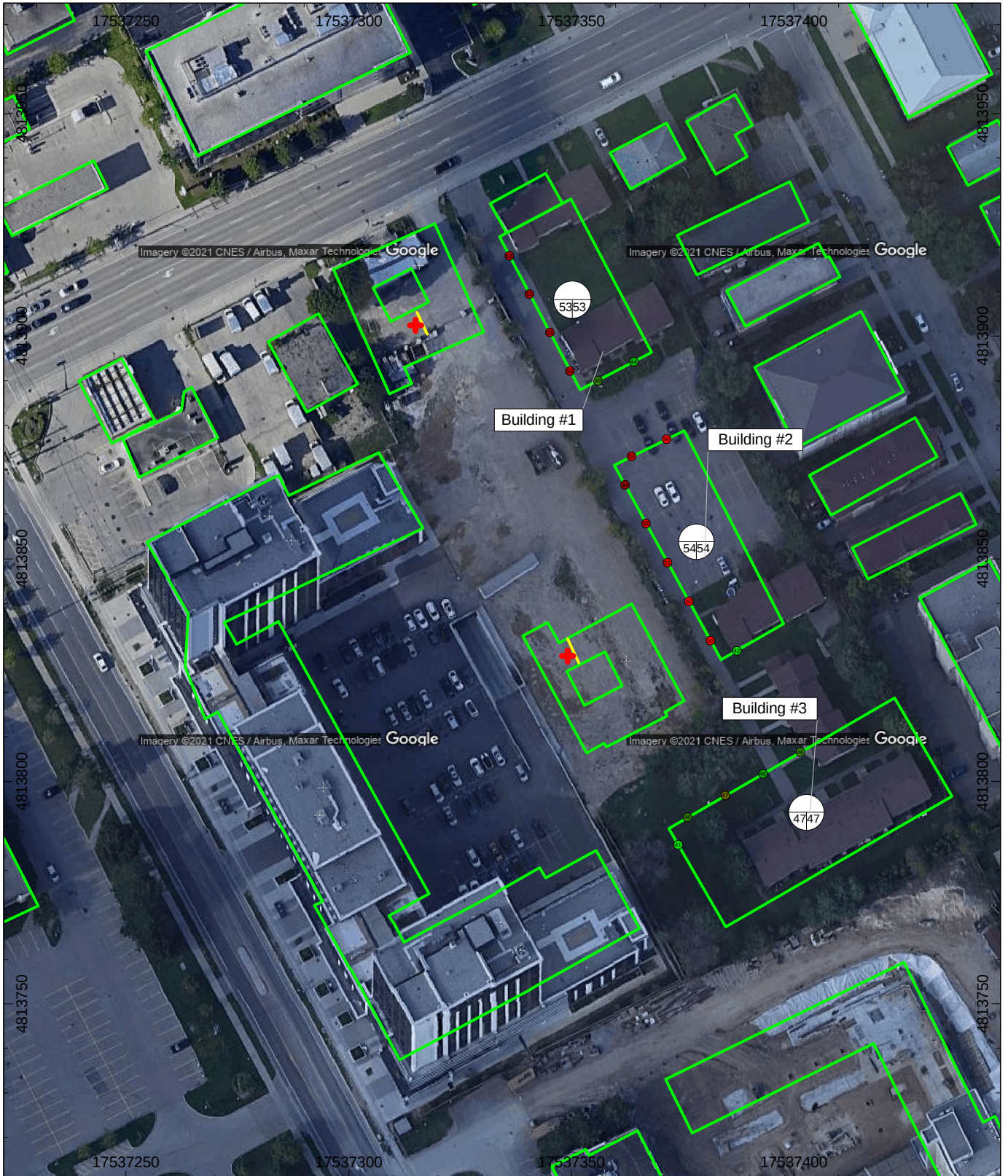
Figure 1 - Stationary Noise Impact from Neighboring Buildings to Site



- + Point Source
- Building
- Barrier
- ⊕ Building Evaluation

STATIONARY NOISE IMPACT STUDY  
143 COLUMBIA STREET WEST, WATERLOO, ONTARIO

Figure 2 - Emergency Sources Impact to Site with No Mitigation



- + Point Source
- Building
- Barrier
- ⊕ Building Evaluation

STATIONARY NOISE IMPACT STUDY  
143 COLUMBIA STREET WEST, WATERLOO, ONTARIO

Figure 3 - Emergency Sources Impact to Site with Mitigation

## ATTACHMENT D

Table C1  
Stationary Noise Impact Source Data  
20 University Avenue, Waterloo, Ontario

|                          |                        | Total<br>SWL<br>(dBA) | Data Source<br>or<br>Representative Data | Height<br>Absolute<br>(m) | Above Roof<br>(m) |          |         |
|--------------------------|------------------------|-----------------------|------------------------------------------|---------------------------|-------------------|----------|---------|
| Noise Source Description | Cadna ID               |                       |                                          |                           |                   | x        | y       |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538431 | 4813858 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538430 | 4813866 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538452 | 4813864 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.25                      | 1.25              | 17538428 | 4813915 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.25                      | 1.25              | 17538428 | 4813908 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.25                      | 1.25              | 17538431 | 4813902 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.25                      | 1.25              | 17538440 | 4813904 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.25                      | 1.25              | 17538437 | 4813918 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.25                      | 1.25              | 17538432 | 4813885 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.25                      | 1.25              | 17538442 | 4813893 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 8.25                      | 1.25              | 17538436 | 4813948 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 8.25                      | 1.25              | 17538421 | 4813946 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 8.25                      | 1.25              | 17538429 | 4813948 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.65                      | 1.25              | 17538412 | 4813976 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.65                      | 1.25              | 17538424 | 4813974 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538588 | 4813865 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538576 | 4813845 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538578 | 4813763 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538572 | 4813771 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538562 | 4813768 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538567 | 4813749 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 8.25                      | 1.25              | 17538483 | 4813725 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 8.25                      | 1.25              | 17538463 | 4813719 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 8.25                      | 1.25              | 17538523 | 4813720 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 8.25                      | 1.25              | 17538516 | 4813719 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 8.25                      | 1.25              | 17538483 | 4813708 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538458 | 4813758 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538457 | 4813766 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538455 | 4813751 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538445 | 4813794 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538456 | 4813794 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538464 | 4813802 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538343 | 4813815 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538351 | 4813813 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538358 | 4813814 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538363 | 4813815 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538369 | 4813816 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538378 | 4813821 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538382 | 4813822 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538368 | 4813823 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538389 | 4813827 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 10.25                     | 1.25              | 17538364 | 4813867 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 10.25                     | 1.25              | 17538379 | 4813857 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 10.25                     | 1.25              | 17538379 | 4813859 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 10.25                     | 1.25              | 17538379 | 4813861 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 13.25                     | 1.25              | 17538351 | 4813889 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 13.25                     | 1.25              | 17538354 | 4813892 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 13.25                     | 1.25              | 17538356 | 4813896 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 13.25                     | 1.25              | 17538353 | 4813901 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 13.25                     | 1.25              | 17538352 | 4813904 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 13.25                     | 1.25              | 17538352 | 4813908 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 13.25                     | 1.25              | 17538351 | 4813910 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 13.25                     | 1.25              | 17538359 | 4813900 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 13.25                     | 1.25              | 17538364 | 4813905 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 13.25                     | 1.25              | 17538369 | 4813911 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 13.25                     | 1.25              | 17538366 | 4813919 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 13.25                     | 1.25              | 17538362 | 4813919 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 13.25                     | 1.25              | 17538357 | 4813918 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.25                      | 1.25              | 17538343 | 4813930 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.25                      | 1.25              | 17538347 | 4813931 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.25                      | 1.25              | 17538352 | 4813931 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.25                      | 1.25              | 17538357 | 4813932 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 9.25                      | 1.25              | 17538361 | 4813932 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538351 | 4813937 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538355 | 4813938 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538361 | 4813939 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538363 | 4813947 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538362 | 4813955 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538353 | 4813956 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538351 | 4813965 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538362 | 4813962 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 6.25                      | 1.25              | 17538359 | 4813991 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538467 | 4814012 |
| Small HVAC               | Small HVAC             | 78.9                  | Small HVAC                               | 5.25                      | 1.25              | 17538427 | 4814007 |
| Representative_MUA       | Representative_MUA     | 80.6                  | Representative_MUA                       | 8.5                       | 1.5               | 17538487 | 4813724 |
| Representative_MUA       | Representative_MUA     | 80.6                  | Representative_MUA                       | 29.5                      | 1.5               | 17538556 | 4813917 |
| Representative_MUA       | Representative_MUA     | 80.6                  | Representative_MUA                       | 22.5                      | 1.5               | 17538586 | 4813948 |
| Representative_MUA       | Representative_MUA     | 80.6                  | Representative_MUA                       | 56.5                      | 1.5               | 17538530 | 4813980 |
| Representative_Chiller   | Representative_Chiller | 91.7                  | Representative_Chiller                   | 7                         | 2                 | 17538366 | 4813812 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 10.5                      | 1.5               | 17538378 | 4813866 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 10.5                      | 1.5               | 17538381 | 4813870 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 10.5                      | 1.5               | 17538383 | 4813859 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 10.5                      | 1.5               | 17538369 | 4813857 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 6.5                       | 1.5               | 17538346 | 4813810 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 6.5                       | 1.5               | 17538464 | 4813789 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 8.5                       | 1.5               | 17538498 | 4813706 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 8.5                       | 1.5               | 17538476 | 4813704 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 8.5                       | 1.5               | 17538460 | 4813715 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 8.5                       | 1.5               | 17538474 | 4813719 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 8.5                       | 1.5               | 17538474 | 4813723 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 8.5                       | 1.5               | 17538497 | 4813711 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 48.5                      | 1.5               | 17538579 | 4814031 |
| HVAC_2FAN                | HVAC_2FAN              | 82.8                  | HVAC_2FAN                                | 48.5                      | 1.5               | 17538529 | 4814023 |

## ATTACHMENT E

Owner's Name: 143 Columbia Inc.  
Owner's Address: 156 Columbia Street West  
Waterloo ON N2L 3L3

Re: Road Traffic and Stationary Noise Impact Study, 143 Columbia Street West, Waterloo, Ontario

### OWNER'S STATEMENT

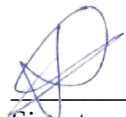
I am the owner of the property, or the owner's agent, and that I understand and agree with the noise assessment and potential attenuation measures detailed in the study entitled Road Traffic and Stationary Noise Impact Study, 143 Columbia Street West, Waterloo, Ontario, dated November 17, 2021.

The application has been designed to avoid the use of berms or walls as noise attenuation features where feasible. Where berms or walls are recommended, the Noise Study provides economic, planning and engineering justification.

If the application is changed in a way that may affect the noise level calculations, I will have a revised noise study submitted to the Region of Waterloo.

Drazen Prica

Name



Signature

December 13, 2021

Date

## ATTACHMENT F

CANADA

PROVINCE OF ONTARIO

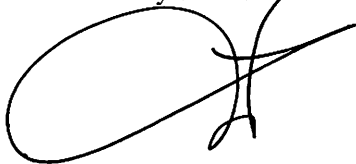
) In the Matter of the  
) Environmental Protection  
) Act and the Planning Act  
)  
)  
) And in the Matter of  
) 143 Columbia Street West,  
Waterloo, Ontario in the Regional  
Municipality of Waterloo

I, Joey Jraige, of JJ Acoustic Engineering Ltd., in the Town of Tilbury,  
SOLEMNLY DECLARE THAT:

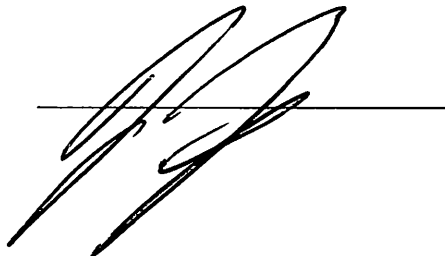
1. I am a Professional Engineer employed by JJ Acoustic Engineering Ltd. which holds a Certificate of Authorization and have personal knowledge of the matters set out below.
2. I was retained or employed as the principal consultant to undertake the assessment of noise impacts and recommendation of noise mitigation measures for the property described as 143 Columbia Street West, Waterloo, Ontario.
3. I have the expertise required to perform these services. Any assessment activities or recommendations requiring the application of engineering principles have been undertaken or supervised by an engineer qualified to perform such services.
4. The information used in the letter report entitled "Road Traffic and Stationary Noise Impact Study" dated November 17, 2021, is the best available information as of the date of the study.
5. The noise level calculations, the interpretation of noise attenuation requirements and the recommended measures are in accordance with Ministry of Environment and Climate Change Guidelines, Region of Waterloo policies, and any applicable policy or guidelines of the Area Municipality, and any other applicable policy or guideline.
6. The physical noise attenuation measures proposed in this study are feasible to implement and will provide the level of attenuation indicated in the study.
7. I acknowledge that this study may be subject to a peer review conducted at my cost.
8. I acknowledge that public authorities and future owners, occupants and others may rely on this statement.

AND I make this solemn Declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath.

DECLARED before me in the Town  
of Tilbury, in the Regional  
Municipality of Chatham-Kent  
This 9th day of December 2021



)  
)  
)  
)  
)



**LOUIS ELTERS  
TAYLOR DELRUE  
BARRISTER, SOLICITOR & NOTARY PUBLIC  
40 QUEEN ST. S., P.O. BOX 459  
TILBURY, ONTARIO N0P 2L0  
MY COMMISSION DOES NOT EXPIRE**