HGC ENGINEERING

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Noise Feasibility Study
Proposed Mixed-Use/Residential Development
55 Kerr Street,
Cambridge, Ontario

Prepared for:

50 Shade Street Investments Inc.
425 Alness Street,
Toronto, Ontario
M3J 2t8

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Project Number: 01800816

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1 Introduction

HGC Engineering was retained by 50 Shade Street Investments Inc. to conduct a noise feasibility study for a mixed-use development to be located at 55 Kerr Street in the City of Cambridge, Ontario. The proposed development is to include one 24-storey residential building and one 30-storey mixed-use building with one shared level of underground parking. This study has been prepared as part of the approvals process as required by the Regional Municipality of Waterloo (RMOW).

The primary noise sources impacting the site are road traffic on Beverly Street, Shade Street and Kerr Street with lesser contributions from Main Street. Projected road traffic volume data was obtained from the RMOW. The data was used to estimate future sound levels (L_{EQ}) at the façades of the proposed mixed-use/residential buildings. The estimated sound levels were compared to the guidelines of the Ministry of the Environment, Conservation and Parks (MECP) and the RMOW.

The results of this study indicate that with suitable noise control measures integrated into the design of the buildings, it is feasible to achieve the indoor MECP guideline sound levels from road traffic sources. The recommended noise control measures include appropriate wall and window glazing assemblies, and an alternative means of ventilation to open windows. Warning clauses will need to be included in the property, tenancy and rental agreements to warn occupants of potentially audible transportation noise levels and of the nearby commercial/institutional uses.

An analysis was also conducted to determine the potential impact of noise from rooftop units at the adjacent commercial/institutional building to the southwest of the subject site on the proposed buildings in addition to the impact of rooftop mechanical equipment at the proposed buildings on existing residences. The analysis was based on a review of the latest site plan prepared by Jonathan Weizel Architect, dated June 6, 2019, aerial photos and a site visit. Reasonable estimates of the size and tonnage of the existing and proposed rooftop mechanical units have been used based on experience with similar projects. Manufacturer's sound power data was used in the analysis to estimate sound levels associated with the existing commercial

building on the proposed dwelling units and sound levels associated with the proposed buildings on existing dwelling units.

A 3D computer model of the area was created, using acoustic modelling software, in order to predict the sound levels at the locations of the proposed buildings and the existing dwelling units. The results indicate that the sound emissions from the existing commercial/institutional building on proposed residential receptors as well as the sound emissions from the proposed building on existing residential receptors will be below the MECP minimum exclusionary sound level limits. Further, physical mitigation measures are not required for the stationary noise sources associated with the existing and proposed buildings.

2 Site Description & Noise Sources

The site is situated on the west side of Shade Street, south of Kerr Street, specifically at 55 Kerr Street, in the City of Cambridge, Ontario. Figure 1 shows a key plan of the subject site. A site plan prepared by Jonathan Weizel Architect, dated June 6, 2019, is shown in Figure 2. Figure 2 also indicates the sound level prediction locations. The proposed development will consist of one 30-storey building and one 24-storey building each with podiums of 8-storeys, 6-storeys and 4-storey and one shared level of underground parking.

HGC Engineering visited the site in January 2019 to investigate the site and the surrounding land uses. The acoustical environment surrounding the site is urban. The subject site is currently vacant. The surrounding lands consist mainly of residential and commercial/institutional uses. The site visit concluded that the significant noise source impacting the study area are road traffic noise on Shade Street, Kerr Street and Beverly Street with lesser contributions from Main Street. There is an existing BB gas station to the north with garage repair uses facing east and Werner's Auto Sales & Services to the further east, but there are residential uses closer to these uses than the subject site. Sounds from the commercial uses in the area were not discernible over road traffic during the site visit, nevertheless, a noise warning clause is recommended to inform the future occupants of the development of the proximity to existing and future commercial uses and that sounds may be audible, as included in Section 5.4.

The sources of sound of greatest potential impact on the proposed buildings are the rooftop units at the existing commercial/institution building located to the southwest of the proposed development. The specific models of the mechanical equipment are not known. Reasonable estimates were used in the analysis along with manufacturer's sound level data contained in HGC Engineering project files. Figure 3 shows the location of the existing rooftop mechanical units, as used in the calculations.

3 Noise Level Criteria

3.1 Road Traffic

Guidelines for acceptable levels of road traffic noise impacting residential developments are given in the MECP publication NPC-300, "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", release date October 21, 2013, and are listed in Table I below. The values in Table I are energy equivalent (average) sound levels [L_{EQ}] in units of A-weighted decibels [dBA].

Table I: MECP Road Traffic Noise Criteria (dBA)

Area	Daytime L_{EQ} (16 hour) Road	Nighttime L_{EQ}(8 hour) Road
Outdoor Living Area	55 dBA	--
Inside Living/Dining Room	45 dBA	45 dBA
Inside Bedroom	45 dBA	40 dBA

Daytime refers to the period between 07:00 and 23:00. Nighttime refers to the time period between 23:00 and 07:00. The term "outdoor living area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace, or other area where passive recreation is expected to occur.

The MECP and Regional Municipality of Waterloo (RMOW) guidelines allow the daytime sound levels in an Outdoor Living Area to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and rental agreements to the property. Where OLA sound levels exceed 60 dBA, physical mitigation is recommended to reduce the OLA sound level to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible. Note that not all OLA's necessarily require protection, if there are other protected

outdoor areas accessible to the residents.

MECP and RMOW guidelines require central air conditioning or other ventilation system to be installed prior to occupancy as an alternative means of ventilation to open windows for dwellings where nighttime sound levels outside bedroom or living/dining room windows exceed 60 dBA or daytime sound levels outside bedroom or living/dining room windows exceed 65 dBA. Provision for air conditioning is required when nighttime sound levels at bedroom or living/dining room windows are in the range of 51 to 60 dBA or daytime sound levels at bedroom or living/dining rooms are in the range of 56 dBA to 65 dBA. Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of window nighttime sound level is greater than 60 dBA or the daytime sound level is greater than 65 dBA due to road traffic noise.

Warning clauses to notify future residents of possible excesses are also required when nighttime sound levels exceed 50 dBA at the plane of the bedroom or living/dining room window and daytime sound levels exceed 55 dBA in the outdoor living area and at the plane of the bedroom or living/dining room window due to road traffic.

4 Assessment of Road Traffic Noise on the Proposed Building, Methods & Results

4.1 Road Traffic

Projected traffic data for Main Street, Kerr Street, Beverly Street, and Shade Street were obtained from the Regional Municipality of Waterloo. The data is in the form of Average Annual Daily Traffic (AADT) values, and is provided in Appendix A. A forecasted AADT of 7,100 vehicles per day was applied to Main Street, along with commercial vehicle percentages of 1.5% for medium trucks and 2.5% for heavy trucks were used. A forecasted AADT of 3,500 vehicles per day was applied to Kerr Street, along with commercial vehicle percentages of 1.2% for medium trucks and 1.1% for heavy trucks was used. A forecasted AADT of 9,400 vehicles per day was applied to Beverly Street, along with commercial vehicle percentages of 1.2% for medium trucks and 2.1% for heavy trucks were used. A forecasted AADT of 2,400 vehicles per

day was applied to Shade Street, along with commercial vehicle percentages of 2.1% for medium trucks and 1.7% for heavy trucks were used.

Posted speed limits of 50 km/h were used for all the roadways in the analysis in conjunction with a 90/10 day/night volume split. The traffic volumes used in the analysis are provided in Table II.

Table II: Forecasted Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Main Street	Daytime	6 134	96	160	6 390
	Nighttime	682	11	18	710
	Total	**6 816**	**107**	**178**	**7 100**
Kerr Street	Daytime	3 078	38	35	3 150
	Nighttime	342	4	4	350
	Total	**3 420**	**42**	**39**	**3 500**
Beverly Street	Daytime	8 181	102	178	8 460
	Nighttime	909	11	20	940
	Total	**9 090**	**113**	**197**	**9 400**
Shade Street	Daytime	2 078	45	37	2 160
	Nighttime	231	5	4	240
	Total	**2 309**	**50**	**41**	**2 400**

4.2 Road Traffic Noise Predictions

To assess the levels of road traffic noise which will impact the subject site in the future, sound level predictions were made using STAMSON version 5.04, a computer algorithm developed by the MECP. Sample STAMSON output is included in Appendix B.

Predictions of the traffic sound levels were made at various façades with exposure to the road traffic noise sources, as shown in Figure 2. The results of these predictions are summarized in Table III. The acoustic recommendations will be subject to modifications if the building envelopes or heights are changed significantly. The worst case prediction locations were chosen at the top floors of the proposed buildings, to investigate ventilation and building façade construction requirements and in the outdoor amenity areas to investigate acoustic barrier requirements.

Table III: Predicted Future Sound Levels, [dBA]

Prediction Location	Building	Description	Daytime – at Façade/OLA $L_{EQ(16)}$	Nighttime – at Façade $L_{EQ(8)}$
A	A	West Façade	58	51
B		North Façade	59	53
C		East Façade	59	53
D		South Façade	57	51
E	B	West Façade	56	50
F		North Façade	55	<50
G		East Façade	58	52
H		South Façade	57	50
I	A	G/F Amenity Space	<55	--
J	B	Rooftop Garden	<55	--
K	B	G/F Amenity Space	<55	--

5 Discussion & Recommendations

The following discussion outlines preliminary recommendations for building façade constructions, ventilation requirements, and noise warning clauses to achieve the noise criteria stated in Table I.

5.1 Outdoor Living Areas

An outdoor amenity area is indicated on the site plan south of Building A at ground level (Prediction Location [I]). Building B also has outdoor amenity areas indicated on the 4th floor (Prediction Location [J]) and on the south side of the ground floor (Prediction Location [K]). The predicted sound level in these areas will be less than 55 dBA.

The dwelling units within the proposed development may have balconies and patios that are less than 4 m in depth. These areas are not considered to be outdoor amenity areas under MECP guidelines, and are therefore exempt from traffic noise assessment.

5.2 Indoor Living Areas & Ventilation Requirements

Provision for the Future Installation of Air Conditioning

The predicted sound levels at the façades of both towers will be between 56 and 65 dBA during the daytime and between 51 and 60 dBA during the nighttime. The proposed buildings will require an alternative means of ventilation to open windows. The use of central air conditioning will exceed this requirement. The guidelines also recommend warning clauses for these dwelling units.

In general, window or through-the-wall air conditioning units are not recommended because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall sound insulating properties of the envelope. Acceptable units are those that are housed in their own closet with an access door for maintenance. Any outdoor air conditioning unit or rooftop mechanical unit should be located, installed, and selected with an appropriate sound emission rating to comply with MECP guidelines NPC-300.

5.3 Building Façade Constructions

Since future road traffic sound levels at the plane of window for the façades of the proposed buildings will be less than 65 dBA during the daytime and 60 dBA during the nighttime, any exterior wall, and double glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for all dwelling units in this development.

5.4 Warning Clauses

MECP guidelines recommend that appropriate warning clauses be used in the Development Agreements and in purchase, sale and lease agreements (typically by reference to the Development Agreements), to inform future owners and occupants about noise concerns from transportation sources in the area. The following clauses are recommended:

(a) Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may on occasion interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City and the Ministry of the Environment, Conservation and Parks.

(b) This dwelling unit has been fitted with a forced air heating system and the ducting etc., was sized to accommodate central air conditioning. Installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Municipality's and the Ministry of the Environment, Conservation and Parks' noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to minimize the noise impacts and comply with criteria of MECP publication NPC-300.)

(c) Purchasers/tenants are advised of the proximity of nearby commercial, institutional, retail and office facilities, the sound from which may at times be audible.

These sample clauses are provided by the MECP as examples and can be modified by the Municipality as required.

6 Stationary Noise Sources

6.1 Criteria for Stationary Sources of Sound

Stationary sources of noise are defined as all sources that emit noise within a commercial or industrial facility boundary. The existing rooftop mechanical equipment on the roof of the adjacent commercial building located to the southwest of the subject site can be classified as stationary sources of sound. It is understood that the proposed building will be serviced by roof mounted make up air units which are also classified as stationary sources of sound.

The Ministry of the Environment, Conservation and Parks (MECP) provides guidelines for the assessment of stationary noise sources. NPC-300 "Environment Noise Guideline Stationary and Transportation sources – Approval and Planning" referenced with regard to traffic noise is also intended for use in the planning of noise sensitive land uses adjacent to residential buildings.

The criteria is based on the background sound level at sensitive points of reception (which are typically residences) in the quietest hour that the source can be in operation. Background sound includes sound from road traffic and natural sounds, but excludes the sources under assessment. For relatively quiet areas where background sound may fall to low levels during some hours, NPC-300 stipulates various minimum limits. In class 1 areas, these limits are 50 dBA for daytime periods (07:00 to 23:00) and 45 dBA at night (23:00 to 07:00).

Sources sound levels for typical rooftop mechanical units and assumed operational information (outlined below) were used as input to a predictive computer model (*Cadna-A version 2019*

(32 bit) : build 167.4905), in order to estimate the sound levels from the existing commercial/institutional building at the proposed development. The computer model is based on the methods from ISO Standard 9613-2.2, "Acoustic – Attenuation of Sound During Propagation Outdoors", which accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures. Assumptions regarding the operating duty cycles of the equipment (100% during the daytime, and 50% during the night-time) were included based on our experience with other projects.

6.2 Assessment of Existing Stationary Noise Sources and their Impact on Proposed Sensitive Receptors

Sound power levels from the existing rooftop mechanical equipment were estimated based on manufacturer's data for mechanical equipment used in similar past projects with locations shown in Figure 3. Rooftop units on the existing commercial/institutional building with sound power ratings of 72 dBA were assumed in the analysis. The results of this assessment indicate a maximum impact of 30 dBA during the daytime and 27 dBA during nighttime at the closest sensitive receptors as shown in Figures 4 and 5. These predicted sound levels are less than the MECP minimum exclusionary limit of 50 dBA during the daytime hours and 45 dBA during the nighttime hours, based on a typical worst-case operating scenario.

It is concluded that sounds from the existing rooftop mechanical equipment associated with the adjacent commercial/institutional building are anticipated to comply with the MECP guidelines at the proposed buildings and physical mitigation is not required.

6.3 Assessment of Proposed Stationary Noise Sources and their Impact on Adjacent Sensitive Receptors

Sound power levels from the proposed rooftop mechanical equipment were estimated based on manufacturer's data for mechanical equipment used in similar past projects. Two make-up air units each were assumed at Buildings A and B. Roof mounted make-up air units at the proposed buildings with sound power ratings of 86 dBA were assumed in the analysis with locations shown in Figure 6. The results of this assessment indicate a maximum impact less than 30 dBA during the daytime and less than 25 dBA during nighttime. These predicted sound levels are less

than the MECP minimum exclusionary limit of 50 dBA during the daytime hours and 45 dBA during the nighttime hours, based on a typical worst-case operating scenario.

It is concluded that sounds from the proposed rooftop mechanical equipment associated with the proposed building are anticipated to comply with the MECP guidelines at the existing sensitive receptors and physical mitigation is not required.

6.4 Impact of the Development on Itself

Section 5.9.1 of the Ontario Building Code (OBC) specifies the minimum required sound insulation characteristics for demising partitions, in terms of Sound Transmission Class (STC) values. In order to maintain adequate acoustical privacy between separate suites in a multi-tenant building, inter-suite walls should meet or exceed STC-50. Walls separating a suite from a noisy space such as a refuse chute, or elevator shaft, should meet or exceed STC-55. In addition, it is recommended that the floor/ceiling constructions separating suites from any amenity or commercial spaces also meet or exceed STC-55. Tables 1 and 2 in Section SB-3 of the Supplementary Guideline to the OBC provide a comprehensive list of constructions that will meet the above requirements.

Tarion's Builder Bulletin B19R requires the internal design of condominium projects to integrate suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of the buildings on its residents. If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself is maintained within acceptable levels.

7 Summary of Recommendations

Sound levels due to road traffic will exceed MECP guidelines at the proposed mixed-use buildings. The following recommendations are provided with regard to noise mitigation.

For transportation noise sources

1. An alternative means of ventilation to open windows should be implemented with a warning clause for the proposed mixed-use/residential buildings. The use of central air conditioning will exceed this requirement.

2. Warning clauses should be used to inform future owners of the road traffic noise issues and the presence of nearby commercial/institutional facilities.

Table IV: Summary of Noise Control Requirements and Noise Warning Clauses

Prediction Location	Building	Description	Ventilation Requirements*	Warning Clause	Upgraded Building Constructions +
A	A	North Façade	Forced Air	A, B, C	OBC
B		East Façade			
C		South Façade			
D		West Façade			
E	B	North Façade			
F		East Façade			
G		South Façade			
H		West Façade			

Notes:
-- no specific requirement
* The location, installation and sound rating of the air conditioning condensers must be compliant with MECP Guideline NPC-300, as applicable.
OBC – Ontario Building Code

For stationary noise sources

1. The predicted sound levels from proposed and existing rooftop mechanical equipment will be well below the MECP minimum exclusionary limit. Physical mitigation will not be required for the proposed and existing rooftop mechanical equipment.

2. Tarion Builder's Bulletin B19R requires that the internal design of condominium projects integrates suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of the buildings on its residents. If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself are maintained within acceptable

levels. Outdoor sound emissions should also be checked to ensure compliance with the City of Waterloo noise by-law.

8 Implementation

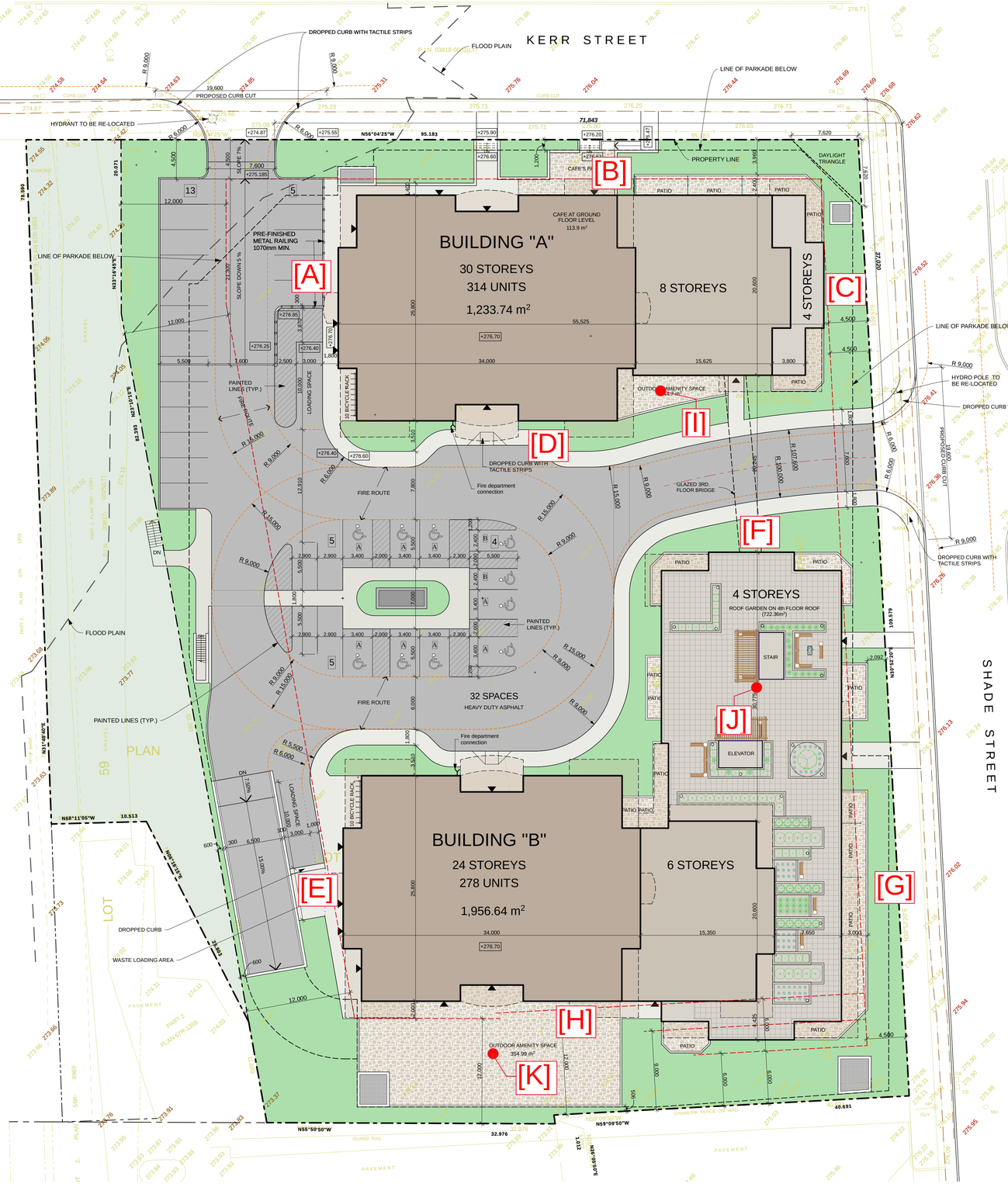
To ensure that the noise control recommendations outlined above are properly included in the building design and properly implemented in the final construction, it is recommended that:

1) Prior to the issuance of occupancy permits for this development, the Municipality's building inspector or a Professional Engineer qualified to provide acoustical engineering services in the Province of Ontario to certify that the noise control measures for the buildings have been properly incorporated, installed and constructed.

2) When detailed rooftop equipment models and locations are known for the proposed buildings, a detailed noise study should be conducted by a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario to confirm that sound emitted by the building mechanical systems will not exceed the MECP limits at neighbouring residences and provide any additional recommendations which may be required in that regard.

3) The mechanical roof top units should be similar to those assumed in the current analysis. If alternate rooftop units are chosen or the location of the mechanical units are modified, an acoustical engineer should verify that the source sound level does not exceed current analysis, and the locations for the HVAC units conform to the assumptions made in this report, and that acceptable sound levels will result at all offsite residential receptors.

Figure 1: Key Plan



1 Site plan
SCALE: 1:250

Figure 2: Proposed Site Plan

Preliminary Site Statistics

Site area	10,099.4m2
Building "A" Ground Floor Area	1,233.74.04m2
Building "B" Ground Floor Area	1,956.64m2
Building's Total Ground Floor Area	3,190.38m2
Building's Coverage	31.59%
Asphalt Area	2,478.54m2
Landscape Area	4,430.48m2
Landscape Coverage	43.87%
Parking Spaces required	592 Spaces
Parking Spaces provided	
On grade	32 Spaces
P-1 Level	203 Spaces
P-2 Level	203 Spaces
P-3 Level	206 Spaces
Total	644 Spaces

Building "A"	314 UNITS
Building "B"	278 UNITS
Building's Total	592 UNITS
Bicycle Parking Recommended as per City of Kitchener Draft Zoning By-law April 2018	296 SPACE
Bicycle Parking Provided	+/-284 SPACE

	Condo "A"	Condo "B"	Project Total
Residential Area	26,794.12 m²	24,195.08 m²	50,989.20 m²
Retail Area	113.90 m²	0.00 m²	113.90 m²
Total Area	**26,908.02 m²**	**24,195.08 m²**	**51,103.10 m²**
Studio	12 Units	8 Units	20 Units
1 Bedroom	76 Units	47 Units	123 Units
1 Bedroom + Den	93 Units	95 Units	188 Units
2 Bedroom	17 Units	20 Units	37 Units
2 Bedroom + Den	116 Units	108 Units	224 Units
Total Condo Units	**314 Units**	**278 Units**	**592 Units**
Residential Units' Area	**22,112.17 m²**	**20,329.08 m²**	**42,441.25 m²**

KERR STREET

SHADE STREET

INFORMATION ON THIS DRAWING WAS TAKEN FROM SURVEY
PART OF LOTS 1 AND 2, WEST OF SHADE STREET AND SOUTH OF KERR STREET
LOT 3 AND PART OF LOTS 1, 2 AND 4, NORTH OF KERR STREET AND WEST OF SHADE STREET
LOTS 2, 3 AND BLOCK A AND PART OF LOT 4, WEST OF SHADE STREET AND SOUTH OF KERR STREET
PLAN 615 AND LOT 60 AND PART OF LOT 59, PLAN D-7
CITY OF CAMBRIDGE, REGIONAL MUNICIPALITY OF WATERLOO
BY MacDONALD TAMBLYN LORD SURVEYING
DATED : May 07, 2018

Preliminary

No.	Reference	Date
9	More Info Added and Issued	June 06, 2019
9	Units' Area & type and Building-A (26th to 29th) & Building-B (20th to 23) plans added	June 03, 2019
8	Parking Revised & more stats Added	May 28, 2019
7	Issued For Client Review	May 13, 2019
6	Loading spaces area revised	May 01, 2019
5	3D Views added	April 15, 2019
4	Re-issued to consultants	Mar. 21, 2019
3	Issued to consultants	Feb. 08, 2019
2	Project Name updated and Issued	Jan. 24, 2018
1	Issued For Client Review	Nov. 15, 2017

Revisions

THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ARCHITECT
DO NOT SCALE THE DRAWINGS
THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION PURPOSES UNTIL SIGNED BY THE ARCHITECT

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Project

SK SOUTH Option 3

Residential Development

55 Kerr Street Cambridge ON

Drawing Title

Site Plan

Scale	Date
	Nov. 2017
Project Number	**Drawing Number**
217/14	A-01

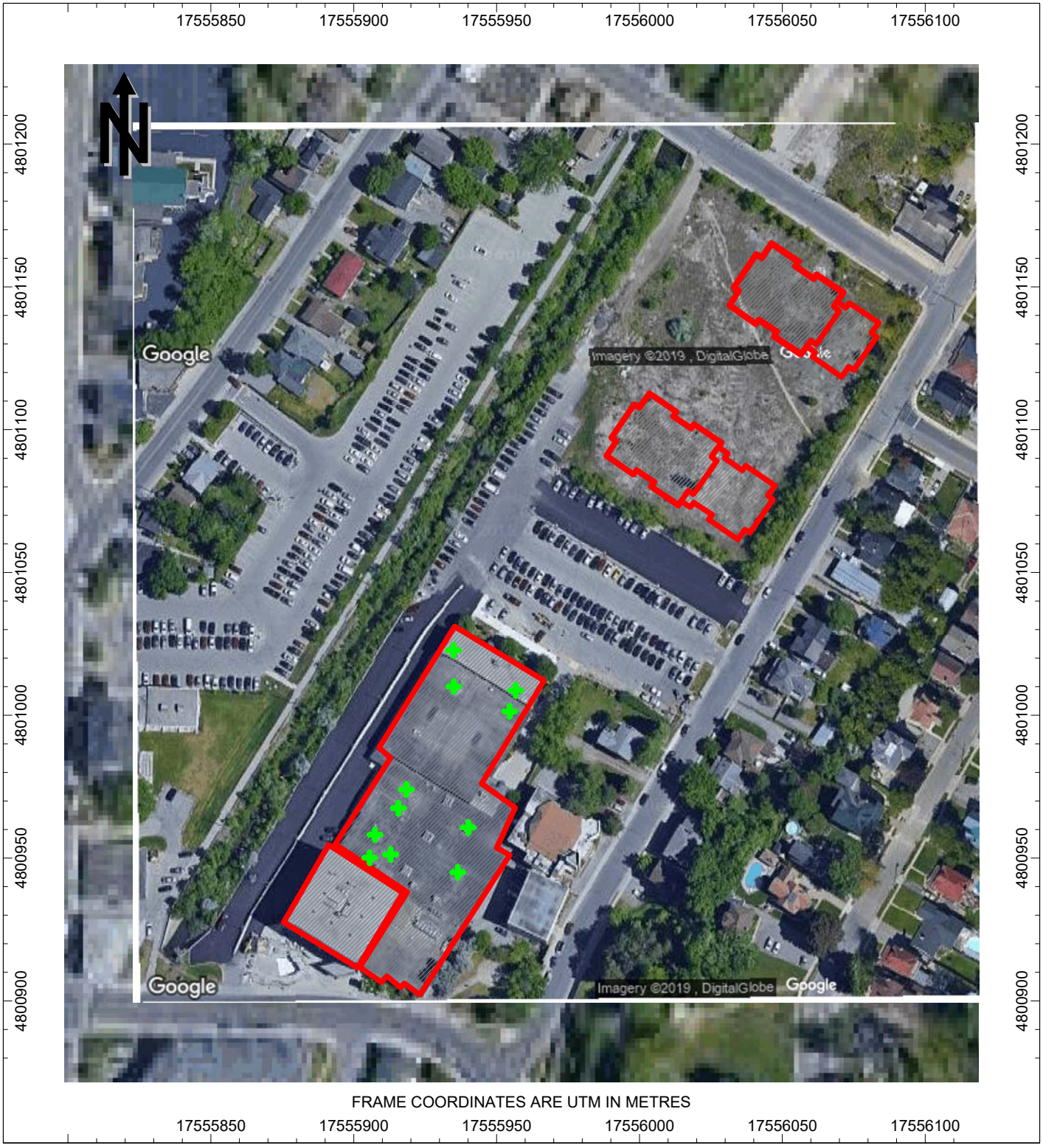

Figure 3 - Noise Source Locations

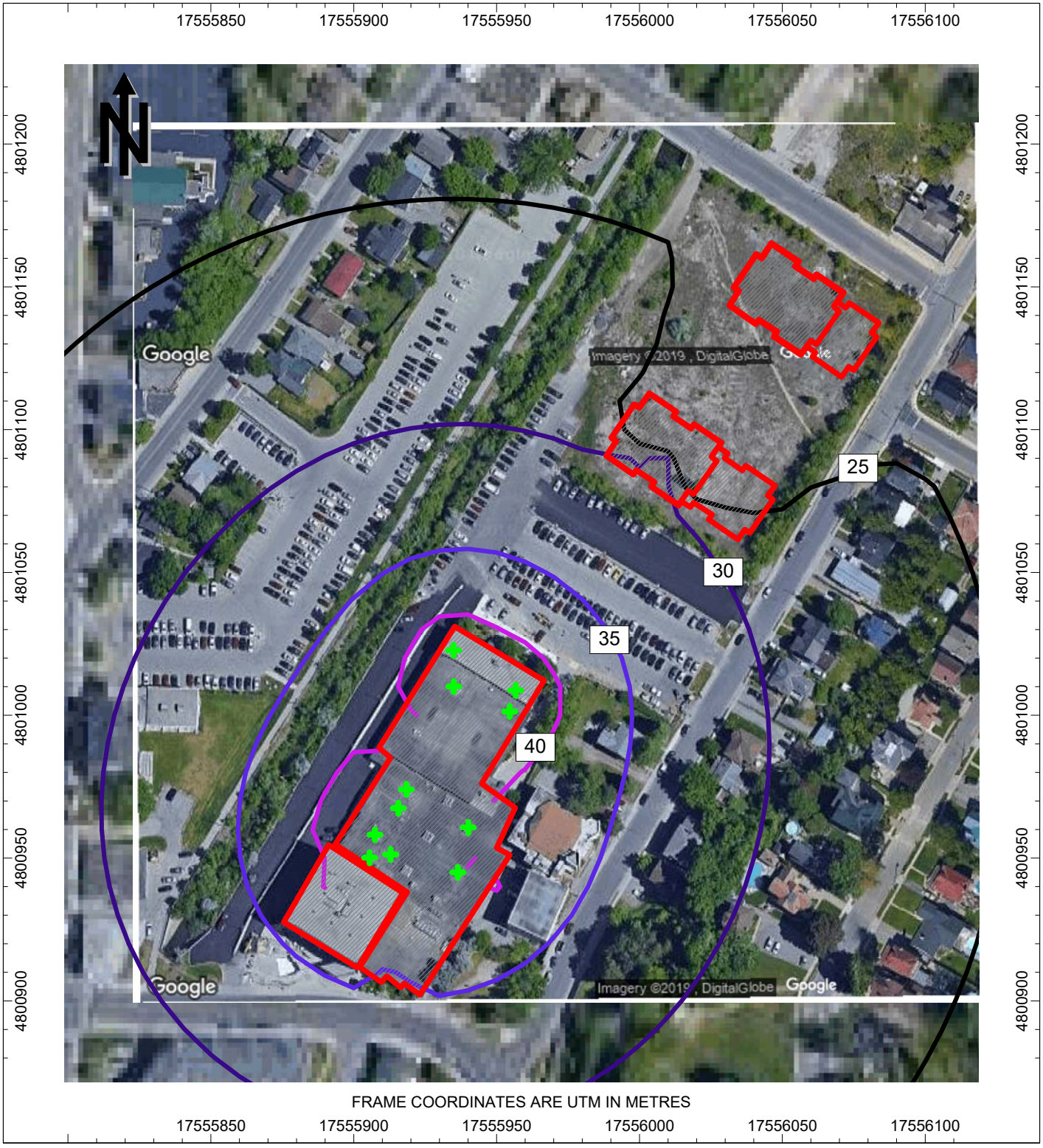

Figure 4 – Predicted Daytime Sound Levels, dBA (Without Mitigation)

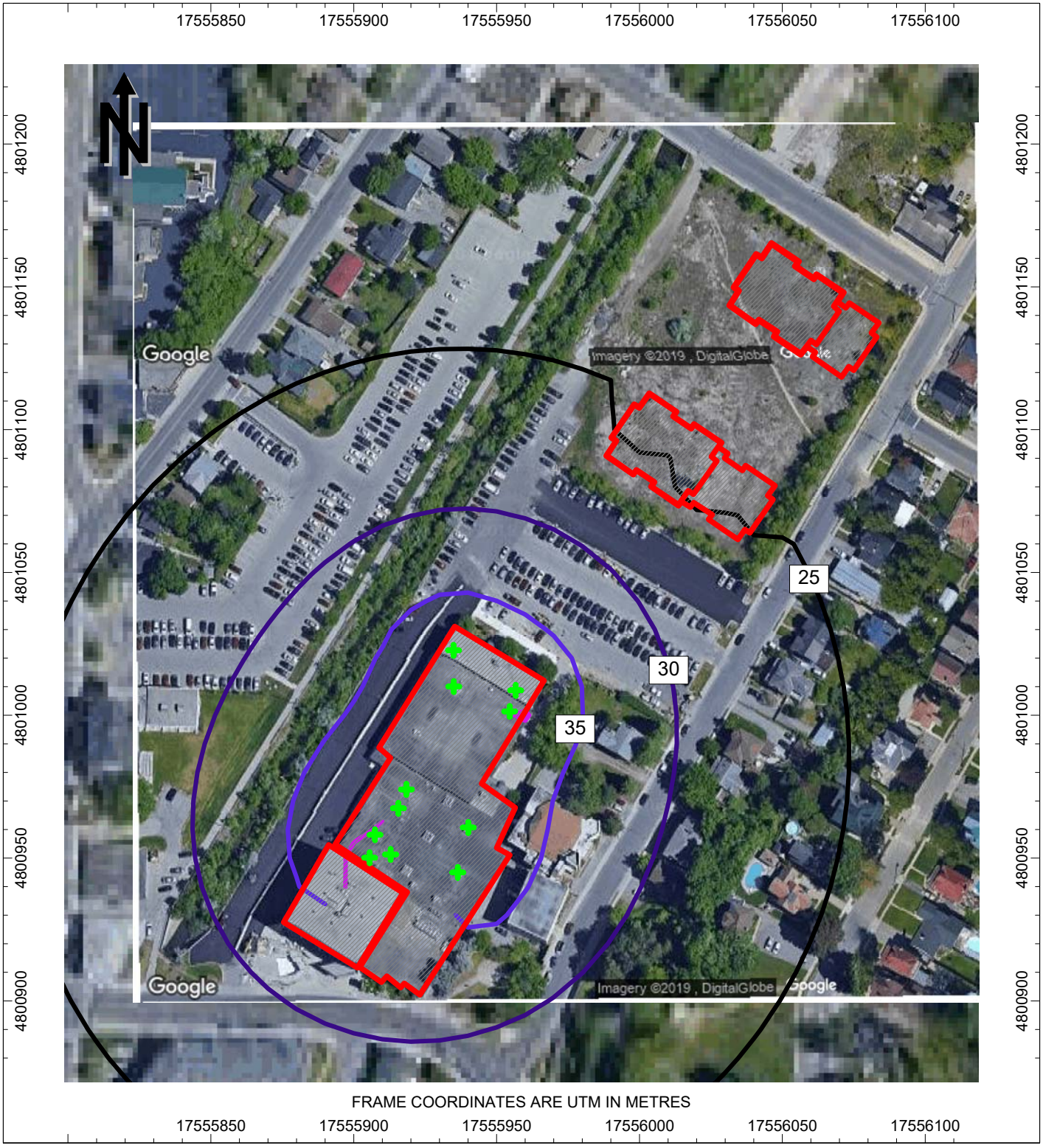

Figure 5 – Predicted Nighttime Sound Levels, dBA (Without Mitigation)

Figure 6 - Proposed Noise Source Locations

APPENDIX A

Road Traffic Information

Region of Waterloo AADT Forecast for Noise Studies

1. Development/Location	Main Street (Wellington Street - Shade Street)
2. Current AADT (2018)	6,400
3. Forecast AADT (2028)	7,100
4. Commercial Vehicle Rates	% Medium Trucks 1.5% % Heavy Trucks 2.5%
5. Posted Speed Limit	50 km/h
6. Day/Night Splits	Regional Standard 90/10 Day/Night Split
7. Expiry	December 31st, 2020
8. Notes	This forecast is intended for the purpose of carrying out a noise study only. The above AADTs represent the traffic volumes on Main Street, between Wellington Street and Shade Street, in Cambridge, ON. The City of Cambridge should be contacted to confirm the validity of this forecast, considering that Main Street Street falls within the City's jurisdiction. This forecast remains valid up to the date indicated above. The Region of Waterloo should be contacted for an updated forecast if there are plans to use this forecast beyond the above validity period.

Region of Waterloo AADT Forecast for Noise Studies

1. Development/Location	Kerr Street (Beverly Street - Shade Street)
2. Current AADT (2018)	3,100
3. Forecast AADT (2028)	3,500
4. Commercial Vehicle Rates	% Medium Trucks 1.2% % Heavy Trucks 1.1%
5. Posted Speed Limit	50 km/h
6. Day/Night Splits	Regional Standard 90/10 Day/Night Split
7. Expiry	December 31st, 2019
8. Notes	This forecast is intended for the purpose of carrying out a noise study only. The above AADTs represent the traffic volumes on Kerr Street, between Beverly Street and Shade Street, in Cambridge, ON. The City of Cambridge should be contacted to confirm the validity of this forecast, considering that Kerr Street falls within the City's jurisdiction. This forecast remains valid up to the date indicated above. The Region of Waterloo should be contacted for an updated forecast if there are plans to use this forecast beyond the above validity period.

Region of Waterloo AADT Forecast for Noise Studies

1. Development/Location	Beverly Street (Kerr Street - Dundas Street N)
2. Current AADT (2018)	8,500
3. Forecast AADT (2028)	9,400
4. Commercial Vehicle Rates	% Medium Trucks 1.2% % Heavy Trucks 2.1%
5. Posted Speed Limit	50 km/h
6. Day/Night Splits	Regional Standard 90/10 Day/Night Split
7. Expiry	December 31st, 2019
8. Notes	This forecast is intended for the purpose of carrying out a noise study only. The above AADTs represent the traffic volumes on Beverly Street, between Kerr Street and Dundas Street N, in Cambridge, ON. The City of Cambridge should be contacted to confirm the validity of this forecast, considering that Beverly Street falls within the City's jurisdiction. This forecast remains valid up to the date indicated above. The Region of Waterloo should be contacted for an updated forecast if there are plans to use this forecast beyond the above validity period.

Region of Waterloo AADT Forecast for Noise Studies

1. Development/Location	Shade Street (Kerr Street - Main Street)
2. Current AADT (2018)	2,100
3. Forecast AADT (2028)	2,400
4. Commercial Vehicle Rates	% Medium Trucks 2.1% % Heavy Trucks 1.7%
5. Posted Speed Limit	50 km/h
6. Day/Night Splits	Regional Standard 90/10 Day/Night Split
7. Expiry	December 31st, 2019
8. Notes	This forecast is intended for the purpose of carrying out a noise study only. The above AADTs represent the traffic volumes on Shade Street, between Kerr Street and Main Street, in Cambridge, ON. The City of Cambridge should be contacted to confirm the validity of this forecast, considering that Shade Street falls within the City's jurisdiction. This forecast remains valid up to the date indicated above. The Region of Waterloo should be contacted for an updated forecast if there are plans to use this forecast beyond the above validity period.

APPENDIX B

Sample STAMSON 5.04 Output

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STAMSON 5.0        NORMAL REPORT        Date: 13-06-2019 09:24:38
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: a.te                 Time Period: Day/Night 16/8 hours
Description: Predicted future daytime and nighttime sound levels at the
west façade of Building A, Prediction Location [A].

Road data, segment # 1: Main (day/night)
----------------------------------------
Car traffic volume  :  6134/682   veh/TimePeriod  *
Medium truck volume :    96/11    veh/TimePeriod  *
Heavy truck volume  :   160/18    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):   7100
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   1.50
    Heavy Truck  % of Total Volume     :   2.50
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Main (day/night)
--------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 230.00 / 230.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  87.00 m
Reference angle           :   0.00

Road data, segment # 2: Kerr (day/night)
----------------------------------------
Car traffic volume  :  3078/342   veh/TimePeriod  *
Medium truck volume :    38/4     veh/TimePeriod  *
Heavy truck volume  :    35/4     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):   3500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   1.20
    Heavy Truck  % of Total Volume     :   1.10
    Day (16 hrs) % of Total Volume     :  90.00
```

```
Data for Segment # 2: Kerr (day/night)
--------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  19.00 / 19.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  87.00 m
Reference angle           :   0.00

Road data, segment # 3: Beverly (day/night)
-------------------------------------------
Car traffic volume  :  8181/909   veh/TimePeriod  *
Medium truck volume :   102/11    veh/TimePeriod  *
Heavy truck volume  :   178/20    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):   9400
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   1.20
    Heavy Truck  % of Total Volume     :   2.10
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 3: Beverly (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 100.00 / 100.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :  87.00 m
Reference angle           :   0.00

Results segment # 1: Main (day)
-------------------------------

Source height = 1.26 m

ROAD (0.00 + 47.64 + 0.00) = 47.64 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
```

```
   -90      0   0.00  62.50   0.00 -11.86  -3.01   0.00   0.00   0.00
47.64
-------------------------------------------------------------------------
---

Segment Leq : 47.64 dBA

Results segment # 2: Kerr (day)
-------------------------------

Source height = 1.03 m

ROAD (0.00 + 53.68 + 0.00) = 53.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
     0     90   0.00  57.71   0.00  -1.03  -3.01   0.00   0.00   0.00
53.68
-------------------------------------------------------------------------
---

Segment Leq : 53.68 dBA


Results segment # 3: Beverly (day)
----------------------------------

Source height = 1.20 m

ROAD (0.00 + 55.01 + 0.00) = 55.01 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  63.24   0.00  -8.24   0.00   0.00   0.00   0.00
55.01
-------------------------------------------------------------------------
---

Segment Leq : 55.01 dBA

Total Leq All Segments: 57.84 dBA
Results segment # 1: Main (night)
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Source height = 1.26 m

ROAD (0.00 + 41.15 + 0.00) = 41.15 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
```

```
   -90      0   0.00  56.02   0.00 -11.86  -3.01   0.00   0.00   0.00
41.15
-------------------------------------------------------------------------
---

Segment Leq : 41.15 dBA

Results segment # 2: Kerr (night)
---------------------------------

Source height = 1.03 m

ROAD (0.00 + 47.17 + 0.00) = 47.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
     0     90   0.00  51.21   0.00  -1.03  -3.01   0.00   0.00   0.00
47.17
-------------------------------------------------------------------------
---

Segment Leq : 47.17 dBA

Results segment # 3: Beverly (night)
------------------------------------

Source height = 1.21 m

ROAD (0.00 + 48.49 + 0.00) = 48.49 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  56.73   0.00  -8.24   0.00   0.00   0.00   0.00
48.49
-------------------------------------------------------------------------
---

Segment Leq : 48.49 dBA

Total Leq All Segments: 51.33 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.84
                           (NIGHT): 51.33
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APPENDIX C

Consultant Statutory Declaration

CONSULTANT STATUTORY DECLARATION

CANADA	)	In the Matter of the
	)	Environmental Protection
PROVINCE OF ONTARIO	)	Act and the Planning Act
	)	
	)	And in the Matter of an
	)	Application for a Proposed
	)	Mixed-Use Development
	)	55 Kerr Street, Cambridge
	)	Regional of Waterloo

I, Sheeba Paul, of the City of Brampton, in the Regional of Peel, SOLEMNLY DECLARE THAT:

1. I am a Professional Engineer employed by HGC Engineering 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 a Proposed Mixed-Use Development at 55 Kerr Street, Cambridge, Region of Waterloo.

3. I had 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 study entitled Noise Feasibility Study, Proposed Mixed-Use Development at 55 Kerr Street, Cambridge, Ontario is the best available information as of the date of the study.

5. The sound level calculations, the interpretation of noise attenuation requirements, and the recommended measures are in accordance with Ministry of the Environment, Conservation and Parks' Guidelines, Region of Waterloo policies, any applicable policy of guidelines or 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 at the City of Mississauga, in the Region of Peel

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)
)

Sheeba Paul

this 19 day of June 2019

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