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Noise Feasibility Study
Proposed Residential Development
309 – 311 Hawthorn Street
Waterloo, Ontario

Prepared for:

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VERSION CONTROL

Noise Feasibility Study,

309 – 311 Hawthorn Street,

Waterloo, Ontario.

Ver.	Date	Version Description / Changelog	Prepared By
0	August 19, 2024	Noise Feasibility Study prepared as part of the planning and approvals process.	Y.Lo/S.Paul
1	February 5, 2025	Noise Feasibility Study updated to reflect peer review comments.	Y.Lo/S.Paul

Limitations

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1 Introduction and Summary

HGC Engineering was retained by Qing Yuan Investments Ltd. to conduct a noise feasibility study for a residential development to be located north of Hickory Street, on the west side of Hawthorn Street, in Waterloo, Ontario. The site is proposed to include one 6-storey residential building with one basement level. This study is required by the Regional Municipality of Waterloo (RMOW) as part of the planning and approvals process.

This report is being updated to reflect peer review comments prepared by RWDI dated January 17, 2025, included in Appendix D.

The primary sources of transportation noise are road traffic on Hickory Street, Columbia Street, Hazel Street, and King Street. Forecasted traffic data obtained from the RMOW and City of Waterloo personnel was used to predict future sound levels at the residential facades and outdoor amenity area. The predicted sound levels were compared to the guidelines of the Ministry of the Environment, Conservation and Parks (MECP) and the Region.

The sound level predictions indicate that future road traffic sound levels will exceed MECP guidelines at the façades of the proposed building. There are no specific acoustic recommendations for the development and noise warning clauses will not be required. Any building construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for the proposed building.

An analysis was also conducted to determine the potential noise impact of the stationary noise sources associated with the proposed building on existing sensitive uses as well as the impact of existing noise sources on the proposed building and the impact of the building on itself. The analysis is based on a review of the latest site plan, site visits and experience with similar past projects in the absence of mechanical information at this time.

A computer model of the building was created using acoustic modelling software in order to predict the sound levels from proposed rooftop mechanical equipment at the closest façades of the existing and proposed sensitive uses. The results indicate that sound emissions from the assumed rooftop noise sources and existing noise sources are expected to be within MECP limits at the existing and proposed sensitive uses and physical mitigation measures are not required. The impact of the

development on itself is also within the noise guidelines as long as the mechanical equipment including louvres are located on the other side of the proposed rooftop amenity area. When further details of the roof plans and mechanical equipment selections are available, an acoustical engineer should verify that the source sound level specifications and 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 and at the proposed rooftop OLA.

2 Site Description and Sources of Sound

A key plan showing the location of the proposed residential development is attached as Figure 1. The subject site is located north of Hickory Street, on the west side of Hawthorn Street, in Waterloo, Ontario. A site plan dated November 5, 2024, prepared by Z Square Consulting Inc. is included as Figure 2. The development will consist of a 6-storey residential building with one basement level.

A site visit was conducted by HGC Engineering personnel in June 2024 to make observations of the acoustic environment and to identify the significant noise sources in the vicinity. The primary source of transportation noise is road traffic on Hickory Street, Columbia Street, Hazel Street, and King Street. The subject site is currently occupied by two existing dwelling units which will be demolished to make way for the proposed development. There are existing residential uses in the surrounding area. There are existing institutional uses to the further northwest and south (Wilfred Laurier University and Waterloo Collegiate Institute). There are no significant sources of stationary noise within 500 m of the subject site.

3 Sound Level Criteria

3.1 Road Traffic Noise Criteria

Guidelines for acceptable levels of road traffic noise impacting residential developments are given in the MECP publication NPC-300 “Environment Noise Guideline Stationery and Transportation sources – Approval and Planning”, release date October 21, 2013, and are listed in Table I below. The Regional Municipality of Waterloo Noise Policy Implementation Guideline was also referenced. The values in Table I are energy equivalent (average) sound levels [L_{EQ}] in units of A-weighted decibels [dBA].

Table I: Road Traffic Noise Criteria (dBA)

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

The MECP and Regional Municipality of Waterloo (RMOW) guidelines allow the sound level in an OLA 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 required 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.

The target sound level in an OLA is 55 dBA. The guidelines in the MECP publication allow the sound level in an OLA to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in property and rental agreements. Where OLA sound levels exceed 60 dBA, physical mitigation is required to reduce the OLA sound level to 55 dBA. Where mitigation is not technically, economically and administratively feasible, a minor excess above 55 dBA is acceptable with the use of a noise warning clause with some justification.

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. If the sound level in the plane of a bedroom or living/dining room window is greater than 55 dBA and less than or equal to 65 dBA, the dwelling should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. 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.

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 noise excesses are also required when nighttime sound levels exceed 50 dBA at the plane of the bedroom or living/dining room window, or 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 Traffic Noise Predictions

4.1 Road Traffic Data

Road traffic data for Hickory Street, King Street and Columbia Street were obtained from the RMOW in the form of forecasted traffic counts and is provided in Appendix A. A speed limit of 50 km/h and a regional day/night split of 90%/10% was applied for all roads. Commercial vehicle percentages for each road were also provided and included in the analysis.

Road traffic data for Hazel Street was obtained from City of Waterloo personnel in the form of peak turning movement counts. The data was projected to the year 2035 (ten years beyond the expected construction completion date) using a conservative estimate of 2.5% growth per year. A speed limit of 40 km/h was used as indicated in the City of Waterloo's Speed Limit Management Plan.

Table II below summarizes the road traffic data used in the analysis. Road traffic information is included in Appendix A.

Table II: Forecasted Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Hickory Street	Daytime	3 793	39	39	3 870
	Nighttime	421	4	4	430
	Total	**4 214**	**43**	**43**	**4 300**
Hazel Street	Daytime	5 025	106	159	5 289
	Nighttime	558	12	18	588
	Total	**5 583**	**118**	**176**	**5 877**
King Street	Daytime	8 094	109	167	8 370
	Nighttime	899	12	19	930
	Total	**8 993**	**121**	**186**	**9 300**
Columbia Street	Daytime	19 555	202	403	20 160
	Nighttime	2 173	22	45	2 240
	Total	**21 728**	**224**	**448**	**22 400**

4.2 Road Traffic Noise Predictions

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

Predictions of the traffic sound levels were made at the top-storey building façades and in the outdoor amenity area. Prediction locations are indicated in Figures 2a and 2b. The results of the predicted sound levels at the proposed building are summarized in Table III.

Table III: Predicted Future Traffic Sound Levels Without Mitigation, [dBA]

Prediction Location	Description	Daytime ($L_{EQ\text{-}16\ hr}$)	Nighttime ($L_{EQ\text{-}8\ hr}$)
A	South Façade	55	49
B	East Façade	54	48
C	North Façade	55	49
D	West Façade	55	49
E	OLA (rooftop)*	50	--

Note: *Assuming a 1.07 m high solid parapet or wall

4.3 Recommendations for Road Traffic Noise

The predictions indicate that the traffic sound levels are expected to be within MECP limits during daytime and nighttime hours at the proposed residential building. The following discussion and recommendations are provided.

4.3.1 Outdoor Living Areas

The proposed residential units 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 no noise mitigation measures are required.

The predicted sound level at the outdoor amenity area on the mechanical penthouse level (Prediction Location [E]) is less than 55 dBA during the daytime. Physical mitigation will not be required for this area.

4.3.2 Indoor Living Areas and Ventilation Requirements

The predicted future sound levels at all the lots are less than 50 dBA and 55 dBA during nighttime and daytime, respectively. This is below the MECP limit and thus there are no specific ventilation requirements for the proposed development.

4.3.3 Building Façade Constructions

Since the future road traffic sound levels outside all the dwelling units within the development will be less than 60 dBA at night and less than 65 dBA during the daytime, any exterior wall, insulated metal exterior door and double glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation.

5 Warning Clauses

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements.

Suitable wording to inform future residents of the adjacent institutional facilities and that sounds from these facilities may at times be audible.

Type E:

> Purchasers/tenants are advised that due to the proximity of the nearby institutional facilities, noise from the facilities 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 Assessment

6.1 Description of Noise Sources

The proposed rooftop mechanical equipment has been identified to have potential noise impact on surrounding sensitive receptors. Existing noise sources may also have potential noise impact on the proposed building. Information regarding rooftop mechanical equipment for the proposed building is not available during this time. Assumptions based on similar past projects have been made to determine the potential noise impact associated with the proposed rooftop mechanical equipment on surrounding sensitive uses.

6.2 Criteria Governing Stationary Noise Sources

An industrial or commercial facility is classified in the MECP guidelines as a stationary source of sound (as compared to sources such as traffic or construction, for example) for noise assessment purposes. The mechanical equipment associated with the proposed and existing buildings are considered stationary sources of sound which may impact surrounding sensitive uses. Note that there are no identified exhaust shafts (there are no underground parking levels) and the emergency transformer is housed in its own room on the ground floor of the proposed building.

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 the

top-storeys of existing and proposed 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. The subject site is located in a Class 1 area. In Class 1 areas, the limits are 50 dBA during the day (07:00 to 23:00) and 45 dBA at night (23:00 to 07:00) at the façades and 50 dBA during the day at the outdoor amenity areas. To ensure a conservative analysis, the exclusionary minimum criteria will be adopted at the proposed residential building.

6.3 Stationary Noise Source Analysis

The potentially significant noise sources associated with the proposed residential building and existing uses nearby include the rooftop mechanical equipment. At this stage in the development, information regarding the proposed mechanical equipment are not currently available. Assumptions regarding the type of units and tonnage of the proposed equipment have been made based on HGC Engineering project files for buildings of similar nature. One make-up air unit and one cooling tower are included as potential noise sources for the proposed building in the analysis. The noise sources associated with the existing buildings include a cooling tower for the residential building to the northeast, and a make-up air unit and HVAC units for the school to the northwest.

The assumed source levels associated with the proposed and existing equipment are listed in Table IV below in terms of sound power level.

Table IV: Source Sound Power Levels [dB re 10-12 W]

HVAC Unit	ID	Octave Band Centre Frequency [Hz]								Overall [dBA]
		63	125	250	500	1k	2k	4k	8k	
Make-up Air Unit	MUA	89	87	85	87	87	83	78	72	91
Cooling Tower	CT	95	92	99	94	90	83	79	75	96
10 Ton HVAC Unit	10T	--	76	79	84	83	79	73	66	88

The above sound levels were used as input to a predictive computer model. The software used for this purpose (*Cadna-A version 2024 MR1 (64 bit), build: 205.5427*) is a computer implementation of ISO Standard 9613-2.2 “Acoustics - Attenuation of Sound During Propagation Outdoors.” The ISO method accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures such as barriers.

The following information and assumptions were used in the analysis.

- The height of the existing mid-rise buildings to the east are assumed to be 18.0 to 30.0 m. The height of the existing single detached dwelling units in the surrounding area are assumed to be between 6.0 m.
- The proposed and existing noise sources and noise sensitive receptors are indicated in Figures 3a and 3b. The rooftop equipment are assumed to be 1.5 m in height. Sound data was assumed based on experience with similar buildings.

We have considered typical worst-case (busiest hour) scenarios for each time period to be as follows:

Assumed daytime worst-case hour scenario:

- All rooftop equipment operating continuously at 100% capacity (60 minutes in an hour);

Assumed nighttime worst-case hour scenario:

- All rooftop equipment operating on a 50% duty cycle (30 minutes in an hour);

Cadna Evaluation Parameters:

- Temperature: 10°C, Relative Humidity: 70%
- Reference Time: Day (07:00 – 23:00) and Night (23:00 – 07:00)
- Maximum Order of Reflections: 1
- Generally flat terrain
- Global Ground Absorption: 0.25

6.4 Predicted Sound Levels at Existing Noise Sensitive Receptors

The sound levels due to the rooftop mechanical equipment at the proposed buildings are summarized in Table V. Resultant sound levels at the surrounding sensitive uses are shown graphically in Figures 4a and 4b. Cadna output for receiver R1 (indicated in Figure 3a) is provided in Appendix C.

Table V: Predicted Maximum Sound Levels from Proposed Noise Sources at Surrounding Sensitive Uses, with No Mitigation [dBA]

Building	Description	Criteria (Day/Night)	Day OLA	Day Façade	Night Façade
R1	Existing 2-storey residential building to the southwest	50 / 45	45	46	43
R2	Existing 2-storey residential building to the southwest	50 / 45	46	45	42
R3	Existing 2-storey residential building to the south	50 / 45	45	45	42
R4	Existing 2-storey residential building to the southeast	50 / 45	45	42	39
R5	Existing 2-storey residential building to the east	50 / 45	43	33	30
R6	Existing 6-storey residential building to the northeast	50 / 45	--	39	35
R7	Existing 7-storey residential building to the northeast	50 / 45	--	35	32
R8	Existing highrise building to the east (8 Hickory St)	50 / 45	--	43	40
R9	Existing midrise building to the west (50 Hickory St)	50 / 45	--	47	44
OLA	Proposed Outdoor Living Area (rooftop)	50 / --	47	--	--

These predicted sound levels are expected to be within the MECP minimum exclusionary limit of 50 dBA during the daytime hours and 45 dBA during the nighttime hours at the surrounding sensitive receptors, based on this typical worst-case operating scenario. Noise mitigation measures are not required.

6.5 Predicted Sound Levels at Proposed Noise Sensitive Receptors

The sound levels due to the rooftop mechanical equipment at existing buildings are summarized in the Table VI below. Resultant sound levels at the surrounding sensitive uses are shown graphically in Figures 5a and 5b.

Table VI: Predicted Maximum Sound Levels from Existing Noise Sources at Proposed Sensitive Uses, with No Mitigation [dBA]

Location	Criteria (Day/Night)	Day	Night
North Façade	50 / 45	47	44
East Façade	50 / 45	47	44
South Façade	50 / 45	40	37
West Façade	50 / 45	42	39
OLA	50 / --	47	--

These predicted sound levels are expected to be within the MECP minimum exclusionary limit of 50 dBA during the daytime hours and 45 dBA during the nighttime hours at the proposed building façades and outdoor living area, based on this typical worst-case operating scenario. Noise mitigation measures are not required.

7 Impact of the Development on Itself

Section 5.8.1.1 of the Ontario Building Code (OBC), released on January 1, 2020, specifies the minimum required sound insulation characteristics for demising partitions, in terms of Sound Transmission Class (STC) or Apparent Sound Transmission Class (ASTC) values. In order to maintain adequate acoustical privacy between separate suites in a multi-tenant building, inter-suite walls must meet or exceed STC-50 or ASTC-47. Suite separation from a refuse chute or elevator shaft must 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 building 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.

Noise from the rooftop mechanical equipment and louvres associated with the mechanical penthouse may have potential noise impact at the proposed rooftop outdoor amenity area. The rooftop mechanical penthouse building provides some shielding from mechanical equipment to the proposed OLA. Further, though exhaust vents are not currently indicated in the plans, there may be associated noise impacts from such sources at the closest proposed suites. Noise excesses from exhaust fans can typically be mitigated using quieter models and/or silencers.

When mechanical details are available including make/model and location, an analysis should be conducted to determine the potential noise impact of the proposed rooftop mechanical equipment on the outdoor amenity area and the exhaust shafts on the closest proposed suites.

8 Summary of Recommendations

The following list and Table VII summarize the recommendations made in this report. The reader is referred to the previous sections of the report where these recommendations are discussed in more detail.

For transportation noise sources

1. There are no specific ventilation requirements required.

2. Any building construction meeting the minimum requirements of the Ontario Building Code will provide sufficient acoustical insulation for the proposed building.

3. The use of warning clauses in the property and tenancy agreements is recommended to inform future residents of the proximity to existing institutional uses.

4. 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's noise by-law.

For stationary noise sources

1) When details of the roof plans, mechanical equipment selection, and exhaust fan locations are available, an acoustical engineer should verify that the source sound level specifications and locations for the HVAC units conform to the assumptions made in this report and that acceptable sound levels will result at all surrounding sensitive receptors. Use of larger and louder rooftop equipment may result in the requirement for rooftop acoustic screens or mitigation for the exhaust fans.

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

Prediction Location	Description	Acoustic Barrier	Ventilation Requirements*	Type of Warning Clause	Building Construction
A	West Façade	--	--	E	OBC
B	North Façade	--			
C	East Façade	--			
D	South Façade	--			
E	OLA (rooftop)	--			

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

The reader is referred to previous sections of this report where these recommendations are discussed in more detail.

8.1 Implementation

To ensure that the noise control recommendations outlined above are fully implemented, 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 should certify that the suggested noise control measures have been properly incorporated, installed and constructed.

2) When further details of the roof plans, mechanical equipment selection, and exhaust fan locations are available, an acoustical engineer should verify that the source sound level

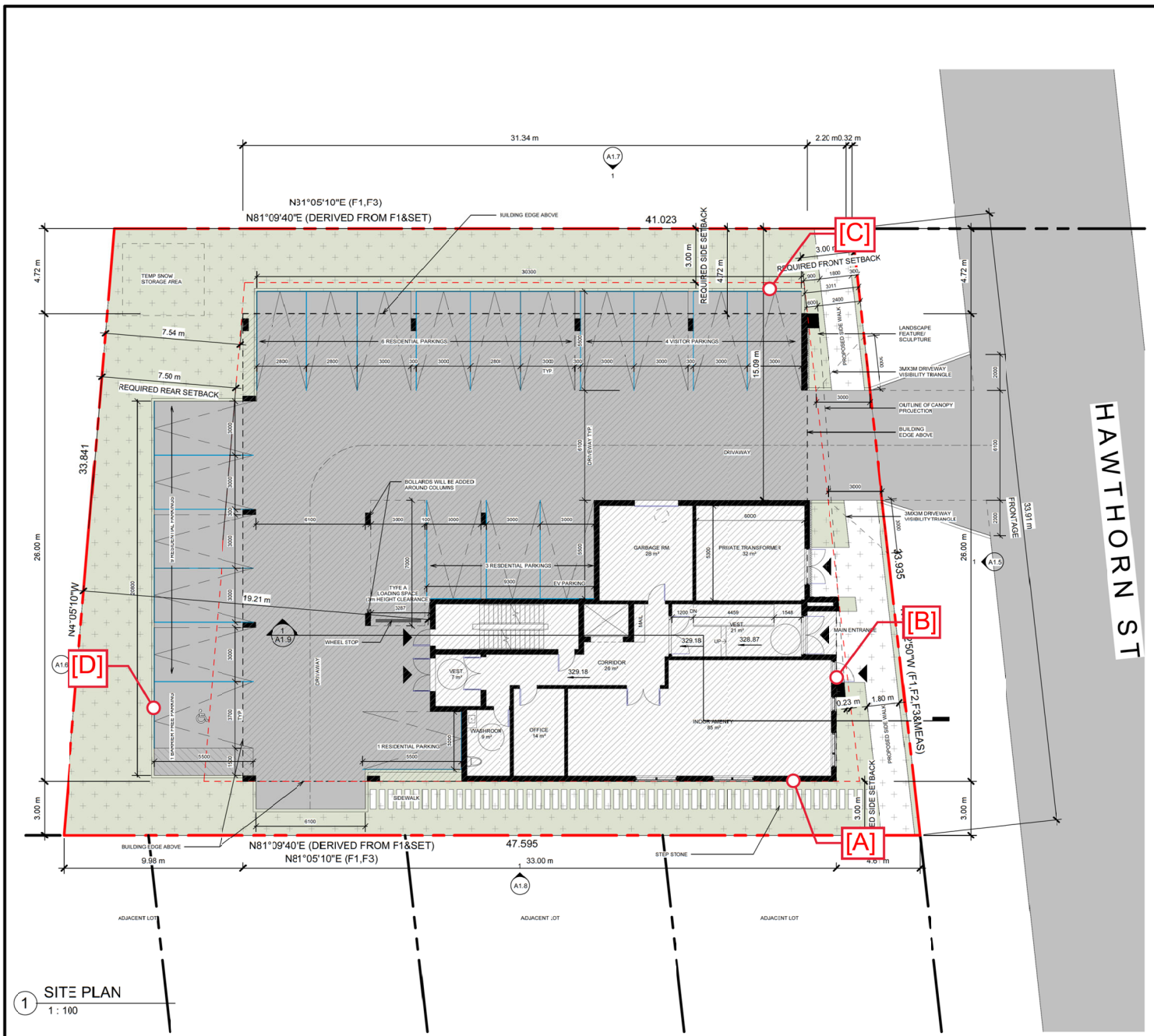
specifications and locations for the HVAC units conform to the assumptions made in this report and that acceptable sound levels will result at all offsite residential receptors. Use of larger and louder rooftop equipment may result in the requirement for rooftop acoustic screens.

9 Conclusions

The results of this study indicate that the proposed development located at 309 – 311 Hawthorn Street is feasible on this site from a noise impact perspective. A warning clause is recommended to advise residents of the proximity to existing institutional uses.



Figure 1: Key Plan



1 SITE PLAN
1 : 100



KEY PLAN

SITE STATISTICS

PROVISION		REQUIRED	PROPOSED
ZONING		2018-053, RN-6	
PROPOSED STATUS #			BCIN# 55
	EXISTING SITE AREA (m²)	1494m²	
DENSITY	BUILDING AREA (m²)	N/A	832
	BUILDING COVERAGE (%)	N/A	55.69%
	TOTAL GFA	N/A	4543.9m²
	TOTAL NUM. OF UNIT	N/A	55
	TOTAL NUM. OF BDRM	MAX. 8E	80
	TOTAL DENSITY/ BPH	N/A	536
SETBACK	FRONTAGE(m)	MIN. 20	33.9
	FRONT YARD(m)	MIN. 3	3
	NORTH(m)	MIN. 3	4.72
	SOUTH(m)	MIN. 3	3
	REAR YARD(m)	MIN. 7.5 OR 1/2 BLDG. HEIGHT	7.5
BUILDING HEIGHT	NUM. OF STOREY	N/A	6
	PODIUM HEIGHT(m)	N/A	N/A
	BLGD. HEIGHT(m)	MAX. 21.5	20.3
	SETBACK FROM PODIUM(m)	N/A	N/A
	GROUND FLOOR HEIGHT(m)	MIN. 4	4.8
PARKING SPACE	PARKING	COMMERCIAL: 0 (3/100m²)	0
		VISITOR: 4 (0.05/BDRM)	4
		RESIDENTIAL: N/A	16
		TOTAL: 4	20
	B.F. PARKING	1	1
	EV PARKING	1	1
	BICYCLE PARKING	COMMERCIAL: 0 (1/100m²)	N/A
		RESIDENTIAL: 20 (0.25/BDRM)	36
		TOTAL: 20	36
	LOADING SPACE	TYPE A : 1	1
OPEN LANDSCAPE SPACE (%)		30%	32.87%
		491.138m² AT GRADE	
NUM. OF DRIVEWAY		1	1
AMENITY AREA(m²)		215	TOTAL: 215 INDOOR: 85 OUTDOOR: 130

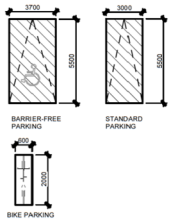
PROJECT GROSS FLOOR AREA

Level	Area SM	Area SF
GROUND FLOOR	282.42 m²	3039.9 SF
LEVEL 2	831.86 m²	8954.4 SF
LEVEL 3	831.86 m²	8954.4 SF
LEVEL 4	831.86 m²	8954.4 SF
LEVEL 5	831.86 m²	8954.4 SF
LEVEL 6	831.86 m²	8954.4 SF
MECH. LEVEL	102.02 m²	1098.1 SF
Grand total: 89	4543.60 m²	48910.2 SF

PROJECT GROSS LEASABLE AREA

Level	Area SM	Area SF
LEVEL 2	755.05 m²	8127.7 SF
LEVEL 3	755.05 m²	8127.7 SF
LEVEL 4	755.05 m²	8127.7 SF
LEVEL 5	755.05 m²	8127.7 SF
LEVEL 6	755.05 m²	8127.7 SF
Grand total: 55	3775.45 m²	40638.7 SF

PARKING NOTES:



NOTES:

1. ALL DIMENSIONS AND QUANTITIES OF MATERIALS ARE THE RESPONSIBILITY OF THE CONTRACTOR. AN ACCEPTABLE LEVEL OF FINISH MUST BE ACHIEVED AND APPROVED BY OWNER.

2. ALL TRADES TO VERIFY DIMENSIONS AND DATA HEREIN WITHEXISTING ON SITE.

3. REPORT ALL DISCOVERIES OF ERRORS, OMISSIONS OR DISCREPANCIES TO THE DESIGNER OR DESIGN ENGINEER AS APPLICABLE.

4. GENERAL CONTRACTOR TO PROVIDE ALL BLOCKING REQUIRED IN WALLS TO ACCOMODATE INSTALLATION OF MILLWORK, ARTWORK, FURNITURE, WASHROOM ACCESSORIES, AND EQUIPMENT.

5. MOULD RESISTANT GYPSUM BOARD IN LIEU OF GYPSUM BOARD INDICATED ON WALL SURFACES WITHN WASHROOMS & MUDROOMS.

6. TILE BACKER BOARD TO BE USED IN LIEU OF GYPSUM BOARD INDICATED ON WALL TYPES TO EXTENT OF WALLS WHERE CERAMIC WALL TILES ARE INDICATED TO BE INSTALLED.

7. DO NOT SCALE DRAWINGS.

REVISION RECORD

No.	Description	Date
1	PRE CONSULTATION MEETING	2022-01-26
2	ISSLED FOR ZBA	2022-10-05

ISSUE RECORD

Z Square Consulting Inc.
1100 Gordon Baker Road,
Toronto, Ontario, M2H 3B3
T 647 291 0088
E info@zsquareconsulting.com
W www.zsquareconsulting.com

TRUE NORTH

309-311 HAWTHORN STREET DEVELOPMENT
309-311 HAWTHORN STREET

for
\

\	As indicated	TJ	MDZ
PROJECT	SCALE	DRAWN	REVIEWED

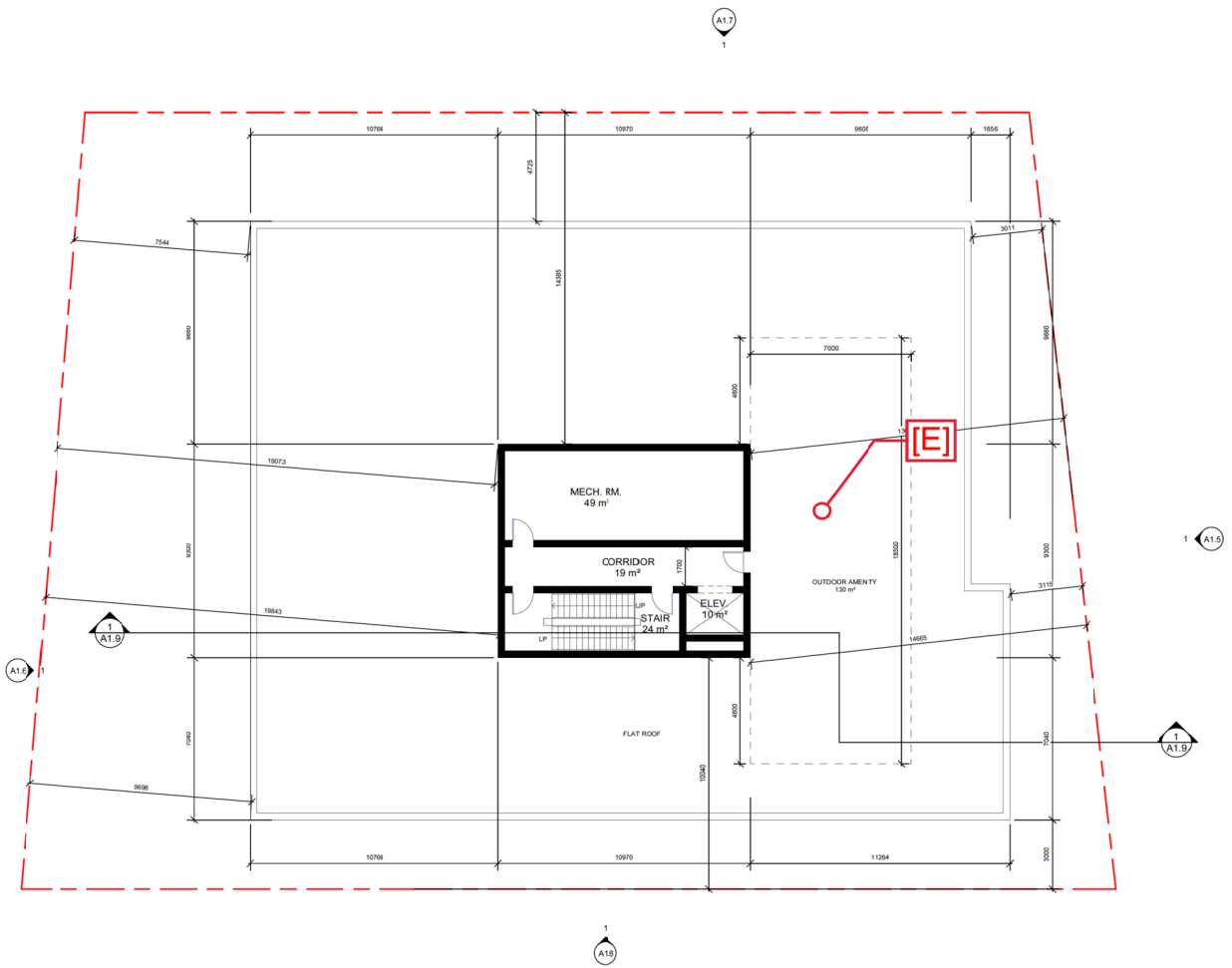
SITE PLAN & STATISTIC

A0.2

Note: This drawing is the property of the Architect and may not be reproduced or
used without the expressed consent of the Architect. The Contractor is responsible
for checking ad verifying all levels and dmensions and shall report sl discrepancies o the Architect and obtain clarification prior to commencing work.

11/5/2024 11:36:04 AM

Figure 2a: Proposed Site Plan Showing Prediction Locations



1 MECH. LEVEL
1 : 100

WITH THE EXCEPTION OF BEDROOMS IDENTIFIED,NO FLOOR AREA IN A RESIDENTIAL UNIT (INCLUDING A DEN) SHALL BE USED AS A BEDROOM OR CONVERTED TO A BEDROOM WITHOUT THE PRIOR CONSENT OF THE CITY, BASED ON THE OWNER DEMONSTRATING COMPLIANCE WITH APPLICABLE LAWS INCLUDINGTHE ZONING BY-LAW AND THE ONTARIO BUILDING CODE, TO THE SATISFACTION OF THE CITY.

NOTES:

1. ALL DIMENSIONS AND QUANTITIES OF MATERIALS ARE THE FESPONSIBILITY OF THE CONTRACTOR. AN ACCEPTABLE LEVEL OF FINISH MUST BE ACHIEVED AND APPROVED BY OWNER.

2. ALL TRADES TO VERIFY DIMENSIONS AND DATA HEREIN WITHEXISTING ON SITE.

3. REPORT ALL DISCOVERIES OF ERRORS, OMISSIONS OR DISCREPANCIES TO THE DESIGNER OR DESIGN ENGINEER AS APPLICABLE.

4. GENERAL CONTRACTOR TO PROVIDE ALL BLOCKING REQUIRED IN WALLS TO ACCOMODATE INSTALLATION OF MILLWORK, ARTWORK, FURNITURE, WASHROOM ACCESSORIES, AND EQUIPMENT.

5. MOULD RESISTANT GYPSUM BOARD IN LIEU OF GYPSUM BOARD INDICATED ON WALL SURFACES WITHN WASHROOMS & MUDROOMS.

6. TILE BACKER BOARD TO BE USED IN LIEU OF GYPSUM BOARD INDICATED ON WALL TYPES TO EXTENT OF WALLS WHERE CERAMIC WALL TILES ARE INDICATED TO BE INSTALLED.

7. DONOT SCALE DRAWINGS.

REVISION RECORD

No.	Description	Date
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ISSUE RECORD

Z Square Consulting Inc.
1100 Gordon Baker Road,
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W www.zsquareconsulting.com

TRUE NORTH

309-311 HAWTHORN STREET DEVELOPMENT
309-311 HAWTHORN STREET

for
\

\	1 : 100	TJ	MDZ
PROJECT	SCALE	DRAWN	REVIEWED

PENTHOUSE PLAN

A1.3

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used without the expressed consent of the Architect. The Contractor is responsible
for checking ad verifying all levels and dimensions and shall report all discrepancies o the Architect and obtain clarification prior to commencing work.

11/5/2024 11:35:07 AM

Figure 2b: Proposed Site Plan Showing Prediction Locations



Figure 3b: Proposed Stationary Noise Source Locations



Figure 3a: Existing Stationary Noise Source Locations



Figure 4a: Predicted Maximum Daytime Sound Levels from Proposed Stationary Noise Sources, dBA (Without Mitigation)

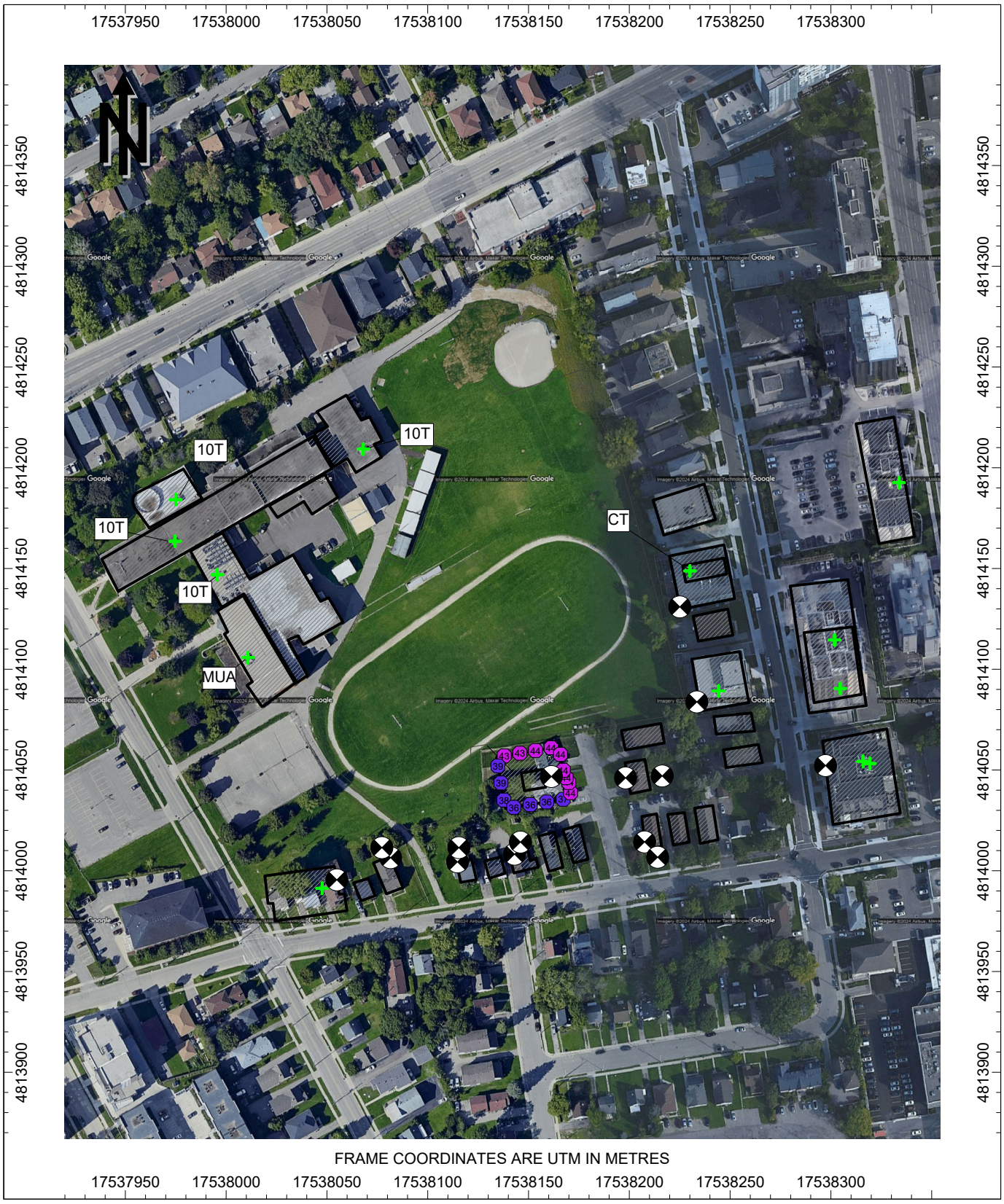


Figure 4b: Predicted Maximum Nighttime Sound Levels from Proposed Stationary Noise Sources, dBA (Without Mitigation)



Figure 5a: Predicted Maximum Daytime Sound Levels from Proposed Stationary Noise Sources, dBA (Without Mitigation)

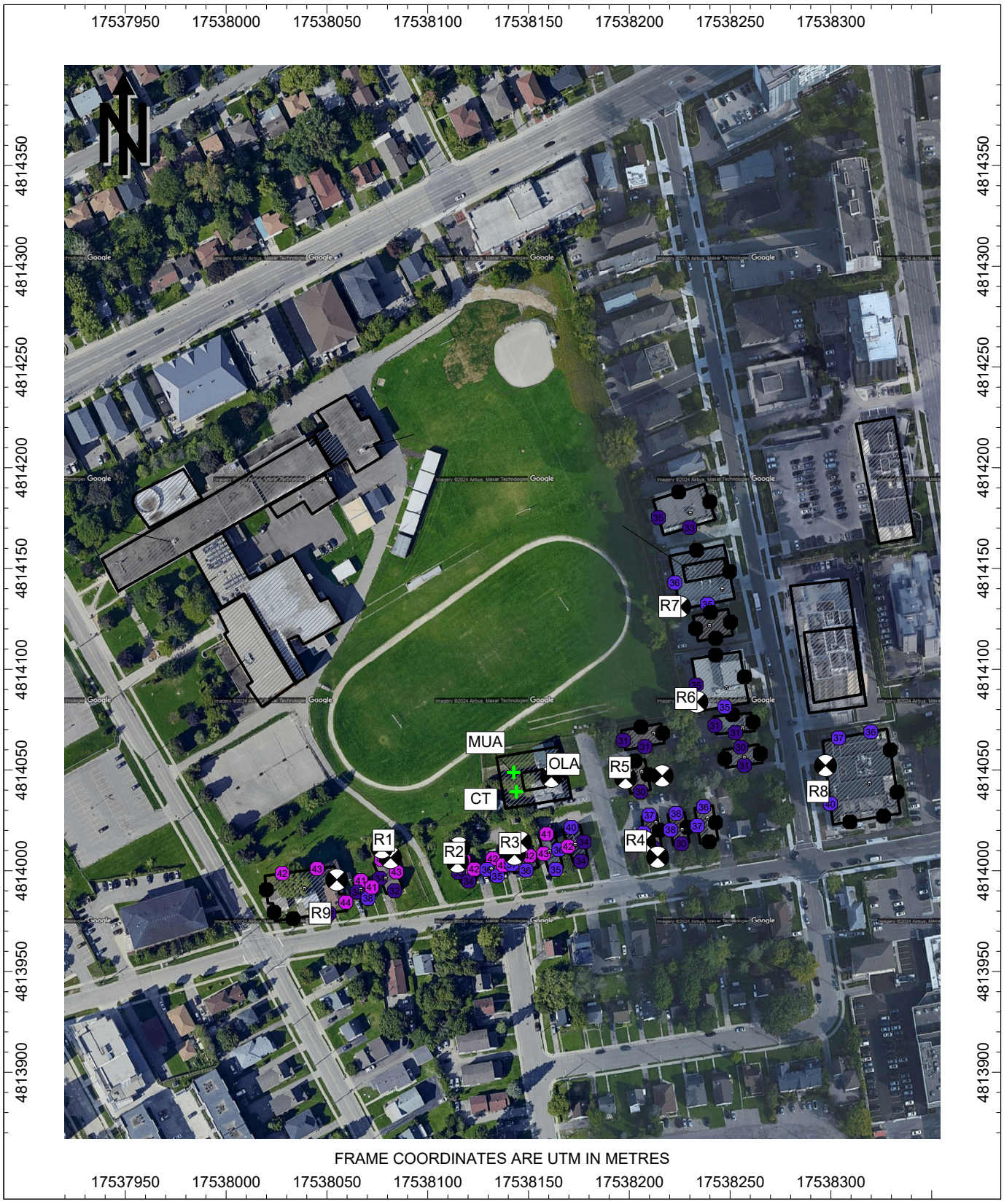


Figure 5b: Predicted Maximum Nighttime Sound Levels from Proposed Stationary Noise Sources, dBA (Without Mitigation)

APPENDIX A

Road Traffic Data

Region of Waterloo AADT Forecast for Noise Studies

1. Development/Location	309-311 Hawthorn St, Waterloo

	Hickory St
2. Current AADT (2024)	3,700

	Hickory St
3. Forecast AADT (2034)	4,300

4. Commercial Vehicle Rates	Hickory St
% Medium Trucks	1%
% Heavy Trucks	1%

	Hickory St
5. Posted Speed Limit	50 km/h

6. Day/Night Splits	Regional Standard 90/10 Day/Night Split
7. Expiry	31-Dec-2025

8. Notes

This forecast is intended for the purpose of carrying out a noise study only. As Hickory St is under the juridiction of City of Waterloo, City of Waterloo should verify the forecast for this road segment. The Region of Waterloo should be contacted for an updated forecast if there are plans to use this forecast beyond the above validity period.

Peak Hour Diagram

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Specified Period		One Hour Peak	
From:	07:30:00	From:	07:45:00
To:	10:30:00	To:	08:45:00

Intersection: Columbia St W & Hazel St
Site Code: 0000001224
Count Date: Oct 04, 2023

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Columbia St W runs E/W

North Approach

	Out	In	Total
	124	71	195
	12	6	18
	5	0	5
	141	**77**	**218**

Hazel St

	1	4	0	0
	3	6	3	0
	35	76	13	0
Totals	**39**	**86**	**16**	**0**

East Approach

	Out	In	Total
	950	819	1769
	36	31	67
	7	1	8
	993	**851**	**1844**

Peds: 64

Columbia St W

			Totals
0	0	0	**0**
0	1	19	**20**
1	24	734	**759**
0	2	89	**91**

Peds: 29



Peds: 204

Columbia St W

	Totals			
	0	0	0	0
	15	15	0	0
	897	854	36	7
	81	81	0	0

Peds: 62

West Approach

	Out	In	Total
	842	945	1787
	27	44	71
	1	8	9
	870	**997**	**1867**

Hazel St

Totals	**61**	**42**	**76**	**0**
	56	37	72	0
	5	5	4	0
	0	0	0	0

South Approach

	Out	In	Total
	165	246	411
	14	8	22
	0	4	4
	179	**258**	**437**

71/1867 = 3.8%
MT = 3.8*5/13 = 1.5%
HT =3.8*8/13 = 2.3%

- Trucks

- Bicycles

22/437 = 5.0%
MT = 5.0*5/13 = 2.0%
HT =5.0*8/13 = 3.0%

Comments

Region of Waterloo AADT Forecast for Noise Studies

1. Development/Location

Development including 330 Albert St, Waterloo, ON

2. Current AADT (2024)

Columbia St W	Albert St	Hickory St W
20,300	6,900	4,400

3. Forecast AADT (2034)

Columbia St W	Albert St	Hickory St W
22,400	7,300	5,100

4. Commercial Vehicle Rates

	Columbia St W	Albert St	Hickory St W
% Medium Trucks	1%	1%	2%
% Heavy Trucks	2%	1%	2%

5. Posted Speed Limit

Columbia St W	Albert St	Hickory St W
50 km/h	50 km/h	50 km/h

6. Day/Night Splits

Regional Standard 90/10 Day/Night Split

7. Expiry

Dec 31 2025

8. Notes

This forecast is intended for the purpose of carrying out a noise study for the development including 330 Albert St, Waterloo only. The above AADT represents the traffic volumes for each road section indicated above, parallel to the property. As Columbia St W, Albert St, and Hickory St W are under the jurisdiction of the City of Waterloo, the City of Waterloo should be contacted to verify the forecast.

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

354 King Street North, Waterloo

2. Current AADT (2023)

King Street	Weber Street	Columbia Street	Regina Street
8,400	18,100	15,600	4,800

3. Forecast AADT (2033)

King Street	Weber Street	Columbia Street	Regina Street
9,300	19,000	16,400	5,100

4. Commercial Vehicle Rates

	King Street	Weber Street	Columbia Street	Regina Street
% Medium Trucks	1.3%	1.1%	1.1%	0.8%
% Heavy Trucks	2.0%	0.8%	1.8%	0.6%

5. Posted Speed Limit

King Street	Weber Street	Columbia Street	Regina Street
50 km/h	60 km/h	50 km/h	50 km/h

6. Day/Night Splits

Regional Standard 90/10 Day/Night Split

7. Expiry

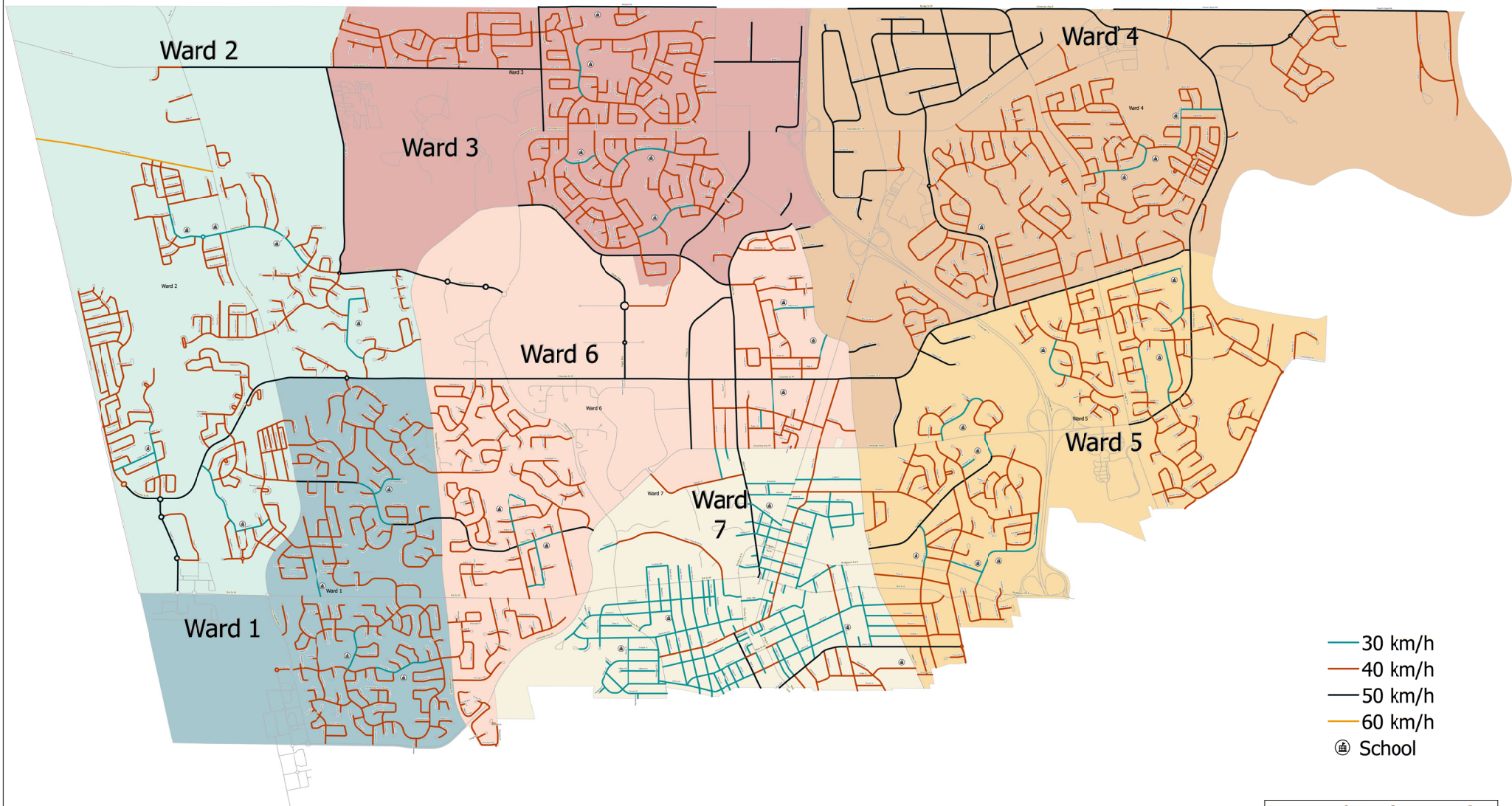
31-Dec-2024

8. Notes

This forecast is intended for the purpose of carrying out a noise study for 354 **King Street North in the City of Waterloo**. The above AADTs represents forecasted traffic volumes on King Street (Columbia Street - Hickory Street), Weber Street (Columbia Street - Hickory Street), Columbia Street (King Street - Regina Street), and Regina Street (Columbia Street - Hickory Street).

Columbia Street and Regina Street are under the jurisdiction of the City of Waterloo, so the above forecasts should be confirmed by City staff.

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.



Proposed Implementation Schedule

Phase 1: School Zones
Phase 2: Ward 2 & 7
Phase 3: Ward 4, 5 & 6
Phase 4: Ward 1 & 3

N

THE CITY OF Waterloo

Speed Limit Management Plan

0 0.5 1 2 Kilometres

Map © 2024, City of Waterloo
Revision Date: 2024-01-02
Produced by: Engineering Infrastructure, IPPW
Imagery: May 2014
Property Information © 2001-2015
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*HIS IS NOT A PLAN OF SURVEY

APPENDIX B

Sample STAMSON 5.04 Output

STAMSON 5.0 NORMAL REPORT Date: 05-02-2025 22:05:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: a.te Time Period: Day/Night 16/8 hours
Description: **Predicted daytime and nighttime sound levels at the south façade of the proposed building, prediction location [A].**

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

Car traffic volume : 3793/421 veh/TimePeriod *
Medium truck volume : 39/4 veh/TimePeriod *
Heavy truck volume : 39/4 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): 4300
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 : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Hickory (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 : 48.00 / 48.00 m
Receiver height : 18.50 / 18.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 5025/558 veh/TimePeriod *
Medium truck volume : 106/12 veh/TimePeriod *
Heavy truck volume : 159/18 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 4370
Percentage of Annual Growth : 2.50
Number of Years of Growth : 12.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 3.00
Day (16 hrs) % of Total Volume : 90.00

```
Data for Segment # 2: Hazel (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  : 130.00 / 130.00 m
Receiver height           :  18.50 / 18.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 3: King (day/night)
--------------------------------------
Car traffic volume  :  8094/899   veh/TimePeriod  *
Medium truck volume :   109/12    veh/TimePeriod  *
Heavy truck volume  :   167/19    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):   9300
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   1.30
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 3: King (day/night)
--------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 200.00 / 200.00 m
Receiver height           :  18.50 / 18.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

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

Source height = 1.00 m

ROAD (0.00 + 53.34 + 0.00) = 53.34 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  58.39   0.00  -5.05   0.00   0.00   0.00   0.00
53.34
```

```
------------------------------------------------------------------------
---

Segment Leq : 53.34 dBA

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

Source height = 1.32 m

ROAD (0.00 + 48.00 + 0.00) = 48.00 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
------------------------------------------------------------------------
---
     0     90   0.00  60.39   0.00  -9.38  -3.01   0.00   0.00   0.00
48.00
------------------------------------------------------------------------
---

Segment Leq : 48.00 dBA

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

Source height = 1.19 m

ROAD (0.00 + 47.51 + 0.00) = 47.51 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
------------------------------------------------------------------------
---
   -90      0   0.00  63.10   0.00 -11.25  -3.01   0.00  -1.33   0.00
47.51
------------------------------------------------------------------------
---

Segment Leq : 47.51 dBA

Total Leq All Segments: 55.25 dBA

Results segment # 1: Hickory (night)
------------------------------------

Source height = 0.98 m

ROAD (0.00 + 46.65 + 0.00) = 46.65 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
------------------------------------------------------------------------
---
   -90     90   0.00  51.70   0.00  -5.05   0.00   0.00   0.00   0.00
46.65
```

```
------------------------------------------------------------------------
---

Segment Leq : 46.65 dBA

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

Source height = 1.32 m

ROAD (0.00 + 41.53 + 0.00) = 41.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
------------------------------------------------------------------------
---
     0     90   0.00  53.92   0.00  -9.38  -3.01   0.00   0.00   0.00
41.53
------------------------------------------------------------------------
---

Segment Leq : 41.53 dBA

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

Source height = 1.20 m

ROAD (0.00 + 42.36 + 0.00) = 42.36 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
------------------------------------------------------------------------
---
   -90      0   0.00  56.62   0.00 -11.25  -3.01   0.00   0.00   0.00
42.36
------------------------------------------------------------------------
---

Segment Leq : 42.36 dBA

Total Leq All Segments: 48.90 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.25
                           (NIGHT): 48.90
```

APPENDIX C

Cadna Output

	R1	17538082	4814007	4.5																			
Src ID	Src Name	X	Y	Z	LxD	LxE	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	CmetD	CmetE	CmetN	ReflD	ReflE	ReflN	LrD	LrE	LrN
MUA	Make-Up Air Unit	17538142	4814049	21.5	91	--	88	48.6	0	0.0	-1.8	5.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38	--	35
CT	Cooling Tower	17538144	4814040	21.5	96	--	93	48.2	0	0.0	-2.2	4.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45	--	42

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl

APPENDIX D

Comments & HGC's Responses

HGC
NOISE | VIBRATION | ACOUSTICS

HGC Noise Vibration Acoustics
2000 Argentia Road, Plaza One, Suite 203
Mississauga, Ontario, L5N 1P7
t: 905.826.4044

February 5, 2025

Susanna Reid, MCIP, RPP
Regional Municipality of Waterloo
150 Frederick Street, 8th Floor.
Kitchener, ON N2G 4J3

Via Email: sreid@regionofwaterloo.ca

RE : Response to Peer Review Comments,
310, 330, 332 Albert and 291, 293, 295 Hemlock, Waterloo, ON
HGC Project #: 02400068

Dear Susanna,

We are providing this letter in response to the Peer Review comments prepared by RWDI dated January 17, 2025 for the proposed residential development located in Kitchener, Ontario. Our previous report was entitled, "Noise Feasibility Study, Proposed Residential Development, 309 – 311 Hawthorn Street, Waterloo, Ontario" dated August 19, 2024.

Our responses are as follows:

4. The provided Noise study is lacking a Consultant Statutory Declaration, and an Owner's Declaration, which is required per RMOW guidelines.

Noted. A statutory declaration form has been included in the revised noise study.

6. The Noise Report does not address any of the other adjacent transportation sources that may contribute to the Development. The following transportation sources should be assessed or justifications provided on their exclusion as impacts may change the conclusions
   a. Hazel Street – 2 lanes urban collector road within 200 m of the development.
   b. King Street North – 4 lane arterial road within 200 m of the development
   c. Columbia Street West – 4 lane arterial road.

Road traffic data requests are completed via an online portal and Region personnel determine the major roadways that have major impact on the proposed development (i.e. specific roads are not requested and inclusion of road data for certain roads is up to Region personnel). Nonetheless, road traffic data for the additional roads was obtained from City of Waterloo personnel and from HGC project files for past projects in the area

(used in place of latest data as Region of Waterloo personnel did not respond to repeated requests for road traffic data at the time of this report), included in Section 4.1 of the revised report and used in the analysis.

d. Table III only shows thresholds for the future traffic sound levels. For peer review purposes the actual predicted values should be reported along with the applicable criteria to demonstrate they can be met. This detail should be corrected in future updates of this assessment.

e. The STAMSON output in Appendix B reports that the predicted sound levels from Hickory Street alone as 53 dBA and 47 dBA for daytime and nighttime periods respectively for location [A]. Inclusion of other road sources (noted above) may elevate levels, changing the conclusions and recommendations.

Exact sound levels have been provided in the revised report.

c. Review of the area indicate other buildings and sources that should be considered based on similar distance separation, or justification provided for their exclusion. These include:

i. 50 Hickory Street, a midrise residential development (not pictured in satellite imagery).
ii. 313 Spruce Street, a midrise residential development.
iii. 318 Spruce Street, a high-rise mixed-use development which includes commercial and retail.
iv. 8 Hickory Street, a high-rise mixed-use development which includes commercial and retail.
v. 333 King Street a high-rise residential development.

The units with the greatest anticipated contribution to noise levels at the proposed building have been included in the model based on shielding from intervening buildings, distance to the site, and height of the existing buildings. The following noise sources were included in the model for the above buildings.

50 Hickory Street – a 10 ton rooftop HVAC unit
313 Spruce Street – a make-up air unit
318 Spruce Street – a cooling tower and make-up air unit
8 Hickory Street – two make-up air units
333 King Street – make-up air unit

9. Predicted sound levels at existing noise sensitive receptors from the development itself are evaluated with the following notes:
    a. Assumed sound powers for roof top HVAC provided in Table IV of the Noise Report are reasonable, and the operating conditions for daytime and nighttime periods are acceptable.
    b. OLAs for the existing noise sensitive receptors are not considered in the Noise Report and should be evaluated.
    c. The mid-rise residential at 50 Hickory Street was not considered. The elevated points of reception should be evaluated in the Noise Report.

Noted. Sound level predictions at the OLA's of existing receptors and at the existing building located at 50 Hickory Street is provided in the revised report. Sound levels at the OLA's and at the building located at 50 Hickory Street are expected to be within MECP limits. Noise mitigation measures will not be required for the proposed stationary noise sources.

We trust the above is sufficient for your current purposes. If we can be of further assistance, please call.

Best regards,
Howe Gastmeier Chapnik Limited

Yvonne Lo, M.Eng, P.Eng

Limitations

This document was prepared solely for the addressed party and titled project or named part thereof and should not be relied upon or used for any other project without obtaining prior written authorization from HGC Noise Vibration Acoustics (HGC). Further, the input of content from any document produced by HGC or related HGC intellectual property into any Artificial Intelligence tool is expressly prohibited. HGC accepts no responsibility or liability for any consequence of this document being used for a purpose other than for which it was commissioned. Any person or party using or relying on the document for such other purpose agrees and will by such use or reliance be taken to confirm their agreement to indemnify HGC for all loss or damage resulting therefrom. HGC accepts no responsibility or liability for this document to any person or party other than the party by whom it was commissioned.

Any conclusions and/or recommendations herein reflect the judgment of HGC based on information available at the time of preparation and were developed in good faith on information provided by others, as noted in the report, which has been assumed to be factual and accurate. Changed conditions or information occurring or becoming known after the date of this report could affect the results and conclusions presented.

APPENDIX E

Consultant 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
	)	Residential Development at
	)	309 – 311 Hawthorn Street
	)	Waterloo, Ontario

I, Yvonne Lo, of the City of Toronto, 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 Residential Development at 309 – 311 Hawthorn Street, Waterloo, Ontario.

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 Residential Development, 309 – 311 Hawthorn Street, Waterloo, 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.

Sworn (or Affirmed or Declared) remotely by Yvonne Lo before me at the City of Toronto in the Province of Ontario, on February 06, 2025, in accordance with O. Reg 431/20, Administering Oath or Declaration Remotely.

)
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Yvonne Lo

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KAZUKI TAKAHASHI
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OWNER/AUTHORIZED AGENT STATEMENT

I am the owner of the property, or the owner's agent, and that I understand and agree with the noise attenuation measures proposed in the study entitled "Noise Feasibility Study, Proposed Residential Development, 309 – 311 Hawthorn Street, Waterloo, Ontario" dated February 5, 2025.

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.

Name	Jun Li	Signature	Jun Li
Title	Partner	Company	Z Square Group
Date	Feb 11, 2024		