SLR Consulting (Canada) Ltd.
100 Stone Road West, Suite 201, Guelph, ON N1G 5L3

April 8, 2025

Attention: Lance Kaprielian

Studio Lamina Inc.
180 Shaw Street, Suite 315,
Toronto, ON M6J 2W5

SLR Project No.: 241.30640.00000

RE: Response to Peer Review of Environmental Noise Study for 1 Columbia Street West, Waterloo, Ontario

SLR Consulting (Canada) Ltd. (SLR), was retained by was retained by Studio Limina Inc. to an Environmental Noise Assessment in support of the Site Plan Approval (SPA) for 1 Columbia Street West, in Waterloo, Ontario (Project site).

The findings of the original study were presented in the following report:

- Environmental Noise Assessment – 1 Columbia Street West, City of Toronto, Ontario, dated November 18, 2022 (the Noise Study).

A peer review of the above was conducted on behalf of the Region of Waterloo by RWDI, in a letter dated May 10, 2024.

The findings of the Updated study were presented in the following report:

- Environmental Noise Assessment – 1 Columbia Street West, City of Toronto, Ontario, dated October 18, 2024 (Updated Noise Study).

A further peer review of the above was conducted on behalf of the Region of Waterloo by RWDI, in a letter dated February 25, 2025. The peer review response comments are included in Attachment A. The purpose of this letter is to provide responses their comments.

In summary, the opinions concluded in our original/Updated Noise Study, together with the current response to the peer review, demonstrate that the Project site will be compatible with the surroundings with the inclusions of the recommendations outlined in the Updated Noise Study.

Only peer review comments requiring a response are included below.

Noise Comments

SLR Response to Noise Comment #4

a) Source parameters were unintentionally left out of the Updated Noise Study. Included as Attachment B for completeness.

b) As per the source parameters included in Attachment B, operating times for HVAC units are assumed to be 60 minutes per hour during daytime/evening hours and 30 minutes per hour during nighttime hours.

c) Based on discussions with RWDI, the predicted sound levels are and have been demonstrated to meet the applicable guideline limits. No additional assessment is required.

SLR Response to Noise Comment #5

Based on additional assessment by SLR, and discussions with RWDI. The PTAC units associated with the King's Court building (345 King Street) were assumed (actual sound level measurements were not feasible at the time of the site visit) to be at the upper limit of the applicable noise guideline limits at existing noise sensitive receptors. Source/operational information for the PTAC units, including sound power level adjustments (for self compliance), and sound directivity pattern applied are included in Attachment B. Attachment C, Figures C.1 and C.2 show the predicted worst-case daytime/evening and nighttime sound levels, respectively. Figure C.2 shows predicted sound levels of PTAC units which would just meet guideline limits at King's Court receptors and existing receptors at the Project site. A 1 dB excess is anticipated at limited locations, on the south façade of the Project Site, during nighttime hours only. Therefore, it is anticipated that compliance would be demonstrated at the Project site with all King's Court PTAC units in operation simultaneously, or a marginal excess of up to 1 dB (imperceptible to the human ear) may occur at limited locations of the south façade of the Project site building.

SLR Response to Noise Comment #6

a) Point of reception heights are outlined below:
    - Existing 1 Columbia Street West – building height of approximately 66 m, building evaluations assessed at 1.5 m above grade, every 3 m thereafter.
    - 346 King Street - Building height of approximately 16 m with building evaluations assessed at 1.5 m above grade, every 3 m thereafter.
    - 345 King Street - Building height of approximately 42 m, building evaluations assessed at 1.5 m above grade, every 3 m thereafter.
    - 348 Spruce Street - Building height of approximately 6 m with building evaluations assessed at 1.5 m and 4.5m above grade.

b) Source parameters are included in Attachment B of this response letter.

c) Mechanical information for the parking garage fans were not available at the time of the assessment (though vent shaft locations are shown in Project site drawings). The fans (along with all other onsite mechanical equipment) should be assessed in the future when information is made available.

SLR Response to Noise Comment #7

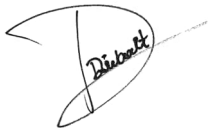
A preliminary assessment of noise from the existing 1 Columbia building was completed and discussed with RWDI. Based on a combination of observations made while on site and aerial photography, sources of interest include a rooftop HVAC unit, cooling tower, and emergency generator. None of the equipment has a direct line of sight to the Project site proposed building due to the height difference between the two buildings. Equipment sound power levels used in the modelling are included in Attachment B. Two scenarios were modelled, one for non-emergency equipment, and one for emergency generator testing. Figures showing the predicted sound levels are included in Appendix C, Figures C.3 to C.5.

Closure

We trust that the Updated Noise Study combined with the above responses has addressed all of RWDI's comments. In summary, the opinions concluded in our original/Updated Noise Study, together with the current responses to the peer review of the Project, demonstrate that the proposed development can be compatible with the surrounding land uses.

Should you or they have any additional questions, please do not hesitate to contact us. Yours sincerely,

SLR Consulting (Canada) Ltd.





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Attachments A – Peer Review Comments

B – Source Modelling Parameters

C – Figures

Attachment A – Peer Review Comments

Peer Review Response

1 Columbia Street West

Studio Lamina Inc.

SLR Project No.: 241.30640.00000

April 8, 2025

600 Southgate Drive
Guelph ON Canada
N1G 4P6

Tel: +1.519.823.1311
E-mail: solutions@rwdi.com

MEMORANDUM

DATE:	2025-02-25	**RWDI Reference No.:** 2300540.49
TO:	Rita Szilock	**EMAIL:** Rita.Szilock@waterloo.ca
CC:	Susanna Reid Alyssa Bridge	**EMAIL:** sreid@regionofwaterloo.ca ABridge@regionofwaterloo.ca
FROM:	Benjamin Coulson	**EMAIL:** Ben.Coulson@RWDI.com
RE:	**Noise Peer Review of Resubmission** **1 Columbia Street West** **Waterloo, Ontario**	

Dear Rita,

The Region of Waterloo retained RWDI to conduct a peer review of a noise study for 1 Columbia Street West & 351 and 355 King Street North development in Waterloo, completed in support of a Zoning Bylaw Amendment and Official Plan Amendment application. The applicant is proposing a 7-storey residential building on lands currently occupied by 2 single family homes (311 and 355 King Street North).

Background

Peer review comments were provided in May 2024 on the original noise assessment. The following items or information were requested as a result of that review:

A. Update of the assessment based on the most current design drawings.
B. Review/revision of the Cadna/A implementation of ORNAMENT to reflect the Stamson validation files, and reconsideration of the applicable warning clauses/ventilation requirements if necessary.
C. Re-evaluation of King Street North transportation noise considering the road gradient.
D. Consideration of the McDonald's restaurant drive-thru and rooftop equipment.
E. Consideration of the PTAC units on the King's Court residential building (345 King Street North) to the south of the proposed development.
F. Assessment of the building's mechanical systems on itself and its surroundings.
G. Assessment of the existing 1 Columbia mechanical equipment on the new building.

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This memorandum addresses the update to the study entitled "Environmental Noise Assessment, 1 Columbia Street West, Waterloo, Ontario", SLR Project Number 241.30640.00000, Revision 1 and dated October 21, 2024 (i.e., "Updated Noise Study") and received in December 2024 for review. A letter responding to the peer review comments dated October 21, 2024 and addressed to Lance Kaprielian of Studio Lamina Inc. (i.e., "Response Letter") was also reviewed along with the updated development drawings.

This review reflects best practices for land-use planning, as well as guidelines and policies mandated by the Regional Municipality of Waterloo (RMOW) and, where applicable, the Province of Ontario. The City of Waterloo Terms of Reference for completing noise assessments has also been considered. Where differences in guidance may exist, the RMOW has provided direct guidance to this peer reviewer on their expectations. In all cases, the direction and policies of the City of Waterloo and RMOW take precedence. Comments requiring action by the applicant are highlighted throughout this document for ease of identification.

Peer Review

Based on the current noise assessment information contained in the Updated Noise Study, the following comments are provided:

1. The Updated Noise Study appropriately reflects the current design drawings.
2. The transportation noise validation files appropriately reflect the modelled results, and the warning clauses/ventilation requirements have been appropriately updated.
    a. Residential units fronting onto King Street (i.e., east façade) will require central air conditioning and MECP Type D warning clause.
    b. Residential units on the north and south facades of the building will require forced air heating with the provision for future installation of central air conditioning, along with MECP Type C warning clause.
    c. The east façade is assumed to be composed of a wall meeting STC 45 and as a result upgraded glazing is not required. The STC rating of the assumed wall construction should be verified to meet or exceed STC 45 once its design is available.
3. The gradient of King Street North has been appropriately considered in the transportation noise modelling.
4. Noise sources at the nearby McDonald's restaurant were considered. Based on Figure 5 of the Updated Noise Study, it appears that adequate noise sources have been considered. Section 3.1.5 of the report suggests noise data is included in Appendix F, however this appears to be omitted.
    a. The report does not include any information to validate the source parameters assumed in the modelling which is contrary to the City's Terms of Reference. Source parameters (e.g., sound power level, operating times, heights, locations, etc.) must be provided.

b. Further, the report identifies that reduced equipment operating times were considered for nighttime periods but does not specify them. The Region of Waterloo has typically required that minimum nighttime operating times of 30 minutes of every hour be considered. However, in this case, the McDonald's is open 24-hours and hence appropriate justification must be provided for any reduced operating times assumed or alternately operating times must be confirmed.

c. The results for the north façade summarized in Table 11 indicate nighttime values of 47 dBA are predicted. The applicable sound level limits for this same façade indicate a range of 45-49 dBA. Based on these results, there is potential that the lower end of this range is exceeded at some points on the façade. Additional information must be provided to support the supposition that stationary source levels are below the applicable guideline limits at all facades. Sample calculations or additional results may assist with this demonstration.

5. The King's Court PTAC units were not evaluated as requested. The Response Letter indicates that the PTAC units must meet at the building's own residential units and the existing homes. Given the elevation of the proposed building (i.e., much taller than the existing homes), the proximity of the PTACs to the proposed building and their direct line of sight to the proposed building's windows, additional information is requested to support the assumption that the King's Court PTAC units will not be a concern at the proposed building. This rationale should be a technical discussion and not rely on anecdotal or presumptive opinion.
6. The proposed building's mechanical systems were included in the assessment.
    a. The nearest sensitive receivers are identified but no details are provided on heights. Information on the height of the receivers considered is requested.
    b. Data sheets for the proposed equipment are included in Appendix F, excluding the garbage exhaust fan. Suitable source data are included in Table 12. Operating time assumptions are not detailed and are requested to be provided.
    c. The building appears to include near-grade parking garage exhaust fans for the underground parking in the drawings but do not appear to be considered. Rationale must be provided for this exclusion, or these sources should be considered.
    d. Mitigation is required on the building's mechanical systems to meet the applicable limits at neighbouring buildings and the building itself. In some cases, these reductions are notable (e.g., up to 17 dB) but should be feasible. The anticipated mitigation design should be assessed and confirmed prior to building permits being issued.
7. The mechanical systems on the existing 1 Columbia building are not included in the assessment per the Response Letter as requested per item G. These sources must be considered or their exclusion justified with appropriate technical rationale. The rationale provided is insufficient to rationalize how these sources would not impact the proposed building since the proposed building is taller and closer to the existing building than the

existing homes on the site or other neighbouring buildings; hence there is a reasonable expectation that the impacts at the proposed building could be worse.

Section 1.1 of the Updated Noise Study indicates the building mechanical systems were not sufficiently designed and hence should be assessed in future; however, this assessment is included, and the statement is assumed to be included in error. The study otherwise appears to have been appropriately conducted.

Conclusions

Based on our review of the Updated Noise Study, several items as outlined above still need to be addressed to confirm that noise has been adequately considered and compatibility demonstrated. These concerns relate to the stationary noise source assessment and include:

- Providing source and receiver input parameters, modelling methodology, and sample calculations consistent with the City of Waterloo's Terms of Reference for noise assessments.
- Consideration of the parking garage exhaust systems.
- Assessment of the nearby mechanical systems on the existing 1 Columbia and King's Court buildings, or appropriate technical rationale to demonstrate why the expected impacts are not of concern.

In addition, mitigation measures are proposed on the building's mechanical systems and assumptions are made regarding the noise attenuation properties of the building's façade construction. These details should be verified and the mitigation design by a qualified acoustical consultant confirmed prior to building permit issuance.

Yours truly,

Benjamin Coulson, M.A.Sc., P.Eng.
Principal, Senior Consultant
RWDI

Attachment B – Source Modelling Parameters

Peer Review Response

1 Columbia Street West

Studio Lamina Inc.

SLR Project No.: 241.30640.00000

April 8, 2025

Table B.1: Summary of Noise Source Sound Power Levels (Unmitigated)

Source Description	ID	Maximum Sound Power Levels (1/1 Octave Band Levels)									Total PWL (dBA)	Notes
		32 (dB)	63 (dB)	125 (dB)	250 (dB)	500 (dB)	1000 (dB)	2000 (dB)	4000 (dB)	8000 (dB)		
Commercial Stationatory Sources												
HVAC Unit (5 ton)	HVAC_5ton	77	80	81	81	80	78	74	70	64	83	- Based on SLR historical data - Assumed to operate continuously during the daytime and evening with 50% duty cycle during the nighttime
HVAC Unit (10 ton)	HVAC_10ton	80	83	84	84	83	81	77	73	67	86	- Based on SLR historical data - Assumed to operate continuously during the daytime and evening with 50% duty cycle during the nighttime
HVAC Unit (15 ton)	HVAC_15ton	83	86	87	87	86	84	80	76	70	88	- Based on SLR historical data - Assumed to operate continuously during the daytime and evening with 50% duty cycle during the nighttime
Exhaust Fan	Exhuast Fan	-	-	80	76	79	71	67	64	59	79	- Based on SLR historical data - Assumed to operate continuously during all times of the day
Development Proposed Sources												
Heat Pump	CU-1	76	79	80	80	79	77	73	69	63	82	- Based on Manufacturers data - Assumed to operate continuously during the daytime and evening with 50% duty cycle during the nighttime
Heat Pump	CU-2	74	77	78	78	77	75	71	67	61	80	- Based on Manufacturers data - Assumed to operate continuously during the daytime and evening with 50% duty cycle during the nighttime
Heat Pump	CU-3	76	79	80	80	79	77	73	69	63	82	- Based on Manufacturers data - Assumed to operate continuously during the daytime and evening with 50% duty cycle during the nighttime
Heat Pump	CU-4	104	107	98	100	97	91	87	84	78	98	- Based on Manufacturers data - Assumed to operate continuously during the daytime and evening with 50% duty cycle during the nighttime
Exhaust Fan	Exhuast Fan	-	-	90	91	93	94	96	93	85	102	- Based on SLR historical data - Assumed to operate continuously during all times of the day
Make Up Air Unit	MUA	-	89	92	90	90	87	84	77	72	92	- Based on Manufacturers data - Assumed to operate continuously during all times of the day
Existing Kings Court PTACs												
PTAC	PTAC	-	78	74	72	66	61	57	53	52	69	- Based on SLR Historical Measurements - Assumed to operate continuously during the daytime and evening with 50% duty cycle during the nighttime - Includes assumed 5 dB reduction to meet guidelines in existing conditions
1 Columbia Existing Equipment												
HVAC	HVAC	80	83	84	84	83	81	77	73	67	86	- Based on SLR historical data - Assumed to operate continuously during the daytime and evening with 50% duty cycle during the nighttime
Cooling Tower	CT	102	105	105	102	99	95	92	89	81	101	- Based on SLR historical data - Assumed to operate continuously during the daytime and evening with 50% duty cycle during the nighttime
Emergency Generator	Egen	-	97	98	98	94	91	88	85	78	100	- Based on MECP requirement of 75 dBA @ 7 m for ECA expemption - Assumed to be tested for 1 hour during any time of day

	Directivity (dB) rotationally symmetrical								
	Frequency (Hz)								
Theta (°)	31.5	63	125	250	500	1000	2000	4000	8000
0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	2.0	2.0	2.0	2.3	2.0	2.0	2.0	2.0	2.0
30	1.0	1.0	1.0	1.7	1.0	1.0	1.0	1.0	1.0
45	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
60	-3.0	-3.0	-3.0	-3.0	-4.0	-5.0	-7.0	-8.0	-9.0
75	-6.5	-7.0	-7.5	-8.5	-10.5	-12.0	-14.5	-16.0	-17.5
90	-10.0	-11.0	-12.0	-14.0	-17.0	-19.0	-22.0	-24.0	-26.0
105	-10.3	-11.3	-12.7	-14.7	-17.7	-20.0	-23.3	-25.3	-27.3
120	-10.7	-11.7	-13.3	-15.3	-18.3	-21.0	-24.7	-26.7	-28.7
135	-11.0	-12.0	-14.0	-16.0	-19.0	-22.0	-26.0	-28.0	-30.0
150	-11.0	-12.0	-14.0	-16.0	-19.0	-22.0	-26.0	-28.0	-30.0
165	-11.0	-12.0	-14.0	-16.0	-19.0	-22.0	-26.0	-28.0	-30.0
180	-11.0	-12.0	-14.0	-16.0	-19.0	-22.0	-26.0	-28.0	-30.0

Attachment C – Figures

Peer Review Response

1 Columbia Street West

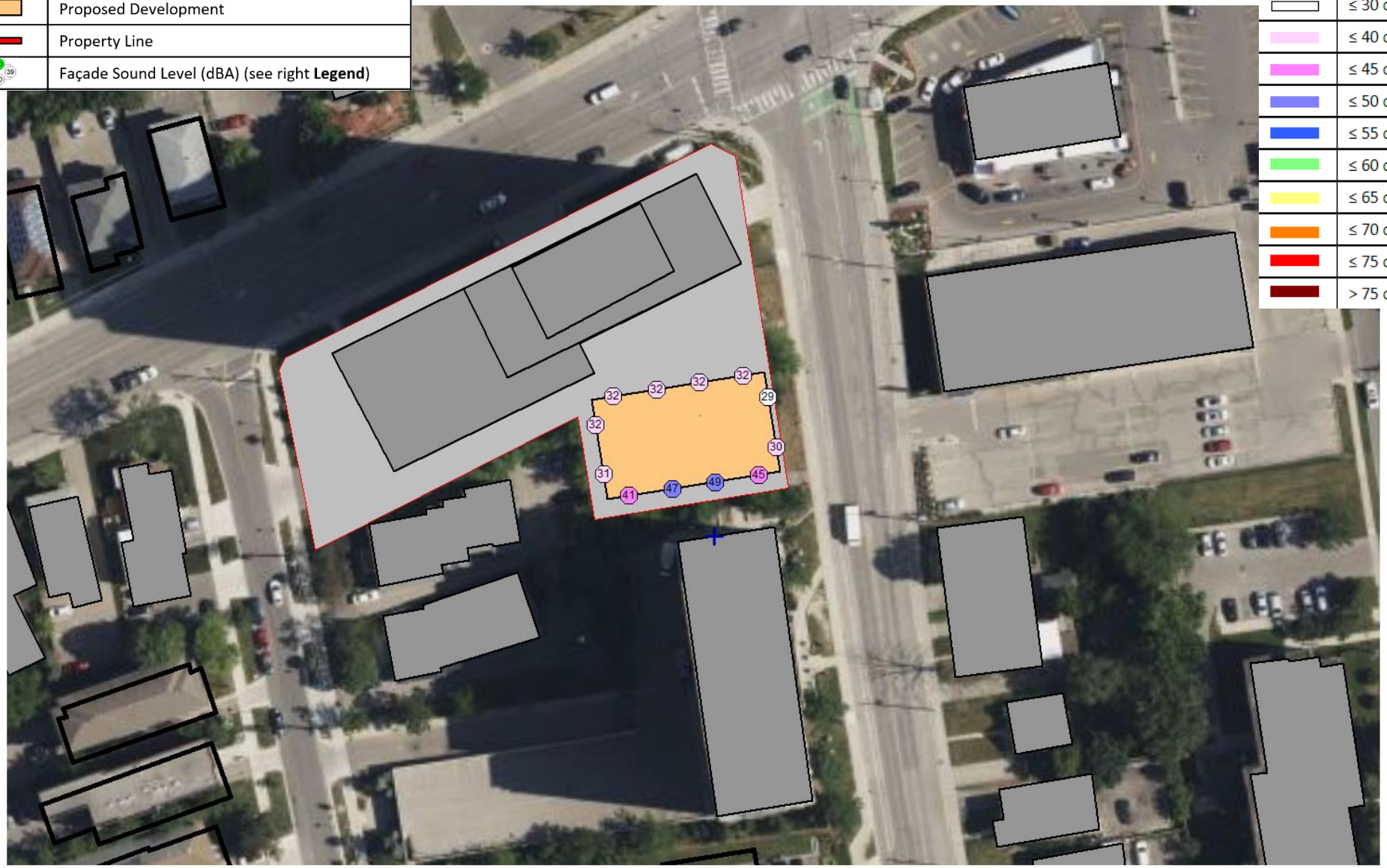
Studio Lamina Inc.

SLR Project No.: 241.30640.00000

April 8, 2025

Legend	
	Proposed Development
	Property Line
	Façade Sound Level (dBA) (see right **Legend**)

Legend (Sound Levels)	
	≤ 30 dBA
	≤ 40 dBA
	≤ 45 dBA
	≤ 50 dBA
	≤ 55 dBA
	≤ 60 dBA
	≤ 65 dBA
	≤ 70 dBA
	≤ 75 dBA
	> 75 dBA



STUDIO LIMINA INC.

1 COLUMBIA STREET

PREDICTED WORST-CASE SOUND LEVELS – KINGS COURT PTACS – DAYTIME/EVENING

True North

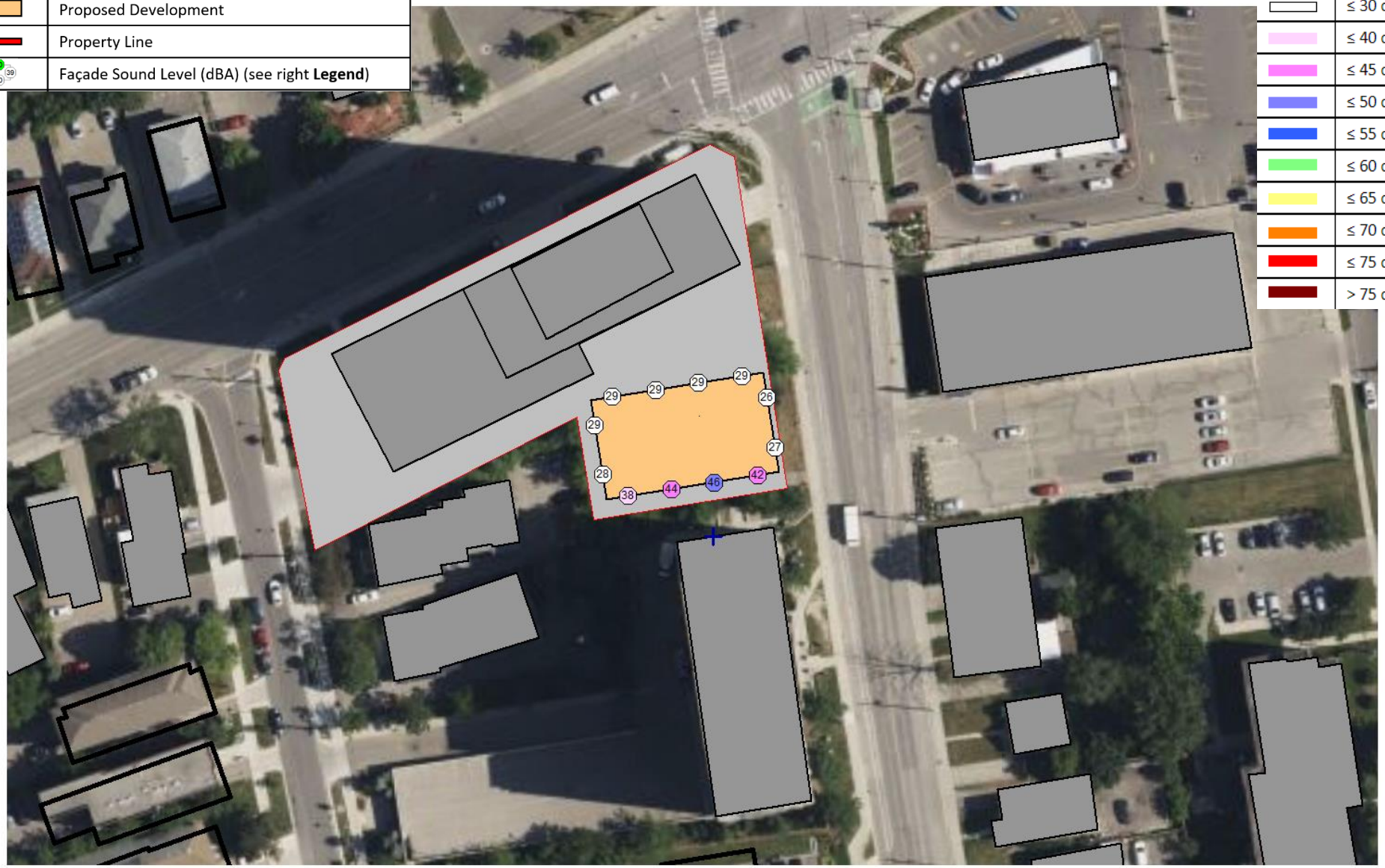
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Date: April 2025 Rev 1.0

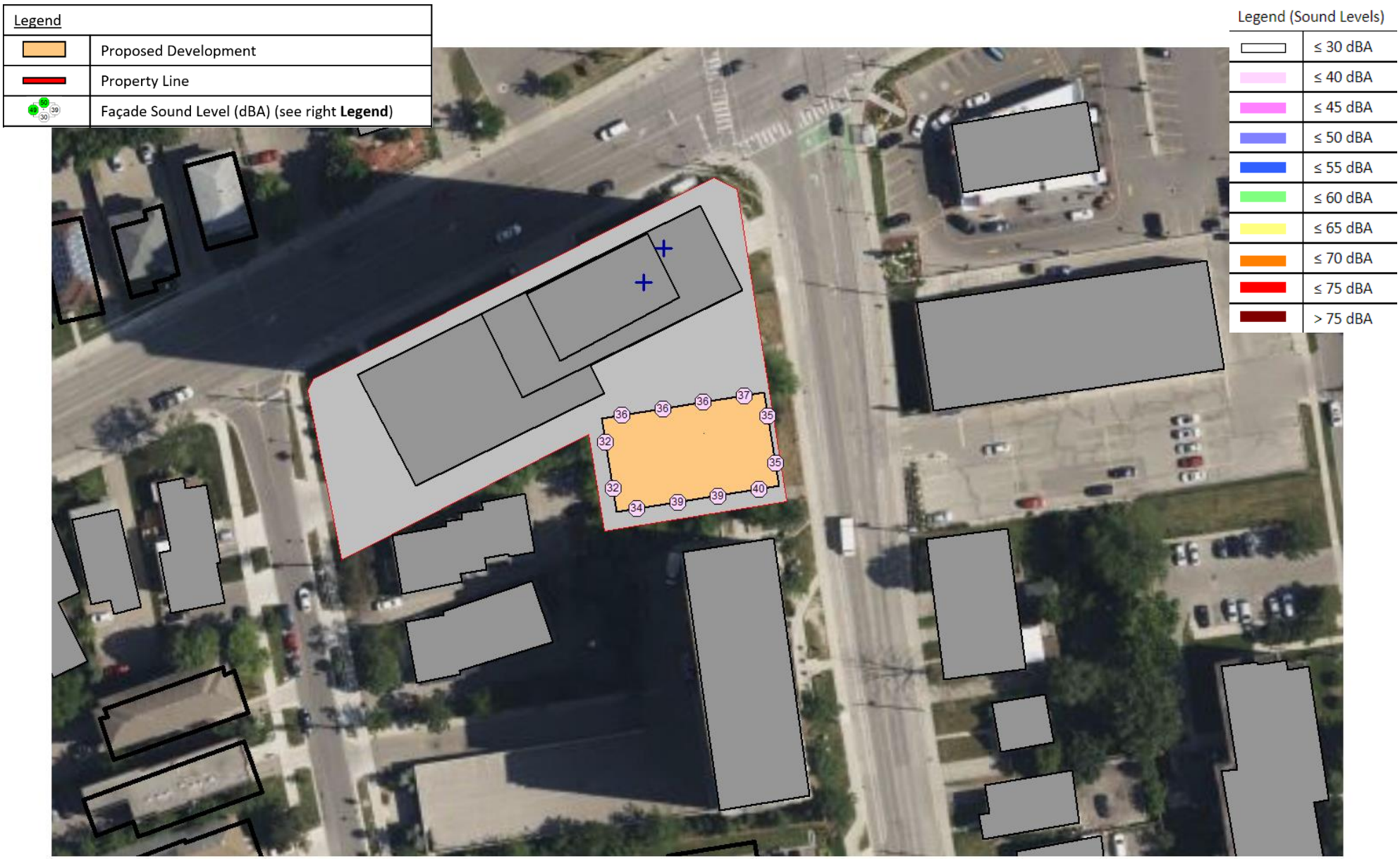
Project No. 241.30640.00000

Figure No. **C.1**

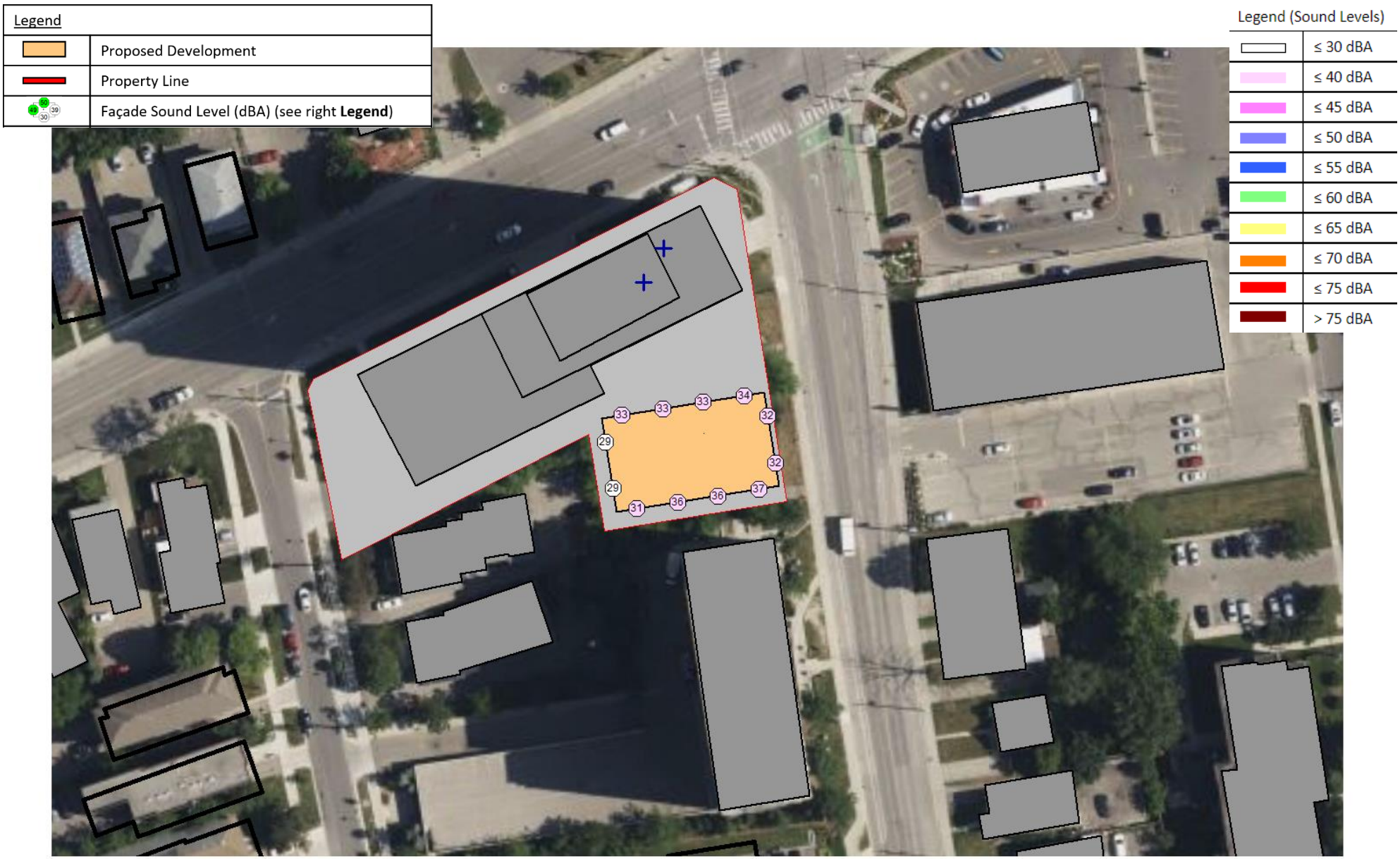
SLR



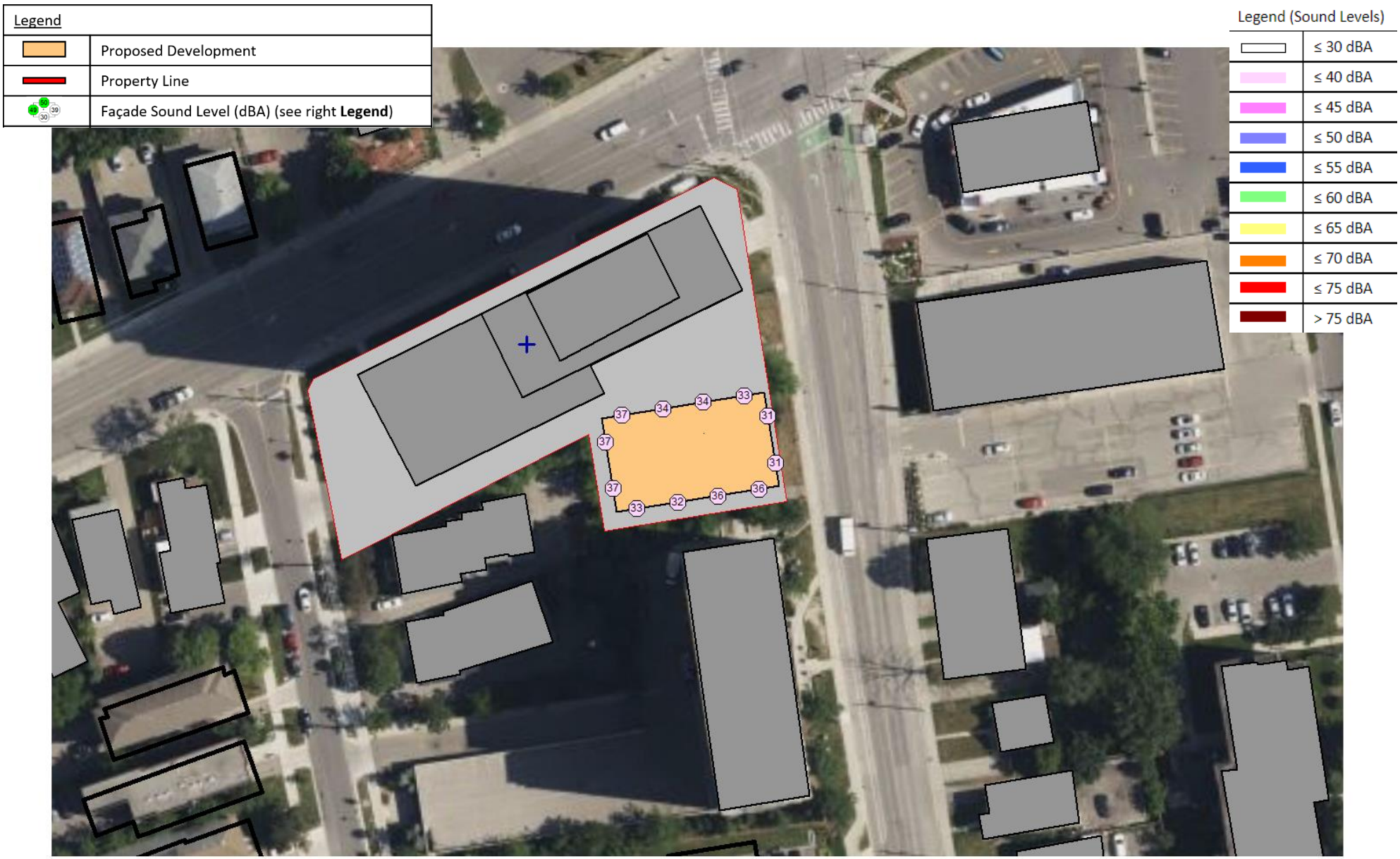
STUDIO LIMINA INC.	True North	Scale: 1:1000	METRES	SLR
1 COLUMBIA STREET		Date: April 2025 Rev 1.0	Figure No. **C.2**	
PREDICTED WORST-CASE SOUND LEVELS – KINGS COURT PTACS – NIGHTTIME		Project No. 241.30640.00000		



STUDIO LIMINA INC.	True North	Scale: 1:1000	METRES	SLR
1 COLUMBIA STREET		Date: April 2025 Rev 1.0	Figure No. **C.3**	
PREDICTED SOUND LEVELS – EXISTING 1 COLUMBIA – NON-EMERGENCY EQUIPMENT – DAYTIME/EVENING		Project No. 241.30640.00000		



STUDIO LIMINA INC.	True North	Scale: 1:1000	METRES	SLR
1 COLUMBIA STREET		Date: April 2025 Rev 1.0	Figure No. **C.4**	
PREDICTED SOUND LEVELS – EXISTING 1 COLUMBIA – NON-EMERGENCY EQUIPMENT – NIGHTTIME		Project No. 241.30640.00000		



STUDIO LIMINA INC.	True North	Scale: 1:1000	METRES	SLR
1 COLUMBIA STREET		Date: April 2025 Rev 1.0	Figure No. **C.5**	
PREDICTED SOUND LEVELS – EXISTING 1 COLUMBIA –EMERGENCY GENERATOR TESTING – DAYTIME/EVENING		Project No. 241.30640.00000		