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Environmental Noise Control Study

Proposed Commercial Development
2025 Mer Bleue Road - Ottawa

Prepared For

SmartREIT

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Report: PG4302-1

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1.0 Introduction

Paterson Group (Paterson) was commissioned by SmartREIT to conduct an environmental noise control study for the proposed commercial development to be located at 2025 Mer Bleue Road, in the City of Ottawa. For the purposes of the noise control study, both Phase 1 and Phase 2 of the proposed development have been analyzed simultaneously.

The objectives of the current study are to:

- ❑ Determine the primary noise sources from the site and compare the projected sound levels to guidelines set out by the Ministry of Environment and Climate Change (MOECC) and the City of Ottawa for the neighbouring site.
- ❑ Review the projected noise levels and offer recommendations regarding warning classes, construction materials or alternative sound barriers.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains our findings and includes acoustical recommendations pertaining to the design and construction of the subject development as they are understood at the time of writing this report.

This study has been conducted according to City of Ottawa document - Engineering Noise Control Guidelines (ENCG), dated January 2016, and the Ontario Ministry of the Environment Guideline NPC-300.

2.0 Background

It is understood that the proposed development will consist of several slab-on-grade buildings with associated parking and landscaped areas. There will also be two drive thru laneways (one in Phase 1 and one in Phase 2) located within of the proposed development.

The commercial development will not contain any noise sensitive receptors. Therefore, the analysis of this project is contained to the stationary noise sources that are located on the subject site and their effects on the neighbouring residential neighbourhood.

The closest noise-sensitive reception point to the subject site will be the residential dwellings located along the north side of Innes Road, to the north of the subject site. All other development within a 100 m radius of the proposed commercial development consists of other commercial buildings and associated parking lots.

3.0 Methodology and Noise Assessment Criteria

The City of Ottawa outlines three (3) sources of environmental noise that must be analyzed separately:

- ☐ Surface Transportation Noise
- ☐ Stationary Noise
 - ☐ new noise-sensitive development applications (noise receptors) in proximity to existing or approved stationary sources of noise, and
 - ☐ new stationary sources of noise (noise generating) in proximity to existing or approved noise-sensitive developments
- ☐ Aircraft noise

As previously discussed, since there are no noise sensitive receptors on the subject site, a surface transportation noise and aircraft noise analysis will not be required. However, since there are proposed stationary noise sources in proximity to existing noise-sensitive developments (the residential dwellings to the north), the following report will focus on stationary noise.

Stationary Noise

Stationary noise sources include sources or facilities that are fixed or mobile and can cause a combination of sound and vibration levels emitted beyond the property line. These sources may include commercial air conditioner units, generators and fans. Facilities that may contribute to stationary noise may include car washes, snow disposal sites, transit stations and manufacturing facilities.

The impact of stationary noise sources are directly related to the location of the subject site within the urban environment. The proposed development can be classified as Class 2 by provincial guidelines and outlined in the ENGC, meaning “a suburban areas of the City outside of the busy core where the urban hum is evident but within the urban boundary.”

Table 1 - Guidelines for Stationary Noise - Class 2		
Time of Day	Outdoor Point of Reception	Pane of Window
7:00-19:00	50	50
19:00-23:00	45	50
23:00-7:00	-	45
<input type="checkbox"/> Standards taken from Table 3.2a; Guidelines for Stationary Noise - Steady and Varying Sound		

4.0 Analysis

The proposed development is bordered to the north by Innes Road followed by residential dwellings. A sound barrier is located between Innes Road and the residential dwellings as a sound mitigation measure for the road noise. The proposed development is bordered to the west by Mer Bleue Road followed by commercial development. A commercial development also borders the site to the east, and a commercial development is proposed to be located to the south.

The proposed development will include four proposed buildings within Phase 1 and three proposed buildings within Phase 2. At the time of writing this report, the specifics were not known for any roof top units that will be required.

Three loading zones were noted for the proposed development. It is assumed that the loading docks will be used occasionally for retail stores. It is noted in Ministry of the Environment (MOE) Publication LU-131 entitled "Noise Assessment Criteria in Land Use Planning" that the "occasional movement of vehicles on the property such as infrequent delivery of goods to convenience stores and fast food restaurants" not be included in a stationary noise analysis. Therefore, no delivery trucks were included in this analysis.

There are two (2) drive-thru laneways located within the proposed development. There are two (2) noise sources associated with a drive-thru: idling cars and the speaker. It was also outlined in the MOE document LU-131 that the "operation of signaling devices including but not limited to...production, reproduction, or amplification of any similar sounds by reproduction". Therefore, the analysis will focus on the sound resulting from idling cars. A worst case scenario for the drive thru laneway would consist of 9 cars idling at one time during the day. It is assumed that there will be no idling cars in the evening.

Predictive noise analysis was completed using Predictor - LimA version 11.21. Predictor-LimA is a state-of-the-art environmental noise modeling software using International Standards Organization (ISO) standard 9613 parts 1 and 2.

As previously noted, the specifics for the roof top units on the commercial buildings were not known. Therefore, a standard “unit”, with typical power levels specified within Predictor-LimA was utilized for the analysis. The power level for idling cars was manually inputted based on typical values identified for idling cars. The following table outlines the equipment sound power levels in decibels (dBA) that was used in the analysis.

Table 2 - Equipment Sound Power Levels (dBA)									
Description	Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	Total
Unit	44.7	53.9	62.8	65.2	72.6	71.3	61.6	4.8	75.87
Idling Car	n/a	n/a	n/a	n/a	82	n/a	n/a	n/a	82

It should be noted that the idling cars within the drive thru is the primary noise source and it is not expected that the roof top units will influence the results.

The analysis was divided into two (2) time categories - daytime and night. During the day, it is assumed that there will be a maximum of nine (9) idling cars and the roof top units will be working at 100% capacity. This would represent the worst case scenario during the day. During the evening, it is anticipated that there will be no idling cars at the drive through, and the roof top units will be working at 50% capacity.

For the analysis, it is assumed that the terrain is relatively flat. A hard, reflective surface was utilized for the proposed development and the neighbouring roads. A residential area with grass and an absorptive surface was input for the existing houses. A sound barrier was noted to be located between Innes Road and the existing residential houses. This sound barrier, although used in the modeling software, was not considered for the analysis, which represents a worst-case scenario. An additional analysis was performed with the sound barrier in place to compare the results.

All contours were completed for a 1.5 m height above the ground surface. Additionally, no meteorological corrections was utilized for the analysis.

5.0 Results

The primary descriptors are the one hour equivalent sound level, L_{eq} . The results (without a sound barrier) are illustrated graphically in the Figure 1 - L_{den} Noise Contours, Figure 2 - Daytime Noise Contours and Figure 3 - Nighttime Noise Contours enclosed in Appendix 2. The analysis was completed for the entire development, including the residential dwellings to the north.

Table 3 and 4 below presents the results of the one hour equivalent sound level at various reception points along pane of windows on the ground floor and second floor in addition to the back yard.

Table 3 - One Hour Equivalent Sound Level, No Barrier						
Name	Description	Height (m)	Day (dBA)	Night (dBA)	L_{den} (dBA)	Meets ENCG
REC-1	Back Yard	1.5	48.5	39.8	50.2	Yes
REC-2	Back Yard	1.5	48.3	39.7	50	Yes
REC-3	Back Yard	1.5	49.9	42.3	51.7	Yes
REC-4	Back Yard	1.5	47.9	40.1	49.9	Yes
REC-5	Back Yard	1.5	47.8	38.9	49.4	Yes
REC-6	Pane of Window	1.5	45.8	37.4	47.6	Yes
REC-6	Pane of Window	4.5	46.1	37.5	47.8	Yes
REC-7	Pane of Window	1.5	47.7	39.7	49.6	Yes
REC-7	Pane of Window	4.5	47.8	39.9	49.8	Yes
REC-8	Pane of Window	1.5	46.2	37.8	48	Yes
REC-8	Pane of Window	4.5	46.3	37.8	48	Yes
REC-9	Pane of Window	1.5	47.1	38.7	48.9	Yes
REC-9	Pane of Window	4.5	47.3	38.8	49.1	Yes
REC-10	Pane of Window	1.5	45.1	36.2	46.8	Yes
REC-10	Pane of Window	4.5	45.4	36.7	47.1	Yes

Table 4 - One Hour Equivalent Sound Level, Including Existing Barrier						
Name	Description	Height (m)	Day (dBA)	Night (dBA)	L_{den} (dBA)	Meets ENCG
REC-1	Back Yard	1.5	37.9	29.6	39.7	Yes
REC-2	Back Yard	1.5	37.6	29.2	39.4	Yes
REC-3	Back Yard	1.5	39.1	31.8	41.3	Yes
REC-4	Back Yard	1.5	35.9	28.1	37.9	Yes
REC-5	Back Yard	1.5	37	28	38.6	Yes
REC-6	Pane of Window	1.5	35.9	27.6	37.8	Yes
REC-6	Pane of Window	4.5	46.1	37.5	47.8	Yes
REC-7	Pane of Window	1.5	37.4	29.8	39.4	Yes
REC-7	Pane of Window	4.5	47.8	39.9	49.8	Yes
REC-8	Pane of Window	1.5	37	29.1	38.9	Yes
REC-8	Pane of Window	4.5	46.3	37.8	48	Yes
REC-9	Pane of Window	1.5	37	29	38.9	Yes
REC-9	Pane of Window	4.5	47.3	38.8	49.1	Yes
REC-10	Pane of Window	1.5	36	27.8	37.8	Yes
REC-10	Pane of Window	4.5	45.4	36.7	47.1	Yes

As it is observed in Figure 1, Figure 2 and Figure 3, the drive thru laneway is the primary noise source of the development. It is also noted that the noise contours at the residential buildings and within the back yard falls are below the MOECC threshold values. Therefore, the proposed development is considered acceptable from a noise attenuation perspective.

6.0 Statement of Limitations

The recommendations made in this report are in accordance with our present understanding of the project. Our recommendations should be reviewed when the project drawings and specifications are complete.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than the SmartREIT or their agent(s) is not authorized without review by this firm for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.


Stephanie A. Boisvenue, P.Eng.



David J. Gilbert, P.Eng.



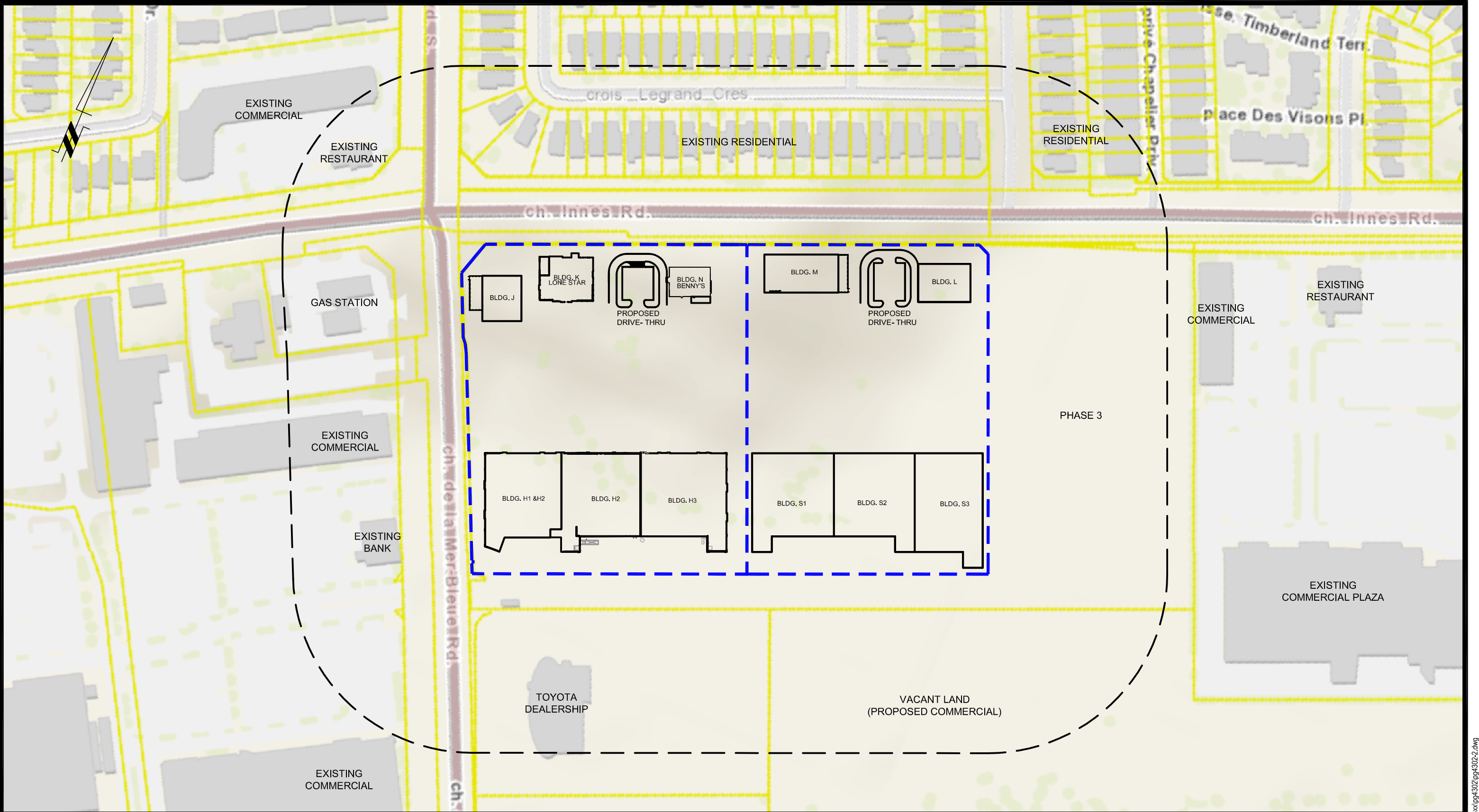
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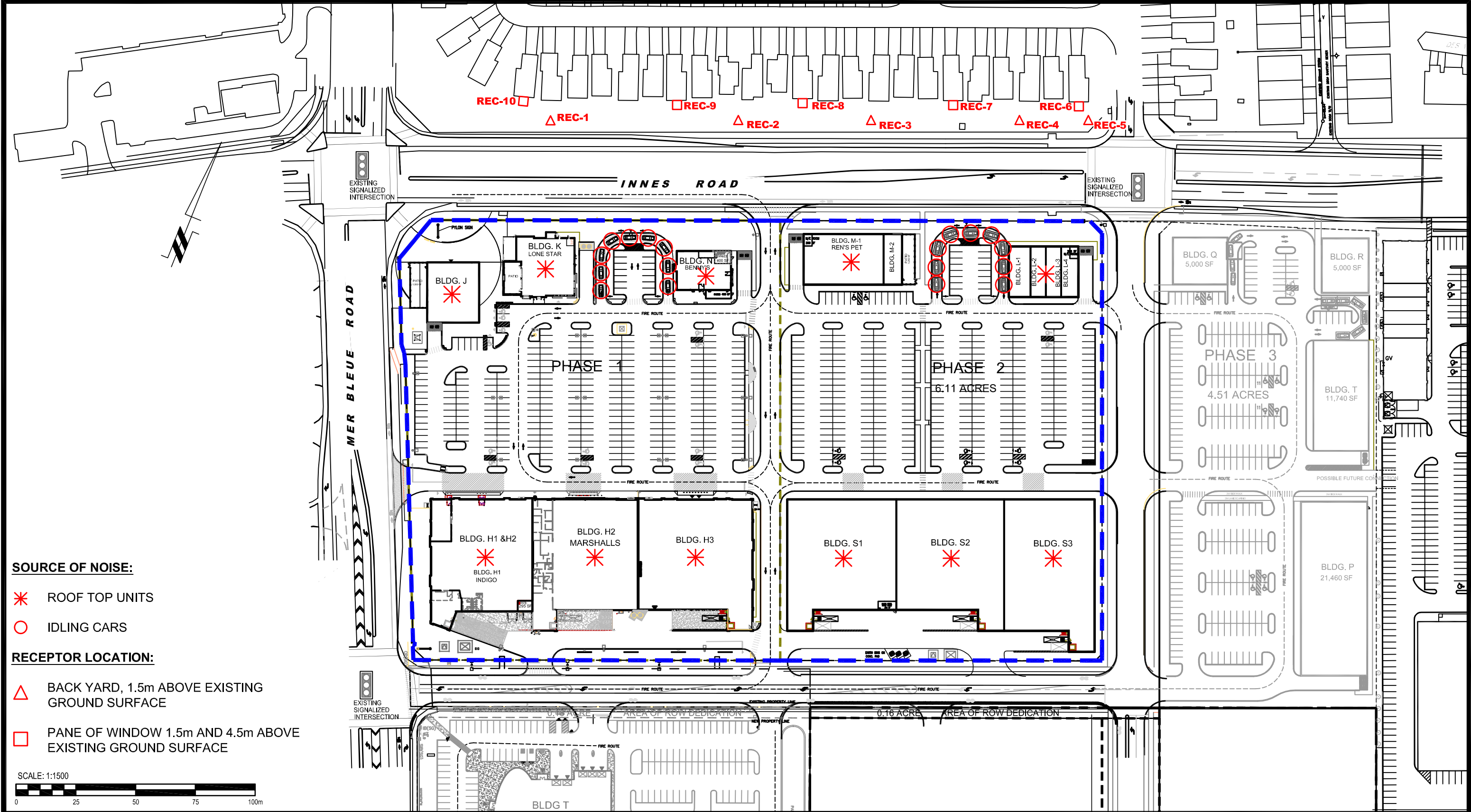
APPENDIX 1

DRAWING PG4302-1 - SITE PLAN

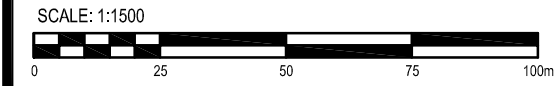
DRAWING PG4302-2 - RECEPTOR AND SOURCE LOCATION PLAN



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						Drawn by: <div>RCG</div>		Report No.: <div>PG4302-1</div>	
						Checked by: <div>SB</div>		Dwg. No.: <div>PG4302-1</div>	
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	NO.	REVISIONS	DATE	INITIAL					



- SOURCE OF NOISE:**
- * ROOF TOP UNITS
 - IDLING CARS
- RECEPTOR LOCATION:**
- △ BACK YARD, 1.5m ABOVE EXISTING GROUND SURFACE
 - PANE OF WINDOW 1.5m AND 4.5m ABOVE EXISTING GROUND SURFACE



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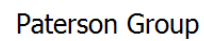
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APPENDIX 2

FIGURE 1 - L_{den} NOISE CONTOURS

FIGURE 2 - DAYTIME NOISE CONTOURS

FIGURE 3 - NIGHTTIME NOISE CONTOURS



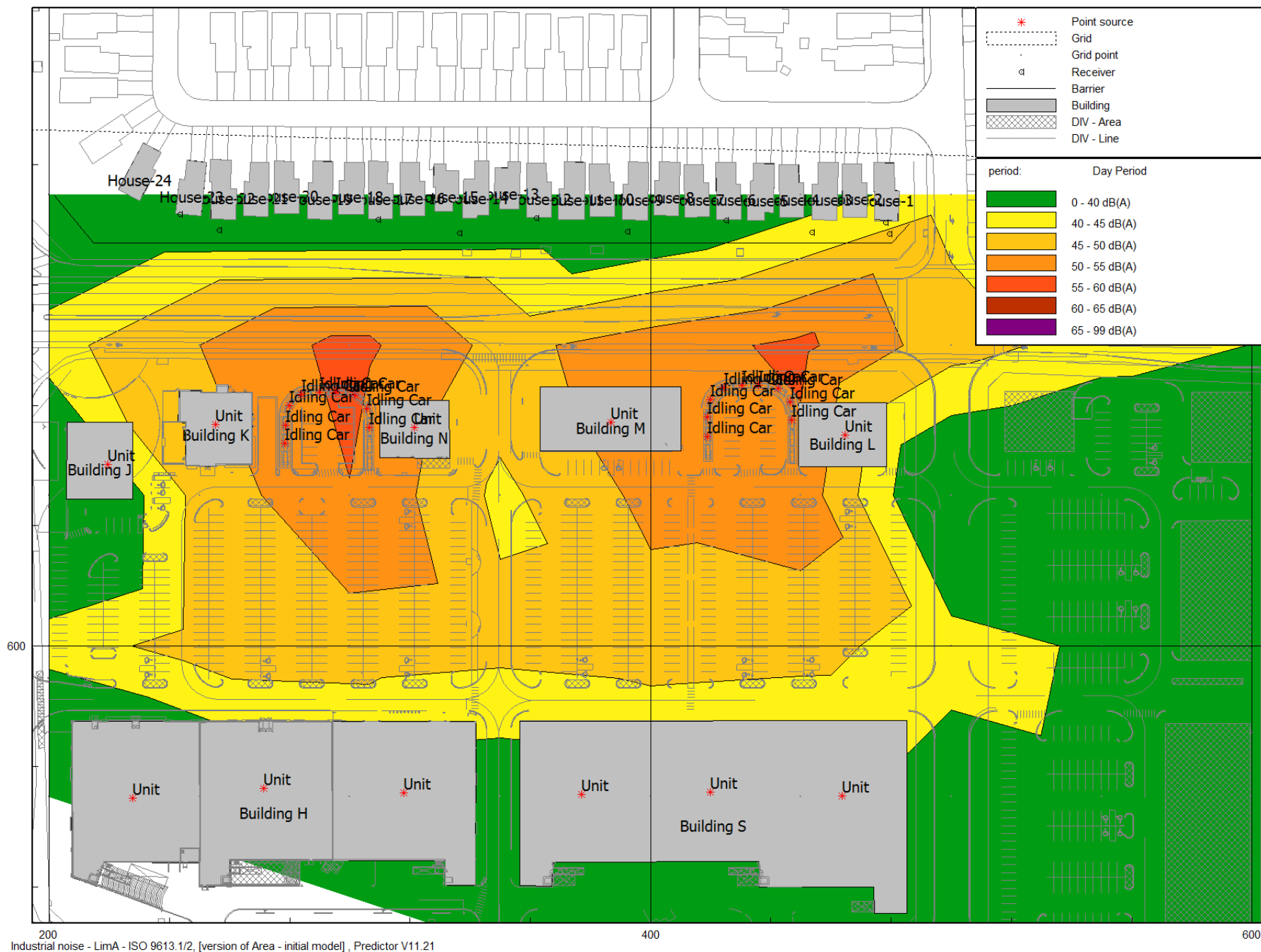


Figure 2 - Daytime Noise Contours

