

PHASE 1 NOISE FEASIBILITY STUDY

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975 Gladstone Avenue
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Client:

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CBN Gladstone Facility Expansion
Canadian Bank Note Company, Limited
975 Gladstone Avenue
Ottawa, Ontario

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EXECUTIVE SUMMARY

In accordance with the Ontario Ministry of the Environment, Conservation and Parks (MECP) Environmental Noise Guideline and the City of Ottawa Environmental Noise Control Guidelines, this report presents a Phase 1 Noise Feasibility Study for the proposed expansion of the Canadian Bank Note Company, Limited operational and logistics facility located at 975 Gladstone Avenue in Ottawa, Ontario.

This facility and its associated activities are considered to be a “Stationary Source” located within a Class 1 urban area, with primarily residential land uses south and west of the site, and industrial land uses to the north and east. The facility currently complies with provincial requirements for environmental noise emissions, confirmed most recently in an Acoustic Assessment Report reporting on the status as of 31 December 2019.

The proposed expansion project would involve the addition of new rooftop HVAC equipment. This report presents an initial analysis of the likely changes to environmental noise emissions due to the expansion project. Recommendations are provided to ensure that environmental noise requirements are properly accounted for as part of project planning and execution. It is concluded that the expansion project can be completed in a manner that ensures ongoing compliance with MECP and City of Ottawa requirements for noise emissions from a Stationary Source.

1.0 INTRODUCTION / BACKGROUND INFORMATION

In accordance with the Ontario Ministry of the Environment, Conservation and Parks (MECP) Environmental Noise Guideline and the City of Ottawa Environmental Noise Control Guidelines (ENCG), this report presents a Phase 1 Noise Feasibility Study for the proposed expansion of the Canadian Bank Note Company, Limited (CBN) operational and logistics facility located at 975 Gladstone Avenue in Ottawa, Ontario (the “Gladstone facility”).

CBN, headquartered at 145 Richmond Road in Ottawa, specializes in the production of secure-printed products. The Gladstone facility is bordered by single-storey and two-storey houses to the south across Gladstone Avenue, to the west across Breezehill Avenue North, and to the north across Laurel Street.

In accordance with provincial guideline NPC-300, the impact of operating this facility has been assessed against MECP exclusion limits for a Class 1 area in a recent Acoustic Assessment Report, current to 31 December 2019. It was concluded that the facility complied with the applicable sound level limits. While there have been no changes to worst-case facility noise emissions since 31 December 2019, a number of outdoor equipment changes are planned for implementation in the near future. These near-future changes have been verified to ensure ongoing compliance with noise limits, in accordance with CBN's obligations to the MECP.

A Site Plan showing the proposed expansion is included in Appendix A. There are two main components:

- 1) an addition meant for storage and transport; and
- 2) an interior truck loading bay.

In both cases, the uses are commercial in nature. There are therefore no indoor noise requirements. There are no outdoor amenity areas associated with this proposal.

Site Plans and figures representing the current facility, its noise sources, and noise emission modelling are provided in Appendix B.

1.1 REFERENCES

This study is based in part on information presented in the following documents.

- Acoustic Assessment Report Update, prepared by Integral DX Engineering Ltd., dated 31 March 2019 and reporting on the status of Gladstone facility noise emissions as of 31 December 2019.
- 27375-003 P SP (1), Proposed Addition Site Plan, plotted December 18 2019, included in Appendix A with additional markup.

Reference is also made to the following documents:

- 1) City of Ottawa Environmental Noise Control Guidelines, January 2016 (ENCG).
- 2) MECP publication NPC-300: Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning, updated 24 August 2017.

In this report:

- Unless otherwise indicated, noise levels are reported in terms of sound pressure levels (“SPL”) in decibels, referenced to 2×10^{-5} pascals.

1.2 PURPOSES

The purposes of this Noise Feasibility Study are

1. to explore whether the proposed expansion project is likely to result in environmental noise issues at the Gladstone facility; and
2. to provide general recommendations to manage environmental noise issues during planning and execution of the expansion project.

1.3 SCOPE

This report presents a study of the issues, as required per Part 4, Section 3.1 of the ENCG.

The scope of this report is limited to the issues described above, and makes no claim as to the validity of the noise level criteria or their ability to satisfy the expectations of all persons.

2.0 CURRENT ENVIRONMENTAL NOISE EMISSIONS SUMMARY

2.1 NOISE IMPACT SUMMARY AS OF 31 DECEMBER 2019

The most recent Acoustic Assessment Report (AAR) for the Gladstone facility is dated 31 March 2020, and reported on the status of worst-case noise emissions as of 31 December 2019. The report states that the facility, at that time (i.e. without the proposed expansion), complied with ENCG and NPC-300 noise level limits. This section provides a summary of noise impacts per the AAR.

The provincial exclusion limits for a Class 1 urban environment set the sound level limits at all points of reception in the vicinity of the Gladstone facility. The predicted noise levels at points of reception due to the operation of all significant sources of steady and varying sound at 975 Gladstone Avenue, excluding emergency equipment, are summarized in Table 1 below. All points of reception are identified on Figure B.1 and Figure B.2 (Appendix B). There are no sources of impulsive sound associated with the facility.

Table 1: Summary of Non-Emergency Equipment Noise Impacts at Each Receptor (Current)

Receptor	Calculated Levels (dBA)		Sound Level Limits (dBA)		Sound Level Limit met?	
	Daytime / Evening	Nighttime	Daytime / Evening	Nighttime	Daytime / Evening	Nighttime
RW1	39.2	36.8	50.0	45.0	Yes	Yes
RW2	39.4	36.6	50.0	45.0	Yes	Yes
RW3	39.1	34.4	50.0	45.0	Yes	Yes
RW4	41.4	38.6	50.0	45.0	Yes	Yes
RW5	39.8	38.7	50.0	45.0	Yes	Yes
RW6	36.8	35.8	50.0	45.0	Yes	Yes
RW7	39.3	38.6	50.0	45.0	Yes	Yes
RW8	41.1	41.0	50.0	45.0	Yes	Yes
RW9	37.7	37.5	50.0	45.0	Yes	Yes
RW10	41.0	41.0	50.0	45.0	Yes	Yes
RW11	43.9	43.9	50.0	45.0	Yes	Yes
RW12	42.3	37.5	50.0	45.0	Yes	Yes
RW13	37.7	29.3	50.0	45.0	Yes	Yes
RW14	43.0	43.0	50.0	45.0	Yes	Yes

Receptor	Calculated Levels (dBA)		Sound Level Limits (dBA)		Sound Level Limit met?	
	Daytime / Evening	Nighttime	Daytime / Evening	Nighttime	Daytime / Evening	Nighttime
RS1	43.4	43.3	50.0	45.0	Yes	Yes
RS2	42.3	42.3	50.0	45.0	Yes	Yes
RS3	43.9	43.8	50.0	45.0	Yes	Yes
RS4	44.0	43.9	50.0	45.0	Yes	Yes
RS5	44.9	44.2	50.0	45.0	Yes	Yes
RS6	44.5	43.7	50.0	45.0	Yes	Yes
RVL4	40.8	36.0	50.0	45.0	Yes	Yes
RVL5	40.9	36.0	50.0	45.0	Yes	Yes
RN1	41.9	35.8	50.0	45.0	Yes	Yes

The AAR also includes an assessment of noise levels due to routine testing of emergency equipment, which shows noise levels well below the applicable sound level limits at all receptors. There are no additional emergency equipment being installed as part of the proposed expansion project.

2.2 CHANGES SINCE 31 DECEMBER 2019

There have been no changes to worst-case facility noise emissions since 31 December 2019. Several projects (other than the proposed expansion) are in-process which will change worst-case noise emissions in the near future: a total of seven new outdoor noise sources will be added to the facility. All new equipment has been selected with noise control as required to ensure ongoing compliance with the applicable sound level limits in worst-case scenarios. Predicted noise levels including these near-future changes are presented in Table 2.

Table 2: Summary of Non-Emergency Equipment Noise Impacts at Each Receptor, including Near-Future Equipment Changes

Receptor	Calculated Levels (dBA)		Sound Level Limits (dBA)		Sound Level Limit met?	
	Daytime / Evening	Nighttime	Daytime / Evening	Nighttime	Daytime / Evening	Nighttime
RW1	39.7	36.6	50.0	45.0	Yes	Yes
RW2	40.5	36.9	50.0	45.0	Yes	Yes
RW3	37.9	35.2	50.0	45.0	Yes	Yes
RW4	42.9	39.2	50.0	45.0	Yes	Yes

Receptor	Calculated Levels (dBA)		Sound Level Limits (dBA)		Sound Level Limit met?	
	Daytime / Evening	Nighttime	Daytime / Evening	Nighttime	Daytime / Evening	Nighttime
RW5	42.5	39.3	50.0	45.0	Yes	Yes
RW6	39.5	36.6	50.0	45.0	Yes	Yes
RW7	42.2	39.1	50.0	45.0	Yes	Yes
RW8	42.2	41.4	50.0	45.0	Yes	Yes
RW9	39.4	38.0	50.0	45.0	Yes	Yes
RW10	41.9	41.4	50.0	45.0	Yes	Yes
RW11	44.6	44.4	50.0	45.0	Yes	Yes
RW12	42.1	38.3	50.0	45.0	Yes	Yes
RW13	40.8	30.2	50.0	45.0	Yes	Yes
RW14	43.4	43.3	50.0	45.0	Yes	Yes
RS1	43.6	43.5	50.0	45.0	Yes	Yes
RS2	42.7	42.6	50.0	45.0	Yes	Yes
RS3	44.4	44.4	50.0	45.0	Yes	Yes
RS4	44.5	44.4	50.0	45.0	Yes	Yes
RS5	45.3	45.0	50.0	45.0	Yes	Yes
RS6	44.8	44.5	50.0	45.0	Yes	Yes
RVL4	41.6	40.8	50.0	45.0	Yes	Yes
RVL5	41.7	40.9	50.0	45.0	Yes	Yes
RN1	41.6	38.7	50.0	45.0	Yes	Yes

All planned changes discussed above are accounted for in Section 3.0. Appendix B provides site plans showing the locations of noises sources, points of reception, nearby residences, and grade elevations.

3.0 PROPOSED EXPANSION PROJECT

3.1 CBN RESPONSIBILITIES

CBN has been granted an Environment Compliance Approval certificate, permitting the operation of the Gladstone facility. It is CBN's responsibility to ensure that compliance with NPC-300 sound level limits is maintained following any changes to noise emissions from the site.

3.2 INITIAL ASSESSMENT OF ENVIRONMENTAL NOISE IMPACTS

The expansion project will include new HVAC-related noise sources, to be located on the rooftop of the proposed addition. No other outdoor noise sources (e.g. due to interior processes ducted through the building) are contemplated.

At this stage of the design process, the equipment has not been selected. Integral DX Engineering Ltd. maintains an acoustic model of the Gladstone facility in conformance with NPC-300 requirements. This acoustic model was used to estimate maximum permissible sound power levels for the new equipment: the proposed building addition was added, and a single point source was included at 2m above the centre of its roof. This point source (location shown in Appendix A) is representative of the combined sound power of all new equipment. The sound power level curve of a Carrier 39M Central Air Handler, size 06W unit was chosen as an approximation given the type of equipment that are anticipated. The sound power level was increased equally in all octave bands until the daytime and nighttime limits were reached at the worst-case point of reception.

The results indicate maximum allowable A-weighted sound power levels of 93 dBA during the daytime, and 87 dBA during the nighttime. Appendix B includes sound level contour plots 4.5m above grade for daytime and nighttime emissions which include all current and near-future noise sources, as well as the representative point source for the expansion project.

It is likely that all new outdoor HVAC equipment can be selected to achieve lower combined daytime and nighttime sound power levels. Potential noise control options include low noise equipment (low-noise and/or speed-limited fans, compressor wraps, etc.), alternative equipment placement on the roof (i.e. farther from worst-case points of reception), and/or local noise barriers for some equipment.

4.0 SUMMARY, CONCLUSION, AND RECOMMENDATIONS

A previous AAR written for the Gladstone facility confirmed that, as of 31 December 2019, the site complied with ENCG and NPC-300 environmental noise emissions requirements as a stationary noise source. There have been no changes to worst-case noise emissions since 31 December 2019. Near-future equipment changes (not associated with the expansion project) are in-process, which have been designed to ensure that compliance with noise limits is maintained.

The proposed expansion project will result in additional environmental noise due to new outdoor HVAC equipment. Detailed acoustic analysis will be required throughout the project design stage to ensure ongoing compliance with environmental noise limits. A preliminary analysis indicates that combined sound power levels for all new expansion project equipment of up to 93 dBA during the daytime and 87 dBA during the nighttime could be accommodated without creating noise excesses at existing receptors. It is expected that equipment can be selected with lower combined sound power levels. Multiple options will be available for noise control as required.

We conclude that the proposed expansion project at the Gladstone facility can be completed in a manner that ensures ongoing compliance with environmental noise emissions per MECP and City of Ottawa requirements at all nearby points of reception.

4.1 RECOMMENDATIONS

We provide the following recommendations to manage changes to facility noise emissions as a result of the proposed expansion.

1. All new equipment selections shall be made with consideration for environmental noise emissions. This shall include acoustic modelling of proposed equipment based on manufacturer-reported noise levels.
2. Should acoustic modelling show possible environmental noise issues, options to reduce noise emissions shall be investigated, potentially including alternative (quieter) equipment selections, optimized equipment locations (e.g. away from worst-case points of reception), and/or local noise control (noise barriers, silencers, acoustic wraps, etc.).

3. As part of equipment commissioning, all new equipment noise levels shall be measured to confirm actual noise levels correspond to manufacturer-reported levels.

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20 May 2020

This Phase 1 Noise Feasibility Study was prepared by Integral DX Engineering for the account of Canadian Bank Note Company, Limited. The material in it reflects Integral DX Engineering's best judgement in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibilities of such third parties. Integral DX Engineering accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Attachments:

- Appendix A: Gladstone Expansion Site Plan with Markup
- Appendix B: Site Plans & Noise Contour Plots

APPENDIX A: GLADSTONE EXPANSION SITE PLAN WITH MARKUP

(attachment to Integral DX Engineering Ltd. report dated 20 May 2020)

APPENDIX B: SITE PLANS & NOISE CONTOUR PLOTS

(attachment to Integral DX Engineering Ltd. report dated 20 May 2020)

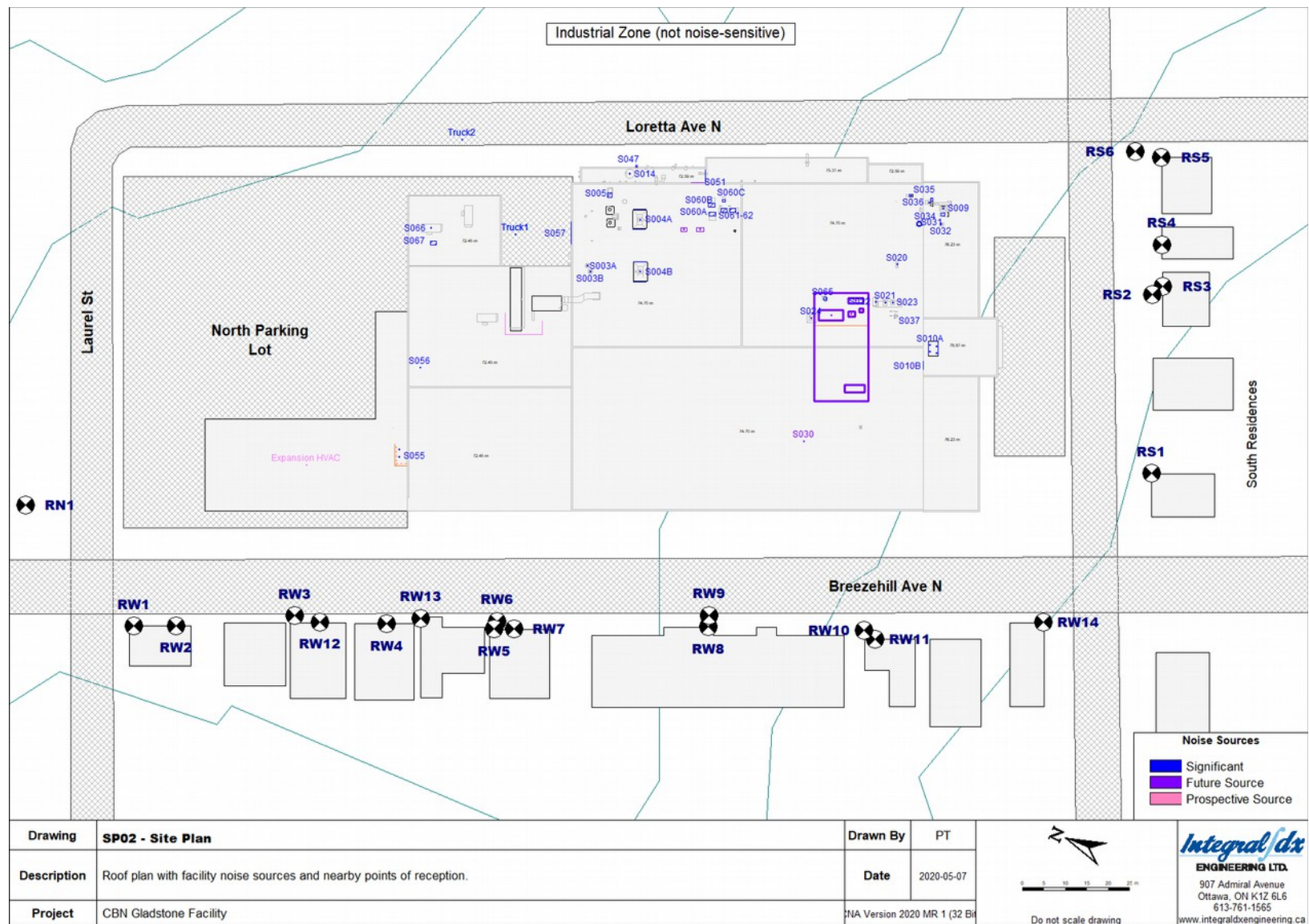


Figure B.1: Site Plan of CBN Gladstone Facility Showing Location of Noise Sources (Current and Planned Sources, and Upper-Limit Point Source for the Proposed Expansion), Receptors, and Nearby Residences

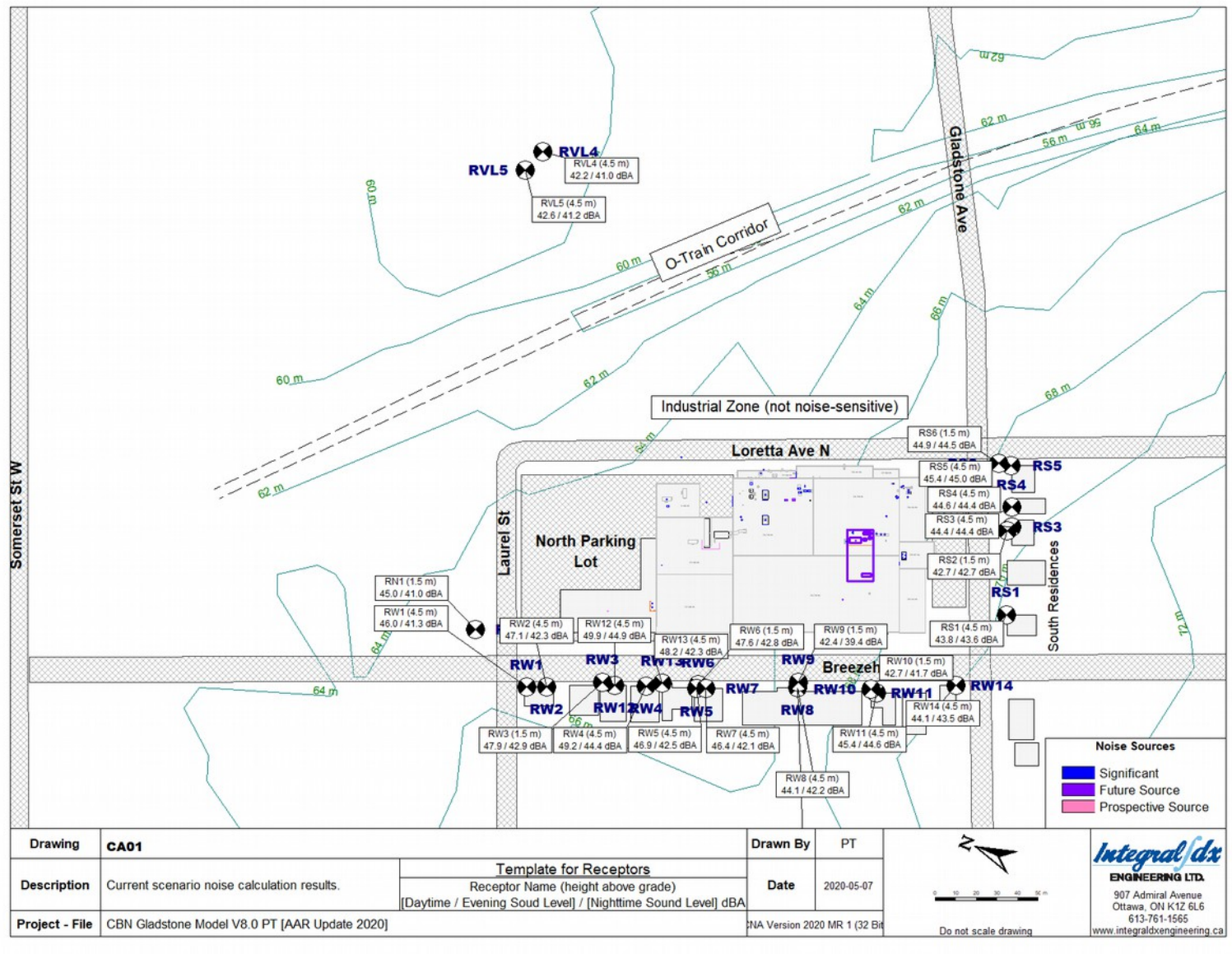


Figure B.2: Calculation Summary at Receptors (Current and Planned Sources, and Upper-Limit Point Source for the Proposed Expansion). Grade Elevations are also Shown.

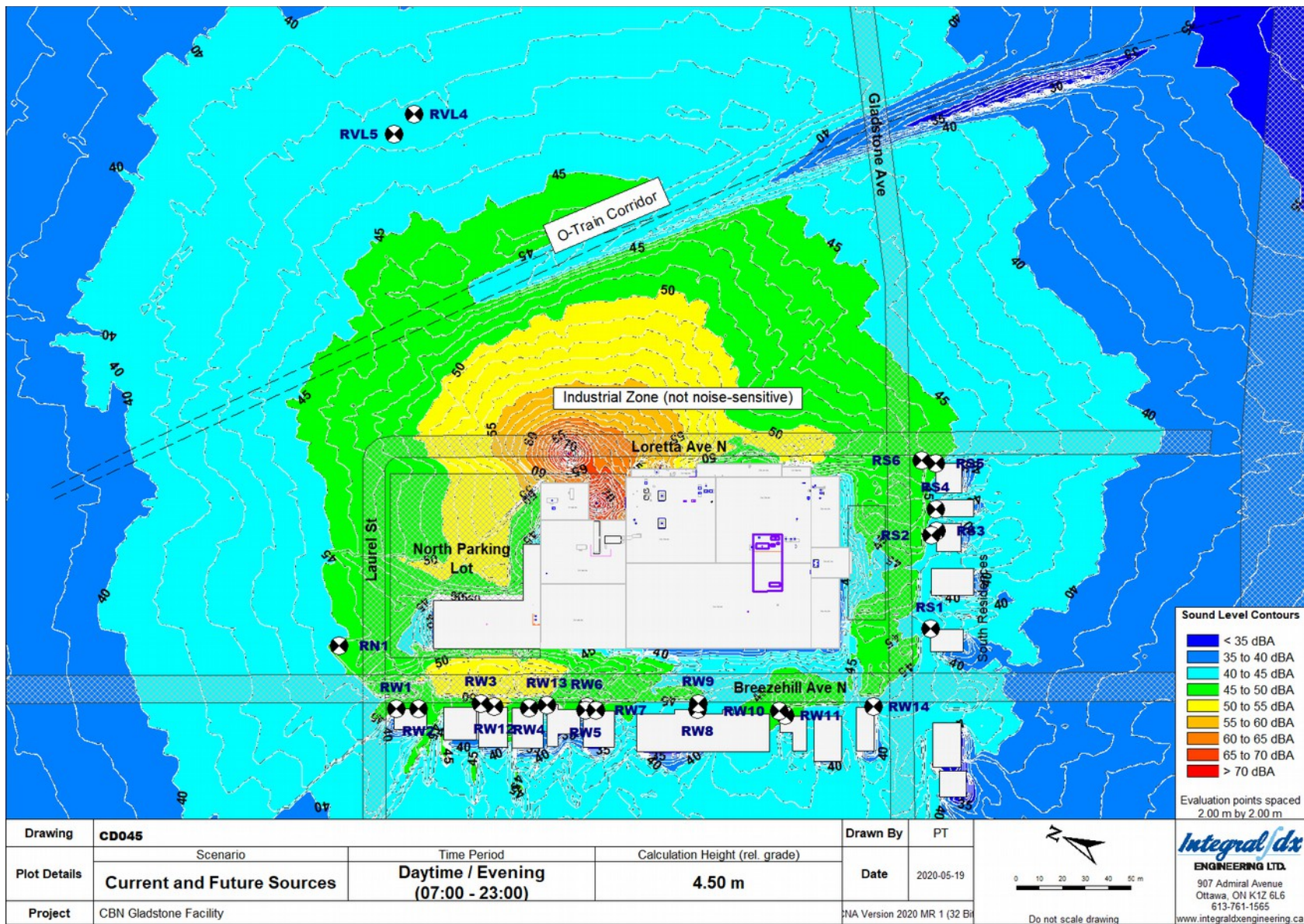


Figure B.3: Daytime Noise Contour Plot – Includes Current and Planned Sources, and Upper Limit Point Source for the Proposed Expansion

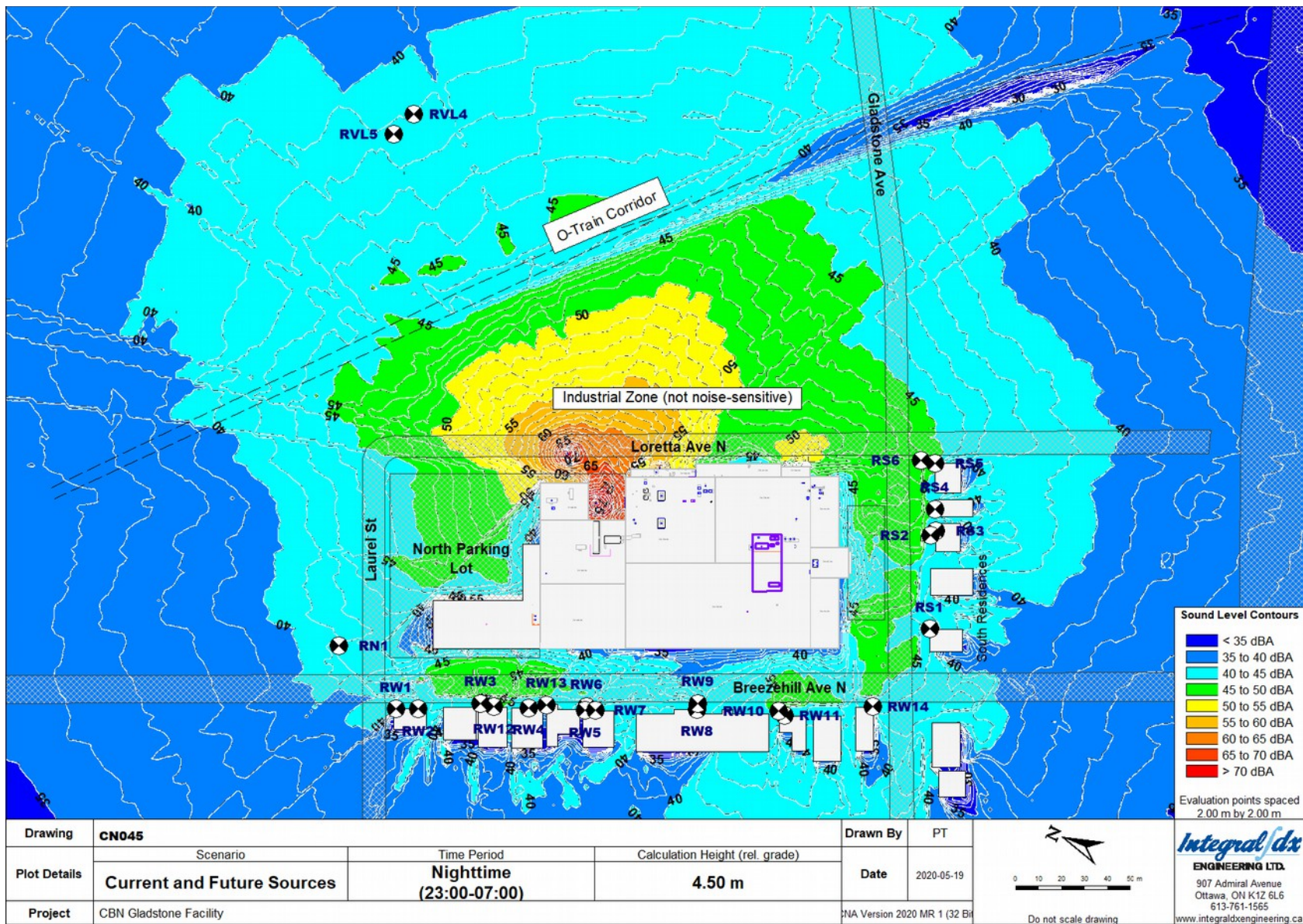


Figure B.4: Nighttime Noise Contour Plot – Includes Current, and Planned Sources, and Upper-Limit Point Source for the Proposed Expansion