Thornton Tomasetti

Noise Impact Study

5431 Fernbank Road
Ottawa, Ontario

25019017

Prepared For
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Vice President

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1.0 Introduction

At the request of N45 Architecture Inc. (Client), Thornton Tomasetti (TT) presents this Noise Impact Study (NIS) regarding the proposed Fernbank Catholic High School development located at 5431 Fernbank Road in Ottawa, ON (the Project).

Based on a pre-consultation preliminary assessment completed on March 14, 2025 (File No.: PC2025-0021), a transportation noise study is required for the project. As such, the purpose of this study is to assess the transportation noise impacts on the Project from surrounding sources. This report is intended to support the Site Plan Control (SPC) application for the Project.

Where applicable, this report will provide noise control recommendations to meet the requirements of the relevant Land Use Planning Authority (LUPA). LUPAs generally adopt the noise criteria developed by the Ontario Ministry of the Environment, Conservation and Parks (MECP), but may also have unique requirements.

Where predicted noise impacts are lower than applicable action thresholds identified, the project should be designed to meet the Ontario Building Code (OBC) as a minimum standard.

2.0 Site and Surrounding Area

2.1 Project Location

The Project is located southeast of the intersection of Cope Drive and Atlas Ter along Fernbank Road. The Project is generally surrounded by residential, open space and parks, agricultural and general mixed use land uses.

An illustration of the project location and surrounding area is provided in Figure 1.

2.2 Zoning & Official Plan

The Project site is zoned as an Institutional Zone under the City of Ottawa Zoning By-Law No. 2008-250. Surrounding areas are zoned for residential, general mixed use (to the east), and agricultural use (to the South).

A zoning map is presented in Figure 2.

2.3 Planned Development

The Project will consist of a new three storey catholic high school which includes an outdoor sports field.

The proposed new site plan is provided in Figure 3.

2.4 Topography

For the purposes of predictive noise modelling conducted as part of this report, terrain heights on the Project itself were assumed to be not be significantly different of the surrounding terrain heights. Terrain

heights outside the boundaries of the Project grading plan were referenced to publicly available topographic data from Google Earth.

3.0 Ministry of the Environment Conservation and Parks

The MECP does not have direct authority in approving land use planning decisions, but their guidance documents have been widely adopted by LUPAs. The MECP's *Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning* (NPC-300) provides province wide guidance regarding assessment standards and criteria for evaluating noise impacts from transportation sources such as roads, railways and aircraft; as well as stationary sources such as mechanical equipment, and industrial facilities. In preparing this report, TT has referred to *Part A Background* and *Part C Land Use Planning* of NPC-300.

This NIS report has been prepared to support land use planning decisions, and is not intended to support an application for an Environmental Compliance Approval (ECA) in accordance with *Part B Stationary Sources* of NPC-300, and Section 9 of the Environmental Protection Act.

4.0 Land Use Planning Authority

In addition to adopting the MECP's recommended standards and criteria, some LUPAs impose additional requirements on applications for development approval. The LUPA for this Project is the City of Ottawa.

4.1 City of Ottawa

In accordance with the City of Ottawa's *Environmental Noise Control Guidelines* (ENCG), available from the City's website, the following additional considerations beyond those required by NPC-300 have been included in this report.

- ENCG includes default road categories with corresponding assumed traffic levels and related parameters;
- ENCG includes different and expanded warning clause language; and,
- ENCG includes additional requirements and recommendations for the construction of noise barriers.

5.0 Transportation Noise Assessment

5.1 Critical Transportation Noise Receptors

ENCG defines a point of reception for the assessment of transportation noise sources as either the Plane of Window (POW) of a noise sensitive indoor space or an Outdoor Amenity Area (OAA) representing an area of a noise sensitive land use intended for quiet enjoyment of the outdoor environment.

Based on the nature of the Project being an institutional development, OAAs associated with the Project are not considered to be points of noise reception as per ENCG. As such, OAAs have not been included as part of this assessment.

Based on provided site plans of the Project, the worst-case locations for POW receptor(s) are those representing the operable classroom windows on the third storey along the north façade of the proposed school as outlined in Table 1.

Table 1: Points of Reception – Transportation Noise

Receptor ID	Description	Receptor Location
TPOR1	North façade, highest window	Centre of plane of window, 9.1m above ground

5.2 Transportation Noise Sources

5.2.1 Road Noise Sources

Based on a review of the closest roadways within the vicinity of the development and the City of Ottawa's Official Plan, the significant road noise sources for the Project would be Fernbank Road and Terry Fox Drive categorized as an arterial road, and Cope Drive and Rouncey Road categorized as major collector roads. Table 2 and Figure 4 provide a summary of the distances between the roadways and closest noise sensitive façade for the Project.

Table 2: Summary of Road Noise Sources

Road Name	Description	Approximate Separation Distance (m)
Terry Fox Drive	Two-way single lane road, located East of the Project	~313
Fernbank Road	Two-way single lane road, located South of the Project	~185
Rouncey Road	Two-way single lane road, located West of the Project	~241
Cope Drive	Two-way single lane road, located North of the Project	~22

It should be noted that ENCG Section 2.1 states that for new noise-sensitive development the noise impacts from surface transportation noise must be evaluated if it is within 100m from the right-of-way of an existing arterial, collector or major collector road, or within 250m from an existing highway. As shown in Table 2 and Figure 4, the only roadway in the vicinity of the proposed development that meet these separation distances is Cope Drive. Therefore, an assessment of road noise sources is only required for Cope Drive, which has been completed as part of this report.

Following the traffic and road parameters outlined in Appendix B of ENCG, Table 3 provides a summary of the road traffic data utilized as part of this assessment.

Table 3: Road Traffic Data Summary

Parameter	Cope Drive
AADT	12,000
% Annual Growth	-
Years of Annual Growth	-
% Medium Trucks	7%
% Heavy Trucks	5%
% Day (16h) / Night (8h)	92% / 8%
Speed Limit	50 km/hr
Gradient	0%

5.2.2 Rail Noise Sources

Based on a review of rail noise sources within the vicinity of the development, no existing rail lines located within 300m or freight rail yards within 1000m of the Project have been identified.

5.2.3 Aircraft Noise Sources

No airports located in the vicinity of the project have been identified.

5.3 Transportation Sound Level Limits

5.3.1 Indoor Noise Sensitive Areas

Impacts to indoor noise sensitive areas are assessed against a 16-hour daytime (07:00 – 23:00) and 8-hour nighttime (23:00 – 07:00) equivalent sound pressure level (L_{eq}) reported in dBA, at the relevant POW receptors.

Requirements for ventilation and warning clauses to address transportation noise impacts to the project façades are determined based on the impact of road transportation sources. The applicable POW sound level limits and the sliding scale of required ventilation measures and warning clauses are listed in Table 4.

Table 4: POW Sound Level Limit: Ventilation & Warning Clauses – Road Traffic

Category	Daytime $L_{eq,16hr}$ (dBA)	Nighttime $L_{eq,8hr}$ (dBA)	Mitigation Measures	Warning Clause Required
POW Limit	55	50	None	Yes
POW Mitigation Threshold Noise Sensitive Spaces	56 - 65	51 – 60	Include forced air heating and provision for central air conditioning	Yes
POW Mitigation Threshold Noise Sensitive Spaces	>65	>60	Include central air conditioning	Yes

The applicable indoor and POW sound level limits and required building construction measures to address transportation noise impacts to indoor sound levels are listed in Table 5.

Table 5: Indoor Sound Level Limit: Construction Requirements – Road Traffic

Category	Daytime $L_{eq,16hr}$ (dBA)	Nighttime $L_{eq,8hr}$ (dBA)	Total $L_{eq,24hr}$ (dBA)	Mitigation Measures
Road Sound Level Indoor Limit Noise Sensitive Spaces	45 / 45	45 / 40	-	Not Applicable
Road POW Sound Level Noise Sensitive Spaces	>65	>60	-	Design building components to achieve indoor sound level limit

For the purpose of this assessment only the daytime hours were considered since the proposed development is a high school which is anticipated to only be occupied during daytime hours.

5.4 Transportation Sound Level Predictions

The predicted noise impacts described below are based on the conditions identified in current drawings and information provided to TT at the time of this report and include any barriers, or other measures currently planned for the Project, but do not include additional noise measures identified in Section 5.5 of this report.

5.4.1 Unmitigated Road Traffic

Calculations of road traffic sound levels were performed using STAMSON 5.04, the software implementation of the MECP ORNAMENT model, which was developed and published by the MECP for transportation noise prediction. The calculated sound levels at the receptors are presented in Table 6.

Table 6: Calculated Sound Levels due to Road Sources

Worst-Case Façade	Predicted Transportation Sound Levels (dBA)
	Daytime (07:00–23:00) $L_{eq,16hr}$
North Façade Receptor (TPOR1)	66

*Based on impacts from TPOR1, -3 dB adjustment was applied based on a correction from 180 degrees exposure to 90 degrees.

The STAMSON calculation outputs for the traffic noise predictions are attached in Appendix C.

5.5 Transportation Noise Control Recommendations

Noise control recommendations for the identified critical receptors and the corresponding noise sensitive land uses that they represent in the proposed redevelopment are summarized in Table 7 and discussed in the subsequent sections.

Table 7: Transportation Noise Control Measures Summary

Worst-Case Façade	Noise Barrier	Ventilation	Warning Clause	Building Components
North Façade Receptor (TPOR1)	N/A	Central air conditioning	Yes	Designed to achieve indoor sound level criteria

5.5.1 Indoor Noise Sensitive Areas - Ventilation

Sensitive receptors along the north facades of the Project are expected to face POW sound levels above 65 dBA during the 16-hour day (07:00 – 23:00) due to road noise, therefore central air conditioning will be required for the spaces on the first and second floors of the school along this facade.

5.5.2 Indoor Noise Sensitive Areas – Building Components

Sensitive receptors along the north facade of the Project are expected to face POW sound levels above 65 dBA during the 16-hour day (07:00 – 23:00) due to road noise, therefore building components on these façades must be designed to achieve the indoor sound level limit.

Table 8 shows TT's estimation of the maximum exterior wall, fixed window, and operable window component areas as a percentage of the floor area of a typical room and the minimum recommended STC requirement of each component. If a component with a higher STC rating than the noted requirement is used, then the maximum allowable area of that component may increase, and if a component occupies a smaller area the STC rating required may decrease.

Table 8: Building Envelope Requirements

Component	Maximum Component Area as Percentage of Floor Area	STC Required
Sensitive Spaces Along the North Facade of the Project		
Solid Exterior	27%	OBC
Fixed Glazing	10%	OBC
Operable Glazing	3%	OBC

5.5.3 Warning Clauses

The following examples of warning clause wordings are based on applicable guidance documents and TT's experience regarding common requests from stakeholders. Precise wordings may be modified by the Client with input from the relevant LUPA(s) and legal counsel if required.

A warning clause is required to be included in the development agreements if one or more representative POW receptors is predicted to be exposed to transportation sound pressure levels greater than 55 dBA during the 16-hour day (07:00 – 23:00) and the Project includes central air conditioning. An example of a warning clause is as follows:

"Purchasers/tenants are advised that sound levels due to increasing road traffic may on occasion, interfere with some activities of the development occupants as the sound levels exceed the sound level limits of the City and the Ministry of the Environment.

To help address the need for sound attenuation this development includes:

- *Central air conditioning; and*
- *STC rated assembly for the building façades that meet OBC requirements.*

To ensure that provincial sound level limits are not exceeded it is important to maintain these sound attenuation features.

This building has been supplied with a central air conditioning system and other measures which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment"

It is important to note that the warning clause would be applicable to the entire development.

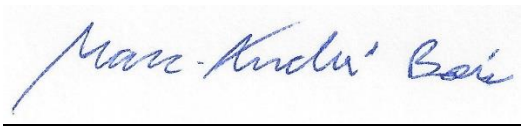
6.0 Concluding Comments

Noise impacts associated with the proposed new high school development at 5431 Fernbank Road are expected to be able to meet all applicable LUPA noise requirements with the inclusion of central air conditioning, building components for the building envelop that meet OBC requirements and warning clauses presented in Section 5.3 of this report for transportation noise sources. The proposed development should therefore be approved.

Please do not hesitate to contact us if there are any questions.

Yours Truly,

Thornton Tomasetti



Marc-André Bois
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Reviewed by:

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Vice President

Disclaimer

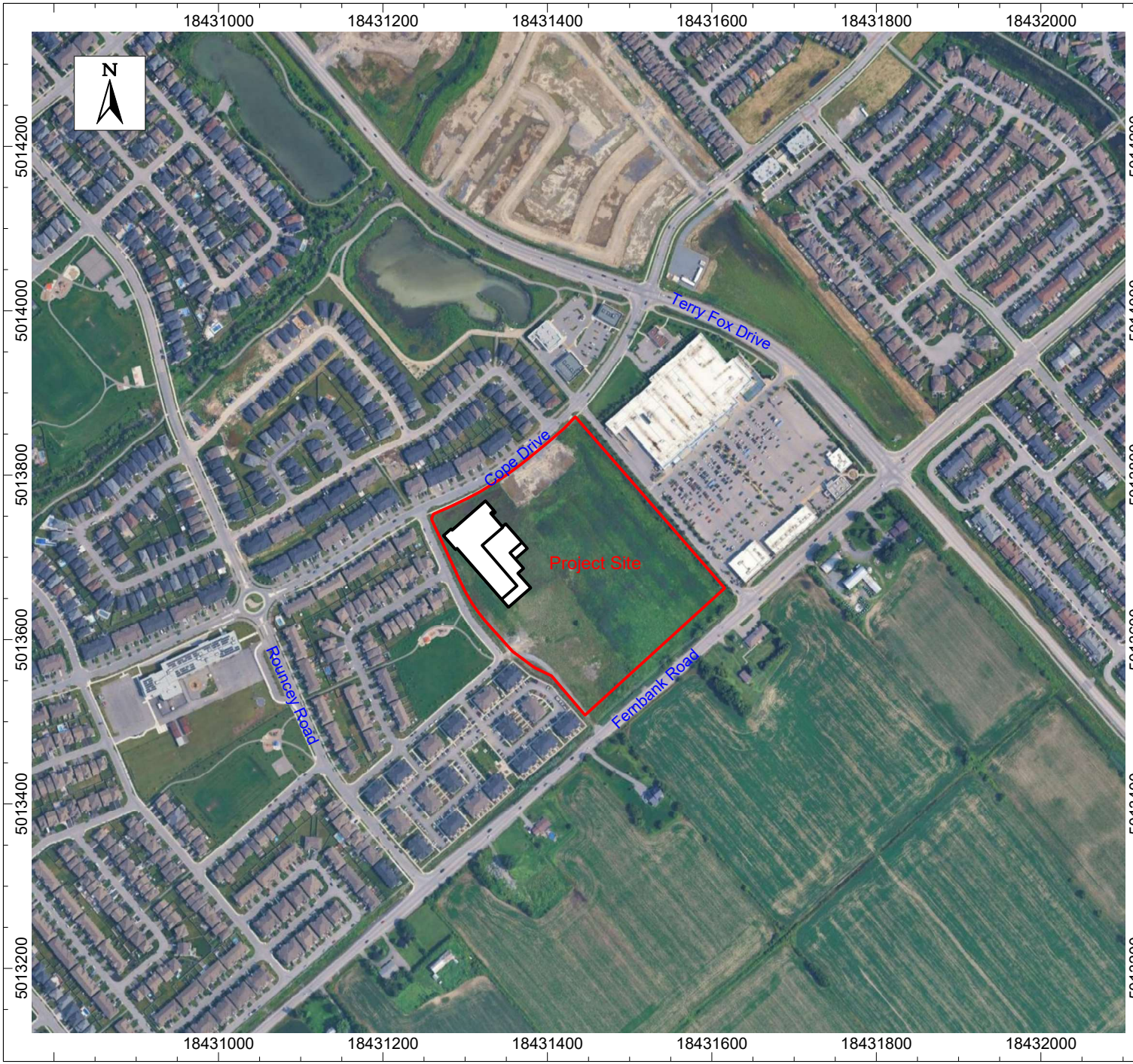
This report is provided in accordance with the contractual agreement between TT and the Client. In addition to our contractual obligations TT notes the following general disclaimers and qualifications regarding the content of this report.

In preparing this report, TT has relied upon the accuracy and completeness of information provided by the Client and other third parties (manufacturers, other consultants, etc.) and accepts no responsibility for errors or emissions by other parties in the information provided to TT.

This report has been prepared solely for the benefit of the Client and the content of this report is intended for informational purposes only. This report shall not be relied upon by any other parties, including but not limited to other consultants retained by the Client, or utilized for any other purposes.

Ultimate responsibility for the design and construction remains solely with the architect/engineer of record and/or the contractor(s). Achieving the required mitigation requirements relies on correct incorporation of mitigation recommendations into Architectural and Mechanical drawings and specifications, as well as correct installation during construction. It is recommended that the implementation of mitigation measures be reviewed by a qualified acoustical consultant.
On request, TT will provide a proposal for additional work such as to peer review noise control measures or observe on-site conditions as appropriate; however, notwithstanding the foregoing, it is expressly understood and agreed that TT shall not have control or charge of, and shall not be responsible for the acts or omissions, including but not limited to means, methods, techniques, sequences and procedures, of the Design Professionals and/or Contractors performing design and/or construction on the Project. Accordingly, TT shall not be held responsible for the failure of any party to properly incorporate the mitigation measures stated in this report.

Appendix A: Figures



Thornton Tomasetti

Client Name

N45 Architecture Inc.

Project Name

5431 Fernbank Road
Ottawa, Ontario

Figure Title

Project Location & Surroundings

Produced By

MAB

TT Project #

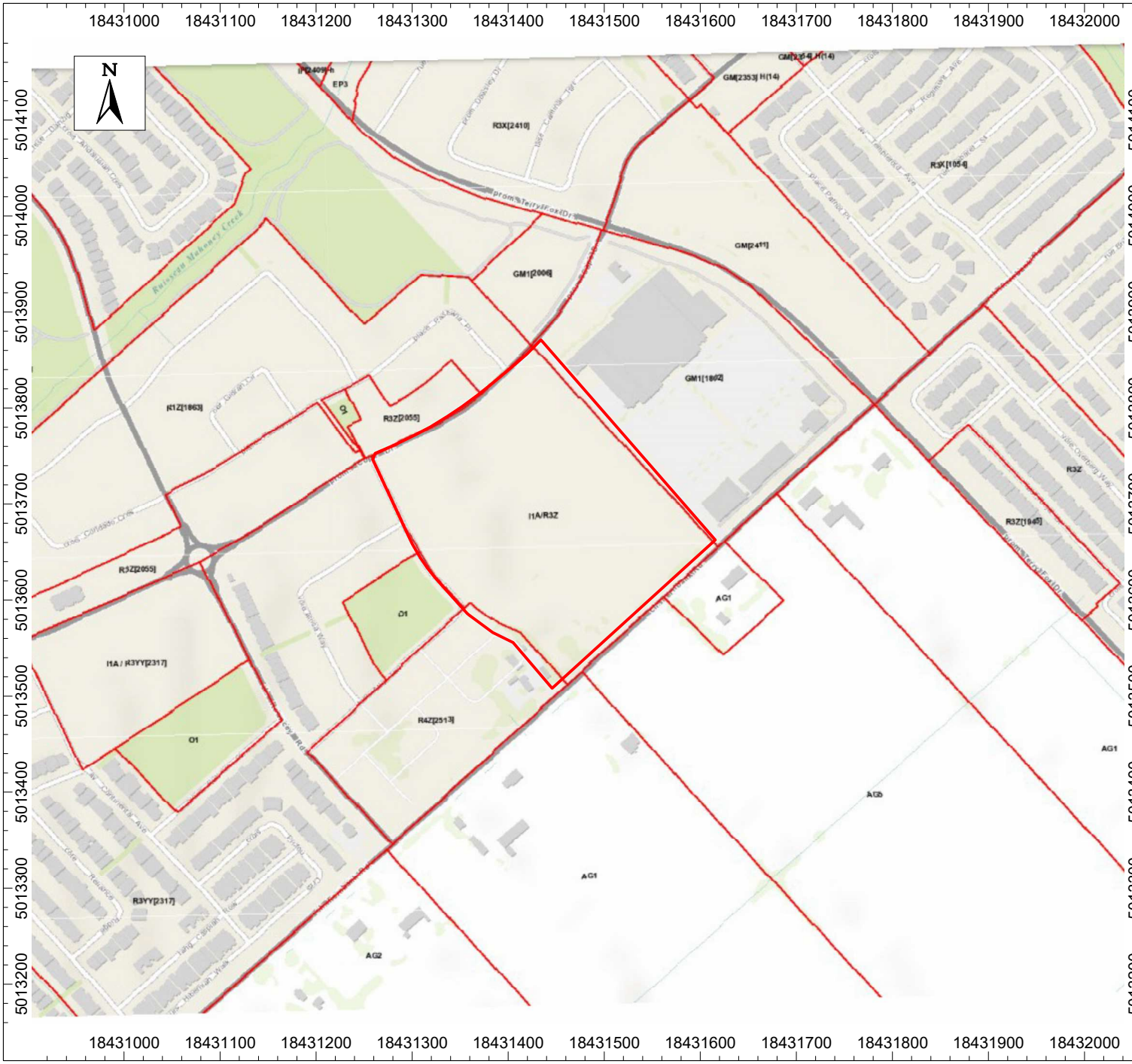
25019017

Figure #

1

Date

05/09/2025



Thornton Tomasetti

Client Name

N45 Architecture Inc.

Project Name

5431 Fernbank Road
Ottawa, Ontario

Ottawa Zoning By-Law #2008-250

Zone Code	Zone Name
AG	Agricultural
EP	Environmental Protection
GM	General Mixed Use
I1	Minor Institutional
O1	Parks and Open Space
R1 & R3	Residential

Figure Title

Zoning Map

Produced By

MAB

TT Project #

25019017

Date

05/09/2025

Figure #

2

Thornton Tomasetti

Client Name

N45 Architecture Inc.

Project Name

5431 Fernbank Road
Ottawa, Ontario

Figure Title

Project Site Plan

Produced By

MAB

TT Project #

25019017

Figure #

3

Date

05/09/2025

Thornton Tomasetti

Client Name

N45 Architecture Inc.

Project Name

5431 Fernbank Road
Ottawa, Ontario

Points of Noise Reception

ID	Height above ground (m)
TPOR1	9.1

Legend

Building
Receiver

Figure Title

Transportation Noise PORs & Sources

Produced By

MAB

TT Project #

25019017

Figure #

4

Date

05/09/2025

Appendix B: Traffic Data

Appendix B: Table of Traffic and Road Parameters To Be Used For Sound Level Predictions

Table B1 Traffic And Road Parameters To Be Used For Sound Level Predictions

Row Width (m)	Implied Roadway Class	AADT Vehicles/Day	Posted Speed Km/Hr	Day/Night Split %	Medium Trucks %	Heavy Trucks % [1]
NA [2]	Freeway, Queensway, Highway	18,333 per lane	100	92/8	7	5
37.5-44.5	6-Lane Urban Arterial-Divided (6 UAD)	50,000	50-80	92/8	7	5
34-37.5	4-Lane Urban Arterial-Divided (4-UAD)	35,000	50-80	92/8	7	5
23-34	4-Lane Urban Arterial-Undivided (4-UAU)	30,000	50-80	92/8	7	5
23-34	4-Lane Major Collector (4-UMCU)	24,000	40-60	92/8	7	5
30-35.5	2-Lane Rural Arterial (2-RAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Urban Arterial (2-UAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Major Collector (2-UMCU)	12,000	40-60	92/8	7	5
30-35.5	2-Lane Outer Rural Arterial (near the extremities of the City) (2-RAU)	10,000	50-80	92/8	7	5
20-30	2-Lane Urban Collector (2-UCU)	8,000	40-50	92/8	7	5

[1] The MOE Vehicle Classification definitions should be used to estimate automobiles, medium trucks and heavy trucks.

[2] The number of lanes is determined by the future mature state of the roadway.

Appendix C: Transportation Noise Predictions

STAMSON 5.0 NORMAL REPORT Date: 05-09-2025 10:43:56
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: tpor1.te Time Period: 16 hours
Description: Transportation Noise Impact at TPOR1

Road data, segment # 1: Cope Drive

Car traffic volume : 9715 veh/TimePeriod *
Medium truck volume : 773 veh/TimePeriod *
Heavy truck volume : 552 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Cope Drive

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 22.00 m
Receiver height : 9.10 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Cope Drive

Source height = 1.50 m

ROAD (0.00 + 65.85 + 0.00) = 65.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.51	0.00	-1.66	0.00	0.00	0.00	0.00	65.85

Segment Leq : 65.85 dBA

Total Leq All Segments: 65.85 dBA

TOTAL Leq FROM ALL SOURCES: 65.85