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Prepared for:

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Noise Control Feasibility Study

1927 Maple Grove Road



Noise Control Feasibility Study

1927 Maple Grove Road

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Noise Control Feasibility Study

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1.0 INTRODUCTION

In 2021, J.L. Richards & Associates Limited (JLR) was retained by Maple Grove Towns Inc. (MGTI) to prepare a Noise Control Feasibility Study for their residential development located at 1927 Maple Grove Road, in the Kanata West area within the City of Ottawa. The purpose of this study is to assess the potential environmental noise impact on the Development, due to vehicular traffic on Maple Grove Road. This Noise Control Feasibility Study develops a strategy for subdivision development that minimizes the reliance upon noise barriers, ventilation requirements and air conditioning as a means of addressing roadway noise and instead examines land use, roadway layout and building orientation as a principal means to mitigate roadway noise. Land use and building orientation identified in this study will then be examined in detail as part of the Noise Control Detailed Design Study prepared for the site plan and subdivision applications.

This report is prepared to satisfy the Ministry of the Environment (MOE) Environmental Noise Guidelines NPC-300 and the City of Ottawa Environmental Noise Control Guidelines (approved by City Council January 2016) and in particular Part 4 Section 3.1 Noise Control Feasibility Study Requirements.

2.0 PROJECT DESCRIPTION

The proposed residential development is situated on a ±0.89 ha parcel of land that is bounded by vacant land to the north and east, Maple Grove Road and existing residential to the south and existing/future residential to the west, as shown on Figure 1 - Location Plan.

The proposed development will consist of 38 Townhouse units as shown on the Conceptual Plan (Option 2) prepared by Fotenn (dated August 19, 2021) provided in Appendix 'A'.

3.0 TRANSPORTATION NOISE SOURCE

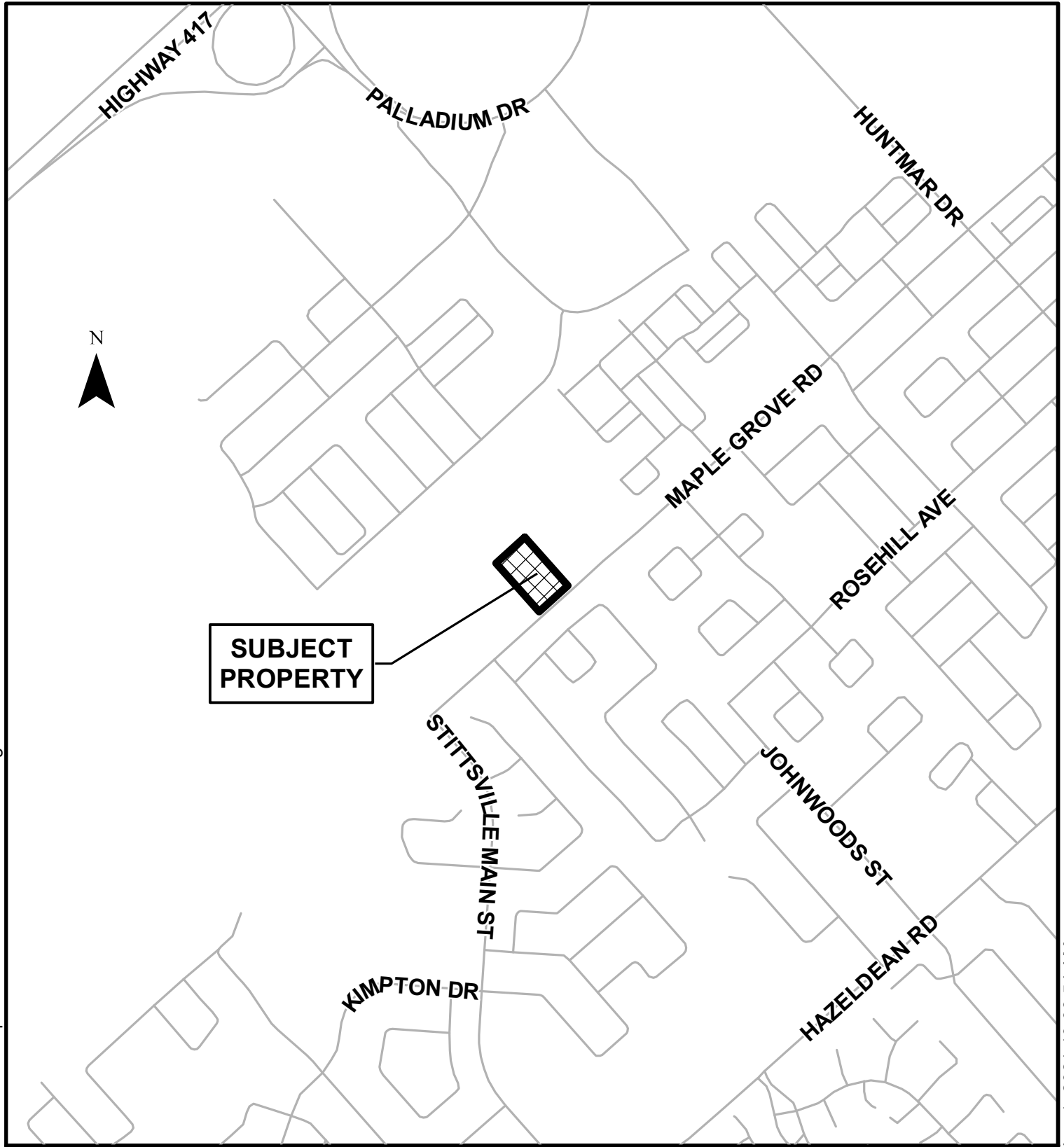
The transportation noise source is Maple Grove Road. Drawing N1 shows the location of the noise source and existing roadways in relation to the proposed development.

3.1 Transportation Sound Level Criteria

For the purpose of determining the predicted noise levels, and based on the sound level criteria established by the City of Ottawa Environmental Noise Control Guidelines (ENCG), the following will be used as the maximum acceptable sound levels (Leq) for residential development and other land uses, such as nursing homes, schools and daycare centres:

<u>Receiver Location</u>	<u>Criteria</u>	<u>Time Period</u>
Outdoor Living Area:	55 dBA	Daytime (0700 - 2300 hrs.)
Indoor Living/Dining Rooms (inside):	45 dBA	Daytime (0700 - 2300 hrs.)
General Office, Reception Area (inside):	50 dBA	Daytime (0700 - 2300 hrs.)
Sleeping Quarters (inside):	40 dBA	Nighttime (2300 - 0700 hrs.)

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**SUBJECT
PROPERTY**

PROJECT: **MAPLE GROVE TOWNS INC.**
1927 MAPLE GROVE
 1927 MAPLE GROVE ROAD, OTTAWA, ONTARIO

DRAWING: **LOCATION PLAN**

J.L. Richards
 ENGINEERS · ARCHITECTS · PLANNERS
 www.jlrichards.ca

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DESIGN:	TB
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FIGURE 1

Plot Date: Wednesday, September 1, 2021 10:08:54 AM

Noise Control Feasibility Study

1927 Maple Grove Road

Outdoor Living Areas (OLA) are defined as that portion of the outdoor amenity area of a dwelling for the quiet enjoyment of the outdoor environment during the daytime period. Typically, the point of assessment in an OLA is 3.0 m from the building façade mid-point and 1.5 m above the ground within the designated OLA for each individual unit. OLAs commonly include backyards, balconies (with a minimum depth of 4 m as per NPC-300), common outdoor living areas, and passive recreational areas.

3.2 Transportation Noise Attenuation Requirements

When the sound levels are equal to or less than the specified criteria, per the City of Ottawa ENCG and/or MOE NPC-300, no noise attenuation (control) measures are required.

The following tables outline noise attenuation measures to achieve required dBA Leq for surface transportation noise, per the City of Ottawa ENCG.

Table 1: Outdoor Noise Control Measures for Surface Transportation Noise

Primary Mitigation Measure (in order of preference)	Secondary Mitigation Measures	
	Landscape Plantings and/or Non-acoustic Fence to Obscure Noise Source	Warning Clauses
Distance setback with soft ground	Recommended	
Insertion of Noise insensitive land uses between the source and receiver receptor		
Orientation of buildings to provide sheltered zones in rear yards	Required	Warning Clauses necessary and to include: <ul style="list-style-type: none"> - Reference to specific noise mitigation measures in the development. - Whether noise is expected to increase in the future. - That there is a need to maintain mitigation.
Shared outdoor amenity areas		
Earth berms (sound barriers)		
Acoustic barriers (acoustic barriers)		

Table 2: Indoor Noise Control Measures for Surface Transportation Noise

Primary Mitigation Measure (in order of preference)	Secondary Mitigation Measures	
	Landscape Plantings and/or Non-acoustic Fence to Obscure Noise Source	Warning Clauses
Distance setback with soft ground	Recommended	Not necessary
Insertion of Noise insensitive land uses between the source and receiver receptor		
Orientation of buildings to provide sheltered zones or modified interior spaces and amenity areas	Required	Warning Clauses necessary and to include: <ul style="list-style-type: none"> - Reference to specific noise mitigation measures in the development.
Enhanced construction techniques and construction quality		

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Earth berms (sound barriers)		<ul style="list-style-type: none"> - Whether noise is expected to increase in the future. - That there is a need to maintain mitigation.
Indoor isolation – air conditioning and ventilation, enhanced dampening materials (indoor isolation)		

The following tables outline the noise level limits per the MOE NPC-300 and City of Ottawa ENCG.

Table 3: Outdoor Living Area (OLA) Noise Limit for Surface Transportation

Time Period	Leq (16 hr) (dBA)
16 hr., 07:00 am - 23:00	55

Table 4: Indoor Noise Limit for Surface Transportation

Type of Space	Time Period	Leq (dBA)	
		Road	Rail
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	07:00-23:00	45	40
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	23:00-07:00	45	40
Sleeping quarters	07:00-23:00	45	40
	23:00-07:00	40	35

In addition to the implementation of noise attenuation features, if required, and depending on the severity of the noise problem, warning clauses may be recommended to advise the prospective purchasers/tenants of affected units of the potential environmental noise. These warning clauses should be included in the Site Plan and Subdivision Agreements, in the Offers of Purchase and Sale, and should be registered on Title. Warning clauses may be included for any development, irrespective of whether it is considered a noise sensitive land use.

Where site measures are required to mitigate noise levels, the City of Ottawa requires that notices be placed on Title informing potential buyers and/or tenants of the site conditions. Sample templates of the notices that could be registered on Title are included in Appendix 'B' as presented in the City of Ottawa ENCG.

Detailed wording for clauses should be provided as part of a detailed Noise Impact Study to be completed in support of the Subdivision Application. Clauses are to be worded to describe the mitigation measures and noise conditions applicable where MOE and City of Ottawa noise criteria are exceeded.

Noise Control Feasibility Study

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3.3 Prediction of Noise Levels

3.3.1 Road Traffic Data

The following traffic data was used to predict noise levels:

Table 5: Road Traffic Data to Predict Noise Levels

	Maple Grove Road
Total Traffic Volume (AADT)	8,000
Day/Night Split (%)	92/8
Medium Trucks (%)	7
Heavy Trucks (%)	5
Posted Speed (km/hr.)	50
Road Gradient (%)	1
Road Classification	2-Lane Urban Collector (2-UCU)

Schedule 'E' and Annex 1 of the City of Ottawa Official Plan (May 2003) were utilized to determine the road classification and protected right-of-way. These road classifications were compared to Map 6 of the City of Ottawa Transportation Master Plan (Road Network – Urban). All findings were then compared to Table B1 (Part 4, Appendix 'B') of the City of Ottawa Environmental Noise Control Guidelines in order to determine an appropriate AADT value.

3.3.2 Noise Level Calculations (Transportation)

Noise contours for the daytime periods were developed using the MOE Road Traffic Noise Computer program STAMSON, Version 5.03.

Distances were calculated from the centre of the roadway to even 5 dBA freefield noise levels ranging from 50 dBA to 70 dBA for each of the roadways. Table 6 below presents this information. Computer printouts are included in Appendix 'C'. Drawing N1 identifies the receiver locations as contours for the calculations of the roadway freefield noise levels.

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Table 6: Predicted Freefield Noise Levels and Distances from Noise Sources

Roads	Contour (dBA)	OLA (Freefield) Distance (m)
		Daytime
2-UCU Maple Grove Road (50km/hr)	50	108.90
	55	54.43
	60	27.20
	65	n/a
	70	n/a

3.4 Summary of Findings (Transportation)

1927 Maple Grove will result in multiple blocks of residential units that will be impacted by roadway traffic noise.

Due to the proximity of the residential development, Maple Grove Road has the highest noise impact on the development. To help mitigate the noise impact of this transportation noise source, the building orientation of the condo blocks has been carefully placed to mitigate the noise for the development and reduce the need for noise barriers. Despite best efforts to passively mitigate the transportation noise, barriers may still be required.

The predicted noise contours shown on Drawing N1 are freefield and considered a conservative analysis. Existing development will also help mitigate noise levels. Freefield noise levels at the property lines adjacent to Maple Grove Road are estimated to be approximately 65 dBA as presented on Drawing N1. Noise barriers and berms are projected to be required to mitigate outdoor living area noise levels. As a minimum, a 2.2 m high noise barrier will be required along the rear and side lot lines. In some locations the noise barriers will be 2.5 m high. The approximate location of potential noise barriers, based on freefield noise calculations, are presented on Drawing N2. It is recommended that a Noise Control Detailed Study be completed to review and confirm the height and location of required noise barriers and/or berms.

As an alternative to noise barriers, setback buffers could be considered to reduce or eliminate noise barriers. However, in some locations, units flanking transportation noise sources may have to be eliminated. This is not a financially practical solution.

As part of the recommended Noise Control Detailed Study, a preliminary building component analysis should be included.

Warning clauses similar to those presented in Appendix 'B' will be required to highlight the exceedance of MOE and City of Ottawa noise criteria and to identify mitigation measures integrated into the subdivision design. Warning clauses could be required until it can be demonstrated that the noise guideline criteria is not exceeded. It is recommended that specific wording be developed for each unit and/or block in the Noise Control Detailed Study prepared to support the subdivision application.

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At the time this study was completed, a detailed grading plan was not available.

4.0 CONCLUSION AND RECOMMENDATIONS

Predicted noise levels are expected to exceed the City of Ottawa ENCG and MOE criteria for the proposed units adjacent to Maple Grove Road. To address these exceedances, the developer has revised the draft plan of subdivision to reduce the reliance of noise barriers as the primary noise mitigation tool. Building orientation and increased separation to the transportation noise source have been used to reduce noise levels for residential units in close proximity to the transportation noise sources. Noise barriers may still be required to protect outdoor living areas.

It is recommended that the City of Ottawa accept the draft plan of subdivision submitted and include the condition for the proponent to complete a Noise Control Detailed Study as per the City of Ottawa ENCG 2016.

It is further recommended that the following be addressed as part of the Noise Control Detailed Study:

- Noise barrier details, such as height and location.
- Noise levels should be assessed at the building façade of units nearest the transportation noise sources.
- If it is determined that the noise level at the façade of a building exceeds 64.49 dBA, then the Acoustical Insulation Factor (AIF) method should be utilized to review building acoustic measures to be incorporated into the building construction. This method is described in the Ministry of the Environment of Ontario document, *Environmental Noise Assessment in Land Use Planning*, 1987 and 1999.

This report has been prepared for the exclusive use of Maple Grove Towns Inc., for the stated purpose, for the named facility. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of Maple Grove Towns Inc. and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

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Noise Control Feasibility Study 1927 Maple Grove Road

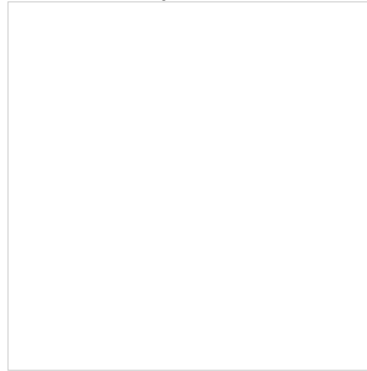
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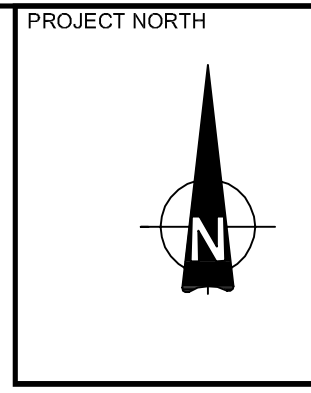
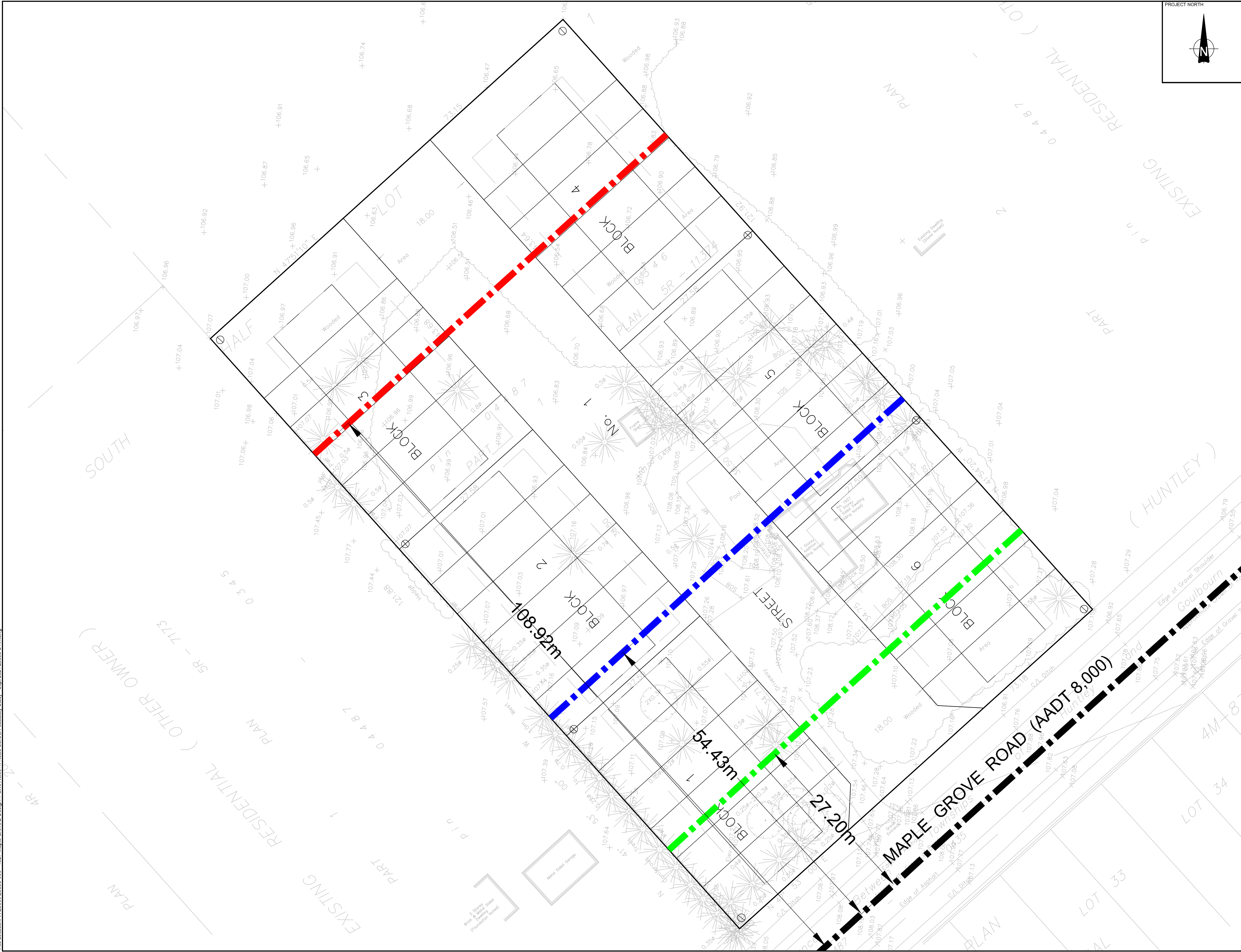
Appendix A

Concept Plan

Freefield Daytime Noise
Contours – N1

Potential Noise Barrier
Locations – N2

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LEGEND

- APPROXIMATE ROAD CENTERLINE
- NOISE CONTOURS
- 50 dBA
- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA

01	ISSUED FOR DRAFT PLAN OF SUBDIVISION APPLICATION	31/08/21
No.	ISSUE / REVISION	DDMMYY

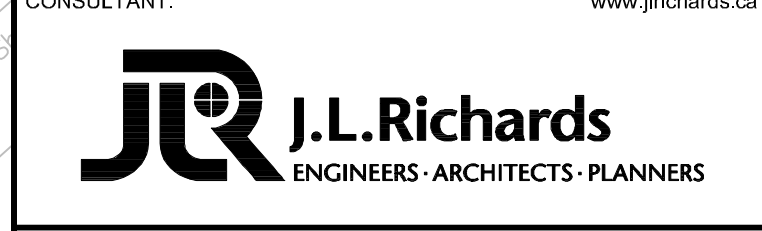
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PROJECT:

MAPLE GROVE TOWNS INC.

1927 MAPLE GROVE ROAD, OTTAWA

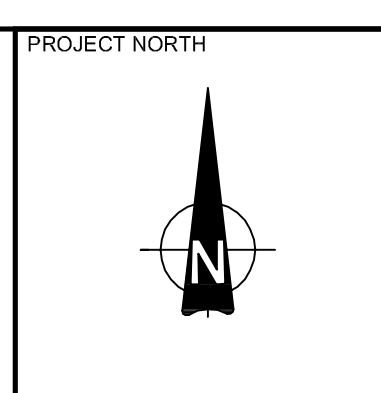
DRAWING:

FREEFIELD DAYTIME NOISE CONTOURS

DESIGN: TB	DRAWING #: N1
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JLR #: 29893	

PLOT DATE: Thursday, September 2, 2021 1:26:01 PM

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POTENTIAL PERMANENT NOISE FENCE
(MIN. 2.2m HIGH; MAX. 2.5m HIGH)


01	ISSUED WITH NOISE CONTROL FEASIBILITY STUDY	08/09/21
No.	ISSUE / REVISION	DDMMYY

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CONSULTANT:  **J.L. Richards**
ENGINEERS - ARCHITECTS - PLANNERS

CONSULTANT:

PROFESSIONAL STAMP

PROJECT:
MAPLE GROVE TOWNS INC.
1927 MAPLE GROVE ROAD, OTTAWA

DRAWING:
POTENTIAL NOISE BARRIER LOCATIONS

DESIGN: TB	DRAWING #:
DRAWN: TB	N2
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JLR #: 29893	

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Appendix B

City of Ottawa Surface
Transportation Sample
Warning Clauses

City of Ottawa Environmental Noise Control Guidelines Sample Warning Clauses

Generic

Purchasers/tenants are advised that sound levels due to increasing road/rail/Light Rail/transitway traffic may occasionally interfere with some outdoor activities as the sound levels may exceed the sound level limits of the City and the Ministry of the Environment.

To help address the need for sound attenuation this development has been designed so as to provide an outdoor amenity area that is within provincial guidelines. Measures for sound attenuation could include:

- A setback of buildings from the noise source and/or
- An acoustic barrier.

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

The acoustic barrier shall be maintained and kept in good repair by the property owner. Any maintenance, repair or replacement is the responsibility of the owner and shall be with the same material or to the same standards, having the same colour, appearance and function of the original.

Additionally this development includes trees and shrubs to screen the source of noise from occupants.

Extensive mitigation of indoor and outdoor amenity area

Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road/rail/Light Rail/transitway traffic may, on occasion, interfere with some activities of the dwelling 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:

- multi-pane glass;
- double brick veneer;
- an earth berm; and
- an acoustic barrier.

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

The acoustic barrier shall be maintained and kept in good repair by the property owner. Any maintenance, repair or replacement is the responsibility of the owner and shall be with the same material or to the same standards, having the same colour, appearance and function of the original.

This dwelling unit has also been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning 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. Additionally this development includes trees and shrubs to screen the source of noise from occupants.

No Outdoor amenity area

Purchasers/tenants are advised that sound levels due to increasing road/rail/Light Rail/transitway traffic will interfere with outdoor activities 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:

- multi-pane glass;
- double brick veneer;
- high sound transmission class walls.

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

This dwelling unit 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

Appendix C

Transportation Noise Source Predictions

- Detailed Predicted Freefield
Noise Level Calculations
(Transportation Noise Sources)

Filename: mg_50db.te Time Period: Day/Night 16/8 hours
 Description: 1927 Maple Grove 2UCU ff 50dba

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

```
-----
Car traffic volume : 6477/563   veh/TimePeriod *
Medium truck volume : 515/45    veh/TimePeriod *
Heavy truck volume : 368/32     veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient      : 1 %
Road pavement     : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth         : 0.00
Number of Years of Growth           : 0.00
Medium Truck % of Total Volume      : 7.00
Heavy Truck % of Total Volume       : 5.00
Day (16 hrs) % of Total Volume      : 92.00
```

Data for Segment # 1: Maple Grove (day/night)

```
-----
Angle1  Angle2      : -90.00 deg  90.00 deg
Wood depth      : 0      (No woods.)
No of house rows : 0 / 0
Surface         : 1      (Absorptive ground surface)
Receiver source distance : 108.90 / 108.90 m
Receiver height  : 1.50 / 4.50 m
Topography      : 1      (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

↑
 Results segment # 1: Maple Grove (day)

Source height = 1.50 m

ROAD (0.00 + 50.00 + 0.00) = 50.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.75	0.00	-14.29	-1.46	0.00	0.00	0.00	50.00

Segment Leq : 50.00 dBA

Total Leq All Segments: 50.00 dBA

↑
Results segment # 1: Maple Grove (night)

Source height = 1.50 m

ROAD (0.00 + 43.34 + 0.00) = 43.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	58.16	0.00	-13.52	-1.30	0.00	0.00	0.00	43.34

Segment Leq : 43.34 dBA

Total Leq All Segments: 43.34 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 50.00
(NIGHT): 43.34

↑
STAMSON 5.0 NORMAL REPORT Date: 03-09-2021 09:06:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: mg_55db.te Time Period: Day/Night 16/8 hours
Description: 1927 Maple Grove 2UCU ff 55dba

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

Car traffic volume : 6477/563 veh/TimePeriod *

Medium truck volume : 515/45 veh/TimePeriod *

Heavy truck volume : 368/32 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 1 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 7.00

Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Maple Grove (day/night)

```

-----
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth           :           0   (No woods.)
No of house rows     :           0 / 0
Surface              :           1   (Absorptive ground surface)
Receiver source distance : 54.43 / 54.43 m
Receiver height      : 1.50 / 4.50 m
Topography           :           1   (Flat/gentle slope; no barrier)
Reference angle      :           0.00

```

↑
Results segment # 1: Maple Grove (day)

Source height = 1.50 m

ROAD (0.00 + 55.00 + 0.00) = 55.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.75	0.00	-9.29	-1.46	0.00	0.00	0.00	55.00

Segment Leq : 55.00 dBA

Total Leq All Segments: 55.00 dBA

↑
Results segment # 1: Maple Grove (night)

Source height = 1.50 m

ROAD (0.00 + 48.07 + 0.00) = 48.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	58.16	0.00	-8.79	-1.30	0.00	0.00	0.00	48.07

Segment Leq : 48.07 dBA

Total Leq All Segments: 48.07 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 55.00
(NIGHT): 48.07

↑
↑

STAMSON 5.0 NORMAL REPORT Date: 03-09-2021 08:35:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: mg_60db.te Time Period: Day/Night 16/8 hours
Description: 1927 Maple Grove 2UCU ff 60dba

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

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Maple Grove (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 27.20 / 27.20 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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Results segment # 1: Maple Grove (day)

Source height = 1.50 m

ROAD (0.00 + 60.00 + 0.00) = 60.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.75	0.00	-4.29	-1.46	0.00	0.00	0.00	60.00

Segment Leq : 60.00 dBA

Total Leq All Segments: 60.00 dBA

↑

Results segment # 1: Maple Grove (night)

Source height = 1.50 m

ROAD (0.00 + 52.80 + 0.00) = 52.80 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.57 58.16 0.00 -4.06 -1.30 0.00 0.00 0.00 52.80

Segment Leq : 52.80 dBA

Total Leq All Segments: 52.80 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 60.00
(NIGHT): 52.80

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