JLR No.: 29899-000.1
Revision: 0

April 8, 2022

Prepared for:

12714001 CANADA INC.
100-768 Boulevard St. Joseph
Gatineau, QC
J8Y 4B8

Prepared by:

J.L. RICHARDS & ASSOCIATES LIMITED
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K1Z 5M2
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Noise Control Feasibility Study

2983, 3053, & 3079 NAVAN ROAD

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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1.0 INTRODUCTION

In 2020, J.L. Richards & Associates Limited (JLR) was retained by 12714001 Canada Inc to prepare a Noise Control Feasibility Study for their development known as 2983, 3053 & 3079 Navan Road, located at the intersection of Navan Road and Brian Coburn Boulevard, within the City of Ottawa. The legal description of the subject property is Part of Lot 6, Concession 3 (Ottawa Front) Geographic Township of Gloucester, City of Ottawa. The purpose of this study is to assess the potential environmental noise impact on the Development, due to vehicular traffic on Navan Road and Brian Coburn Boulevard and Bus Rapid Transit (BRT). This Noise Control Feasibility Study develops a strategy for site plan and 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 development is situated on a ±5.2 ha parcel of land that is bounded by existing residential and Page Road to the east, Brian Coburn Boulevard to the north-west and Navan Road to the south-west, as shown on Figure 1 - Location Plan.

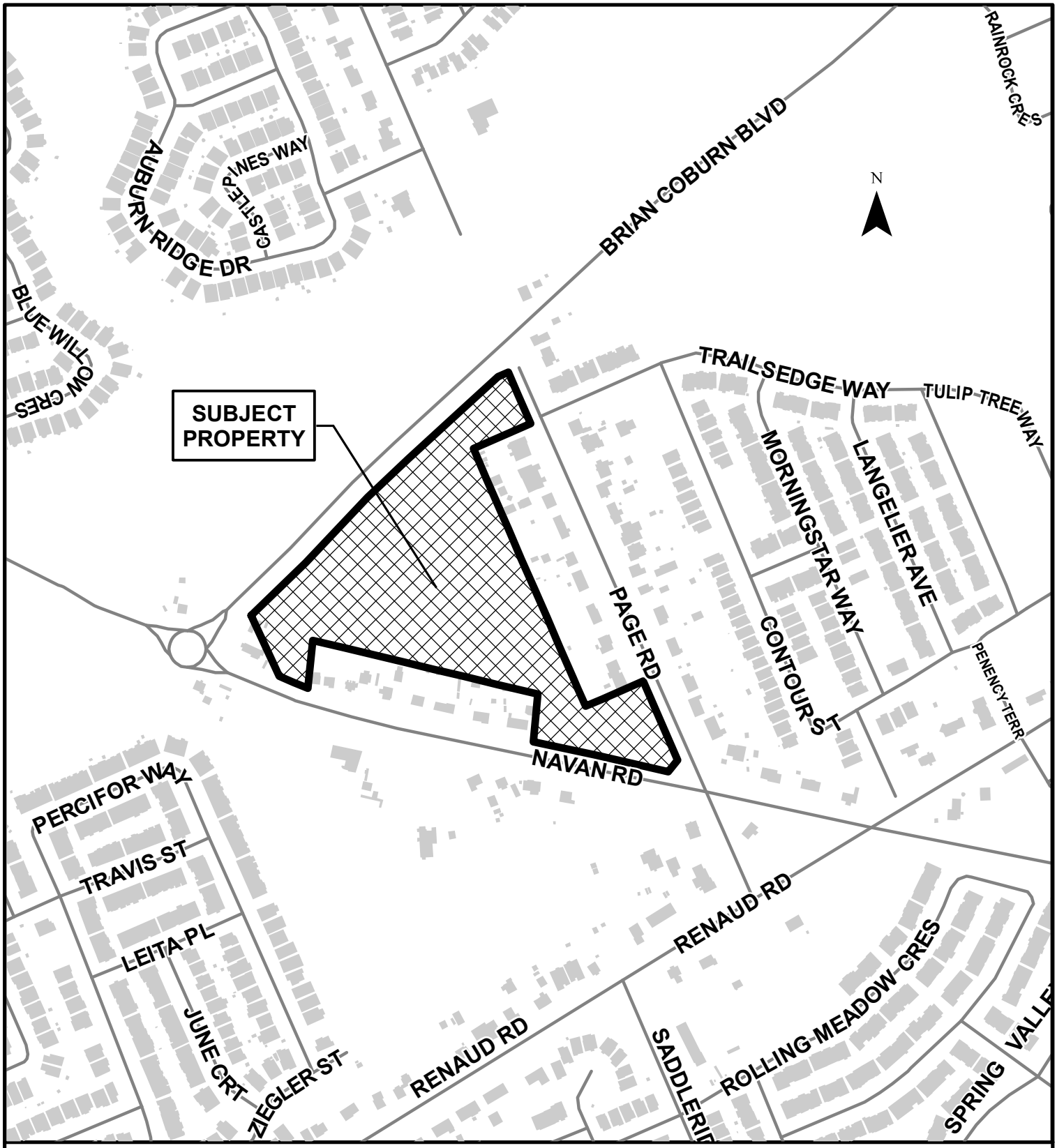
The proposed development consists of 69 townhouse units on 11 blocks and 263 condo units in 6 Condominium buildings (4 stories each) for a total of 332 units as shown on the Site Plan (dated August 30, 2021) provided in Appendix ‘A’. In addition, the development has five (5) blocks for parks, and one (1) block for storm water management as shown on the Plan of Subdivision provided in Appendix 'A'.

3.0 TRANSPORTATION NOISE SOURCE

The transportation noise sources are Navan Road and Brian Coburn Boulevard. Drawing N1 shows the location of the existing roadway and BRT 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



PROJECT:

12714001 CANADA INC.
2983, 3053, 3079 NAVAN ROAD
OTTAWA, ONTARIO

DRAWING:

LOCATION PLAN

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

DESIGN:	TB
DRAWN:	TB
CHECKED:	LJ
JLR #:	29899

DRAWING #:

FIGURE 1

File Location: P:\29000\29899-000 - Gas Bar 3079 Navan\5-Production\1-Civil\FIGURE\29899-LocationPlan.mxd

Plot Date: Tuesday, July 6, 2021 1:28:10 PM

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:

Receiver Location	Criteria	Time Period
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.)

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

<table>
<tr><th rowspan="2">Primary Mitigation Measure
(in order of preference)</th><th colspan="2">Secondary Mitigation Measures</th></tr>
<tr><th>Landscape Plantings and/or Non-acoustic Fence to Obscure Noise Source</th><th>Warning Clauses</th></tr>
<tr><td>Distance setback with soft ground</td><td rowspan="2">Recommended</td><td rowspan="2"></td></tr>
<tr><td>Insertion of Noise insensitive land uses between the source and receiver receptor</td></tr>
<tr><td>Orientation of buildings to provide sheltered zones in rear yards</td><td rowspan="4">Required</td><td rowspan="4">Warning Clauses necessary and to include:
- 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.</td></tr>
<tr><td>Shared outdoor amenity areas</td></tr>
<tr><td>Earth berms (sound barriers)</td></tr>
<tr><td>Acoustic barriers (acoustic barriers)</td></tr>
</table>

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: - 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.
Enhanced construction techniques and construction quality		
Earth berms (sound barriers)		
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.

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

	Navan Road	Brian Coburn Boulevard
Total Traffic Volume (AADT)	15,000	15,000
Day/Night Split (%)	92/8	92/8
Medium Trucks (%)	7	7
Heavy Trucks (%)	5	5
Posted Speed (km/hr.)	60	70
Road Gradient (%)	1	1
Road Classification	2-Lane Urban Arterial (2-UAU)	2-Lane Urban Arterial (2-UAU)

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 Bus Rapid Transit Corridor Data

Drawing N1 shows the location of the Bus Rapid Transit (BRT) Corridor in relation to the proposed residential development. The following data was used to predict BRT noise levels:

Table 6: Bus Rapid Transit Corridor Data to Predict Noise Levels

	Bus Rapid Transit Corridor
Total Traffic Volume (AADT)	270
Day/Night Split (%)	74/26
Medium Trucks (%)	100
Heavy Trucks (%)	0
Posted Speed (km/hr)	80
Road Gradient (%)	1

Appendix 'C' includes confirmation from the City specific to the Bus Rapid Transit Corridor, including the speed limit, AADT value and the day/night split.

The computer program Stamson is used to predict noise levels associated with the bus rapid transit corridor.

3.3.3 Noise Level Calculations (Transportation)

Noise contours for the daytime periods were developed using the MOE Road Traffic Noise Computer program STAMSON, Version 5.03. The following procedure was used to establish the contours:

1. 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.

2. Additional calculations were conducted to generate freefield noise levels where two roadways intersect to establish the distances along a 45 degree angle from the centre of the intersection.

3. These calculations were then compiled to prepare freefield composite noise level contours for each of Navan Road and Brian Coburn Boulevard. Drawing N1 presents these contours. For the purpose of this study, only the daytime freefield noise levels are presented. Computer printouts are included in Appendix 'D' for each of the receivers presented on Drawing N1.

4. The above procedure was used to establish freefield noise levels for the BRT. Receiver locations and contours for the BRT are identified on Figure N2. Computer printouts are included in Appendix 'E'. It is anticipated that noise levels generated from the BRT will be in the range of 50 to 55 dBA. The noise from the BRT (50 dBA) will have minimal effect on the noise generated from Brian Coburn Boulevard (65 dBA). The difference between the BRT and Brian Coburn Boulevard noise levels is approximately 15 dBA.

Using the Nomograph method of adding noise levels together, the noise difference results in an additional 0.15 dBA.

Table 7: Predicted Freefield Noise Levels and Distances from Individual Noise Sources

Roads	Contour (dBA)	OLA (Freefield) Distance (m)
		Daytime
2-UAU (Brian Coburn Boulevard) 70 km/hr.	50	235.71
	55	117.78
	60	58.87
	65	29.45
	70	n/a
2-UAU (Navan Road) 60 km/hr.	50	196.40
	55	98.12
	60	49.04
	65	24.50
	70	n/a
BRT 80 km/hr.	50	46.50
	55	23.23
	60	n/a
	65	n/a
	70	n/a

3.4 Summary of Findings (Transportation)

2983, 3053 & 3079 Navan Road will result in multiple blocks of residential units that will be impacted by roadway traffic noise.

Due to their proximity to the 2983, 3053 & 3079 Navan Road development, Navan Road and Brian Coburn Boulevard have the highest noise impact on the development. To help mitigate the noise impact of these transportation noise sources, 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. The exact location of noise barriers will be determined in the Noise Control Detailed Study. Where possible,

non-sensitive land uses have been placed adjacent to the transportation noise sources (i.e. SWM Blocks, and Parks).

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 barrier, setback buffers could be considered to reduce or eliminate noise barriers. However, in some locations, units flanking arterial roads may have to be eliminated. This is not a financially practical solution.

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.

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

Block 16 will be the subject of a sperate future site plan application. As such, it will be the responsibility of the proponent and site designer to consider the latest Urban design Guidelines and Environmental Noise Control Guidelines for any drive-thru or car wash facility.

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 Navan Road and Brian Coburn Boulevard. 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 60.49 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 12714001 Canada 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 12714001 Canada Inc. and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

Thomas Blais, A.Sc.T.
Senior GIS Technologist

Reviewed by:

Lee Jablonski, P.Eng.
Associate
Senior Civil Engineer

Appendix A

Plan of Subdivision

Freefield Daytime Noise Contours (Roads) – N1

Freefield Daytime Noise Contours (BRT) – N2

LOTS AREAS

LOT NUMBER	AREAS (M2)	LOT NUMBER	AREAS (M2)
L1	376	L39	184
L2	176	L40	174
L3	176	L41	234
L4	181	L42	234
L5	181	L43	174
L6	176	L44	184
L7	176	L45	184
L8	286	L46	174
L9	5,745	L47	487
L10	281	L48	748
L11	176	L49	286
L12	184	L50	265
L13	184	L51	246
L14	174	L52	242
L15	233	L53	242
L16	250	L54	321
L17	182	L55	240
L18	182	L56	7,485
L19	182	L57	5,411
L20	182	L58	444
L21	250	L59	182
L22	233	L60	182
L23	174	L61	182
L24	184	L62	182
L25	174	L63	552
L26	280	L64	387
L27	1,410	L65	174
L28	736	L66	184
L29	5,288	L67	184
L30	523	L68	174
L31	174	L69	233
L32	184	L70	233
L33	184	L71	174
L34	174	L72	184
L35	234	L73	174
L36	234	L74	184
L37	174	L75	174
L38	184	L76	399

SITE PLAN LEGEND

- EXISTING BUILDING
- NEW BUILDING
- NEW BUILDING WITH COMMERCIAL SPACE AT-GRADE
- GRASS
- ASPHALT
- LOT LINE
- SETBACKS
- NEW TREE
- FIREWALL
- SIDEWALK

SITE INFORMATION & DEVELOPMENT STATISTICS

LOTS — PIN

04756 - 0303
04756 - 0315
04756 - 0316
04756 - 1337

ZONING: GM[2546] H(14.5)

SITE AREA

TOTAL SITE AREA:	~53,441.14 m² (5.34ha)
TOTAL DEVELOPABLE AREA:	~45,956.28 m² (4.59ha)
NET SITE AREA:	~38,956.28 m² (3.89ha)

UNITS

TOWNHOUSES: 69 UNITS
APARTMENTS: 6 BUILDINGS / TOTAL OF 263 UNITS
COMMERCIAL SPACES: ~20,000 m²

TOTAL NUMBER OF UNITS : 332

	REQUIRED	PROVIDED
MAXIMUM DENSITY	NO MAX.	85.3 units/net ha
MINIMUM LOT WIDTH	NO MIN.	5.8 m
MINIMUM LOT AREA	NO MIN.	174 m²
MAXIMUM BUILDING HEIGHT	14.5 m	14.5 m
SETBACKS		
MINIMUM FRONT YARD:	3 m	3 m
MINIMUM CORNER SIDE YARD:	3 m	3 m
MINIMUM INTERIOR SIDE YARD:		
NON-RESIDENTIAL OR MIXED-USE:	5 m	5 m
LOW-RISE RESIDENTIAL :	1.2 m	1.2 m
MID-RISE RESIDENTIAL :	3 m	3 m
MINIMIM REAR YARD:		
ABUTTING A STREET:	3 m	3 m
FROM A RESIDENTIAL ZONE:	7.5 m	7.5 m
FOR A RESIDENTIAL BUILDING:	7.5 m	7.5 m

PARKING RATES

R9 - TOWNHOUSES:	1 p/unit = 69	69 (GARAGES)
VISITOR:	0	69 DRIVE AISLES
R12 - APARTMENTS - BLOCK 01:	1.2 p/unit = 101	101
VISITOR:	0.2 p/unit = 17	17
R12 - APARTMENTS - BLOCK 02:	1.2 p/unit = 101	101
VISITOR:	0.2 p/unit = 17	17
R12 - APARTMENTS - BLOCK 03:	1.2 p/unit = 116	~145
VISITOR:	0.2 p/unit = 20	8 ext. + 12 int.
N79 - RETAIL STORE - BLOCK 01:	3.4 p/100 m² GFA = 32	32
N79 - RETAIL STORE - BLOCK 02:	3.4 p/100 m² GFA = 32	32

GROSS FLOOR AREA

TOWNHOUSE A:	267 m²
TOWNHOUSE B:	239 m²
TOWNHOUSE C:	232 m²
TOWNHOUSE C (CORNER UNIT):	236 m²
TOWNHOUSE D:	225 m²
TOTAL MODEL 01 (ABBBBBBA)	1,968 m²
TOTAL MODEL 02 (ABBBBBA)	1,729 m²
TOTAL MODEL 03 (ABBBBA)	1,490 m²
TOTAL MODEL 04 (CDCDCDC)	1,611 m²
TOTAL MODEL 05 (CDCCDC)	1,386 m²
TOTAL MODEL 06 (CDCDC)	1,154 m²
APARTMENT BUILDING 1:	TOTAL: 4,130 m²
RESIDENTIAL:	3,201 m²
COMMERCIAL:	929 m²
APARTMENT BUILDING 2:	TOTAL: 4,130 m²
RESIDENTIAL:	4,130 m²

NOTE

1. ASSUMES TYPICAL RESIDENTIAL FLOOR HEIGHT OF 3m.

2. THE BASE PLAN (LOT LINES, EXISTING ROADS AND SURROUNDING AREAS) IS BASED ON THE TOPOGRAPHICAL PLAN OF SURVEY, SURVEYED STANTEC GEOMATICS LTD.

3. DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0,3048.

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PROJECT

NAVAN ROAD DEVELOPMENT

2983, Navan Road, Orleans, ON K1C 7G4

OWNER

Groupe Heafey Group

768, BOUL. SAINT-JOSEPH, SUITE 100
GATINEAU, QC J8Y 4B8

ARCHITECTURAL

PMA ARCHITECTES

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INFO@PMAARCHITECTES.COM

3070, CHEMIN DES QUATRE-BOURGEOIS
QUÉBEC (QC) G1W 2K4
PMAARCHITECTES.COM

LAPALME RHEAULT ARCHITECTES | ASSOCIÉS

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GATINEAU, QC J8Y 1R8

ENGINEERS / PLANNER

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

1565 CARLING AVENUE, SUITE 700,
OTTAWA, ON K1Z 8R1

SURVEYOR

Stantec

1331 CLYDE AVENUE, SUITE 400,
OTTAWA, ON K2C 3G4

KEY PLAN

ARCHITECT SEAL

ONTARIO ASSOCIATION OF ARCHITECTS
PIERRE MARTIN
LICENCE 8757

REVISIONS

NO	DESCRIPTION	DATE
3	FOR COORDINATION	2021-08-30
2	FOR COORDINATION	2021-08-25
1	FOR COORDINATION	2021-08-18

NOTE

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON THE SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT. ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS. DO NOT SCALE DRAWINGS.

FOR COORDINATION
DO NOT USE FOR CONSTRUCTION
2021-08-30

DATE	DESIGNED
2021-08-30	PP
	DRAWN
	PP
PROJECT No	CHECKED
20054	PM

SHEET TITLE

SITE PLAN

SHEET No

A100

APPROVED UNDER SECTION 51 OF THE PLANNING ACT BY THE CITY OF OTTAWA.

THIS _____ DAY OF _____________ 2021.

____

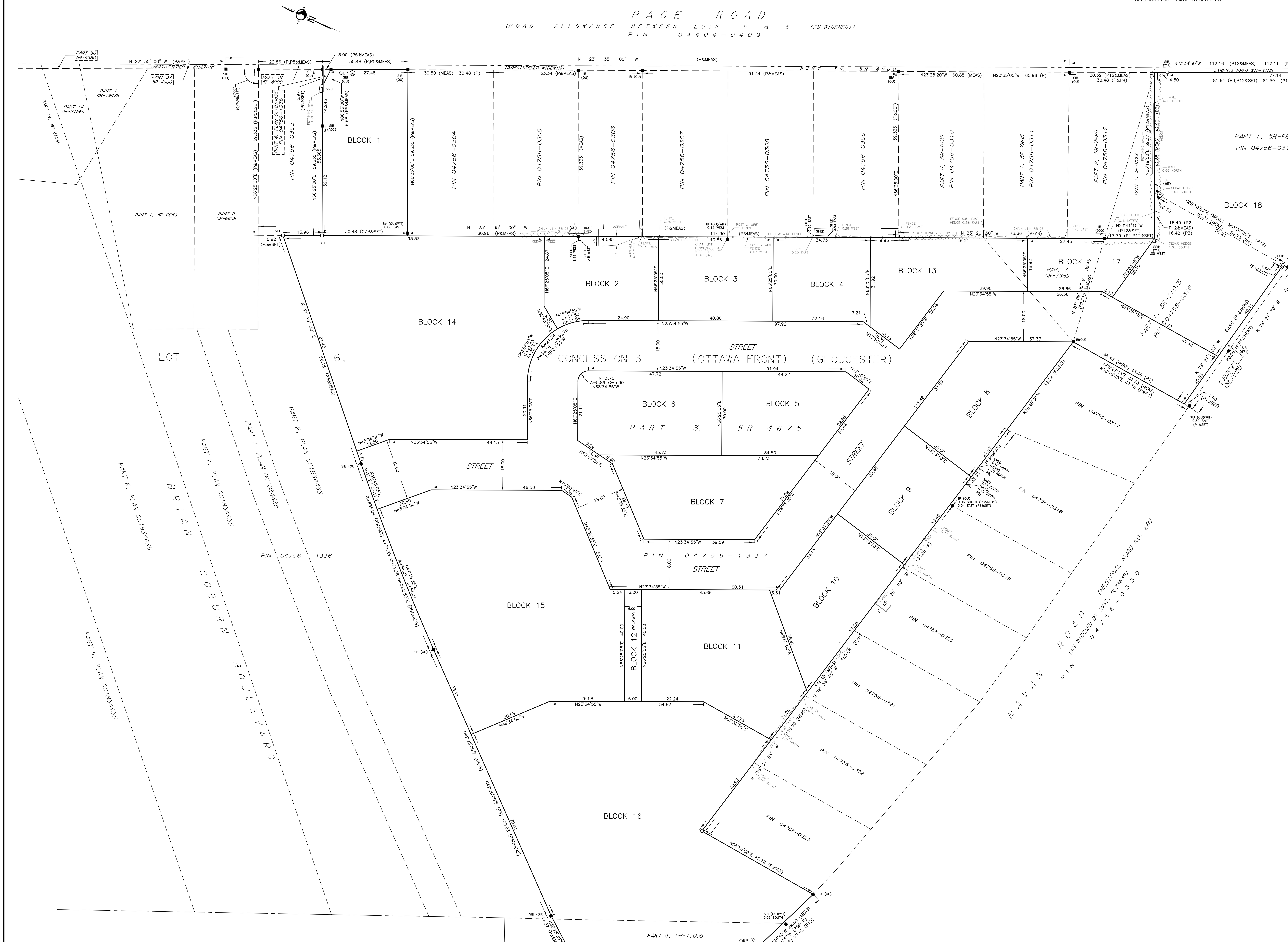
STEPHEN WILLIS, MCIP, RPP, GENERAL MANAGER
PLANNING, INFRASTRUCTURE AND ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

PLAN 4M-

I HEREBY CERTIFY THAT THIS PLAN 4M-______ IS REGISTERED IN THE LAND REGISTRY OFFICE FOR THE LAND TITLES DIVISION OF OTTAWA-CARLETON (No.4) AT_____ O'CLOCK ON THE______ DAY OF _____________, 2021 AND ENTERED IN THE REGISTER FOR P.I.N.____________________, AND THE REQUIRED CONSENTS ARE REGISTERED AS PLAN DOCUMENT NUMBER OC-____________.

REPRESENTATIVE FOR LAND REGISTRAR

THIS PLAN COMPRISES OF ALL OF PINS 04756-0315 & 04756-1337 AND PART OF PIN 04756-0316.



PLAN OF SUBDIVISION OF

PART OF LOT 6
CONCESSION 3 (OTTAWA FRONT)

(GEOGRAPHIC TOWNSHIP OF GLOUCESTER)

CITY OF OTTAWA

Scale 1:500

10 0 10 20 30 METRES

METRIC CONVERSION

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

GRID SCALE CONVERSION

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999964

BEARING NOTE

BEARINGS ARE GRID, DERIVED FROM CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL).

FOR BEARING COMPARISONS, BEARINGS ON PLANS P, P1, P2 & P3 HAVE BEEN ROTATED 0°41'30" COUNTERCLOCKWISE.

LEGEND

■	DENOTES	FOUND MONUMENTS
□	"	SET MONUMENTS (IB) UNLESS OTHERWISE NOTED
IB	"	IRON BAR
IBØ	"	ROUND IRON BAR
SIB	"	STANDARD IRON BAR
SSIB	"	SHORT STANDARD IRON BAR
CC	"	CUT CROSS
CP	"	CONCRETE PIN
WIT	"	WITNESS
PIN	"	PROPERTY IDENTIFICATION NUMBER
MEAS	"	MEASURED
PROP	"	PROPORTIONED
OU	"	ORIGIN UNKNOWN
SG	"	STANTEC GEOMATICS LTD.
ORP	"	OBSERVED REFERENCE POINT
P	"	PLAN 5R-4675
P1	"	PLAN 5R-11075
P2	"	PLAN 5R-7985
P3	"	PLAN 5R-9893
P4		PLAN 5R-8022
P5	"	PLAN OC183445
P6	"	PLAN 5R-4980
P7	"	PLAN 5R-6659
P8		PLAN BY FMW DATED SEPTEMBER 9, 2015
P9	"	PLAN BY 1175 DATED SEPTEMBER 30, 1987
P10	"	PLAN 5R-11005
P11	"	REGISTERED PLAN 4M-1133
P12	"	PLAN BY 1465 DATED DECEMBER 10, 2020
C/P	"	CALCULATION PER

NOTES

1. ALL PLANTED MONUMENTS SHOWN HEREON ARE IRON BARS (IB) UNLESS OTHERWISE NOTED.
2. TOTAL AREA OF LANDS BEING SUBDIVIDED HEREON BY * IS * Ha.

OWNER'S CERTIFICATE

ALL OF PINS 04756-0315 & 04756-1337 & PART OF 04756-0316.

THIS IS TO CERTIFY THAT :

1. BLOCKS 1 TO 11, BOTH INCLUSIVE, BLOCKS 13 TO 17, BOTH INCLUSIVE, THE STREETS, NAMELY STREET AND LANES, NAMELY BLOCK 12, HAVE BEEN LAID OUT IN ACCORDANCE WITH OUR INSTRUCTIONS.

2. THE STREETS AND LANES ARE DEDICATED TO THE CITY OF OTTAWA AS PUBLIC HIGHWAYS.

DATE

*,PRESIDENT
####### ONTARIO LIMITED
I HAVE THE AUTHORITY TO BIND THE CORPORATION

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 1st DAY OF MAY, 2021.

DATE

FRANCIS LAU
ONTARIO LAND SURVEYOR

OBSERVED REFERENCE POINTS DERIVED FROM THE CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL).
COORDINATES TO URBAN ACCURACY PER SEC 14(2) OF O.REG. 216/10

ORP ID	NORTHING	EASTING
(A)	5033144.88	381482.57
(B)	5032879.91	381255.06

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

Stantec Geomatics Ltd.
CANADA LANDS SURVEYORS
ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 400
OTTAWA, ONTARIO, K2C 3G4
TEL. 613.722.4420 FAX. 613.722.2799
stantec.com

DRAWN: ME/NJ	CHECKED: KJ	DATE: KJ	FIELD: ES/LG	PROJECT No.: 161614345-132

PROJECT NORTH

BRIAN COBURN BOULEVARD (AADT 15,000)

NAVAN ROAD (AADT 15,000)

STREET 1

STREET 2

STREET 3

BLOCK 1

BLOCK 2

BLOCK 3

BLOCK 4

BLOCK 5

BLOCK 6

BLOCK 7

BLOCK 8

BLOCK 9

BLOCK 10

BLOCK 11

BLOCK 12

BLOCK 13

BLOCK 14

BLOCK 15

BLOCK 16

BLOCK 17

BLOCK 18

BUILDING - A

BUILDING - B

BUILDING - C

BUILDING - D

BUILDING - E

98.12m

49.04m

24.50m

29.45m

58.87m

LEGEND

NOISE CONTOURS

- 50 dBA
- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA

No.	ISSUE / REVISION	DD/MM/YY
2	NOISE CONTROL FEASIBILITY STUDY RESUBMISSION	08/04/22
1	ISSUED WITH NOISE CONTROL FEASIBILITY STUDY	16/08/21

VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:750

0 15 30 45 60m

CLIENT: Heafey Group

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

PROJECT:

2983, 3053 and 3079 NAVAN ROAD & 2690 PAGE ROAD

DRAWING:

FREEFIELD DAYTIME NOISE CONTOURS (ROADS)

DESIGN: TB	
DRAWN: TB	DRAWING #:
CHECKED: LJ	N1
JLR #: 29899	

PLOT DATE: Friday, April 8, 2022 12:59:58 PM

File Location: V:\29000\29899-000 - Gas Bar 3079 Navan\2-Design\1-Civil\Noise\2 - Noise Feasibility - April 2022\29899 C N1.dwg

PROJECT NORTH

LEGEND

NOISE CONTOURS

- 50 dBA
- 55 dBA

46.50m

23.23m

APPROXIMATE BRT ALIGNMENT (AADT 270)

STREET 1

STREET 2

STREET 3

BLOCK 1

BLOCK 2

BLOCK 3

BLOCK 4

BLOCK 5

BLOCK 6

BLOCK 7

BLOCK 8

BLOCK 9

BLOCK 10

BLOCK 11

BLOCK 12

BLOCK 13

BLOCK 14

BLOCK 15

BLOCK 16

BLOCK 17

BLOCK 18

BUILDING - A

BUILDING - B

BUILDING - C

BUILDING - D

BUILDING - E

No.	ISSUE / REVISION	DD/MM/YY
2	NOISE CONTROL FEASIBILITY STUDY RESUBMISSION	08/04/22
1	ISSUED WITH NOISE CONTROL FEASIBILITY STUDY	16/08/21

VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:750

0 15 30 45 60m

CLIENT: Heafey Group

CONSULTANT: www.jlrichards.ca

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

PROJECT:

2983, 3053 and 3079 NAVAN ROAD & 2690 PAGE ROAD

DRAWING:

FREEFIELD DAYTIME NOISE CONTOURS (BRT)

DESIGN: TB	
DRAWN: TB	DRAWING #: N2
CHECKED: LJ	
JLR #: 29899	

PLOT DATE: Friday, April 8, 2022 12:59:29 PM

File Location: V:\29000\29899-000 - Gas Bar 3079 Navan\2-Design\1-Civil\Noise\2 - Noise Feasibility - April 2022\29899 C N1.dwg

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 (Individual Noise Sources)

STAMSON 5.0 NORMAL REPORT Date: 23-07-2021 10:36:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: BC_50.te Time Period: Day/Night 16/8 hours
Description: Brian Coburn 50dba

Road data, segment # 1: Brian Coburn (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 70 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): 15000
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: Brian Coburn (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 : 235.71 / 235.71 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Brian Coburn (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	71.32	0.00	-19.86	-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: Brian Coburn (night)

Source height = 1.50 m

ROAD (0.00 + 43.63 + 0.00) = 43.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.72	0.00	-18.78	-1.30	0.00	0.00	0.00	43.63

Segment Leq : 43.63 dBA

Total Leq All Segments: 43.63 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 50.00
(NIGHT): 43.63

↟
↟
STAMSON 5.0 NORMAL REPORT Date: 23-07-2021 10:34:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: BC_55.te Time Period: Day/Night 16/8 hours
Description: Brian Coburn 55dba

Road data, segment # 1: Brian Coburn (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 70 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): 15000
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: Brian Coburn (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 : 117.78 / 117.78 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Brian Coburn (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	71.32	0.00	-14.86	-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: Brian Coburn (night)

Source height = 1.50 m

ROAD (0.00 + 48.36 + 0.00) = 48.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.72	0.00	-14.05	-1.30	0.00	0.00	0.00	48.36

Segment Leq : 48.36 dBA

Total Leq All Segments: 48.36 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.00
(NIGHT): 48.36

STAMSON 5.0 NORMAL REPORT Date: 23-07-2021 10:33:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: BC_60.te Time Period: Day/Night 16/8 hours
Description: Brian Coburn 60dba

Road data, segment # 1: Brian Coburn (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 70 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): 15000
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: Brian Coburn (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 : 58.87 / 58.87 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Brian Coburn (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	71.32	0.00	-9.86	-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: Brian Coburn (night)

Source height = 1.50 m

ROAD (0.00 + 53.09 + 0.00) = 53.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.72	0.00	-9.32	-1.30	0.00	0.00	0.00	53.09

Segment Leq : 53.09 dBA

Total Leq All Segments: 53.09 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 60.00
(NIGHT): 53.09

↟
↟
STAMSON 5.0 NORMAL REPORT Date: 23-07-2021 10:31:03
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: BC_65.te Time Period: Day/Night 16/8 hours
Description: Brian Conburn 65dba

Road data, segment # 1: Brian Coburn (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 70 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): 15000
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: Brian Coburn (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  :  29.45 / 29.45  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

↟

```
Results segment # 1: Brian Coburn (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 65.00 + 0.00) = 65.00 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  71.32   0.00  -4.86  -1.46   0.00   0.00   0.00  65.00
-------------------------------------------------------------------------------

Segment Leq : 65.00 dBA

Total Leq All Segments: 65.00 dBA
```

↟

```
Results segment # 1: Brian Coburn (night)
-----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.82 + 0.00) = 57.82 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.57  63.72   0.00  -4.60  -1.30   0.00   0.00   0.00  57.82
-------------------------------------------------------------------------------

Segment Leq : 57.82 dBA

Total Leq All Segments: 57.82 dBA
```

↟

TOTAL Leq FROM ALL SOURCES (DAY): 65.00
(NIGHT): 57.82

STAMSON 5.0 NORMAL REPORT Date: 23-07-2021 09:57:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: navan50.te Time Period: Day/Night 16/8 hours
Description: Navan Road 50dba

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 60 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): 15000
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: Navan (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 : 196.40 / 196.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Navan (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	70.00	0.00	-18.54	-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: Navan (night)

Source height = 1.50 m

ROAD (0.00 + 43.56 + 0.00) = 43.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	62.40	0.00	-17.54	-1.30	0.00	0.00	0.00	43.56

Segment Leq : 43.56 dBA

Total Leq All Segments: 43.56 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 50.00
(NIGHT): 43.56

↟
↟
STAMSON 5.0 NORMAL REPORT Date: 23-07-2021 09:56:38
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: navan55.te Time Period: Day/Night 16/8 hours
Description: Navan Road 55dba

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 60 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): 15000
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: Navan (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  :  98.12 / 98.12  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

↟

```
Results segment # 1: Navan (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  70.00   0.00 -13.54  -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: Navan (night)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 48.29 + 0.00) = 48.29 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.57  62.40   0.00 -12.81  -1.30   0.00   0.00   0.00  48.29
-------------------------------------------------------------------------------

Segment Leq : 48.29 dBA

Total Leq All Segments: 48.29 dBA
```

↟

TOTAL Leq FROM ALL SOURCES (DAY): 55.00
(NIGHT): 48.29

STAMSON 5.0 NORMAL REPORT Date: 23-07-2021 09:55:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: navan60.te Time Period: Day/Night 16/8 hours
Description: Navan Road 60dba

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

Car traffic volume	: 12144/1056	veh/TimePeriod *
Medium truck volume	: 966/84	veh/TimePeriod *
Heavy truck volume	: 690/60	veh/TimePeriod *
Posted speed limit	: 60 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)	15000
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: Navan (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	: 49.04 / 49.04	m
Receiver height	: 1.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Results segment # 1: Navan (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  70.00   0.00  -8.54  -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: Navan (night)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 53.02 + 0.00) = 53.02 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.57  62.40   0.00  -8.08  -1.30   0.00   0.00   0.00  53.02
-------------------------------------------------------------------------

Segment Leq : 53.02 dBA

Total Leq All Segments: 53.02 dBA

↟



TOTAL Leq FROM ALL SOURCES (DAY): 60.00
                           (NIGHT): 53.02
↟
↟
STAMSON 5.0        NORMAL REPORT        Date: 23-07-2021 09:51:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: navan65.te           Time Period: Day/Night 16/8 hours
Description: Navan Road 65dba


Road data, segment # 1: Navan (day/night)
----------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    60 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):  15000
    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: Navan (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  :  24.50 / 24.50  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```



```
Results segment # 1: Navan (day)
--------------------------------

Source height = 1.50 m

ROAD (0.00 + 65.00 + 0.00) = 65.00 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  70.00   0.00  -3.54  -1.46   0.00   0.00   0.00  65.00
-------------------------------------------------------------------------------

Segment Leq : 65.00 dBA

Total Leq All Segments: 65.00 dBA
```



```
Results segment # 1: Navan (night)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.75 + 0.00) = 57.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.57  62.40   0.00  -3.35  -1.30   0.00   0.00   0.00  57.75
-------------------------------------------------------------------------------

Segment Leq : 57.75 dBA

Total Leq All Segments: 57.75 dBA
```

TOTAL Leq FROM ALL SOURCES (DAY): 65.00
(NIGHT): 57.75

Appendix D

Transportation Noise Source Predictions

- Detailed Predicted Freefield Noise Level Calculations (Combined Road Noise Sources)

STAMSON 5.0 NORMAL REPORT Date: 26-07-2021 10:22:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 2UCU_50.te Time Period: Day/Night 16/8 hours
Description: 2UCU composite 50 dba

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 60 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): 15000
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: Navan (day/night)

Angle1 Angle2 : -90.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 196.40 / 196.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Road data, segment # 2: Brian Coburn (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 70 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): 15000
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 # 2: Brian Coburn (day/night)
------------------------------------------------
Angle1   Angle2           : -90.00 deg   45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 500.00 / 500.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

🠝

```
Results segment # 1: Navan (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 49.17 + 0.00) = 49.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     45   0.66  70.00   0.00 -18.54  -2.29   0.00   0.00   0.00  49.17
-------------------------------------------------------------------------------

Segment Leq : 49.17 dBA
```

🠝

```
Results segment # 2: Brian Coburn (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 43.75 + 0.00) = 43.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     45   0.66  71.32   0.00 -25.28  -2.29   0.00   0.00   0.00  43.75
-------------------------------------------------------------------------------

Segment Leq : 43.75 dBA

Total Leq All Segments: 50.27 dBA
```

🠝

```
Results segment # 1: Navan (night)
-----------------------------------
```

Source height = 1.50 m

ROAD (0.00 + 42.68 + 0.00) = 42.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.57	62.40	0.00	-17.54	-2.18	0.00	0.00	0.00	42.68

Segment Leq : 42.68 dBA

Results segment # 2: Brian Coburn (night)

Source height = 1.50 m

ROAD (0.00 + 37.63 + 0.00) = 37.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.57	63.72	0.00	-23.91	-2.18	0.00	0.00	0.00	37.63

Segment Leq : 37.63 dBA

Total Leq All Segments: 43.86 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 50.27
(NIGHT): 43.86

STAMSON 5.0 NORMAL REPORT Date: 26-07-2021 09:02:20
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 2UCU_55.te Time Period: Day/Night 16/8 hours
Description: 2UCU composite 55 dba

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 60 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): 15000
    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: Navan (day/night)

Angle1   Angle2   : -90.00 deg   45.00 deg
Wood depth   :   0   (No woods.)
No of house rows   :   0 / 0
Surface   :   1   (Absorptive ground surface)
Receiver source distance : 98.12 / 98.12 m
Receiver height   :   1.50 / 4.50   m
Topography   :   1   (Flat/gentle slope; no barrier)
Reference angle   :   0.00

Road data, segment # 2: Brian Coburn (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume :   966/84   veh/TimePeriod *
Heavy truck volume :   690/60   veh/TimePeriod *
Posted speed limit :   70 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): 15000
    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 # 2: Brian Coburn (day/night)

Angle1   Angle2   : -90.00 deg   45.00 deg
Wood depth   :   0   (No woods.)
No of house rows   :   0 / 0
Surface   :   1   (Absorptive ground surface)
Receiver source distance : 300.00 / 300.00 m
Receiver height   :   1.50 / 4.50   m
Topography   :   1   (Flat/gentle slope; no barrier)
Reference angle   :   0.00

Results segment # 1: Navan (day)

Source height = 1.50 m

ROAD (0.00 + 54.17 + 0.00) = 54.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.66	70.00	0.00	-13.54	-2.29	0.00	0.00	0.00	54.17

Segment Leq : 54.17 dBA

Results segment # 2: Brian Coburn (day)

Source height = 1.50 m

ROAD (0.00 + 47.43 + 0.00) = 47.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.66	71.32	0.00	-21.60	-2.29	0.00	0.00	0.00	47.43

Segment Leq : 47.43 dBA

Total Leq All Segments: 55.00 dBA

Results segment # 1: Navan (night)

Source height = 1.50 m

ROAD (0.00 + 47.41 + 0.00) = 47.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.57	62.40	0.00	-12.81	-2.18	0.00	0.00	0.00	47.41

Segment Leq : 47.41 dBA

Results segment # 2: Brian Coburn (night)

Source height = 1.50 m

ROAD (0.00 + 41.11 + 0.00) = 41.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.57	63.72	0.00	-20.43	-2.18	0.00	0.00	0.00	41.11

Segment Leq : 41.11 dBA

Total Leq All Segments: 48.32 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.00
(NIGHT): 48.32

STAMSON 5.0 NORMAL REPORT Date: 26-07-2021 08:57:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 2UCU_60.te Time Period: Day/Night 16/8 hours
Description: 2UCU composite 60 dba

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 60 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): 15000
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: Navan (day/night)

Angle1 Angle2 : -90.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 49.04 / 49.04 m

```
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

↟

```
Road data, segment # 2: Brian Coburn (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    70 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):  15000
    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 # 2: Brian Coburn (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 150.00 / 150.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

↟

```
Results segment # 1: Navan (day)
--------------------------------

Source height = 1.50 m

ROAD (0.00 + 59.17 + 0.00) = 59.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     45   0.66  70.00   0.00  -8.54  -2.29   0.00   0.00   0.00  59.17
-------------------------------------------------------------------------------

Segment Leq : 59.17 dBA
```

↟

```
Results segment # 2: Brian Coburn (day)
```

Source height = 1.50 m

ROAD (0.00 + 52.43 + 0.00) = 52.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.66	71.32	0.00	-16.60	-2.29	0.00	0.00	0.00	52.43

Segment Leq : 52.43 dBA

Total Leq All Segments: 60.00 dBA

Results segment # 1: Navan (night)

Source height = 1.50 m

ROAD (0.00 + 52.14 + 0.00) = 52.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.57	62.40	0.00	-8.08	-2.18	0.00	0.00	0.00	52.14

Segment Leq : 52.14 dBA

Results segment # 2: Brian Coburn (night)

Source height = 1.50 m

ROAD (0.00 + 45.84 + 0.00) = 45.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.57	63.72	0.00	-15.70	-2.18	0.00	0.00	0.00	45.84

Segment Leq : 45.84 dBA

Total Leq All Segments: 53.05 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.00
(NIGHT): 53.05

STAMSON 5.0 NORMAL REPORT Date: 26-07-2021 08:35:56
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 2UCU_65.te Time Period: Day/Night 16/8 hours
Description: 2UCU composite 65 dba

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 60 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): 15000
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: Navan (day/night)

Angle1 Angle2 : -90.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 24.50 / 24.50 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Brian Coburn (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 70 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):  15000
    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 # 2: Brian Coburn (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  75.00 / 75.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```



```
Results segment # 1: Navan (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.17 + 0.00) = 64.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     45   0.66  70.00   0.00  -3.54  -2.29   0.00   0.00   0.00  64.17
-------------------------------------------------------------------------------

Segment Leq : 64.17 dBA
```



```
Results segment # 2: Brian Coburn (day)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.42 + 0.00) = 57.42 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     45   0.66  71.32   0.00 -11.60  -2.29   0.00   0.00   0.00  57.42
-------------------------------------------------------------------------------

Segment Leq : 57.42 dBA

Total Leq All Segments: 65.00 dBA
```



```
Results segment # 1: Navan (night)
```

Source height = 1.50 m

ROAD (0.00 + 56.88 + 0.00) = 56.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.57	62.40	0.00	-3.35	-2.18	0.00	0.00	0.00	56.88

Segment Leq : 56.88 dBA

Results segment # 2: Brian Coburn (night)

Source height = 1.50 m

ROAD (0.00 + 50.57 + 0.00) = 50.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.57	63.72	0.00	-10.97	-2.18	0.00	0.00	0.00	50.57

Segment Leq : 50.57 dBA

Total Leq All Segments: 57.79 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.00
(NIGHT): 57.79

STAMSON 5.0 NORMAL REPORT Date: 26-07-2021 11:41:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 2ucu_70.te Time Period: Day/Night 16/8 hours
Description: 2UCU Composite 70 dba

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 60 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):  15000
    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: Navan (day/night)
---------------------------------------
Angle1   Angle2           : -90.00 deg   45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  18.25 / 18.25  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

♠
Road data, segment # 2: Brian Coburn (day/night)
------------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    70 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):  15000
    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 # 2: Brian Coburn (day/night)
----------------------------------------------
Angle1   Angle2           : -90.00 deg   45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  18.25 / 18.25  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
```

Reference angle : 0.00

↟
Results segment # 1: Navan (day)

Source height = 1.50 m

ROAD (0.00 + 66.29 + 0.00) = 66.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.66	70.00	0.00	-1.41	-2.29	0.00	0.00	0.00	66.29

Segment Leq : 66.29 dBA

↟
Results segment # 2: Brian Coburn (day)

Source height = 1.50 m

ROAD (0.00 + 67.61 + 0.00) = 67.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.66	71.32	0.00	-1.41	-2.29	0.00	0.00	0.00	67.61

Segment Leq : 67.61 dBA

Total Leq All Segments: 70.01 dBA

↟
Results segment # 1: Navan (night)

Source height = 1.50 m

ROAD (0.00 + 58.88 + 0.00) = 58.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.57	62.40	0.00	-1.34	-2.18	0.00	0.00	0.00	58.88

Segment Leq : 58.88 dBA

↟
Results segment # 2: Brian Coburn (night)

Source height = 1.50 m

ROAD (0.00 + 60.20 + 0.00) = 60.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.57	63.72	0.00	-1.34	-2.18	0.00	0.00	0.00	60.20

Segment Leq : 60.20 dBA

Total Leq All Segments: 62.60 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.01
(NIGHT): 62.60

Appendix E

Transportation Noise Source Predictions

- Detailed Predicted Freefield Noise Level Calculations (Bus Rapid Transit Noise Source)

STAMSON 5.0 NORMAL REPORT Date: 23-07-2021 11:30:56
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: brt_50.te Time Period: Day/Night 16/8 hours
Description: BRT 50dba

RT/Custom data, segment # 1: BRT (day/night)
---
1 - Bus:
Traffic volume : 200/70 veh/TimePeriod
Speed : 80 km/h

Data for Segment # 1: BRT (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 : 46.50 / 46.50 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: BRT (day)

Source height = 0.50 m

RT/Custom (0.00 + 50.00 + 0.00) = 50.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	59.61	-8.16	-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: BRT (night)

Source height = 0.50 m

RT/Custom (0.00 + 48.85 + 0.00) = 48.85 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	58.06	-7.86	-1.35	0.00	0.00	0.00	48.85

Segment Leq : 48.85 dBA

Total Leq All Segments: 48.85 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 50.00
(NIGHT): 48.85

↟
↟

STAMSON 5.0 NORMAL REPORT Date: 23-07-2021 11:28:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: brt_55.te Time Period: Day/Night 16/8 hours
Description: BRT 55dba

RT/Custom data, segment # 1: BRT (day/night)
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1 - Bus:
Traffic volume : 200/70 veh/TimePeriod
Speed : 80 km/h

Data for Segment # 1: BRT (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 : 23.23 / 23.23 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: BRT (day)

Source height = 0.50 m

RT/Custom (0.00 + 55.00 + 0.00) = 55.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	59.61	-3.15	-1.46	0.00	0.00	0.00	55.00

Segment Leq : 55.00 dBA

Total Leq All Segments: 55.00 dBA

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Results segment # 1: BRT (night)

Source height = 0.50 m

RT/Custom (0.00 + 53.67 + 0.00) = 53.67 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	58.06	-3.04	-1.35	0.00	0.00	0.00	53.67

Segment Leq : 53.67 dBA

Total Leq All Segments: 53.67 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 55.00
(NIGHT): 53.67

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