STRIK BALDINELLI MONIZ

PLANNING • CIVIL • STRUCTURAL • MECHANICAL • ELECTRICAL

ENVIRONMENTAL NOISE ASSESSMENT REPORT

517, 521, 525 FANSHAWE PARK ROAD EAST
LONDON, ONTARIO

FANSHAWE PARK MIDRISE

ROYAL PREMIER HOMES

SEPTEMBER 2021

SBM-21-0466

LONDON LOCATION

1599 Adelaide Street N. Units 301 & 203
London, Ont, N5X 4E8
P: 519.471.6667

KITCHENER LOCATION

1415 Huron Rd., Unit 225
Kitchener, Ont, N2R 0L3
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Royal Premier Homes
509 Commissioners Road West #425
London, Ontario N6J 1J5

September 14, 2021
SBM-21-0466

Re: Environmental Noise Assessment Report
517, 521, 525 Fanshawe Park Road East
London, Ontario

1 INTRODUCTION

This Noise Assessment Report (Report) has been prepared by Strik, Baldinelli, Moniz Ltd (SBM) to address requirements of the Record of Pre-Application Consultation dated January 26, 2021 for the proposed residential development at 517, 521, and 525 Fanshawe Park Road East in the City of London.

This site is located on the south side of Fanshawe Park Road East, immediately east of Geary Avenue. The 0.57 ha subject site is bordered by Fanshawe Park Road East Right-of-Way (ROW) to the north, Geary Avenue to the west, and residential properties to the east and south, as shown in Figure 1 – Location Plan. It is our understanding that the proposed development is to include a 6-storey apartment building with 99 residential units.

This Report will serve the following purposes:

- To summarize the applicable noise criteria and guidelines from the Ministry of the Environment, Conservation, and Parks (MECP) for residential developments;
- To determine future noise levels and how they will affect the future residents using the MECP (formerly Ontario Ministry of the Environment) noise model, ORNAMENT, by utilizing the STAMSON V5.03 computer software;
- Recommend noise control measures (if applicable) to satisfy the planning requirements of the City and "Chapter 16 – Noise Attenuation Measures" of the City's "Design Specifications and Requirements Manual" (DS&RM);
- Recommend noise control measures (if applicable) to meet the MECP requirements prescribed in the publication *Environmental Noise Guideline NPC-300* (Ministry of the Environment, August 2013) concurrently with the aforementioned City requirements;
- Outline general methodology for providing acceptable noise levels for the proposed development.

2 NOISE STUDY CRITERIA

The MECP has compiled guidelines in regards to noise levels (NPC-300) which are used for land use planning and noise estimation. These guidelines, in regards to transportation noise sources, have been further classified with respect to indoor and outdoor locations and day and night time conditions.

2.1 DAYTIME OUTDOOR SOUND LEVEL LIMIT

Table 1: Sound Level Limit for Outdoor Living Areas Road and Rail

Time Period	L_{eq} (16hrs) (dBA)
16-hour (0700 – 2300)	55

As per NPC-300, this One-Hour Equivalent Sound Level (L_{eq}) limit applies to the entire daytime period. The Outdoor Living Area (OLA) should be assessed at a rear yard, patio/terrace, or amenity area. When the L_{eq} at the OLA is equal to 55 dBA or less, no noise control measurement are required per NPC-300 "C3.2.2 Daytime Outdoor Sound Level Limit." If the L_{eq} at the OLA is greater than 55 dBA and less than or equal to 60 dBA, the purchasers or tenants should be provided a warning clause so that they may be made aware to the potential noise level issues. If the L_{eq} at the OLA is greater than 60 dBA, a warning clause is required and physical control measures must be implemented.

2.2 DAY AND NIGHT TIME INDOOR SOUND LEVEL LIMIT

Table 2: Indoor Sound Level Limits Road and Rail

Type of Space	Time Period	L_{eq} (dBA) Road	Leq (dBA) Rail
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	Day Time 16-hours (0700 – 2300)	45	40
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	Day Time 8-hours (2300 – 0700)	45	40
Sleeping quarters	Day Time 16-hours (0700 – 2300)	45	40
Sleeping quarters	Night Time 8-hours (2300 – 0700)	40	35

The L_{eq} for maximum indoor road noise level is measured at the plane of the window (POW) of a living room or bedroom. These noise values are the maximum levels and are applied to the indoor spaces with windows and doors closed. Examples of noise mitigation for excessive indoor living areas include noise barriers, building envelope measures (i.e. windows, exterior walls, doors, insulation, drywall, etc.) with sound isolation performance upgrades and/or central air conditioning, site planning, and architectural design. When the indoor sound level is equal to 45 dBA or less between the hours of 0700 to 2300, no noise control measures are required. When the indoor sound level is equal to 40 dBA or less between the hours of 2300 to 0700, no noise control measures are required. If the noise levels are exceeded up to a maximum of 10 dBA, the residence must be designed with the allowance for a central air conditioning

system. This is traditionally done by installing heating ducts sized to properly convey a central air conditioning system. A warning clause must also be provided to inform prospective purchasers and tenants of potential road noise levels. When maximum noise levels exceed allowable values in excess of 10 dBA, central air conditioning system installation is mandatory as are noise isolation building components and a warning clause to future purchasers and tenants.

3 CALCULATIONS AND ANALYSIS

Following the MECP noise model, ORNAMENT, which is the basis for calculating anticipated noise levels, STAMSON noise software (v5.03) was used. The software can be used to model noise levels from roadways and railways. The program accepts input values related to noise sources, traffic volumes, and noise barriers.

3.1 NOISE SOURCES

The noise sources considered for this site were:

- Fanshawe Park Road East (Arterial Road)
- Adelaide Street North (Arterial Road)

Other ROW's were not considered due to the limitations of ORNAMENT. Per the October, 1989 ORNAMENT report, "The prediction accuracy also decreases in cases of highly irregular topography and the method does not apply to traffic volume less than 40 vehicles per hour and to speeds less than 50km/h." Referencing Table 2: Adjustment to the Reference Hourly Sound Level for Traffic Volume of the "ORNAMENT Technical Document" illustrates the reason. When vehicles per hour are 40 or less, there is no substantial increase in reference sound levels. As the nearby local roads are assumed to average less than 40 vehicles per hour, they were not included in the analysis.

Railways were not considered as the nearest rail corridor is in excess of 4.0 km away and has numerous developments and wooded areas between itself and the subject site. The London International Airport was not considered as it is in excess of 7 km away.

3.2 ROAD TRAFFIC

Road traffic information was provided for Fanshawe Park Road East and Adelaide Street North by the City's Transportation Planning & Design Department, as per the email correspondence provided in Appendix A.

3.2.1 FANSHAWE ROAD EAST

The ultimate Annual Average Daily Traffic (AADT) for Fanshawe Park Road East is 36,000 vehicles per day with 0% medium truck traffic and 4% heavy truck traffic. A 95/5 day/night split was used for all calculations. Fanshawe Park Road East traffic information is summarized below in Table 3.

Table 3: Fanshawe Park Road East - Road and Traffic Information (Ultimate Condition)

Time Period	No. of Cars	No. of Medium Trucks	No. of Heavy Trucks	Posted Speed Limit (km/hr)
0700 – 2300	32,832	0	1,368	60
2300 – 0700	1,728	0	72	60

Noise calculations are attached in Appendix B

3.2.2 ADELAIDE STREET NORTH

The ultimate Annual Average Daily Traffic (AADT) for Adelaide Street North is 36,000 vehicles per day with 0% medium truck traffic and 4% heavy truck traffic. A 95/5 day/night split was used for all calculations. Adelaide Street North traffic information is summarized below in Table 4.

Table 4: Adelaide Street North - Road and Traffic Information (Ultimate Condition)

Time Period	No. of Cars	No. of Medium Trucks	No. of Heavy Trucks	Posted Speed Limit (km/hr)
0700 – 2300	32,832	0	1,368	60
2300 – 0700	1,728	0	72	60

Noise calculations are attached in Appendix B

3.3 PROJECTED NOISE LEVELS

Using STAMSON (v5.03) computer software, noise levels were predicted for day and night time conditions based on the MECP's noise model, ORNAMENT. The following assumptions were made for all calculations:

- Day time conditions comprise the time period 0700 to 2300
- Night time conditions comprise the time period of 2300 to 0700
- An average road gradient of 0% for Fanshawe Park Road East and Adelaide Street North
- **Receiver locations as per the attached Noise Study Plan (see Figure 2)**
- Indoor day time and night time receiver locations assumed to be at building face and at an elevations of 1.5m (ground floor), 5.1m (second floor), 15.0m (5th floor) and 18.3m (6th floor) above ground level (lowest and highest apartment levels for each building face)
- Outdoor day time receiver locations assumed to be at the centre of the outdoor amenity area (south of the building) and at 3.0m from the north building face for the rooftop terrace, both at an elevation of 1.5m above ground/floor level
- A standard wall construction provides a noise level attenuation of 10 dBA (i.e. if the outside POW calculated value was 65 dBA, the indoor value would be 55 dBA).

POW, indoor building, and OLA noise levels were calculated (see Appendix B for STAMSON reports) and have been summarized in Table 5 below.

Table 5: Noise Level Summary

Receiver Location	Outdoor Living Area (OLA)	Day Time Indoor Noise Level Limit (dBA)	Day Time Outdoor Noise Level Limit (dBA)	STAMSON Outdoor Calculated Noise Level (dBA)	STAMSON Indoor Calculated Noise Level (dBA)	Exceeds Noise Level Limit By (dBA)	Comment	Night Time Indoor Noise Level Limit (dBA)	STAMSON Outdoor Calculated Noise Level (dBA)	STAMSON Indoor Calculated Noise Level (dBA)	Exceeds Noise Level Limit By (dBA)	Comment
PoR-01 (1.5m HT)	N/A	45	55	67.0	57.0	12.0	**WC 'D' (AC installed prior to occupancy and Building Components potentially require acoustic treatment)**	40	57.2	47.2	7.2	Day L_{eq} Dictates
PoR-01 (18.3m HT)	N/A	45	55	69.2	59.2	14.2	**WC 'D' (AC installed prior to occupancy and Building Components potentially require acoustic treatment)**	40	59.5	49.5	9.5	Day L_{eq} Dictates
PoR-02 (5.1m HT)	N/A	45	55	63.3	53.3	8.3	**WC 'C' (provisions for AC)**	40	53.5	43.5	3.5	Day L_{eq} Dictates
PoR-02 (15m HT)	N/A	45	55	64.8	54.8	9.8	**WC 'C' (provisions for AC)**	40	55.0	45.0	5.0	Day L_{eq} Dictates
PoR-02a (18.3m HT)	N/A	45	55	64.0	54.0	9.0	**WC 'C' (provisions for AC)**	40	54.2	44.2	4.2	Day L_{eq} Dictates
PoR-03 (1.5m HT)	N/A	45	55	48.3	38.3	0	None	40	38.5	28.5	0	Day L_{eq} Dictates
PoR-03 (18.3m HT)	N/A	45	55	52.8	42.8	0	None	40	43.0	33.0	0	Day L_{eq} Dictates
PoR-04 (1.5m HT)	N/A	45	55	62.8	52.8	7.8	**WC 'C' (provisions for AC)**	40	53.0	43.0	3.0	Day L_{eq} Dictates
PoR-04 (15.0m HT)	N/A	45	55	64.9	54.9	9.9	**WC 'C' (provisions for AC)**	40	55.2	45.2	5.2	Day L_{eq} Dictates

Receiver Location	Outdoor Living Area (OLA)	Day Time Indoor Noise Level Limit (dBA)	Day Time Outdoor Noise Level Limit (dBA)	STAMSON Outdoor Calculated Noise Level (dBA)	STAMSON Indoor Calculated Noise Level (dBA)	Exceeds Noise Level Limit By (dBA)	Comment	Night Time Indoor Noise Level Limit (dBA)	STAMSON Outdoor Calculated Noise Level (dBA)	STAMSON Indoor Calculated Noise Level (dBA)	Exceeds Noise Level Limit By (dBA)	Comment
PoR-04 (18.3m HT)	N/A	45	55	65.5	55.5	10.5	**WC 'D' (AC installed prior to occupancy and Building Components potentially require acoustic treatment)**	40	56.1	46.1	6.1	Day L_{eq} Dictates
PoR-05 (18.3m HT)	Yes	N/A	55	59.7	N/A	4.5	**WC 'A'**	N/A	N/A	N/A	N/A	Day L_{eq} Dictates
PoR-06 (1.5m HT)	Yes	N/A	55	54.2	N/A	0	None	N/A	N/A	N/A	N/A	Day L_{eq} Dictates

Table 5 Footnotes:

- Warning Clause (WC) may refer to WC Type A, Type B, Type D, or Type D as per "Noise Study Plan," Figure 2 and the guidelines of Section C7 "Noise Control Measures" of the "Environmental Noise Guideline - Stationary and Transportation Sources - Approval and Planning (NPC-300)." August 2013. Ontario Ministry of Environment and Climate Change.
- Central Air Conditioning System (AC) installation should be designed by a Professional Engineer and adhere to the guidelines of the Ontario Building Code (OBC) and the following publications:
  - "Environmental Noise Guidelines for Installation of Residential Air Conditioning Devices." September 1994. Ontario Ministry of Environment and Energy. ISBN 0-7778-1616-4. PIBS 2721e01.
  - "Residential Air Conditioning Devices - Publication NPC-216." 1993. Ontario Ministry of Environment and Energy.
- For elevated OLAs, the point of assessment is located at 3m from the front of the building at an elevation of 1.5m above the floor level.
- A standard wall construction provides a noise level attenuation of 10 dBA.

4 NOISE RECOMMENDATIONS

Based on the preceding analysis, the following recommendations can be put forth for this site:

- Per NPC-300, an OLA includes “backyards, front yards, gardens, terraces, or patios.” As per Table 5, the OLA at PoR5 (rooftop terrace) exceeds the allowable outdoor noise level by less than 5 dBA, therefore a warning clause is required on title such as:

  Warning Clause Type A:

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

- Installation of a central air conditioning system will be required for units whose indoor sound levels exceed the allowable by 10 dBA or more. A warning clause for future purchasers and tenants will also be mandatory. All units along the north side of the building (fronting Fanshawe Park Road East) along with the sixth floor units on the east face of the building are recommended to have mandatory central air conditioning installed. The following warning clause shall be included in all agreements of rental, sale, or lease of this unit:

  Warning Clause Type D:

  "This dwelling unit has been supplied with a central air conditioning system 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 Municipality and the Ministry of the Environment.”

- Provisions for a central air conditioning system are required for units whose indoor noise levels exceed the guidelines by less than 10 dBA. Typically, this is achieved by sizing the heating ducts sufficiently to allow for a future installation of a central air conditioning system. Prospective residents will then have the option of closing their windows and doors to block bothersome noise levels. This requirement will apply to the units along the east and west sides of the building, with the following warning clause given to prospective purchasers or tenants.

  Warning Clause Type C:

  "This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment. Refer to "Environmental Noise Guideline - Stationary and Transportation Sources - Approval and Planning (NPC-300)," Section C8.1, Ontario Ministry of the Environment and Climate Change (MOECC), Aug. 2013 for clarification and additional measures. Refer to "Residential Air Conditioning Devices (NPC-216)," Ontario Ministry of the Environment and Energy (MOEE), 1993 for clarification and recommendation as to air conditioning system criteria, placement, installation, etc. Refer to "Model Municipal Noise Control By-law: Final Report," Ontario Ministry of the Environment (MOE), Aug. 1978 for clarification and recommendation as to air conditioning system criteria, placement, installation, etc. Central air conditioning systems are to be designed and constructed to the specifications of a registered professional engineer in accordance with the Ontario Building Code."

  If air conditioning will be provided in these units, warning clause Type D should be used instead of warning clause Type C.

- Building components with sufficient Acoustical Insulation Factors will be required for units that have a day time sound level in excess of 65 dBA outside the living room window or a night time sound in excess of 60 dBA outside the bedroom window. For these units, the building components including doors, windows, and walls must be designed and installed so that the indoor sound levels meet the noise levels outlined by the MOECC in NPC-300.
- All units along the north side of the building (fronting Fanshawe Park Road) along with the sixth floor units on the east side of the building will require building components with noise isolation. An EW5 construction rating or masonry equivalent from floor to ceiling is recommended along with the installation of double glazed windows. An example of exterior wall construction EW5 includes 12.7 mm gypsum board, vapour barrier, and 38 x 89mm studs with 50mm (or thicker) mineral wool or fiberglass batts in interstud cavities, plus sheathing, 25mm air space and brick/concrete. SB-3 of the "Supplementary Standards" of the Ontario Building Code supplies alternative EW5 construction examples and pertinent STC ratings for alternative construction techniques.
- We recommend that the following disclaimer be included in all agreements in regards to purchase, sale, or lease for all residential units on this site:

  "Under no circumstances shall the City or its affiliates, suppliers, partners or licensors be liable for any construction of noise reduction structures or mitigation measures for the subject site. Under no circumstances shall the City or its affiliates, suppliers, partners or licensors be held responsible for increased noise levels in the outdoor or indoor areas of the subject site dwellings due to increased traffic on adjacent roadways."
- The City's Building Inspector or a Professional Engineer qualified to perform acoustical engineering services in Ontario should certify that the building design has properly incorporated the noise mitigation measures.

5 NOISE CONCLUSION

Proper execution of the above noise mitigation measures should produce noise levels within this development that will meet noise requirements of the City and the MECP.

6 LIMITATIONS

This Report was prepared by SBM for The Corporation of the City of London and Royal Premier Homes. Use of this report by any third party, or any reliance upon its findings, is solely the responsibility of that party. SBM accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions undertaken as a result of this report. Third party use of this report, without the express written consent of the Consultant, denies any claims, whether in contract, tort, and/or any other cause of action in law, against the Consultant.

All findings and conclusions presented in this report are based on site conditions as they appeared during the period of the investigation. This report is not intended to be exhaustive in scope, or to imply a risk-free facility. It should be recognized that the passage of time may alter the opinions, conclusions, and recommendations provided herein.

The design was limited to the documents referenced herein and on the SBM drawings provided separately. SBM accepts no responsibility for the accuracy of the information provided by others. All designs and recommendations presented in this report are based on the information available at the time of the review.

7 CLOSURE

We trust this Report meets your satisfaction. Should you have any questions or require further information, please do not hesitate to contact us.

Respectfully submitted,

Strik, Baldinelli, Moniz Ltd.
Planning • Civil • Structural • Mechanical • Electrical

Jonah Lester, P.Eng.
Transportation Engineer

DRAWN BY	CHECKED BY	DRAWING No.
JBL	JBL	FIG1
DATE: 16/03/2021		
SCALE: 1:5000		
PROJECT No.: SBM-21-0466		

No.	REVISIONS	D/M/Y
1	FOR ZBA	16/03/21

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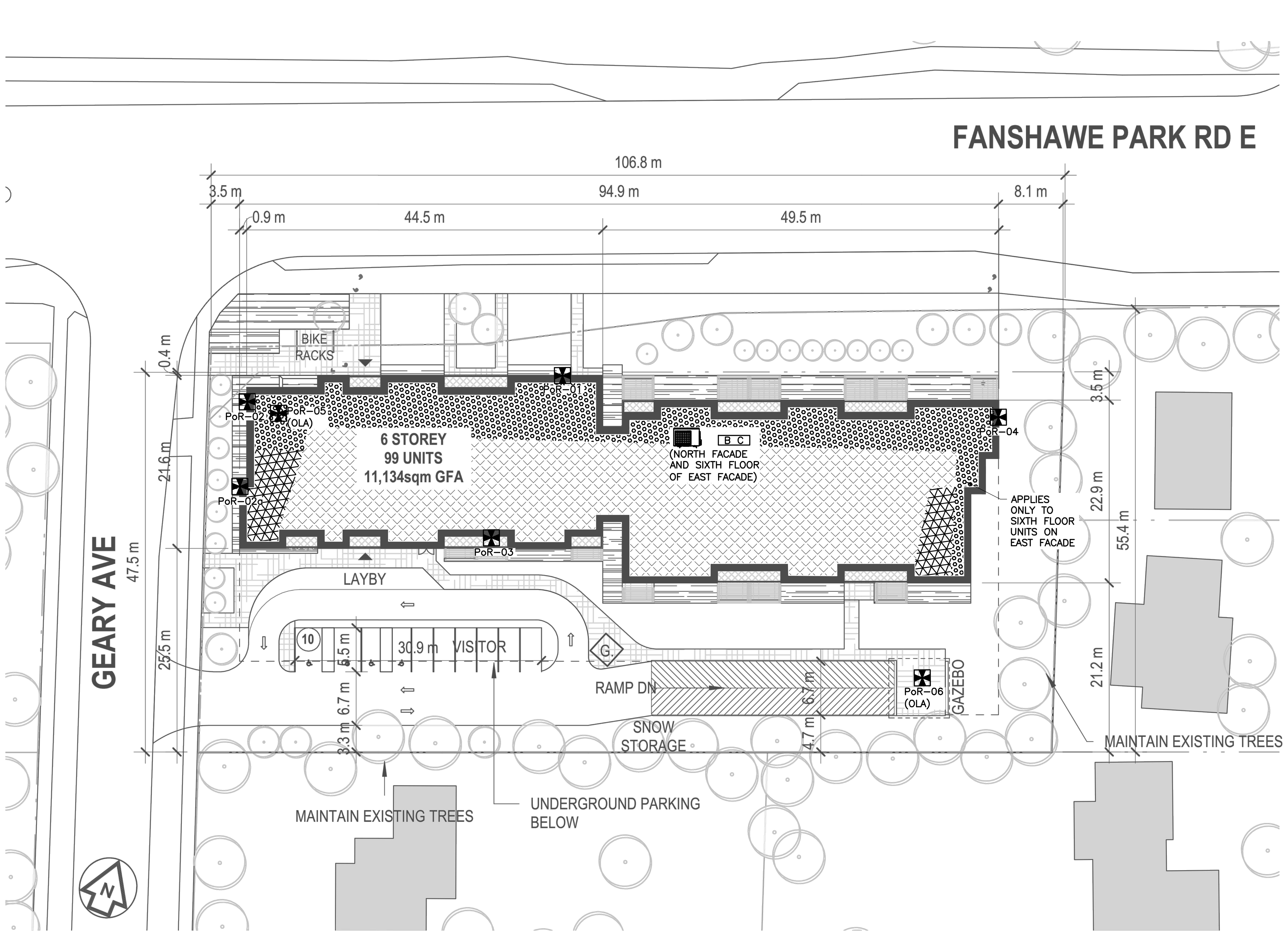
TITLE
LOCATION PLAN

PROJECT
FANSHAWE PARK MIDRISE
517, 521, 525 FANSHAWE PARK ROAD EAST, LONDON, ON.



KEY PLAN

N.T.S.

LEGEND:

- ORNAMENT (STAMSON) RECEIVER TEST LOCATION
- WARNING CLAUSE 'A' APPLICABLE
- WARNING CLAUSE 'B' APPLICABLE
- WARNING CLAUSE 'C' APPLICABLE
- WARNING CLAUSE 'D' APPLICABLE
- AIR CONDITIONING SYSTEM INSTALLATION REQUIRED
- B C — BUILDING COMPONENT INSTALLATION REQUIRED

POINT OF ASSESSMENT NOTES:

1. FOR THE PURPOSE OF NOISE IMPACT ASSESSMENT IN AN OUTDOOR LIVING AREA, THE RECEIVER LOCATION HAS BEEN ASSUMED TO BE AT THE CENTER OF THE OUTDOOR AMENITY AREA AND ROOFTOP TERRACE.
2. NOISE SENSITIVE LAND USES MAY HAVE ONE OR MORE POINTS OF RECEPTION. THE FOLLOWING IS A POINT OF RECPTION:
   2.1. LOCATION IN THE CENTRE OF ANY WINDOW ON A NOISE SENSITIVE SPACE OF A DWELLING OR A BUILDING USED FOR NOISE SENSITIVE INSTITUTIONAL PURPOSE OR A NOISE SENSITIVE COMMERCIAL PURPOSE; THE LOCATION SHOULD BE A MINIMUM OF 1.5 METRES ABOVE GROUND FOR A FIRST STOREY WINDOW, A MINIMUM OF 4.5 METRES ABOVE GROUND FOR A SECOND STOREY WINDOW, A MINIMUM OF 7.5 METRES ABOVE GROUND FOR A THIRD STOREY WINDOW, AND THE HEIGHT OF THE VERTICAL MIDPOINT OF THE NEAREST AND MOST EXPOSED STOREY FOR A HIGH-RISE MULTI-UNIT BUILDING.
3. BUILDING FACE POINTS OF ASSESSMENT UTILIZED AS DAYTIME AND NIGHT TIME RECEIVERS FOR CALCULATIONS.

PLEASE REFER TO "ENVIRONMENTAL NOISE GUIDELINE – STATIONARY AND TRANSPORTATION SOURCES – APPROVAL AND PLANNING (NPC-300)," MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE (MOECC), AUG. 2013

WARNING CLAUSES:

A. "PURCHASERS/TENANTS ARE ADVISED THAT SOUND LEVELS DUE TO INCREASING ROAD TRAFFIC MAY OCCASIONALLY INTERFERE WITH SOME ACTIVITIES OF THE DWELLING OCCUPANTS AS THE SOUND LEVELS EXCEED THE SOUND LEVEL LIMITS OF THE MUNICIPALITY AND THE MINISTRY OF THE ENVIRONMENT."

B. "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 TRAFFIC MAY ON OCCASIONS INTERFERE WITH SOME ACTIVITIES OF THE DWELLING OCCUPANTS AS THE SOUND LEVELS EXCEED THE SOUND LEVEL LIMITS OF THE MUNICIPALITY AND THE MINISTRY OF THE ENVIRONMENT."

C. "THIS DWELLING UNIT HAS BEEN DESIGNED WITH THE PROVISION FOR ADDING CENTRAL AIR CONDITIONING AT THE OCCUPANT'S DISCRETION. INSTALLATION OF CENTRAL AIR CONDITIONING BY THE OCCUPANT IN LOW AND MEDIUM DENSITY DEVELOPMENTS WILL ALLOW WINDOWS AND EXTERIOR DOORS TO REMAIN CLOSED, THEREBY ENSURING THAT THE INDOOR SOUND LEVELS ARE WITHIN THE SOUND LEVEL LIMITS OF THE MUNICIPALITY AND THE MINISTRY OF THE ENVIRONMENT."

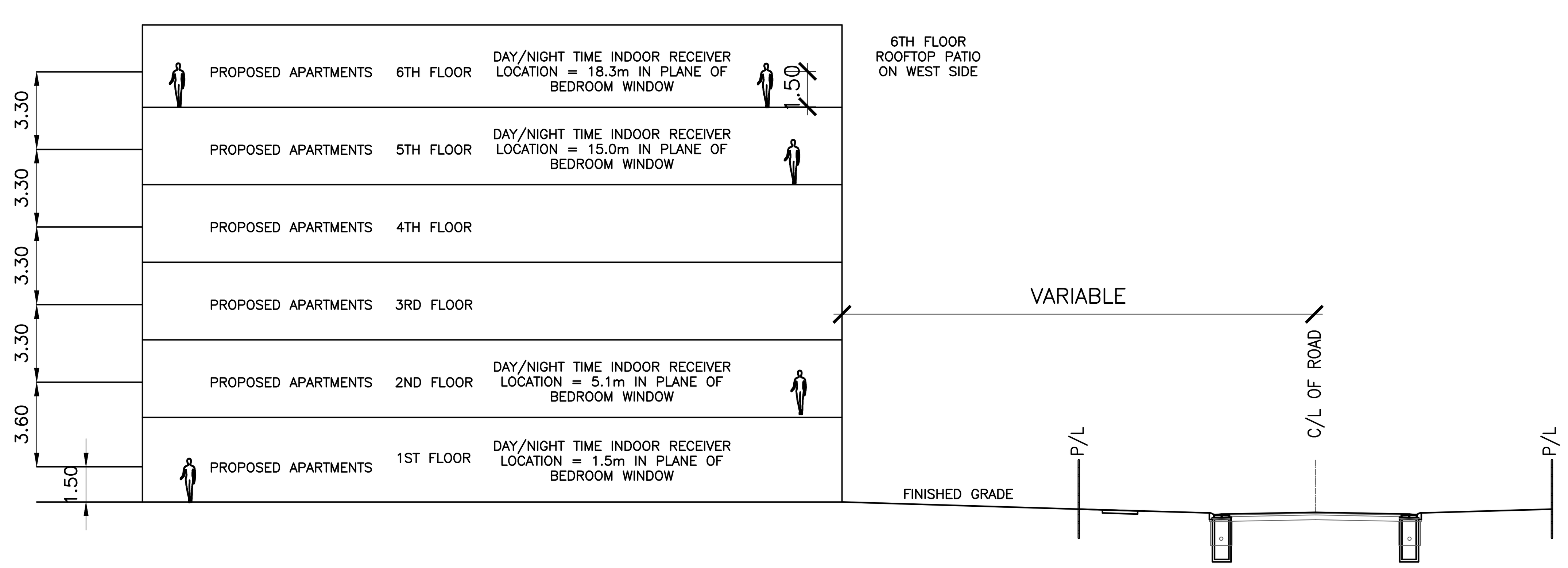
D. "THIS DWELLING UNIT HAS BEEN SUPPLIED WITH A CENTRAL AIR CONDITIONING SYSTEM WHICH WILL ALLOW WINDOWS AND EXTERIOR DOORS TO REMAIN CLOSED, THEREBY ENSURING THAT THE INDOOR SOUND LEVELS ARE WITHIN THE SOUND LEVEL LIMITS OF THE MUNICIPALITY AND THE MINISTRY OF THE ENVIRONMENT."

REFER TO "ENVIRONMENTAL NOISE GUIDELINE – STATIONARY AND TRANSPORTATION SOURCES – APPROVAL AND PLANNING (NPC-300)," SECTION C8.1, ONTARIO MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE (MOECC), AUG. 2013 FOR CLARIFICATION AND ADDITIONAL MEASURES.

REFER TO "RESIDENTIAL AIR CONDITIONING DEVICES (NPC-216)," ONTARIO MINISTRY OF THE ENVIRONMENT AND ENERGY (MOEE), 1993 FOR CLARIFICATION AND RECOMMENDATION AS TO AIR CONDITIONING SYSTEM CRITERIA, PLACEMENT, INSTALLATION, ETC.

REFER TO "MODEL MUNICIPAL NOISE CONTROL BY-LAW: FINAL REPORT," ONTARIO MINISTRY OF THE ENVIRONMENT (MOE), AUG. 1978 FOR CLARIFICATION AND RECOMMENDATION AS TO AIR CONDITIONING SYSTEM CRITERIA, PLACEMENT, INSTALLATION, ETC.

CENTRAL AIR CONDITIONING SYSTEMS ARE TO BE DESIGNED AND CONSTRUCTED TO THE SPECIFICATIONS OF A REGISTERED PROFESSIONAL ENGINEER IN ACCORDANCE WITH THE ONTARIO BUILDING CODE.



REPRESENTATIVE CROSS SECTION OF RECEIVER LOCATIONS

SCALE: NTS

AS CONSTRUCTED SERVICES	COMPLETION			No.	REVISIONS	D/M/Y	BY
		DESIGN	JBL	1	ISSUED FOR ZONING BYLAW AMENDMENT	16/03/21	JBL
		DRAWN	JBL				
		CHECKED	JBL				
		APPROVED	JBL				
		DATE	16/03/2021				
		CAD	21-0466				

CONSULTANT

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ENGINEER'S STAMP

ENGINEER'S STAMP

CLIENT

ROYAL PREMIER HOMES
509 COMMISSIONERS ROAD W. SUITE #425
LONDON, ON
N6J 1J5
P: 519.495.0115
E: RPH@ROYALPREMIERHOMES.CA

SCALE

SCALE – 1:400
4.0 0 8.0m

TITLE

NOISE STUDY PLAN

FANSHAWE PARK MIDRISE

517, 521, 525 FANSHAWE PARK ROAD EAST
LONDON, ON.

PROJECT No. SBM-21-0466

SHEET No. FIG2

PLAN FILE No. –

Appendix A – Traffic Data

Jonah Lester

Subject: FW: Traffic Data - Fanshawe Park Road East and Adelaide Street North

From: Gardiner, Joshua <jgardine@london.ca>
Sent: Thursday, February 25, 2021 9:05 AM
To: Jonah Lester <jlester@sbmltd.ca>
Subject: RE: Traffic Data - Fanshawe Park Road East and Adelaide Street North

My apologies Jonah,

I have not been provided everything that I have requested.

36,000 AADT is acceptable
Heavy and Medium trucks I do not have a definitive answer on, I would just use something typical (3-5%).
Day/night split 95/5 is typical.

Sorry this really shouldn't have taken this long for such a simple question, I was just hoping to provide a little more supporting information.

Thank you for your patience.

Joshua Gardiner
Transportation Technologist
Transportation Planning and Design
City of London

300 Dufferin Ave., London ON N6A 4L9
P: 519.661.CITY(2489) x 7365
jgardine@london.ca | www.london.ca

From: Jonah Lester
Sent: Tuesday, February 9, 2021 4:51 PM
To: Gardiner, Joshua <jgardine@london.ca>
Subject: Traffic Data - Fanshawe Park Road East and Adelaide Street North

Hi Josh,

SBM will be preparing a Noise Study for a proposed residential development at 517-525 Fanshawe Park Road East. We would like to request traffic count information including ultimate AADTs (we usually use 36,000 vpd for 4-lane arterials, but please confirm), percentage of heavy and medium trucks, and day/night splits for Fanshawe Park Road East and Adelaide Street North in the vicinity of the Fanshawe/Adelaide intersection.

If you're no longer handling this type of request, could you please pass it along to the correct person and provide me with their contact info?

Thanks very much.

Jonah

Please note I am working full-time from home. I do not have access to my work phone, so if you wish to speak to me by phone, please call my cell at 519-670-3155.

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Transportation Engineer
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Appendix B – Noise Calculations

STAMSON 5.0 NORMAL REPORT Date: 12-03-2021 12:37:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r01_015.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 36000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 4.00
Day (16 hrs) % of Total Volume : 95.00

Data for Segment # 1: Fanshawe (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 : 25.50 / 25.50 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 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): 36000
Percentage of Annual Growth : 0.00

```
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   0.00
    Heavy Truck  % of Total Volume     :   4.00
    Day (16 hrs) % of Total Volume     :  95.00

Data for Segment # 2: Adelaide (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      3 / 3
House density             :     60 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 480.00 / 480.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Fanshawe (day)
-----------------------------------

Source height = 1.41 m

ROAD (0.00 + 66.99 + 0.00) = 66.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  72.28   0.00  -3.83  -1.46   0.00   0.00   0.00  66.99
-------------------------------------------------------------------------------

Segment Leq : 66.99 dBA


Results segment # 2: Adelaide (day)
-----------------------------------

Source height = 1.41 m

ROAD (0.00 + 36.82 + 0.00) = 36.82 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.66  72.28   0.00 -24.99  -4.47   0.00  -6.00   0.00  36.82
-------------------------------------------------------------------------------

Segment Leq : 36.82 dBA

Total Leq All Segments: 66.99 dBA


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

Source height = 1.41 m

ROAD (0.00 + 57.22 + 0.00) = 57.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	62.50	0.00	-3.83	-1.46	0.00	0.00	0.00	57.22

Segment Leq : 57.22 dBA

Results segment # 2: Adelaide (night)

Source height = 1.41 m

ROAD (0.00 + 27.05 + 0.00) = 27.05 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.66	62.50	0.00	-24.99	-4.47	0.00	-6.00	0.00	27.05

Segment Leq : 27.05 dBA

Total Leq All Segments: 57.22 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.99
(NIGHT): 57.22

STAMSON 5.0 NORMAL REPORT Date: 12-03-2021 12:37:51
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r01_183.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 36000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 4.00
Day (16 hrs) % of Total Volume : 95.00

Data for Segment # 1: Fanshawe (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 : 25.50 / 25.50 m
Receiver height : 18.30 / 18.30 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 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): 36000
Percentage of Annual Growth : 0.00

```
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   0.00
    Heavy Truck  % of Total Volume     :   4.00
    Day (16 hrs) % of Total Volume     :  95.00

Data for Segment # 2: Adelaide (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 480.00 / 480.00 m
Receiver height           :  18.30 / 18.30  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Fanshawe (day)
-----------------------------------

Source height = 1.41 m

ROAD (0.00 + 69.17 + 0.00) = 69.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.16  72.28   0.00  -2.67  -0.43   0.00   0.00   0.00  69.17
-------------------------------------------------------------------------------

Segment Leq : 69.17 dBA


Results segment # 2: Adelaide (day)
-----------------------------------

Source height = 1.41 m

ROAD (0.00 + 51.39 + 0.00) = 51.39 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.16  72.28   0.00 -17.44  -3.45   0.00   0.00   0.00  51.39
-------------------------------------------------------------------------------

Segment Leq : 51.39 dBA

Total Leq All Segments: 69.24 dBA


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

Source height = 1.41 m

ROAD (0.00 + 59.39 + 0.00) = 59.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.16	62.50	0.00	-2.67	-0.43	0.00	0.00	0.00	59.39

Segment Leq : 59.39 dBA

Results segment # 2: Adelaide (night)

Source height = 1.41 m

ROAD (0.00 + 41.61 + 0.00) = 41.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.16	62.50	0.00	-17.44	-3.45	0.00	0.00	0.00	41.61

Segment Leq : 41.61 dBA

Total Leq All Segments: 59.46 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.24
(NIGHT): 59.46

STAMSON 5.0 NORMAL REPORT Date: 12-03-2021 12:38:10
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r02_051.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 36000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 4.00
Day (16 hrs) % of Total Volume : 95.00

Data for Segment # 1: Fanshawe (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height : 5.10 / 5.10 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Fanshawe (day)

Source height = 1.41 m

ROAD (0.00 + 63.31 + 0.00) = 63.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.55	72.28	0.00	-4.68	-4.29	0.00	0.00	0.00	63.31

Segment Leq : 63.31 dBA

Total Leq All Segments: 63.31 dBA

Results segment # 1: Fanshawe (night)

Source height = 1.41 m

ROAD (0.00 + 53.53 + 0.00) = 53.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.55	62.50	0.00	-4.68	-4.29	0.00	0.00	0.00	53.53

Segment Leq : 53.53 dBA

Total Leq All Segments: 53.53 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.31
(NIGHT): 53.53

STAMSON 5.0 NORMAL REPORT Date: 12-03-2021 12:38:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r02_150.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 36000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 4.00
Day (16 hrs) % of Total Volume : 95.00

Data for Segment # 1: Fanshawe (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height : 15.00 / 15.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Fanshawe (day)

Source height = 1.41 m

ROAD (0.00 + 64.80 + 0.00) = 64.80 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.26	72.28	0.00	-3.79	-3.68	0.00	0.00	0.00	64.80

Segment Leq : 64.80 dBA

Total Leq All Segments: 64.80 dBA

Results segment # 1: Fanshawe (night)

Source height = 1.41 m

ROAD (0.00 + 55.03 + 0.00) = 55.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.26	62.50	0.00	-3.79	-3.68	0.00	0.00	0.00	55.03

Segment Leq : 55.03 dBA

Total Leq All Segments: 55.03 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.80
(NIGHT): 55.03

STAMSON 5.0 NORMAL REPORT Date: 12-03-2021 12:39:21
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r02a_183.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 36000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 4.00
Day (16 hrs) % of Total Volume : 95.00

Data for Segment # 1: Fanshawe (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 39.00 / 39.00 m
Receiver height : 18.30 / 18.30 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Fanshawe (day)

Source height = 1.41 m

ROAD (0.00 + 64.02 + 0.00) = 64.02 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.16	72.28	0.00	-4.81	-3.45	0.00	0.00	0.00	64.02

Segment Leq : 64.02 dBA

Total Leq All Segments: 64.02 dBA

Results segment # 1: Fanshawe (night)

Source height = 1.41 m

ROAD (0.00 + 54.24 + 0.00) = 54.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.16	62.50	0.00	-4.81	-3.45	0.00	0.00	0.00	54.24

Segment Leq : 54.24 dBA

Total Leq All Segments: 54.24 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.02
(NIGHT): 54.24

STAMSON 5.0 NORMAL REPORT Date: 12-03-2021 12:39:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r03_015.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 36000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 4.00
Day (16 hrs) % of Total Volume : 95.00

Data for Segment # 1: Fanshawe (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 : 45.00 / 45.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 18.00 m
Barrier receiver distance : 0.01 / 0.01 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 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):  36000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   0.00
    Heavy Truck  % of Total Volume     :   4.00
    Day (16 hrs) % of Total Volume     :  95.00

Data for Segment # 2: Adelaide (day/night)
------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      6 / 6
House density             :     60 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 480.00 / 480.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Fanshawe (day)
-----------------------------------

Source height = 1.41 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.41 !        1.50 !        1.50 !         1.50

ROAD (0.00 + 48.16 + 0.00) = 48.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  72.28   0.00  -4.77   0.00   0.00   0.00 -19.35  48.16
-------------------------------------------------------------------------------

Segment Leq : 48.16 dBA


Results segment # 2: Adelaide (day)
-----------------------------------

Source height = 1.41 m
```

ROAD (0.00 + 32.32 + 0.00) = 32.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.66	72.28	0.00	-24.99	-4.47	0.00	-10.50	0.00	32.32

Segment Leq : 32.32 dBA

Total Leq All Segments: 48.27 dBA

Results segment # 1: Fanshawe (night)

Source height = 1.41 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.41	1.50	1.50	1.50

ROAD (0.00 + 38.38 + 0.00) = 38.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.50	0.00	-4.77	0.00	0.00	0.00	-19.35	38.38

Segment Leq : 38.38 dBA

Results segment # 2: Adelaide (night)

Source height = 1.41 m

ROAD (0.00 + 22.55 + 0.00) = 22.55 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.66	62.50	0.00	-24.99	-4.47	0.00	-10.50	0.00	22.55

Segment Leq : 22.55 dBA

Total Leq All Segments: 38.49 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 48.27
(NIGHT): 38.49

STAMSON 5.0 NORMAL REPORT Date: 12-03-2021 12:39:52
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r03_183.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 36000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 4.00
Day (16 hrs) % of Total Volume : 95.00

Data for Segment # 1: Fanshawe (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 : 45.00 / 45.00 m
Receiver height : 18.30 / 18.30 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 20.30 m
Barrier receiver distance : 0.01 / 0.01 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 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):  36000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   0.00
    Heavy Truck  % of Total Volume     :   4.00
    Day (16 hrs) % of Total Volume     :  95.00

Data for Segment # 2: Adelaide (day/night)
------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     60 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 480.00 / 480.00 m
Receiver height           :  18.30 / 18.30  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Fanshawe (day)
-----------------------------------

Source height = 1.41 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.41 !       18.30 !       18.30 !        18.30

ROAD (0.00 + 50.87 + 0.00) = 50.87 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  72.28   0.00  -4.77   0.00   0.00   0.00 -16.64  50.87
-------------------------------------------------------------------------------

Segment Leq : 50.87 dBA


Results segment # 2: Adelaide (day)
-----------------------------------

Source height = 1.41 m
```

ROAD (0.00 + 48.39 + 0.00) = 48.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.16	72.28	0.00	-17.44	-3.45	0.00	-3.00	0.00	48.39

Segment Leq : 48.39 dBA

Total Leq All Segments: 52.81 dBA

Results segment # 1: Fanshawe (night)

Source height = 1.41 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.41	18.30	18.30	18.30

ROAD (0.00 + 41.09 + 0.00) = 41.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.50	0.00	-4.77	0.00	0.00	0.00	-16.64	41.09

Segment Leq : 41.09 dBA

Results segment # 2: Adelaide (night)

Source height = 1.41 m

ROAD (0.00 + 38.61 + 0.00) = 38.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.16	62.50	0.00	-17.44	-3.45	0.00	-3.00	0.00	38.61

Segment Leq : 38.61 dBA

Total Leq All Segments: 43.03 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.81
(NIGHT): 43.03

STAMSON 5.0 NORMAL REPORT Date: 12-03-2021 12:40:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r04_015.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 36000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 4.00
Day (16 hrs) % of Total Volume : 95.00

Data for Segment # 1: Fanshawe (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 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): 36000
Percentage of Annual Growth : 0.00

```
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   0.00
    Heavy Truck  % of Total Volume     :   4.00
    Day (16 hrs) % of Total Volume     :  95.00

Data for Segment # 2: Adelaide (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      5 / 5
House density             :     60 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 460.00 / 460.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Fanshawe (day)
-----------------------------------

Source height = 1.41 m

ROAD (0.00 + 62.81 + 0.00) = 62.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.66  72.28   0.00  -5.00  -4.47   0.00   0.00   0.00  62.81
-------------------------------------------------------------------------------

Segment Leq : 62.81 dBA


Results segment # 2: Adelaide (day)
-----------------------------------

Source height = 1.41 m

ROAD (0.00 + 37.12 + 0.00) = 37.12 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  72.28   0.00 -24.68  -1.46   0.00  -9.02   0.00  37.12
-------------------------------------------------------------------------------

Segment Leq : 37.12 dBA

Total Leq All Segments: 62.82 dBA


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

Source height = 1.41 m

ROAD (0.00 + 53.03 + 0.00) = 53.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.66	62.50	0.00	-5.00	-4.47	0.00	0.00	0.00	53.03

Segment Leq : 53.03 dBA

Results segment # 2: Adelaide (night)

Source height = 1.41 m

ROAD (0.00 + 27.35 + 0.00) = 27.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	62.50	0.00	-24.68	-1.46	0.00	-9.02	0.00	27.35

Segment Leq : 27.35 dBA

Total Leq All Segments: 53.04 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.82
(NIGHT): 53.04

STAMSON 5.0 NORMAL REPORT Date: 12-03-2021 12:40:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r04_150.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 36000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 4.00
Day (16 hrs) % of Total Volume : 95.00

Data for Segment # 1: Fanshawe (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height : 15.00 / 15.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 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): 36000
Percentage of Annual Growth : 0.00

```
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   0.00
    Heavy Truck  % of Total Volume     :   4.00
    Day (16 hrs) % of Total Volume     :  95.00

Data for Segment # 2: Adelaide (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     60 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 460.00 / 460.00 m
Receiver height           :  15.00 / 15.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Fanshawe (day)
-----------------------------------

Source height = 1.41 m

ROAD (0.00 + 64.80 + 0.00) = 64.80 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.26  72.28   0.00  -3.79  -3.68   0.00   0.00   0.00  64.80
-------------------------------------------------------------------------------

Segment Leq : 64.80 dBA


Results segment # 2: Adelaide (day)
-----------------------------------

Source height = 1.41 m

ROAD (0.00 + 49.89 + 0.00) = 49.89 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.26  72.28   0.00 -18.70  -0.67   0.00  -3.02   0.00  49.89
-------------------------------------------------------------------------------

Segment Leq : 49.89 dBA

Total Leq All Segments: 64.94 dBA


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

Source height = 1.41 m

ROAD (0.00 + 55.03 + 0.00) = 55.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.26	62.50	0.00	-3.79	-3.68	0.00	0.00	0.00	55.03

Segment Leq : 55.03 dBA

Results segment # 2: Adelaide (night)

Source height = 1.41 m

ROAD (0.00 + 40.11 + 0.00) = 40.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.26	62.50	0.00	-18.70	-0.67	0.00	-3.02	0.00	40.11

Segment Leq : 40.11 dBA

Total Leq All Segments: 55.17 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.94
(NIGHT): 55.17

STAMSON 5.0 NORMAL REPORT Date: 12-03-2021 12:40:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r04_183.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 36000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 4.00
Day (16 hrs) % of Total Volume : 95.00

Data for Segment # 1: Fanshawe (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height : 18.30 / 18.30 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 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): 36000
Percentage of Annual Growth : 0.00

```
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   0.00
    Heavy Truck  % of Total Volume     :   4.00
    Day (16 hrs) % of Total Volume     :  95.00

Data for Segment # 2: Adelaide (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     60 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 460.00 / 460.00 m
Receiver height           :  18.30 / 18.30  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Fanshawe (day)
-----------------------------------

Source height = 1.41 m

ROAD (0.00 + 65.34 + 0.00) = 65.34 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.16  72.28   0.00  -3.49  -3.45   0.00   0.00   0.00  65.34
-------------------------------------------------------------------------------

Segment Leq : 65.34 dBA


Results segment # 2: Adelaide (day)
-----------------------------------

Source height = 1.41 m

ROAD (0.00 + 51.60 + 0.00) = 51.60 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.16  72.28   0.00 -17.22  -0.43   0.00  -3.02   0.00  51.60
-------------------------------------------------------------------------------

Segment Leq : 51.60 dBA

Total Leq All Segments: 65.52 dBA


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

Source height = 1.41 m

ROAD (0.00 + 55.56 + 0.00) = 55.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.16	62.50	0.00	-3.49	-3.45	0.00	0.00	0.00	55.56

Segment Leq : 55.56 dBA

Results segment # 2: Adelaide (night)

Source height = 1.41 m

ROAD (0.00 + 41.82 + 0.00) = 41.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.16	62.50	0.00	-17.22	-0.43	0.00	-3.02	0.00	41.82

Segment Leq : 41.82 dBA

Total Leq All Segments: 55.74 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.52
(NIGHT): 55.74

STAMSON 5.0 NORMAL REPORT Date: 12-03-2021 12:40:49
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r05_183.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Fanshawe1 (day/night)

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 36000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 4.00
Day (16 hrs) % of Total Volume : 95.00

Data for Segment # 1: Fanshawe1 (day/night)

Angle1 Angle2 : -90.00 deg 35.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 35.00 deg
Barrier height : 0.00 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 0.00 m
Receiver elevation : 16.80 m
Barrier elevation : 16.80 m
Reference angle : 0.00

Road data, segment # 2: Fanshawe2 (day/night)

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %

```
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  36000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   0.00
    Heavy Truck  % of Total Volume     :   4.00
    Day (16 hrs) % of Total Volume     :  95.00

Data for Segment # 2: Fanshawe2 (day/night)
------------------------------------------
Angle1   Angle2           :  35.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  30.00 / 30.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  35.00 deg   Angle2 : 90.00 deg
Barrier height            :   3.50 m
Barrier receiver distance :   4.00 / 4.00   m
Source elevation          :   0.00 m
Receiver elevation        :  16.80 m
Barrier elevation         :  16.80 m
Reference angle           :   0.00


Results segment # 1: Fanshawe1 (day)
------------------------------------

Source height = 1.41 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.41 !        1.50 !       -0.19 !        16.61

ROAD (0.00 + 59.47 + 0.00) = 59.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     35   0.66  72.28   0.00  -5.00  -2.64   0.00   0.00  -5.17  59.47
-------------------------------------------------------------------------------

Segment Leq : 59.47 dBA
```

Results segment # 2: Fanshawe2 (day)

Source height = 1.41 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.41	1.50	-0.75	16.05

ROAD (0.00 + 46.26 + 0.00) = 46.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
35	90	0.45	72.28	0.00	-4.37	-6.98	0.00	0.00	-14.67	46.26

Segment Leq : 46.26 dBA

Total Leq All Segments: 59.67 dBA

Results segment # 1: Fanshawe1 (night)

Source height = 1.41 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.41	1.50	-0.19	16.61

ROAD (0.00 + 49.69 + 0.00) = 49.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	35	0.66	62.50	0.00	-5.00	-2.64	0.00	0.00	-5.17	49.69

Segment Leq : 49.69 dBA

Results segment # 2: Fanshawe2 (night)

Source height = 1.41 m

Barrier height for grazing incidence

```
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.41 !        1.50 !       -0.75 !        16.05

ROAD (0.00 + 36.48 + 0.00) = 36.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    35     90   0.45  62.50   0.00  -4.37  -6.98   0.00   0.00 -14.67  36.48
-------------------------------------------------------------------------------

Segment Leq : 36.48 dBA

Total Leq All Segments: 49.89 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 59.67
                           (NIGHT): 49.89
```

STAMSON 5.0 NORMAL REPORT Date: 12-03-2021 12:41:04
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r06_015.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Fanshawe1 (day/night)

Car traffic volume : 32832/1728 veh/TimePeriod *
Medium truck volume : 0/0 veh/TimePeriod *
Heavy truck volume : 1368/72 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 36000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 0.00
Heavy Truck % of Total Volume : 4.00
Day (16 hrs) % of Total Volume : 95.00

Data for Segment # 1: Fanshawe1 (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 64.00 / 64.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -75.00 deg Angle2 : 15.00 deg
Barrier height : 20.30 m
Barrier receiver distance : 11.00 / 11.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Fanshawe1 (day)

Source height = 1.41 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.41	1.50	1.49	1.49

ROAD (42.27 + 42.96 + 53.51) = 54.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-75	0.66	72.28	0.00	-10.46	-16.85	0.00	-2.69	0.00	42.27
-75	15	0.66	72.28	0.00	-10.46	-3.77	0.00	-2.69	0.00	55.35
-75	15	0.00	72.28	0.00	-6.30	-3.01	0.00	0.00	-20.00	42.96
15	90	0.66	72.28	0.00	-10.46	-5.61	0.00	-2.69	0.00	53.51

Segment Leq : 54.17 dBA

Total Leq All Segments: 54.17 dBA

Results segment # 1: Fanshawe1 (night)

Source height = 1.41 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.41	1.50	1.49	1.49

ROAD (35.19 + 33.19 + 46.43) = 46.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-75	0.66	62.50	0.00	-10.46	-16.85	0.00	0.00	0.00	35.19
-75	15	0.00	62.50	0.00	-6.30	-3.01	0.00	0.00	-20.00	33.19
15	90	0.66	62.50	0.00	-10.46	-5.61	0.00	0.00	0.00	46.43

Segment Leq : 46.93 dBA

Total Leq All Segments: 46.93 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.17
(NIGHT): 46.93