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November 26, 2024

Attention: Mr. Jonathan Seguin
Poirier Seguin Holdings Ltd.
T: 519-980-5667

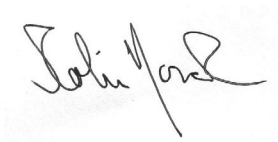
Re: Environmental Noise Assessment in support of Zoning By-Law Amendment Application, 4641 Malden Road, City of Windsor.

Dear Mr. Seguin,

Please find enclosed a noise assessment report in support of a severance and rezoning application for 4641 Malden Road, in the City of Windsor. This assessment pertains to the noise impacts from the nearby roadways which impact the subject site.

I trust that the enclosed information meets your requirements. Please do not hesitate to contact me if you have any questions.

Sincerely,



Colin Novak PhD, PEng

Noise Assessment in support of Zoning By-Law Amendment Application, 4641 Malden Road, City of Windsor

Attention: Mr. Jonathan Seguin
Poirier Seguin Holdings Ltd.
T: 519-980-5667

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Statement of Liability

Akoustik Engineering Limited prepared this report for Poirier Seguin Holdings Ltd.. The material in it reflects Dr. Helen Ule's and Dr. Colin Novak's judgement considering the information available to them and Akoustik Engineering Limited at the time of the measurements and report preparation, under the stated test conditions. Any use that a Third Party makes of this report, or any reliance on decisions made based on it, is the responsibility of such Third Parties. Akoustik Engineering Limited accepts no responsibility for damages, if any, suffered by any Third Party resulting from decisions made or actions based on this report.

Introduction

This report is a noise assessment in support of a land severance and rezoning application for 4641 Malen Road, in the City of Windsor. The application proposes to divide the existing property into four lots by adding three new lots and retaining the existing home on a fourth lot. Each added lot is proposed to have lot areas of 278.7 m^2 with frontage of 9.14 m and a depth of 30.48 m. The retained lot would thus have a lot area of 297.2 m^2 with a frontage of 9.75 m and a depth of 30.48 m. There were no proposed site plans that show the location and orientation of future houses on the divided lots available at the time of this report, other than details detailing the proposed lot sizes and orientation. It is assumed that a future single residential home is to be constructed on each of the new lots.

This assessment pertains to the environmental noise impact from the nearby roadways. An illustration of the geographical area of the proposed development location is given in Appendix A. A zoning map of the area is given in Appendix B. The expected noise impacts from the roads have been predicted using the Ministry of the Environment, Conservation and Parks (MECP) prediction software STAMSON and are based on the available road traffic volumes, which have been projected 10 years forward. Given that the road traffic occurs during all periods of a 24-hour day, as defined by the applicable Noise Pollution Control document NPC-300, the assessment has been carried out for the entire 24-hour period. All assumptions used for the calculations given in this report are detailed in Appendix C. Any recommended abatement measures, if required to control noise, are included in this report.

Identification of Noise Sources

The proposed development is bordered by residential lands to the north, west and east. The current zoning of the land is DRD1.1, Development Reserve District. The rezoning application is to rezone the property to RD1.3, Low Density Residential District. The Ministry of the Environment (MECP) typical specifications for the identification of existing or future major sources of noise impact on a development is whether they are within 500 metres of the site. The transportation noise sources which could possibly produce an impact on the proposed development are Malden Road and the E.C. Row Expressway. The E.C. Row Expressway will be considered as two sources: Eastbound and Westbound. It should be noted that the proposed lots are protected rom the expressway noise by a substantial noise barrier wall located along the expressway. There are no sources of stationary noise or vibration which may impact this property.

Given that the land of the proposed development falls outside the Windsor International Airport's NEF/NEP 25 contours, no consideration for aircraft noise is warranted. There are no other significant sources of noise which are expected to have an impact on the proposed development.

Ministry of the Environment and Climate Change Noise Criteria

Transportation Sources

In accordance with the MECP Guideline NPC-300, the following sound level limits for residential developments of Class 2 have been set and are shown for roadway noise in Table 1 below. Select pages from the NPC-300 guideline have been included in Appendix D: NPC-300 Reference Pages for reference. The proposed development is classified as a Class 2 area, given that the region exhibits features of both a Class 1 and a Class 3 area, based on the environmental noise characteristics. It is worth noting that when the sound level limits presented in Table 1 are exceeded, noise control abatement is required.

Table 1: Ministry of the Environment, Conservation and Parks Noise Criteria for Roadway Noise

Location	Daytime L_{eq} [dBA]	Nighttime L_{eq} [dBA]
Outdoor Living Area (OLA)	55	--
Plane of Window (Indoor)	55 (45)	50 (40)

From Table 1, daytime refers to the period from 07:00 to 23:00 and nighttime refers to the period from 23:00 to 07:00 hours. An outdoor living area (OLA) refers to a location such as a patio, yard, or barbeque area. For this project it will be assumed that an OLA would be present at the rear of any proposed residential development.

The limits presented in Table 1 are the limits before noise control measures are required. The noise level limit in an OLA may be exceeded by up to 5 dBA if proper warning clauses are inserted in the titles, deeds, and any tenancy agreements relating to the property and only after barriers or other noise control measures have been found to be impractical or unfeasible. A noise attenuation barrier is required to protect and bring the sound level down to 55 dBA in the OLA if the noise level exceeds 60 dBA. Only in cases where the required noise control measures are not feasible for technical, economic or administrative reasons would an excess above the limit (55 dBA) be acceptable with the appropriate warning clause; in this situation, any excess above the noise limit will not be deemed acceptable if it exceeds 5 dB.

The guideline also recommends the provision for the installation of central air conditioning when the noise level outside the plane of a window exceeds 55 dBA for the daytime or 50 dBA for the nighttime. If the noise level exceeds 65 dBA for the daytime or 60 dBA for the nighttime, the installation of central air conditioning should be implemented. Further, building components including exterior walls, windows and doors should be designed to have sufficient Sound Transmission Class (STC) ratings to meet the indoor noise guidelines.

Noise Source Data

Prior to modelling the noise, road traffic volume data for Malden Road was obtained from the City of Windsor in the form of annual average daily traffic (AADT) volumes. The projected road traffic volumes along with the breakdown of vehicle types are given in Appendix E. Also, given in Appendix E are the distances used for the noise prediction model between the representative receptor locations and the roadway. The volume of commercial traffic for Malden Road was taken as 10 percent with an equal mix of heavy and medium trucks.

Road traffic volume data for the E.C. Row Expressway was obtained from the MTO's (Ministry of Transportation) iCorridor website in the form of annual average daily traffic (AADT) volumes. The

projected road traffic volumes along with the breakdown of vehicle types are given in Appendix E. Also, given in Appendix E are the distances used in the noise prediction model between the representative receptor locations and the Expressway. Data provided on iCorridor showed a vehicle distribution of 84% automobiles and 16% truck traffic with an assumed equal mix of heavy and medium trucks.

A conservative approach was taken to use the latest and most up to date traffic volume, which has been included in Appendix E. Based on historical data, a calculated growth rate of 0.37% was used for E.C. Row Expressway. Malden Road had a negative calculated growth rate, and it was therefore assumed that there is a 0% growth rate in order to be conservative in the calculation methodology Day and night traffic volumes were calculated using an assumed 66% day and 33 % night for highways and 90%-day and 10%-night for municipal roadways.

Identification of the Representative Receptor Locations

Since no site plan is available for the proposed three new lots, a proposed worst-case footprint was used to calculate the noise impacts. Proposed Lot 1 (north most lot) is chosen as the worst-case residential development given that it is nearest to the E.C. Row Expressway. The front façade is taken to be located 6 metres from the west property line and the home is assumed to have a depth of 13 m. POR1A and POR1B are located on the north façade of this proposed home at a height of 1.5 m and 4.5 m. An OLA (outdoor living area) is located 3 m away from the rear (east) façade of the proposed home.

Assessment Approach

The predicted sound levels from the nearby road traffic have been determined through the application of the prediction noise modelling software STAMSON 5.0. All input data pertaining to the lot layout parameters was based on the severance plan provided at the time of the study, as shown in Appendix A: Site Location. The input data used to calculate the predicted sound level exposures for the proposed lot impacted by the road traffic noise, and the resulting outputs, are given in Appendix F: Noise Model Printout.

The acoustic propagation model used to predict the noise levels at the proposed lots was developed to determine the noise impacts and extent of the noise control measures required (if any). The MECP requires the calculation of the noise impacts at the outdoor living area (OLA) and plane of window of the dwellings, in this case the residential sleeping quarters.

Results and Noise Control Requirements

The following section is a summary and assessment of the modeled results for the proposed lot.

Road Noise

As specified by the MECP Environmental Noise Guideline NPC-300, the outdoor and indoor sound level limits (based on one-hour LA_{eq} values) at a residence for road traffic noise are categorized into three (3) limits, based on the type of space assessed. The document also specifies the recommended noise control measures, if required, that should be followed for the OLA, plane of a window (ventilation requirements) and the indoor living area (building components) noise assessments. Select pages from the NPC-300

guideline are given in Appendix D: NPC-300 Reference Pages, which includes the stated warning clauses and other requirements based on the predicted noise levels.

The predicted noise level impacts for the daytime and nighttime periods for the representative Points of Reception (POR)s with no control measures are given in Table 3.

Table 3: Predicted Noise Levels – Plane of Window and Outdoor Living Area

POR (height in metres)	Daytime Period LAeq (dBA) – plane of window	Nighttime Period LAeq (dBA) – plane of window
1 (1.5 m)	63	58
1 (4.5 m)	64	59
OLA (1.5 m)	55	N/A

- red text denotes exceedance

Notes taken from NPC-300 (where applicable):

Note A: Noise control measures may be applied to reduce the sound level to 55 dBA. If measures are not provided, prospective purchasers or tenants should be informed of potential noise problems by a warning clause Type A.

Note B: Noise control measures should be implemented to reduce the level to 55 dBA. Only in cases where the required noise control measures are not feasible for technical, economic or administrative reasons would an excess above the limit (55 dBA) be acceptable with a warning clause Type B.

Note C: The dwelling should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. Warning clause Type C is also recommended.

Note D: Installation of central air conditioning should be implemented with a warning clause Type D. In addition, building components including windows, walls and doors, where applicable, should be designed so that the indoor sound levels comply with the sound level limits in Table C-2.

Note E: Building components including windows, walls and doors, where applicable, need to be designed so that the indoor sound levels comply with the sound level limits in Table C-2. The acoustical performance of the building components (windows, doors and walls) needs to be specified.

For all buildings and units that are applicable to Note E, it is recommended that the building plans be inspected and approved by a qualified acoustical engineer prior to the issuance of a building permit to ensure that the proposed building materials and design comply with the noise control requirements.

If required, the following warning clauses are to be implemented in all development agreements, offers to Purchase, and agreements of Purchase or Sale or Lease of each dwelling unit:

Warning Clause(s) (where applicable):

Type A: “Purchasers/tenants are advised that sound levels due to increasing road traffic and rail 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, Conservation and Parks.”

Type 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 and rail 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, Conservation and Parks."

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, Conservation and Parks.”

Type D: “This dwelling unit has been equipped with central air conditioning in order to 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, Conservation and Parks. Air conditioning units are to be installed in a noise insensitive area.”

Comparing the predicted road noise levels given in Table 3 to the MECP noise guidelines detailed in Table 1, it is concluded that the predicted worst-case impacts from transportation sources exceed the MECP guidelines during the daytime and nighttime periods. While no physical noise control measures are required for the transportation noise, warning clause(s) are needed for all three proposed lots. It should be noted that the sound level in the outdoor living area does not exceed the noise guideline limits, and as such, noise abatement to protect the OLA (noise barrier) is not required.

Results Summary

Table 5 summarizes the required warning clauses and building requirements, if any, for the three proposed lots. It is required that any necessary warning clauses be implemented in all future development agreements, offers to Purchase, and agreements of Purchase or Sale or Lease for any future development. Given that this report is only in support of the severance and rezoning application, there is no proposed site plan available. As such, any future proposed development should be verified for noise control and warning clauses requirements based on the final orientation and position of the homes on the proposed lot.

Table 5: Summary of Warning Clauses and Building Component Requirements

Lot(s)	Noise Barrier Requirement (Y/N)	Warning Clause(s)	Building Component Requirement(s)	Ventilation Requirement(s)
Proposed Lots #1, #2 and #3	N/A	Type A, C	Minimum Building Code	Provision for the installation of central air conditioning

Conclusion

A noise impact assessment was carried out for the proposed lots at 4641 Malden Road, in the City of Windsor, in support for a severance and rezoning application. For this, the nearby Malden Road and E.C. Row Expressway were considered as contributing transportation sources of noise. It is shown in this report that the measured and predicted levels exceed the limits set by the Ontario Ministry of the Environment, Conservation and Parks. However, given that the noise impacts can be mitigated with the installation of central air conditioning and inclusion of warning clauses, it is recommended that the severance and rezoning application be given approval for noise impacts with the understanding that any future development on the proposed new lots verify the stated warning clauses and conditions and that these warning clauses and conditions will be implemented.

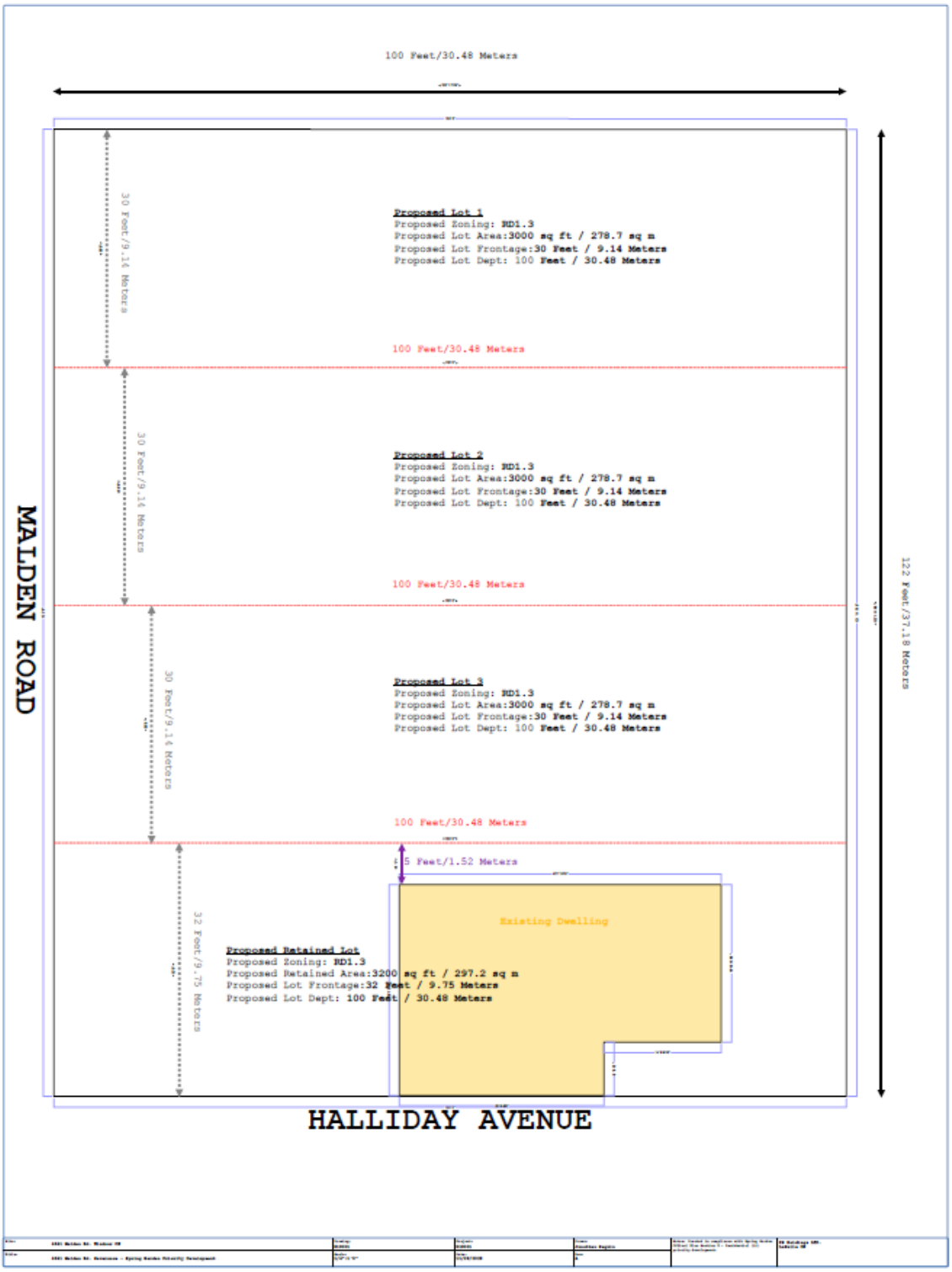
For akoustik engineering limited		
	Prepared by: **Helen Ule, Ph.D., PEng**	**Reviewed by:** **Colin Novak, Ph.D., PEng**

LICENSED PROFESSIONAL ENGINEER
H. J. ULE
100138148
PROVINCE OF ONTARIO

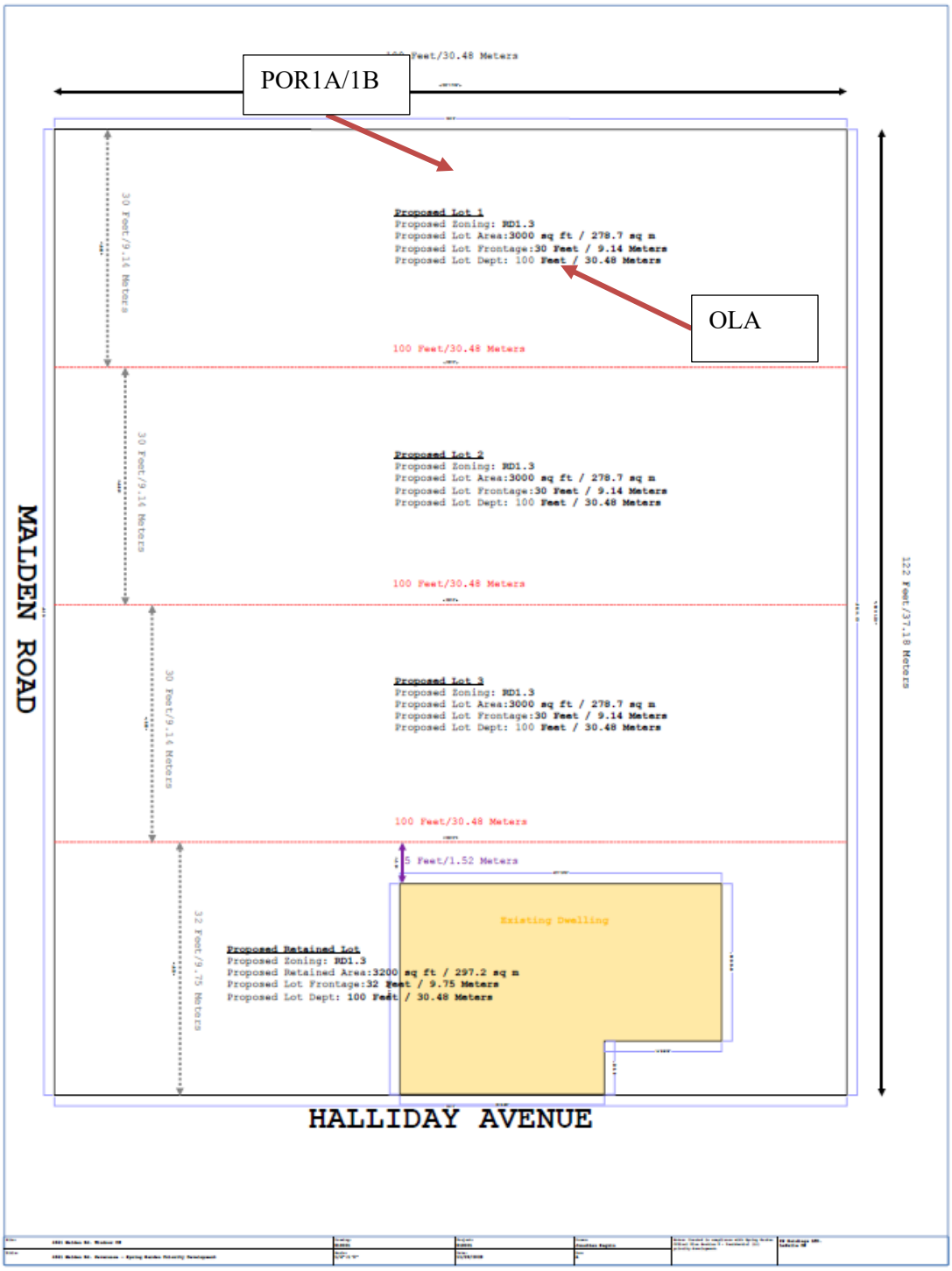
Appendix A: Site Location

A 1: General Location of Proposed Development and Nearby Surrounding Area

A 2:Proposed Development Site showing detailed Surrounding Area Features

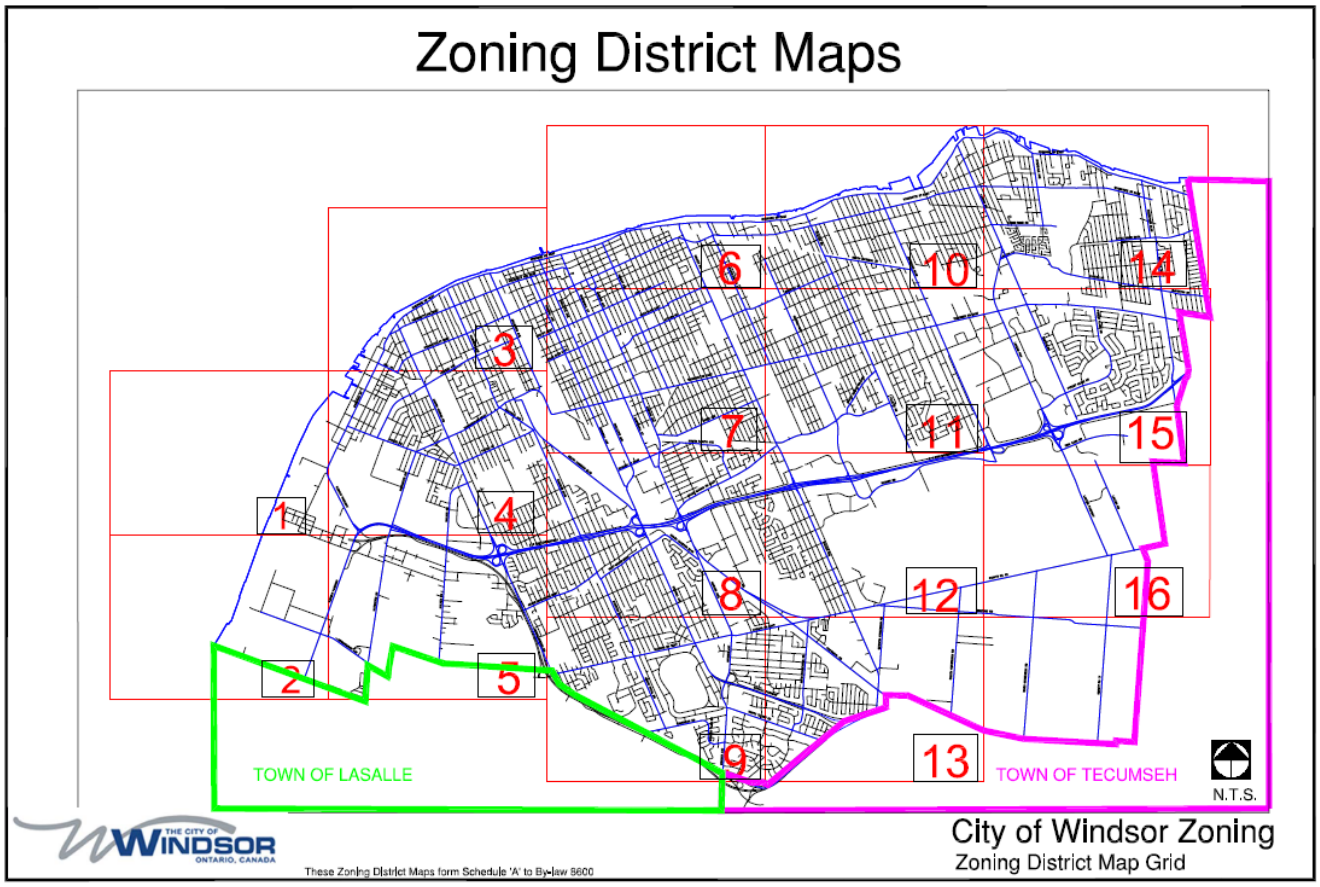


A 3: Proposed Severance Drawing (dated November 29, 2023)



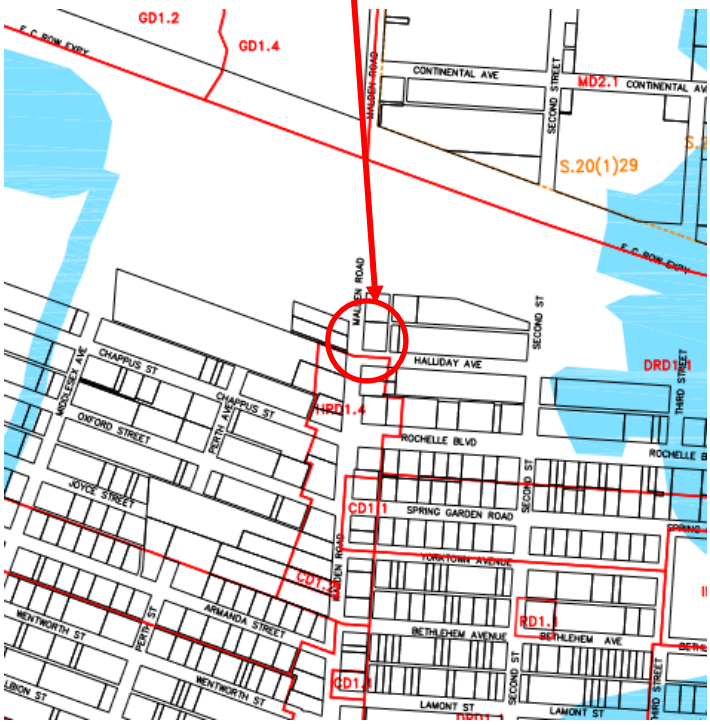
A 4: Proposed Development with Representative PORs Identified

Appendix B: Land-use Zoning Map of Area



B 1: City of Windsor Zoning – Zoning District Map Grid

B 2: City of Windsor Zoning Map #5



B 3: City of Windsor Zoning Map #5, site location

Appendix C: Report and Model Assumptions

Malden Road:

- Traffic counts (AADT) provided by Dinesh Dhamotharan, City of Windsor
- Traffic volumes projected to 2034
- Historical roadway data:
    - Malden Road, North of Spring Garden Road:
        - 2013 7,100
        - 2017 6,400
        - 2034 6,400 (projected)
- 90% of traffic during day period and 10% during night period
- 90% cars, 5% medium trucks, 5% heavy trucks
- Growth rate of 0% assumed

POR	Floor	Height (m)	Malden	
			Angle	Distance (m)
1	1	1.5	-90-90	15
1	2	4.5	-90-90	15
OLA1	1	1.5	-90-90	22

- 2034 Road Volume
    - Malden Road, North of Spring Garden Road
        - Cars – 5,760 day, 640 night
        - Commercial –
            - Medium – 288 day, 32 night
            - Heavy – 288 day, 32 night
- Speed:
    - Malden Road – 50 km/h

E.C. Row Expressway:

- Traffic counts (AADT) provided by MTO's iCorridor webpage (https://icorridor-mto-on-ca.hub.arcgis.com/apps/4f4b6a27ee0a4a4e86ab9a94597475f3/explore)
- Traffic volumes projected to 2034
- Historical roadway data:
    - E.C. Row Expressway (EB and WB combined), Malden to Huron Church Road:
        - 2015 21,300
        - 2016 21,300
        - 2017 21,400
        - 2018 21,500
        - 2019 21,600
        - 2034 22,830 (projected)
- 66% of traffic during day period and 33% during night period
- 84% cars, 8% medium trucks, 8% heavy trucks
- Growth rate of 0.37% calculated

POR	Floor	Height (m)	ECRow (WB & EB)	
			Angle	Distance (m)
1	1	1.5	-90-90	204/128
1	2	4.5	-90-90	204/128
OLA1	1	1.5	-90-90	204/128

- 2034 Road Volume
    - E.C. Row Expressway (EB and WB, each), Malden to Huron Church Road
        - Cars – 6,328 day, 3,260 night
        - Commercial –
            - Medium – 603 day, 310 night
            - Heavy – 603 day, 310 night
- Speed:
    - Malden Road – 100 km/h

PROPERTY:

- Assume:
    - POR heights: 1.5m, 4.5m
    - POR1A and POR1B facing north
    - OLA behind home facing east

General:

- Model is 16 hour day, 8 hour night
- Height of E.C. Row Expressway is 5 m
- Barrier height on E.C. Row Expressway is 4.2 m
- 90% density of houses built on proposed three lots
- Maximum footprint of home to be built on proposed lot is 20’x44’ with 5’ side yards and 6 m to front property line

Appendix D: NPC-300 Reference Pages

L_{eq} (8). For complete description on assessing road traffic impacts, refer to ORNAMENT. Other traffic noise prediction models have been and are being developed by various authorities and may be adopted from time to time for use in Ontario by the MOE.

In order to be consistent with MOE guidelines, the sound level should be assessed in an OLA, such as a rear yard or a patio, and in indoor living areas, such as bedrooms and living rooms. Where the noise impact exceeds the applicable sound level limits, mitigation measures such as site planning, architectural design, noise barriers, building envelope elements (windows, exterior walls, doors) with upgraded sound isolation performance and/or central air conditioning may be required. Noise control measures are not required if the sound level estimated in the OLA is 55 dBA or less during the daytime and 50 dBA or less in the plane of bedroom windows during either daytime or nighttime.

C3.2.2 Daytime Outdoor Sound Level Limit

Table C-1 gives the equivalent sound level (L_{eq}) limit for designated OLAs. The limit applies to the entire daytime period from 07:00 to 23:00.

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

Time Period	L_{eq} (16) (dBA)
16-hour, 07:00 – 23:00	55

C3.2.3 Indoor Sound Level Limits

Table C-2 gives the equivalent sound level (L_{eq}) limits and the applicable time periods for the indicated types of indoor spaces. The specified indoor sound level limits are maxima and apply to the indicated indoor spaces with windows and doors closed.

Table C-2
Indoor Sound Level Limits
Road and Rail

Type of Space	Time Period	L_{eq} (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

D 1: Daytime Outdoor and Daytime/Nighttime Indoor Sound Level Limits

the emissions are not required to be included with the overall noise assessment of a stationary source facility.

In addition, sound level limits do not apply to emergency equipment operating in emergency situations.

C4.5.4 Sound Level Limits for Layover Sites

The sound level limit for noise from a layover site in any hour, expressed in terms of the One-Hour Equivalent Sound Level (L_{eq}) is the higher of either 55 dBA or the background sound level.

C5 Noise Impact Assessment – Multiple Sources

Impulse sources, non-impulse sources and emergency equipment are to be analyzed separately. Where there are multiple, non-impulse sources at a stationary source, the noise assessment should be based on the combined effect of all sources comprising the stationary source, added together on an energy basis.

C6 Noise Impact Assessment – Supplementary Noise Limits

Indoor limits for transportation sources applicable to noise sensitive land uses are specified in Table C-2 and Table C-4. Table C-9 and Table C-10 are expanded versions of Table C-2 and Table C-4, and present guidelines for acceptable indoor sound levels that are extended to land uses and developments which are not normally considered noise sensitive. The specified values are maximum sound levels and apply to the indicated indoor spaces with the windows and doors closed. The sound level limits in Table C-9 and Table C-10 are presented as information, for good-practice design objectives.

Table C-9
Supplementary Indoor Sound Level Limits
Road and Rail

Type of Space	Time Period	L_{eq} (Time Period) (dBA)	
		Road	Rail
General offices, reception areas, retail stores, etc.	16 hours between 07:00 – 23:00	50	45
Living/dining areas of residences, hospitals, schools, nursing/retirement homes, daycare centres, theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms, etc.	16 hours between 07:00 – 23:00	45	40
Sleeping quarters of hotels/motels	8 hours between 23:00 – 07:00	45	40
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	8 hours between 23:00 – 07:00	40	35

D 2: Noise Impact Assessment – Supplementary Noise Limits

Table C-10
Supplementary Indoor Aircraft Noise Limits
(Applicable over 24-hour period)

Type of Space	Indoor NEF/NEP*
General offices, reception areas, retail stores, etc.	15
Individual or semi-private offices, conference rooms, etc.	10
Living/dining areas of residences, sleeping quarters of hotels/motels, theatres, libraries, schools, daycare centres, places of worship, etc.	5
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	0

* The indoor NEF/NEP values listed in Table C-10 are not obtained from NEF/NEP contour maps. The values are representative of the indoor sound levels and are used as assessment criteria for the evaluation of acoustical insulation requirements.

C7 Noise Control Measures

The following sections provide MOE guidance for appropriate noise control measures. These sections constitute requirements that are applied to MOE approvals for stationary sources. This information is also provided as guidance which land use planning authorities may consider adopting.

The definition in Part A describes the various types and application of noise control measures. All the noise control measures described in the definition are appropriate to address the impact of noise of transportation sources (road, rail and aircraft) on planned sensitive land uses. Only some of the noise control measures described in the definition are appropriate to address the noise impact of stationary sources on planned sensitive land uses.

C7.1 Road Noise Control Measures

C7.1.1 Outdoor Living Areas

If the 16-Hour Equivalent Sound Level, L_{eq} (16) in the OLA is greater than 55 dBA and less than or equal to 60 dBA, noise control measures may be applied to reduce the sound level to 55 dBA. If measures are not provided, prospective purchasers or tenants should be informed of potential noise problems by a warning clause Type A.

If the 16-Hour Equivalent Sound Level, L_{eq} (16) in the OLA is greater than 60 dBA, noise control measures should be implemented to reduce the level to 55 dBA. Only in cases where the required noise control measures are not feasible for technical, economic or administrative reasons would an excess above the limit (55 dBA) be acceptable with a warning clause Type B. In the above situations, any excess above the limit will not be acceptable if it exceeds 5 dBA.

D 3: Noise Control Measures – Road Noise Control Measures

C7.1.2 Plane of a Window – Ventilation Requirements

C7.1.2.1 Daytime Period, 07:00 – 23:00 Hours

Noise control measures may not be required if the L_{eq} (16) daytime sound level in the plane of a bedroom or living/dining room window is less than or equal to 55 dBA. If the sound level in the plane of a bedroom or living/dining room window is greater than 55 dBA and less than or equal to 65 dBA, the dwelling should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. Warning clause Type C is also recommended.

If the daytime sound level in the plane of a bedroom or living/dining room window is greater than 65 dBA, installation of central air conditioning should be implemented with a warning clause Type D. In addition, building components including windows, walls and doors, where applicable, should be designed so that the indoor sound levels comply with the sound level limits in Table C-2. The location and installation of the outdoor air conditioning device should comply with sound level limits of Publication NPC-216, Reference [32], and guidelines contained in Environmental Noise Guidelines for Installation of Residential Air Conditioning Devices, Reference [6], or should comply with other criteria specified by the municipality.

C7.1.2.2 Nighttime Period, 23:00 – 07:00 Hours

Noise control measures may not be required if the L_{eq} (8) nighttime sound level in the plane of a bedroom or living/dining room window is less than or equal to 50 dBA. If the sound level in the plane of a bedroom or living/dining room window is greater than 50 dBA and less than or equal to 60 dBA, the dwelling should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. Warning clause Type C is also recommended.

If the nighttime sound level in the plane of a bedroom or living/dining room window is greater than 60 dBA, installation of central air conditioning should be implemented, with a warning clause Type D. In addition, building components including windows, walls and doors, where applicable, should be designed so that the indoor sound levels comply with the sound level limits in Table C-2. The location and installation of the outdoor air conditioning device should comply with sound level limits of Publication NPC-216, Reference [32], and guidelines contained in Environmental Noise Guidelines for Installation of Residential Air Conditioning Devices, Reference [6], or should comply with other criteria specified by the municipality.

C7.1.3 Indoor Living Areas – Building Components

If the nighttime sound level outside the bedroom or living/dining room windows exceeds 60 dBA or the daytime sound level outside the bedroom or living/dining area windows exceeds 65 dBA, building components including windows, walls and doors, where applicable, should be designed so that the indoor sound levels comply with the

D 4: Noise Control Measures – Road Noise Control Measures (Continued)

In Class 4 areas, where windows for noise sensitive spaces are assumed to be closed, the use of central air conditioning may be acceptable if it forms an essential part of the overall building designs.

C7.9 Verification of Noise Control Measures

It is recommended that the implementation of noise control measures be verified by qualified individuals with experience in environmental acoustics.

C8 Warning Clauses

The use of warning clauses or easements in respect of noise are recommended when circumstances warrant. Noise warning clauses may be used to warn of potential annoyance due to an existing source of noise and/or to warn of excesses above the sound level limits. Direction on the use of warning clauses should be included in agreements that are registered on title to the lands in question. The warning clauses would be included in agreements of Offers of Purchase and Sale, lease/rental agreements and condominium declarations. Alternatively, the use of easements in respect of noise may be appropriate in some circumstances. Additional guidance on the use of noise warning clauses is provided in Section C7.1.1, Section C7.1.2.1, Section C7.1.2.2, Section C7.3 and Section C7.4.

C8.1 Transportation Sources

The following warning clauses may be used individually or in combination:

TYPE A: (see Section C7.1.1)

> "Purchasers/tenants are advised that sound levels due to increasing road traffic (rail traffic) (air 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."

TYPE B: (see Section C7.1.1 and Section C7.4)

> "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 (rail traffic) (air 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."

TYPE C: (see Section C7.1.2.1, Section C7.1.2.2 and Section C7.4)

> "This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of

D 5: Noise Control Measures – Warning Clauses

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."

TYPE D: (see Section C7.1.2.1, Section C7.1.2.2 and Section C7.4)

"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."

C8.2 Stationary Sources

It is not acceptable to use warning clauses in place of physical noise control measures to identify an excess over the MOE sound level limits. Warning clause (Type E) for stationary sources may identify a potential concern due to the proximity of the facility but it is not acceptable to justify exceeding the sound level limits.

TYPE E: (see Section C7.6)

"Purchasers/tenants are advised that due to the proximity of the adjacent industry (facility) (utility), noise from the industry (facility) (utility) may at times be audible."

C8.3 Class 4 Area Notification

TYPE F: (see Section B9.2 and Section C4.4.2)

"Purchasers/tenants are advised that sound levels due to the adjacent industry (facility) (utility) are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed."

D 6: Noise Control Measures – Warning Clauses (Continued)

Appendix E: Road Traffic Volume Data

E 1: Predicted Road Traffic

Year	Road	Location	AADT
2034	Malden Road	North of Spring Garden Road	6,400
2034	E.C. Row Expressway Eastbound	Malden to Huron Church Road	11,415
2034	E.C. Row Expressway Westbound	Malden to Huron Church Road	11,415

E 2: Predicted Hourly Traffic Volumes per Period and Breakdown of Cars, Medium Trucks and Heavy Trucks – Malden Road

Period	Hourly Traffic Volume (Vehicles/hr)	Auto Traffic Volume (Vehicles/hr)	Medium Truck Traffic Volume (Vehicles/hr)	Heavy Truck Traffic Volume (Vehicles/hr)
Day	360	324	18	18
Night	80	72	4	4

E 3: Predicted Hourly Traffic Volumes per Period and Breakdown of Cars, Medium Trucks and Heavy Trucks – E.C. Row Expressway Eastbound

Period	Hourly Traffic Volume (Vehicles/hr)	Auto Traffic Volume (Vehicles/hr)	Medium Truck Traffic Volume (Vehicles/hr)	Heavy Truck Traffic Volume (Vehicles/hr)
Day	471	396	38	38
Night	485	408	38	38

E 4: Predicted Hourly Traffic Volumes per Period and Breakdown of Cars, Medium Trucks and Heavy Trucks – E.C. Row Expressway Westbound

Period	Hourly Traffic Volume (Vehicles/hr)	Auto Traffic Volume (Vehicles/hr)	Medium Truck Traffic Volume (Vehicles/hr)	Heavy Truck Traffic Volume (Vehicles/hr)
Day	471	396	38	38
Night	485	408	38	38

Appendix F: Noise Model Printouts

POR5 (7.5m height)

```
STAMSON 5.0        NORMAL REPORT        Date: 25-11-2024 15:08:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: POR1a.te             Time Period: Day/Night 16/8 hours
Description: Malden POR1A


Road data, segment # 1: Malden (day/night)
-----------------------------------------
Car traffic volume  :  5184/576   veh/TimePeriod
Medium truck volume :   288/32    veh/TimePeriod
Heavy truck volume  :   288/32    veh/TimePeriod
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Malden (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  :  15.00 / 15.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: EC Row EB (day/night)
---------------------------------------------
Car traffic volume  :  6328/3260  veh/TimePeriod
Medium truck volume :   603/310   veh/TimePeriod
Heavy truck volume  :   603/310   veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: EC Row EB (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      1       (Wood depth 30 to less than 60
metres)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 128.00 / 128.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.20 m
Elevation                 :   5.00 m
```

```
Barrier receiver distance : 120.00 / 120.00 m
Source elevation          :   5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   5.00 m
Reference angle           :   0.00

Road data, segment # 3: EC Row WB (day/night)
---------------------------------------------
Car traffic volume  :  6328/3260  veh/TimePeriod
Medium truck volume :   603/310   veh/TimePeriod
Heavy truck volume  :   603/310   veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: EC Row WB (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      1       (Wood depth 30 to less than 60
metres)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 204.00 / 204.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.20 m
Elevation                 :   5.00 m
Barrier receiver distance : 120.00 / 120.00 m
Source elevation          :   5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   5.00 m
Reference angle           :   0.00

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

Source height = 1.50 m

ROAD (0.00 + 62.99 + 0.00) = 62.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.66  64.44   0.00   0.00  -1.46   0.00   0.00   0.00
62.99
-------------------------------------------------------------------------
--

Segment Leq : 62.99 dBA
```

```
Results segment # 2: EC Row EB (day)
-----------------------------------

Source height = 1.68 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.68 !        1.50 !        1.36 !         6.36

ROAD (0.00 + 49.07 + 0.00) = 49.07 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.20  72.95   0.00 -11.22  -0.55  -5.00   0.00   0.00
56.19
   -90     90   0.25  72.95   0.00 -11.66  -0.66   0.00   0.00 -11.55
49.07
-------------------------------------------------------------------------
--

Segment Leq : 49.07 dBA


Results segment # 3: EC Row WB (day)
-----------------------------------

Source height = 1.68 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.68 !        1.50 !       -0.45 !         4.55

ROAD (0.00 + 48.99 + 0.00) = 48.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.20  72.95   0.00 -13.65  -0.55  -5.00   0.00   0.00
53.75
   -90     90   0.25  72.95   0.00 -14.20  -0.66   0.00   0.00  -9.10
48.99
-------------------------------------------------------------------------
--

Segment Leq : 48.99 dBA

Total Leq All Segments: 63.33 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 56.45 + 0.00) = 56.45 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.66  57.91   0.00   0.00  -1.46   0.00   0.00   0.00
56.45
-------------------------------------------------------------------------
--

Segment Leq : 56.45 dBA


Results segment # 2: EC Row EB (night)
--------------------------------------

Source height = 1.68 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.68 !        1.50 !        1.36 !         6.36

ROAD (0.00 + 49.19 + 0.00) = 49.19 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.20  73.07   0.00 -11.22  -0.55  -5.00   0.00   0.00
56.31
   -90     90   0.25  73.07   0.00 -11.66  -0.66   0.00   0.00 -11.56
49.19
-------------------------------------------------------------------------
--

Segment Leq : 49.19 dBA


Results segment # 3: EC Row WB (night)
--------------------------------------

Source height = 1.68 m

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

```
------------+-------------+-------------+--------------
       1.68 !        1.50 !       -0.45 !         4.55

ROAD (0.00 + 49.11 + 0.00) = 49.11 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.20  73.07   0.00 -13.65  -0.55  -5.00   0.00   0.00
53.87
   -90     90   0.25  73.07   0.00 -14.20  -0.66   0.00   0.00  -9.10
49.11
-------------------------------------------------------------------------------
--

Segment Leq : 49.11 dBA

Total Leq All Segments: 57.82 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 63.33
                           (NIGHT): 57.82
```