Jade Acoustics Inc.
Consulting Engineers
411 Confederation Parkway
Unit 19
Concord, Ontario
L4K 0A8
Tel: (905) 660-2444
Fax: (905) 660-4110

PRELIMINARY ENVIRONMENTAL NOISE REPORT

PROPOSED RESIDENTIAL DEVELOPMENT
16469 10 SIDE ROAD
TOWN OF HALTON HILLS
FILE: D00ENQ23.035

JADE ACOUSTICS

PREPARED FOR
RUSSELL PINES PROPERTY CORP.

February 18, 2025
File: 20-107-01

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

SUMMARY

The proposed residential development is located on the north side 10 Side Road between 10th Line and Adamson Street South in the Town of Halton Hills. The subject site will be divided in two parts by Norval West Bypass, a 4-lane roadway proposed to be constructed between two future roundabouts. The proposed development consists of a mix of residential properties including detached dwellings, dual frontage townhouses, street townhouses, back-to-back townhouses and residential reserve lands. The proposed development also includes a commercial mixed-use block, a storm water management block, internal roadways and park, open space, walkway/servicing/buffer, greenbelt and road widening lands.

The subject site is impacted by road traffic on 10 Side Road, 10th Line, Adamson Street South, Guelph Street, Norval West Bypass and the internal roadways including Street A, Street B, Street C and Street E. Additionally, potential noise associated with an existing pump station located at the northwest corner of 10 Side Road and 10th Line, an existing gas regulating station located on the west side of 10th Line, north of 10 Side Road and existing commercial and institutional uses located along Guelph Street has been evaluated.

The environmental noise guidelines of the Town of Halton Hills, the Region of Halton and the Ministry of the Environment, Conservation and Parks (MOE) set out sound level limits for both indoor and outdoor space. Sound levels due to the adjacent roads were determined using ORNAMENT, the noise prediction model of the MOE.

Using the road traffic data obtained from the Town of Halton Hills, Region of Halton, Region of Peel, Ministry of Transportation (MTO) and TYLin/LEA Consulting Ltd., the sound levels for various locations within the residential development were determined.

The analysis of the noise sources associated with the existing stationary noise sources (pump and gas regulation stations) was based on information collected by Jade Acoustics Inc. during a site visit and from Google maps.

The predicted sound levels due to the nearby roads were compared to the applicable noise guidelines to determine if mitigation is required and the proposed measures. It was found that with appropriate noise mitigation measures, all residential lots and blocks (units) in the proposed development will meet the noise guidelines.

To address road traffic noise, all lots and blocks (units) adjacent to 10 Side Road and Norval West Bypass require mandatory central air conditioning and a warning clause. Other lots and blocks (units) require forced air heating systems sized to accommodate central air conditioning at a later date if noise becomes a concern (provision for adding central air conditioning). Table 3 and Figure 2 show the central air conditioning requirements.

As shown on Figure 2, some residential lots and blocks (units) require sound barriers.

Where minor excesses exist or mitigation is required, future occupants will be advised through the use of warning clauses.

Better than standard window, exterior door and exterior wall construction is required for the residential blocks (units) immediately adjacent to 10 Side Road and Norval West Bypass. Standard window, exterior doors and exterior wall construction is acceptable for all other residential lots and blocks (units).

Based on the preliminary analysis of the stationary sources of noise external to the proposed residential development, physical noise mitigation measures are not required. See Sections 2.2, 4.2 and 5.2 for more details.

Due to their proximity to the existing facilities with stationary sources of noise, some residential lots and blocks (units) should be provided with a proximity warning clause notifying the purchasers/tenants that the activities and/or equipment associated with the existing pumping and natural gas regulating stations may at times be audible. See Table 3, notes to Table 3 and Figure 2 for details.

A noise assessment may need to be prepared for the existing farmhouse, once information regarding its final location and future use becomes available. This residential farmhouse is located east of the proposed Norval West Bypass.

As no information regarding the proposed commercial/mixed use block (Block 345) is available at this time, a separate environmental noise report will need to be prepared when the information/detailed plans become available. However, a proximity warning clause for the residential blocks (units) in close proximity to Block 345, notifying the purchasers/tenants that the activities and/or equipment associated with the commercial block may at times be audible, is included in the current noise report.

A Detailed Environmental Noise Report (DENR) will need to be prepared once a final draft plan of subdivision and grading plans become available.

Prior to issuance of building permits, the acoustical requirements should be reviewed to ensure compliance with the applicable guidelines.

Prior to final occupancy, the lots and blocks (units) requiring mitigation should be inspected by an acoustical consultant to ensure the required mitigative measures have been incorporated.

1.0 INTRODUCTION

Jade Acoustics Inc. has been retained by Russell Pines Property Corp. to prepare a Preliminary Environmental Noise Report to investigate the potential impact of environmental noise on the proposed residential development to the satisfaction of the Town of Halton Hills and the Region of Halton.

An evaluation of the potential acoustic impact between the residential units (townhouse blocks) and all internal acoustic matters is outside of the scope of work of this preliminary report.

The proposed site is identified as:

Part of Lots 11 &12
Concession 11
(Geographic Township of Esquesing)
Formerly the Village of Norval
Now in the Town of Halton Hills
Regional Municipality of Halton

The site is bound by 10th Line and existing residential and non-residential uses beyond to the west, 10 Side Road to the south, Adamson Street South to the east and valley/greenbelts lands and existing residential/commercial/institutional uses to the north. The existing non-residential uses located on the west side of 10th Line include a pumping station and a gas regulating station.

A Key Plan is attached as Figure 1.

The proposed development consists of a mix of the residential properties including single lots (detached dwellings), dual frontage townhouses, street townhouses, back-to-back townhouses and residential reserve lands, a commercial mixed-use block, a storm water management block and internal roadways. The proposed development also includes park, open space, walkway/servicing/buffer, greenbelt and road widening lands and is divided in two parts by a future 4-lane roadway, Norval West Bypass.

Figure 2 shows a draft plan of the proposed subdivision.

The analysis was based on the following:

- Draft plan of subdivision prepared by Glen Schnarr & Associates Inc., dated February 13, 2025;
- Road traffic information provided by the Town of Halton Hills, Region of Halton, Region of Peel, Ministry of Transportation and TYLin/LEA Consulting Ltd.; and
- Site visit conducted by Jade Acoustics Inc. staff on September 9, 2024.

It is expected that single lots will accommodate two-storey dwellings and townhouse blocks three-storey dwellings.

It is also expected that an existing farmhouse located east of the proposed Norval West Bypass will be relocated. As information regarding the final location and future use are not available, the farmhouse is not addressed in this noise report. Once the information becomes available, a noise assessment may need to be prepared.

As no information regarding the proposed commercial/mixed use block (Block 345) is available at this time, a separate environmental noise report will need to be prepared when the information/detailed plans become available.

2.0 NOISE SOURCES

2.1 Transportation Sources

The noise source of potential impact on the proposed development is road traffic on 10 Side Road, 10th Line, Adamson Street South, Guelph Street, Norval West Bypass and the internal roadways including Street A, Street B, Street C and Street E.

For 10 Side Road and future Norval West Bypass, the ultimate road traffic volume (AADT, annual average daily traffic) and other information provided by the Region of Halton on September 16, 2024, were used in the noise calculations.

Road traffic data for the Winston Churchill Boulevard location positioned at a distance of 300 m south of Guelph Street, provided by the Region of Peel on November 19, 2024, was taken to be applicable for Adamson Street South and, as such, used in the noise assessment.

The potential noise impact of Guelph Line was assessed using the 2035 road traffic volume (SADT, summer average daily traffic) and other road traffic data provided and confirmed by the Ontario Ministry of Transportation (MTO) on September 22, 2020 and August 27, 2024, respectively.

The noise calculations prepared for 10th Line and the internal roadways mentioned above were prepared using the road traffic information provided by the Town of Halton Hills on November 20, 2024 and the 2031 PM road traffic volumes included in a Secondary Plan Study dated May 2024, prepared by LEA Consulting Ltd. and sent to our office by TYLin on November 14, 2024. The 2031 AADT volumes were calculated assuming that the 2031 PM volumes are 10% of the AADT. As advised by the Town of Halton Hills, an annual percentage of increase of 2% was used to determine the 2035 AADT (10-year projection) volumes which were used in the noise calculations.

Road traffic information detailed above and other assumptions used in the noise calculations are summarized in Table 1. Correspondence regarding the road traffic information is included in Appendix A.

The proposed development is not affected by rail or aircraft traffic.

2.2 Stationary Sources

An existing pumping station is located at the northwest corner of 10 Side Road and 10th Line. An existing natural gas regulating station is positioned on the west side of 10th Line, approximately 100 m north of the pump station. Both facilities include equipment which generate noise and, as such, have potential to impact the proposed residential development.

Based on the site visit and Google maps, the pumping and natural gas regulating stations are surrounded by existing residential lots; therefore, they are required to meet the applicable noise guidelines at the existing noise sensitive receptors. It is expected that meeting the noise guidelines at the existing residential lots will ensure achieving compliance at the proposed development as well. This means that noise mitigation measures are not required to be implemented at the existing pumping and natural gas regulating stations by the proponent of the subject site. This will need to be confirmed at the detailed stage of the project.

Block 345 is proposed to be a commercial/mixed-use block. It is expected that the future commercial uses will include stationary noise sources. Therefore, a separate environmental noise report will need to be prepared when the information/detailed plans regarding Block 345 become available.

3.0 ENVIRONMENTAL NOISE CRITERIA

The most recent document of the Ontario Ministry of the Environment, Conservation and Parks (MOE) titled "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning, Publication NPC-300", dated August 2013, released October 21, 2013 (updated final version # 22) was used for this report.

The following two Region of Halton documents were also consulted in the preparation of the report:

- Noise Abatement Guidelines dated June 18, 2014; and
- Land Use Compatibility Guidelines dated June 18, 2014.

A brief summary of the NPC-300 guidelines is given in Appendix B. The applicable guidelines are also summarized below.

3.1 Transportation Sources

3.1.1 Indoors

If the nighttime (11:00 p.m. to 7:00 a.m.) sound level in terms of Leq at the exterior face of a bedroom or living/dining room window/exterior door is greater than 60 dBA or if the daytime (7:00 a.m. to 11:00 p.m.) sound level in terms of Leq at the exterior face of a bedroom or living/dining room window/exterior door is greater than 65 dBA, means must be provided so that windows can be kept closed for noise control purposes and central air conditioning is required.

For nighttime sound levels (LeqNight) greater than 50 dBA to less than or equal to 60 dBA on the exterior face of a bedroom or living/dining room window/exterior door or daytime sound levels (LeqDay) greater than 55 dBA to less than or equal to 65 dBA on the exterior face of a bedroom or living/dining room window/exterior door, there need only be the provision for adding central air conditioning by the occupant at a later date. This typically involves a ducted heating system sized to accommodate the addition of central air conditioning by the occupant at a later date. A warning clause advising the occupant of the potential interference with some activities is also required.

As required by the MOE, indoor noise criteria for road traffic noise are 40 dBA (Leq8hour) for the bedrooms during nighttime hours, 45 dBA (Leq8hour) for living/dining rooms during nighttime hours and 45 dBA (Leq16hour) for the living/dining rooms and bedrooms during daytime hours. These criteria are used to determine the architectural requirements.

Based on the Town of Halton Hills By-law No. 2010-0030 (Noise By-law), the general sound level limit for all air conditioning devices in Urban Class 1 and Rural Class 2 areas is one-hour equivalent sound level (Leq1hour) of road traffic plus 5 dBA measured during the period between 07:00 a.m. to 9:00 p.m. The specific sound level limits for central air conditioning devices are 50 dBA (Leq1hour) for Urban Class 1 areas and 45 dBA (Leq1hour) for Rural Class 2 areas.

In addition, the air-cooled condenser units must be sited in accordance with the zoning by-laws with respect to setbacks as well as location.

3.1.2 Outdoors

The definition of outdoor amenity area as defined by the MOE is given below.

"Outdoor Living Area (OLA) (applies to impact assessments of transportation sources) means that part of a noise sensitive land use that is:

- intended and designed for the quiet enjoyment of the outdoor environment; and
- readily accessible from the building.

The OLA includes:

- backyards, front yards, gardens, terraces or patios;
- balconies and elevated terraces (e.g. rooftops), with a minimum depth of 4.0 meters, which are not enclosed, provided they are the only outdoor living area (OLA) for the occupant; or
- common outdoor living areas (OLAs) associated with high-rise multi-unit buildings."

Based on the MOE guidelines, for the outdoor amenity areas, a design goal of 55 dBA daytime (7:00 a.m. to 11:00 p.m.) sound level is used with an excess not greater than 5 dBA considered acceptable in some cases. Where the unmitigated sound level during the day exceeds 55 dBA (LeqDay) but is less than 60 dBA (LeqDay), a warning clause is required, and mitigation should be considered. When the unmitigated sound level exceeds 60 dBA, sound barriers and warning clauses are generally required to achieve as close to 55 dBA as is technically, economically and administratively feasible.

Based on the Region of Halton guidelines, the height of sound barriers is to be a minimum 2.4 m to a maximum of 3.5 m, as measured with respect to the barrier base elevation. Sound barriers must be constructed on the regional right-of-way or on an easement in favor of the Region. The Region assumes the ownership and maintenance of such noise mitigation measures.

Typically, the maximum acoustic fence height is 2.5 m. If the required sound barrier height exceeds 2.5 m, it should be accommodated using a berm and 2.5 m high acoustic fence combination.

Lower than a 2.4 m high sound barrier (acoustic fence) is acceptable to the Town of Halton Hills.

For both indoor and outdoor conditions, where the acoustic criteria are exceeded, warning clauses must be placed in offers of purchase and sale or lease agreements and in the development agreement.

3.2 Stationary Sources

The Ontario Ministry of the Environment, Conservation and Parks (MOE) document NPC-300 titled "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning" is to be used for the commercial/institutional/industrial facilities.

The MOE also has vibration guidelines with respect to stationary sources, NPC-207. These guidelines require that the peak vibration velocities not exceed 0.3 mm/s at the point of reception during the day or night.

The MOE recognizes the need for back-up beepers/alarms as safety devices and as such does not have any guidelines or criteria to address these sources.

With respect to stationary sources of noise in urban areas, the MOE guidelines require that the sound level due to the stationary source at the building façade and outdoor amenity spaces not exceed the sound level due to road traffic and in certain situations due to rail traffic in any hour of source operation, subject to specific exclusions. For Class 1 area, exclusion sound level limits are 50 dBA (daytime and evening) and 45 dBA (nighttime). Tables C-5, C-6, C-7 and C-8 of NPC-300 included in Appendix B provided the exclusion limit values of one-hour equivalent sound level (Leq, dBA) and impulsive sound level (L_{lm}, dBAI).

The sound level limits for noise produced by emergency equipment operating in non-emergency situations, which include testing or maintenance, are 5 dB greater with respect to the sound level limits generally used for stationary sources. Therefore, for Class 1 area, exclusion sound level limits of 55 dBA (daytime and evening) and 50 dBA (nighttime) apply. Sound level limits do not apply to emergency equipment operating in emergency situations.

It should be noted that the MOE guidelines do not require that the source be inaudible, but rather that specific sound level limits be achieved.

In addition, the MOE guidelines require that most industries have a valid Environmental Compliance Approval (ECA) or its precursor, a Certificate of Approval (C of A) to operate.

In general, if the criteria for a stationary source of noise are exceeded, the MOE recommends that control be implemented at the source rather than at the receiver. Alternatively, if the receiver is set back from the source or if a physical barrier is constructed so that the criteria can be met at the receiver, no additional mitigative measures are required. In addition, a warning clause in offers of purchase and sale and/or lease agreement noting the proximity of houses to such a source should be considered. Treatment of the receptor building by the use of suitable wall and window construction and central air conditioning to keep windows closed is not an acceptable solution to the MOE in Class 1 and 2 areas (urban).

3.3 Town of Halton Hills Noise By-Law

The Town of Halton has a By-law to prohibit or regulate noise, Consolidation By-law No. 2010-0030 dated May 25, 2010 and By-law No. 2023-0067 to amend the noise exemption process and Schedule B included in the Town's Noise By-law No. 2010-0030. The by-law provides specific sound level limits, limitations on interior sound levels through party walls, exemptions, penalties and enforcement and lists noise prohibitions by time and place.

3.4 Region of Halton Guidelines

As previously mentioned, the Region of Halton has two guideline documents related to noise, Noise Abatement Guidelines and Land Use Compatibility Guidelines both dated June 18, 2014. They outline methods and requirements for the assessment of proposed residential developments and include references to traffic noise predictions, design criteria and noise control measures.

4.0 NOISE IMPACT ASSESSMENT

4.1 Road

For road traffic noise, the sound levels in terms of Leq, the energy equivalent continuous sound level for both day (Leq16) and night (Leq8) were determined using the MOE Traffic Noise Prediction Model (ORNAMENT).

For detached dwellings and street townhouses, the rear yard receptor (outdoor living area) was assumed to be 3.0 m from the centre of the rear wall of the house.

Based on preliminary information provided by the proponent for the proposed detached dual frontage dwellings, the outdoor living area was taken to be a courtyard located on one side of the dwelling behind the garage. For Lots 104 to 144, the courtyard area is well screened by the unit itself from the road traffic on 10th Line. For lots 1, 103 and 145, the courtyard is assumed to be located on the east side of the dwelling; therefore, screened by the unit itself relative to 10th Line. The other detached dual frontage dwellings/lots are located along the internal roadways with low traffic volumes.

The outdoor living area for the proposed dual frontage townhouses was assumed to be an elevated terrace above the garage with a depth exceeding 4.0 m. Typically, there are no outdoor living areas associated with back-to-back townhouse units; therefore, the proposed back-to-back townhouses were only included in the assessment of sound levels at the dwelling façades.

Where applicable, the sound levels were calculated using an absorption coefficient of 0.33 to account for the reduced ground absorption across areas such as the proposed commercial/mixed-use block, storm water management block and single loaded roads.

The proposed single lots are expected to accommodate two-storey dwellings and the townhouses to be three-storey dwellings. Accordingly, façade noise sensitive receptor heights of 4.5 m and 7.5 m above ground for the single lots and townhouses, respectively, were accounted for in the noise calculations.

The highest sound levels are predicted for the residential lots and blocks (units) along 10 Side Road and Norval West Bypass. The unmitigated sound levels at the top floor windows/exterior doors fully exposed to road traffic are predicted to be up to 71 dBA for the daytime hours between 7:00 a.m. and 11:00 p.m. and up to 64 dBA for the nighttime hours between 11:00 p.m. and 7:00 a.m. The unmitigated sound levels in the rear yards were predicted to be up to 66 dBA. Lower unmitigated sound levels were predicted for other analyzed residential lots and blocks (units).

Table 2 provides a summary of the predicted sound levels outdoors due to road traffic at specific locations without any mitigative measures. Appendix C includes sample calculations.

All lots and blocks (units) along 10th Line and within a distance of 150 m measured from the centreline of 10 Side Road and Norval West Bypass are predicted to exceed a sound level of 55 dBA during daytime hours.

Where the sound level limits are predicted to exceed the noise guidelines, mitigative measures and warning clauses are required.

4.2 Stationary Sources

As discussed in Section 2.2, due to their position relative to the existing residential lots, the pumping station and natural gas regulating station located on the west side of 10th Line are expected to meet the applicable sound level limits at the proposed residential development. Therefore, noise mitigation measures implemented by the proponent of the subject lands are not required.

Block 345 is proposed to be a commercial/mixed-use block. As noted in Section 2.2, it is expected that the future commercial uses will include stationary noise sources. Therefore, a separate environmental noise report will need to be prepared when the information/detailed plans regarding Block 345 become available.

5.0 NOISE MITIGATION REQUIREMENTS

The noise mitigation requirements for both the indoor and outdoor locations are detailed below. Table 3 and Figure 2 provide a summary of the acoustical mitigative requirements for the lots and blocks (units) in the proposed development.

5.1 Transportation Sources

5.1.1 Indoors

As required, indoor sound level criteria for road traffic can be achieved in all cases by using appropriate architectural elements for exterior walls, windows, exterior doors, and roof construction. The indoor limit for road traffic noise is 40 dBA (Leq8hour) for the bedrooms during nighttime hours, 45 dBA (Leq8hour) for the living/dining rooms during nighttime hours and 45 dBA (Leq16hour) for the living/dining rooms and bedrooms during daytime hours. These criteria have been used in this analysis. The characteristic spectra for road traffic have been accounted for in the determination of the architectural components. Appendix D contains a sample calculation of the architectural component selection.

Since dwelling plans are not yet available, the final architectural choices cannot be made. Therefore, a noise analysis using assumed window/exterior door and exterior wall percentages has been conducted to provide an indication of the architectural requirements.

In determining the architectural requirements, for the lots and blocks (units) adjacent to the roadways, it is assumed that the bedroom located on the upper floor, during daytime hours, will be the worst-case noise sensitive receptor because the day/night traffic split resulted in 6 dB to 7 dB difference between the predicted daytime and nighttime sound levels for the worst-case locations. This difference exceeds the difference between the MOE indoor noise criteria for road traffic for daytime and nighttime hours of 5 dB and, therefore, a bedroom during the daytime hours was used in the analysis. The exterior walls were assumed to be 55% of the associated floor area for the wall parallel to the noise source and the wall perpendicular to the noise source. The windows/exterior doors were assumed to be 25% of the associated floor area and located on the wall parallel and the wall perpendicular to the noise source

The townhouses along 10 Side Road and Norval West Bypass are the locations most exposed to the road traffic. Based on the ratios mentioned above, windows and exterior doors need to be up to STC 32 and exterior walls need to be up to STC 40. An STC 32 rating for windows and exterior doors and an STC 40 rating for exterior walls requires better than standard construction. For all lots and other townhouses, standard window, exterior door and exterior wall construction which comply with the minimum structural and safety requirements. See Table 3 for details.

The acoustical performance of a window and an exterior door as a whole depends on glass configuration/ thickness, air space, material used for frames and construction details including seals. Therefore, the acoustical performance of the glass configuration alone expressed as a sound transmission class (STC) rating, generally available in the literature, does not address the STC rating of the whole window/exterior door. Glass configurations with different frame materials and/or construction details often produce different STC ratings. Therefore, it is recommended that prior to installation, the window/exterior door manufacturers provide proof (STC test results of window configuration from an accredited laboratory) that their products meet the required STC ratings.

An STC 54 rating for the roof, normally met by most residential roof constructions with ventilated attic space, would be acoustically acceptable.

Once dwelling plans are available, the noise control requirements should be confirmed.

In general, where the sound level is greater than 60 dBA (nighttime) or greater than 65 dBA (daytime) on the outside face of a window, the indoor sound level criteria would not be met with open windows and provisions must be met to permit the windows to remain closed. The Region of Halton guidelines require central air conditioning. In addition, a warning clause is needed. Based on the predicted sound levels, central air conditioning is required for all lots and blocks (units) in close proximity to 10 Side Road and Norval West Bypass. See Table 3 and Figure 2 for details.

Where the sound level is exceeded by 1 dBA to 10 dBA (i.e. LeqNight between 51 dBA and 60 dBA inclusive and LeqDay between 56 dBA and 65 dBA inclusive), the provision for adding central air conditioning by the occupants must be made. All lots and townhouse blocks (units) along 10th Line and within 150 m from the centreline of 10 Side Road and Norval West Bypass, excluding the lots and blocks (units) with the mandatory central air conditioning requirement, need to be provided with the provision for adding central air conditioning in the form of forced air heating systems sized to accommodate central air conditioning at a later date if noise becomes a concern. See Table 3 and Figure 2 for details.

Warning clauses will also be required to be placed in offers of purchase and sale, lease agreements, and included in the subdivision agreement for all relevant lots and blocks (units) to make future occupants are aware of the potential noise situation. See Table 3 and Notes to Table 3 for details.

5.1.2 Outdoors

The outdoor amenity area is required to be exposed to a sound level of less than 55 dBA during the day. A 5 dBA increase is considered acceptable in certain situations. Where the unmitigated sound level during the day exceeds 55 dBA but is less than 60 dBA, a warning clause is required

and mitigation should be considered. When the unmitigated sound level exceeds 60 dBA, sound barriers and warning clauses are generally required to achieve as close to 55 dBA as is technically, economically and administratively feasible.

The unmitigated sound levels in the rear yards of some lots and blocks (units) are predicted to exceed 60 dBA; therefore, physical mitigation measures are needed. As detailed grading plans are not available at this stage of the proposed development, the base of receptor elevation was assumed to be 0.5 m higher with respect to both the base of source elevation and the base of barrier elevation to assess the sound barrier requirements.

Up to 3.9 m high sound barriers would be needed to achieve 55 dBA in the rear yards. As the maximum acoustic fence height acceptable to the Town of Halton Hills and the Region of Halton is expected to be 2.5 m, up to 1.4 m high berms would need to be constructed to accommodate the sound barrier heights of up to 3.9 m. Based on the draft plan of subdivision, the only land available for a 1.4 m high berm with a 3:1 side slope in the form of a 4.5 m wide buffer block is provided along the side property line of Block 318. Therefore, a berm and acoustic fence combination is recommended for Block 318. As no buffer blocks are proposed for other lots and blocks (units), berms are not feasible and acoustic fences are recommended where sound barriers are required.

For Block 318 (west unit), a 3.9 m high sound barrier comprised of a 1.4 m high berm and a 2.5 m high acoustic fence on top of the berm is recommended to be installed along the side property line. One side of the 1.4 m high berm with a flat top expected to be 0.3 m wide should be installed within the 4.5 m wide buffer block. The 2.5 m high acoustic fence is to be installed on the flat top; therefore, the acoustic fence will be positioned within the buffer block which will be conveyed to the Region of Halton satisfying the Region requirements. The berm and acoustic fence within the buffer block will be maintained by the Region of Halton. The recommended 3.9 m high berm and acoustic fence combination should be returned and extended along the rear property line tapering down to a 2.5 m high acoustic fence at the southeast corner of Block 318 (west unit). The 2.5 m high acoustic fence should be returned to the side wall of the dwelling. The mitigated sound level in the rear yard is predicted to be 56 dBA.

A 2.5 m high acoustic fence is recommended for Lots 40 to 51, 56, 57 and 69 to 79 and Blocks 295 to 297 (all units), 304 (west unit), 310 (west unit), 311 (west unit), 317 (west unit), 318 (all units except west unit), 319 to 321 (all units) and 322 (west unit). Where applicable, the 2.5 m high acoustic fence should be returned to the side wall of the dwelling. The mitigated sound levels in the rear yards are predicted to be between 55 dBA and 59 dBA.

A 2.0 m high acoustic fence recommended for Lot 7 flanking 10th Line is predicted to achieve the mitigated sound levels in the rear yard of less than 55 dBA. The 2.0 m high acoustic fence should be installed along the side and rear property line and returned to the side wall of the dwelling.

See Table 3 for more details.

The location, extent and height of the proposed sound barriers are shown on Figure 2.

Sample calculations of the sound barrier analysis are included as Appendix E.

As noted in Section 4.1, the courtyard outdoor living area associated with the detached dual frontage dwellings exposed to road traffic on 10th Line is well screened; therefore, sound barriers are not required.

As noted in Section 4.1, the outdoor living area for the proposed dual frontage townhouses was assumed to be an elevated terrace above the garage with a depth exceeding 4.0 m. Based on the preliminary calculations accounting for more than 4.0 m deep elevated terraces, a 1.8 m high acoustic fence would be required for the elevated terrace at Blocks 280 (south unit), 281 (west unit), 282 (south unit), 292 (north unit), 294 (south unit) and 344 (east unit) to achieve the mitigated sound levels of 55 dBA or less.

Based on the guidelines, sound barriers are not required for elevated terraces with a depth of less than 4.0 m. As such, we recommend that all elevated terraces associated with the proposed dual frontage townhouses be less than 4.0 m deep.

Generally, if a sound barrier is to be used, the sound barrier may be a fence, made of any one or a combination of various materials, berm, or a berm/fence combination. The sound barrier should be of continuous construction, with no gaps and should have a minimum surface density of 20 kg/m2 or more. Appropriate treatment of the sound barrier at all discontinuities and points of termination would be required to ensure that the sound barrier is effective. This would involve extending the barrier to the front property line, returning to the side wall of the house or extending the sound barrier for a minimum of three times the distance between the side wall and the sound barrier, past the rear wall of the house. An acoustic gate of 20 kg/m^2 is very heavy. Therefore, if a gate is required, provided that it is of continuous construction with no gaps between the boards, it may have a surface density of between 10 kg/m^2 and 20 kg/m^2. In addition, any gaps at the bottom of the gate should be kept to a minimal height.

Note that any openings under the acoustic fence for drainage must be kept to a minimum. If drainage under the acoustic fence is intended, an acoustical engineer should be consulted.

Where an excess will remain or where mitigation is required, a warning clause should be placed in offers of purchase and sale or lease agreements and included in the subdivision agreement.

5.2 Stationary Sources

As discussed in Sections 2.2 and 4.2, the pumping station and gas regulating station located on the west side of 10th Line are expected to meet the applicable sound level limits at the proposed residential development. This is due to their position with respect to the existing residential lots which surround the two facilities. Therefore, noise mitigation measures implemented by the proponent of the subject lands are not required. This will need to be confirmed at the detailed stage of the project.

A proximity warning clause should be provided for all lots and blocks (units) exposed to the pumping and natural gas regulating stations to advise the purchasers that this development is in proximity to the two facilities whose activities may at times be audible.

As no information regarding the proposed commercial/mixed use block (Block 345) is available at this time, a separate environmental noise report will need to be prepared when the information/detailed plans become available. However, a proximity warning clause for the residential blocks (units) in close proximity to Block 345, notifying the purchasers/tenants that the activities and/or equipment associated with the commercial block may at times be audible, is included in the current noise report.

6.0 RECOMMENDATIONS

1. The requirements as stipulated in Table 3 should be incorporated into the development.

2. A noise assessment may need to be prepared for the existing farmhouse, once information regarding its final location and future use becomes available.

3. Once detailed information/plans become available, a separate environmental noise report should be prepared for the proposed commercial/mixed-use block, Block 345.

4. A detailed environmental noise report should be prepared once the final draft plan of subdivision and grading plans are available to ensure that the appropriate criteria are achieved.

7.0 CONCLUSIONS

With the incorporation of the items discussed (see Table 3, Notes to Table 3 and Figure 2), the sound levels will be within the applicable noise criteria. In accordance with the Town of Halton Hills, the Region of Halton and the Ontario Ministry of the Environment, Conservation and Parks implementation guidelines, where mitigation is required, future occupants will be advised through the use of warning clauses.

A noise assessment may need to be prepared for the existing farmhouse, once information regarding its final location and future use become available.

A separate environmental noise report should be prepared when detailed information and plans for Block 345 (proposed commercial/mixed-use block) are available.

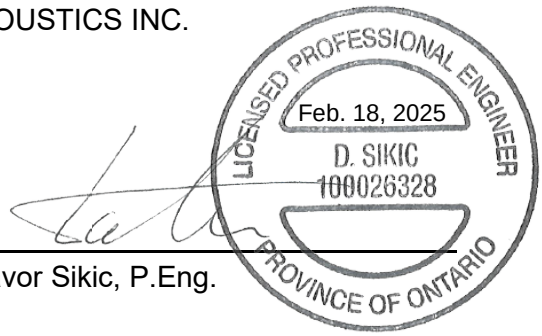
A detailed environmental noise report will need to be prepared once the final draft plan of subdivision and grading plans become available.

Prior to the issuance of building permits, the dwelling plans should be reviewed by an acoustical consultant to ensure compliance with the applicable guidelines.

Prior to final occupancy, the lots and blocks (units) should be inspected by an acoustical consultant to ensure the required mitigative measures have been incorporated.

Respectfully submitted,

JADE ACOUSTICS INC.



Per: _____

Davor Sikic, P.Eng.

Per: _____

Chris B. Kellar, P.Eng.

DS/CK/sh
J:\Reports\20-107-01 Feb 18-25 16469 10 Side Road - PENR.docx

8.0 REFERENCES

1. "Model Municipal Noise Control By-Law" Final Report, Ontario Ministry of the Environment, August 1978.

2. "ORNAMENT – Ontario Road Noise Analysis Method for Environment and Transportation", Ontario Ministry of the Environment, October 1989.

3. "Building Practice Note No. 56: Controlling Sound Transmission into Buildings", J.D. Quirt, Division of Building Research, National Research Council of Canada, September 1985.

4. "Noise Abatement Guidelines", Regional Official Plan Guidelines, Halton Region, Version 1.0, June 18, 2014.

5. "Land Use Compatibility Guidelines", Regional Official Plan Guidelines, Halton Region, Version 1.0, June 18, 2014.

6. "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", Ontario Ministry of the Environment, Publication NPC-300, August 2013, released October 21, 2013 (updated final version # 22).

7. "Impulse Vibration in Residential Buildings", Ontario Ministry of Environment Publication NPC-207 (Draft), November 1983.

8. Consolidation By-law No. 2010-0030 (Noise By-law), Town of Halton Hills, May 25, 2010.

9. By-law No. 2023-0067 to amend Town's Noise By-law 2010-0030, Town of Halton Hills, July 10, 2023.

TABLE 1

PROPOSED RESIDENTIAL DEVELOPMENT

16469 10 SIDE ROAD

TOWN OF HALTON HILLS

FILE: D00ENQ23.035

SUMMARY OF ROAD TRAFFIC DATA

ROAD	10 SIDE ROAD	NORVAL WEST BYPASS	10TH LINE	ADAMSON STREET SOUTH	GUELPH STREET
AADT/SADT*	36,000 (Ultimate AADT)	36,000 (Ultimate AADT)	5,000 (2035 AADT)	16,200 (Ultimate AADT)	30,000 (2035 SADT)
No. of Lanes	4	4	2	2	2
Speed (km/h)	80	80	60	50	50
Medium Trucks (%)	2	2	0.65	1.5/1.5**	2.5
Heavy Trucks (%)	2	2	0.65	1.3/0.9**	7.5
Day/Night Split (%)	90/10	90/10	90/10	87/13	87/13#
R.O.W (m)	42	42	26	36	20

* AADT: Annual Average Daily Traffic; SADT: Summer Average Daily Traffic

** Daytime/Nighttime

*** Assumed to be equal to percentage of trucks for 10th Line

Assumed to be equal to day/night split for Adamson Street South

Assumed to be equal to day/night split for 10th Line

Assumed

TABLE 1 - Continued

PROPOSED RESIDENTIAL DEVELOPMENT

16469 10 SIDE ROAD

TOWN OF HALTON HILLS

FILE: D00ENQ23.035

SUMMARY OF ROAD TRAFFIC DATA

ROAD	STREET A	STREET B	STREET C	STREET E
AADT/SADT*	3,550 (2035 AADT)	2,450 (2035 AADT)	2,450 (2035 AADT)	2,450 (2035 SADT)
No. of Lanes	2	2	2	2
Speed (km/h)	50###	50###	50###	50###
Medium Trucks (%)	0.65***	0.65***	0.65***	0.65***
Heavy Trucks (%)	0.65***	0.65***	0.65***	0.65***
Day/Night Split (%)	90/10##	90/10##	90/10##	90/10##
R.O.W (m)	23	23	23	23

* AADT: Annual Average Daily Traffic; SADT: Summer Average Daily Traffic

** Daytime/Nighttime

*** Assumed to be equal to percentage of trucks for 10th Line

Assumed to be equal to day/night split for Adamson Street South

Assumed to be equal to day/night split for 10th Line

Assumed

TABLE 2

PROPOSED RESIDENTIAL DEVELOPMENT

16469 10 SIDE ROAD

TOWN OF HALTON HILLS

FILE: D00ENQ23.035

SAMPLE OF PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS DUE TO TRANSPORTATION SOURCES

Lots/ Blocks (Units)*	Location**	Source	Distance (m)	Leq (dBA)			
				Day		Night	
				Separate	Combined	Separate	Combined
Lot 7	Rear Yard	10th Line	14.5	56	--	--	--
	Side Wall	10th Line	18.5	59	--	53	--
Lot 35	Rear Yard	Norval West Bypass SB	62.5	61	63	--	--
		Norval West Bypass NB	74.5	60		--	
	Side Wall	Norval West Bypass SB	59.0	62	65	56	58
		Norval West Bypass NB	71.0	61		55	
Lot 70	Side Wall	Norval West Bypass SB	41.0	61	63	--	--
		Norval West Bypass NB	53.0	59		--	
	Rear Yard	Norval West Bypass SB	32.5	64	66	58	60
		Norval West Bypass NB	44.5	62		56	
Lot 95	Front Wall	Street A	14.5	56	--	49	--
Lot 141	Front Wall	10th Line	13.0	60	--	54	--

* See Figure 2.

** Rear yard location taken 3 m from the centre of the rear wall and 1.5 m above grade. Elevated terrace location taken in the middle and 1.5 m above the floor of the terrace. Wall location taken at 4.5 m above grade for 2nd floor of single lots, 7.5 m above grade for 3rd floor of townhouse units.

TABLE 2 - Continued

PROPOSED RESIDENTIAL DEVELOPMENT

16469 10 SIDE ROAD

TOWN OF HALTON HILLS

FILE: D00ENQ23.035

SAMPLE OF PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS DUE TO TRANSPORTATION SOURCES

Lots/ Blocks (Units)*	Location**	Source	Distance (m)	Leq (dBA)			
				Day		Night	
				Separate	Combined	Separate	Combined
Lot 234	Rear Yard	Street C	16.0	54	--	--	--
	Rear Wall	Street C	19.0	53	--	50	--
Block 280 (South Unit)	Elevated Terrace	10 Side Road WB	50.5	59	61	--	--
		10 Side Road EB	61.5	57		--	
		10th Line	31.0	47		--	
Block 280 (South Unit)	Front Wall	10 Side Road WB	49.0	61	64	55	58
		10 Side Road EB	60.0	60		53	
		10th Line	14.5	57		50	
Block 281 (West Unit)	Elevated Terrace	10 Side Road WB	33.0	57	59	--	--
		10 Side Road EB	44.0	55		--	
		10th Line	53.5	47		--	
	Front Wall	10 Side Road WB	16.5	69	71	63	64
		10 Side Road EB	27.5	66		59	
		10th Line	52.5	48		41	

* See Figure 2.

** Rear yard location taken 3 m from the centre of the rear wall and 1.5 m above grade. Elevated terrace location taken in the middle and 1.5 m above the floor of the terrace. Wall location taken at 4.5 m above grade for 2nd floor of single lots, 7.5 m above grade for 3rd floor of townhouse units.

TABLE 2 – Continued

PROPOSED RESIDENTIAL DEVELOPMENT

16469 10 SIDE ROAD

TOWN OF HALTON HILLS

FILE: D00ENQ23.035

SAMPLE OF PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS DUE TO TRANSPORTATION SOURCES

Lots/ Blocks (Units)*	Location**	Source	Distance (m)	Leq (dBA)			
				Day		Night	
				Separate	Combined	Separate	Combined
Block 282 (South Unit)	Elevated Terrace	10 Side Road WB	48.5	59	61	--	--
		10 Side Road EB	59.5	58		--	
	Side Wall	10 Side Road WB	45.5	62	64	55	58
		10 Side Road EB	56.5	61		54	
Block 292 (North Unit)	Elevated Terrace	Norval West Bypass SB	36.0	56	58	--	--
		Norval West Bypass NB	48.0	54		--	
	Front Wall	Norval West Bypass SB	19.5	68	70	62	63
		Norval West Bypass NB	31.5	65		58	
Block 295 (East Unit)	Rear Yard	Norval West Bypass SB	61.0	58	62	--	--
		Norval West Bypass NB	73.0	57		--	
		10 Side Road WB	140.0	55		--	
		10 Side Road EB	151.0	55		--	
	Side Wall	Norval West Bypass SB	57.0	60	62	53	56
		Norval West Bypass NB	69.0	59		52	

* See Figure 2.

** Rear yard location taken 3 m from the centre of the rear wall and 1.5 m above grade. Elevated terrace location taken in the middle and 1.5 m above the floor of the terrace. Wall location taken at 4.5 m above grade for 2nd floor of single lots, 7.5 m above grade for 3rd floor of townhouse units.

TABLE 2 – Continued

PROPOSED RESIDENTIAL DEVELOPMENT

16469 10 SIDE ROAD

TOWN OF HALTON HILLS

FILE: D00ENQ23.035

SAMPLE OF PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS DUE TO TRANSPORTATION SOURCES

Lots/ Blocks (Units)*	Location**	Source	Distance (m)	Leq (dBA)			
				Day		Night	
				Separate	Combined	Separate	Combined
Block 310 (West Unit)	Rear Yard	Norval West Bypass NB	53.0	61	64	--	--
		Norval West Bypass SB	65.0	60		--	
	Side Wall	Norval West Bypass NB	49.0	63	66	57	59
		Norval West Bypass SB	61.0	62		56	
Block 317 (West Unit)	Rear Yard	Norval West Bypass NB	31.0	63	65	--	--
		Norval West Bypass SB	43.0	61		--	
	Side Wall	Norval West Bypass NB	27.0	66	68	59	61
		Norval West Bypass SB	39.0	64		57	
Block 318 (West Unit)	Rear Yard	Norval West Bypass SB	29.0	63	65	--	--
		Norval West Bypass NB	41.0	61		--	
	Side Wall	Norval West Bypass SB	24.0	67	69	60	62
		Norval West Bypass NB	36.0	64		58	
Block 322 (West Unit)	Rear Yard	Adamson Street South	104.0	53	56	--	--
		Norval West Bypass NB	185.5	50		--	
		Norval West Bypass SB	197.5	50		--	

* See Figure 2.

** Rear yard location taken 3 m from the centre of the rear wall and 1.5 m above grade. Elevated terrace location taken in the middle and 1.5 m above the floor of the terrace. Wall location taken at 4.5 m above grade for 2nd floor of single lots, 7.5 m above grade for 3rd floor of townhouse units.

TABLE 2 – Continued

PROPOSED RESIDENTIAL DEVELOPMENT

16469 10 SIDE ROAD

TOWN OF HALTON HILLS

FILE: D00ENQ23.035

SAMPLE OF PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS DUE TO TRANSPORTATION SOURCES

Lots/ Blocks (Units)*	Location**	Source	Distance (m)	Leq (dBA)			
				Day		Night	
				Separate	Combined	Separate	Combined
Block 325 (North Unit)	Rear Yard	Guelph Street	201.5	53	--	--	--
	Rear Wall	Guelph Street	201.0	54	--	49	--

* See Figure 2.

** Rear yard location taken 3 m from the centre of the rear wall and 1.5 m above grade. Elevated terrace location taken in the middle and 1.5 m above the floor of the terrace. Wall location taken at 4.5 m above grade for 2nd floor of single lots, 7.5 m above grade for 3rd floor of townhouse units.

TABLE 3

PROPOSED RESIDENTIAL DEVELOPMENT

16469 10 SIDE ROAD

TOWN OF HALTON HILLS

FILE: D00ENQ23.035

SUMMARY OF MINIMUM NOISE MITIGATION MEASURES

Lots/Blocks (Units)	Air Conditioning[1]	Exterior Wall[2]*	Window/ Exterior Doors[3]*	Sound Barrier[4]	Warning Clause[5]
Block 318 (west unit)	Mandatory	STC 39	STC 31	3.9 m**	A, B, D
Blocks 311 (west unit) and 317 (west unit)	Mandatory	STC 39	STC 31	2.5 m***	A, B, E
Lot 70 and Blocks 304 (west unit) and 310 (west unit)	Mandatory	N/R	N/R	2.5 m***	A, B, E
Block 281 (west unit)	Mandatory	STC 40	STC 32	1.8 m#	A, B, E, F
Block 344 (east unit)	Mandatory	STC 40	STC 32	1.8 m#	A, B, E
Block 281 (all units except west unit)	Mandatory	STC 40	STC 32	No	A, B, F
Blocks 341 to 343 (all units) and 344 (all units except east unit)	Mandatory	STC 40	STC 32	No	A, B
Blocks 292 (north unit) and 294 (south unit)	Mandatory	STC 39	STC 31	1.8#	A, B, E
Blocks 292 (all units except north unit, 293 (all units) and 294 (all units except south unit)	Mandatory	STC 39	STC 31	No	A, B

* See Section 5.1.1 for details.

** 3.9 m high sound barrier (1.4 m high berm and 2.5 m high acoustic fence combination). See Section 5.1.2 and Figure 2 for details.

*** Acoustic fence. See Section 5.1.2 and Figure 2 for details.

1.8 m high acoustic fence at an elevated terrace. If an elevated terrace is less than 4.0 m deep, an acoustic fence is not required. See Section 5.1.2 and Figure 2 for details.

N/R Denotes no special construction techniques above typical construction practices are required.

See Notes to Table 3 on following pages.

TABLE 3 – Continued

PROPOSED RESIDENTIAL DEVELOPMENT

16469 10 SIDE ROAD

TOWN OF HALTON HILLS

FILE: D00ENQ23.035

SUMMARY OF MINIMUM NOISE MITIGATION MEASURES*

Lots/Blocks (Units)	Air Conditioning(1)	Exterior Wall(2)**	Window/ Exterior Doors(3)**	Sound Barrier(4)	Warning Clause(5)
Lots 40 to 51, 56, 57, 69 and 71 to 79 and Blocks 318 (all units except west unit), 319 to 321 (all units) and 322 (west unit)	Provision for Adding	N/R	N/R	2.5 m***	A, C, E
Blocks 295 to 297 (all units)	Provision for Adding	N/R	N/R	2.5 m***	A, C, E, G
Lot 7	Provision for Adding	N/R	N/R	2.0 m***	A, C, E
Block 280 (south unit)	Provision for Adding	N/R	N/R	1.8 m#	A, C, E, F
Blocks 275 to 279 (all units) and 280 (all units except south unit)	Provision for Adding	N/R	N/R	No	A, C, F
Block 282 (south unit)	Provision for Adding	N/R	N/R	1.8 m#	A, C, E, G

* See Section 5.1.1 for details.

** 3.9 m high sound barrier (1.4 m high berm and 2.5 m high acoustic fence combination). See Section 5.1.2 and Figure 2 for details.

*** Acoustic fence. See Section 5.1.2 and Figure 2 for details.

1.8 m high acoustic fence at an elevated terrace. If an elevated terrace is less than 4.0 m deep, an acoustic fence is not required. See Section 5.1.2 and Figure 2 for details.

N/R Denotes no special construction techniques above typical construction practices are required.

See Notes to Table 3 on following pages.

TABLE 3 – Continued

PROPOSED RESIDENTIAL DEVELOPMENT

16469 10 SIDE ROAD

TOWN OF HALTON HILLS

FILE: D00ENQ23.035

SUMMARY OF MINIMUM NOISE MITIGATION MEASURES*

Lots/Blocks (Units)	Air Conditioning[1]	Exterior Wall[2]**	Window/ Exterior Doors[3]**	Sound Barrier[4]	Warning Clause[5]
Blocks 282 (all units except south unit), 283 (all units) and 284 (all units)	Provision for Adding	N/R	N/R	No	A, C, G
Lots 1, 31 to 39, 52 to 55, 58 to 68, 80 to 144, 171 to 177, 198 to 203 and 231 to 236 and Blocks 285 to 291 (all units), 298 to 303 (all units), 304 (all units except west unit), 305 to 309 (all units), 310 (all units except west unit), 311 (all units except west unit), 312 to 316 (all units), 317 (all units except west unit), 322 (all units except west unit), 323 (all units) and 335 to 340 (all units)	Provision for Adding	N/R	N/R	No	A, C
All other lots and blocks	No Special Requirements				

* See Section 5.1.1 for details.

** 3.9 m high sound barrier (1.4 m high berm and 2.5 m high acoustic fence combination). See Section 5.1.2 and Figure 2 for details.

*** Acoustic fence. See Section 5.1.2 and Figure 2 for details.

1.8 m high acoustic fence at an elevated terrace. If an elevated terrace is less than 4.0 m deep, an acoustic fence is not required. See Section 5.1.2 and Figure 2 for details.

N/R Denotes no special construction techniques above typical construction practices are required.

See Notes to Table 3 on following pages.

NOTES TO TABLE 3

1. Means must be provided to allow windows to remain closed for noise control purposes. For air cooled condenser units, the AHRI sound rating must not exceed 7.6 bels. The air-cooled condenser units should be placed in a noise insensitive location which complies with municipal by-laws.

   Provision for adding central air conditioning would involve a ducted heating system sized to accommodate the addition of central air conditioning by the occupant at a later date. The air-cooled condenser unit should be placed in a noise insensitive location which complies with municipal by-laws. It is recommended that the air- cooled condenser unit AHRI sound rating does not exceed 7.6 bels.

2. STC – Sound Transmission Class Rating (Reference ASTM-E413). Values shown are based on an assumed wall area of 55% of the associated floor area for the wall facing the noise source and 80% for the wall perpendicular to the noise source.

3. STC – Sound Transmission Class Rating (Reference ASTM-E413). Values shown are based on an assumed glazed area of 25% of the associated floor area on the wall facing the noise source. A sliding glass walkout door should be considered as a window and be included in the percentage of glazing. Requirements are to be finalized once building plans are available.

4. Sound barriers must be of a solid construction with no gaps and have a minimum surface density of 20 kg/m^2. Earthen berms, solid walls/fences of adequate density or combinations of berms and walls/fences may be used.

5. Suggested warning clauses to be included in the subdivision agreement and to be included in offers of purchase and sale or lease agreements on designated lots and blocks (units):

   A. "Purchasers/tenants are advised that despite the inclusion of noise control features in this development area and within the dwelling units, noise due to increasing road traffic may continue to be of concern, occasionally interfering with the activities of the occupants as the sound levels may exceed the noise criteria of the Municipality and the Ministry of the Environment, Conservation and Parks. I, the purchaser hereby agree to place this clause in all subsequent offers of purchase and sale when I sell the property."

B. “Purchasers/tenants are advised that this dwelling unit has been or will be fitted with a central air conditioning system which will enable occupants to keep windows closed if road traffic noise interferes with their indoor activities. The air- cooled condenser unit shall have a sound rating not exceeding 7.6 bels and shall be located so as to have the least possible noise impact on the outdoor activities of the occupants and their neighbours.”

C. "Purchasers/tenants are advised that the dwelling unit can be fitted with a central air conditioning system at the owner’s option and expense which will enable occupants to keep windows closed if road traffic noise interferes with the indoor activities. If central air conditioning is installed, the air-cooled condenser unit shall have a sound rating not exceeding 7.6 bels and shall be located so as to have the least possible noise impact on outdoor activities of the occupants and their neighbours."

D. “Purchasers/tenants are advised that the berm and acoustic fence as installed along the side property line shall be maintained, repaired or replaced by the Region of Halton. The acoustic fence as installed along the rear property line and returned to the side wall of the dwelling shall be maintained, repaired or replaced by the owner. Any maintenance, repair or replacement shall be with the same material, to the same standards, and having the same colour and appearance of the original."

E. "Purchasers/tenants are advised that the berm and/or acoustic fence as installed shall be maintained, repaired or replaced by the owner. Any maintenance, repair or replacement shall be with the same material, to the same standards, and having the same colour and appearance of the original."

F. “Purchasers/tenants are advised that the residential block (unit) is in proximity to the existing pumping station and/or natural gas regulating station whose activities may at times be audible.”

G. “Purchasers/tenants are advised that the residential block(unit) is in proximity to the future commercial block whose activities may at times be audible.”

6. Conventional ventilated attic roof construction meeting typical construction practices is satisfactory in all cases.

N.T.S.

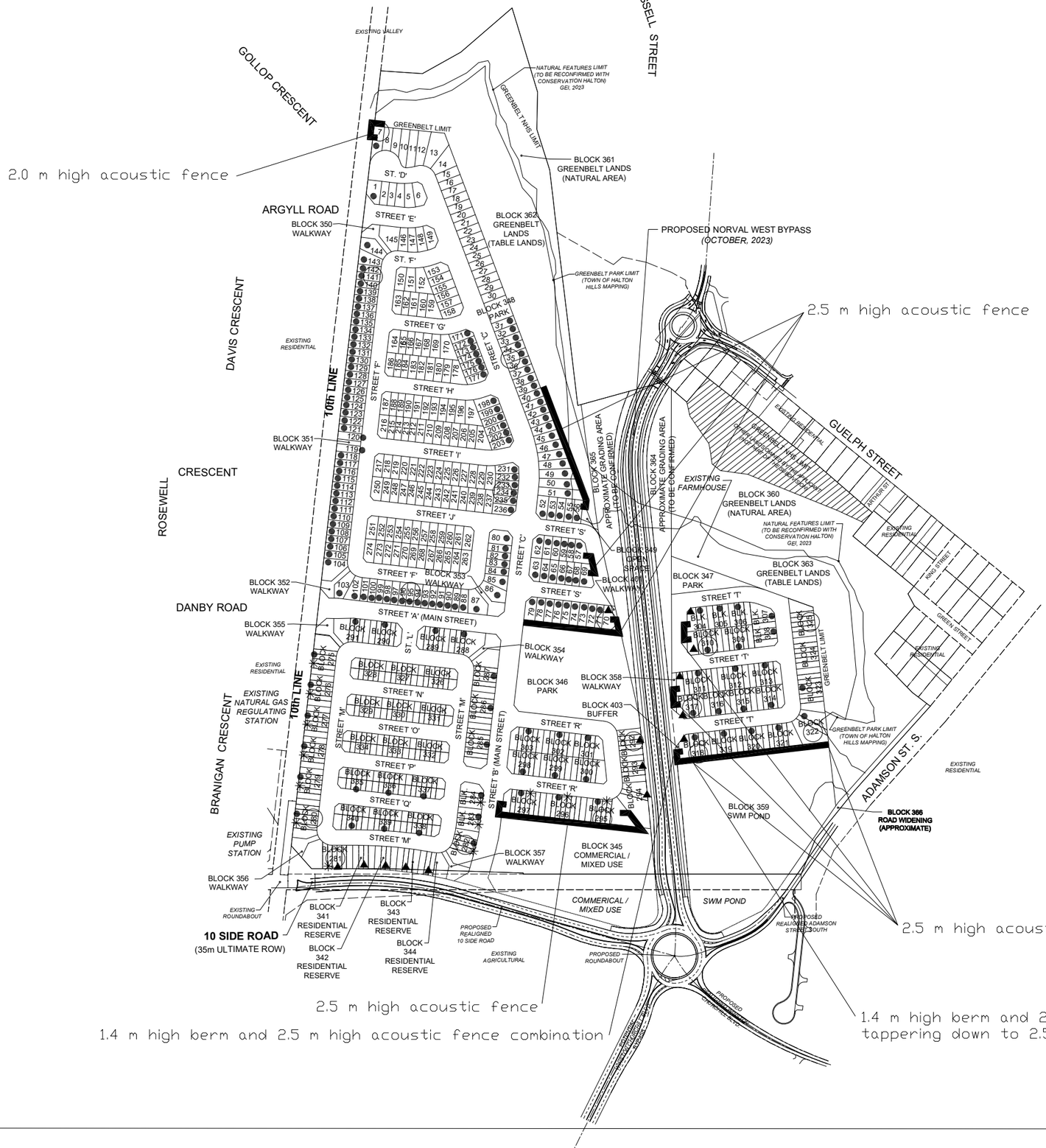
Proposed Residential Development
16469 10 Side Road
Town of Halton Hills
File: D00ENQ23.035

Date: February 2025 File: 20-107-01

KEY PLAN

FIGURE 1

JADE ACOUSTICS



Legend:

- Sound Barrier (see text and tables for details)
- ▲ Mandatory Central Air Conditioning and Warning Clause (see text and tables for details)
- ● Provision for Central Air Conditioning and Warning Clause (see text and tables for details)
- ✳ Proximity Warning Clause (see text and tables for details)
- ◯ Lot/Block Analyzed

Note:

For Blocks 280 (south unit), 281 (west unit), 282 (south unit), 292 (north unit), 294 (south unit) and 344 (east unit), a 1.8 m high acoustic fence is required to be installed at the elevated terrace. If the elevated terrace is less than 4.0 m deep, an acoustic fence is not required. See Section 5.1.2 for details.

N.T.S.

Proposed Residential Development
16469 10 Side Road
Town Of Halton Hills
File: D00ENQ23.035

Date: February 2025 Our File: 20-107-01

JADE ACOUSTICS

DRAFT PLAN OF SUBDIVISION SHOWING MINIMUM NOISE MITIGATION MEASURES

FIGURE 2

APPENDIX A

CORRESPONDENCE REGARDING ROAD TRAFFIC

CORRESPONDENCE FROM
TOWN OF HALTON HILLS

Davor Sikic

From: Branko Georgievski <bgeorgievski@haltonhills.ca>
Sent: November 20, 2024 2:57 PM
To: Nova Bonaldo; Davor Sikic
Subject: RE: Proposed Residential Development, 16469 10th Side Road, Town of Halton Hills (Jade File: 20-107-01)
Attachments: Tenth Line between Argyll Road and 10 Side Road- SB Incoming.pdf

Hi Davour,

I have attached the traffic report for 10th Line between 10 Side Road and Argyll Road from 2023.

Thank you and let me know if you have any questions.

Branko

From: Nova Bonaldo <novab@haltonhills.ca>
Sent: Tuesday, November 19, 2024 11:26 AM
To: Davor Sikic <davor@jadeacoustics.com>
Cc: Branko Georgievski <bgeorgievski@haltonhills.ca>
Subject: RE: Proposed Residential Development, 16469 10th Side Road, Town of Halton Hills (Jade File: 20-107-01)

Hi Davor,

Please find receipt attached.

Thanks!

Nova Bonaldo
Administrative Assistant – Crossing Guard Coordinator
Transportation & Public Works
Town of Halton Hills | 1 Halton Hills Drive, Halton Hills, L7G 5G2
Cell: 289-541-4293
905-873-2600 ext. 2436
novab@haltonhills.ca
haltonhills.ca

From: Branko Georgievski <bgeorgievski@haltonhills.ca>
Sent: Friday, November 15, 2024 12:24 PM
To: Davor Sikic <davor@jadeacoustics.com>
Cc: Nova Bonaldo <novab@haltonhills.ca>
Subject: RE: Proposed Residential Development, 16469 10th Side Road, Town of Halton Hills (Jade File: 20-107-01)

Hi Nova,

Can you please send over the invoice. Once the payment is completed let me know and I will send over the count.

Thanks

For Project:	Tenth Line between Argyll Road and 10 SR				
Project Notes:					
Location/Name:	Merged				
Report Generated:	7/17/2023	09:22			
Speed Intervals	1 km/h				
Time Intervals	Instant				
Traffic Report From	7/6/2023	00:00:00	through	7/12/2023	23:59:59
85th Percentile Speed	69 km/h				
85th Percentile Vehicles	10439				
Max Speed	121 km/h	on	7/6/2023	10:41:35	
Total Vehicles	12281				
AADT:	1754				

Volumes - weekly counts

	Time	5 Day	7 Day
Average Daily		1871	1754
AM Peak	08:00	120	98
PM Peak	05:00	175	152

Speed

Speed Limit:	50		
85th Percentile Speed:	69		
50th Percentile Speed:	60		
10 km/h Pace Interval:	56.0 km/h	to	66.0 km/h
Average Speed:	60.33		

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Count over limit	1692	1722	1802	1707	1490	1342	1207
% over limit	90.8	89.0	90.4	89.8	89.7	85.8	88.7
Avg Speeder	62.0	62.0	62.3	62.4	62.4	62.1	62.6

Class Counts

	Number	%
VEH_SM	17	0.1
VEH_MED	12099	98.5
VEH_LG	165	1.3

[VEH_SM=motorcycle, VEH_MED = sedan, VEH_LG = truck]

CORRESPONDENCE FROM
REGION OF HALTON

Davor Sikic

From: Scattolon, Walter <Walter.Scattolon@halton.ca>
Sent: September 16, 2024 1:29 PM
To: Davor Sikic
Subject: RE: 16469 10th Side Road, Proposed Residential Development (Jade File: 20-107-01) - Halton Region Response

Hello Davor, (*With our apologies for the delay! - It took more time than expected to determine some of the specific values below.*)

In response to your inquiry for traffic data for a **Noise Impact study** for a proposed residential development at **16469 10th Side Road**, we have the following replies:

Local Roads:

Regarding any traffic data required for the Local roads, **Tenth Line *north of 10 Side Road*;** and **Adamson Street *west of Guelph Street*,** please contact to the Town of Halton Hills directly for that information, as these segments are not Regional Roads.

Regional Roads:

For the Regional roadways, please use the following assumptions for **Ultimate** volumes:

10 Side Road (*east of Tenth Line)*:

Lanes: **4**
AADT: **36,000**
Heavy Trucks: **2%**
Medium Trucks: **2%**
day/night traffic split: 90/10
Posted speed limit: **In the existing alignment**

- the posted speed limit varies from **60 km/h** (west portion) to **80 km/h** (east portion)**.**
- values may change in the ultimate alignment of the MCEA Study preferred concept and Detailed Design.

For the **Ultimate alignment**

- conservatively assume an **80 km/h** posted speed limit**,**
- **with speed reductions** (on approach/departure) in vicinity of planned roundabout (*with Norval West By-Pass*)

Right-of-way width: The ultimate ROW is designated as **42m,** for a **4 lane** corridor, per **the latest MCEA Study progress to-date**.
The ultimate alignment of the corridor may differ from existing location.
Gradient of the road: Unknown. The ultimate roadway is still in the pre-design phase.
The preferred design plan and profile elevations of the roadway may need to be verified with the design consultant.

Future Norval West Bypass:

Lanes: **4**

AADT: **36,000**
Heavy Trucks: **2%**
Medium Trucks: **2%**
day/night traffic split: 90/10
Posted speed limit: For the **Ultimate alignment**

- conservatively assume an **80 km/h** posted speed limit**,**
- **with speed reductions** (on approach/departure) in vicinity of planned roundabout (*with 10 Side Road*)
- values may change in the ultimate alignment of the MCEA Study preferred concept and Detailed Design.

Right-of-way width: The ultimate ROW is designated as **42m,** for a **4 lane** corridor, per **the latest MCEA Study progress to-date**.
Gradient of the road: Unknown. The ultimate roadway is still in the pre-design phase.
The preferred design plan and profile elevations of the by-pass roadway may need to be verified with the design consultant.

For further information on the **Norval West By-Pass MCEA Study**, please review details on-line here:
https://www.halton.ca/For-Residents/Roads-Construction/Municipal-Class-Environmental-Assessment-Studies/Norval-West-Bypass-Transportation-Corridor-Improve

If needed for Regional roads, Existing AADT and any available hourly traffic count data would have to be requested directly from accesshalton@halton.ca .

Trusting this meets with your needs at this time, we thank you for your patience with our response.

Take care,

Walter Scattolon

Walter Scattolon, BASc (Eng.), PMP
Project Manager I – Transportation Development Review
Development Services
Public Works
Halton Region
905-825-6000, ext. 2687 | 1-866-442-5866

From: Davor Sikic <davor@jadeacoustics.com>
Sent: Thursday, August 15, 2024 10:20 AM
To: Scattolon, Walter <Walter.Scattolon@halton.ca>
Subject: FW: 16469 10th Side Road, Proposed Residential Development (Jade File: 20-107-01)

Good morning Walter,

CORRESPONDENCE FROM
REGION OF PEEL

Date: November 19, 2024
Requestor: Davor Sikic, Jade Acoustics Inc.
Request Type: Noise Traffic Data Request
Location: Winston Churchill Blvd - 300m South of Guelph Street

Davor Sikic,

As per your request, please see below traffic data from 2023:

	Existing	**Ultimate**
24 Hour Traffic Volume	14795	16200
# of Lanes	2	2
Day/Night Split	87/13	87/13
Day Trucks (% of Total Volume)	1.5% Medium 1.3% Heavy	1.5% Medium 1.3% Heavy
Night Trucks (% of Total Volume)	1.5% Medium 0.9% Heavy	1.5% Medium 0.9% Heavy
Right-of-Way Width	36 meters	
Posted Speed Limit	50 km/h	

Note:
1. The current volume is not the Annual Average Daily Traffic, but the averaged raw volumes over three data collection days. For Annual Average Traffic Volume, visit the Peel Open Data website below: http://opendata.peelregion.ca/data-categories/transportation/traffic-count-stations.aspx'2. The ultimate volume is the planned volume during a level of service 'D' where a 2 second vehicle headway and a volume to capacity ratio of 0.9 is assumed. Traffic signals and hourly variations in traffic are also incorporated into the ultimate volume.

If you require further assistance, please contact me at transportationplanningdata@peelregion.ca

Regards,

Shuvangkor Shusmoy Roy
Intermediate Planner, Transportation Planning
Transportation Division | Public Works | Region of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton, ON L6T 4B9

CORRESPONDENCE FROM
LEA CONSULTING LTD.

SGL Planning and Design Inc.

SECONDARY PLAN STUDY

Southeast Georgetown Secondary Plan, Town of Halton Hills

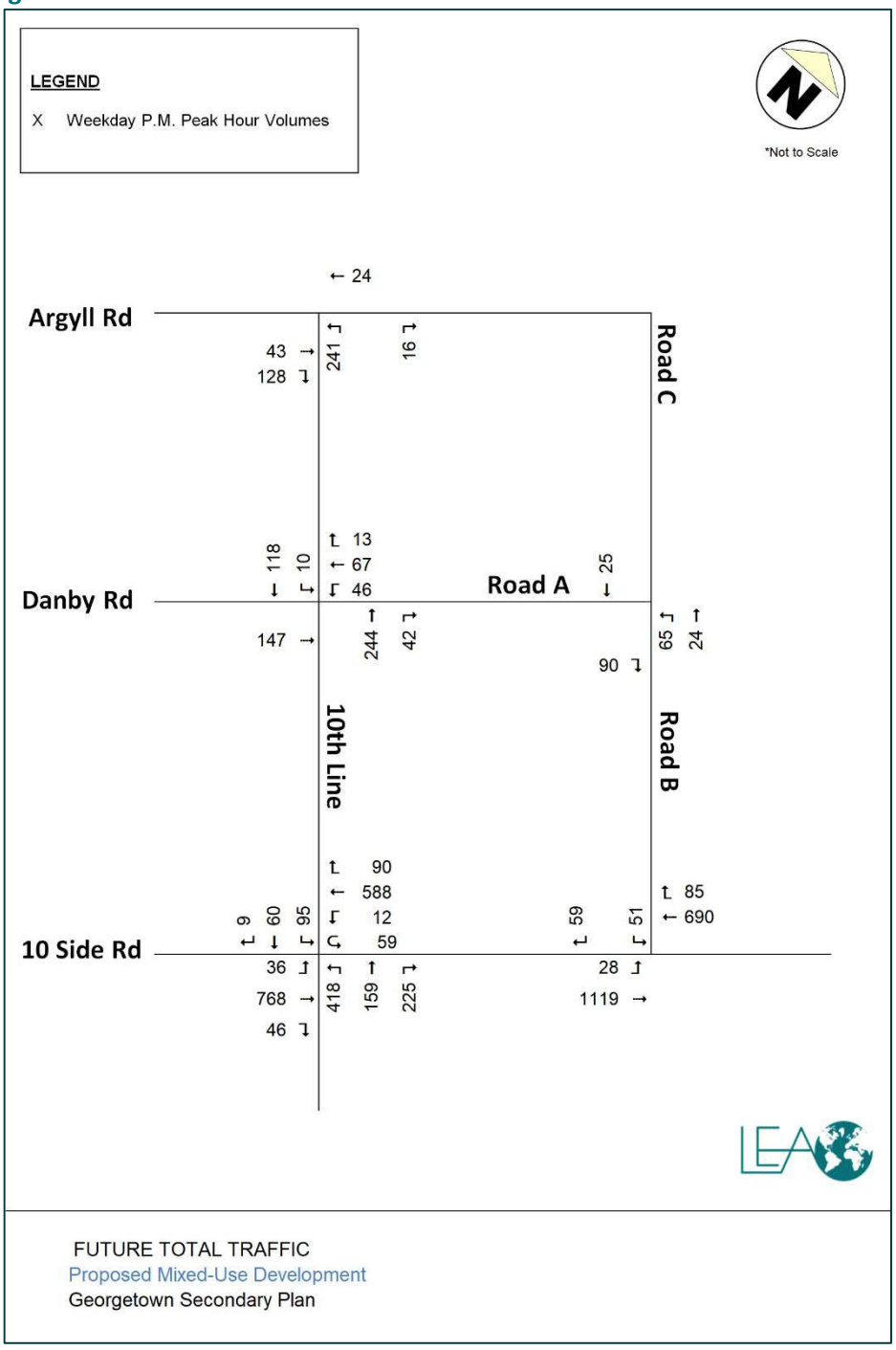
May 2024

21212

Table 7-1: Subject Site Vehicle Trip Generation

To calculate the traffic demand for the studied intersections in the future scenario, it was assumed that the future traffic volumes will be a combination of the projected 2031 traffic volumes provided by the Client and the additional traffic generated by Southeast Georgetown development (site generated traffic). The Future Total traffic volumes are shown in **Figure 7-2**.

Figure 7-2: Future Total Traffic Volumes



CORRESPONDENCE FROM
ONTARIO MINISTRY OF TRANSPORTATION

Davor Sikic

From: Tai, Arthur (MTO) <Arthur.Tai@ontario.ca>
Sent: August 27, 2024 10:28 AM
To: Davor Sikic
Subject: RE: Road Traffic Data, Proposed Residential Development, 10469 10 Side Road, Norval, Halton Hills (Jade File: 20-107-01)

Importance: Low

Hi Davor,

Our initial assessment of the preferred concept for Norval West Bypass is that our previous provided information is still valid. Again, the project itself is at a very earlier stage and is therefore subject to changes in the future.

Have you received information from the municipalities on how the Bypass will affect local road traffic?

Thanks

Arthur

From: Davor Sikic <davor@jadeacoustics.com>
Sent: Monday, August 26, 2024 4:29 PM
To: Tai, Arthur (MTO) <Arthur.Tai@ontario.ca>
Subject: RE: Road Traffic Data, Proposed Residential Development, 10469 10 Side Road, Norval, Halton Hills (Jade File: 20-107-01)

Hi Arthur,

The previous forecast provided by MTO is for Highway 7, west of Adamson Street in Norval, Halton Hills.

Please see the MTO September 22, 2020 email in the chain of emails below and advise if the information is still valid.

Thank you.

Davor Sikic, P.Eng.
Jade Acoustics Inc.
411 Confederation Parkway Unit 19
Concord, On L4K 0A8
Office: 905-660-2444 x 235
Cell: 647-968-7743
F: 905-660-4110
E: davor@jadeacoustics.com
W: www.jadeacoustics.com

From: Tai, Arthur (MTO) <Arthur.Tai@ontario.ca>
Sent: August 26, 2024 4:23 PM
To: Davor Sikic <davor@jadeacoustics.com>
Subject: RE: Road Traffic Data, Proposed Residential Development, 10469 10 Side Road, Norval, Halton Hills (Jade File: 20-107-01)
Importance: Low

Hi Davor,

This is a municipal study and I don't think MTO is engaged, as least from traffic forecasting perspectives. It will take some times from the opening of this bypass to evaluate whether our previous provided forecasts still stands.

Free feel to let me know if you have questions.

Thanks

Arthur

From: Davor Sikic <davor@jadeacoustics.com>
Sent: Tuesday, August 6, 2024 3:01 PM
To: Tai, Arthur (MTO) <Arthur.Tai@ontario.ca>
Subject: FW: Road Traffic Data, Proposed Residential Development, 10469 10 Side Road, Norval, Halton Hills (Jade File: 20-107-01)

Good afternoon Arthur,

I hope that you can assist us with respect to this project.

I would kindly ask you to advise if the road traffic data provided by Ahsan Alam in his September 22, 2020 email below is still applicable and can be used for our noise calculations.

Based on the proposed development plan, Norval West Bypass connecting to Highway 7 is planned to be constructed in the future. If MTO is involved in this road project, please provide us with road traffic data.

If there are any questions, please contact me.

Thank you.

Davor Sikic, P.Eng.
Jade Acoustics Inc.
411 Confederation Parkway Unit 19
Concord, On L4K 0A8
Office: 905-660-2444 x 235
Cell: 647-968-7743
F: 905-660-4110
E: davor@jadeacoustics.com
W: www.jadeacoustics.com

From: Alam, Ahsan (MTO) <Ahsan.Alam@ontario.ca>
Sent: September 22, 2020 12:32 PM
To: Davor Sikic <davor@jadeacoustics.com>
Subject: RE: Road Traffic Data, Proposed Residential Development, Russell Pines, Norval, Halton Hills (Jade File: 20-107)

Good Afternoon Davor,

In response to your request please find below the information available from this office for Highway 7, west o
Adamson Street, in Norval, Halton Hills:

2016 SADT = 20,000
2016 SADT= 23,800
2035 estimated AADT = 25,000
2035 estimated SADT = 30,000
Existing Number of Through Lanes = 2

Posted Speed = 50 km/hr
% Trucks (in 2016) = 10%

Please note that the above information is estimated based upon our current knowledge of the area, which m
subject to change in the future. Other information related to ROW, gradient, day/night split and heavy/mediu
split will be available from Central Region Traffic Office.

If you require further information, please don't hesitate to contact me.

Thanks,
Ahsan

From: Davor Sikic <davor@jadeacoustics.com>
Sent: September 22, 2020 11:27 AM
To: Alam, Ahsan (MTO) <Ahsan.Alam@ontario.ca>
Subject: RE: Road Traffic Data, Proposed Residential Development, Russell Pines, Norval, Halton Hills (Jade File: 20-107)

Hi Ahsan,

The closest address to the proposed residential development is 484 Guelph Street in Norval, Halton Hills. It is Guelph Street (I believe Highway 7) west of Adamson Street.

Thank you.

Davor Sikic, P.Eng.
Jade Acoustics Inc.
411 Confederation Parkway Unit 19
Concord, On L4K 0A8
Office: 905-660-2444 x 235
Cell: 647-968-7743
F: 905-660-4110
E: davor@jadeacoustics.com

APPENDIX B

ENVIRONMENTAL NOISE CRITERIA

ONTARIO MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MOE)

Reference: "Environmental Noise Guidelines Stationary and Transportation Sources – Approval and Planning", Publication NPC-300, August, 2013, released October 21, 2013 (updated final version # 22).

SOUND LEVEL CRITERIA FOR ROAD AND RAIL NOISE

TABLE C-1

Sound Level Limit for Outdoor Living Areas

Road and Rail

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

TABLE C-2

Indoor Sound Level Limits
Road and Rail

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

SOUND LEVEL CRITERIA FOR AIRCRAFT NOISE

TABLE C-3

Outdoor Aircraft Noise Limit

Time Period	NEF/NEP
24-hour	30

TABLE C-4

Indoor Aircraft Noise Limit
(Applicable over 24-hour period)

Type of Space	Indoor NEF/NEP*
Living/dining/den areas of residences, hospitals, nursing/retirement homes, schools, daycare centres, etc.	5
Sleeping Quarters	0

* The indoor NEF/NEP values in Table C-4 are used to determine acoustical insulation requirements based on the NEF/NEP contour maps.

SOUND LEVEL CRITERIA FOR STATIONARY SOURCES

TABLE C-5

Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA)
Outdoor Points of Reception

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	55
19:00 – 23:00	50	45	40	55

TABLE C-6

Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA)
Plane of Window of Noise Sensitive Spaces

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	60
19:00 – 23:00	50	50	40	60
23:00 – 07:00	45	45	40	55

TABLE C-7

Exclusion Limit Values for Impulsive Sound Level (L_{LM}, dBAI)
Outdoor Points of Reception

Time of Day	Actual Number of Impulses in Period of One Hour	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 23:00	9 or more	50	50	45	55
	7 to 8	55	55	50	60
	5 to 6	60	60	55	65
	4	65	65	60	70
	3	70	70	65	75
	2	75	75	70	80
	1	80	80	75	85

TABLE C-8

Exclusion Limit Values of Impulsive Sound Level (L_{LM}, dBAI)
Plane of Window - Noise Sensitive Spaces (Day/Night)

Actual Number of Impulses in Period of One Hour	Class 1 Area (07:00-23:00)/ (23:00-07:00)	Class 2 Area (07:00-23:00)/ (23:00-07:00)	Class 3 Area (07:00-19:00)/ (19:00-07:00)	Class 4 Area (07:00-23:00)/ (23:00-07:00)
9 or more	50/45	50/45	45/40	60/55
7 to 8	55/50	55/50	50/45	65/60
5 to 6	60/55	60/55	55/50	70/65
4	65/60	65/60	60/55	75/70
3	70/65	70/65	65/60	80/75
2	75/70	75/70	70/65	85/80
1	80/75	80/75	75/70	90/85

SUPPLEMENTARY SOUND LEVEL 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	Leq (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

TABLE C-10

Supplementary Indoor Aircraft Noise Limit
(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 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.

ENVIRONMENTAL NOISE CRITERIA

REGION OF PEEL

Reference: "General Guidelines for the Preparation of Acoustical Reports in the Region of Peel", December 2002.

ROAD TRAFFIC NOISE

TYPE OF SPACE	TIME PERIOD	SOUND LEVEL LIMIT Leq*
Outdoor living area	7 a.m. – 11 p.m.	Leq (16 hr.) = 55 dBA
Outside bedroom window	11 p.m. – 7 a.m.	Leq (8 hr.) = 50 dBA
Indoor (bedrooms, hospitals)	11 p.m. – 7 a.m.	Leq (8 hr.) = 40 dBA
Indoor (living rooms, hotels, private offices, reading rooms)	7 a.m. – 11 p.m.	Leq (16 hr.) = 45 dBA
Indoor (general offices, shops)	7 a.m. – 11 p.m.	Leq (16 hr.) = 50 dBA

* Leq, measured in A-weighted decibels (dBA), is the value of the constant sound level which would result in exposure to the same total sound level as would the specified time varying sound, if the constant sound level persisted over an equal time interval.

APPENDIX C

SAMPLE CALCULATION OF PREDICTED UMITIGATED SOUND LEVELS DUE TO ROAD TRAFFIC

APPENDIX C-1
SAMPLE CALCULATION OF PREDICTED SOUND LEVELS

FILE: 20-107-01
NAME: 16469 10 Side Road
REFERENCE DRAWINGS: Draft Plan
LOCATION: Block 317 (West Unit), side wall

Noise Source:	Norval West Bypass NB	Norval West Bypass SB
Time Period:	16 hr. (day)	16 hr. (day)
Segment Angle:	-90 to 90	-90 to 90
Distance (m):	27.0	39.0

CALCULATION OF PREDICTED SOUND LEVELS*

Reference Leq (dBA)*:	70.97	70.97
Height and/or Distance Correction (dBA):	-3.80	-6.18
Finite Element Correction (dBA):	-1.15	-1.15
Allowance for Screening (dBA):	0.00	0.00
Allowance for Future Growth (dBA):	incl.	incl.
LeqDay (dBA):	66.01	63.63
Combined LeqDay (dBA):	67.99	

* Leq determined using the computerized model of the Ontario Ministry of the Environment and Climate Change Noise Assessment Guidelines, STAMSON Version 5.04 (ORNAMENT). See attached printouts.

APPENDIX C-2
SAMPLE CALCULATION OF PREDICTED SOUND LEVELS

FILE: 20-107-01
NAME: 16469 10 Side Road
REFERENCE DRAWINGS: Draft Plan
LOCATION: Block 317 (West Unit), side wall

Noise Source:	Norval West Bypass NB	Norval West Bypass SB
Time Period:	8 hr. (night)	8 hr. (night)
Segment Angle:	-90 to 90	-90 to 90
Distance (m):	27.0	39.0

CALCULATION OF PREDICTED SOUND LEVELS*

Reference Leq (dBA)*:	64.44	64.44
Height and/or Distance Correction (dBA):	-3.80	-6.18
Finite Element Correction (dBA):	-1.15	-1.15
Allowance for Screening (dBA):	0.00	0.00
Allowance for Future Growth (dBA):	incl.	incl.
LeqNight (dBA):	59.48	57.10
Combined LeqNight (dBA):	61.46	

* Leq determined using the computerized model of the Ontario Ministry of the Environment and Climate Change Noise Assessment Guidelines, STAMSON Version 5.04 (ORNAMENT). See attached printouts.

STAMSON 5.0 NORMAL REPORT Date: 18-12-2024 13:48:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 358sw.te Time Period: Day/Night 16/8 hours
Description: Block 317 (west unit), side wall

```
Road data, segment # 1: Norval W. NB (day/night)
-----------------------------------------------
Car traffic volume  : 15552/1728  veh/TimePeriod  *
Medium truck volume :   324/36    veh/TimePeriod  *
Heavy truck volume  :   324/36    veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  18000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00


Data for Segment # 1: Norval W. NB (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  27.00 / 27.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: Norval W. SB (day/night)
-----------------------------------------------
Car traffic volume  : 15552/1728  veh/TimePeriod  *
Medium truck volume :   324/36    veh/TimePeriod  *
Heavy truck volume  :   324/36    veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  18000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00


Data for Segment # 2: Norval W. SB (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  :  39.00 / 39.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Norval W. NB (day)
---------------------------------------

Source height = 1.19 m

ROAD (0.00 + 66.01 + 0.00) = 66.01 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.49  70.97   0.00  -3.80  -1.15   0.00   0.00   0.00  66.01
-------------------------------------------------------------------------------

Segment Leq : 66.01 dBA


Results segment # 2: Norval W. SB (day)
---------------------------------------

Source height = 1.19 m

ROAD (0.00 + 63.63 + 0.00) = 63.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.49  70.97   0.00  -6.18  -1.15   0.00   0.00   0.00  63.63
-------------------------------------------------------------------------------

Segment Leq : 63.63 dBA

Total Leq All Segments: 67.99 dBA


Results segment # 1: Norval W. NB (night)
-----------------------------------------

Source height = 1.19 m

ROAD (0.00 + 59.48 + 0.00) = 59.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.49  64.44   0.00  -3.80  -1.15   0.00   0.00   0.00  59.48
-------------------------------------------------------------------------------

Segment Leq : 59.48 dBA


Results segment # 2: Norval W. SB (night)
-----------------------------------------

Source height = 1.19 m

ROAD (0.00 + 57.10 + 0.00) = 57.10 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.49  64.44   0.00  -6.18  -1.15   0.00   0.00   0.00  57.10
-------------------------------------------------------------------------------

Segment Leq : 57.10 dBA

Total Leq All Segments: 61.46 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 67.99
                           (NIGHT): 61.46
```

APPENDIX C-3
SAMPLE CALCULATION OF PREDICTED SOUND LEVELS

FILE: 20-107-01
NAME: 16469 10 Side Road
REFERENCE DRAWINGS: Draft Plan
LOCATION: Block 317 (West Unit), rear yard

Noise Source:	Norval West Bypass NB	Norval West Bypass SB
Time Period:	16 hr. (day)	16 hr. (day)
Segment Angle:	-36 to 74	-36 to 74
Distance (m):	31.0	43.0

CALCULATION OF PREDICTED SOUND LEVELS*

Reference Leq (dBA)*:	70.97	70.97
Height and/or Distance Correction (dBA):	-5.23	-7.59
Finite Element Correction (dBA):	-2.79	-2.79
Allowance for Screening (dBA):	0.00	0.00
Allowance for Future Growth (dBA):	incl.	incl.
LeqDay (dBA):	62.94	60.58
Combined LeqDay (dBA):	64.93	

* Leq determined using the computerized model of the Ontario Ministry of the Environment and Climate Change Noise Assessment Guidelines, STAMSON Version 5.04 (ORNAMENT). See attached printouts.

```
STAMSON 5.0        NORMAL REPORT        Date: 17-12-2024 09:04:59
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 358ola.te            Time Period: Day 16 hours
Description: Block 317, west unit, rear yard, unmitigated


Road data, segment # 1: Norval W. NB (day)
-----------------------------------------
Car traffic volume  : 15552 veh/TimePeriod  *
Medium truck volume :   324 veh/TimePeriod  *
Heavy truck volume  :   324 veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  18000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00


Data for Segment # 1: Norval W. NB (day)
----------------------------------------
Angle1   Angle2           : -36.00 deg   74.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  31.00 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -36.00 deg   Angle2 : 74.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   8.50 m
Source elevation          :   0.00 m
Receiver elevation        :   0.50 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Road data, segment # 2: Norval W. SB (day)
-----------------------------------------
Car traffic volume  : 15552 veh/TimePeriod  *
Medium truck volume :   324 veh/TimePeriod  *
Heavy truck volume  :   324 veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  18000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00
```

```
Data for Segment # 2: Norval W. SB (day)
----------------------------------------
Angle1   Angle2           : -36.00 deg   74.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  43.00 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -36.00 deg   Angle2 : 74.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   8.50 m
Source elevation          :   0.00 m
Receiver elevation        :   0.50 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Results segment # 1: Norval W. NB (day)
----------------------------------------

Source height = 1.19 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.19 !        1.50 !        1.78 !         1.78

ROAD (0.00 + 62.94 + 0.00) = 62.94 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -36     74   0.66  70.97   0.00  -5.23  -2.79   0.00   0.00   0.00  62.94*
   -36     74   0.66  70.97   0.00  -5.23  -2.79   0.00   0.00   0.00  62.94
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 62.94 dBA


Results segment # 2: Norval W. SB (day)
----------------------------------------

Source height = 1.19 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.19 !        1.50 !        1.84 !         1.84

ROAD (0.00 + 60.58 + 0.00) = 60.58 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -36     74   0.66  70.97   0.00  -7.59  -2.79   0.00   0.00   0.00  60.58*
   -36     74   0.66  70.97   0.00  -7.59  -2.79   0.00   0.00   0.00  60.58
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 60.58 dBA


Total Leq All Segments: 64.93 dBA
```

APPENDIX D

SAMPLE CALCULATION OF ARCHITECTURAL COMPONENT SELECTION

APPENDIX D-1
SAMPLE CALCULATION OF ARCHITECTURAL COMPONENT SELECTION*

FILE: 20-107-01
NAME: 16469 10 Side Road
REFERENCE DRAWINGS: Draft Plan
LOCATION: Block 281 (West Unit), corner bedroom, daytime

ROAD

Wall area as a percentage of floor area:	South:	55%
	West:	55%
Window/Exterior Door area as a percentage of floor area:	South:	25%
	West:	25%

Number of components:	4	
Outdoor (Daytime) Leq:	South:	71 (+3 for reflections) = 74 dBA
	West:	68 (+3 for reflections) = 71 dBA
Indoor Leq Limit:	45 dBA	
Noise Reduction:	South:	29 dBA
	West:	26 dBA
Noise Spectrum:	Mixed Road Traffic	Angle Correction: 0
Absorption:	Medium	

APPROPRIATE ELEMENTS

		STC Rating
Exterior Wall	South	STC 40
	West	STC 37
Window/Exterior Door	South	STC 32
	West	STC 29

* Based upon “Controlling Sound Transmission into Buildings”, Building Practice Note 56 by National Research Council of Canada, September 1985.

APPENDIX E

SAMPLE CALCULATION OF SOUND BARRIER ANALYSES

STAMSON 5.0 NORMAL REPORT Date: 17-12-2024 09:04:59
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 358ola.te Time Period: Day 16 hours
Description: Block 317, west unit, rear yard, mitigated

Road data, segment # 1: Norval W. NB (day)

Car traffic volume : 15552 veh/TimePeriod *
Medium truck volume : 324 veh/TimePeriod *
Heavy truck volume : 324 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 2 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 18000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Norval W. NB (day)

Angle1 Angle2 : -36.00 deg 74.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 31.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -36.00 deg Angle2 : 74.00 deg
Barrier height : 0.00 m
Barrier receiver distance : 8.50 m
Source elevation : 0.00 m
Receiver elevation : 0.50 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: Norval W. SB (day)

Car traffic volume : 15552 veh/TimePeriod *
Medium truck volume : 324 veh/TimePeriod *
Heavy truck volume : 324 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 2 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 18000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

```
Data for Segment # 2: Norval W. SB (day)
----------------------------------------
Angle1   Angle2           : -36.00 deg   74.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  43.00 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -36.00 deg   Angle2 : 74.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   8.50 m
Source elevation          :   0.00 m
Receiver elevation        :   0.50 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Results segment # 1: Norval W. NB (day)
----------------------------------------

Source height = 1.19 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.19 !        1.50 !        1.78 !         1.78

ROAD (0.00 + 62.94 + 0.00) = 62.94 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -36     74   0.66  70.97   0.00  -5.23  -2.79   0.00   0.00   0.00  62.94*
   -36     74   0.66  70.97   0.00  -5.23  -2.79   0.00   0.00   0.00  62.94
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 62.94 dBA


Results segment # 2: Norval W. SB (day)
----------------------------------------

Source height = 1.19 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.19 !        1.50 !        1.84 !         1.84

ROAD (0.00 + 60.58 + 0.00) = 60.58 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -36     74   0.66  70.97   0.00  -7.59  -2.79   0.00   0.00   0.00  60.58*
   -36     74   0.66  70.97   0.00  -7.59  -2.79   0.00   0.00   0.00  60.58
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 60.58 dBA


Total Leq All Segments: 64.93 dBA
```

Barrier table for segment # 1: Norval W. NB (day)

Barrier Height	Elev of Barr Top	Road dBA	Tot Leq dBA	
1.50	1.50	62.94	62.94	
1.60	1.60	62.94	62.94	
1.70	1.70	62.94	62.94	
1.80	1.80	58.34	58.34	
1.90	1.90	58.31	58.31	
2.00	2.00	58.22	58.22	
2.10	2.10	58.07	58.07	
2.20	2.20	57.85	57.85	
2.30	2.30	57.59	57.59	
2.40	2.40	57.29	57.29	
2.50	2.50	56.96	56.96	2.5 m high acoustic fence
2.60	2.60	56.60	56.60	
2.70	2.70	56.22	56.22	
2.80	2.80	55.83	55.83	
2.90	2.90	55.43	55.43	
3.00	3.00	55.03	55.03	
3.10	3.10	54.64	54.64	
3.20	3.20	54.24	54.24	
3.30	3.30	53.85	53.85	
3.40	3.40	53.47	53.47	

Barrier table for segment # 2: Norval W. SB (day)

Barrier Height	Elev of Barr Top	Road dBA	Tot Leq dBA	
1.50	1.50	60.58	60.58	
1.60	1.60	60.58	60.58	
1.70	1.70	60.58	60.58	
1.80	1.80	60.58	60.58	
1.90	1.90	56.14	56.14	
2.00	2.00	56.11	56.11	
2.10	2.10	56.01	56.01	
2.20	2.20	55.86	55.86	
2.30	2.30	55.66	55.66	
2.40	2.40	55.42	55.42	
2.50	2.50	55.14	55.14	2.5 m high acoustic fence
2.60	2.60	54.83	54.83	
2.70	2.70	54.49	54.49	
2.80	2.80	54.15	54.15	
2.90	2.90	53.79	53.79	
3.00	3.00	53.42	53.42	
3.10	3.10	53.05	53.05	
3.20	3.20	52.68	52.68	
3.30	3.30	52.32	52.32	
3.40	3.40	51.96	51.96	

Combined LeqDay = 59.15 dBA accounting for a 2.5 m high acoustic fence