

DEVELOPMENT AT DERRY ROAD & HIGHWAY 25

MILTON, ONTARIO

NOISE STUDY

RWDI #2101382

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SUBMITTED TO

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EXECUTIVE SUMMARY

Militeron Developments Limited retained RWDI to complete the environmental noise study as part of an application Official Plan and Zoning By-law amendment for the proposed development to be located at the southeast corner of Derry Road and Highway 25 in Milton, Ontario. This report has been completed as an update to the previous report, dated April 21, 2023, which has been reviewed by the Region of Halton and addressed the reviewer comment of modelling ambient background to show that the stationary sources meet applicable sound limits.

The purpose of this assessment was to predict noise levels affecting the proposed development using the applicable guidelines, determine the overall feasibility of the project, and provide recommendations on the locations and heights of on-site noise barriers.

This study assessed sound impacts due to road-traffic noise and stationary sources surrounding the development. The sound levels modelled for the road-traffic noise and stationary sources were assessed using the MECP Guideline NPC-300 and the Halton Region Noise Abatement Policy. Per the guideline, the impact from road-traffic noise and stationary sources were assessed separately.

The sound levels due to road-traffic sources are predicted to exceed the Publication NPC-300 sound level limits at the development. For assessing road-traffic sources, the development can meet the sound level requirements of NPC-300 with:

- The implementation of central air conditioning or provision for its future installation, as applicable;
- Warning Clauses in purchase or rental agreements;
- Selection of windows and building components to meet the appropriate indoor levels to be determined when the suite layouts and floor plans are finalized; and
- Inclusion of podium and ground-level sound barriers.

Detailed background sound modelling at the worst-case locations has been completed to determine elevated sound level limits for stationary sources. For sound due to surrounding stationary sources, the proposed development is predicted to meet the applicable NPC-300 limits.

This noise study is based on assumptions regarding currently available building configuration and construction information. As such, the recommendations presented herein must be refined if the building is changed.



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1 INTRODUCTION

Milteron Developments Limited retained RWDI to update the environmental noise study as part of an Official Plan and Zoning By-law amendment application for the proposed development to be located at the southeast corner of Derry Road and Highway 25 in Milton, Ontario. The noise assessment was based on the design drawings dated August 16, 2023. The site plan implements noise barrier walls previously recommended by RWDI. This report has been completed as an update to the previous report, dated April 21, 2023, which has been reviewed by the Region of Halton and addressed the reviewer comment of modelling ambient background to show that the stationary sources meet applicable sound limits.

The purpose of this assessment was to predict noise and levels affecting the proposed development using the applicable guidelines, determine the overall feasibility of the project, and provide recommendations on the locations and heights of on-site noise barriers.

The Ontario Ministry of the Environment, Conservation and Parks (MECP) noise guidelines were used to assess impacts and determine the appropriate noise control measures. The relevant sources of sound for a noise impact assessment are as follows:

- Transportation-related sources namely sound due to road traffic; and
- Stationary sources specifically existing heating, ventilation and air-conditioning (HVAC) equipment on the commercial buildings to the north across Derry Road.

The scope of this study did not include evaluation of noise from stationary sources proposed as part of the development itself. The mechanical equipment will be designed to achieve compliance with MECP guidelines.

2 DESCRIPTION OF PROJECT AND SITE

The proposed development site will be located on the southeast corner of Derry Road and Highway 25 in Milton, Ontario. The proposed development will include 9 buildings (see **Figure 1**). There will be five 3-storey townhouse complexes (Buildings TH-3A through TH-3E), a 3-storey building consisting of 27 stacked townhouses (Building D), and three towers ranging from 16 to 25 storeys located on a common 3-storey podium (Buildings A through C). The development includes four common outdoor amenity areas on the 3-storey podium, and a common outdoor amenity area at ground level behind the podium. The townhouses have private outdoor living areas. The patios associated with Building B, fronting onto Derry Road, are not more than 2.5 m deep. The patios associated with Building D, located along the back of the building, have a depth of 3.4 m.

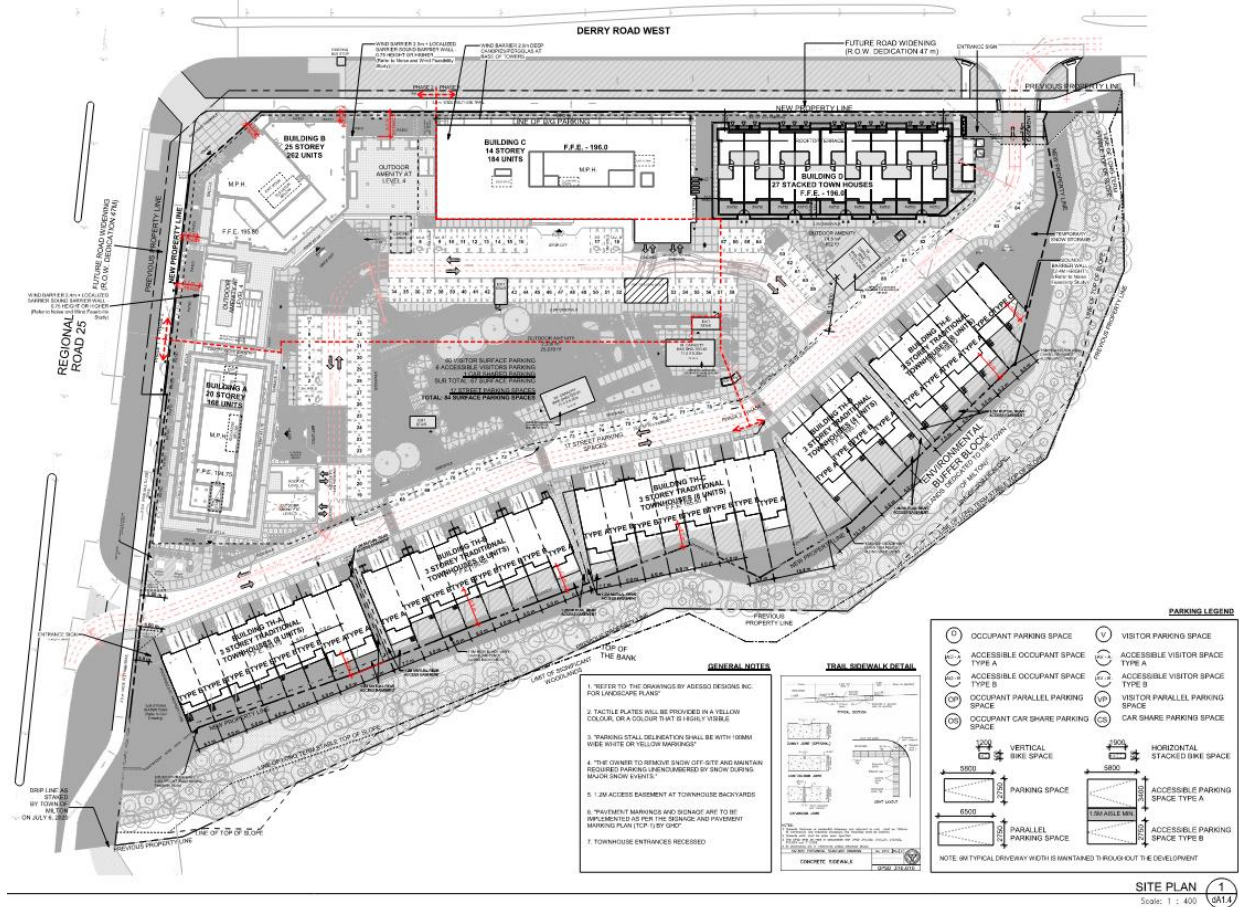


Figure 1: Site Plan of the Proposed Development

Derry Road and Highway 25 are the nearest sources of road traffic noise. There are no other transportation-related noise sources, such as rail lines or airports, in close proximity to the development. Commercial buildings across Derry Road to the north of the development were considered to be potential sources of stationary sound.

3 SOUND ON PROPOSED DEVELOPMENT

The detailed evaluation of transportation-related and stationary sources affecting the development were assessed using the MECP NPC-300 Guidelines (MOE, 2013), the MECP Land Use Compatibility D-Series Guidelines (MOE, 1995), and the Halton Region Land Use Compatibility Guidelines (Halton, 2014). The relevant section of the NPC-300 Guideline is Part C – Land Use Planning. Publication NPC-300 specifies that transportation-related and stationary sources are to be assessed separately.



3.1 Road-Traffic Noise Assessment

3.1.1 Road-Traffic Source Assessment Criteria

For assessing sound originating from road-traffic sources, Publication NPC-300 defines sound level criteria for two types of locations: outdoor living areas (OLAs), and indoor areas of sensitive uses.

An OLA is defined as an outdoor area easily accessible from the building and designed for the quiet enjoyment of the outdoor environment. Courtyards, terraces and balconies (with a depth of more than 4 m) are considered noise-sensitive OLAs. The daytime sound level limit for an OLAs is an equivalent sound level of 55 dBA averaged over the daytime hours (07:00 to 23:00h). NPC-300 does not define a nighttime sound level limit for OLAs.

Indoor spaces have daytime and nighttime sound level limits relating to the type of usage, such as living/dining rooms or bedrooms. Indoor living areas within the proposed developments include dining/living rooms and bedrooms. The sound level criteria are based on all windows and doors being closed to the environment. The daytime sound level limit for indoor spaces is an L_{EQ} of 45 dBA averaged over 07:00 to 23:00h. The nighttime sound level limits for indoor spaces are L_{EQS} of 45 and 40 dBA averaged over 23:00 to 07:00h, for an indoor living area and sleeping quarters, respectively.

The NPC-300 sound level criteria for transportation-related sources are summarized in Table.

Table 1: NPC-300 Road-Traffic Source Sound Level Criteria for Sensitive Land Uses

Assessment Location	Time of Day	Time Period	Sound Level Limit ^[1]
Outdoor Living Area	Daytime	07:00-23:00h	55 dBA
Indoor Living Area	Daytime	07:00-23:00h	45 dBA
	Nighttime	23:00-07:00h	45 dBA
Sleeping Quarters	Daytime	07:00-23:00h	45 dBA
	Nighttime	23:00-07:00h	40 dBA

Notes: [1] The average sound level over the time period at the assessment location must not exceed the sound level limit.

The Halton Region Noise Abatement Policy for Regional Roads and New Developments sets out details of noise barrier placement. Barrier heights are constrained by a minimum height of 2.4 m. Halton staff have advised that, where a barrier is not able to demonstrate achievement of 55 dBA, a table should be provided demonstrating the sound levels achieved, up to a maximum barrier height of 3.5 m total height.

3.1.2 Traffic Data

The two roadways that have the greatest potential to impact the proposed residential development are Derry Road to the northwest and Highway 25 to the southwest. The location of the proposed development in relation to the major roadways is shown in **Figure 1**.



The ultimate annual average daily traffic (UAADT) and vehicle type breakdown were provided by the Halton Region. The UAADT was split into daytime, and nighttime counts using a typical 90%/10% split for daytime/nighttime. A summary of the traffic data is provided in **Table 2**. Appendix A includes a copy of the traffic data provided by the Halton Region.

Table 2: Road Traffic Data for Transportation-related Source Assessment

Roadway Link	Ultimate AADT ^[1] (2030)	Daytime / Nighttime Split (%Day / %Night)	%Light	%Medium	%Heavy	Speed (km/hr.)
Highway 25	40,000	90 / 10	90	5	5	60
Derry Road	45,000		94	3	3	50

Notes: [1] UAADT – Ultimate Annual Average Daily Traffic.

3.1.3 Representative Receptors for Transportation Sources

Worst-case receptor locations were chosen based on drawings dated August 16, 2023. The drawings show the intended use of areas within the proposed building and locations of outdoor living areas. The OLA locations include an additional 7 OLAs that were added in response to a Halton Region request in 2019 for detailed barrier analysis. Receptors 19 and 20 were added for the addition of Building D to represent the worst-case façades. The patios associated with Building B are up to 2.5 m deep, and the patios associated with Building D are 3.4 m deep therefore these patios do not qualify as points of reception. The locations of the receptors in relation to the roadways and the development are shown in **Figure 2: Representative Receptors for Traffic Modelling**



Figure 2: Representative Receptors for Traffic Modelling

20 worst-case outdoor receptors were selected for modelling:

- R01 - Building TH-3B - West Facade
- R02 - Building C - Northwest Facade
- R03 - Building B - West Facade
- R04 - Building A - Southwest Facade
- R05 - Building TH-3A - Southwest Facade
- R06 - Building TH-3E - North Facade
- R07 - Building A&B - Podium Amenity Area

- R07B – Building A – Podium Amenity Area
- R08 - Building B&C – Podium Amenity Area
- R09 - Building C - Podium Amenity Area
- R10 - Building TH-3A – End-unit Outdoor Living Area
- R11 - Building TH-3E – End-unit Outdoor Living Area
- R12 - Building TH-3A – Second-from-end unit Outdoor Living Area
- R13 - Building TH-3A – Third-from-end unit Outdoor Living Area
- R14 - Building TH-3A – Fourth-from-end unit Outdoor Living Area
- R15 - Building TH-3A – Fifth-from-end unit Outdoor Living Area
- R16 - Building TH-3A – Sixth-from-end unit Outdoor Living Area
- R17 - Building TH-3E – Second-from-end unit Outdoor Living Area
- R18 - Building TH-3E – Third-from-end unit Outdoor Living Area
- R19 - Building D – Northwest Façade
- R20 - Building D – Northeast Façade

Façade receptor locations represent the exterior plane of window into indoor sensitive areas such as sleeping or living rooms. No private balconies or patios on the towers or podium have a depth of more than four metres and were therefore not assessed. Only common amenity areas on the podium were considered OLAs for Buildings A through C.

3.1.4 Noise Modelling Results

Sound levels due to road traffic were predicted using ORNAMENT. The sound level calculations are provided in Appendix B and the results summarized in Table and 4. The predicted façade sound levels represent the sound levels at the exterior plane of the window. Indoor sound levels were calculated from the plane of the window calculation by assuming a 10 dB loss through an open window, consistent with industry standard practice.

Table 3: Results of Façade ORNAMENT Modelling for Traffic-Noise Assessment

Receptor	Predicted Façade Road-Traffic Sound Exposures (dBA)		Predicted Indoor Road-Traffic Sound Exposures (dBA) ^[1]		Indoor Sound Level Limit (dBA)		Meets Criteria? (Yes/No)
	Daytime LEQ, 16hr	Nighttime LEQ, 8hr	Daytime LEQ, 16hr	Nighttime LEQ, 8hr	Daytime LEQ, 16hr	Nighttime LEQ, 8hr	
R01	54	52	44	42	45	40	No
R02	71	65	61	55	45	40	No
R03	72	65	62	55	45	40	No
R04	71	65	61	55	45	40	No
R05	69	63	59	53	45	40	No
R06	64	58	54	48	45	40	No
R19	70	64	60	54	45	40	No
R20	67	60	57	50	45	40	No

Notes: [1] Predicted indoor sound levels include a 10 dB reduction in sound level due to loss through an open window.

Table 4: Results of OLA ORNAMENT Modelling for Traffic-Noise Assessment



Receptor	Predicted OLA Road-Traffic Sound Exposures (dBA)		Outdoor Sound Level Limit (dBA)		Meets Criteria? (Yes/No)
	Daytime L _{EQ} , 16hr	Nighttime L _{EQ} , 8hr	Daytime L _{EQ} , 16hr	Nighttime L _{EQ} , 8hr	
R07	62	-	55	-	No
R07B	60	-	55	-	No
R08	61	-	55	-	No
R09	67	-	55	-	No
R10	66	-	55	-	No
R11	64	-	55	-	No
R12	65	-	55	-	No
R13	64	-	55	-	No
R14	63	-	55	-	No
R15	63	-	55	-	No
R16	62	-	55	-	No
R17	63	-	55	-	No
R18	61	-	55	-	No

Sound levels from road traffic at all receptors exceed the MECP sound level limits. Noise control recommendations are presented in Section 3.1.5.

3.1.5 Addressing Excess Sound

For façade receptors R02 through R05, R19, and R20 where the sound level at the window is greater than 65 dBA during the daytime, and/or 60 dBA during the nighttime, the MECP requires that the residential unit includes the installation of central air conditioning. A warning clause of “Type D” is also required.

Receptor R01 and R06 are predicted to have levels, which only warrant Warning Clause “Type C”. Warning Clause “Type C” requires the dwelling to be designed to allow for the installation of air conditioning, while Warning Clause “Type D” requires the installation of air conditioning.

Warning Clause “Type C” is also applicable to the west facades of TH-3D and TH-3E and the north-west facade of TH-3C, based on the predicted sound levels at R01. If the proposed development will be built with central air conditioning for all units, Warning Clause type “D” is appropriate for all units. The wording of the “Type D” warning clause is presented in Section 0. The facades where warning clauses apply are shown in **Figure 3**.

The feasibility of sound barriers for protection of the OLA receptors has been analyzed in detail for both rooftop and at-grade OLAs. Due to the rooftop location of OLAs R07, R07B, R08 and R09, the placement of barriers at the roof edge requires a minimum barrier height of 0.75 m. For R09, the barrier would be required along the west and north sides. The proposed barrier locations are shown in **Appendix C**.



Receptors R10 and R12 to 16 would be served by a barrier extending along the side of the R10 OLA and returning along the back of the OLA for all of these receptors (see Appendix C). Receptors R11, R17 and R18 are served by a barrier running along the side of the R11 OLA and returning along the backs of the OLAs. The barriers therefore protect the entire rear yard of the dwellings. The rear yard is considered the only area that can be protected for each dwelling, since the front yards contain driveways. Although the protected area is less than the minimum 37 m² specified in NPC-300, it is the only meaningful OLA for the dwellings.

The sound levels for barrier heights from 2.4 m up to the height needed for compliance are provided in **Table C.1** in Appendix C. A barrier height of 3.3 m would be needed to achieve compliance of Receptors R10 and R12 to 16. Receptors R11, R17, and R18 would require a barrier height of 2.9 m to achieve compliance.

As shown in **Table C.1**, there is little benefit in increasing the barrier height from 2.4 m to either 2.9 m or 3.3 m. Based on comments received from Halton Region, dated March 2, 2019, from their review of RWDI's noise report, dated December 12, 2018, 2.4 m high barriers would be sufficient to mitigate noise to acceptable levels.

Sound barriers are to be constructed without gaps or cracks, having a minimum face density of 20 kg/m². Where located on a building, they are to be sealed to the building at the bottom and ends. Where on-building barriers also form a guard rail, only the lower 0.75 m is required to be constructed as a sound barrier. Barriers at-grade are permitted to have a few small, localized gaps along the bottom for drainage. Halton Region requires that all barriers be constructed of Western Red Cedar or of concrete.

In addition to the required warning clauses, building components including windows, walls and doors need to be designed to ensure the indoor sound levels comply with the limits detailed in **Table 1**. To meet the indoor sound level limits at Buildings A, B, C, D, and TH-3A, transmission losses beyond those typically present in standard Ontario Building Code window construction may be required. The facades where upgraded façade construction may be required are shown in **Figure 3**. Upgraded window construction will be required for all storeys. All other indoor sound level limits should be met with standard Ontario Building Code window construction. As the design of the proposed development progresses to a stage where window and room dimensions are available, a detailed design study of suitable building components is required.

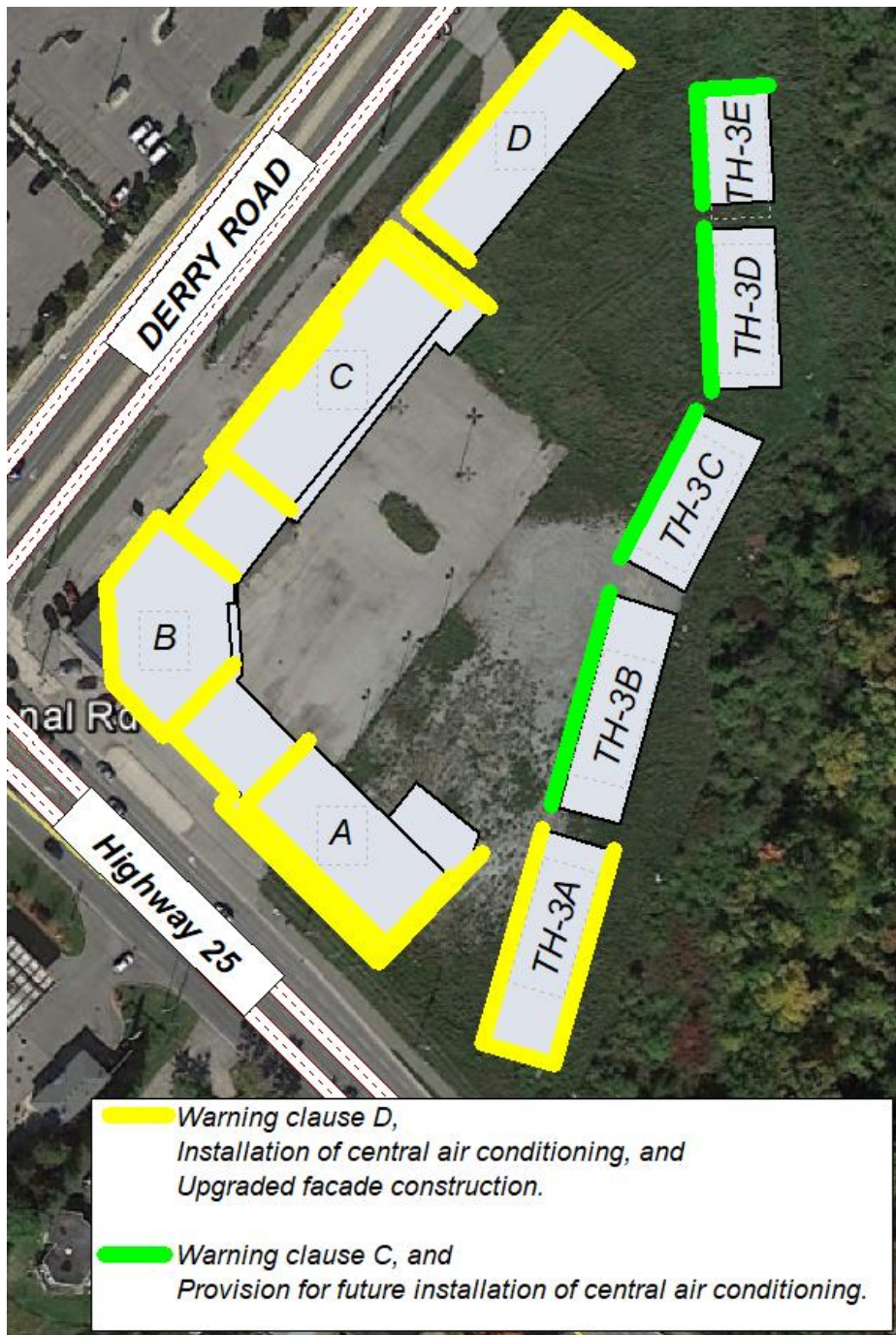


Figure 3: Facades Requiring Warning Clauses and Upgraded Façade Construction

3.2 Stationary Source Noise Assessment

The potential influence of the existing commercial development to the northwest of the facility across Derry Road was evaluated. The location of the commercial development with respect to the proposed development is shown in **Figure 4**.

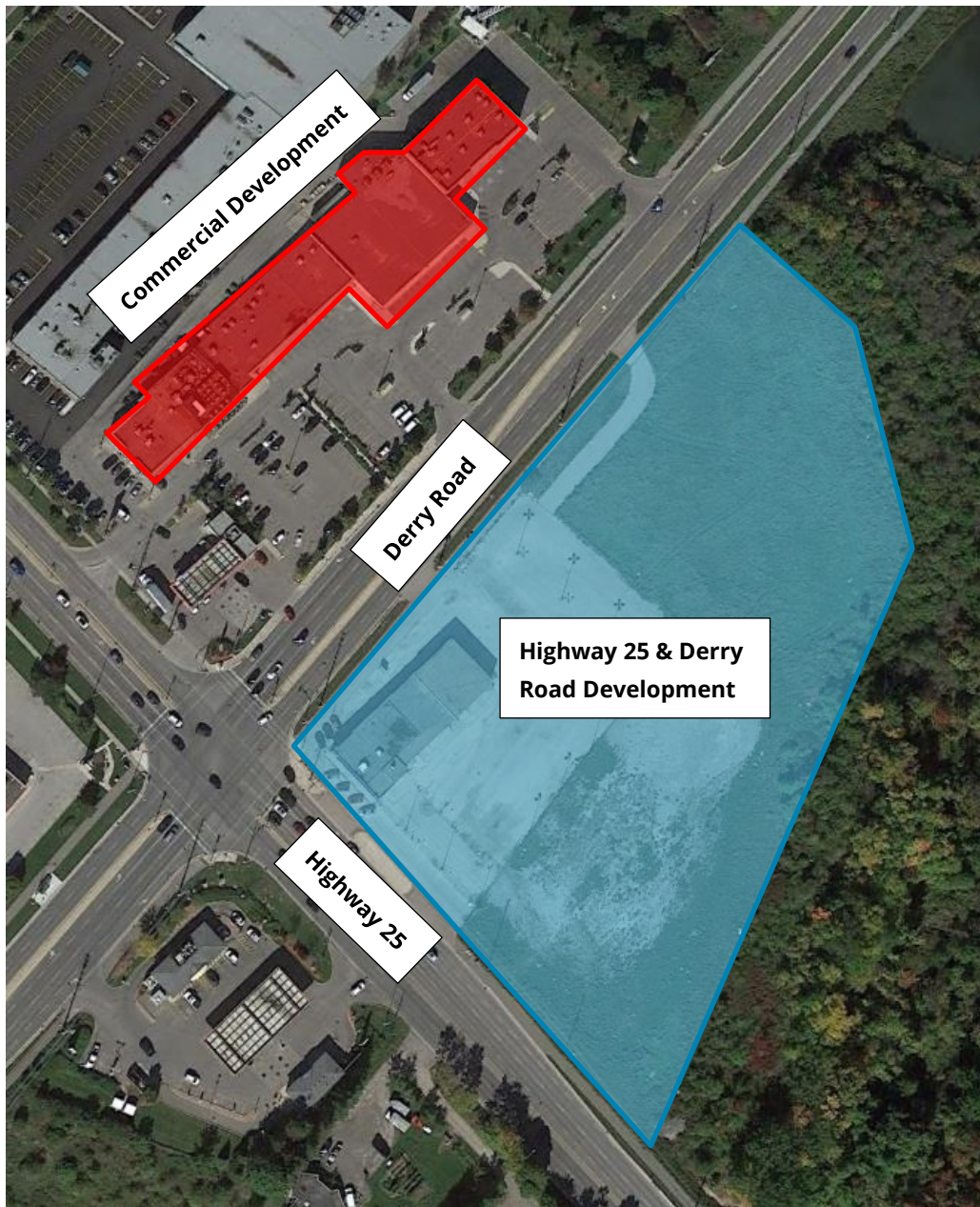


Figure 4: Location of Commercial Development

3.2.1 Applicable Limits

The stationary source assessment considered the following applicable guidelines:

- Halton Region Land Use Compatibility Guidelines (Halton, 2014);
- MECP Land Use Compatibility D-Series Guidelines (MOE, 1995); and
- MECP Environmental Noise Guideline NPC-300, Stationary and Transportation Sources – Approval and Planning (MOE, 2013).

3.2.1.1 Halton Region Guidelines and Policy

Halton Region Guidelines provide guidance for the process of assessing land use compatibility. The Guidelines offer clarifications on the application of the MECP NPC-300 guidelines and the MECP D-Series guidelines. These clarifications were used, where required, in completing the assessment using the NPC-300 and D-Series guidelines.

3.2.1.2 D-Series Guidelines

The MECP D-series guidelines provide direction for land use planning to maximize compatibility of industrial uses with adjacent land uses. The goal of Guideline D-6 is to minimize encroachment of sensitive land uses on industrial facilities, and vice versa, in order to address potential incompatibility due to adverse effects such as noise, odour and dust. Recommended minimum separation distances are provided based on the industry size and operation type.

Guideline D-6 separates industry into three broad categories, depending on the nature of their operations and the types of potential impacts:

- Class I facilities are small scale, self-contained plants or buildings, which produce and/or store products in a package and have low probability of fugitive emissions. They have daytime operations only, with infrequent movements of products and/or heavy trucks.
- Class II facilities perform medium scale processing, with some outdoor storage of wastes and materials, frequent movement of products and/or heavy trucks, and shift work.
- Class III facilities conduct large scale manufacturing, and are characterized by their large size, large production volumes, continuous operations and movements of products, and a high probability of fugitive emissions.

The recommended minimum separation distances and areas of potential influence (i.e., distance within which adverse effects could potentially occur) are summarized in Table 5.



Table 5: Guideline D-6 Recommended Setback Distances and Area of Influence

Industry Classification	Recommended Minimum Separation Distance (m)	Potential Area of Influence (m)
Class I: Light Industry	20	70
Class II: Medium Industry	70	300
Class III: Heavy Industry	300	1000

The commercial development located on the north side of Derry Road would be classified as a Class I industry. The proposed development is within the potential area of influence of the commercial development. Therefore, the noise impacts of this commercial development on the proposed development were assessed.

There is no other Class I, II, or III industrial land uses located closer to the proposed development than the recommended setback distances in **Table 5**. Therefore, no other compatibility issues with any industrial uses are expected.

3.2.1.3 NPC-300 Guidelines – Stationary Sources

Stationary sources are treated differently from transportation sources and require sound levels to be assessed for the predictable worst-case 1-hour L_{EQ} for each period of the day. For assessing sound originating from stationary sources, NPC-300 defines sound level criteria for two types of Points of Reception (PORs): outdoor and façade.

The assessment criteria for all points PORs are the higher of either the exclusion limit per NPC-300 or the minimum background sound level that occurs or is likely to occur at a POR. The applicable exclusion limit is determined based on the level of urbanization or “Class” of the area.

This development is considered to be in a Class 1 (urban) area. The background sound levels were modelled based on traffic data provided by the local traffic authority and are higher than the Class 1 exclusions limits.

Only continuous stationary sources influence the proposed development. No significant impulsive sources were identified. The NPC-300 limits for continuously operating stationary sources are summarized in **Table 6**.

For the façade, the sound limits apply at the exterior plane of window assuming that interior noise will be acceptable if façade levels are lower than the values shown in **Table 6**.

Table 6: NPC-300 Class 1 Stationary Exclusion Limit – Continuous Source

Assessment Location	Time of Day	Time Period	Exclusion Limit ^[1]
			Class 1 L _{EQ-1hr}
Outdoor Point of Reception	Daytime	07:00-23:00h	50 dBA
	Evening	19:00-23:00h	50 dBA
Façade Point of Reception	Daytime	07:00-23:00h	50 dBA
	Evening	19:00-23:00h	50 dBA
	Nighttime	23:00-07:00h	45 dBA

Notes: [1] The sound level averaged over a one-hour time period at the assessment location must not exceed the exclusion limit or background sound level, whichever is higher.

3.2.2 Stationary Source Data

The existing stationary sources were identified from publicly available aerial imagery of the commercial development to the north of the proposed development. From this imagery, a total of 30 HVAC units were identified, as shown in **Figure**.

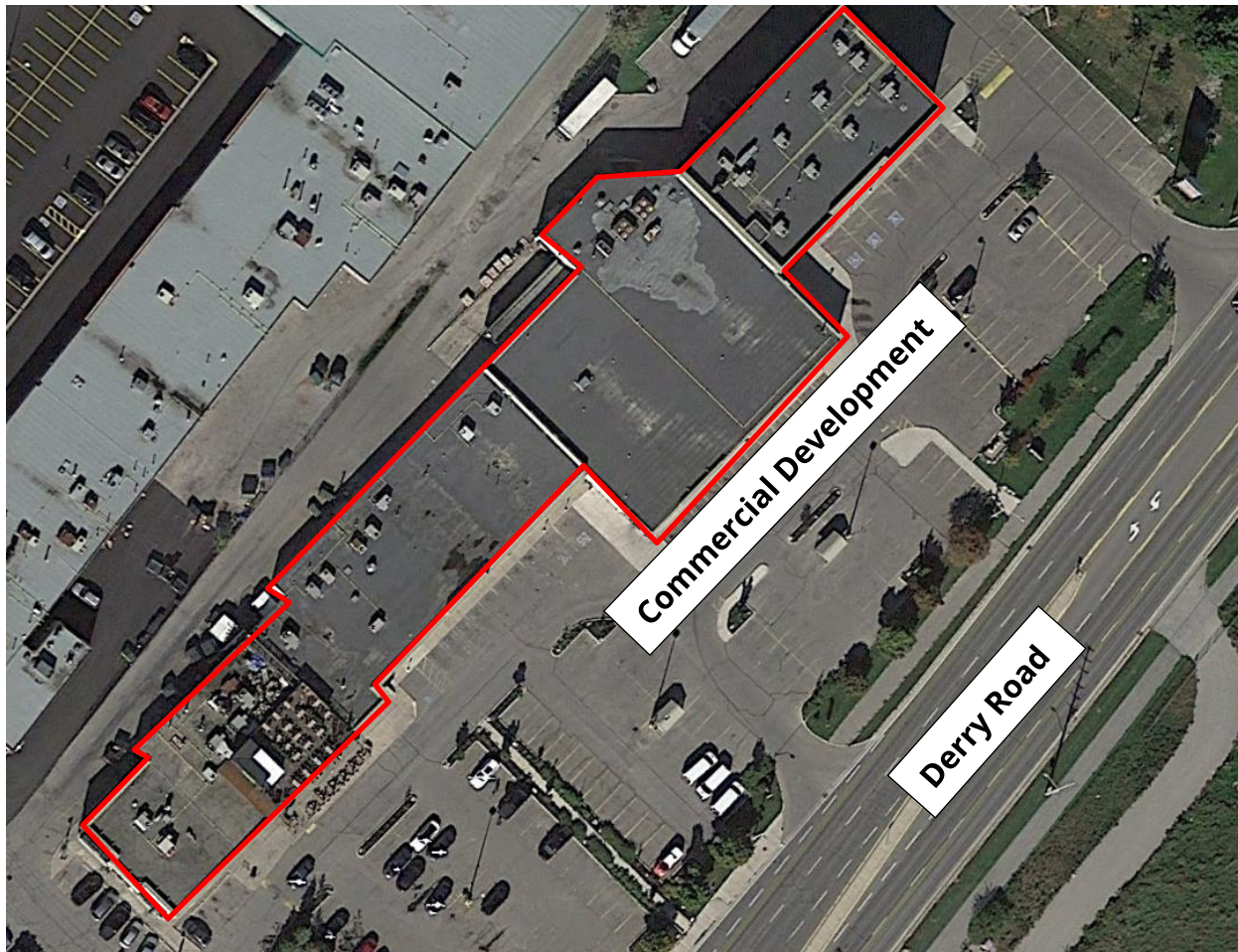


Figure 5: HVAC Units on Commercial Development to the Northwest of the Development Site.

Mechanical equipment on the commercial development was assumed to operate fully during the daytime and evening and at 50% capacity during the nighttime. HVAC equipment were conservatively assumed to emit a sound power level of 88 dBA, based on proxy sound data on file at RWDI.

3.2.3 Representative Receptors

The impact of the adjacent stationary sources was assessed at the façade of buildings TH-3E, TH-3D, B, C, D, and the podium of Buildings A, B, and C. Sound levels were investigated at the plane of window of each floor of the buildings. Sound levels were also investigated at the rooftop amenity area of the podium to the northeast of Buildings B and C (R08 and R09). The modelled points of reception are the worst-case locations while the rest of the development is exposed to lower sound levels due to stationary sources.

3.2.4 Background Sound Levels

As outlined in NPC-300, applicable sound level limits are the higher of exclusion limits or background sound levels attributed to transportation activities during the quietest hour of the corresponding time period. Detailed background level modelling was completed for the points of reception where stationary noise levels exceeded the exclusion Class 1 limits.

Additional traffic data were obtained from the Halton Region in the form of hourly counts over a 24-hour period for Derry Road and Highway 25 segments adjacent to the proposed development. The ambient sound levels experienced at the proposed development due to traffic were determined using ORNAMENT. These sound levels represent the background sound levels experienced at the development during the quietest hours during the corresponding daytime and nighttime hours.

Traffic data and ORNAMENT calculations used for modelling background sound level limits are provided in **Appendix D**.

3.2.5 Noise Modelling Results

Detailed noise modelling of existing stationary sources was carried out using the Cadna/A software package, a commercially available implementation of the ISO 9613 algorithms (ISO, 1994 and ISO, 1996). The predicted sound levels for the worst-case locations of the development are presented in **Table 7**.

Table 7: Predicted Sound Levels at Worst-case Locations – Continuous

Receptor ID and Description	Time of Day	Sound Level (dBA)	Sound Level Exclusion Limit (dBA)	Meets Criteria?
North-West Façade of Podium of Buildings A, B, and C	Day / Evening	52	61 ^[1]	Yes
	Night	49	51 ^[1]	Yes
North-East Façade of Building B	Day / Evening	50	50	Yes
	Night	47	47 ^[1]	Yes
North-East Façade of Building C	Day / Evening	49	50	Yes
	Night	46	47 ^[1]	Yes
North-East Façade of Podium of Building C	Day / Evening	49	50	Yes
	Night	46	46 ^[1]	Yes
North-West Façade of Building C	Day / Evening	52	61 ^[1]	Yes
	Night	49	51 ^[1]	Yes
R08 OLA, Rooftop Podium OLA to the North-East of Building B ^[2]	Day	51	57 ^[1]	Yes

Receptor ID and Description	Time of Day	Sound Level (dBA)	Sound Level Exclusion Limit (dBA)	Meets Criteria?
R09 OLA, Rooftop Podium OLA to the North-East of Building C^[2]	Day	52	58 ^[1]	Yes
North-West Façade of Building D	Day / Evening	52	61 ^[1]	Yes
	Night	49	51 ^[1]	Yes
South-West Façade of Building D	Day / Evening	49	50	Yes
	Night	46	46 ^[1]	Yes
West Façade of Building TH 3E	Day / Evening	47	50	Yes
	Night	44	45	Yes
North Façade of Building TH 3E	Day / Evening	48	50	Yes
	Night	45	45	Yes

Notes: [1] Quietest background sound levels have been modelled for the corresponding time period.

[2] Modelled at worst-case impacted location, closest to stationary sources, with the previously recommended 0.75m barrier in place.

Background sound levels were modelled for the quietest hour during daytime and nighttime for the points of receptions where the stationary sound level exceeded the default Class 1 exclusion limits, as discussed in Section 3.2.4. Other façade may also have elevated background sound levels, but no further investigation was required since the exclusion limits were met. In conclusion, the proposed development is predicted to meet the applicable NPC-300 limits at all points of reception.

4 WARNING CLAUSES

Warning clauses are required for specific areas of the development are shown in **Figure 6**, and summarized in **Table 8**. The warning clauses are as follows:

MECP Type C: *“This dwelling unit has been designed with the provision for adding central air conditioning at the occupant’s discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment.”*

MECP Type D: *“This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment.”*



Halton Region A: *"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may on occasion interfere with some activates of the dwelling occupants, including any raised patio and/or balcony, as sound levels exceed the sound level limits of the municipality and Ministry of the Environment."*

Halton Region B: *"Purchasers are advised that ground floor units with balconies with direct unobstructed access to the Regional road system and/or the Active Transportation Network will not be eligible under the retrofit provisions of the Region's Noise Attenuation Policy/Noise Abatement Guidelines in the Future"*

Halton Region C: *"A noise barrier(s) has been constructed adjacent to this lot to mitigate noise generated from the adjacent road network. The noise barrier(s) will need to be maintained in good condition (per existing barrier height, material, etc.) by the property owner until such a time as the subdivision has been assumed by the local municipality. Once assumed, the ownership and future maintenance will become the responsibility of Halton Region. An easement has been placed on this Lot/Block to permit this access. Halton Region will require, from time to time, access to this Lot/Block in order to maintain this noise barrier."*

Halton Region D: *"A noise barrier(s) has been constructed on this Lot/Block to mitigate the noise generated from the adjacent road network. The noise barrier(s) will need to be maintained in good condition (as per existing height, material, etc.) by the property owner until such time as the subdivision has been assumed by the local municipality. Once assumed all future costs associated with the maintenance and replacement of this noise barrier(s) will be the responsibility of the current and future property owners in perpetuity."*

Table 8: Summary of Blocks to which Warning Clauses Apply

Warning Clause	Block/Building
MECP clause C	TH-3E, TH-3D, TH-3B
MECP clause D	A, B, C, D, TH-3A
Halton clause A	TH-3A, TH-3E
Halton clause B	A, B, C, D
Halton clause D	TH-3A, TH-3E

Halton Region warning clause C states that, *"Once assumed, the ownership and future maintenance will become the responsibility of Halton Region."* It has been confirmed that the noise barriers will be maintained by the property owners (Condominium Corporation) and not Halton Region, which is consistent with the requirements of Halton Region warning clause D.



Figure 6: Facades of Units Requiring Warning Clauses



5 CONCLUSION

RWDI completed a noise study to assess the noise impact potential of noise sources affecting the proposed development at the southeast corner of Derry Road and Highway 25 in Milton, Ontario.

Road traffic noise from Derry Road and Highway 25 and applicable stationary sources on the commercial development to the northwest of the development site were identified as the sources of sound that can impact the proposed development. The sound emissions were assessed at the proposed development using the applicable noise guidelines.

Road traffic noise was predicted to exceed the guideline limits at most modelled receptors. Mitigation measures, their locations and implementation are described in Section 3.1.5. They are summarized below:

- The implementation of central air conditioning;
- Warning clauses provided in Section 4 in purchase or rental agreements;
- Selection of windows and building components to meet the appropriate indoor levels to be determined when the suite layouts and floor plans are finalized; and
- Inclusion of podium and ground level barriers.

Detailed background sound modelling at the worst-case locations has been completed to determine elevated sound level limits for stationary sources. For sound due to surrounding stationary sources, the proposed development is predicted to meet the applicable NPC-300 limits.

When data become available, noise impact associated with the proposed development's mechanical equipment on the development itself and on the surrounding environment should be assessed. An acoustical consultant must review the final building plans to ensure compliance with the MECP guidelines.

This noise assessment was based on assumptions regarding currently available building configuration. A detailed assessment is required prior to the construction of the building, when additional building details become available, to ensure that appropriate noise control measures have been incorporated into the final design.

6 REFERENCES

1. Ontario Ministry of the Environment (MOE), 1995, *Guideline D-6, Compatibility Between Industrial Facilities and Sensitive Land Uses*
2. Ontario Ministry of the Environment (MOE), August 2013, Publication NPC-300, *Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning*
3. Ontario Ministry of the Environment (MOE), 1989, ORNAMENT Ontario Road Noise Analysis Method for Environment and Transportation, Technical Publication
4. International Organization for Standardization (ISO), 1994b, International Standard ISO 9613-1:1994, *Acoustics –Attenuation of Sound during propagation outdoors. Part 1: Calculation of the absorption of sound by the atmosphere.*
5. International Organization for Standardization (ISO), 1996, International Standard ISO 9613-2:1996, *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation*
6. Region of Halton (Halton), 2014, *Land Use Compatibility Guidelines – Regional Official Plan Guidelines.*

7 STATEMENT OF LIMITATION

This report entitled Development at Derry Road & Highway 25 – Noise Study, dated August 21, 2023, was prepared by Rowan Williams Davies & Irwin Inc. (“RWDI”) for Milteron Developments Limited (“Client”). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein (“Project”). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect changes made to the facility and/or the operations therein after the date of this report, RWDI recommends that it be retained by Client in the event such changes are contemplated/implemented in order to verify that the results and recommendations provided in this report are still applicable for such changes.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

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APPENDIX A

Gillian Redman

From: Sealey, Jonathan <Jonathan.Sealey@halton.ca>
Sent: Friday, August 25, 2017 3:57 PM
To: Gillian Redman
Subject: RE: Traffic Data Request

Follow Up Flag: Follow up
Flag Status: Completed

Good Afternoon Gillian,

Sorry for the delay I was confirming the numbers with planning. Please use the below:

Derry Road

Between Bronte Street South and Highway 25
Between Highway 25 and Thompson Road South

Ultimate AADT: 45,000
Trucks: Med 3% , Heavy 3%
Lanes: 6

Regional Road 25

Between Derry Road and Louis Saint Laurent Avenue

Ultimate AADT: 40,000
Trucks: Med 5%, Heavy 5%
Lanes: 6

Jonathan Sealey

Traffic Operations & Safety Coordinator
Waste Management & Road Operations
Public Works
Halton Region
905-825-6000, ext. 7578 | 1-866-442-5866



halton.ca ☎ 311

From: Gillian Redman [mailto:Gillian.Redman@rwdi.com]
Sent: Tuesday, August 22, 2017 11:49 AM
To: Qalw, Lina
Cc: Sealey, Jonathan
Subject: RE: Traffic Data Request

Hi Lina,

Thank you! We need to use 10-year horizon data for completing out assessment. Do you have a standard growth rate you'd use for these roads? If not, I will assume 1.5%.

Gillian

From: Qalw, Lina [<mailto:Lina.Qalw@halton.ca>]
Sent: Tuesday, August 22, 2017 9:18 AM
To: Gillian Redman <Gillian.Redman@rwdi.com>
Cc: Sealey, Jonathan <Jonathan.Sealey@halton.ca>
Subject: RE: Traffic Data Request

Hi Gillian,

Please find the attached file- TMC for Derry and regional road 25 / Ontario St.

Thanks,
Lina

From: Gillian Redman [<mailto:Gillian.Redman@rwdi.com>]
Sent: Tuesday, August 22, 2017 8:55 AM
To: Qalw, Lina
Cc: Sealey, Jonathan; John Alberico
Subject: RE: Traffic Data Request

Hi Lina,

Please proceed. We will pay by credit card.

Thank you,



Gillian Redman, BAsc., MSc. | Noise and Vibration Scientist
RWDI
600 Southgate Drive, Guelph, ON N1G 4P6 Canada
Tel: (519) 823-1311 ext 2315 | Fax: (519) 823-1316
rwdi.com

From: Qalw, Lina [<mailto:Lina.Qalw@halton.ca>]
Sent: Monday, August 21, 2017 2:37 PM
To: Gillian Redman <Gillian.Redman@rwdi.com>
Cc: Sealey, Jonathan <Jonathan.Sealey@halton.ca>
Subject: Traffic Data Request

Hi Gillian,

We can provide you with turning movement counts for Derry road and Regional road 25/Ontario street today. However, our handling fee is \$68.65 plus tax.

Please let me know if you would like to proceed.

Thanks,
Lina

Lina Qalw
Traffic Operations & Safety Co-op student
Waste Management & Road Operations
Public Works
Halton Region
905-825-6000, ext. 7174 | 1-866-442-5866



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APPENDIX B



ORNAMENT

Ontario Road Noise Analysis Method for Environment and Transportation
version 2.07

Job No. 2101382
Job Name Development at Derry Road & Highway 25

ROAD CHARACTERISTICS

SOURCE-RECEIVER-BARRIER-TOPOGRAPHY CHARACTERISTICS

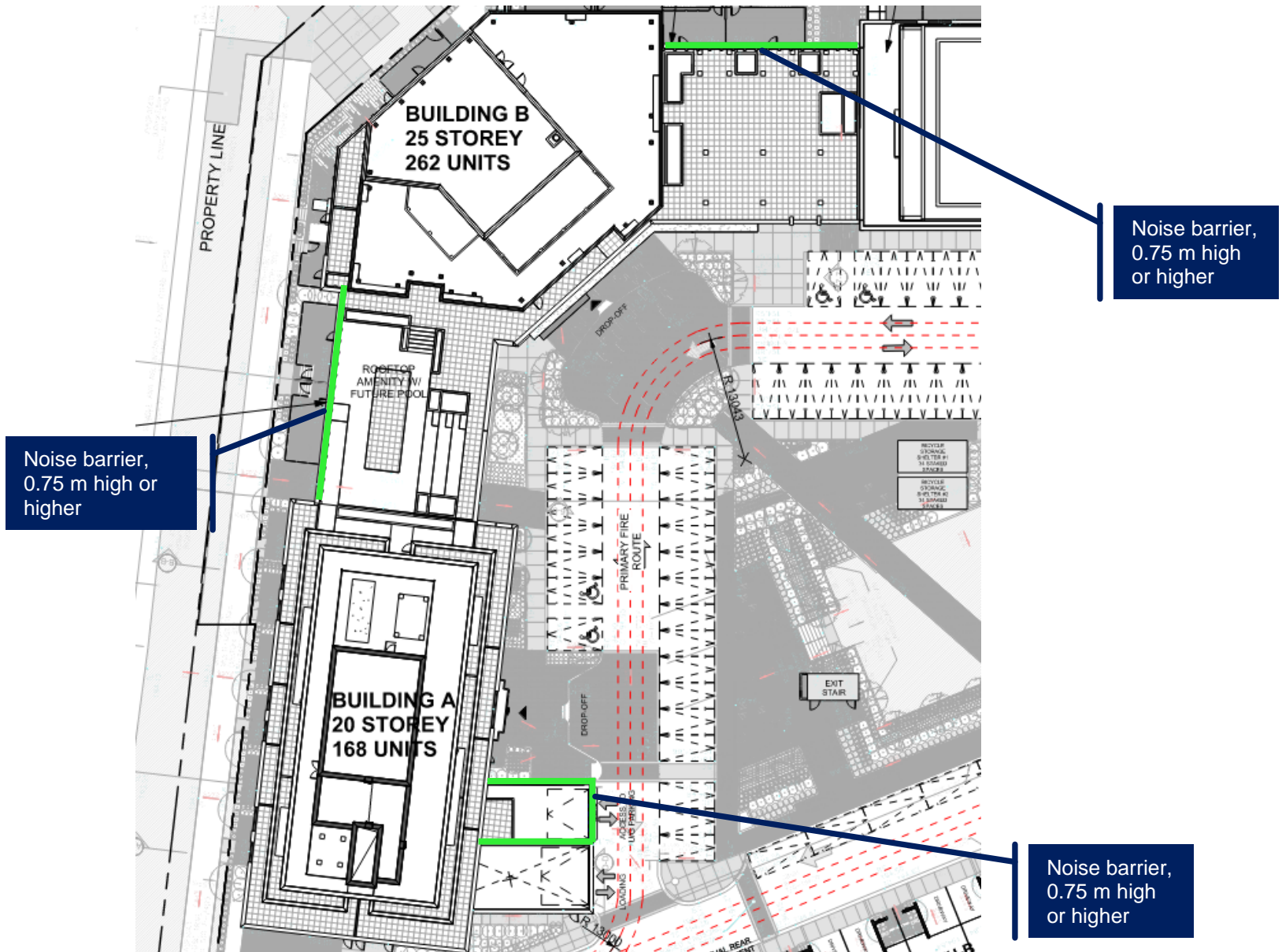
ID	Description	Time Period	Number of Vehicles			Speed (km/h)	Road Gradient (%)	Two Way? (y/n)	Pavement Type	Road Viewable Angle		Source-Receiver Distance (m)	Ground Type (Hard/Soft)	Topography Type	Source Height (m)	Road Elevation (m asl)	Receptor Height (m)	Receptor Elevation (m asl)	Ground Elevation Change (m)			Barrier Height (m)	Barrier Elevation (m asl)	Barrier-Receiver Distance (m)	Barrier Viewable Angle		No. of Rows of Houses	Density of Houses (% Houses)	Depth of Woods	Adjustment (dB)	Reason For Adjustment	Total Segment L _{eq} (dBA)			
			Autos	Medium	Heavy					θ ₁	θ ₂								Elevation Change e (m)	Hor. Dist a (m)	Hor. Dist b (m)				θ ₁	θ ₂									
R01_day	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	53	61	100.0	Hard	A	1.3																	47.8			
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	53	61	113.0	Hard	A	1.3																		47.3		
	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	-29	-16	104.0	Hard	A	1.5																		49.4		
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	-29	-16	113.0	Hard	A	1.5																		49.0		
R01_Day_Total																												54							
R01_night	Derry Road Eastbound Nighttime	8	2115	68	68	60	0	n	1	53	61	100.0	Hard	A	1.3																	41.3			
	Derry Road Westbound Nighttime	8	2115	900	900	60	0	n	1	53	61	113.0	Hard	A	1.3																		50.4		
	Highway 25 Northbound Nighttime	8	1800	100	100	50	0	n	1	-29	-16	104.0	Hard	A	1.5																		42.9		
	Highway 25 Southbound Nighttime	8	1800	100	100	50	0	n	1	-29	-16	112.0	Hard	A	1.5																		42.5		
R01_Night_Total																												52							
R02_day	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	-90	90	19.0	Hard	A	1.3																		68.9		
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	-90	90	32.0	Hard	A	1.3																			66.6	
	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	0	90	75.0	Hard	A	1.5																			59.5	
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	0	90	83.0	Hard	A	1.5																			59.1	
R02_Day_Total																												71							
R02_night	Derry Road Eastbound Nighttime	8	2115	68	68	60	0	n	1	-90	90	19.0	Hard	A	1.3																		62.3		
	Derry Road Westbound Nighttime	8	2115	68	68	60	0	n	1	-90	90	32.0	Hard	A	1.3																			60.1	
	Highway 25 Northbound Nighttime	8	1800	100	100	50	0	n	1	0	90	75.0	Hard	A	1.5																			53.0	
	Highway 25 Southbound Nighttime	8	1800	100	100	50	0	n	1	0	90	83.0	Hard	A	1.5																			52.5	
R02_Night_Total																												65							
R03_day	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	-90	50	25.0	Hard	A	1.3																			66.6	
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	-90	50	38.0	Hard	A	1.3																				64.8
	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	-47	90	27.0	Hard	A	1.5																				65.7
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	-47	90	35.0	Hard	A	1.5																				64.5
R03_Day_Total																												72							
R03_night	Derry Road Eastbound Nighttime	8	2115	68	68	60	0	n	1	-90	50	25.0	Hard	A	1.3																			60.1	
	Derry Road Westbound Nighttime	8	2115	68	68	60	0	n	1	-90	50	38.0	Hard	A	1.3																				58.3
	Highway 25 Northbound Nighttime	8	1800	100	100	50	0	n	1	-47	90	27.0	Hard	A	1.5																				59.1
	Highway 25 Southbound Nighttime	8	1800	100	100	50	0	n	1	-47	90	35.0	Hard	A	1.5																				58.0
R03_Night_Total																												65							
R04_day	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	-90	0	68.0	Hard	A	1.3																			60.4	
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	-90	0	81.0	Hard	A	1.3																				59.6
	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	-90	90	20.0	Hard	A	1.5																				68.2
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	-90	90	28.0	Hard	A	1.5																				66.7
R04_Day_Total																												71							
R04_night	Derry Road Eastbound Nighttime	8	2115	68	68	60	0	n	1	-90	0	68.0	Hard	A	1.3																			53.9	
	Derry Road Westbound Nighttime	8	2115	68	68	60	0	n	1	-90	0	81.0	Hard	A	1.3																				53.1
	Highway 25 Northbound Nighttime	8	1800	100	100	50	0	n	1	-90	90	20.0	Hard	A	1.5																				61.7
	Highway 25 Southbound Nighttime	8	1800	100	100	50	0	n	1	-90	90	28.0	Hard	A	1.5																				60.2
R04_Night_Total																												65							
R05_day	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	-90	65	25.0	Hard	A	1.5																			66.6	
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	-90	65	33.0	Hard	A	1.5																			65.4	
R05_Day_Total																												69							

ID	Description	Time Period	Number of Vehicles			Speed (km/h)	Road Gradient (%)	Two Way? (y/n)	Pavement Type	Road Viewable Angle		Source-Receiver Distance (m)	Ground Type (Hard/Soft)	Topography Type	Source Height (m)	Road Elevation (m asl)	Receptor Height (m)	Receptor Elevation (m asl)	Ground Elevation Change (m)			Barrier Height (m)	Barrier Elevation (m asl)	Barrier-Receiver Distance (m)	Barrier Viewable Angle		No. of Rows of Houses	Density of Houses (% Houses)	Depth of Woods	Adjustment (dB)	Reason For Adjustment	Total Segment L _{eq} (dBA)
			Autos	Medium	Heavy					θ ₁	θ ₂								Elevation Change e (m)	Hor. Dist a (m)	Hor. Dist b (m)				θ ₁	θ ₂						
R05_night	Highway 25 Northbound Nighttime	8	1800	100	100	50	0	n	1	-90	65	25.0	Hard	A	1.5																60.1	
	Highway 25 Southbound Nighttime	8	1800	100	100	50	0	n	1	-90	65	33.0	Hard	A	1.5																58.9	
		R05_Night_Total																										63				
R06_day	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	-15	90	57.0	Hard	A	1.3																61.8	
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	-15	90	70.0	Hard	A	1.3																60.9	
		R06_Day_Total																										64				
R06_night	Derry Road Eastbound Nighttime	8	2115	68	68	60	0	n	1	-15	90	57.0	Hard	A	1.3																55.3	
	Derry Road Westbound Nighttime	8	2115	68	68	60	0	n	1	-15	90	70.0	Hard	A	1.3																54.4	
		R06_Night_Total																										58				
R07_day	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	-55	58	28.0	Hard	A	1.5		1.5	13.5													64.7	
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	-55	58	46.0	Hard	A	1.5		1.5	13.5													62.6	
		R07_Day_Total																										66.8				
R07B_day_unmit	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	5	20	100.5	Hard	A	1.3		1.5	9.0			13.5	0.0	65.0	5	20						32.4	
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	5	20	115.5	Hard	A	1.3		1.5	9.0			13.5	0.0	65.0	5	20						33.4	
	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	-90	-60	45.2	Hard	A	1.5		1.5	9.0													57.2	
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	-90	-60	55.0	Hard	A	1.5		1.5	9.0													56.3	
		R07B_Day_Total																										59.8				
R07_day_mit	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	-55	58	28.0	Hard	A	1.5		1.5	13.5			0.7	13.5	7.6	-55	58						50.3	
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	-55	58	46.0	Hard	A	1.5		1.5	13.5			0.7	13.5	7.6	-55	58						53.3	
		R07_Day_Mit_Total																										55.1				
R07B_day_mit	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	5	20	100.5	Hard	A	1.3		1.5	9.0			13.5	0.0	65.0	5	20						32.4	
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	5	20	115.5	Hard	A	1.3		1.5	9.0			13.5	0.0	65.0	5	20						33.4	
	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	-90	-60	45.2	Hard	A	1.5		1.5	9.0			0.8	9.0	5.0	-90	-60						52.1	
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	-90	-60	55.0	Hard	A	1.5		1.5	9.0			0.8	9.0	5.0	-90	-60						51.3	
		R07B_Day_Mit_Total																										54.8				
R08_day	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	-55	55	28.2	Hard	A	1.3		1.5	13.5													65.1	
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	-55	55	46.2	Hard	A	1.3		1.5	13.5													62.9	
		R08_Day_Total																										67.1				
R08_day_mit	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	-55	55	28.2	Hard	A	1.3		1.5	13.5			0.6	13.5	8.3	-55	55						50.2	
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	-55	55	46.2	Hard	A	1.3		1.5	13.5			0.6	13.5	8.3	-55	55						53.3	
		R08_Day_Mit_Total																										55.0				
R09_day	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	-6	90	28.6	Hard	A	1.3		1.5	13.5													64.4	
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	-6	90	46.6	Hard	A	1.3		1.5	13.5													62.3	
		R09_Day_Total																										66.5				
R09_day_mit	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	-6	90	28.6	Hard	A	1.3		1.5	13.5			0.8	13.5	10.8	-6	90						50.8	
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	-6	90	46.6	Hard	A	1.3		1.5	13.5			0.8	13.5	10.8	-6	90						52.2	
		R09_Day_Mit_Total																										54.6				
R10_day	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	-60	24	32.0	Hard	A	1.5		1.5														62.8	
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	-60	24	50.0	Hard	A	1.5		1.5														60.9	
	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	-90	-60	32.0	Hard	A	1.5		1.5														58.7	
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	-90	-60	50.0	Hard	A	1.5		1.5														56.7	
		R10_Day_Total																										66				
R10_day_mit	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	-60	24	32.0	Hard	A	1.5		1.5				2.4		4.7	-60	24						54.5	
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	-60	24	50.0	Hard	A	1.5		1.5				2.4		4.7	-60	24						52.7	
	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	-90	-60	32.0	Hard	A	1.5		1.5				2.4		1.8	-90	-60						51.4	
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	-90	-60	50.0	Hard	A	1.5		1.5				2.4		1.8	-90	-60						49.5	
		R10_Day_Mit_Total																										58				
R11_day	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	-10	35	63.6	Hard	A	1.3		1.5														57.8	
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	-10	35	81.6	Hard	A	1.3		1.5														56.7	
	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	35	90	63.6	Hard	A	1.3		1.5														58.6	
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	35	90	81.6	Hard	A	1.3		1.5														57.5	
		R11_Day_Total																										64				

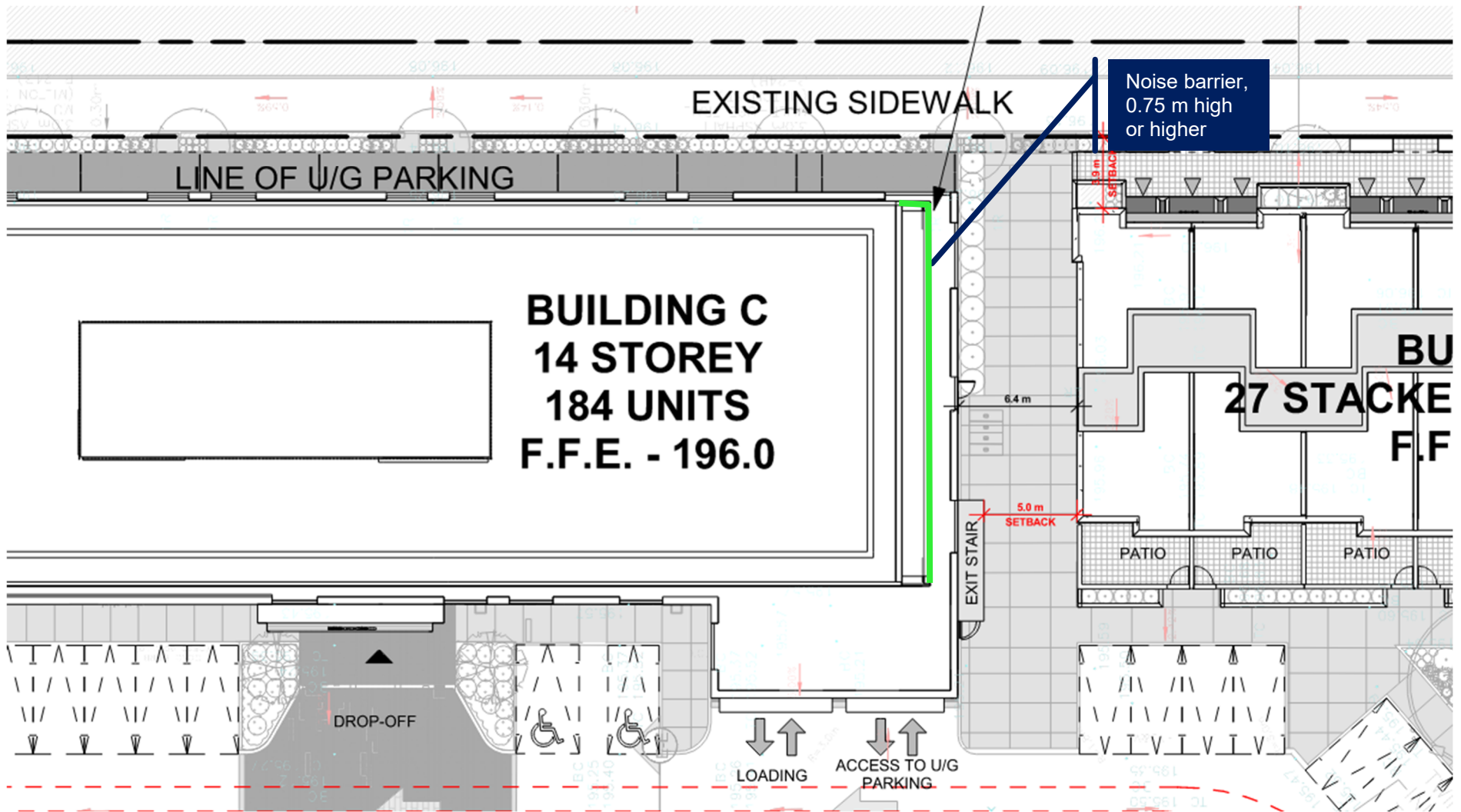
ID	Description	Time Period	Number of Vehicles			Speed (km/h)	Road Gradient (%)	Two Way? (y/n)	Pavement Type	Road Viewable Angle		Source-Receiver Distance (m)	Ground Type (Hard/S oft)	Topo-graphy Type	Source Height (m)	Road Elevation (m asl)	Receptor Height (m)	Receptor Elevation (m asl)	Ground Elevation Change (m)			Barrier Height (m)	Barrier Elevation (m asl)	Barrier-Reciever Distance (m)	Barrier Viewable Angle		No. of Rows of Houses	Density of Houses (% Houses)	Depth of Woods	Adjustment (dB)	Reason For Adjustment	Total Segment L _{eq} (dBA)					
			Autos	Medium	Heavy					θ ₁	θ ₂								Elevation Change e (m)	Hor. Dist a (m)	Hor. Dist b (m)				θ ₁	θ ₂											
	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	-90	-31	58.2	Hard	A	1.5		1.5					2.4		26.7	-90	-31						53.0					
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	-90	-31	76.2	Hard	A	1.5		1.5						2.4		26.7	-90	-31						51.9				
																																	R16_Day_Mit_Total	56			
R17_day	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	7	30	69.3	Hard	A	1.3		1.5																	54.6			
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	7	30	87.3	Hard	A	1.3		1.5																	53.6			
	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	26	90	69.3	Hard	A	1.3		1.5																	58.8			
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	26	90	87.3	Hard	A	1.3		1.5																	57.8			
																																		R17_Day_Total	63		
R17_day_mit	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	7	30	69.3	Hard	A	1.3		1.5					2.4		11.0	7	30								48.0			
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	7	30	87.3	Hard	A	1.3		1.5					2.4		11.0	7	30								47.1			
	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	26	90	69.3	Hard	A	1.5		1.5					2.4		7.8	30	90								53.0			
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	26	90	87.3	Hard	A	1.5		1.5					2.4		7.8	30	90								51.9			
																																		R17_Day_Mit_Total	57		
R18_day	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	30	35	73.1	Hard	A	1.3		1.5																	49.2			
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	30	35	91.1	Hard	A	1.3		1.5																		48.2		
	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	35	90	73.1	Hard	A	1.3		1.5																		58.0		
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	35	90	91.1	Hard	A	1.3		1.5																		57.1		
																																			R18_Day_Total	61	
R18_day_mit	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	30	35	73.1	Hard	A	1.3		1.5					2.4		13.8	30	35									44.4		
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	30	35	91.1	Hard	A	1.3		1.5					2.4		13.8	30	35									43.5		
	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	35	90	73.1	Hard	A	1.3		1.5					2.4		11.8	35	90									52.3		
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	35	90	91.1	Hard	A	1.3		1.5					2.4		11.8	35	90								51.4			
																																		R18_Day_MitTotal	56		
R19_day	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	-90	90	22.0	Hard	A	1.3																				68.2		
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	-90	90	35.0	Hard	A	1.3																				66.2		
	Highway 25 Northbound Daytime	16	16200	900	900	50	0	n	1	0	33	162.0	Hard	A	1.5																				51.9		
	Highway 25 Southbound Daytime	16	16200	900	900	50	0	n	1	0	33	169.0	Hard	A	1.5																				51.8		
																																			R19_Day_Total	70	
R19_night	Derry Road Eastbound Nighttime	8	2115	68	68	60	0	n	1	-90	90	22.0	Hard	A	1.3																				61.7		
	Derry Road Westbound Nighttime	8	2115	68	68	60	0	n	1	-90	90	35.0	Hard	A	1.3																				59.7		
	Highway 25 Northbound Nighttime	8	1800	100	100	50	0	n	1	0	33	162.0	Hard	A	1.5																				45.4		
	Highway 25 Southbound Nighttime	8	1800	100	100	50	0	n	1	0	33	169.0	Hard	A	1.5																				45.2		
																																			R19_Night_Total	64	
R20_day	Derry Road Eastbound Daytime	16	19035	608	608	60	0	n	1	0	90	26.0	Hard	A	1.3																				64.6		
	Derry Road Westbound Daytime	16	19035	608	608	60	0	n	1	0	90	39.0	Hard	A	1.3																				62.8		
																																				R20_Day_Total	67
R20_night	Derry Road Eastbound Nighttime	8	2115	68	68	60	0	n	1	0	90	26.0	Hard	A	1.3																				58.0		
	Derry Road Westbound Nighttime	8	2115	68	68	60	0	n	1	0	90	39.0	Hard	A	1.3																				56.3		
																																			R20_Night_Total	60	

The page features a decorative background with a blue triangle in the top-left corner and a large, light-grey curved shape that dominates the lower half of the page. The text 'APPENDIX C' is centered within the grey area.

APPENDIX C



Barriers at Building A and B Derry Road & Highway 25, Milton, ON	Figure: C1	
	Date: July 21, 2023	



Barrier on Building C, Level 4 east end

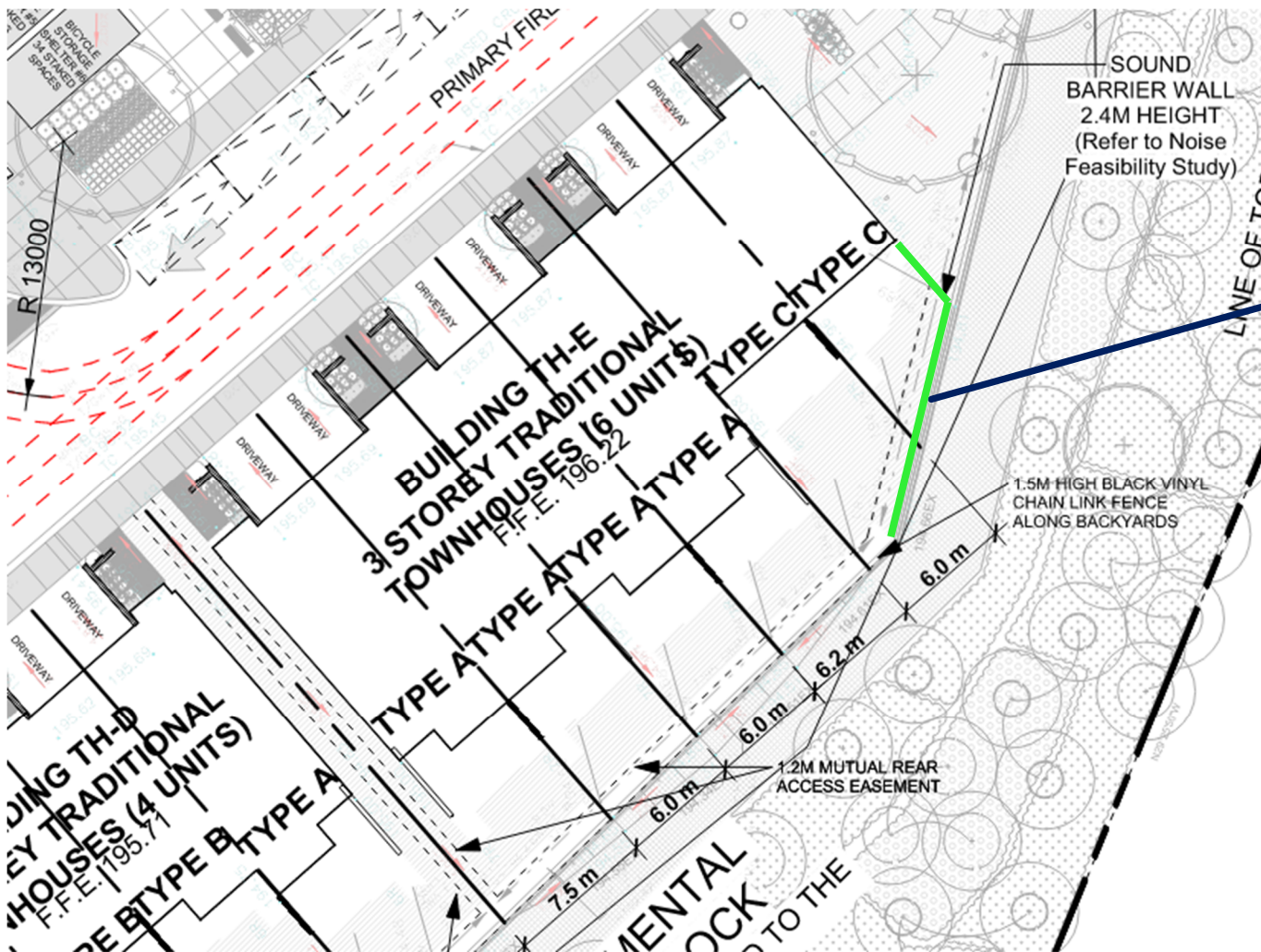
Figure: C2

Derry Road & Highway 25, Milton, ON

Project #2101382

Date: April 24, 2022





Barrier at TH-3E

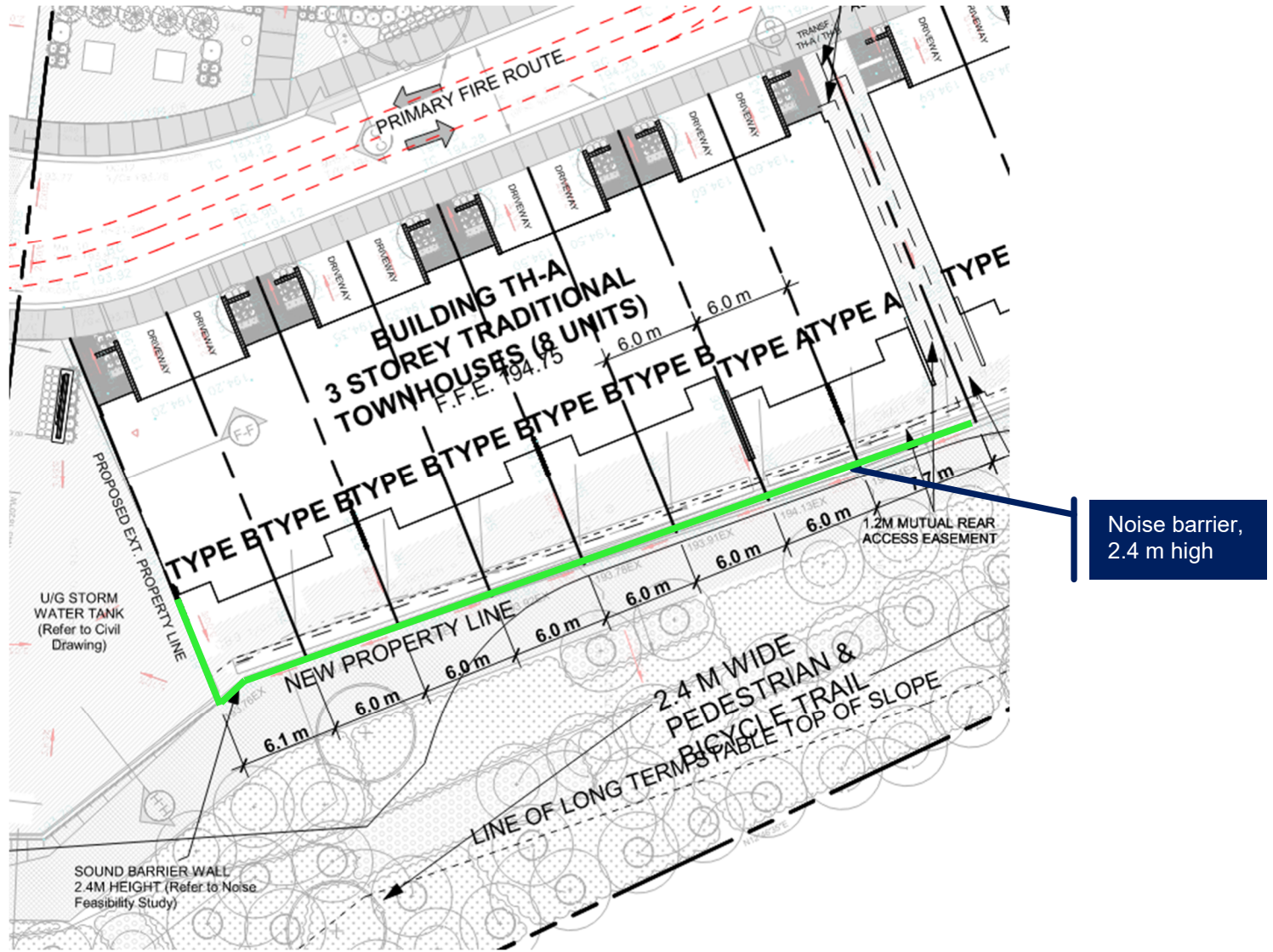
Derry Road & Highway 25, Milton, ON

Figure: C3

Date: April 24, 2023



Project #2101382



Barrier at TH-3A

Derry Road & Highway 25, Milton, ON

Figure: C4

Project #2101382

Date: April 24, 2023



Table C1: OLA Road Traffic Sound Levels for Increasing Barrier Height, from ORNAMENT Modelling

Receptor	Barrier Height (m)	Sound Level (dBA)	Barrier Height (m)	Sound Level (dBA)	Barrier Height (m)	Sound Level (dBA)
R10	2.4	58	2.9	56	3.3	55
R12		58		56		55
R13		57		56		55
R14		57		56		55
R15		57		56		55
R16		56		55		54
R11	2.4	56	2.6	55	2.9	54
R17		56		56		55
R18		56		55		55

The page features a decorative background with a large, light gray curved shape on the right side and a blue triangular shape on the top left. A white curved line separates the blue and gray areas.

APPENDIX D

Prepared For: Halton Region

Prepared By: **PYRAMID Traffic Inc.**

Location: Reg. Rd. #7 btwn Reg.Rd. 25/Ontario St & Holly

Start Date: Wednesday May 4, 2022

Site ID: 100708

Interval: 15 min.

Period Ending	Channel 1 EB	Channel 2 WB	Hourly Summary	Period Ending	Channel 1 EB	Channel 2 WB	Hourly Summary
0:15	47	45		12:15	198	220	1703
0:30	37	38		12:30	207	246	1738
0:45	35	32		12:45	214	222	1744
1:00	25	28	287	13:00	234	227	1768
1:15	24	18	237	13:15	209	228	1787
1:30	21	16	199	13:30	203	230	1767
1:45	17	14	163	13:45	226	227	1784
2:00	21	16	147	14:00	247	242	1812
2:15	17	20	142	14:15	216	245	1836
2:30	12	16	133	14:30	227	277	1907
2:45	16	12	130	14:45	308	291	2053
3:00	11	6	110	15:00	312	258	2134
3:15	15	11	99	15:15	288	359	2320
3:30	10	11	92	15:30	319	353	2488
3:45	7	13	84	15:45	366	323	2578
4:00	11	14	92	16:00	370	331	2709
4:15	7	25	98	16:15	353	330	2745
4:30	10	19	106	16:30	323	297	2693
4:45	6	20	112	16:45	380	336	2720
5:00	12	56	155	17:00	371	281	2671
5:15	31	74	228	17:15	377	364	2729
5:30	38	79	316	17:30	379	353	2841
5:45	41	99	430	17:45	367	321	2813
6:00	47	113	522	18:00	387	311	2859
6:15	69	152	638	18:15	366	353	2837
6:30	78	145	744	18:30	356	313	2774
6:45	140	171	915	18:45	304	318	2708
7:00	129	191	1075	19:00	311	279	2600
7:15	156	269	1279	19:15	309	308	2498
7:30	176	324	1556	19:30	291	317	2437
7:45	179	372	1796	19:45	273	265	2353
8:00	233	412	2121	20:00	258	266	2287
8:15	247	352	2295	20:15	224	269	2163
8:30	267	433	2495	20:30	232	255	2042
8:45	269	363	2576	20:45	232	240	1976
9:00	312	336	2579	21:00	209	200	1861
9:15	250	285	2515	21:15	182	198	1748
9:30	204	251	2270	21:30	167	177	1605
9:45	192	219	2049	21:45	160	156	1449
10:00	187	244	1832	22:00	144	136	1320
10:15	171	195	1663	22:15	137	138	1215
10:30	175	211	1594	22:30	123	143	1137
10:45	190	204	1577	22:45	105	123	1049
11:00	177	185	1508	23:00	121	97	987
11:15	197	192	1531	23:15	83	90	885
11:30	194	224	1563	23:30	84	76	779
11:45	205	225	1599	23:45	71	88	710
12:00	204	233	1674	0:00	76	51	619

AM Peak: **2579**

PM Peak: **2859**

24 HR VOLUME: **35729**

Prepared For: Halton Region

Prepared By: **PYRAMID Traffic Inc.**

Location: Reg. Rd. #25 btwn Derry Rd & Louis St Laurent

Start Date: Thursday Apr 21, 2022

Site ID: 102522

Interval: 15 min.

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary	Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
0:15	39	51		12:15	174	178	1398
0:30	28	41		12:30	179	168	1403
0:45	24	28		12:45	175	177	1405
1:00	23	26	260	13:00	199	225	1475
1:15	17	20	207	13:15	188	179	1490
1:30	17	27	182	13:30	212	170	1525
1:45	12	19	161	13:45	188	159	1520
2:00	9	15	136	14:00	191	162	1449
2:15	16	9	124	14:15	207	186	1475
2:30	18	16	114	14:30	225	201	1519
2:45	9	8	100	14:45	243	184	1599
3:00	17	13	106	15:00	252	169	1667
3:15	10	10	101	15:15	229	188	1691
3:30	6	15	88	15:30	270	221	1756
3:45	10	10	91	15:45	254	223	1806
4:00	15	14	90	16:00	247	222	1854
4:15	11	14	95	16:15	254	211	1902
4:30	17	8	99	16:30	240	216	1867
4:45	26	19	124	16:45	258	210	1858
5:00	30	25	150	17:00	222	198	1809
5:15	57	35	217	17:15	253	174	1771
5:30	49	45	286	17:30	246	223	1784
5:45	60	69	370	17:45	245	214	1775
6:00	76	64	455	18:00	236	233	1824
6:15	69	83	515	18:15	242	210	1849
6:30	81	97	599	18:30	245	233	1858
6:45	123	170	763	18:45	234	204	1837
7:00	122	130	875	19:00	207	177	1752
7:15	128	163	1014	19:15	190	200	1690
7:30	159	192	1187	19:30	199	190	1601
7:45	199	227	1320	19:45	206	190	1559
8:00	241	205	1514	20:00	169	196	1540
8:15	259	204	1686	20:15	128	163	1441
8:30	297	213	1845	20:30	127	163	1342
8:45	231	210	1860	20:45	118	138	1202
9:00	250	189	1853	21:00	110	140	1087
9:15	177	194	1761	21:15	117	126	1039
9:30	175	158	1584	21:30	128	122	999
9:45	172	159	1474	21:45	128	117	988
10:00	185	156	1376	22:00	120	110	968
10:15	145	163	1313	22:15	93	110	928
10:30	166	131	1277	22:30	91	109	878
10:45	160	160	1266	22:45	76	92	801
11:00	187	170	1282	23:00	74	74	719
11:15	151	166	1291	23:15	59	113	688
11:30	182	160	1336	23:30	68	79	635
11:45	170	180	1366	23:45	48	66	581
12:00	178	176	1363	0:00	49	66	548

AM Peak: **1860**

PM Peak: **1902**

24 HR VOLUME: **26152**

Master Station	Description	Count date	total vol	ampl end	ampl vol	off pk end	offpk vol	pm pk end	pkhr vol	8hr vol	13hr vol	sted speed	10% speed (k	avg (km	85percent	Variance	exceeding (#cars	# sml trk	# med trk/b	# hvy trk	% cars	%smal trk	% med trk/	% hvy trk	headway m	headway m	temp min	(Temp max	surface
100708	Derry Road - between Reg. Rd. 25/Ontario St and Holly Ave.	4-May-22	35,729	9:00	2,579	14:00	1,812	18:00	2,859	18,193	27,342	60	60	70	79.65	19.65	85.30%	34,823	196	327	351	97.6%	0.5%	0.9%	1.0%	1.21	50.00	11	29	Dry
102522	Regional Road 25 - 200m north of Louis St Laurent	21-Apr-22	26,152	8:45	1,860	13:30	1,525	16:15	1,902	13,141	20,093	70	70	80	90.64	20.64	86.40%	24,369	295	564	856	93.4%	1.1%	2.2%	3.3%	1.76	50.00	6	30	Dry



ORNAMENT

Ontario Road Noise Analysis Method for Environment and Transportation
version 2.07

Job No. 2101382
Job Name Development at Derry Road & Highway 25

ROAD CHARACTERISTICS

SOURCE-RECEIVER-BARRIER-TOPOGRAPHY CHARACTERISTICS

Receptor Description	Road Noise Source Description	Time Period	Number of Vehicles			Speed (km/h)	Road Gradient (%)	Two Way? (y/n)	Pavement Type	Road Viewable Angle		Source-Receiver Distance (m)	Ground Type (Hard/Soft)	Topography Type	Source Height (m)	Road Elevation (m asl)	Receptor Height (m)	Receptor Elevation (m asl)	Ground Elevation Change (m)			Barrier Height (m)	Barrier Elevation (m asl)	Barrier-Receiver Distance (m)	Barrier Viewable Angle		No. of Rows of Houses	Density of Houses (% Houses)	Depth of Woods	Adjustment (dB)	Reason For Adjustment	Total Segment L _{eq} (dBA)	
			Autos	Medium	Heavy					θ ₁	θ ₂								Elevation Change (m)	Hor. Dist a (m)	Hor. Dist b (m)				θ ₁	θ ₂							
Building C Tower - Northwest Façade	Derry Road Daytime	1	968	9	10	60	0	y	1	-90	90	54	Hard	A	1.0	0.0	1.5	45.0														61	
Building C Tower - Northwest Façade Total:																											61						
Building C Tower - Northwest Façade	Derry Road Nighttime	1	90	1	1	60	0	y	1	-90	90	54	Hard	A	1.0	0.0	1.5	45.0															51
Building C Tower - Northwest Façade Total:																											51						
Building B Tower - Northeast Façade	Derry Road Nighttime	1	90	1	1	60	0	y	1	0	90	84	Hard	A	1.0	0.0	1.5	72.0															46
Building B Tower - Northeast Façade	Hwy 25 Nighttime	1	85	2	3	50	0	y	1	-90	90	91	Hard	A	1.4	0.0	1.5	72.0											-10.0	opposite side of tower		39	
Building B Tower - Northeast Façade Total:																											47						
Building C Tower - Northeast Façade	Derry Road Nighttime	1	90	1	1	60	0	y	1	0	90	61	Hard	A	1.0	0.0	1.5	45.0															47
Building C Tower - Northeast Façade Total:																											47						
Building C Podium - Northeast Façade	Derry Road Nighttime	1	90	1	1	60	0	y	1	0	40	36	Hard	A	1.0	0.0	1.5	6.0															46
Building C Podium - Northeast Façade Total:																											46						
Building D Townhouses - Southwest Façade	Derry Road Nighttime	1	90	1	1	60	0	y	1	-40	0	36	Hard	A	1.0	0.0	1.5	6.0															46
Building D Townhouses - Southwest Façade Total:																											46						
Outdoor Amenity - Podium of Building C	Derry Road Nighttime	1	968	9	10	60	0	y	1	-70	90	30	Hard	A	1.0	0.0	1.5	13.5				0.75	13.50	2.0	-70	90						58	
Outdoor Amenity Building C Total:																											58						
Outdoor Amenity - Podium of Building B	Derry Road Nighttime	1	968	9	10	60	0	y	1	-70	60	33	Hard	A	1.0	0.0	1.5	13.5				0.75	13.50	2.0	-70	60						57	
Outdoor Amenity Building B Total:																											57						