

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
1583 CORMACK CRESCENT
CITY OF MISSISSAUGA
REGION OF PEEL



Prepared for
ELM Cormack (2017) Inc.

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SUMMARY

The proposed residential development is located on the east side of Dixie Road, south of the Queen Elizabeth Way (QEW) in the City of Mississauga. It is subject to road traffic noise from Dixie Road, South Service Road and the QEW. The proposed site is outside the noise contour lines of Toronto Pearson International Airport.

The environmental noise guidelines of the City of Mississauga, the Region of Peel and the Ministry of the Environment, Conservation and Parks (MOE) set out sound level limits for both indoor and outdoor space.

The sound levels for various locations in the residential development were determined using the road traffic data obtained from the City of Mississauga, Region of Peel and the Ontario Ministry of Transportation (MTO). Sound levels due to the adjacent roads were determined using ORNAMENT, the noise prediction model of the MOE.

It was found that with appropriate mitigative measures all lots in the development will meet the noise guidelines. Lots 8 to 19 require mandatory central air conditioning. Lots 1 to 7 require provision for adding central air conditioning by the occupants if noise becomes a concern.

Lots 6 to 8 require a 2.4 m high acoustic fence. A 3.5 m high acoustic fence is required for Lots 9 to 19. Table 3 and Figure 2 show the acoustic barrier requirements.

Based on the preliminary analysis, windows, exterior door and exterior wall construction better than standard construction practices is needed for Lot 9. Window, exterior doors and exterior wall construction that complies with standard construction practices are satisfactory for all other lots. Prior to issuance of building permits, the acoustical requirements should be reviewed by an acoustical consultant to ensure compliance with the applicable acoustical guidelines. Prior to occupancy, the lots should be inspected by an acoustical consultant to ensure the required mitigation measures have been incorporated.

Where minor excesses exist and noise mitigation measures are required, future occupants will be advised through the use of warning clauses.

Based on the review, the proposed development is not exposed to acoustically significant stationary noise sources. Purchasers/tenants of all lots will be advised through a warning clause that the dwelling unit is in proximity to commercial buildings whose activities may at times be audible.

1.0 INTRODUCTION

Jade Acoustics Inc. has been retained to update the Preliminary Environmental Noise Report dated May 13, 2019, based on a revised site plan prepared by RN Design and address submission comments prepared by the City of Mississauga.

As in the original noise report, the updated report investigates the potential impact of noise on the proposed development to the satisfaction of the City of Mississauga, Region of Peel and MTO.

The proposed site is identified as:

Part of Lot 5
Concession 2
City of Mississauga
Regional Municipality of Peel

The proposed residential development is located on the east side of Dixie Road, south of the QEW. It is bounded by Dixie Road to the west, an animal clinic property to the north and existing residential lands to the east and south.

The analysis was based on the following:

- Site plan prepared by RN Design dated January 8, 2019, received on October 22, 2020;
- Grading plan prepared by Schaeffers Consulting Engineers, dated February 23, 2021;
- Road traffic information provided by the City of Mississauga, Region of Peel and MTO; and
- Site visit conducted by Jade Acoustics Inc. staff.

A Key Plan is attached as Figure 1.

The proposed development is comprised of nineteen (19) detached dwellings, two (2) open space blocks, a parking area, a future private road connection block and a common element condo road.

Response to City Comments:

Jade Acoustics Inc. has reviewed the comments provided by the City of Mississauga and included in a comment matrix dated December 8, 2019 and received on January 13, 2020. A summary of the comments related to the May 13, 2019 report is included in Appendix A. The following are our responses:

Item 11

As per the August 13, 2020 e-mail prepared by the City of Mississauga, a 3.5 m high sound barrier with a transparent, bird friendly section for the top 1.0 m to 1.5 m is acceptable. A copy of the e-mail is included in Appendix A. Therefore, a 3.5 m high acoustic fence which consists of a 2.4 m high solid portion and a 1.1 m high transparent top portion is proposed in this report for Lots 9 to 19.

Item 28

As the future roadway alignments present the worst case noise condition when compared with the existing alignments, all noise calculations were prepared accounting for the future Dixie Road and Q.E.W. interchange with a new Dixie Road to-Q.E.W. ramp and a re-aligned South Service Road, turning in a southerly direction and connecting with Dixie Road in close proximity to the proposed development. As Cormack Crescent will cease to exist, this roadway is not included in the noise analysis. See Section 4.1 for details.

The comments regarding a 3.4 m (3.5 m as shown in the May 13, 2019 noise report) high acoustic fence are included in our response to Item 11 above.

Item 64

- (i) As requested, a table depicting a range of sound barrier heights has been added in this report. Table 4 includes different sound barrier heights and corresponding mitigated sound levels for the most exposed lot, Lot 9;
 - (ii) The City of Mississauga has accepted a 3.5 m high acoustic fence which consists of a 2.4 m high solid portion and a 1.1 m high transparent top portion. As no berm is proposed, cross-sections are not included in this report; and
 - (iii) Unit #22 has been removed. Figure 2 shows the revised site plan.
- (2) As noted above, the City of Mississauga has accepted the use of a 3.5 m high acoustic fence. The sound barrier requirements included in this report will be confirmed/re-evaluated in a final detailed noise study.

Item 70

Based on the revised site plan, Lots 1 to 7 require the provision for adding central air conditioning at the occupant's discretion. See Table 3 and Figure 2 for details.

Item 71

Based on the revised site plan, Lots 8 to 19 require a central air conditioning system, which will allow windows and exterior doors to remain closed for noise control purposes. See Table 3 and Figure 2 for details.

2.0 NOISE SOURCES

2.1 Transportation Sources

The noise source to be investigated for potential impact on the proposed development is road traffic on Dixie Road, South Service Road and the Queen Elizabeth Way (QEW). The site is not impacted by railway traffic or aircraft traffic.

North Service Road located approximately 220 m north of the proposed development on the north side of the QEW is acoustically insignificant and, as such, is not considered further in this report.

The ultimate road traffic data used in the analysis was provided by the City of Mississauga for South Service Road, Region of Peel for Dixie Road and the MTO for the QEW. Road traffic is summarized in Table 1. Correspondence regarding the road traffic information is included in Appendix A.

The road traffic data provided by the Region of Peel on October 7, 2020 is valid for Dixie Road approximately 1.27 km north of Lakeshore Road, which is approximately 0.45 km south of the proposed site where Dixie Road is and will remain to be a two-lane roadway. As the final configuration of the future Dixie Road/QEW interchange in terms of the number of lanes on Dixie Road is not known to the Region, road traffic data in addition to the information included in their letter dated October 7, 2020 is not available at this time.

The road traffic data for Dixie Road approximately 0.2 km south of the QEW, provided by the Region of Peel on October 10, 2018 was applicable to this roadway in vicinity of the proposed site and, as such, was used for the May 13, 2019 noise report. This information was based on a six-lane configuration of Dixie Road.

The above noted road traffic data was discussed with the Region of Peel on October 8, 2020. They have advised that if the section of Dixie Road adjacent to the proposed site is planned to have six lanes, the ultimate 24-hour road traffic volume would be 48,600 (8,100 vehicles per lane). This is only 500 vehicles more when compared with the planned 24-hour volume shown in the October 10, 2018 letter. The acoustic impact of this change is insignificant.

As the most recent information prepared by the MTO and AECOM shows Dixie Road with six lanes in vicinity of the proposed site, an ultimate AADT of 48,600 and all other road traffic data provided by the Region of Peel on October 10, 2018 were used for Dixie Road.

As the medium truck to heavy truck ratio was not available from the MTO, a typical ratio of 25% medium/75% heavy trucks was accounted for in the analysis of the QEW.

2.2 Stationary Sources

An animal clinic building is located approximately 55 m north of the proposed site. Based on information collected during our site visit, the clinic closed at the end of February, 2019. No information regarding the future use of this site is currently available.

The Dixie Mall, a commercial development, is located on the west side of Dixie Road with the closest building situated approximately 100 m from the proposed development. There is one small loading area facing toward the subject site.

3.0 ENVIRONMENTAL NOISE CRITERIA

The MOE document “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 in the analysis. A brief summary of the NPC-300 guidelines is given in Appendix B.

The City of Mississauga Official Plan (Section 6.10, Value the Environment/Noise) dated March 13, 2019 was also used in the analysis.

The environmental noise criteria used for residential developments in the City of Mississauga, Region of Peel and the MOE environmental noise criteria are 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 60 dBA or greater and/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 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.

In all cases, air cooled condenser units must not exceed an AHRI sound rating of 7.6 bels. The air cooled condenser units must be sited in accordance with the zoning by-laws with respect to setbacks as well as location.

As required by the MOE, indoor noise criteria for road traffic noise is 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.

3.1.2 Outdoors

For the outdoor amenity areas, a design goal of 55 dBA for the daytime period between 7:00 a.m. to 11:00 p.m. is used for road and rail traffic. In some cases, an excess not exceeding 5 dBA is considered acceptable. Where the unmitigated sound levels during the day exceed 55 dBA (Leq16hour, daytime) but are equal to or less than 60 dBA (Leq16hour, daytime), a warning clause is required and mitigation should be considered. Where the unmitigated sound levels exceed 60 dBA, mitigation measures and a warning clause are required.

The City of Mississauga generally requires that the acoustic fence portion of the sound barrier not exceed 2.4 m in height.

As per the August 13, 2020 e-mail prepared by the City of Mississauga, a 3.5 m high acoustic fence with a transparent, bird friendly section for the top 1.0 m to 1.5 m is acceptable for the proposed development.

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 included in the development agreement.

3.2 Stationary Sources

MOE Noise Guidelines

The guidelines of the Ontario Ministry of the Environment, Conservation and Parks (MOE) for stationary sources are to be used for commercial/industrial facilities.

The MOE has recently published the document NPC-300 titled “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning”.

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.

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.

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. 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 ($L_{eq,dBA}$) and impulsive sound level ($L_{LM,dBAI}$).

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. 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). In addition, a warning clause in offers of purchase and sale and/or lease agreement noting the proximity of dwellings to such a source should be considered.

3.3 City of Mississauga Noise Control By-law

The City of Mississauga has a by-law to prohibit or regulate unusual noises likely to disturb the inhabitants of the City; Noise Control By-law Number 360-79. The by-law does not provide specific sound level limits, but rather provides qualitative information with respect to sources and provides prohibitions by time and place.

4.0 NOISE IMPACT ASSESSMENT

4.1 Road Traffic

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).

The analysis was based on the revised site plan prepared by RN Design, received on October 22, 2020 and the preliminary grading plan prepared by Schaeffer Consulting Engineers, received on October 22, 2020. The topography between the source and the receiver and screening effect due to the proposed houses, where applicable, have been taken into account. The rear yard receiver was assumed to be 3 m from the centre of the rear wall of the dwelling.

The future road plan and profile information prepared by AECOM and the MTO received in June 2020 has been used in the analysis. Appendix C includes two plan drawings and two profile drawings. As shown on the plan drawings, the Dixie Road/QEW interchange is planned to be re-constructed. A new ramp will be constructed, South Service Road will be re-aligned and Cormack Crescent will cease to exist. This road configuration represents the worse case when compared with the existing road configuration, and as such has been used to prepare the noise calculations. The expected future sound barrier along the QEW has also been included in the analysis.

Detailed noise calculations to be included in a detailed environmental noise report prepared at a later date, should be based on the most up-to-date road plan and profile information.

For Lot 9 which is proposed to flank Dixie Road, the unmitigated daytime sound level in the rear yard is predicted to be 66 dBA. The daytime sound level at the side wall is predicted to be 69 dBA at the second storey. The nighttime sound level at the side wall is predicted to be 65 dBA at the second storey.

For Lot 8, the sound level at the side wall (second storey) is predicted to be 63 dBA (daytime) and 59 dBA (nighttime). The unmitigated rear yard sound level is predicted to be 60 dBA.

For Lot 19, the unmitigated daytime sound level at the rear yard is predicted to be 59 dBA. The daytime sound levels at the second storey rear wall are predicted to be 62 dBA (daytime) and 61 dBA (nighttime).

Table 2 provides a summary of the predicted sound levels without mitigative measures due to road traffic at the lots listed above. Appendix D gives sample calculations.

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

4.2 Stationary Sources

As mentioned in Section 2.2, the existing animal clinic was closed at the end of February, 2019. Therefore, this use will not impact the proposed site. The future use of the clinic site is not known at this time. A noise study will need to be prepared by the proponent of future development to ensure that the applicable noise guidelines are met at the proposed development.

The commercial buildings within the Dixie Mall site are located at the southwest corner of the QEW and Dixie Road. Due to the type of building and operations and ambient sound levels set by the road traffic on the QEW and intervening Dixie Road, the existing commercial development is not expected to be acoustically significant at the proposed site. Therefore, noise mitigation measures are not required.

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 abatement requirements for the residential lots in this 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 external walls, windows, exterior doors, and roof construction. The indoor limit for road traffic noise is 40 dBA for the bedrooms during nighttime hours, 45 dBA for the living/dining rooms during nighttime hours and 45 dBA 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 E contains a sample calculation of the architectural component selection.

In determining the architectural requirements, for the lots adjacent to roadways, it is assumed that during the nighttime, the bedroom located on the second floor will be the worst case room receptor, because the day/night traffic split results in less than 5 dBA difference between the predicted daytime and nighttime sound levels. This difference is less than the difference between the MOE indoor criteria for road traffic for daytime and nighttime hours; therefore, the bedroom with calculated nighttime sound level was used for the analysis. For the dwellings that are flanking the roadways, the exterior walls and windows would be 55% and 25% respectively of the associated floor area for the wall parallel and the wall perpendicular to the noise source.

The worst case location is the lot in close proximity to Dixie Road, having a corner bedroom at the front or rear of the dwelling. Based on the analysis, windows and exterior doors for Lot 9 need to be STC 31 and exterior walls for the same lot need to be STC 39. An STC 31 rating for windows and exterior doors and an STC 39 rating for exterior walls exceed window, exterior door and exterior wall construction which complies with the minimum structural and safety requirements of standard construction. Standard window, exterior door and exterior wall construction is acoustically satisfactory for all other proposed lots.

Since final house plans are not yet available, the architectural choices cannot be made. Once house plans become available, the noise control requirements should be re-evaluated to determine the final requirements.

Where the sound level from road traffic is 60 dBA or greater (at night), on the outside face of a bedroom or living/dining room window/exterior door, or greater than 65 dBA (during the day) on the outside face of a bedroom or living/dining room window/exterior door, the indoor noise criteria would not be met with open windows and provisions must be made to permit the windows to remain closed. The Regional Municipality of Peel guidelines require central air conditioning and warning clauses. Based on the predicted sound levels and lot locations, Lots 8 to 19 require mandatory central air conditioning and a warning clause.

Where the sound level during nighttime hours is greater than 50 dBA to less than or equal to 59 dBA and during daytime hours is greater than 55 dBA to less than or equal to 65 dBA, provision for adding central air conditioning by the occupants must be made. Based on the analysis, the provision for adding central air conditioning by the occupants is required for Lots 1 to 7. Lots 1 to 7 also require warning clauses.

See Table 3 and Figure 2 for a summary of minimum noise mitigation measures.

The outdoor air conditioning condenser units must also meet the applicable sound level limits (AHRI sound rating of 7.6 bels) and should be sited in accordance with the City's zoning by-laws.

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

5.1.2 Outdoors

The outdoor amenity area is required to be exposed to sound levels of less than or equal to 55 dBA during the day. A 5 dB increase is considered acceptable in certain situations. Typically, if the sound level is above 55 dBA, some form of mitigation and a warning clause is required.

A 3.5 m high acoustic fence is proposed for Lots 9 to 19. The mitigated sound levels in the rear yards are predicted to be between 56 dBA and 59 dBA. A 5.0 m high acoustic fence would be required to achieve 55 dBA in the rear yard. Technically and visually, this height is not considered feasible.

The 3.5 m high acoustic fence is proposed to be installed along the rear property lines of Lots 9 to 19 and extended along the side property line of Lot 9 and Lot 19 as a minimum to a point in line with the rear wall of the dwellings. The 3.5 m high acoustic fence will need to be returned to the side wall of the dwellings on Lot 9 and 19.

It should be noted that the proposed acoustic fence height exceeds the maximum acoustic fence height of 2.4 m generally acceptable to the City of Mississauga. The 3.5 m high acoustic fence is proposed as no space (buffer blocks) is available for earthen berms; therefore, the reduction of acoustic fence height by the use of berm construction is not feasible. After reviewing the proposed acoustic fence height and potential alternatives, the City of Mississauga has accepted the use of a 3.5 m high acoustic fence for the proposed development providing the acoustic fence consists of a solid bottom portion and a transparent, bird friendly section for the top 1.0 m to 1.5 m. This was addressed in their e-mail dated August 13, 2020. A copy of the e-mail is included in Appendix A.

Based on the information provided by the City of Mississauga, the 3.5 m high acoustic fence proposed for Lots 9 to 19 should be constructed of a 2.4 m high solid bottom portion and a 1.1 m high transparent top portion.

For Lots 6 to 8, a 2.4 m high acoustic fence is predicted to achieve 56 dBA or less in the rear yards. The 2.4 m high acoustic fence should be installed along the rear property line of Lots 6 to 8 and returned along the side property line of Lot 8 as a minimum to point in line with the rear wall of the dwelling. The 2.4 m high acoustic fence should also be returned to the side wall of the dwelling on Lot 8.

See Appendix F for sound barrier calculations, Table 3 for a summary of minimum noise mitigation measures and Figure 2 for the acoustic fence locations.

As requested by the City of Mississauga, Table 4 includes different sound barrier heights and corresponding mitigated sound levels. The information shown is for the rear yard of Lot 9.

Based on information provided by the City of Mississauga, any acoustic fence approved through Servicing Agreements should be constructed in accordance with that agreement. The City of Mississauga is to confirm the type of acoustic fence which is to be constructed within this development.

For any new subdivisions which are not yet registered, the City of Mississauga requires that the acoustic fence abutting major roadways (including arterials, major collectors, etc.) be constructed on public property (boundary between the 0.3 m reserve block and the edge of the right-of-way) and the acoustic fence abutting other municipal roads be constructed on private property. As Dixie Road is a major roadway, the flankage (side property line) portions of the proposed acoustic fences on Lot 9 should be installed on public property and should be maintained, repaired or replaced by the City of Mississauga. The portion of the acoustic fences on private property shall be maintained, repaired or replaced by the owner. See Warning Clause D included in the Notes to Table 3 of this noise report.

In addition, the City of Mississauga requires that the acoustic fence be made of durable material. Generally, this would involve the acoustic fence being constructed of red cedar with an actual thickness of 54 mm which exceeds the typically required surface density of 20 kg/m². A copy of the detail used by the City of Mississauga for acoustic fences is included in Appendix G. This detail is applicable to the 2.4 m high acoustic fence proposed for Lots 6 to 8.

As previously noted, to satisfy the City of Mississauga requirements, the 3.5 m high acoustic fence proposed for Lots 9 to 19 must include a transparent top portion. As with other acoustic fences, the transparent top portion should have a surface density of minimum 20 kg/m². Construction details will be included in a detailed noise report to be prepared at a later date.

Appropriate treatment of the sound barrier at all discontinuities and points of termination would be required to ensure that the sound barrier is effective. Generally, this would involve extending the sound 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. Alternatively, a sound barrier return to the side wall of the house with an acoustic gate would provide sufficient mitigation when closed.

An acoustic gate of 20 kg/m² 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/m² and 20 kg/m². The reduced surface density of the acoustic gate will not increase the predicted sound level in the rear yard. In addition, any gaps at the bottom of the gate should be kept to a minimal height.

Where an excess will remain, a warning clause should be placed in offers of purchase and sale or lease agreements and in a registerable portion of the development agreement.

Warning clause requirements are listed in Table 3 and specific wording is included in the Notes to Table 3.

5.2 Stationary Sources

Based on Section 4.2, noise mitigation measures are not required to address the existing stationary sources.

Purchases/tenants of all proposed lots will be advised through a warning clause that the dwelling unit is in proximity to the commercial buildings whose activities may at times be audible.

6.0

CONCLUSIONS

With the incorporation of the items discussed in this report (see Table 3, Notes to Table 3 and Figure 2), the sound levels will be within the appropriate environmental noise criteria. In accordance with City, Region and MOE implementation guidelines where mitigation is required, future occupants will be advised through the use of warning clauses.

A detailed environmental noise report should be prepared once final draft plan of subdivision and grading plans become available and be based on most up to date plan and profile information available for the future Dixie Road/QEW interchange.

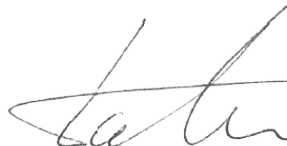
Prior to issuance of building permits, the acoustical requirements along with the architectural drawings should be reviewed by an acoustical consultant to ensure compliance with the applicable guidelines.

Prior to issuance of occupancy permits, an acoustical consultant shall confirm that the acoustical requirements are in compliance with the acoustical report.

Respectfully submitted,

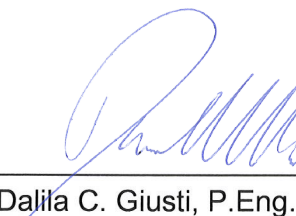
JADE ACOUSTICS INC.

Per:


Davor Sikic, P.Eng.



Per:


Dalila C. Giusti, P.Eng.



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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. "General Guidelines for the Preparation of Acoustical Reports in the Region of Peel", November, 2012.
5. "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).
6. "Impulse Vibration in Residential Buildings", Ontario Ministry of the Environment, Publication NPC-207 (Draft), November, 1983.
7. City of Mississauga Noise Control By-law Number 360-79, dated April 9, 1980.
8. City of Mississauga Official Plan, Section 6.10, March 13, 2019.

TABLE 1

PROPOSED RESIDENTIAL DEVELOPMENT

1583 CORMACK CRESCENT

CITY OF MISSISSAUGA

SUMMARY OF ROAD TRAFFIC DATA

Road	QEW	Dixie Road	South Service Road
AADT*	218,000**	48,600***	15,000**
No. of Lanes	8	6	2
Speed (km/hr)	100	60	60
Trucks (%)	12	3.7 (day)/3.2 (night)	3
Medium/Heavy Split (%)	25/75	32/68 (day)/53/47 (night)	55/45
Gradient (%)	Up to 2	Up to 3	Up to 12
Day/Night Split (%)	67/33	91/9	90/10
Ultimate R.O.W. (m)	--	--	15

* AADT: Annual Average Daily Traffic.

** Ultimate

*** Planned

TABLE 2

PROPOSED RESIDENTIAL DEVELOPMENT

1583 CORMACK CRESCENT

CITY OF MISSISSAUGA

SUMMARY OF PREDICTED SOUND LEVELS

OUTDOORS DUE TO ROAD TRAFFIC

Lots	Location*	Source	Distance (m)	Leq (dBA)			
				Day		Night	
				Separate	Combined	Separate	Combined
Lot 8	Rear Yard	Dixie Road (NB)	60.0	58	60	--	--
		Dixie Road (SB)	76.0	56		--	
	Side Wall	Dixie Road (NB)	54.5	59	63	51	59
		Dixie Road (SB)	70.5	57		49	
		QEW (EB)	227.0	55		55	
Lot 9	Rear Yard	QEW (WB)**	247.5	55	66	55	--
		Dixie Road (NB)	29.0	63		--	
		Dixie Road (SB)	45.0	60		--	
		South Service Road	34.0	58		--	
		QEW (EB)**	195.5	52		--	
	Side Wall	QEW (WB)**	216.0	54	69	--	65
		Dixie Road (NB)	24.0	65		57	
		Dixie Road (SB)	40.0	62		54	
		South Service Road	337.0	54		48	
		QEW (EB)	198.5	61		61	
Lot 19	Rear Yard	QEW (WB)**	219.0	60	59	60	--
		Dixie Road (NB)	151.0	51		--	
		Dixie Road (SB)	167.0	50		--	
		South Service Road	104.5	50		--	
		QEW (EB)**	200.5	53		--	
	Rear Wall	QEW (WB)**	221.0	55	62	--	61
		Dixie Road (NB)	146.0	50		42	
		Dixie Road (SB)	162.0	50		42	
		South Service Road	107.5	50		43	
		QEW (EB)**	203.5	56		56	
		QEW (WB)**	224.0	59		59	

* Rear yard location taken 3 m from centre of the rear wall and 1.5 m above grade. Wall location taken at 4.5 m above grade for two storey dwellings.

** Noise wall along the QEW east of Dixie Road has been included in the calculation.

TABLE 3

PROPOSED RESIDENTIAL DEVELOPMENT

1583 CORMACK CRESCENT

CITY OF MISSISSAUGA

SUMMARY OF MINIMUM NOISE MITIGATION MEASURES

Lots	Air Conditioning⁽¹⁾	Exterior Wall⁽²⁾	Windows⁽³⁾	Acoustic Barrier⁽⁴⁾	Warning Clause⁽⁵⁾
Lot 9	Mandatory	STC 39	STC 31	3.5 m*	A, B, D, F
Lots 10 to 19	Mandatory	Standard	Standard	3.5 m*	A, B, E, F
Lot 8	Mandatory	Standard	Standard	2.4 m**	A, B, E, F
Lots 6 and 7	Provision for Adding	Standard	Standard	2.4 m**	A, C, E, F
Lots 1 to 5	Provision for Adding	Standard	Standard	No	A, C, F

* 3.5 m high acoustic fence (2.4 m high solid bottom portion and 1.1m high transparent top portion). See text and Figure 2 for details.

** 2.4 m high acoustic fence. See text and Figure 2 for details.

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. 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.

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 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.

2. STC - Sound Transmission Class Rating (Reference ASTM-E413). Values shown are based on preliminary calculations using standard assumptions. See text for details.
3. STC - Sound Transmission Class Rating (Reference ASTM-E413). Values shown are based on preliminary calculations using standard assumptions. See text for details. A sliding glass walkout door should be considered as a window and be included in the percentage of glazing.
4. Sound barriers must be of a solid construction with no gaps. Generally, the City of Mississauga requires acoustic fences be constructed of red cedar with an actual thickness of 54 mm. Solid and transparent walls/fences of adequate density or combinations thereof may be used.
5. Suggested warning clauses to be included in the development agreement and to be included in offers of purchase and sale or lease agreements on designated lots:

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 level may exceed the noise criteria of the Municipality and the Ontario 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 the dwelling unit is fitted with a central air conditioning system in order to permit closing of windows for noise control. (Note: locate air cooled condenser unit in a noise insensitive area and ensure that the unit has an AHRI sound rating not exceeding 7.6 bels)."

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 an AHRI 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 portion of acoustic fence installed on public property shall be maintained, repaired or replaced by the City of Mississauga. The portion of acoustic fence installed on private property 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 acoustic fence 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 this development is in proximity to existing commercial buildings whose activities may at times be audible."

TABLE 4

PROPOSED RESIDENTIAL DEVELOPMENT

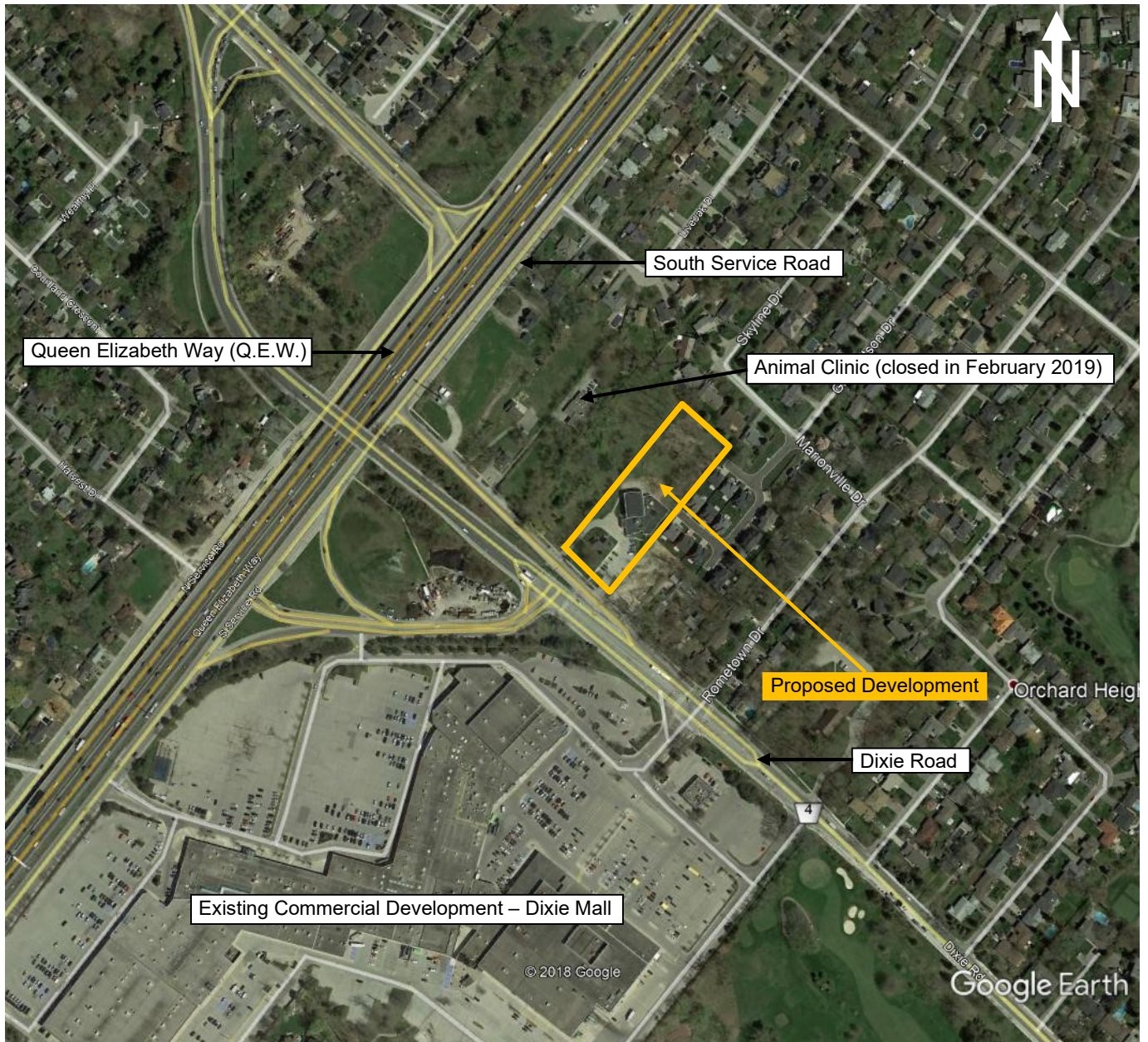
1583 CORMACK CRESCENT

CITY OF MISSISSAUGA

**SOUND BARRIER HEIGHTS TO ACHIEVE SOUND LEVELS
BETWEEN 55 dBA AND 59 dBA***

Lot	Sound Barrier Height(m)				
	55 dBA	56 dBA	57 dBA	58 dBA	59dBA
Lot 9	5.0	4.5	4.1	3.8	3.5

* Sound levels due to Dixie Road, South Service Road and the QEW predicted in the rear yard.



N.T.S

**Proposed Residential Development
1583 Cormack Crescent
City of Mississauga
Region of Peel**

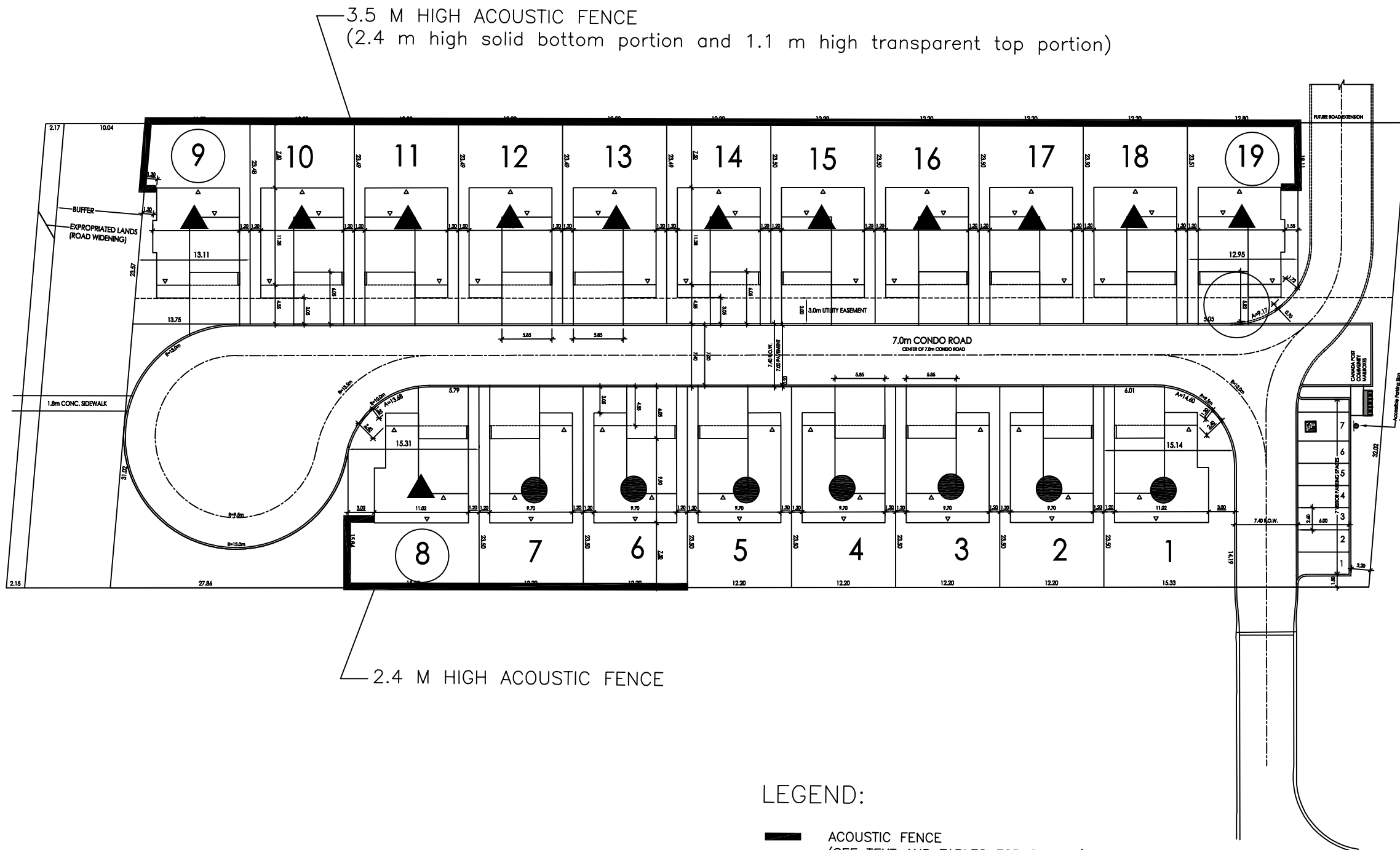
Date: March 2021

File: 18-049

KEY PLAN

FIGURE 1





LEGEND:

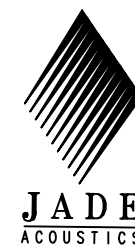
- ACOUSTIC FENCE
(SEE TEXT AND TABLES FOR DETAILS)
- ▲ MANDATORY CENTRAL AIR CONDITIONING
AND A WARNING CLAUSE
(SEE TEXT AND TABLES FOR DETAILS)
- PROVISION FOR ADDING CENTRAL AIR
CONDITIONING AND A WARNING CLAUSE
(SEE TEXT AND TABLES FOR DETAILS)
- LOT ANALYZED

N.T.S.

Proposed Residential Development
1583 Cornack Crescent
City of Mississauga
Region of Peel

Date: March 2021

File: 18-049



PLAN OF DEVELOPMENT
SHOWING MINIMUM NOISE
MITIGATION MEASURES

FIGURE 2

APPENDIX A

CORRESPONDENCE

**SUMMARY OF COMMENTS PROVIDED BY
CITY OF MISSISSAUGA**

1583 CORMACK CRESCENT- DEC 8, 2019

FILE N.: OZ 19 14 & 21T-M 19 5

Comments provided by the City of Mississauga with respect to Preliminary Environmental Noise Report dated May 13, 2019 prepared by Jade Acoustics Inc.

11-A noise wall of 3.4 m is not acceptable. Redesign the noise wall, or submit an alternative layout that reorientates the dwellings/lots which would reduce the need for an excessive noise wall.

28-The Noise Feasibility Study prepared by Jade Acoustics dated May 13, 2019 has been received and the following comments have been provided: - The study should factor in Cormack Crescent as a noise source. - A 3.4m high acoustic fence will not be accepted by the City. Consider integrating a berm and wall configuration within the backyard setback.

64-We have reviewed a feasibility Noise Study dated May 13, 2019 and provide the following comments: (i) Provide a table depicting a range of barrier heights and corresponding mitigated sound levels for the outdoor living areas; (ii) Provide cross-sections for the required berm/fence combinations (including fence returns) to be implemented at this site to control noise levels (iii) Please remove Unit #22 as this unit will not be a part of the proposal (see Traffic Section's comment #2) We advise that the ultimate fence height will be determined in consultation with The Planning and Building Department once the above mentioned table showing the range of barrier heights and corresponding mitigated sound levels has been reviewed. The report recommends a 2.4m high acoustic fence for Lots 7 to 9 and a 3.5m high acoustic fence for Lots 10 to 22. A final detailed noise study will be required at the Site Plan stage.

70-POTL's 1 to 8: This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.

71-POTL's 9 to 22: 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, Conservation and Parks.

Note: The comment numbering above is as per the comment matrix received on January 13, 2020.

AUGUST 13, 2020 EMAIL PROVIDED BY CITY OF MISSISSAUGA

From: Robert Ruggiero <Robert.Ruggiero@mississauga.ca>
Sent: August 13, 2020 5:33 PM
To: Keith MacKinnon <KMackKinnon@KLMPPlanning.com>
Cc: Mana Masoudi <MMasoudi@klmplanning.com>; Frank D'Elia <francesco@elmdevelopments.com>; Dalila Giusti <dalila@jadeacoustics.com>; Hugh Lynch <Hugh.Lynch@mississauga.ca>
Subject: RE: prelim design for noise study at Dixie, QEW, South Service (Jade File: 18-049)

Dear Keith,

Thank you for providing us with this alternate concept plan. We appreciate the effort you've made to explore additional options. Based on review of these options, retaining and protecting for the northerly road connection is preferable. We understand that a 3.5 m noise barrier is required for certain lots, please include the transparent (bird friendly) barrier for the top 1 to 1.5m as discussed.

I recommend reaching out to the local councillor, as I've learned he has had discussions with MTO to facilitate a connection from the subject lands to South Service Road.

Our submissions are entirely digital now. Contact one of the PSC planners at eplans.devdes@mississauga.ca in order to create an eplans application #. You'll need to create an eplans account as well, if you don't already have one <http://www.mississauga.ca/portal/pb/eplans>. Ensure to reference the file numbers: OZ 19/014 W1 and T-M19005 W1.

Thank you,
Robert



Robert Ruggiero

Pronouns: he/him
Development Planner
T 905-615-3200 ext.5725
robert.ruggiero@mississauga.ca

[City of Mississauga](#) | Planning and Building Department,
Development and Design Division



Please consider the environment before printing.

**CORRESPONDENCE REGARDING
ROAD TRAFFIC DATA**

Davor Sikic

From: Bertuen Mickle <Bertuen.Mickle@mississauga.ca>
Sent: October 8, 2020 9:52 AM
To: Davor Sikic
Subject: RE: Road Traffic Data (Jade File: 18-049)...

Hi Davor,

The South Service Road remain basically the same but North Service Road changed.

Regards,
Bert

From: Davor Sikic [mailto:davor@jadeacoustics.com]
Sent: Wednesday, October 7, 2020 11:03 AM
To: Bertuen Mickle
Subject: FW: Road Traffic Data (Jade File: 18-049)...

Good morning Bertuen,

I would kindly ask you to advise if the attached road traffic data is still valid and can be used for noise calculations.

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: Loudel Uy <LOUDEL.UY@mississauga.ca>
Sent: October 10, 2018 4:49 PM
To: 'Davor Sikic' <davor@jadeacoustics.com>
Cc: Alessandro Torresan <Alessandro.Torresan@mississauga.ca>
Subject: RE: Road Traffic Data (Jade File: 18-049)...

Hi Davor
As you requested, please find attached info.

Regards,
Loudel

From: Jadie Adams Thompson **On Behalf Of** Tw Counter
Sent: 2018/10/10 3:47 PM
To: 'Davor Sikic'; Loudel Uy

Date: 10-Oct-18

NOISE REPORT FOR PROPOSED DEVELOPMENT

REQUESTED BY:

Name: Davor Sikic

Company: Jade Accoustics



PREPARED BY:

Name: Loudel Uy

Tel#: (905) 615-3200

Location: North Service Road and South Service Road (just east and west of Dixie Road)

Look Up ID#: 389

ON SITE TRAFFIC DATA

Specific	Street Names				
	North Service Road	South Service Road			
AADT:	17,000	15,000			
# of Lanes:	4 lanes	2 lanes			
% Trucks:	3%	3%			
Medium/Heavy Trucks Ratio:	55/45	55/45			
Day/Night Traffic Split:	90/10	90/10			
Posted Speed Limit:	60km/h	60km/h			
Gradient of Road:	2%	2%			
Ultimate R O W:	14m	15m			

Comments:

Ultimate Traffic Data Only.

Date: October 7, 2020
 From: Davor Sikic, Jade Acoustics Inc.
 Re: Traffic Data Request – Dixie Road (1.27 km north of Lakeshore Road)

Davor,
 As per your request, we are providing the following 2020 traffic data:

	Existing	Ultimate
24 Hour Traffic Volume	11,635	16,200
# of Lanes	2	2
Day/Night Split	93/7	93/7
Day Trucks (% of Total Volume)	2.37% Medium 1.67% Heavy	2.37% Medium 1.67% Heavy
Night Trucks (% of Total Volume)	2.55% Medium 1.53% Heavy	2.55% Medium 1.53% Heavy
Right-of-Way Width	20 meters	
Posted Speed Limit	60 km/h	

Please note:

1. The current volume is not the Annual Average Daily Traffic, but the averaged raw volumes over three data collection days. If you need the Annual Average Traffic Volume, please 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 (905) 791-7800 ext. 4810.

Regards,

Tiggy Chen
 Co-op Student, Transportation System Planning
 Transportation Division, Public Works Services, Region of Peel
 10 Peel Centre Drive, Suite B, 4th Floor
 Brampton, ON L6T 4B9
 W: (905) 791-7800 x4810 C: (647) 918-2827
 E: tiggy.chen@peelregion.ca

October 10, 2018

Davor Sikic,
Jade Acoustics
Traffic Data Request
Dixie Road 0.2 km south of Q.E.W., Mississauga, ON

Davor:

As per your request, we are providing the following traffic data.

	Existing	Planned
24 Hour Traffic Volume	12,762	48,100
# of Lanes	4	6
Day/Night Split	91/9	91/9
Day Trucks (% of Total Volume)	1.2% Medium 2.5% Heavy	1.2% Medium 2.5% Heavy
Night Trucks (% of Total Volume)	1.7% Medium 1.5% Heavy	1.7% Medium 1.5% Heavy
Right-of-Way Width	20 meters	
Posted Speed Limit	60 km/h	

If you require further assistance, please contact me at (905) 791-7800 ext. 4810

Regards,

Viktoriya Zaytseva
Transportation Analyst, Infrastructure Planning & Design
Transportation Division, Public Works, Region of Peel

10 Peel Centre Drive, Suite B, 4th Floor, Brampton, ON, L6T 4B9
E: parshan.bahrami@peelregion.ca • W: 905-791-7800 x8594

Public Works

10 Peel Centre Dr., Suite B, Brampton, ON L6T 4B9
Tel: 905-791-7800 www.peelregion.ca

Davor Sikic

From: Alam, Ahsan (MTO) <Ahsan.Alam@ontario.ca>
Sent: October 7, 2020 11:15 AM
To: Davor Sikic
Cc: Caimano, Riccardo (MTO)
Subject: RE: Q.E.W. at Dixie Road, City of Mississauga (Jade File: 18-049)

Hi Davor,
The information provided previously are still Valid.
For future noise study request, please email directly to Riccardo (copied in the email) who will handle such requests.
Thanks,
Ahsan

From: Davor Sikic <davor@jadeacoustics.com>
Sent: October 7, 2020 11:07 AM
To: Alam, Ahsan (MTO) <Ahsan.Alam@ontario.ca>
Subject: RE: Q.E.W. at Dixie Road, City of Mississauga (Jade File: 18-049)

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Good morning Ahsan,

I would kindly ask you to advise if the road traffic data and other information included in the two October 10, 2018 emails (please see below) is still valid and can be used for noise calculations.

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: October 10, 2018 1:16 PM
To: davor@jadeacoustics.com
Subject: RE: Q.E.W. at Dixie Road, City of Mississauga (Jade File: 18-049)

Hi Davor,
As per the "Southern Highway Program 2017-2021"- the QEW-Dixie interchange reconfiguration is under future improvement plan, but we do not have any detailed information that. Therefore, in our model, we

haven't coded any ramp and hence no forecast for the ramp. The AADT traffic volume we have provided is for the QEW through lanes only (both directions).

Also please note that the segment has currently has 6 lanes. It will have additional 2 lanes in future making ultimate number of lanes as 8 lanes.

Thanks,
Ahsan

From: Alam, Ahsan (MTO)
Sent: October-10-18 11:06 AM
To: 'davor@jadeacoustics.com'
Subject: RE: Q.E.W. at Dixie Road, City of Mississauga (Jade File: 18-049)

Hi Davor,

You could contact the Manager of the Central Region Traffic Office. The contact is below:

Andrew Beal, Manager (Traffic Office-Transportation), 416-235-5612, Email: andrew.beal@ontario.ca

I'll talk to my colleague to see if we have any ramp information available or not.

Thanks,
Ahsan

From: Alam, Ahsan (MTO)
Sent: October-10-18 10:02 AM
To: 'davor@jadeacoustics.com'
Subject: RE: Q.E.W. at Dixie Road, City of Mississauga (Jade File: 18-049)

Good Morning Davor,

In response to your request please find below the information available from this office for Q.E.W, east of Dixie

2016 AADT = 166,000
Ultimate AADT = 218,000
Existing Number of Through Lanes = 6
Planned Number of Through Lanes = 8
Posted Speed = 100 km/hr
% Trucks (Estimated) = 12%

Please note that the above information is estimated based upon our current knowledge of the area, which more detailed traffic data split will be available from Central Region Traffic Office. We do not have traffic data for the north and south side of the road.

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

Thanks,
Ahsan

Ahsan Alam, PhD, Planner
Systems Analysis and Forecasting Office
Transportation Planning Branch, MTO
Suite 700, 7th Floor, 777 Bay Street
Toronto, ON M7A 2J8, Tel: 416-585-6237



From: Semple, Paul (MTO)
Sent: October-09-18 2:47 PM
To: Davor Sikic; Alam, Ahsan (MTO)
Subject: FW: Q.E.W. at Dixie Road, City of Mississauga (Jade File: 18-049)

Hi Davor,

Forwarding this to Ahsan Alam, who is now responsible for addressing these requests.

Cheers,

Paul Semple | Planner
Systems Analysis and Forecasting Office, Ministry of Transportation
T: 416-585-6308 | F: 416-585-7324



From: Davor Sikic [<mailto:davor@jadeacoustics.com>]
Sent: October-09-18 2:33 PM
To: Semple, Paul (MTO)
Subject: Q.E.W. at Dixie Road, City of Mississauga (Jade File: 18-049)

Good afternoon Paul,

We are in the process of preparing a preliminary environmental noise report for the residential development located on the east side of Dixie Road, south of the Q.E.W. in the City of Mississauga. I would kindly ask you to provide us with road traffic data for the Q.E.W. at Dixie Road. We also need road traffic data for the North Service Road and the South Service Road. We are aware that the Q.E.W./Dixie Road interchange will be reconstructed in the near future and expect that the ultimate information will include this scenario. Any road traffic information for the future ramps would be greatly appreciated.

The following information is needed:

- Ultimate AADT/SADT/SAWDT;
- Number of lanes;
- Posted Speed;
- Percentage of trucks; and
- Medium trucks/heavy trucks split, if available.

If there are any questions, please call.

Davor Sikic, P.Eng.
Jade Acoustics Inc.
411 Confederation Parkway Unit 19
Concord, On L4K 0A8
T: 905-660-2444 x 235
F: 905-660-4110
E: davor@jadeacoustics.com
W: www.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	L_{eq} (16) (dBA)
16 hr, 07:00 - 23:00	55

TABLE C-2

**Indoor Sound Level Limits
Road and Rail**

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

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", November, 2012.

ROAD TRAFFIC NOISE

TYPE OF SPACE	TIME PERIOD	SOUND LEVEL LIMIT Leq*
Outdoor living area	7:00 a.m. – 11:00 p.m.	Leq (16 hr) = 55 dBA
Outside bedroom window	11:00 p.m. – 7:00 a.m.	Leq (8 hr) = 50 dBA
Indoor (bedrooms, hospitals)	11:00 p.m. – 7:00 a.m.	Leq (8 hr) = 40 dBA
Indoor (living rooms, hotels, private offices, reading rooms)	7:00 a.m. – 11:00 p.m.	Leq (16 hr) = 45 dBA
Indoor (general offices, shops)	7:00 a.m. – 11:00 p.m.	Leq (16 hr) = 50 dBA

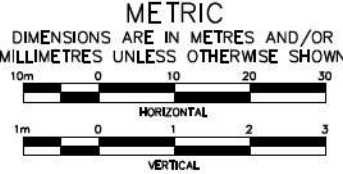
* Leq, measured in A-weighted decibels (dBA), is the value of the constant sound level which would result in exposure to the same total sound level as would the specified time varying sound, if the constant sound level persisted over an equal time interval.

APPENDIX C

FUTURE ROAD PLAN AND PROFILE INFORMATION

JUNE 2020

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Ontario

Ministry of Transportation

CONT No

GWP No

2102-13-00

2432-13-00

SOUTH SERVICE ROAD

EXTENSION

STA 10+000 TO STA 10+350

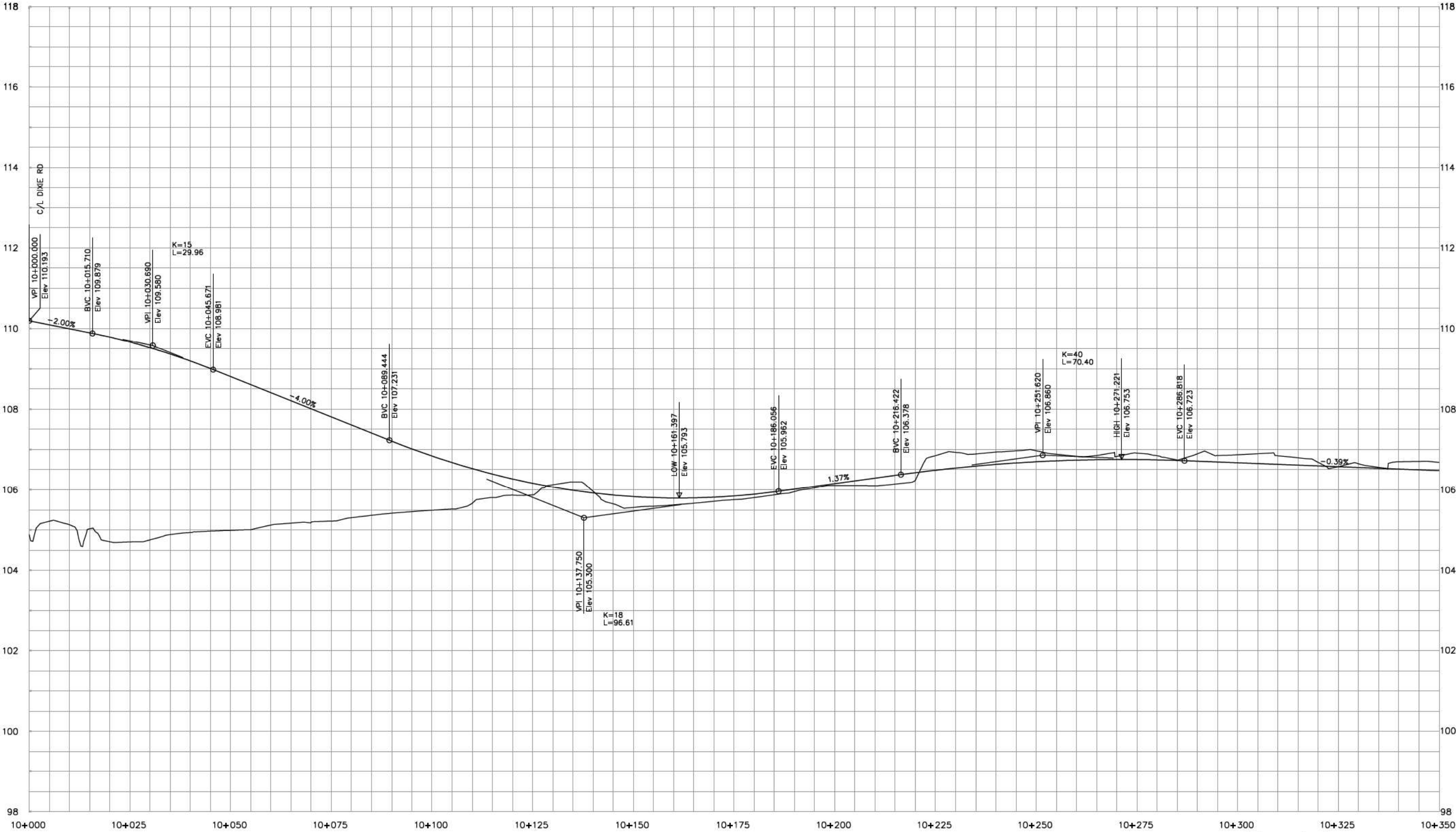
Survey Revised

SHEET

PRX

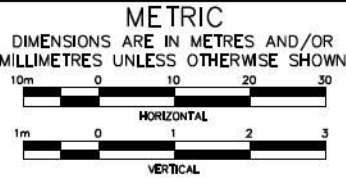
AECOM

SOUTH SERVICE ROAD EXTENSION



REVISIONS			
	DATE	BY	DESCRIPTION

JUNE 2020
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Ontario

Ministry of Transportation

CONT No

GWP No

2102-13-00

2432-13-00

DIXIE ROAD

STA 10+150

TO STA 10+500

Survey

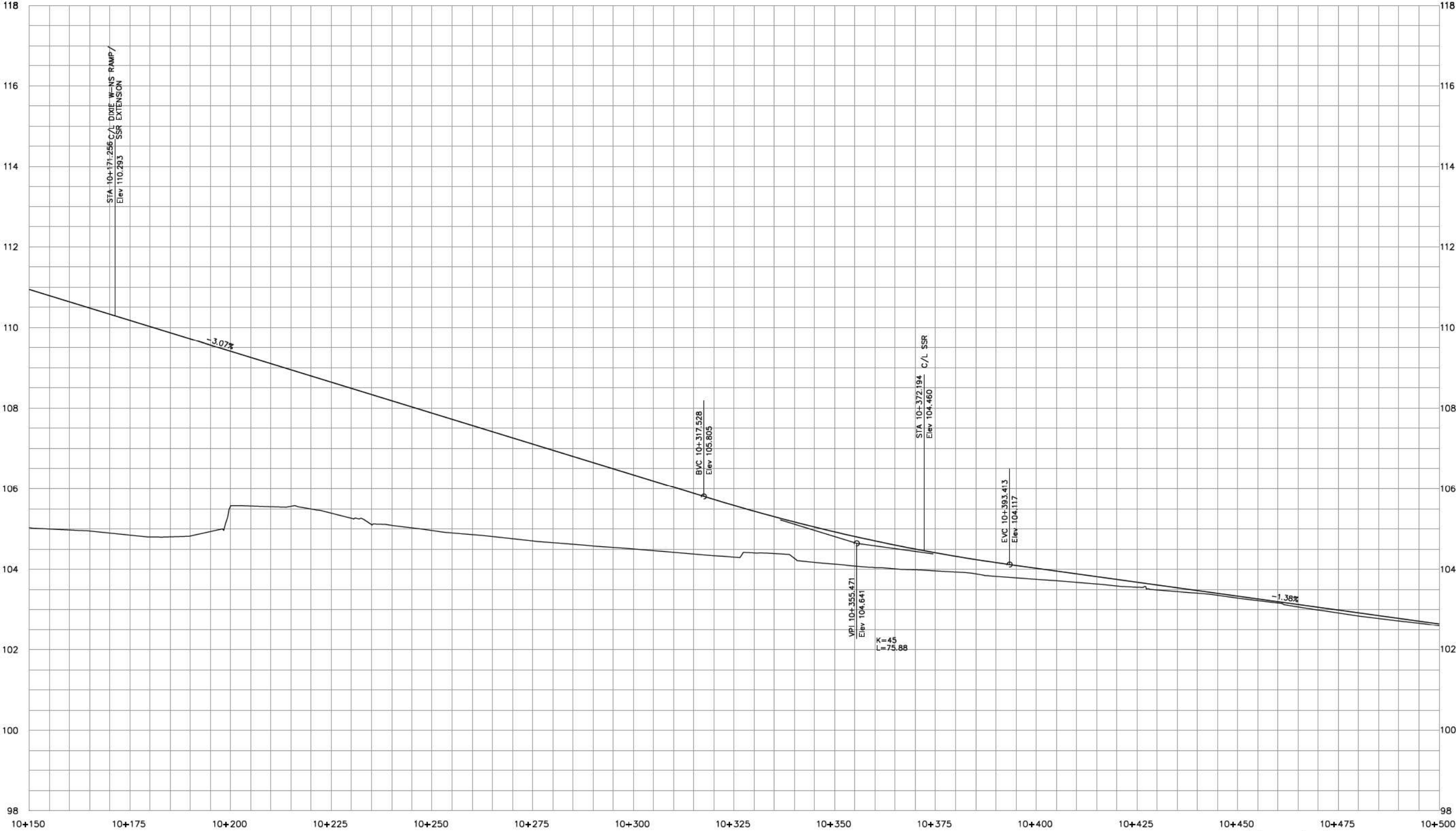
Revised

AECOM

SHEET

PRX

DIXIE ROAD



REVISIONS			
	DATE	BY	DESCRIPTION

JUNE 2020
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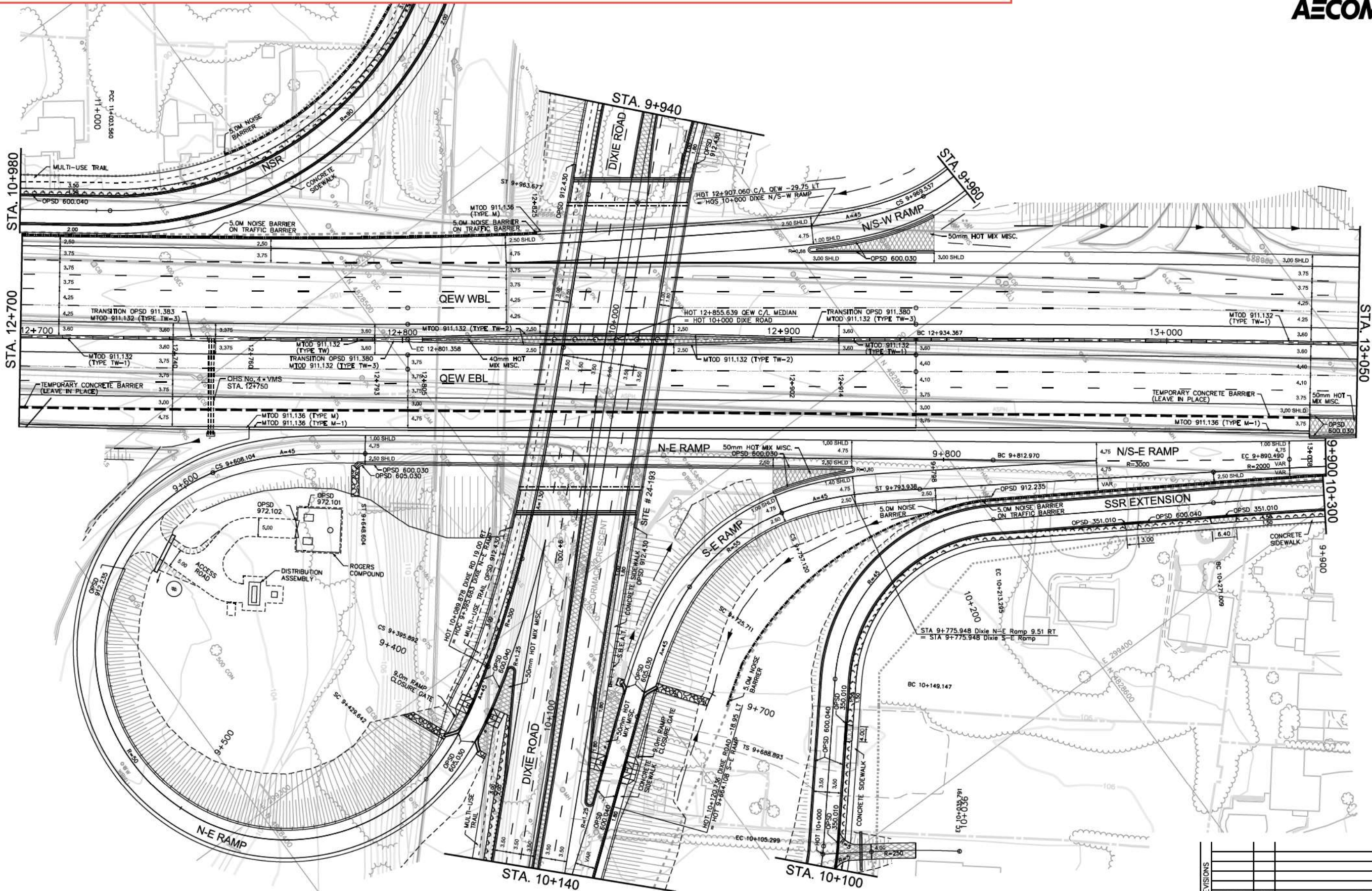
Ministry of
Transportation

CONT No
GWP No
2102-13-00
2432-13-00

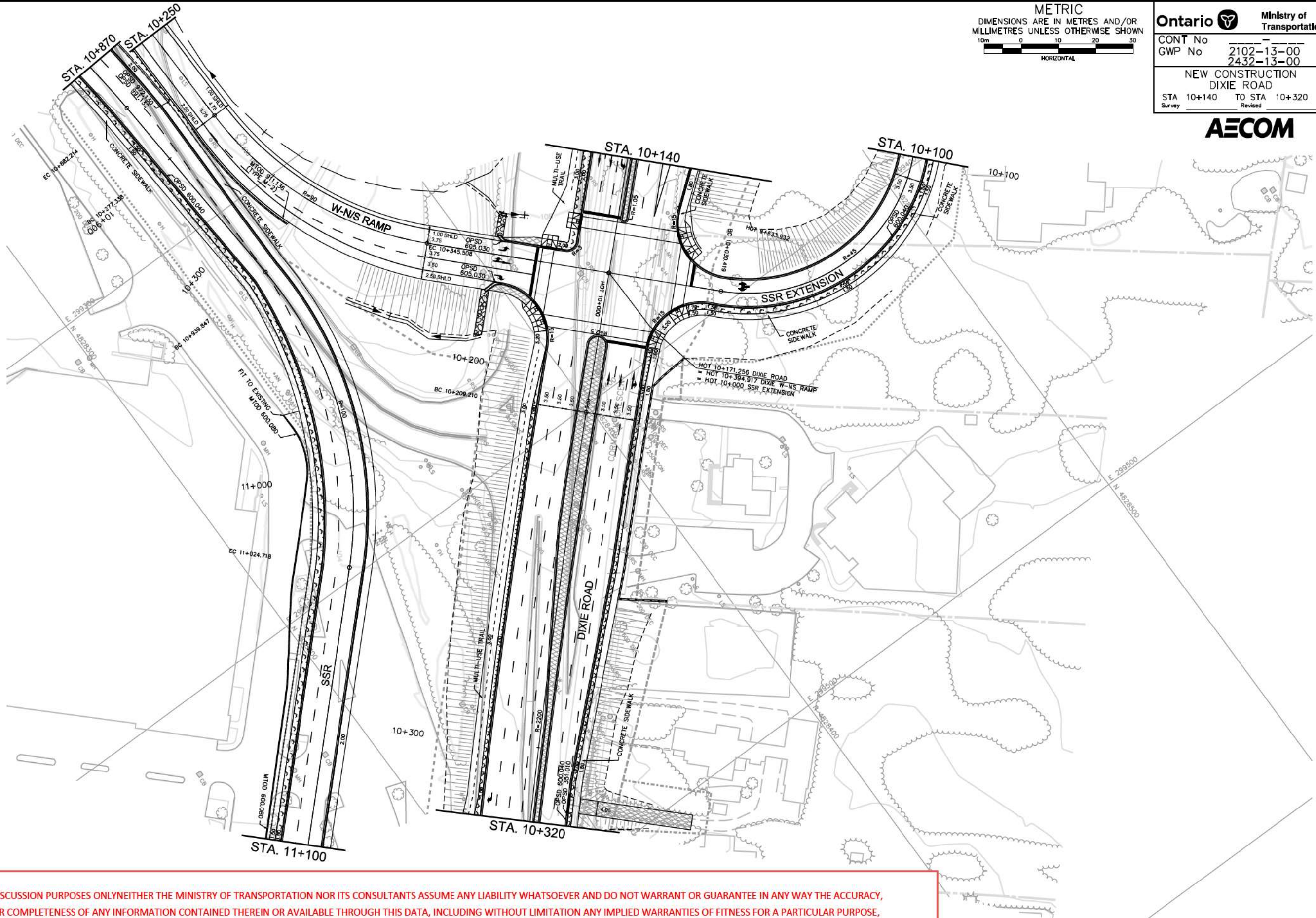
NEW CONSTRUCTION

STA 12+700 TO STA 13+050
Survey Revised


SHEET
NC4



REVISIONS			
NO.	DATE	BY	DESCRIPTION



METRIC
DIMENSIONS ARE IN METRES AND/OR
MILLIMETRES UNLESS OTHERWISE SHOWN
10m 0 10 20 30
HORIZONTAL





Ministry of
Transportation

CONT No
GWP No
2102-13-00
2432-13-00

NEW CONSTRUCTION
DIXIE ROAD
STA 10+140 TO STA 10+320
Survey Revised

SHEET
NC7





JUNE 2020
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REVISIONS			
	DATE	BY	DESCRIPTION

APPENDIX D

SAMPLE CALCULATION OF PREDICTED SOUND LEVELS DUE TO ROAD TRAFFIC

APPENDIX D-1

SAMPLE CALCULATION OF SOUND LEVEL

FILE: 18-049
 NAME: 1583 Cormack Crescent
 REFERENCE DRAWINGS: Site Plan
 LOCATION: Lot 8, 4.5 m above grade, side wall

Noise Source:	Dixie Road (NB)	Dixie Road (SB)	QEW (EB)	QEW (WB)
Time Period:	16 hr. (day)	16 hr. (day)	16 hr. (day)	16 hr (day)
Segment Angle:	-90 to 45	-90 to 45	-90 to -45	-90 to -45
Distance (m):	54.5	70.5	227.0	247.5

CALCULATION SOUND LEVEL*

Reference Leq (dBA)*:	69.97	69.97	82.47	82.47
Distance Correction (dBA):	-8.84	-10.60	-18.44	-19.03
Finite Element Correction (dBA):	-2.19	-2.19	-8.66	-8.66
Allowance for Future Growth (dBA):	incl.	incl.	incl.	incl.

LeqNight (dBA):	58.95	57.19	55.37	54.78
Combined LeqDay (dBA):	62.91			

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

APPENDIX D-2

SAMPLE CALCULATION OF SOUND LEVEL

FILE: 18-049
 NAME: 1583 Cormack Crescent
 REFERENCE DRAWINGS: Site Plan
 LOCATION: Lot 8, 4.5 m above grade, side wall

Noise Source:	Dixie Road (NB)	Dixie Road (SB)	QEW (EB)	QEW (WB)
Time Period:	8 hr. (night)	8 hr. (night)	8 hr. (night)	8 hr (night)
Segment Angle:	-90 to 45	-90 to 45	-90 to -45	-90 to -45
Distance (m):	54.5	70.5	227.0	247.5

CALCULATION SOUND LEVEL*

Reference Leq (dBA)*:	61.96	61.96	82.47	82.47
Distance Correction (dBA):	-8.86	-10.63	-18.44	-19.03
Finite Element Correction (dBA):	-2.19	-2.19	-8.66	-8.66
Allowance for Future Growth (dBA):	incl.	incl.	incl.	incl.

LeqNight (dBA):	50.90	49.14	55.37	54.78
Combined LeqNight (dBA):	59.29			

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

Filename: 8sw.te Time Period: Day/Night 16/8 hours
Description: Lot 8, side wall, daytime

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

Car traffic volume : 21295/2106 veh/TimePeriod *
Medium truck volume : 265/26 veh/TimePeriod *
Heavy truck volume : 553/55 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24300
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.20
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 91.00

Data for Segment # 1: Dixie NB (day)

Angle1 Angle2 : -90.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 54.50 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 21295/2106 veh/TimePeriod *
Medium truck volume : 265/26 veh/TimePeriod *
Heavy truck volume : 553/55 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24300
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.20
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 91.00

Data for Segment # 2: Dixie SB (day)

Angle1 Angle2 : -90.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 70.50 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: QEW EB (day/night)

Car traffic volume : 63950/31970 veh/TimePeriod *
Medium truck volume : 2180/1090 veh/TimePeriod *
Heavy truck volume : 6540/3270 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 109000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 3.00
Heavy Truck % of Total Volume : 9.00
Day (16 hrs) % of Total Volume : 66.67

Data for Segment # 3: QEW EB (day)

Angle1 Angle2 : -90.00 deg -45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 227.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 4: QEW WB (day/night)

Car traffic volume : 63950/31970 veh/TimePeriod *
Medium truck volume : 2180/1090 veh/TimePeriod *
Heavy truck volume : 6540/3270 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 109000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 3.00
Heavy Truck % of Total Volume : 9.00
Day (16 hrs) % of Total Volume : 66.67

Data for Segment # 4: QEW WB (day)

Angle1 Angle2 : -90.00 deg -45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 247.50 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Dixie NB (day)

Source height = 1.26 m

ROAD (0.00 + 58.95 + 0.00) = 58.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.58	69.97	0.00	-8.84	-2.19	0.00	0.00	0.00	58.95

Segment Leq : 58.95 dBA

Results segment # 2: Dixie SB (day)

Source height = 1.26 m

ROAD (0.00 + 57.19 + 0.00) = 57.19 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.58	69.97	0.00	-10.60	-2.19	0.00	0.00	0.00	57.19

Segment Leq : 57.19 dBA

Results segment # 3: QEW EB (day)

Source height = 1.73 m

ROAD (0.00 + 55.37 + 0.00) = 55.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-45	0.56	82.47	0.00	-18.44	-8.66	0.00	0.00	0.00	55.37

Segment Leq : 55.37 dBA

Results segment # 4: QEW WB (day)

Source height = 1.73 m

ROAD (0.00 + 54.78 + 0.00) = 54.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-45	0.56	82.47	0.00	-19.03	-8.66	0.00	0.00	0.00	54.78

Segment Leq : 54.78 dBA

Total Leq All Segments: 62.91 dBA

Filename: 8sw.n.te Time Period: Day/Night 16/8 hours
Description: Lot 8, side wall, nighttime

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

Car traffic volume : 21405/2117 veh/TimePeriod *
Medium truck volume : 376/37 veh/TimePeriod *
Heavy truck volume : 332/33 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24300
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.70
Heavy Truck % of Total Volume : 1.50
Day (16 hrs) % of Total Volume : 91.00

Data for Segment # 1: Dixie NB (night)

Angle1 Angle2 : -90.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 54.50 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 21405/2117 veh/TimePeriod *
Medium truck volume : 376/37 veh/TimePeriod *
Heavy truck volume : 332/33 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24300
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.70
Heavy Truck % of Total Volume : 1.50
Day (16 hrs) % of Total Volume : 91.00

Data for Segment # 2: Dixie SB (night)

Angle1 Angle2 : -90.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 70.50 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: QEW EB (day/night)

Car traffic volume : 63950/31970 veh/TimePeriod *
Medium truck volume : 2180/1090 veh/TimePeriod *
Heavy truck volume : 6540/3270 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 109000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 3.00
Heavy Truck % of Total Volume : 9.00
Day (16 hrs) % of Total Volume : 66.67

Data for Segment # 3: QEW EB (night)

Angle1 Angle2 : -90.00 deg -45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 227.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 4: QEW WB (day/night)

Car traffic volume : 63950/31970 veh/TimePeriod *
Medium truck volume : 2180/1090 veh/TimePeriod *
Heavy truck volume : 6540/3270 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 109000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 3.00
Heavy Truck % of Total Volume : 9.00
Day (16 hrs) % of Total Volume : 66.67

Data for Segment # 4: QEW WB (night)

Angle1 Angle2 : -90.00 deg -45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 247.50 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Dixie NB (night)

Source height = 1.11 m

ROAD (0.00 + 50.90 + 0.00) = 50.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.58	61.96	0.00	-8.86	-2.19	0.00	0.00	0.00	50.90

Segment Leq : 50.90 dBA

Results segment # 2: Dixie SB (night)

Source height = 1.11 m

ROAD (0.00 + 49.14 + 0.00) = 49.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.58	61.96	0.00	-10.63	-2.19	0.00	0.00	0.00	49.14

Segment Leq : 49.14 dBA

Results segment # 3: QEW EB (night)

Source height = 1.73 m

ROAD (0.00 + 55.37 + 0.00) = 55.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-45	0.56	82.47	0.00	-18.44	-8.66	0.00	0.00	0.00	55.37

Segment Leq : 55.37 dBA

Results segment # 4: QEW WB (night)

Source height = 1.73 m

ROAD (0.00 + 54.78 + 0.00) = 54.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-45	0.56	82.47	0.00	-19.03	-8.66	0.00	0.00	0.00	54.78

Segment Leq : 54.78 dBA

Total Leq All Segments: 59.29 dBA

APPENDIX D-3 SAMPLE CALCULATION OF SOUND LEVEL

FILE: 18-049
NAME: 1583 Cormack Crescent
REFERENCE DRAWINGS: Site plan and grading plan
LOCATION: Lot 8, 1.5 m above grade, **rear yard**

Noise Source:	Dixie Road NB	Dixie Road SB
Time Period:	16 hr. (day)	16 hr. (day)
Segment Angle:	-90 to 27	-90 to 27
Distance (m):	60.0	76.0

CALCULATION OF SOUND LEVEL *

Reference Leq (dBA)*:	69.97	69.97
Height and/or Distance Correction (dBA):	-9.58	-11.21
Distance Correction (dBA):	-2.89	-2.89
Finite Element Correction (dBA):	0.00	0.00
Allowance for Future Growth (dBA):	incl.	incl.
LeqDay (dBA):	57.50	55.87
Combined LeqDay (dBA):	59.77	

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

Filename: 80la.te Time Period: Day/Night 16/8 hours
Description: Lot 8, rear yard

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

Car traffic volume : 21295/2106 veh/TimePeriod *
Medium truck volume : 265/26 veh/TimePeriod *
Heavy truck volume : 553/55 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24300
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.20
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 91.00

Data for Segment # 1: Dixie NB (day)

Angle1 Angle2 : -90.00 deg 27.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 60.00 m
Receiver height : 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle : -90.00 deg Angle2 : 27.00 deg
Barrier height : 0.00 m
Elevation : 2.53 m
Barrier receiver distance : 8.50 m
Source elevation : 107.83 m
Receiver elevation : 105.30 m
Barrier elevation : 105.06 m
Reference angle : 0.00

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

Car traffic volume : 21295/2106 veh/TimePeriod *
Medium truck volume : 265/26 veh/TimePeriod *
Heavy truck volume : 553/55 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24300
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.20
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 91.00

Data for Segment # 2: Dixie SB (day)

```

-----
Angle1   Angle2       : -90.00 deg   27.00 deg
Wood depth      :      0           (No woods.)
No of house rows :      0
Surface         :      1           (Absorptive ground surface)
Receiver source distance : 76.00 m
Receiver height  :    1.50 m
Topography      :      4           (Elevated; with barrier)
Barrier angle1   : -90.00 deg   Angle2 : 27.00 deg
Barrier height   :    0.00 m
Elevation       :    2.53 m
Barrier receiver distance : 8.50 m
Source elevation : 107.83 m
Receiver elevation : 105.30 m
Barrier elevation : 105.06 m
Reference angle  :    0.00

```

Results segment # 1: Dixie NB (day)

Source height = 1.26 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
      1.26 !      1.50 !      2.06 !      107.12

```

ROAD (0.00 + 57.50 + 0.00) = 57.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	27	0.59	69.97	0.00	-9.58	-2.89	0.00	0.00	-0.22	57.28*
-90	27	0.59	69.97	0.00	-9.58	-2.89	0.00	0.00	0.00	57.50

* Bright Zone !

Segment Leq : 57.50 dBA

Results segment # 2: Dixie SB (day)

Source height = 1.26 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
      1.26 !      1.50 !      2.00 !      107.06

```

ROAD (0.00 + 55.87 + 0.00) = 55.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	27	0.59	69.97	0.00	-11.21	-2.89	0.00	0.00	-0.25	55.62*
-90	27	0.59	69.97	0.00	-11.21	-2.89	0.00	0.00	0.00	55.87

* Bright Zone !

Segment Leq : 55.87 dBA

Total Leq All Segments: 59.77 dBA

APPENDIX E

SAMPLE CALCULATION OF ARCHITECTURAL COMPONENT SELECTION

APPENDIX E-1
SAMPLE CALCULATION OF ARCHITECTURAL COMPONENT SELECTION*

FILE: 18-049
NAME: 1583 Cormack Crescent
REFERENCE DRAWINGS: Site plan
LOCATION: Lot 9, second storey

		ROAD
Room:	Corner Bedroom	
Wall area as a percentage of Floor Area:	Side:	55%
	Front:	55%
Window area as a percentage of Floor Area:	Side:	25%
	Front:	25%
Number of components:	3	
Outdoor Nighttime Leq:	Side: 65 (+3 for reflection) = 68 dBA	
	Front: 65 (+3 for reflection) = 68 dBA	
Indoor Leq:	40	
Angle Correction:	0	
Noise Reduction (dBA):	Side: 28	
	Front: 28	
Noise Spectrum:	Road	
Absorption:	Intermediate	

APPROPRIATE ELEMENTS

		STC Rating
Wall	Side	STC 39
	Front	STC 39
Window	Side	STC 31
	Front	STC 31

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

APPENDIX F

SAMPLE CALCULATION OF SOUND BARRIER ANALYSES

Filename: 8ola.te Time Period: Day/Night 16/8 hours
Description: Lot 8, rear yard, sound barrier requirements

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

Car traffic volume : 21295/2106 veh/TimePeriod *
Medium truck volume : 265/26 veh/TimePeriod *
Heavy truck volume : 553/55 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24300
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.20
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 91.00

Data for Segment # 1: Dixie NB (day)

Angle1 Angle2 : -90.00 deg 27.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 60.00 m
Receiver height : 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 27.00 deg
Barrier height : 0.00 m
Elevation : 2.53 m
Barrier receiver distance : 8.50 m
Source elevation : 107.83 m
Receiver elevation : 105.30 m
Barrier elevation : 105.06 m
Reference angle : 0.00

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

Car traffic volume : 21295/2106 veh/TimePeriod *
Medium truck volume : 265/26 veh/TimePeriod *
Heavy truck volume : 553/55 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24300
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.20
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 91.00

Data for Segment # 2: Dixie SB (day)

```

-----
Angle1  Angle2      : -90.00 deg   27.00 deg
Wood depth      :      0          (No woods.)
No of house rows :      0
Surface         :      1          (Absorptive ground surface)
Receiver source distance : 76.00 m
Receiver height  :      1.50 m
Topography      :      4          (Elevated; with barrier)
Barrier angle1   : -90.00 deg   Angle2 : 27.00 deg
Barrier height   :      0.00 m
Elevation       :      2.53 m
Barrier receiver distance : 8.50 m
Source elevation : 107.83 m
Receiver elevation : 105.30 m
Barrier elevation : 105.06 m
Reference angle  :      0.00
  
```

Results segment # 1: Dixie NB (day)

Source height = 1.26 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
      1.26 !      1.50 !      2.06 !      107.12
  
```

ROAD (0.00 + 57.50 + 0.00) = 57.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	27	0.59	69.97	0.00	-9.58	-2.89	0.00	0.00	-0.22	57.28*
-90	27	0.59	69.97	0.00	-9.58	-2.89	0.00	0.00	0.00	57.50

* Bright Zone !

Segment Leq : 57.50 dBA

Results segment # 2: Dixie SB (day)

Source height = 1.26 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
      1.26 !      1.50 !      2.00 !      107.06
  
```

ROAD (0.00 + 55.87 + 0.00) = 55.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	27	0.59	69.97	0.00	-11.21	-2.89	0.00	0.00	-0.25	55.62*
-90	27	0.59	69.97	0.00	-11.21	-2.89	0.00	0.00	0.00	55.87

* Bright Zone !

Segment Leq : 55.87 dBA

Total Leq All Segments: 59.77 dBA

Barrier table for segment # 1: Dixie NB (day)

Barrier Height	Elev of Barr Top	Road dBA	Tot Leq dBA
1.50	106.56	57.50	57.50
1.60	106.66	57.50	57.50
1.70	106.76	57.50	57.50
1.80	106.86	57.50	57.50
1.90	106.96	57.50	57.50
2.00	107.06	57.50	57.50
2.10	107.16	53.43	53.43
2.20	107.26	53.43	53.43
2.30	107.36	53.38	53.38
2.40	107.46	53.28	53.28
2.50	107.56	53.15	53.15
2.60	107.66	52.97	52.97
2.70	107.76	52.77	52.77
2.80	107.86	52.54	52.54
2.90	107.96	52.29	52.29
3.00	108.06	52.03	52.03
3.10	108.16	51.77	51.77
3.20	108.26	51.49	51.49
3.30	108.36	51.22	51.22
3.40	108.46	50.94	50.94

Barrier table for segment # 2: Dixie SB (day)

Barrier Height	Elev of Barr Top	Road dBA	Tot Leq dBA
1.50	106.56	55.87	55.87
1.60	106.66	55.87	55.87
1.70	106.76	55.87	55.87
1.80	106.86	55.87	55.87
1.90	106.96	55.87	55.87
2.00	107.06	51.88	51.88
2.10	107.16	51.90	51.90
2.20	107.26	51.87	51.87
2.30	107.36	51.80	51.80
2.40	107.46	51.69	51.69
2.50	107.56	51.54	51.54
2.60	107.66	51.36	51.36
2.70	107.76	51.15	51.15
2.80	107.86	50.92	50.92
2.90	107.96	50.68	50.68
3.00	108.06	50.42	50.42
3.10	108.16	50.16	50.16
3.20	108.26	49.90	49.90
3.30	108.36	49.64	49.64
3.40	108.46	49.37	49.37

Combined Mitigated LeqDay = 55.57 dBA

Filename: 9ola.te Time Period: Day/Night 16/8 hours
Description: Lot 9, rear yard, barrier requirements

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

Car traffic volume : 21295/2106 veh/TimePeriod *
Medium truck volume : 265/26 veh/TimePeriod *
Heavy truck volume : 553/55 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24300
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.20
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 91.00

Data for Segment # 1: Dixie NB (day)

Angle1 Angle2 : -39.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 29.00 m
Receiver height : 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -39.00 deg Angle2 : 80.00 deg
Barrier height : 0.00 m
Elevation : 4.21 m
Barrier receiver distance : 6.00 m
Source elevation : 109.58 m
Receiver elevation : 105.37 m
Barrier elevation : 105.01 m
Reference angle : 0.00

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

Car traffic volume : 21295/2106 veh/TimePeriod *
Medium truck volume : 265/26 veh/TimePeriod *
Heavy truck volume : 553/55 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24300
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.20
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 91.00

Data for Segment # 2: Dixie SB (day)

```

-----
Angle1   Angle2       : -39.00 deg   80.00 deg
Wood depth      :      0           (No woods.)
No of house rows :      0
Surface         :      1           (Absorptive ground surface)
Receiver source distance : 45.00 m
Receiver height  : 1.50 m
Topography      :      4           (Elevated; with barrier)
Barrier angle1   : -39.00 deg   Angle2 : 80.00 deg
Barrier height   : 0.00 m
Elevation        : 4.21 m
Barrier receiver distance : 6.00 m
Source elevation : 109.58 m
Receiver elevation : 105.37 m
Barrier elevation : 105.01 m
Reference angle  : 0.00

```

Road data, segment # 3: S.Service (day/night)

```

-----
Car traffic volume : 13095/1455 veh/TimePeriod *
Medium truck volume : 223/25 veh/TimePeriod *
Heavy truck volume : 182/20 veh/TimePeriod *
Posted speed limit : 60 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): 15000
Percentage of Annual Growth         : 0.00
Number of Years of Growth           : 0.00
Medium Truck % of Total Volume      : 1.65
Heavy Truck % of Total Volume       : 1.35
Day (16 hrs) % of Total Volume      : 90.00

```

Data for Segment # 3: S.Service (day)

```

-----
Angle1   Angle2       : -45.00 deg   45.00 deg
Wood depth      :      0           (No woods.)
No of house rows :      0
Surface         :      1           (Absorptive ground surface)
Receiver source distance : 34.00 m
Receiver height  : 1.50 m
Topography      :      4           (Elevated; with barrier)
Barrier angle1   : -45.00 deg   Angle2 : 45.00 deg
Barrier height   : 0.00 m
Elevation        : 4.21 m
Barrier receiver distance : 4.50 m
Source elevation : 109.58 m
Receiver elevation : 105.37 m
Barrier elevation : 105.01 m
Reference angle  : 0.00

```

Road data, segment # 4: QEW EB (day/night)

Car traffic volume : 63950/31970 veh/TimePeriod *
Medium truck volume : 2180/1090 veh/TimePeriod *
Heavy truck volume : 6540/3270 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 109000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 3.00
Heavy Truck % of Total Volume : 9.00
Day (16 hrs) % of Total Volume : 66.67

Data for Segment # 4: QEW EB (day)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 195.50 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 90.00 deg
Barrier height : 5.00 m
Barrier receiver distance : 184.50 m
Source elevation : 106.35 m
Receiver elevation : 105.37 m
Barrier elevation : 106.35 m
Reference angle : 0.00

Road data, segment # 5: QEW WB (day/night)

Car traffic volume : 63950/31970 veh/TimePeriod *
Medium truck volume : 2180/1090 veh/TimePeriod *
Heavy truck volume : 6540/3270 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 109000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 3.00
Heavy Truck % of Total Volume : 9.00
Day (16 hrs) % of Total Volume : 66.67

Data for Segment # 5: QEW WB (day)

```

-----
Angle1 Angle2      :    0.00 deg    90.00 deg
Wood depth          :          0      (No woods.)
No of house rows    :          0
Surface             :          1      (Absorptive ground surface)
Receiver source distance : 216.00 m
Receiver height     :    1.50 m
Topography          :          2      (Flat/gentle slope; with barrier)
Barrier angle1      :    0.00 deg    Angle2 : 90.00 deg
Barrier height      :    5.00 m
Barrier receiver distance : 184.50 m
Source elevation    : 106.35 m
Receiver elevation  : 105.37 m
Barrier elevation   : 106.35 m
Reference angle     :    0.00

```

Results segment # 1: Dixie NB (day)

Source height = 1.26 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.26 !          1.50 !          2.68 !          107.69

```

ROAD (0.00 + 63.11 + 0.00) = 63.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-39	80	0.54	69.97	0.00	-4.41	-2.45	0.00	0.00	0.00	63.11*
-39	80	0.54	69.97	0.00	-4.41	-2.45	0.00	0.00	0.00	63.11

* Bright Zone !

Segment Leq : 63.11 dBA

Results segment # 2: Dixie SB (day)

Source height = 1.26 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.26 !          1.50 !          2.39 !          107.40

```

ROAD (0.00 + 60.17 + 0.00) = 60.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-39	80	0.54	69.97	0.00	-7.35	-2.45	0.00	0.00	0.00	60.17*
-39	80	0.54	69.97	0.00	-7.35	-2.45	0.00	0.00	0.00	60.17

* Bright Zone !

Segment Leq : 60.17 dBA

Results segment # 3: S.Service (day)

Source height = 1.08 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.08	1.50	2.36	107.37

ROAD (0.00 + 57.88 + 0.00) = 57.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	45	0.55	66.64	0.00	-5.50	-3.26	0.00	0.00	0.00	57.88*
-45	45	0.55	66.64	0.00	-5.50	-3.26	0.00	0.00	0.00	57.88

* Bright Zone !

Segment Leq : 57.88 dBA

Results segment # 4: QEW EB (day)

Source height = 1.73 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.73	1.50	1.66	108.01

ROAD (0.00 + 51.96 + 0.00) = 51.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.35	82.47	0.00	-15.09	-3.89	0.00	0.00	-11.53	51.96

Segment Leq : 51.96 dBA - 5 dBA (double barrier) = 46.96 dBA

Results segment # 5: QEW WB (day)

Source height = 1.73 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.73	1.50	1.56	107.91

ROAD (0.00 + 53.78 + 0.00) = 53.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.35	82.47	0.00	-15.67	-3.89	0.00	0.00	-9.12	53.78

Segment Leq : 53.78 dBA - 5 dBA (double barrier) = 48.78 dBA

Total Leq All Segments: 66.12 dBA

Barrier table for segment # 1: Dixie NB (day)

Barrier Height	Elev of Barr Top	Road dBA	Tot Leq dBA
1.50	106.51	63.11	63.11
1.60	106.61	63.11	63.11
1.70	106.71	63.11	63.11
1.80	106.81	63.11	63.11
1.90	106.91	63.11	63.11
2.00	107.01	63.11	63.11
2.10	107.11	63.11	63.11
2.20	107.21	63.11	63.11
2.30	107.31	63.11	63.11
2.40	107.41	63.11	63.11
2.50	107.51	63.11	63.11
2.60	107.61	63.11	63.11
2.70	107.71	58.75	58.75
2.80	107.81	58.71	58.71
2.90	107.91	58.60	58.60
3.00	108.01	58.41	58.41
3.10	108.11	58.16	58.16
3.20	108.21	57.86	57.86
3.30	108.31	57.51	57.51
3.40	108.41	57.13	57.13
3.50	108.51	56.73	56.73
3.60	108.61	56.32	56.32
3.70	108.71	55.90	55.90
3.80	108.81	55.48	55.48
3.90	108.91	55.06	55.06
4.00	109.01	54.65	54.65
4.10	109.11	54.25	54.25
4.20	109.21	53.86	53.86
4.30	109.31	53.48	53.48
4.40	109.41	53.11	53.11
4.50	109.51	52.75	52.75
4.60	109.61	52.40	52.40
4.70	109.71	52.06	52.06
4.80	109.81	51.74	51.74
4.90	109.91	51.43	51.43

Barrier table for segment # 2: Dixie SB (day)

Barrier Height	Elev of Barr Top	Road dBA	Tot Leq dBA
1.50	106.51	60.17	60.17
1.60	106.61	60.17	60.17
1.70	106.71	60.17	60.17
1.80	106.81	60.17	60.17
1.90	106.91	60.17	60.17
2.00	107.01	60.17	60.17
2.10	107.11	60.17	60.17
2.20	107.21	60.17	60.17
2.30	107.31	60.17	60.17
2.40	107.41	56.01	56.01
2.50	107.51	56.00	56.00
2.60	107.61	55.91	55.91
2.70	107.71	55.75	55.75
2.80	107.81	55.54	55.54
2.90	107.91	55.26	55.26
3.00	108.01	54.95	54.95
3.10	108.11	54.61	54.61
3.20	108.21	54.24	54.24
3.30	108.31	53.86	53.86
3.40	108.41	53.47	53.47
3.50	108.51	53.07	53.07
3.60	108.61	52.68	52.68
3.70	108.71	52.29	52.29
3.80	108.81	51.91	51.91
3.90	108.91	51.54	51.54
4.00	109.01	51.18	51.18
4.10	109.11	50.82	50.82
4.20	109.21	50.48	50.48
4.30	109.31	50.15	50.15
4.40	109.41	49.83	49.83
4.50	109.51	49.52	49.52
4.60	109.61	49.22	49.22
4.70	109.71	48.93	48.93
4.80	109.81	48.66	48.66
4.90	109.91	48.39	48.39

Barrier table for segment # 3: S.Service (day)

Barrier Height	Elev of Barr Top	Road dBA	Tot Leq dBA
1.50	106.51	57.88	57.88
1.60	106.61	57.88	57.88
1.70	106.71	57.88	57.88
1.80	106.81	57.88	57.88
1.90	106.91	57.88	57.88
2.00	107.01	57.88	57.88
2.10	107.11	57.88	57.88
2.20	107.21	57.88	57.88
2.30	107.31	57.88	57.88
2.40	107.41	53.45	53.45
2.50	107.51	53.37	53.37
2.60	107.61	53.17	53.17
2.70	107.71	52.88	52.88
2.80	107.81	52.51	52.51
2.90	107.91	52.07	52.07
3.00	108.01	51.58	51.58
3.10	108.11	51.06	51.06
3.20	108.21	50.53	50.53
3.30	108.31	49.98	49.98
3.40	108.41	49.44	49.44
3.50	108.51	48.91	48.91
3.60	108.61	48.39	48.39
3.70	108.71	47.89	47.89
3.80	108.81	47.41	47.41
3.90	108.91	46.94	46.94
4.00	109.01	46.50	46.50
4.10	109.11	46.07	46.07
4.20	109.21	45.66	45.66
4.30	109.31	45.27	45.27
4.40	109.41	44.90	44.90
4.50	109.51	44.55	44.55
4.60	109.61	44.21	44.21
4.70	109.71	43.89	43.89
4.80	109.81	43.58	43.58
4.90	109.91	43.28	43.28

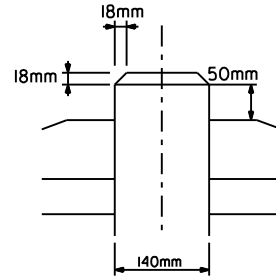
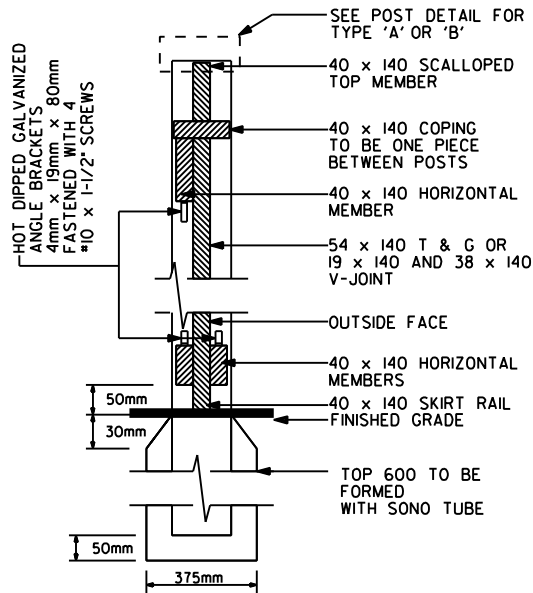
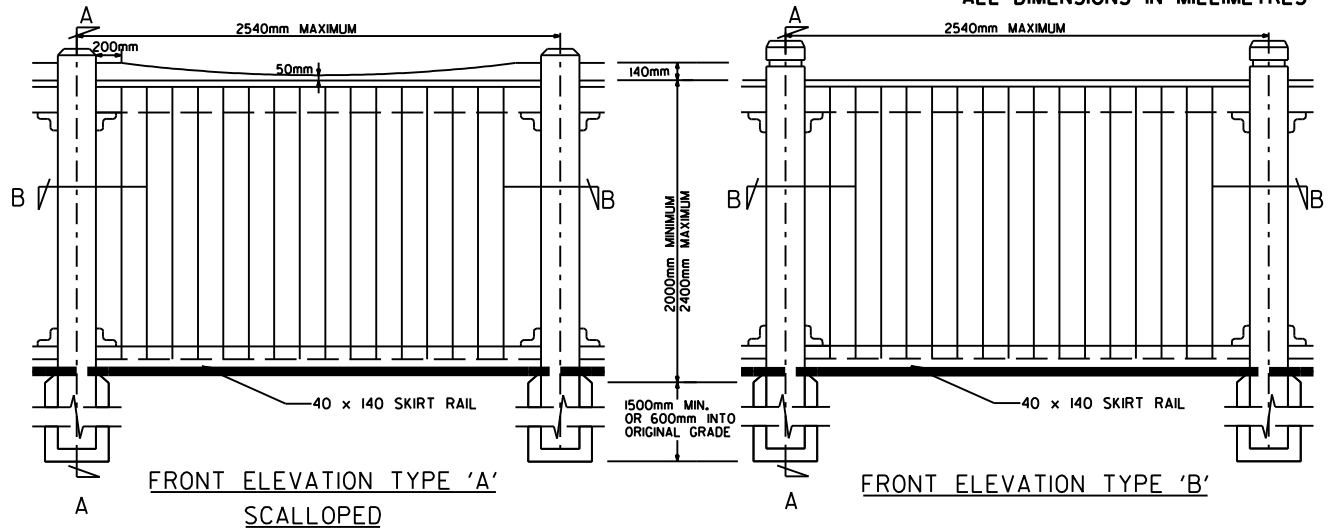
Combined Mitigated LeqDay = 59.43 dBA

APPENDIX G

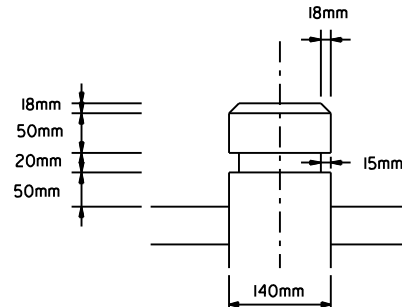
ACOUSTIC FENCE DETAIL FOR LOTS 6 TO 8

METRIC

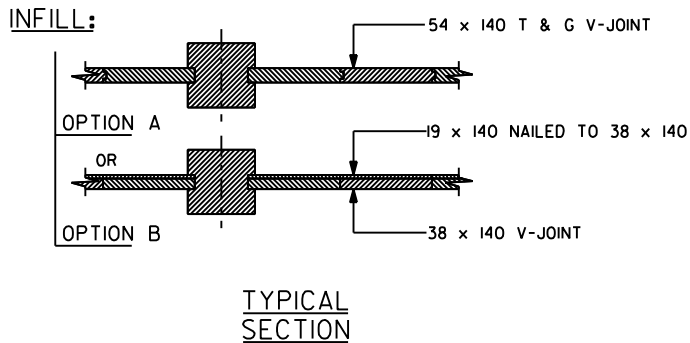
ALL DIMENSIONS IN MILLIMETRES



POST DETAIL TYPE 'A'



POST DETAIL TYPE 'B'



NOTES - SEE STANDARD 2850.050



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STANDARD
WOODEN ACOUSTIC FENCE
TYPE 'A' & 'B'
ON PRIVATE PROPERTY

EFF. DATE	2002-01-01	SCALE	N.T.S.
REV.	I	2006-01-01	STANDARD No. 2850.040

NOTES

MATERIALS

WOOD (GENERAL SPECIFICATIONS)

ALL WOOD SHALL BE RED CEDAR OR APPROVED EQUAL SELECTED FOR GOOD APPEARANCE AND FREE OF WANE AND BARK POCKETS. ALL TORN GRAIN AND SURFACE STAIN SHALL BE ELIMINATED BY SANDING OR PLANING. MEMBERS WITH HEAVY KNOTS AND/OR SAP STAIN SHALL BE WELL DISTRIBUTED THROUGHOUT THE INSTALLATION. THE SKIRT RAIL SHALL BE PRESSURE TREATED.

INFILL

- (A) - 2-1/8" T & G SELECT (SOUND) TIGHT KNOT NLGA PATTERN 18-(200) MODIFIED 54mm (DRESSED BOTH SIDES) WITH BEVELLED EDGES ON BOTH SIDES; OR
- (B) - 19 x 140 AND 38 x 140 V-JOINT OVERLAPPED

HORIZONTAL MEMBERS

SHALL BE 40mm x 140mm DRESSED TO PATTERN, THE GRADE TO BE NLGA 204B OR BETTER SELECT TIGHT KNOT GRADE.

POSTS

SHALL BE 150 x 14, STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS. CSA SPECIFICATIONS S16.1 AND CSA SPECIFICATION G40.21 TYPE 350W

STAIN FOR WOOD FENCE

STAIN SHALL CONSIST OF:

- A BASE OF BLENDED RESINS AND OILS IN A WATER SUSPENSION
- SUSPENDED SOLIDS WHICH ARE NOT LESS THAN 21% AND NOT GREATER THAN 31% BY VOLUME
- V.O.C.'S (VOLATILE ORGANIC COMPOUNDS) WHICH ARE NOT IN EXCESS OF 350g/L IN ACCORDANCE WITH A.S.T.M. D-2369
- LEVELS OF LIQUID MICROBICIDES AND ANY OTHER POTENTIAL TOXIC SUBSTANCES WHICH ARE ENVIRONMENTALLY SAFE (NOT REQUIRED PROVINCIAL OR FEDERAL REGISTRATION)
- NONE OF THE FOLLOWING HAZARDOUS SUBSTANCES:
 - FALPET [N-(TRICHLOROMETHYL)O] PHTHALIMIDE]
 - BIS (TIBUTYL TIN) OXIDE
 - COPPER NAPHTHENATE
 - COPPER B QUINOLINOLATE
 - ZINC NAPHTHENATE
- CLEAR STAIN i.e. NO COLOUR

STAIN APPLICATION

APPLY TWO COATS ON CLEAN DRY WOOD USING SPRAY, BRUSH OR DIPPING METHODS TO ACHIEVE FULL COVERAGE OF ALL EXPOSED SURFACES. APPLY OUTDOORS ONLY IN SUITABLE WEATHER CONDITIONS DURING WHICH THE TEMPERATURE IS BETWEEN 5 C AND 21 C FOR A PERIOD OF 48 HOURS FOLLOWING APPLICATIONS.

FASTENERS

INCLUDING ARDOX NAILS, BOLTS, NUTS AND WASHERS, SHALL BE HOT-DIPPED GALVANIZED STEEL.

CONCRETE

SHALL BE 30 MPa AT 28 DAYS MINIMUM.

EXECUTION

SOIL

WITHIN IMMEDIATE AREA OF FOOTINGS SHALL BE 95% STANDARD PROCTOR DENSITY.

POSTS

SHALL BE PLUMB WITHIN 5mm/m

INFILL

MEMBERS SHALL BE TIGHT FITTED AND NAILED AT REGULAR INTERVALS TO ELIMINATE ALL GAPS AND RATTLING. INFILL PANEL MEMBERS SHALL BE NAILED ONLY ON THE INSIDE (LOW QUALITY) FENCE.

STEP FENCE

ON SLOPES (MINIMUM 3° STEPS).

DOUBLE POST

ALL DIRECTION CHANGES GREATER THAN 20°.

WARRANTY

THE FENCE SHALL BE GUARANTEED FOR THREE YEARS AS FOLLOWS:
5mm/m ON PLUMB OF POSTS AND LEVEL OF INFILL MEMBERS.
GAPS BETWEEN INFILL MEMBERS SHALL NOT EXCEED 6mm (1/4").
INFILL MEMBERS SHALL BE TIGHT AND FREE OF RATTLING.



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STANDARD
NOTES FOR THE WOODEN
ACOUSTIC FENCE
TYPE 'A' & 'B'
ON PRIVATE PROPERTY

EFF. DATE	2002-01-01	SCALE	N.T.S.
REV.	2	2015-06-03	STANDARD No. 2850.050