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PRELIMINARY ENVIRONMENTAL NOISE REPORT

PROPOSED RESIDENTIAL DEVELOPMENT
BRADFORD HIGHLANDS
GOLF COURSE RE-DEVELOPMENT
TOWN OF BRADFORD WEST GWILLIMBURY
COUNTY OF SIMCOE



PREPARED FOR
ICG Golf Inc.
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SUMMARY

The proposed golf course re-development into residential lots and blocks (units) and associated community use blocks (i.e. stormwater management, school, parks, etc.) is located south of Line 6, between 10 Sideroad and Simcoe Road in the Town of Bradford West Gwillimbury and is subject to road traffic noise from Line 6, 5th Line and future internal road Street A. The potential noise impact from existing non-residential uses has also been assessed.

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

Using the road traffic data obtained from the Town of Bradford West Gwillimbury and BA Consulting Group Ltd., the sound levels for various locations in the proposed residential development were determined.

Sound levels due to the nearby roads were compared to the applicable noise guidelines to determine if exceedances exist and propose appropriate noise mitigation measures.

A 2.0 m high acoustic fence is required for the lots and blocks (units) flanking Street A, excluding back-to-back townhouse blocks, to achieve less than 55 dBA in the rear yards. See Table 3 and Figure 2 for details.

All lots and blocks (units) along Street A require forced air heating systems sized to accommodate the addition of central air conditioning at a later date, by the occupant, if noise becomes a concern and a warning clause. Table 3 and Figure 2 include details.

Based on the preliminary analysis, no special window, exterior door and exterior wall construction above typical building practices will be necessary for any of the proposed lots and blocks (units). Prior to issuance of building permits, the acoustical requirements should be reviewed to ensure compliance with the applicable guidelines. Prior to final occupancy, the lots and blocks (units) should be inspected by an acoustical consultant to ensure the required mitigation measures have been incorporated.

In conclusion, it was found that, with appropriate mitigation measures mentioned above, all lots and blocks (units) in the development will meet the noise guidelines. Where minor excesses exist or mitigation is required, future occupants will be advised through the use of warning clauses.

Due to locations, separation distances and proximity to the existing noise-sensitive receptors, the existing non-residential uses are not expected to be acoustically significant at the proposed residential lots and blocks (units). Therefore, noise mitigation measures are not required.

An elementary school block (Block 459) is located within the proposed development. Once detailed plans for the school block are available, a noise study should be prepared by the proponent of the school to ensure that the applicable noise guidelines are met at the adjacent residential lots and blocks (units). As shown on Figure 2, the school block may in the future be developed for a residential use. In this case, a separate noise study should be prepared for the residential lots within Block 459.

1.0 INTRODUCTION

Jade Acoustics Inc. was retained to prepare a Preliminary Environmental Noise Report to investigate the potential impact of environmental noise on the proposed re-development of the existing golf course into a residential use to the satisfaction of the Town of Bradford West Gwillimbury.

The proposed site is not affected by ground-borne vibration originating from neighbouring developments/operations; therefore, vibration is not investigated further in the report.

The proposed site is identified as:

Part of Block 36, Plan 51M-221 and
Part of Lot 13
Concession 5
(Geographic Township of West Gwillimbury)
Town of Bradford West Gwillimbury
County of Simcoe

The site is bound by existing residential lots and Line 6 to the north, existing residential lots to the east, open rural space to the west and existing residential lots, 5th Line and Canal Road to the south.

Surrounding land uses include existing and future residential uses and a mix of residential and non-residential uses along Canal Road.

Based on information available at this time, the rural area immediately west of the subject site will be developed for residential and institutional (high school) uses.

The analysis was based on the following:

- Draft plan of subdivision prepared by Malone Given Parsons, dated October 7, 2024, revised on October 29, 2024;
- Preliminary grading plans dated October 25, 2024 prepared by the SCS Consulting Group Ltd.;
- Road traffic data provided by the Town of Bradford West Gwillimbury and BA Consulting Group Ltd.;
- Site visit conducted by Jade Acoustics Inc. staff on September 4, 2024.

The proposed development is comprised of residential lots and blocks (units), one elementary school block, two park blocks, one stormwater management pond block, one environmental protection block, two drainage blocks, one compensation block, several walkway/drainage blocks, several future development blocks and new internal roads.

A key plan is attached as Figure 1. Figure 2 shows the draft plan of the proposed residential development and the minimum noise mitigation measures required to meet the applicable noise guidelines.

All residential dwellings are expected to be mostly two-storey structures. The back-to-back units may be three-storey structures.

Once information becomes available, separate environmental noise reports will need to be prepared for the elementary school block and future development blocks.

2.0 NOISE SOURCES

2.1 Transportation Sources

The noise source of potential impact on the proposed development is the road traffic on Line 6, 5th Line and future internal road Street A.

The proposed residential lots and blocks (units) closest to Canal Road are situated at a distance of approximately 260 m. Due to the separation distance, Canal Road is expected to be acoustically insignificant at the proposed noise-sensitive uses and, as such, not analyzed further in the report.

Simcoe Road and 10 Sideroad are located approximately 590 m and 1230 m respectively from the proposed development. Due to the separation distances, the noise impact of these two roadways on the proposed residential lots and blocks (units) is insignificant; therefore, Simcoe Road and 10 Sideroad are not addressed further in the report.

All other existing and proposed roadways located within and in proximity to the subject site are expected to carry only local traffic. As such, being acoustically insignificant, they are not analyzed further in the report.

A 2036 total future traffic information expressed as AM and PM peak hour volumes included in a Traffic Impact Study (TIS) Update dated September 2023 prepared by BA Consulting Group Ltd. was used to determine the 2036 AADT volumes for Line 6, 5th Line and Street A. The 2036 AADT volumes were calculated by multiplying the AM or PM peak hour volume, whichever is higher, with a factor of 10.

It should be noted that, as advised by the Town of Bradford West Gwillimbury, a Transportation Master Plan dated July 2022, prepared by WSP was reviewed and road traffic data included in the document compared with the information provided in the TIS Update mentioned above. The 2036 AADT volumes determined using the September 2023 TIS Update were higher and, as such, used in the analysis.

A posted speed limit of 50 km/hr was used for Line 6 and 5th Line. A speed limit of 50 km/h was assumed for Street A.

Information regarding the percentage of trucks for Line 6 used in the noise calculations was based on the turning movement count (TMC) data included in the TIS Update mentioned above. The same truck percentages were assumed and used for 5th Line and Street A.

Road information is summarized in Table 1. Correspondence regarding the road traffic information is included in Appendix A.

The site is not affected by rail or aircraft noise sources.

2.2 Stationary Sources

Non-residential uses are located along Canal Road, south, southeast and southwest of the proposed development. They include agricultural, commercial and industrial facilities mixed with residential buildings. The main non-residential facilities observed during our site visit are a trucking company and a fan distributor facility.

The closest proposed residential lots and blocks (units) are located more than 300 m from the existing non-residential uses. There are intervening residential properties positioned at closer distances when compared with the proposed noise sensitive uses where noise compliance due to the potential stationary noise sources needs to be achieved.

In conclusion, due to their locations, separation distances and proximity to the existing noise sensitive receptors, the existing non-residential uses are not expected to be acoustically significant at the proposed residential lots and blocks (units). Therefore, noise mitigation measures are not required.

An elementary school block (Block 459) is proposed to be located within the subject site. This block is shown on Figure 2. It should be noted that, as indicated on Figure 2, the school block may not be developed for the currently proposed institutional use. Instead, the block may be used to construct more residential homes should the school board not require the elementary school facility.

Once detailed plans for the school block or residential lots are available, a noise study should be prepared by the proponent of the school or residential development to ensure that the applicable noise guidelines are met at the adjacent residential lots and blocks (units) or the future residential lots within Block 459. It should be noted that, if Block 459 stays a school, findings included in a noise report recommended to be prepared by the proponent of the school block will not impact the proposed draft plan. Noise mitigation requirements (if any) would need to be implemented within the school block.

3.0 ENVIRONMENTAL NOISE CRITERIA

The environmental noise criteria used to assess the impact of noise on proposed developments in Ontario are based on the criteria defined by the Ontario Ministry of the Environment, Conservation and Parks (MOE). The environmental noise guidelines of the Town of Bradford West Gwillimbury were also used in the report.

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

3.1 Transportation Sources

3.1.1 Indoors

If the nighttime (11:00 p.m. to 7:00 a.m.) sound level in terms of Leq at the exterior face of a bedroom or living/dining room window/exterior door is greater than 60 dBA 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 and/or exterior doors can be kept closed for noise control purposes and central air conditioning is required. A warning clause advising the occupant of the installed mechanical ventilation system is also required.

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

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 are 40 dBA (Leq8hour) for the bedrooms during nighttime hours, 45 dBA (Leq8hour) for living/dining rooms during nighttime hours and 45 dBA (Leq16hour) for the living/dining rooms and bedrooms during daytime hours. These criteria are used to determine the architectural requirements.

3.1.2 Outdoors

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

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

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

The OLA includes:

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

Based on the MOE guidelines, for the outdoor amenity areas, a design goal of 55 dBA 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. When the unmitigated sound levels exceed 60 dBA, mitigation measures and a warning clause are required.

Based on information previously provided by the Town of Bradford West Gwillimbury, a typical noise fence height is 2.0 m; however, depending on site specifics, the Town would accept acoustic fences higher than 2.0 m.

For arterial roads, it is expected that up to 2.4 m high acoustic fences would be acceptable to the Town.

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 Town of Bradford West Gwillimbury Noise Control By-law

The Town of Bradford West Gwillimbury has a by-law to prohibit or regulate unusual noises likely to disturb the inhabitants of the Town; By-law Number 2008-083 dated September 2, 2008 amended by By-law Number 2022-31 dated April 5, 2022 (last amendment). The by-law does not provide specific sound level limits, but rather provide qualitative information with respect to sources and prohibitions by time and place.

4.0 NOISE IMPACT ASSESSMENT

4.1 Transportation Sources

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

The topography between the source and the receiver has been taken into account. Shielding provided by the buildings has also been accounted for in the analysis. The rear yard receiver was assumed to be 3 m from the centre of the rear wall of the house and 1.5 m above ground.

As detailed grading plans are not available in this stage of the development, the rear yard ground elevation was assumed to be 0.5 m higher than the base of source and the base of sound barrier elevations for the analyzed lots and blocks (units). This approach is generally considered to be acceptable for the preparation of preliminary environmental noise reports

The proposed residential development will include back-to-back townhouse units with no ground level outdoor living areas. It is expected that balconies and/or elevated terraces (if any) associated with the back-to-back townhouse units will be less than 4.0 m deep. Therefore, based on the MOE guidelines, no noise sensitive outdoor living areas are proposed for the back-to-back townhouse units. As such, no further analysis of the sound barrier requirements for these blocks is included in the report.

The highest sound levels from road traffic were calculated for the lots and blocks (units) along Street A. The unmitigated daytime sound levels in the rear yards are predicted to be up to 58 dBA. For the wall/window locations, the unmitigated daytime and nighttime sound levels are predicted to be up to 60 dBA (LeqDay) and up to 53 dBA (LeqNight).

For all other lots and blocks (units) within the proposed development, the unmitigated daytime sound levels in the rear yard are predicted to be less than 55 dBA. The unmitigated sound levels at the building envelope are predicted to be 55 dBA or less during daytime hours and less than 50 dBA during nighttime hours.

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

Where the sound level limits are exceeded, mitigative measures and warning clauses are required.

4.2 Stationary Sources

As discussed in Section 2.2, the existing non-residential uses are not expected to be acoustically significant at the proposed noise sensitive receptors; 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 mitigation requirements for the lots and blocks (units) in this development.

5.1 Indoors

As required, indoor sound level criteria for road traffic can be achieved in all cases by using appropriate architectural elements for exterior walls, windows, exterior doors, and roof construction. The indoor limit for road traffic noise is 40 dBA for the bedrooms during nighttime hours. The limit is 45 dBA for the living/dining rooms during daytime and nighttime hours, as well as for the bedrooms during daytime hours. These criteria have been used in this analysis. The characteristic spectrum for road traffic has been accounted for in the determination of the architectural components.

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

Sample preliminary architectural component selection calculations are shown in Appendix D.

Using the ratios mentioned above, for the worst case dwellings along Street A, exterior walls having an STC 29 rating and windows and exterior doors having an STC 21 rating would be required.

The acoustic ratings mentioned above comply with standard construction used for low-rise developments. Therefore, taking into account the ratios mentioned above, window, exterior door and exterior wall construction which complies with the minimum structural and safety requirements of standard construction would be satisfactory for all proposed dwellings.

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

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

Where the sound level is greater than 60 dBA (LeqNight) at the outside face of a bedroom window or living/dining room window or greater than 65 dBA (LeqDay) on the outside face of a bedroom window or living/dining room window, the indoor noise criteria would not be met with open windows and provisions must be made to permit the windows to remain closed. In this case, the MOE guidelines require central air conditioning and a warning clause. No lots or blocks (units) require central air conditioning.

Where the nighttime sound level (LeqNight) is between 51 dBA and 60 dBA inclusive and daytime sound level (LeqDay) is between 56 dBA and 65 dBA inclusive, the provision for adding central air conditioning by the occupants must be made. All lots and blocks (units) along Street A require provision for adding central air conditioning and a warning clause in order to adequately address the road traffic noise. See Table 3 and Figure 2 for details.

The outdoor air conditioning condensing units must meet the applicable sound limits and be sited in accordance with the Town's zoning by-laws.

Warning clauses will also be required to be placed in agreements of purchase and sale, lease agreements and in a registerable portion of the Subdivision Agreement for all relevant lots and blocks (units) to make future occupants aware of the potential noise situation.

5.2 Outdoors

The outdoor living (amenity) area is required to be exposed to sound levels of less than 55 dBA during the day. A 5 dBA exceedance is considered acceptable in certain situations. Typically, if the sound level is above 55 dBA, some form of mitigation is recommended and warning clauses are required. Where the sound levels exceed 60 dBA, mitigation is required.

For all lots and blocks (units) flanking Street A, excluding the back-to-back townhouse units, a sound barrier in the form of a 2.0 m high acoustic fence is predicted to achieve less than 55 in the rear yards. The 2.0 m high acoustic fence is to be installed along the side and rear property lines. The acoustic fence should be returned to the side wall of the respective dwellings. For some lots and blocks (units), the acoustic fence should be returned along the rear property line.

The location of the proposed sound barriers is shown on Figure 2. Sound barrier requirements are given in Table 3. Sample calculations of the sound barrier analysis are included in Appendix E.

Generally, if a sound barrier is to be used, the sound barrier may be a fence, made of any one or a combination of various materials, berm, or a berm/fence combination and should have a surface density of 20 kg/m² or more. The sound barrier should be of continuous construction, with no gaps. Appropriate treatment of the sound barrier at all discontinuities and points of termination would be required to ensure that the sound barrier is effective. This would involve

extending the sound barrier to the front property line; returning to the side wall of the house or extending the sound barrier for a minimum of 3 times the distance between the side wall and barrier, past the rear wall of the house. 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 less than 20 kg/m². In addition, any gaps at the bottom of the gate should be kept to a minimal height.

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

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

5.3 Stationary Sources

As per Sections 2.2 and 4.2, the existing non-residential uses are not expected to be acoustically significant at the proposed noise sensitive receptors; therefore, noise mitigation measures are not required.

6.0 CONCLUSIONS

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

A Detailed Environmental Noise Report will need to be prepared once final draft and detailed grading plans become available.

Separate environmental noise reports will need to be prepared for the elementary school block and future development blocks.

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

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

Respectfully submitted,

JADE ACOUSTICS INC.

Per:


Davor Sikic, P. Eng.



Per:


Chris B. Kellar P. Eng.



7.0 REFERENCES

1. "Model Municipal Noise Control By-Law", Final Report, Ontario Ministry of the Environment, August, 1978.
2. ORNAMENT – "Ontario Road Noise Analysis Method for Environment and Transportation", Ontario Ministry of the Environment, October, 1989.
3. "Building Practice Note No. 56: Controlling Sound Transmission into Buildings", J.D. Quirt, Division of Building Research, National Research Council of Canada, September, 1985.
4. "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", Ontario Ministry of the Environment and Climate Change, Publication NPC-300, August, 2013 (updated final version #22).
5. Town of Bradford West Gwillimbury Noise Control By-law Number 2003-083 (original by-law) dated September 2, 2008 and By-law Number 2022-31 (last amendment) dated April 5, 2022.

TABLE 1

PROPOSED RESIDENTIAL DEVELOPMENT

BRADFORD HIGHLANDS GOLF COURSE RE-DEVELOPMENT

TOWN OF BRADFORD WEST GWILLIMBURY

COUNTY OF SIMCOE

SUMMARY OF ROAD TRAFFIC DATA

Road	Line 6	Street A	5 th Line
AADT* (2036)	17,550	6,450	5,050
No. of Lanes	3	2	2
Speed (km/h)	50	50	50
Medium truck (%)	2.9**	2.9***	2.9***
Heavy truck (%)	1.1**	1.1***	1.1***
Gradient (%)	Up to 2 [#]	Up to 4.5 ^{##}	Up to 2 [#]
Day/Night Split (%)	90/10 ^{###}	90/10 ^{###}	90/10 ^{###}

* AADT: Annual Average Daily Traffic.

** Based on TMC included in TIS prepared by BA Consulting Group Ltd.

*** Assumed based on Line 6 data.

Assumed.

Based on preliminary grading plan.

Typical day/night traffic split.

TABLE 2
PROPOSED RESIDENTIAL DEVELOPMENT
BRADFORD HIGHLANDS GOLF COURSE RE-DEVELOPMENT
TOWN OF BRADFORD WEST GWILLIMBURY
COUNTY OF SIMCOE
SAMPLE OF PREDICTED UNMITIGATED SOUND LEVELS
DUE TO ROAD TRAFFIC

Lots/ Blocks (Units)	Location*	Source	Distance (m)	Leq (dBA)			
				Day		Night	
				Separate	Combined	Separate	Combined
Lot 1	Rear Yard	Street A	22.5	55	57	--	--
		Line 6	100.5	50		--	
	Side Wall	Street A	17.5	59	59	52	53
		Line 6	103.5	48		41	
Lot 68	Front Wall	Street A	17.5	59	--	52	--
Lot 120	Rear Yard	Line 6	94.5	51	--	--	--
	Rear Wall	Line 6	97.5	51	--	45	--
Lot 266	Rear Yard	5 th Line	83.0	45	--	--	--
	Front Wall	Street A	17.5	59	59	52	52
		5 th Line	77.5	45		38	
Block 424 (west unit)	Rear Yard	Street A	17.5	58	--	--	--
	Side Wall	Street A	15.5	60	--	53	--

* Rear yard location taken 3 m from rear wall and 1.5 m above grade. Wall location taken at 4.5 m above grade for second floor.

TABLE 3
PROPOSED RESIDENTIAL DEVELOPMENT
BRADFORD HIGHLANDS GOLF COURSE RE-DEVELOPMENT
TOWN OF BRADFORD WEST GWILLIMBURY
COUNTY OF SIMCOE

SUMMARY OF MINIMUM NOISE MITIGATION MEASURES

Lots/Blocks (Units)	Air Conditioning ⁽¹⁾	Walls STC Rating ⁽²⁾	Windows STC Rating ⁽³⁾	Sound Barrier ⁽⁴⁾	Warning Clause ⁽⁵⁾
Lots 1, 59 (east and west units) and 229 (east and west units) and Blocks 424 (west unit), 425 (west unit), 432 (west unit), 433 (west unit) and 439 (west unit)	Provision for Adding	Standard*	Standard*	2.0 m**	A, B, C
Lots 60 to 106 and 262 to 312 and Blocks 424 (2 nd west unit), 425 (2 nd west unit), 432 (2 nd west unit), 433 (2 nd west unit), 440 (all units), 441 (all units), 442 (four west units), 447 (four west units), 448 (four west units) and 453 (four west units)	Provision for adding	Standard*	Standard*	No	A, B
All other lots and blocks (units)	No Special Requirements				

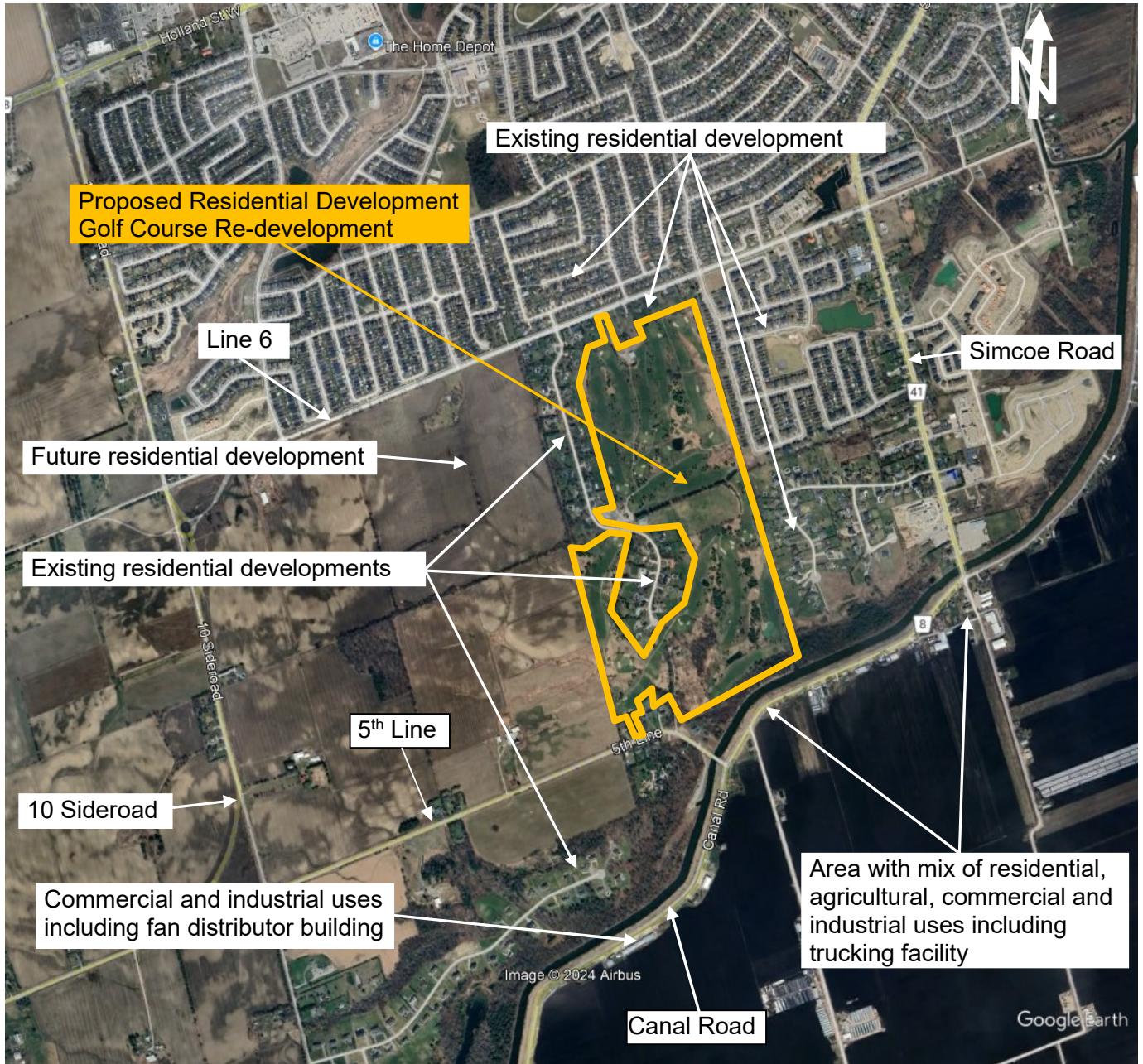
* Denotes any construction which complies with the minimum structural and safety requirements of standard construction. See Section 5.1 for details.

** 2.0 m high acoustic fence. See Section 5.2 and Figure 2 for details.

NOTES TO TABLE 3

1. Provision for adding central air conditioning would involve a ducted heating system sized to accommodate the addition of central air conditioning by the occupant at a later date. The air cooled condenser unit should be placed in a noise insensitive location which complies with municipal by-laws. It is recommended that the air cooled condenser unit AHRI sound rating does not exceed 7.6 bels.
2. STC – Sound Transmission Class Rating (Reference ASTM-E413). – Values shown are based on a wall area of 55% of the associated floor area for the wall facing the noise source and for the wall perpendicular to the noise source.
3. STC – Sound Transmission Class Rating (Reference ASTM-E413). – Values shown are based on a glazed area of 25% of the floor area for the wall facing the noise source and for the wall perpendicular to the noise source. A sliding glass walkout door should be considered as a window and be included in the percentage of glazing. Requirements are to be finalized once building plans are available.
4. Sound barriers must be of a solid construction with no gaps and have a minimum face density of 20 kg/m². Earthen berms, solid walls/fences of adequate density or combinations of berms and walls/fences may be used.
5. Suggested Warning Clauses to be placed in a registerable portion of the subdivision agreement and to be included in agreements of purchase and sale or lease on designated lots and blocks (units):
 - A. "Purchasers 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 occasionally interfere with the activities of the occupants as the sound level may exceed the noise criteria of the Municipality and the Ministry of the Environment and Climate Change. Purchasers are encouraged to place this clause in all subsequent offers of purchase and sale if/when they sell the property."
 - B. "Purchasers 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."
 - C. "Purchasers are advised that the acoustic fence as installed shall be maintained, repaired or replaced by the owner of the dwelling unit. Any maintenance repair or replacement shall be performed with the same material, to the same standards, and having the same colour and appearance of the original."

6. A conventionally ventilated attic roof construction meeting the Building Code requirements is satisfactory in all cases.



N.T.S

**Proposed Residential Development
Bradford Highlands Golf Course Re-
development
Town of Bradford West Gwillimbury
County of Simcoe**

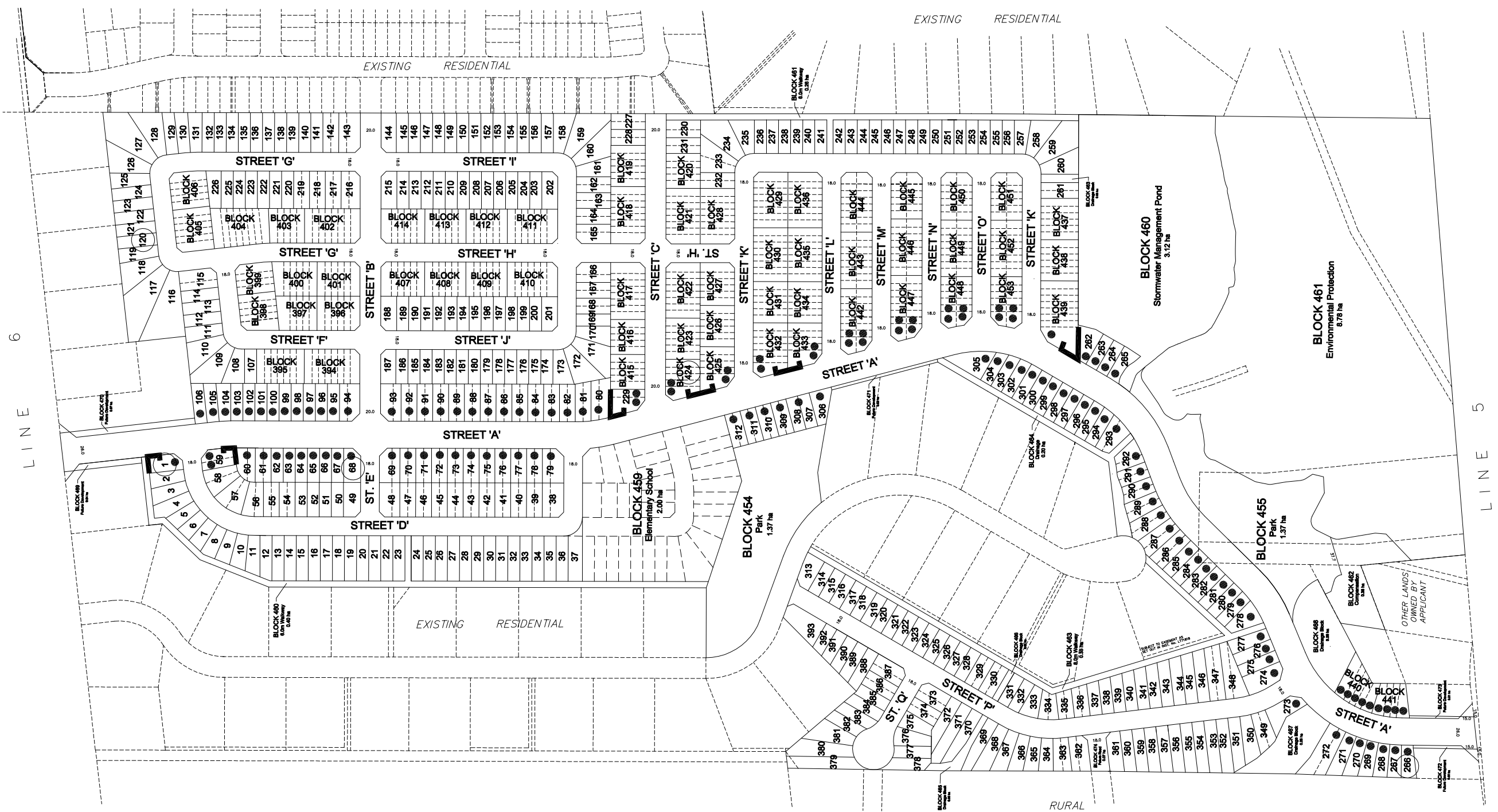
Date: October 2024 File: 15-097-01

**KEY PLAN
FIGURE 1**






LINE 6

LINE 5



Legend:

-  2.0 m high acoustic fence
-  Provision for adding central air conditioning and warning clause
See text and Table 3 for details.
-  Analyzed lot/block

N.T.S.

Proposed Residential Development
 Bradford Highlands Golf Course Re-development
 Town of Bradford West Gwillimbury
 County of Simcoe

Date: October 2024 Our File: 15-097-01



**DRAFT PLAN
 OF SUBDIVISION
 SHOWING MINIMUM
 NOISE MITIGATION
 MEASURES**

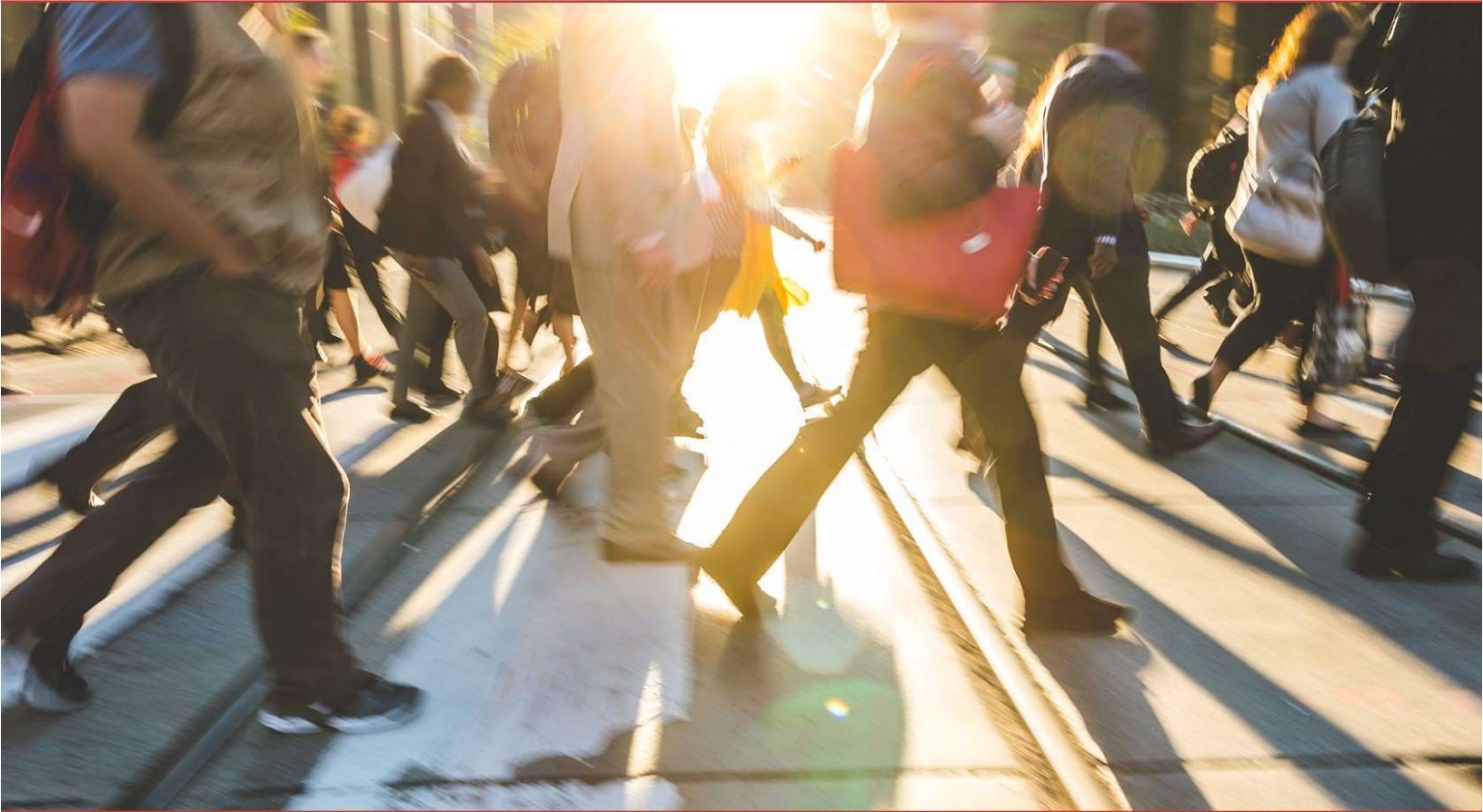
FIGURE 2

APPENDIX A

CORRESPONDENCE REGARDING ROAD TRAFFIC DATA

BRADFORD HIGHLANDS TRAFFIC IMPACT STUDY UPDATE

Town of Bradford West Gwillimbury
Official Plan Amendment, Zoning By-law Amendment & Draft Plan of Sub-Division Applications



Prepared For: ICG Golf Inc., Bayview-Wellington (Highlands) Inc. and 2523951 Ontario Inc. (the
"Bradford Highlands Joint Venture")

September 2023



BA Group

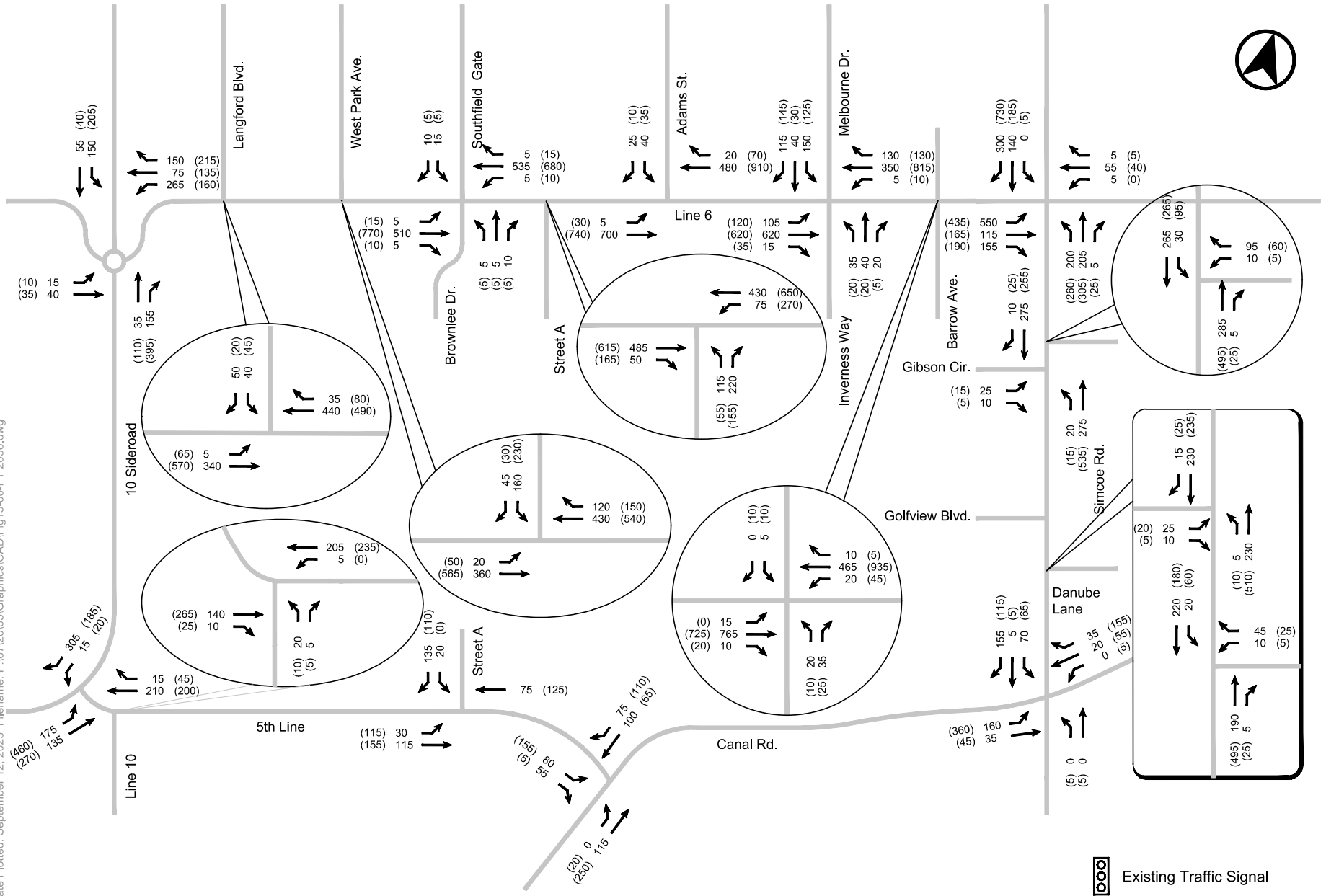


FIGURE 15 FUTURE TOTAL (2036) TRAFFIC VOLUMES

Town of Bradford West Gwillimbury Transportation Master Plan

July 2022

FINAL REPORT

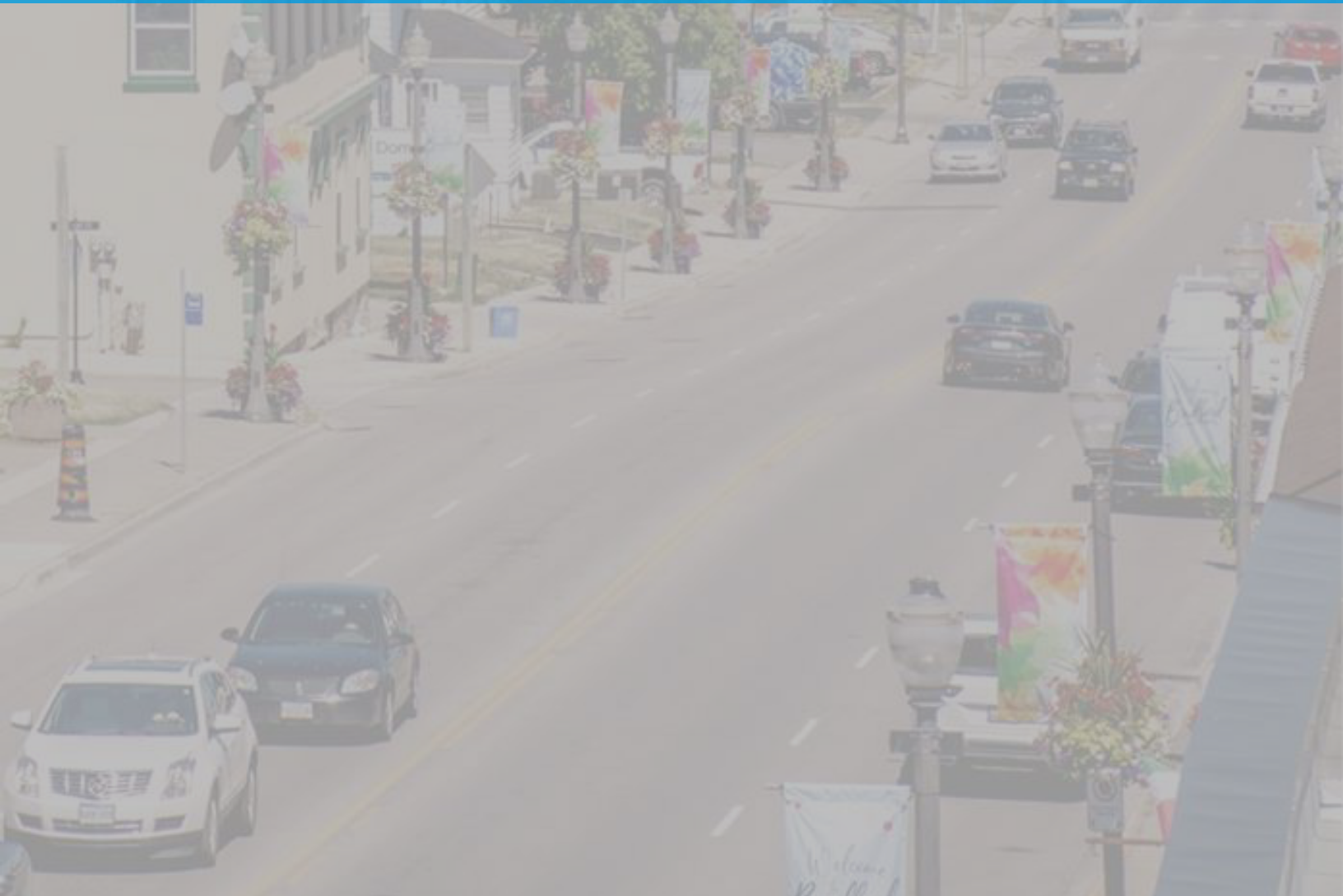


Figure 38. 2031 Scenario without the Bradford Link – AM Peak Hour – Urban Bradford

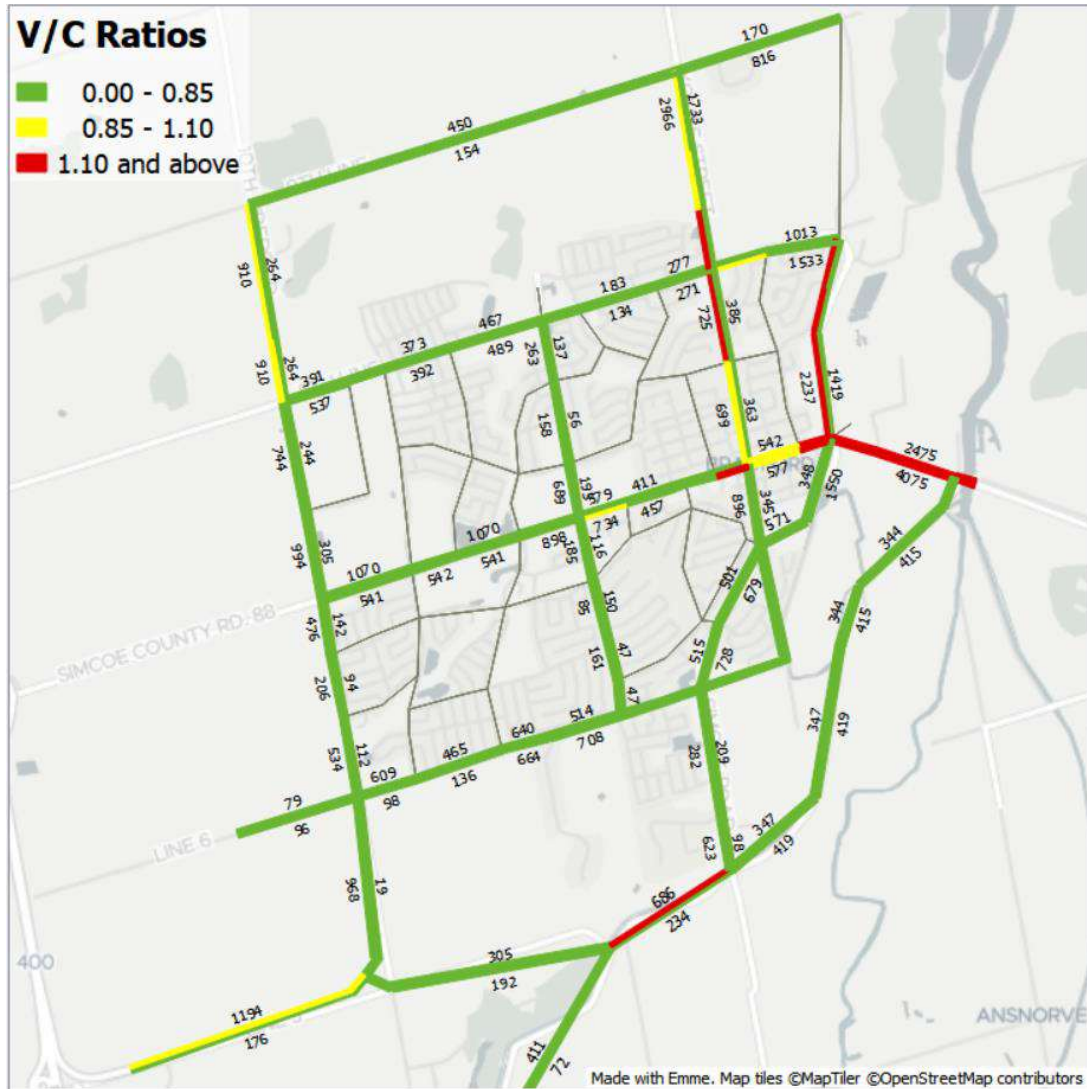
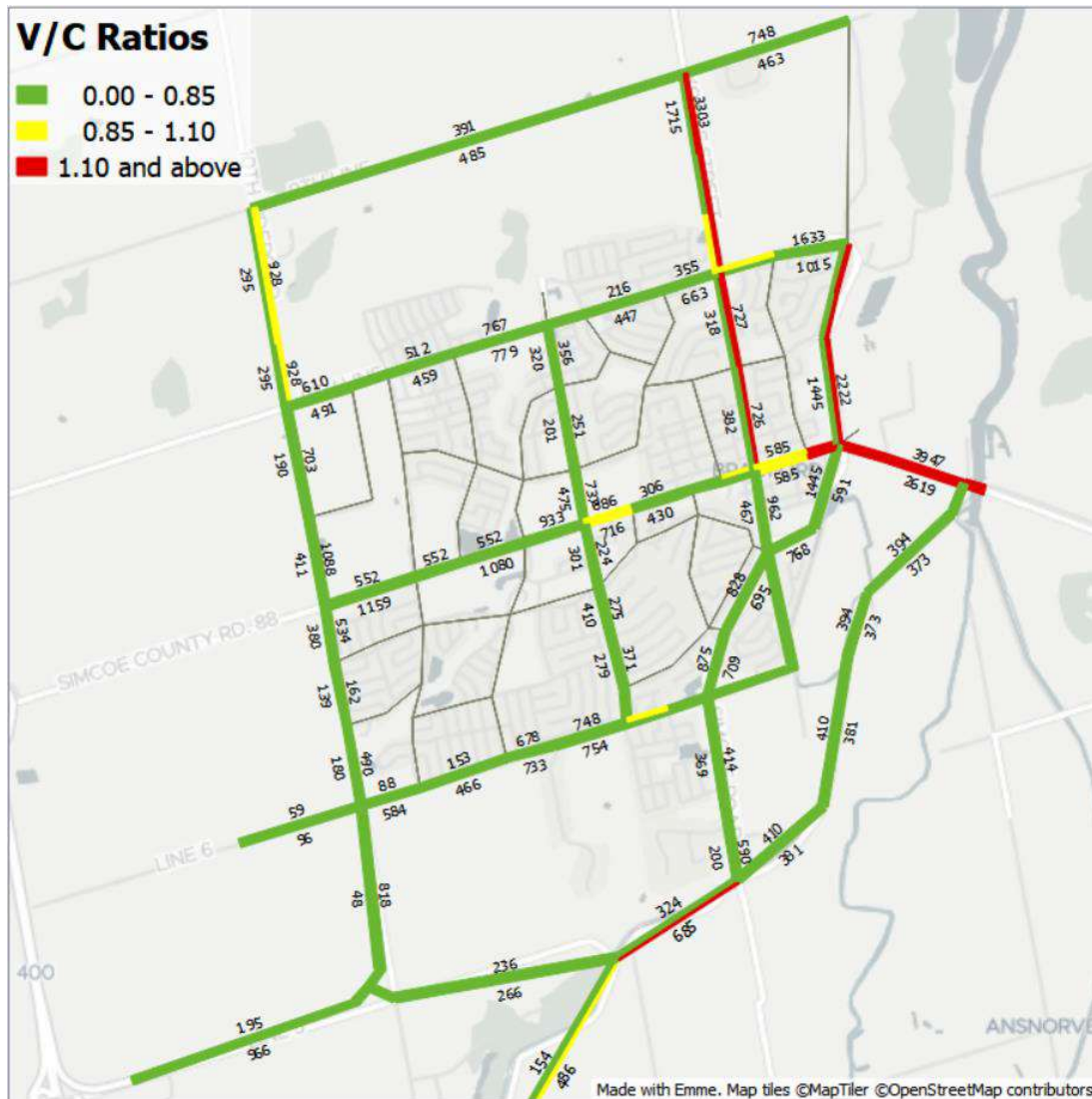


Figure 39. 2031 Scenario without the Bradford Link – PM Peak Hour – Urban Bradford



The more detailed analysis of urban Bradford shows congestion not only on Bridge Street and Yonge Street, but also Barrie Street, Holland Street, Dissette Street, Canal Road, and 10 Sideroad as the growth in population and employment exacerbates existing trends in traffic congestion and leads to new roads showing congestion. Through traffic would be expected to continue to use Bridge, Dissette, Yonge, and Holland Streets and Canal Road with no Bradford Link in place, putting added strain on the road network as the Town also accommodates additional residents and businesses.

6.4.6 Scenario with the Bradford Link

A scenario including the Bradford Link then was tested. As the key areas of interest for road congestion have been shown to be urban Bradford, the urban Bradford a.m. peak hour results are displayed in **Figure 40** and the p.m. peak hour results are shown in **Figure 41**.

Figure 40. 2031 Scenario with the Bradford Link – AM Peak Hour – Urban Bradford

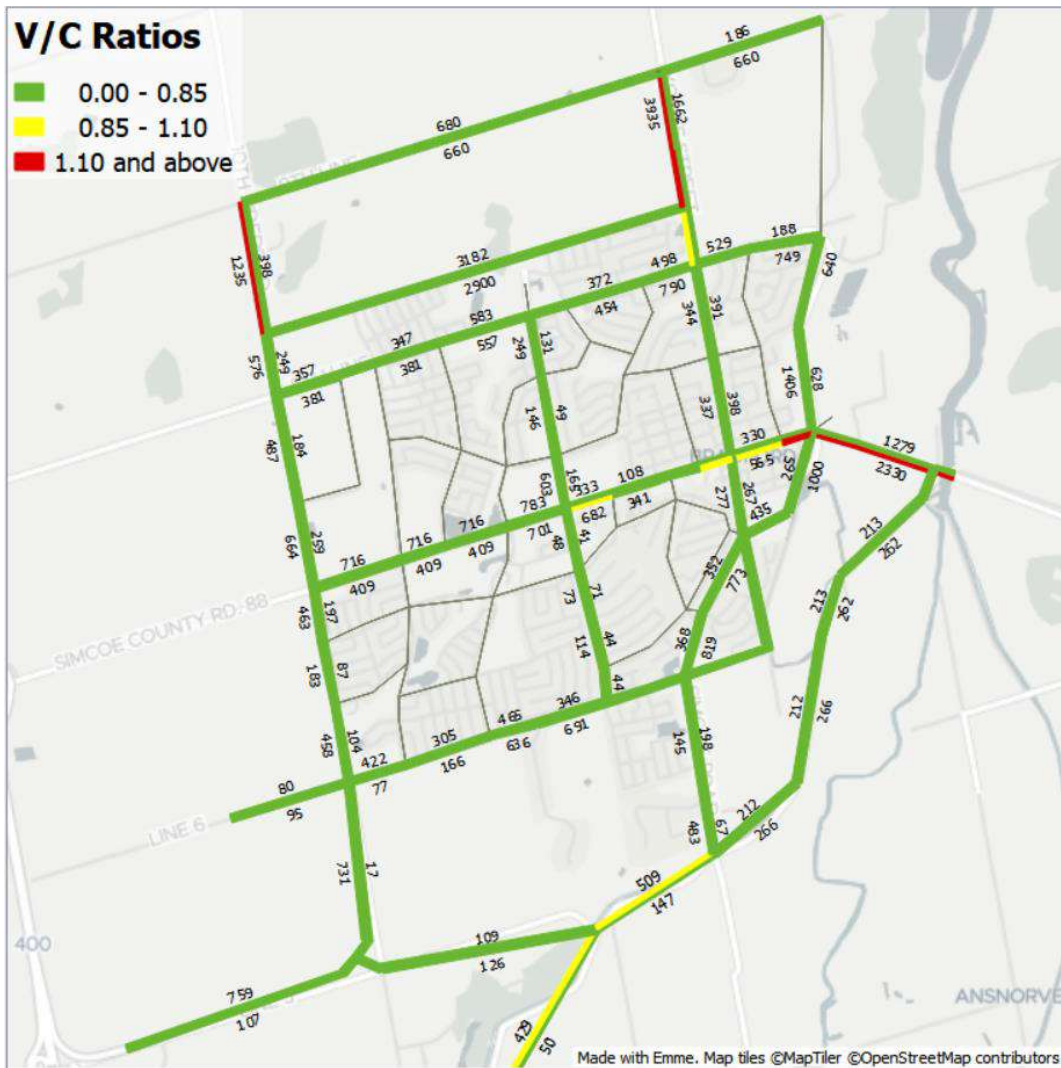
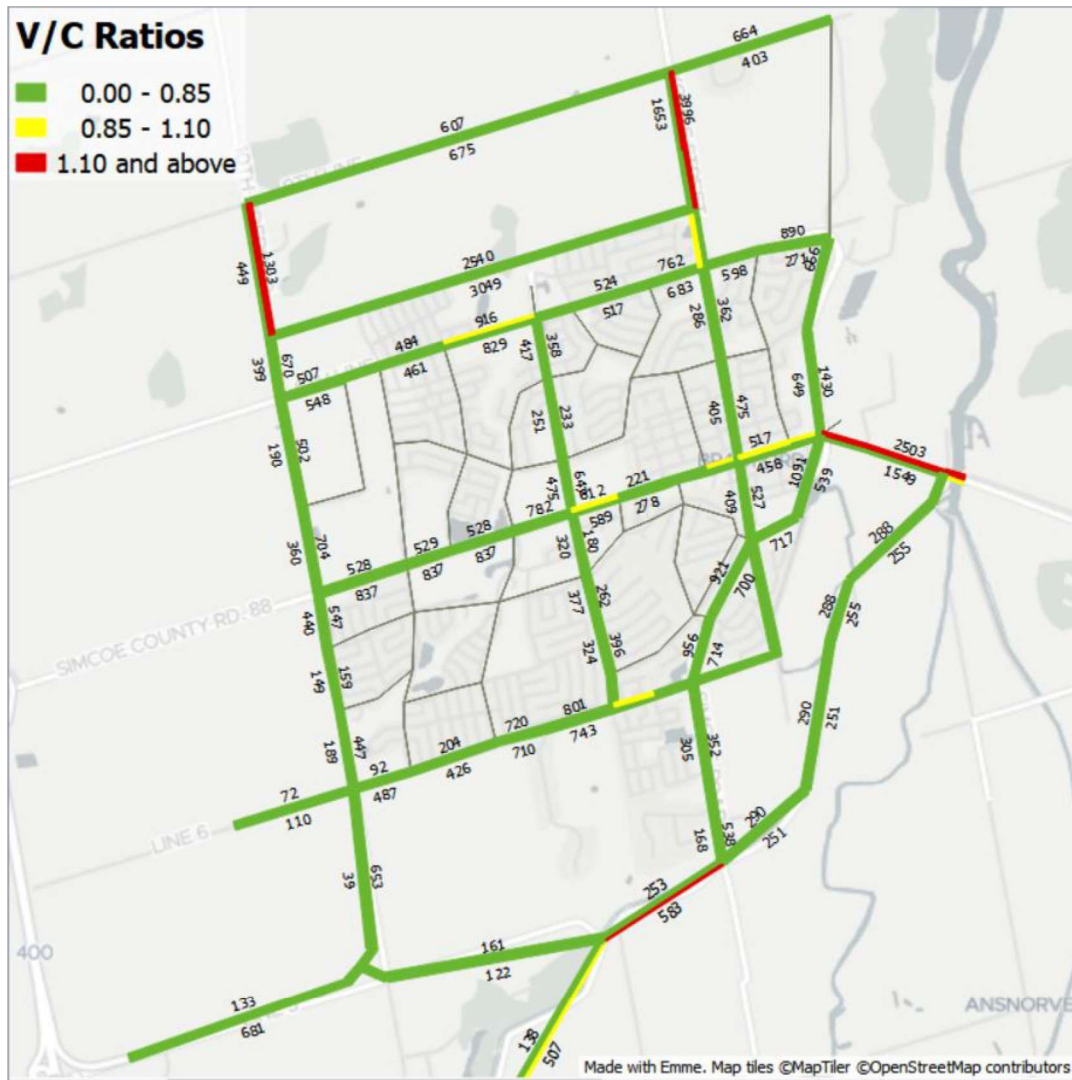


Figure 41. 2031 Scenario with the Bradford Link – PM Peak Hour – Urban Bradford



The Bradford Link would be expected to reduce traffic congestion on Bridge, Dissette, and Holland Street, as well as Canal Road. With Bradford Link highway interchanges at Yonge Street and 10 Sideroad, volumes on these streets would remain high and some congestion would be expected to occur. There are portions of Line 8 and Line 6 that would be expected to experience congestion as some links approach capacity.

The impact of the Bradford Link is shown graphically in **Figure 42**, where the green lines show roads with increased volumes compared to the scenario without the Bradford Link, and the red lines show roads with decreased volumes compared to without the Bradford Link. The Bradford Link is forecast to attract a considerable number of trips and help reduce volumes on Bridge, Dissette, Yonge, and Holland Streets, and on Canal Road and the Southwest Arterial Road. Regionally, there is forecast to be an increase in traffic on portions of Highway 404 and a decrease in traffic on portions of Highway 400.

APPENDIX B

ENVIRONMENTAL NOISE CRITERIA

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

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

SOUND LEVEL CRITERIA FOR ROAD AND RAIL NOISE

TABLE C-1

Sound Level Limit for Outdoor Living Areas

Road and Rail

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

TABLE C-2

Indoor Sound Level Limits

Road and Rail

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

SOUND LEVEL CRITERIA FOR AIRCRAFT NOISE

TABLE C-3

Outdoor Aircraft Noise Limit

Time Period	NEF/NEP
24-hour	30

TABLE C-4

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

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

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

SOUND LEVEL CRITERIA FOR STATIONARY SOURCES

TABLE C-5

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

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

TABLE C-6

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

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

TABLE C-7

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

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

TABLE C-8

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

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

SUPPLEMENTARY SOUND LEVEL LIMITS

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

TABLE C-9**Supplementary Indoor Sound Level Limits
Road and Rail**

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

TABLE C-10**Supplementary Indoor Aircraft Noise Limit
(Applicable over 24-hour period)**

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

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

APPENDIX C

SAMPLE CALCULATION OF PREDICTED UNMITIGATED SOUND LEVELS DUE TO ROAD TRAFFIC

APPENDIX C-1
SAMPLE CALCULATION OF SOUND EXPOSURE

FILE: 15-097-01
NAME: Bradford Highlands Golf Course Re-development
REFERENCE DRAWINGS: Draft Plan of Subdivision
LOCATION: Block 424 (west unit), TH block flanking Street A, 1.5 m above ground, **rear yard**

Noise Source:	Street A
Time Period:	16 hr. (day)
Distance (m):	17.50

CALCULATION OF SOUND EXPOSURE*

Reference Leq (dBA)*:	61.21
Height and/or Distance Correction (dBA):	-1.11
Finite Element Correction (dBA):	-1.87
Allowance for Screening (dBA):	0.00
Allowance for Future Growth (dBA):	incl.

LeqDay (dBA):	58.24
---------------	-------

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

Filename: flsary1.te Time Period: Day 16 hours
Description: Block 424 (west unit), flankage along Street A, rear yard

Road data, segment # 1: Street A (day)

```
-----
Car traffic volume : 5573   veh/TimePeriod  *
Medium truck volume : 168   veh/TimePeriod  *
Heavy truck volume  : 64    veh/TimePeriod  *
Posted speed limit  : 50 km/h
Road gradient       : 4 %
Road pavement      : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 6450
Percentage of Annual Growth         : 0.00
Number of Years of Growth           : 0.00
Medium Truck % of Total Volume      : 2.90
Heavy Truck % of Total Volume       : 1.10
Day (16 hrs) % of Total Volume     : 90.00
```

Data for Segment # 1: Street A (day)

```
-----
Angle1  Angle2      : -90.00 deg  60.00 deg
Wood depth      : 0          (No woods.)
No of house rows : 0
Surface         : 1          (Absorptive ground surface)
Receiver source distance : 17.50 m
Receiver height  : 1.50 m
Topography      : 2          (Flat/gentle slope; with barrier)
Barrier angle1  : -90.00 deg  Angle2 : 60.00 deg
Barrier height   : 0.00 m
Barrier receiver distance : 4.50 m
Source elevation : 0.00 m
Receiver elevation : 0.50 m
Barrier elevation : 0.00 m
Reference angle  : 0.00
```

Results segment # 1: Street A (day)

Source height = 1.02 m

Barrier height for grazing incidence

```
-----
Source      ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.02 ! 1.50 ! 1.75 ! 1.75
```

ROAD (0.00 + 58.24 + 0.00) = 58.24 dBA

```
-----
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
-90    60    0.66 61.21 0.00 -1.11 -1.87 0.00 0.00 -0.11 58.12*
-90    60    0.66 61.21 0.00 -1.11 -1.87 0.00 0.00 0.00 58.24
-----
```

* Bright Zone !

Segment Leq : 58.24 dBA

Total Leq All Segments: 58.24 dBA

APPENDIX C-2
SAMPLE CALCULATION OF SOUND EXPOSURE

FILE: 15-097-01

NAME: Bradford Highlands Golf Course Re-development

REFERENCE DRAWINGS: Draft Plan of Subdivision

LOCATION: Block 424 (west unit), TH block flanking Street A, 4.5 m above grade, **side wall**

Noise Source:

Street A

Time Period:

16 hr. (day)

Distance (m):

15.50

CALCULATION OF SOUND EXPOSURE*

Reference Leq (dBA)*:

61.21

Height and/or Distance Correction (dBA):

-0.23

Finite Element Correction (dBA):

-1.33

Correction for Distance (dBA):

0.00

Allowance for Future Growth (dBA):

incl.

LeqDay (dBA):

59.66

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

APPENDIX C-3
SAMPLE CALCULATION OF SOUND EXPOSURE

FILE: 15-097-01

NAME: Bradford Highlands Golf Course Re-development

REFERENCE DRAWINGS: Draft Plan of Subdivision

LOCATION: Block 424 (west unit), TH block flanking Street A, 4.5 m above grade, **side wall**

Noise Source:

Street A

Time Period:

8 hr. (night)

Distance (m):

15.50

CALCULATION OF SOUND EXPOSURE*

Reference Leq (dBA)*:

54.67

Height and/or Distance Correction (dBA):

-0.23

Finite Element Correction (dBA):

-1.33

Correction for Distance (dBA):

0.00

Allowance for Future Growth (dBA):

incl.

LeqNight (dBA):

53.12

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

Filename: flsaswl.te Time Period: Day/Night 16/8 hours
Description: Block 424 (west unit), flankage along Street A, side wall

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

```
-----
Car traffic volume : 5573/619    veh/TimePeriod *
Medium truck volume : 168/19    veh/TimePeriod *
Heavy truck volume : 64/7        veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient       : 4 %
Road pavement       : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 6450
Percentage of Annual Growth        : 0.00
Number of Years of Growth         : 0.00
Medium Truck % of Total Volume    : 2.90
Heavy Truck % of Total Volume     : 1.10
Day (16 hrs) % of Total Volume    : 90.00
```

Data for Segment # 1: Street A (day/night)

```
-----
Angle1    Angle2                : -90.00 deg    90.00 deg
Wood depth                        : 0             (No woods.)
No of house rows                  : 0 / 0
Surface                            : 1             (Absorptive ground surface)
Receiver source distance         : 15.50 / 15.50 m
Receiver height                   : 4.50 / 4.50 m
Topography                        : 1             (Flat/gentle slope; no barrier)
Reference angle                   : 0.00
```

Results segment # 1: Street A (day)

Source height = 1.02 m

```
ROAD (0.00 + 59.66 + 0.00) = 59.66 dBA
Angle1 Angle2    Alpha RefLeq    P.Adj    D.Adj    F.Adj    W.Adj    H.Adj    B.Adj    SubLeq
-----
-90      90      0.58    61.21    0.00    -0.23    -1.33    0.00    0.00    0.00    59.66
-----
```

Segment Leq : 59.66 dBA

Total Leq All Segments: 59.66 dBA

Results segment # 1: Street A (night)

Source height = 1.02 m

```
ROAD (0.00 + 53.12 + 0.00) = 53.12 dBA
Angle1 Angle2    Alpha RefLeq    P.Adj    D.Adj    F.Adj    W.Adj    H.Adj    B.Adj    SubLeq
-----
-90      90      0.58    54.67    0.00    -0.23    -1.33    0.00    0.00    0.00    53.12
-----
```

Segment Leq : 53.12 dBA

Total Leq All Segments: 53.12 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.66
 (NIGHT): 53.12

APPENDIX D

SAMPLE CALCULATION OF ARCHITECTURAL COMPONENT SELECTION

APPENDIX E

SAMPLE CALCULATION OF SOUND BARRIER ANALYSES

Filename: flsaryl.te Time Period: Day 16 hours
Description: Flankage along Street A, TH block, rear yard

Road data, segment # 1: Street A (day)

```
-----
Car traffic volume : 5573   veh/TimePeriod *
Medium truck volume : 168   veh/TimePeriod *
Heavy truck volume : 64    veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient      : 4 %
Road pavement     : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 6450
Percentage of Annual Growth       : 0.00
Number of Years of Growth         : 0.00
Medium Truck % of Total Volume    : 2.90
Heavy Truck % of Total Volume     : 1.10
Day (16 hrs) % of Total Volume    : 90.00
```

Data for Segment # 1: Street A (day)

```
-----
Angle1 Angle2      : -90.00 deg  60.00 deg
Wood depth          : 0          (No woods.)
No of house rows   : 0
Surface            : 1          (Absorptive ground surface)
Receiver source distance : 17.50 m
Receiver height    : 1.50 m
Topography         : 2          (Flat/gentle slope; with barrier)
Barrier angle1     : -90.00 deg  Angle2 : 60.00 deg
Barrier height     : 0.00 m
Barrier receiver distance : 4.50 m
Source elevation   : 0.00 m
Receiver elevation : 0.50 m
Barrier elevation  : 0.00 m
Reference angle    : 0.00
```

Results segment # 1: Street A (day)

Source height = 1.02 m

Barrier height for grazing incidence

```
-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.02 !      1.50 !      1.75 !      1.75
```

ROAD (0.00 + 58.24 + 0.00) = 58.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	60	0.66	61.21	0.00	-1.11	-1.87	0.00	0.00	-0.11	58.12*
-90	60	0.66	61.21	0.00	-1.11	-1.87	0.00	0.00	0.00	58.24

* Bright Zone !

Segment Leq : 58.24 dBA

Total Leq All Segments: 58.24 dBA

Barrier table for segment # 1: Street A (day)

Barrier Height	Elev of Barr Top	Road dBA	Tot Leq dBA
1.50	1.50	58.24	58.24
1.60	1.60	58.24	58.24
1.70	1.70	58.24	58.24
1.80	1.80	53.41	53.41
1.90	1.90	53.31	53.31
2.00	2.00	53.10	53.10
2.10	2.10	52.81	52.81
2.20	2.20	52.45	52.45
2.30	2.30	52.03	52.03
2.40	2.40	51.58	51.58
2.50	2.50	51.11	51.11
2.60	2.60	50.63	50.63
2.70	2.70	50.15	50.15
2.80	2.80	49.68	49.68
2.90	2.90	49.22	49.22
3.00	3.00	48.77	48.77
3.10	3.10	48.35	48.35
3.20	3.20	47.94	47.94
3.30	3.30	47.54	47.54
3.40	3.40	47.17	47.17

Leq (Day) with a 2.0 m high acoustic fence = 53.10 dBA