

Little D Holdings Ltd.

Detailed Noise Study

Banwell and Mulberry Multi-Residential Development
Windsor, Ontario

19-9073

August 2026

Submitted by
Dillon Consulting Limited

Matthew Brenner
51 Breithaupt St., Suite 200
Kitchener, ON N2H 5G5
P: 519.571.9833
E: MBrenner@dillon.ca

Table of Contents

1.0	Introduction	1
1.1	Purpose and Objectives	1
1.2	Study Updates	1
1.3	The Project and Surrounding Areas.....	1
2.0	Transportation Noise Assessment	2
2.1	Noise Criteria	2
2.2	Transportation Sources	4
2.3	Predicted Sound Level.....	5
2.3.1	Sensitive Receptor Locations	6
2.3.2	Predicted Transportation Noise Impacts	6
2.4	Noise Control Measures	7
2.4.1	Facade Construction Recommendations.....	7
2.4.2	Ventilation Requirements and Warning Clauses	7
2.4.3	Outdoor Living Areas Mitigation	7
2.4.4	TNM Model Verification.....	8
3.0	Stationary Noise Assessment	10
3.1	MECP Guideline D-6 Compatibility Between Industrial Facilities	10
3.2	Facilities.....	10
3.3	Stationary Noise Criteria and Area Classification.....	12
3.4	Stationary Sources.....	13
3.4.1	Noise Sensitive Points of Reception.....	14
3.5	Stationary Noise Modelling	14
3.5.1	Predicted Noise Impacts.....	14
4.0	Conclusions	18
4.1	Transportation Noise Assessment.....	18
4.2	Stationary Noise Assessment	18

5.0	Closure	19
------------	----------------	-----------

References

Figures

Figure 1:	Site and Surrounding Area
Figure 2a and 2b:	Predicted Transportation Impacts
Figures 3-7:	Predicted Stationary Noise Impacts

Table

Table 1: Indoor Sound Level Limits for Road Noise	2
Table 2: Requirements for Building Component Assessment	3
Table 3: Ventilation and Warning Clause Requirements for Combined Road and Rail Noise	3
Table 4: OLA Level Limits for Combined Road and Rail Noise.....	4
Table 5: Future (2037) Road Traffic Data	5
Table 6: Road Noise Prediction Summary Table.....	6
Table 7: Road Noise Prediction Summary Table - Mitigated.....	8
Table 8: TNM Protocol in Cadna/A and ORNAMENT Comparison.....	9
Table 9: Guideline D-6 Influence Area and Recommended Minimum Separation Distance	10
Table 10: Facilities with Proximity to Proposed Development	11
Table 11: Exclusionary Limits for Stationary Noise Sources	12
Table 12: Stationary Noise Sources	13
Table 13: Stationary Noise Impact Summary Table - Surrounding Industries on Proposed Development	15

Appendices

A	Conceptual Development Plan
B	Road Traffic Data
C	Warning Clauses
D	STAMSON Modelling
E	Building Component Analysis
F	Barrier Location and Specifications

G D-6 Classification Criteria

H Noise Source Sound Power Levels

1.0 Introduction

1.1 Purpose and Objectives

Dillon Consulting Limited (Dillon) was retained by Little D Holdings Ltd. (Developer) to update the transportation noise assessment and to complete a stationary noise assessment as requested by the City of Windsor. This study is based on a worst-case scenario multi-residential development. The proposed development is located at the southeast corner of Banwell Road and Mulberry Drive in Windsor, Ontario. This study has been completed in support of a Zoning By-law and Official Plan Amendment application for the proposed development.

The noise assessment presented herein was prepared in accordance with the guidelines and requirements of the City of Windsor, the Ontario Ministry of Environment, Conservation and Parks (MECP) noise publication NPC-300. This assessment focuses on the noise impacts from nearby transportation and stationary sources on the proposed development.

1.2 Study Updates

The noise study has been updated to address the City of Windsor comments (dated November 5th, 2025). This report includes the analysis of the new interchange under construction at Banwell Road and EC Row Expressway, as well as stationary sources from the NextStar Energy facility and the surrounding commercial plazas. Up-to-date traffic counts have been received from the City of Windsor Transportation Planning division.

1.3 The Project and Surrounding Areas

It is Dillon's understanding that the Developer intends to re-zone the Proposed Development lands to residential use for the purpose of selling the lands. As such, a detailed site plan for the Proposed Development does not exist at the time of assessment. A concept plan including two four-storey apartment buildings is being used as a potential worst-case scenario for noise impacts on the property (shown in **Appendix A**).

The significant transportation noise sources considered in the assessment are Banwell Road, west of the site, and the E.C. Row Expressway, south of the site. The stationary noise sources considered are the NextStar Energy facility, south of the site, Banwood Square, Banwell Business Circle, Alexander Daycare Center, and Mercato Fresh, all located northwest of the site. The subject site and surrounding area is shown on **Figure 1**.

2.0 Transportation Noise Assessment

The transportation sources with the potential to impact the proposed development include road traffic along Banwell Road and the E.C. Row Expressway. Impacts from road sources were predicted and compared against the applicable criteria in the Ontario Ministry of Environment, Conservation and Parks (MECP) noise guideline publication, *NPC 300 – Environmental Noise Guideline – Stationary and Transportation Sources – Approvals and Planning* (2013). NPC-300 outlines noise level criteria for sensitive land uses, which assist in determining requirements for façade construction, ventilation requirements, warning clauses, and potential noise barriers for the proposed development.

2.1 Noise Criteria

The applicable transportation noise criteria, as outlined in Part C of NPC-300, are presented in **Table 1** through **Table 4**. **Table 1** summarizes the indoor sound level limits from road noise based on the type of indoor space assessed and time of day. The indoor noise levels are based on the assumption of closed windows and doors.

Table 1: Indoor Sound Level Limits for Road Noise

Type of Space	Time Period	Equivalent Sound Level - L_{eq} Road
General offices, reception areas, retail stores, etc.	Daytime (07:00 - 23:00)	50 dBA
Living/dining areas of residences, hospitals, nursing homes, schools, daycares, etc.	Daytime (07:00 - 23:00)	45 dBA
Living/dining areas of residences, hospitals, nursing homes, etc. (except schools and daycares)	Night-time (23:00 - 07:00)	45 dBA
Sleeping quarters of residences	Daytime (07:00 - 23:00)	45 dBA
	Night-time (23:00 - 07:00)	40 dBA
Sleeping quarters of hotels	Night-time (23:00 - 07:00)	45 dBA

Table 2 outlines the maximum equivalent plane-of-window sound levels for road noise where if exceeded, a detailed building component design assessment is required to ensure the indoor sound level limits (see **Table 1**) are achieved.

Table 2: Requirements for Building Component Assessment

Assessment Location	Time Period	Equivalent Sound Level - L_{eq} Road
Plane of window for living area or sleeping quarters	Daytime (07:00 - 23:00)	65 dBA
	Night-time (23:00 - 07:00)	60 dBA

Table 3 summarizes potential noise warning clauses and ventilation requirements that should be used to warn of potential annoyance due to existing surface transportation noise sources.

Table 3: Ventilation and Warning Clause Requirements for Combined Road and Rail Noise

Assessment Location	Time Period	Equivalent Sound Level - L_{eq} Road/Rail	Ventilation and Warning Clause Requirements ^[1]
Plane of window for living area or sleeping quarters	Daytime (07:00 - 23:00)	≤ 55 dBA	No Requirement
		> 55 dBA and ≤ 65 dBA	Provision for the installation of central air conditioning with a Type C warning clause
		> 65 dBA	Installation of central air conditioning with a Type D warning clause
Plane of window for living area or sleeping quarters	Nighttime (23:00 - 7:00)	≤ 50 dBA	No Requirement
		> 50 dBA and ≤ 60 dBA	Provision for the installation of central air conditioning with a Type C warning clause
		> 60 dBA	Installation of central air conditioning with a Type D warning clause

Note: ^[1] Warning clause types and requirements are provided in **Appendix C**.

The applicable noise criteria for Outdoor Living Areas (OLAs) specific to surface transportation are presented in **Table 4**. If the 16-Hour Equivalent Sound Level (Leq 16hr) at an OLA is greater than 55 dBA and less than or equal to 60 dBA, noise control measures may be applied to reduce the sound level to 55 dBA. Otherwise, prospective purchasers or tenants should be informed of potential elevated noise levels by way of a 'Type A' warning clause. For a Leq 16h of greater than 60 dBA, noise mitigation measures are required to reduce the noise levels to 55 dBA or less.

Table 4: OLA Level Limits for Combined Road and Rail Noise

Assessment Location	Equivalent Sound Level - Leq 16hr ^[1] Road/Rail	Noise Control Measures and Warning Clause Requirements ^[2]
Outdoor Living Area	≤ 55 dBA	No requirement
	> 55 dBA and ≤ 60 dBA	Installation of noise control measure OR a Type A warning clause ^[1]
	> 60 dBA	Installation of noise control measure with a Type B warning clause

Notes: ^[1] Daytime only (07:00 - 23:00)

^[2] Warning clause types and requirements are provided in Appendix C

2.2 Transportation Sources

The development area is located east of Banwell Road and north of the E.C. Row Expressway. The Average Annual Daily Traffic (AADT) and truck percentages were sourced from counts provided by the City of Windsor and from the Banwell Road/ E.C. Row Interchange and Corridor Improvements Noise Impact Assessment. A conservative growth rate of 2% per annum was applied to forecast the potential worst case AADT for the year 2037. A day/night traffic split of 90 / 10 was applied to Banwell Road, while a 67 / 33 split was applied to the E.C. Row Expressway and County Road 22, in line with the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT).

The forecasted future (2037) road traffic data is presented in **Table 5** and the road segments are shown on **Figure 1**. All traffic data used in modelling road traffic is included in **Appendix B**.

Table 5: Future (2037) Road Traffic Data

Roadway	Location	AADT	Heavy Vehicle Percentage	Speed Limit (km/h)
Banwell Road	North of Interchange	25700	4%	50 ^[1]
Banwell Road	South of Interchange	24400	3%	60
E.C. Row Expressway	West of Interchange	76900	5%	100 ^[2]
Essex County Road 22	East of Interchange	62300	5%	80
Off-Ramp	Eastbound Off-Ramp	5800	6%	60
On-Ramp	North – West Ramp	5000	3%	60
On-Ramp	South – West Ramp	9600	2%	60
Off-Ramp	Westbound Off-Ramp	15200	3%	60
On-Ramp	North – East Ramp	3500	6%	60
On-Ramp	South – East ramp	2500	6%	60

Note:

[1] Roundabout speeds were assumed to be 30 km/hr.

[2] Future Build E.C. Row Expressway speed limits were assumed to be consistent with the existing speed limits approximately 420 m west of the existing interchange.

2.3 Predicted Sound Level

The noise analysis was completed using Cadna/A, a noise propagation software. The Cadna/A software includes the implementation of the Transportation Noise Model (TNM) roadway algorithm. The model can incorporate various site specific features, such as elevation, berms, absorptive grounds, and barriers to accurately predict noise levels at specific receptors, pertaining to noise emissions from a particular noise source. The model accounts for reduction in sound level due to increased distance and geometrical spreading, air absorption, ground attenuation, and acoustical shielding by intervening structures and topography. The model is considered conservative as it represents atmospheric conditions that promote propagation of sound from source to receptor.

As the current ministry approved model for transportation noise is the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT), the results of the TNM model were confirmed through equivalent modelling at a representative receptor. The model verification is described in **Section 2.4.3** and **Appendix D**.

2.3.1 Sensitive Receptor Locations

The following noise sensitive points of reception were assessed for transportation noise impacts:

- Façade / window locations of the potential buildings
- The potential outdoor amenity area

2.3.2 Predicted Transportation Noise Impacts

Table 6 summarizes the predicted noise levels from the road noise sources at the sensitive receptors within the Proposed Development.

Table 6: Road Noise Prediction Summary Table

Assessment Location	Road Noise Impacts - $L_{eq}^{[1],[2]}$, [dBA]	
	Daytime (07:00-23:00)	Nighttime (23:00-07:00)
West Building - North Façade	61	54
West Building - East Façade	56	56
West Building - South Façade	64	61
West Building - West Façade	66	61
East Building - North Façade	55	54
East Building - East Façade	62	62
East Building - South Façade	65	63
East Building - West Façade	63	59
Amenity Area	64	N/A ^[3]

Notes: [1] L_{eq} represents maximum predicted impacts.

[2] Predicted noise levels that exceed the applicable limits are presented in **bold**.

[3] OLAs are only assessed during daytime hours.

The predicted transportation sound levels for combined road impacts at the sensitive façades of Proposed Development are shown on **Figure 2a**.

2.4 Noise Control Measures

2.4.1 Façade Construction Recommendations

Based on the predicted façade sound levels shown in **Table 6**, and the threshold criteria outlined in **Table 2**, a detailed building component design analysis is required for both worst-case buildings. An initial building component analysis is shown in **Appendix E**. As detailed floor plans are not yet available, typical unit layouts were assumed for the purposes of this assessment. The predicted maximum impacts for road noise were used to assess the required glazing for the buildings. The analysis determined a minimum required glazing of sound transmission class (STC) 28.

Windows which meet the structural and energy saving requirements of the Ontario Building Code typically have STC29 / STC30 ratings, upgraded glazing is; therefore, not anticipated to be required for the Proposed Development.

Windows should be carefully selected to ensure the ensure assembly (frame and glazing) meets the specified STC ratings. It is recommended that manufacturer tests and specification be reviewed by an acoustical consultant upon selection.

Sensitive spaces located on corners of buildings, which have multiple façade exposure and potential contribution from multiple sources may require an STC increase of 3. As the design progresses, the façade and glazing requirements should be reviewed by an Acoustical Consultant, ideally at the Site Plan Approval (SPA) stage, to confirm or update the above recommended STC ratings.

2.4.2 Ventilation Requirements and Warning Clauses

Based on the predicted façade sound levels shown in **Table 6**, and the threshold criteria outlined in **Table 3**, both worst-case buildings would require the Installation of central air conditioning and a 'Type D' warning clause.

All warning clauses should be included in agreements that are registered on Title for all Offers of Purchase and Sale, lease/rental agreements, and condominium declarations. The list of applicable warning clauses required for the proposed development are provided in **Appendix C**.

2.4.3 Outdoor Living Areas Mitigation

As shown in **Table 6** the predicted sound level at the proposed amenity area is greater than 60 dBA. Therefore, 'Type B' warning clause and noise control measure are required. The following are potential noise control measures:

- Distance setback with soft intervening ground;
- Insertion of noise-insensitive land uses between the source and sensitive receptor;

- Orientation of the site and buildings to provide sheltered zones for rear yards;
- Earth berms; and
- Acoustic barriers.

In this scenario the installation of an acoustic barrier is the most feasible option. A 3-m tall acoustic barrier along the southwest side of the amenity area would attenuate the transportation noise at the OLA to under 55 dBA, with this barrier a 'Type B' warning clause would no longer be required. The mitigates noise impacts are shown in **Table 7** and in **Figure 2b**. The location and specifications of the acoustic barrier are in **Appendix F**. As information on the final grading of the surrounding area becomes available this analysis should be redone.

Table 7: Road Noise Prediction Summary Table - Mitigated

Assessment Location	Road Noise Impacts - $L_{eq}^{[1],[2]}$, [dBA]	
	Daytime (07:00-23:00)	Nighttime (23:00-07:00)
Amenity Area	55	N/A ^[3]

Notes: [1] L_{eq} represents maximum predicted impacts.

[2] Predicted noise levels that exceed the applicable limits are presented in **bold**.

[3] OLAs are only assessed during daytime hours.

All acoustic barriers should have a minimum surface density of 20 kg/m³, be structurally sound, appropriately designed to withstand wind and snow load, and constructed without cracks or surface gaps. Any gaps under the barrier that are necessary for drainage purposes should be minimized and localized, so that the acoustical performance of the barrier is maintained. All acoustic barriers should adhere to the Guelph Guideline's Specifications for Noise Barriers.

2.4.4 TNM Model Verification

For the purpose of verifying the accuracy of the TNM model implemented through Cadna/A, confirmatory modelling was completed using the ministry approved model for transportation noise analysis, ORNAMENT, implemented through STAMSON Version 5.04.

The STAMSON model is capable of incorporating various site specific features, such as elevation, berms, absorptive grounds, and barriers to accurately predict noise levels at specific receptors, pertaining to noise emissions from a particular noise source. The model is considered conservative as it represents atmospheric conditions that promote propagation of sound from source to receptor.

Table 8: TNM Protocol in Cadna/A and ORNAMENT Comparison

Assessment Location	TNM Cadna/A Result	ORNAMENT STAMSON Result	TNM Cadna/A Modelling Parameters	ORNAMENT STAMSON Modelling Parameters
Outdoor Amenity Area	64 dBA	64 dBA	Ground Absorption = 0.3	Reflective Ground

The results indicate that the predicted noise impacts obtained through TNM align with the results expected through STAMSON. The receptor location and TNM results are shown on **Figure 2a** while the STAMSON model output is provided in **Appendix D**.

3.0 Stationary Noise Assessment

A review of the site and surrounding area has been conducted to identify potential stationary sources that have the potential to impact the proposed sensitive use. A site visit was completed by Dillon staff on April 8th, 2026, for the purpose of classifying facilities in proximity to the proposed developments, identifying potential sources of noise, and classifying the acoustic environment.

3.1 MECP Guideline D-6 Compatibility Between Industrial Facilities

The MECP’s land-use compatibility guidelines (D-series) are intended to prevent or minimize the encroachment of sensitive land uses upon industrial/commercial land uses and vice versa, as these two types of land uses are normally incompatible, due to possible adverse effects (e.g., noise) on the sensitive land use. As per the guideline, potential noise impact from industrial or commercial establishments within the potential influence area or recommended minimum separation distance, as outlined in D-6 (see **Table 9**), should be assessed.

Table 9: Guideline D-6 Influence Area and Recommended Minimum Separation Distance

Industrial Classification ^[1]	Area of Influence	Recommended Minimum Separation Distance
Class I	70 m	20 m
Class II	300 m	70 m
Class III	1000 m	300 m

Note: [1] Industrial classifications are outlined in Guideline D-6, and presented in **Appendix G**.

3.2 Facilities

The land use planning guide, *D-6 Compatibility between Industrial Facilities*, was used for the classification of the surrounding industrial facilities and the applicable setback distances in relation to the proposed sensitive land use. The criteria for classification of industrial categories are presented in **Appendix G**.

The surrounding industries that were identified with the potential to have noise impacts on the proposed development are summarized in **Table 10**. Setback distances from the industry’s property line to both the Proposed Development’s property line and nearest sensitive receptor (POR) are included.

Table 10: Facilities with Proximity to Proposed Development

Facility and Address	Setback from Proposed Development		Industrial Classification	Significant Equipment
	Property Line	Nearest POR		
NextStar Energy, 1 NextStar Way, Windsor, ON	720 m	730 m	III	HVAC Equipment, Onsite Truck Movements ^[1]
Banwood Square, 3335 Banwell Road, Windsor, ON	54 m	70 m	I	HVAC Equipment
Banwell Business Circle, 3315 Banwell Rd, Windsor, ON	94 m	132 m	I	HVAC Equipment
Alexander's Daycare Centre – Windsor, 3990 Wildwood Dr, Windsor, ON	180 m	140 m	I	HVAC Equipment
Mercato Fresh, 3235 Banwell Rd, Windsor, ON	315 m	264 m	I	HVAC Equipment

Note: [1] The onsite truck movements are expected to be insignificant based on the relative heights and the significant separation distances. At worst they would be indistinguishable from the truck traffic on the E.C. Row Expressway.

Industries were classified based on site visit observations from publicly accessible areas and through publicly available information.

As shown in **Table 10**, the proposed development fully complies with the minimum separation distances in the D-6 guidelines. As the Next Star Energy and Banwood Square properties are within the D-6 area of influence distances, additional analysis of the potential noise impacts is warranted to confirm acceptable sound levels. As a conservative measure, our analysis includes the potential impacts for all of the properties identified in **Table 10**.

3.3 Stationary Noise Criteria and Area Classification

MECP Publication NPC-300 outlines applicable noise criteria for the proposed development associated with surrounding industrial and commercial stationary noise sources. The noise criteria are defined using area classifications (not to be confused with the D-6 industrial classifications), which are based on the receptor's existing acoustical environment. NPC-300 classification are as follows:

- Class 1 – Urban Area;
- Class 2 – Semi-Urban / Semi-Rural;
- Class 3 – Rural Area; and
- Class 4 – Areas of Redevelopment and Infill (typically in proximity of lawfully operating industrial / commercial facilities).

Different noise guideline limits for stationary noise sources apply to each area classification, as presented in **Table 11**.

Table 11: Exclusionary Limits for Stationary Noise Sources

Assessment Location	Time Period	Exclusionary Sound Level Limit - L_{eq} 1hr			
		Class 1	Class 2	Class 3	Class 4
Plane of window for living area or sleeping quarters ^[1]	Daytime (07:00 - 19:00)	50 dBA	50 dBA	45 dBA	60 dBA
	Evening (19:00 - 23:00)	50 dBA	50 dBA	40 dBA	60 dBA
	Nighttime (23:00 - 07:00)	45 dBA	45 dBA	40 dBA	55 dBA
Outdoor points of reception	Daytime (07:00 - 19:00)	50 dBA	50 dBA	45 dBA	55 dBA

Note: [1] The plane of window for living area or sleeping quarters will be referred to as the "façade" of a receptor.

During the site visit conducted on April 8th, 2026, it was observed that the acoustic environment surrounding the proposed development is dominated by transportation noise and general urban hum from nearby industries during the daytime. Based on the nature of the area, the Class 1 (urban) sound level limits would apply.

3.4 Stationary Sources

The assumed noise sources associated with the identified facilities in **Section 3.2** are outlined below in **Table 12**. Relevant noise source information was gathered from previous environmental approvals.

Table 12: Stationary Noise Sources

Noise Source ^[1]	Associated Facility	Source Type
5-ton HVAC unit	NextStar Energy	Steady
	Banwood Square	Steady
	Banwell Business Circle	Steady
	Alexander's Daycare Centre	Steady
	Mercato Fresh	Steady
10-ton HVAC unit	NextStar Energy	Steady
	Banwell Business Circle	Steady
	Mercato Fresh	Steady
12.5-ton HVAC unit	NextStar Energy	Steady
25-ton HVAC unit	NextStar Energy	Steady
Chiller	Mercato Fresh	Steady

Note: [1] Sound power levels and spectra of noise sources are provided in **Appendix I**.

NextStar Energy includes 245 pieces of HVAC equipment. Banwood square includes of 11 pieces of HVAC equipment. Banwell Business Circle includes 9 pieces of HVAC equipment. Alexander's Daycare Centre includes 9 pieces of HVAC equipment. Mercato Fresh includes 10 pieces of HVAC equipment and 1 chiller. All sources were assessed based on satellite imagery and manufacturer data. Locations of sources are shown in **Appendix I**.

3.4.1 Noise Sensitive Points of Reception

As per the MECP noise guidelines NPC-300, a Point of Reception (POR), as it applies to impact assessments of stationary sources, means any location on a noise sensitive land use where noise from a stationary source is received. Noise sensitive land uses include the following lands:

- Permanent, seasonal, or rental residences;
- Hotels, motels, and campgrounds;
- Schools, universities, libraries, and daycare centres;
- Hospitals and clinics, nursing / retirement homes; and
- Places of worship.

POR identification followed the convention from the Transportation Noise Assessment outlined in **Section 2.3**. All buildings within the site plan were assessed as noise-sensitive receptors. An outdoor POR was assigned to the proposed amenity area at a height of 1.5 m above grade.

3.5 Stationary Noise Modelling

Impacts from the stationary noise sources were predicted through noise propagation modelling (CADNA/A). The predicted receptor noise levels (at the proposed development site) were compared against the applicable criteria, as specified in NPC-300 (see **Table 11**).

The stationary noise model incorporated the following assumptions:

- A global ground absorption coefficient of 0.3 was used to be conservative.
- A second-order reflection was assumed.
- The ground within the study area was considered to be generally flat.
- All sources have been assumed to operate continuously, with the following exceptions:
 - A 50% duty cycle has been applied to all HVAC equipment during the nighttime period, excluding the NextStar sources.

3.5.1 Predicted Noise Impacts

Table 13 summarizes the highest predicted noise impacts on the façades and outdoor point of reception on the Proposed Development.

Table 13: Stationary Noise Impact Summary Table - Surrounding Industries on Proposed Development

Industry	Point of Reception	Maximum Leq ^[1] (1 hour) (dBA)		MECP Class 1 Compliance?
		Daytime (07:00-23:00)	Nighttime (23:00-07:00)	
NextStar Energy	West Building - North Façade	18	18	Yes
	West Building - East Façade	21	21	Yes
	West Building - South Façade	38	38	Yes
	West Building - West Façade	38	38	Yes
	East Building - North Façade	18	18	Yes
	East Building - East Façade	28	28	Yes
	East Building - South Façade	39	39	Yes
	East Building - West Façade	40	40	Yes
	Amenity Area	38	38	Yes
Banwood Square	West Building - North Façade	42	39	Yes
	West Building - East Façade	23	20	Yes
	West Building - South Façade	27	24	Yes
	West Building - West Façade	42	39	Yes
	East Building - North Façade	25	22	Yes
	East Building - East Façade	14	11	Yes
	East Building - South Façade	28	25	Yes
	East Building - West Façade	38	35	Yes
	Amenity Area	38	35	Yes
Banwell Business Circle	West Building - North Façade	40	37	Yes
	West Building - East Façade	25	22	Yes
	West Building - South Façade	22	19	Yes
	West Building - West Façade	40	37	Yes
	East Building - North Façade	30	27	Yes
	East Building - East Façade	15	12	Yes

Industry	Point of Reception	Maximum Leq ^[1] (1 hour) (dBA)		MECP Class 1 Compliance?
		Daytime (07:00-23:00)	Nighttime (23:00-07:00)	
	East Building - South Façade	18	15	Yes
	East Building - West Façade	28	25	Yes
	Amenity Area	25	22	Yes
Alexander's Daycare Centre	West Building - North Façade	35	32	Yes
	West Building - East Façade	18	15	Yes
	West Building - South Façade	19	16	Yes
	West Building - West Façade	35	32	Yes
	East Building - North Façade	24	21	Yes
	East Building - East Façade	9	6	Yes
	East Building - South Façade	21	18	Yes
	East Building - West Façade	33	30	Yes
	Amenity Area	27	24	Yes
Mercato Fresh	West Building - North Façade	41	40	Yes
	West Building - East Façade	29	28	Yes
	West Building - South Façade	21	20	Yes
	West Building - West Façade	40	40	Yes
	East Building - North Façade	38	38	Yes
	East Building - East Façade	22	21	Yes
	East Building - South Façade	17	16	Yes
	East Building - West Façade	30	27	Yes
	Amenity Area	22	21	Yes

Notes: [1] Predicted noise levels that exceed the Class 1 limits are presented in **bold**.

The predicted worst-case (nighttime) stationary noise impacts from the surrounding industries at the façade of the proposed building are presented in **Figure 3** through **Figure 7**.

Based on the predicted façade and outdoor noise levels listed in **Table 13**, the Proposed Development is expected to comply with all NPC-300 stationary façade and outdoor noise criteria for the Class 1 stationary sound level limits.

4.0 Conclusions

Dillon Consulting Limited was retained by Little D Holdings Ltd. to complete a Transportation and Stationary Noise Assessment as requested by the City of Windsor for the proposed multi-residential development located at Banwell Road and Mulberry Drive in Windsor, Ontario. This study has been completed in support of Zoning By-law Amendment and Official Plan Amendment applications for the Proposed Development. As there is no Site Plan or detailed building layout at the time of assessment, a worst-case concept plan including two four-storey apartment buildings and an amenity area were assessed. The Noise Assessments focus on the predicted worst-case impacts from nearby transportation and stationary sources on the Proposed Development.

4.1 Transportation Noise Assessment

As outlined in **Section 2.4**, the results of the transportation noise assessment confirm that the noise impacts on the proposed development can be sufficiently controlled by:

- All buildings including a 'Type D' warning clause and include the installation of central air conditioning;
- The outdoor amenity area include the installation of an acoustic barrier to completely block line of site to the Banwell Road, such as the 3-m tall acoustic barrier shown in **Appendix F**.

Warning clauses shall be included in agreements that are registered on Title for all Offers of Purchase and Sale, lease/rental agreements, and condominium declarations.

This assessment should be updated by an Acoustical Engineer when final site plans are confirmed to verify these recommendations.

4.2 Stationary Noise Assessment

The noise impacts from surrounding commercial and industrial properties on the development were assessed through modelling of stationary sources in Cadna/A. The predicted noise levels show that the potential worst case impacts from the surrounding commercial and industrial properties are expected to comply with the Class 1 noise level limits set by the MECP.

This assessment should be updated by an Acoustical Engineer when final site plans are available to confirm these findings.

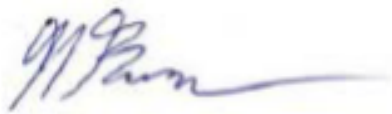
5.0 Closure

This Detailed Noise Study assessment has been prepared based on the information provided and/or approved by Little D Holdings Ltd. This report was prepared by Dillon for the sole benefit of Little D Holdings Ltd. The material in the report reflects Dillon's judgement in light of the information available to Dillon at the time of this report preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that the report is to your satisfaction. Please do not hesitate to contact the undersigned if you have any further questions on this report.

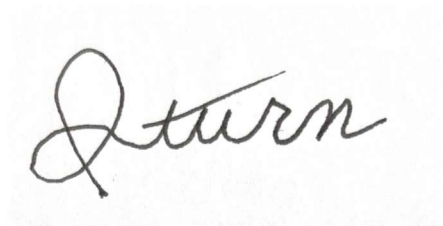
DILLON CONSULTING LIMITED

Review by:



Matthew Brenner, P.Eng.
Associate

Prepared by:



Jacob Turner
Environmental Engineering Graduate

Figures



Figure 1	
Project # 19-9073	
August 2026	

Subject Site and Surrounding Area



DILLON
CONSULTING

0 Mulberry Drive, Windsor, Ontario

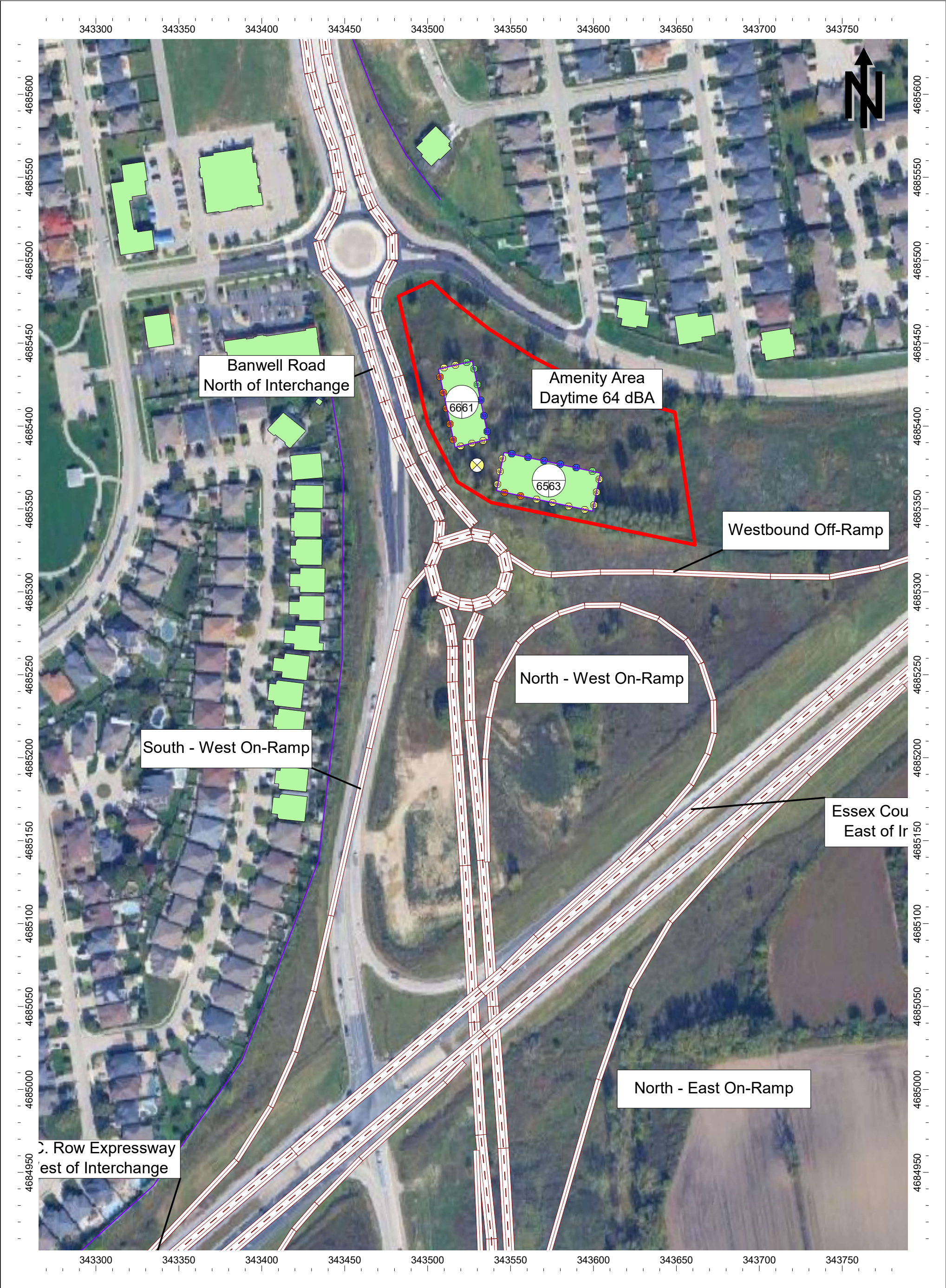


Figure 2a

Project # 19-9073

August 2026

**Predicted Transportation
Noise Impacts**

0 Mulberry Drive, Windsor, Ontario



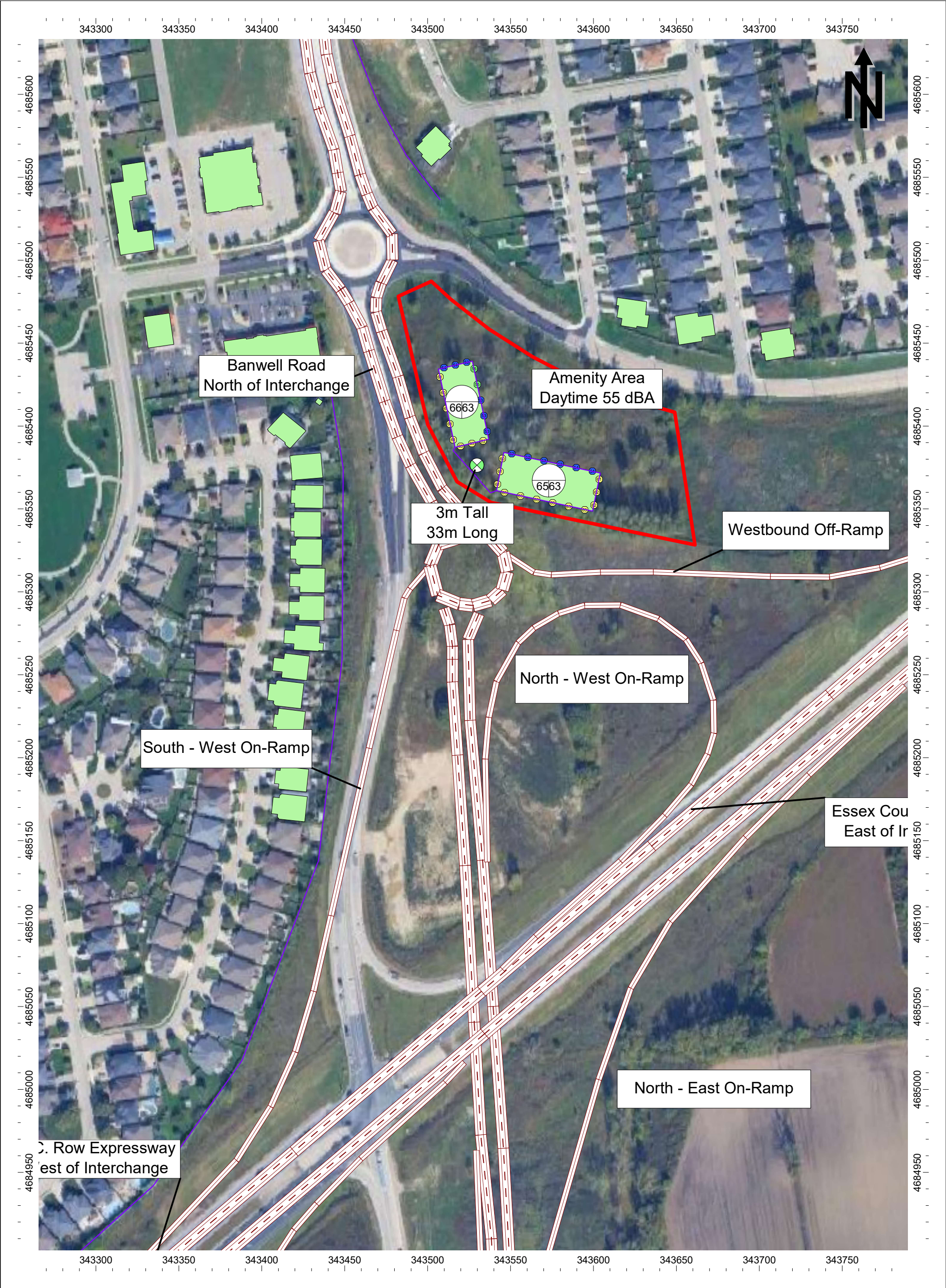


Figure 2b

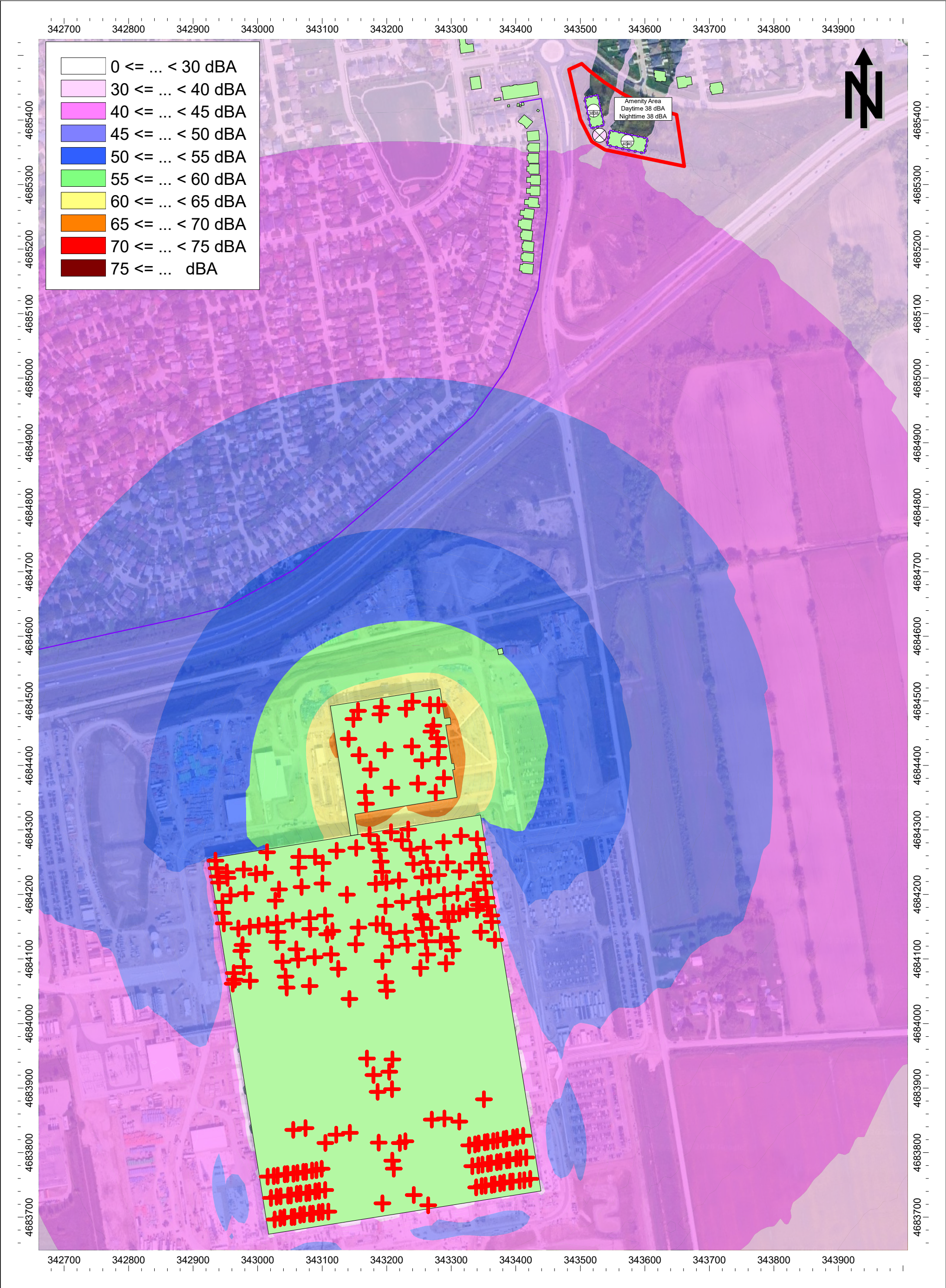
Project # 19-9073

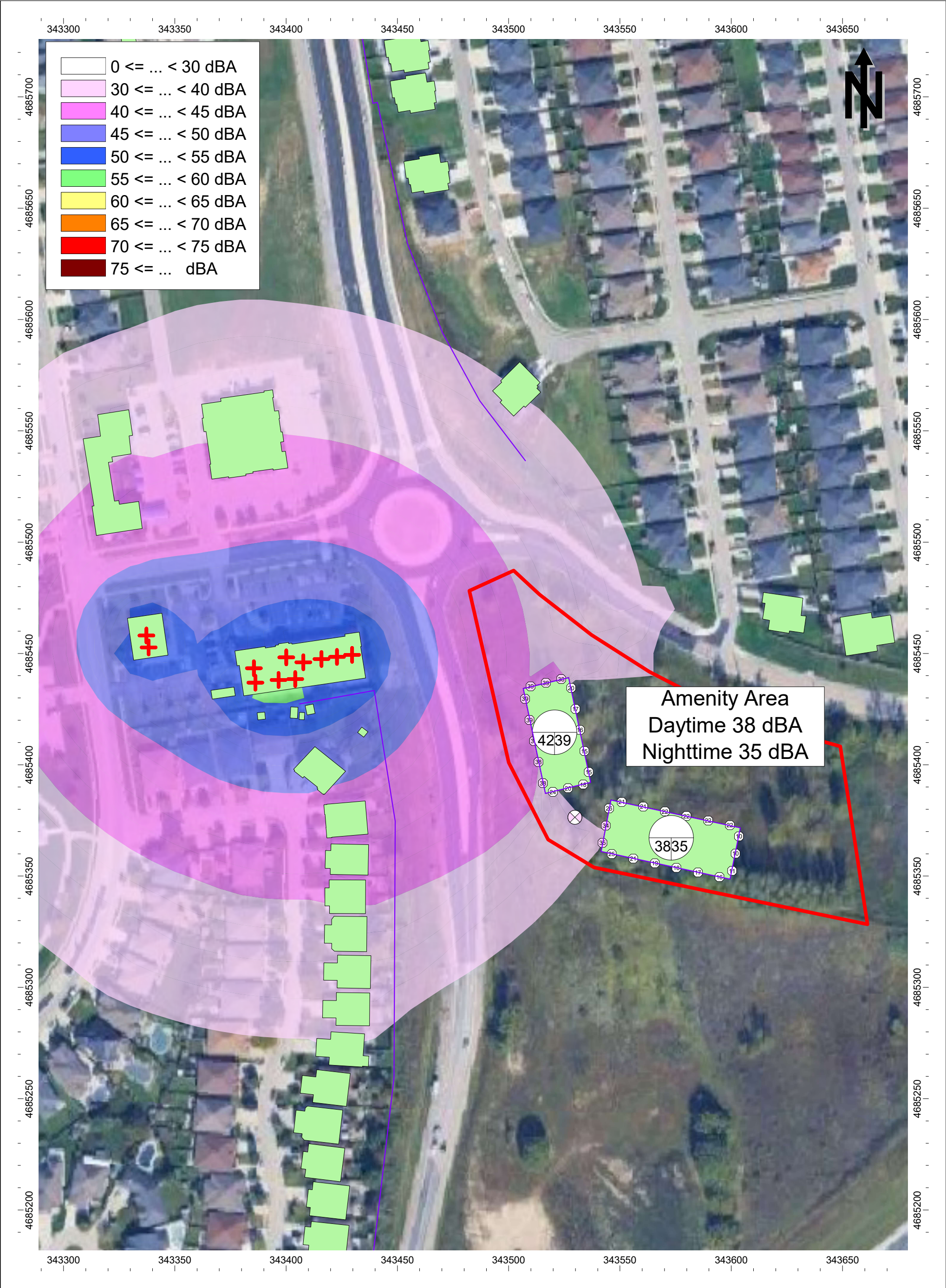
August 2026

**Predicted Transportation
Noise Impacts - Mitigated**

0 Mulberry Drive, Windsor, Ontario







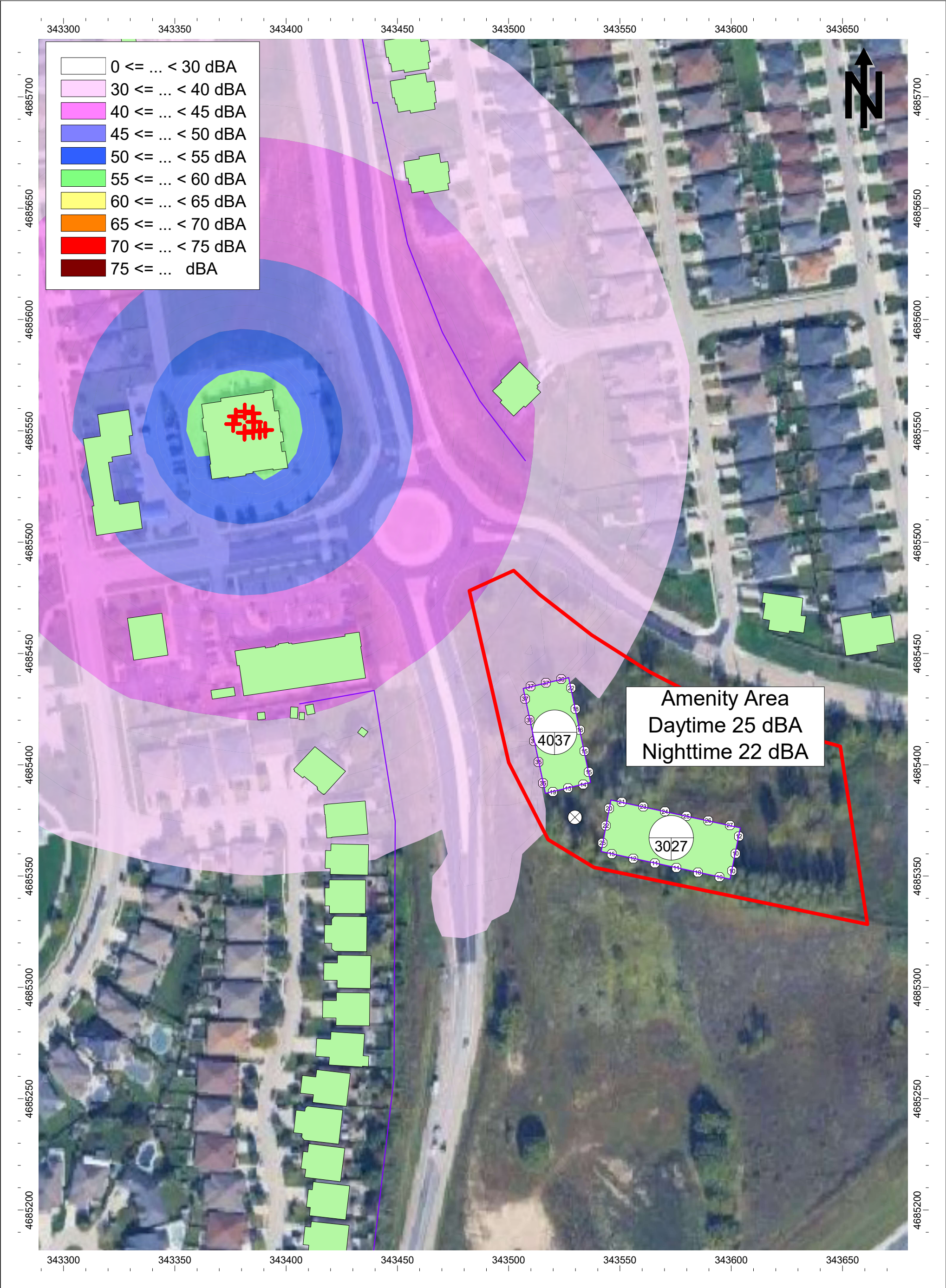


Figure 5	Banwell Business Circle Predicted Stationary Noise Impacts (Nighttime, 10.5m Height)		
			Project # 19-9073
			August 2026

0 Mulberry Drive, Windsor, Ontario

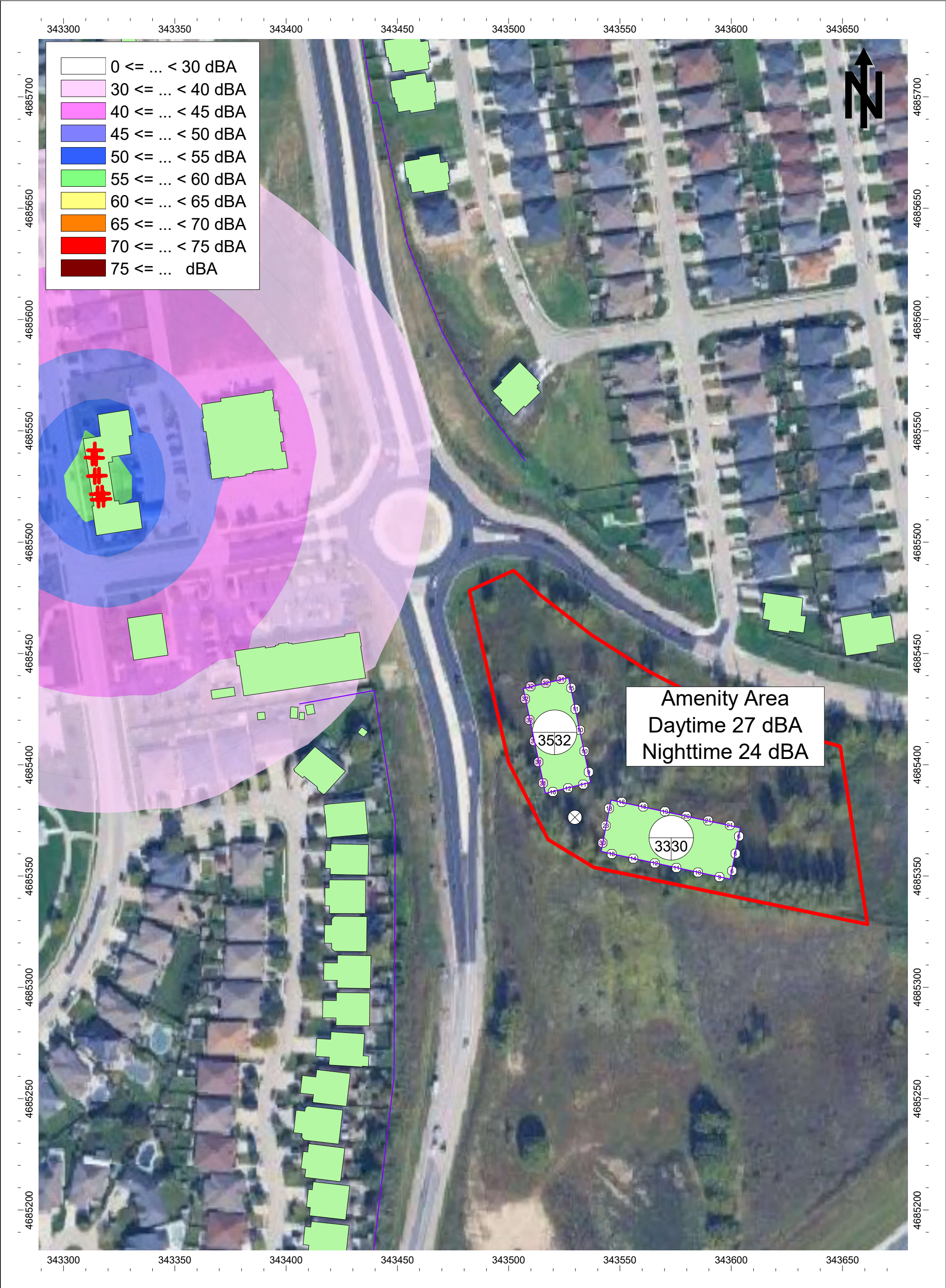


Figure 6	Alexander's Daycare Predicted Stationary Noise Impacts (Nighttime, 10.5m Height)	
Project # 19-9073		
August 2026		

0 Mulberry Drive, Windsor, Ontario

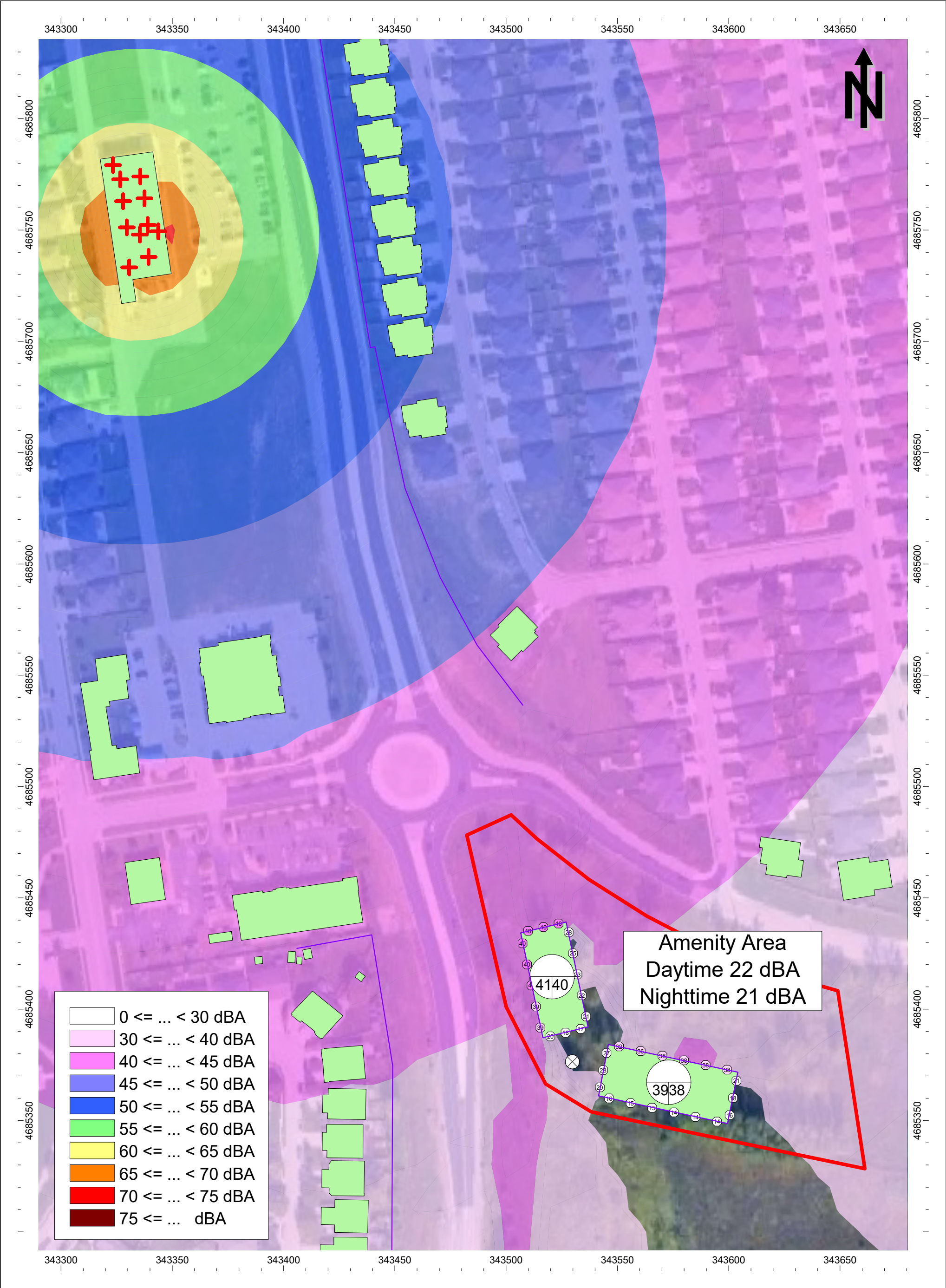


Figure 7

Project # 19-9073

August 2026

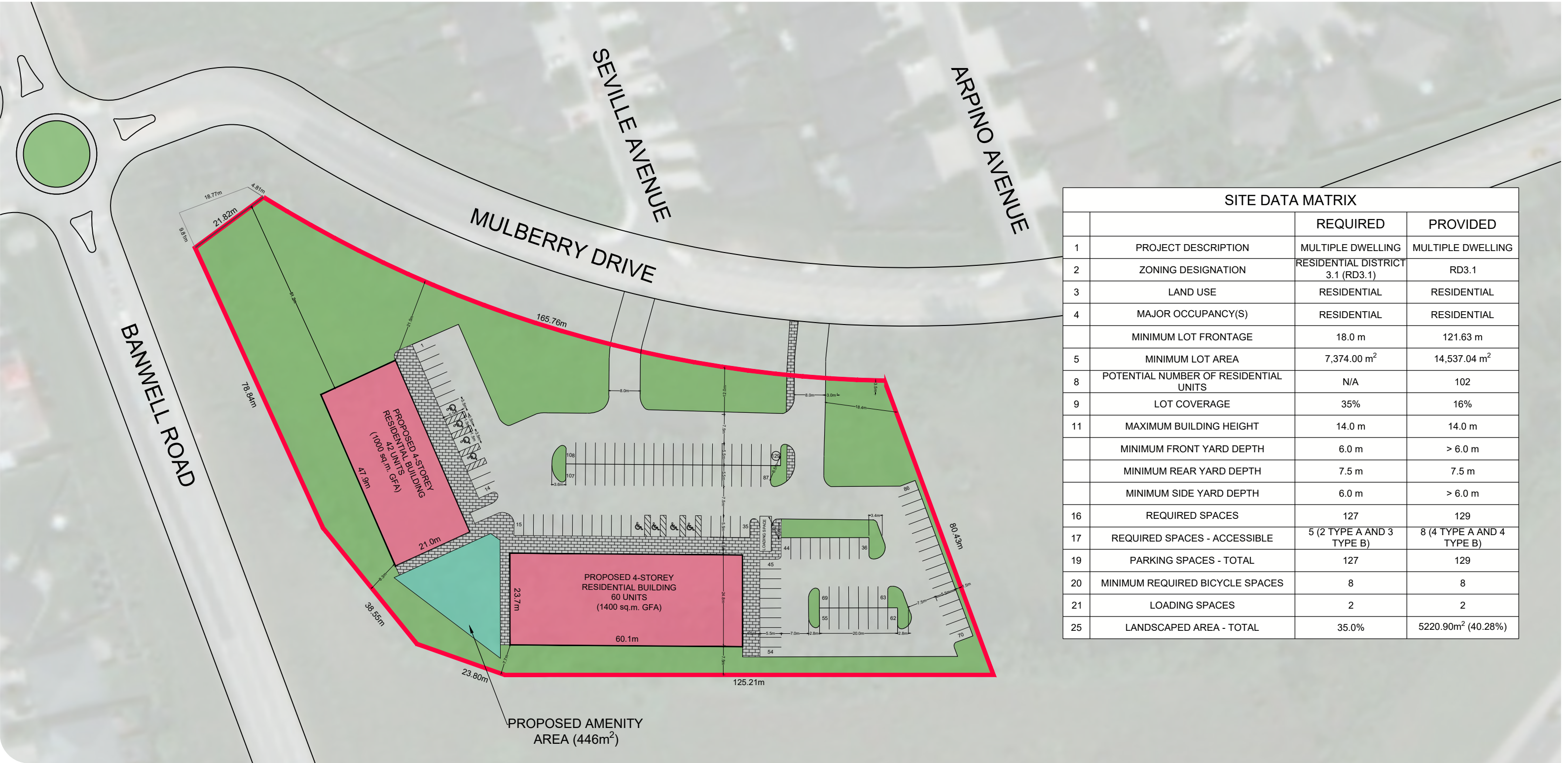
**Mercato Fresh Predicted Stationary
Noise Impacts (Nighttime, 10.5m Height)**

0 Mulberry Drive, Windsor, Ontario



Appendix A

Conceptual Development Plan



SITE DATA MATRIX			
		REQUIRED	PROVIDED
1	PROJECT DESCRIPTION	MULTIPLE DWELLING	MULTIPLE DWELLING
2	ZONING DESIGNATION	RESIDENTIAL DISTRICT 3.1 (RD3.1)	RD3.1
3	LAND USE	RESIDENTIAL	RESIDENTIAL
4	MAJOR OCCUPANCY(S)	RESIDENTIAL	RESIDENTIAL
	MINIMUM LOT FRONTAGE	18.0 m	121.63 m
5	MINIMUM LOT AREA	7,374.00 m ²	14,537.04 m ²
8	POTENTIAL NUMBER OF RESIDENTIAL UNITS	N/A	102
9	LOT COVERAGE	35%	16%
11	MAXIMUM BUILDING HEIGHT	14.0 m	14.0 m
	MINIMUM FRONT YARD DEPTH	6.0 m	> 6.0 m
	MINIMUM REAR YARD DEPTH	7.5 m	7.5 m
	MINIMUM SIDE YARD DEPTH	6.0 m	> 6.0 m
16	REQUIRED SPACES	127	129
17	REQUIRED SPACES - ACCESSIBLE	5 (2 TYPE A AND 3 TYPE B)	8 (4 TYPE A AND 4 TYPE B)
19	PARKING SPACES - TOTAL	127	129
20	MINIMUM REQUIRED BICYCLE SPACES	8	8
21	LOADING SPACES	2	2
25	LANDSCAPED AREA - TOTAL	35.0%	5220.90m ² (40.28%)

Little D Holdings Limited

Little D - Banwell at Mulberry

CONCEPTUAL DEVELOPMENT PLAN

FIGURE 1.0

SUBJECT AREA
(± 1.45ha / 3.58ac)

PROPOSED RESIDENTIAL BUILDING

PROPOSED AMENITY AREA

PROPOSED PAVEMENT

PROPOSED SIDEWALK

PROPOSED LANDSCAPED AREA

File Location:
p:\2019\199073 little d - banwell at mulberry\2. work\drawings\conceptual development plan\199073 - concept plan - may 2025.dwg
August, 07, 2026 12:53 PM

MAP/DRAWING INFORMATION
THIS DRAWING IS FOR INFORMATION PURPOSES ONLY. ALL DIMENSIONS AND BOUNDARY INFORMATION SHOULD BE VERIFIED BY AN O.L.S PRIOR TO CONSTRUCTION.
CREATED BY: AMC
CHECKED BY: MAM
DESIGNED BY: AMC/SS

SCALE: 1:1000

N
W
S
E

DILLON
CONSULTING

PROJECT: 19-9073

STATUS: DRAFT

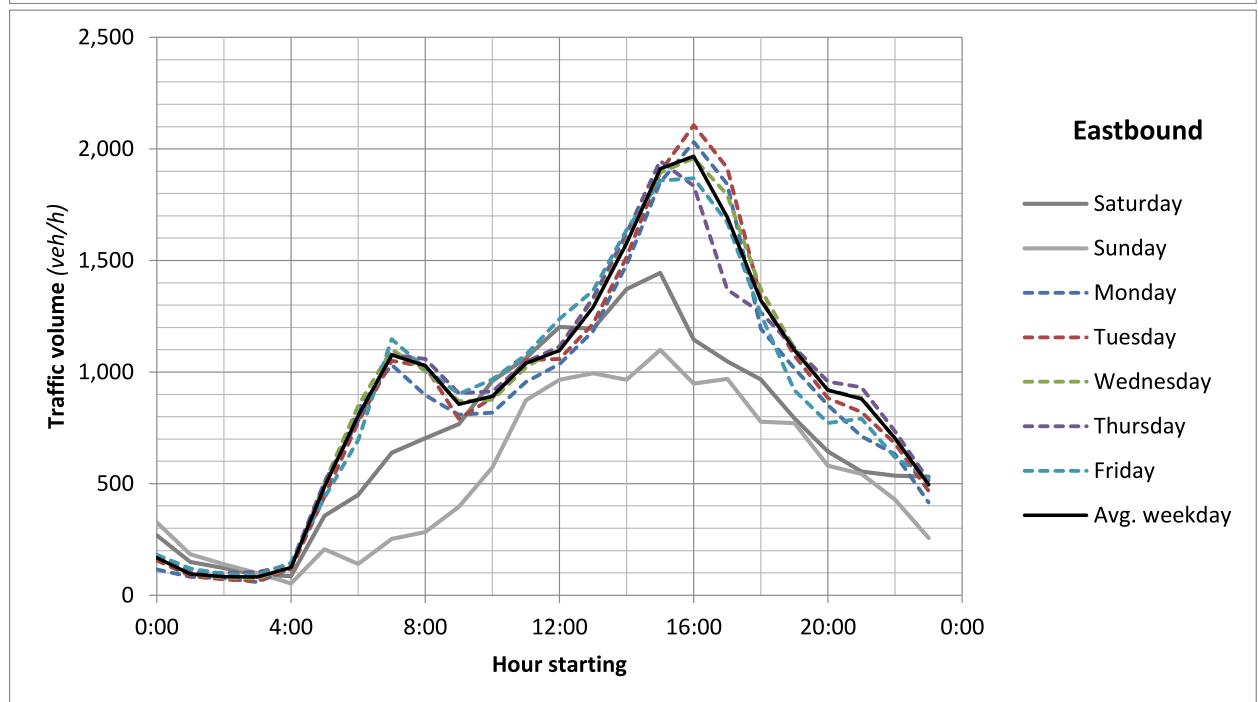
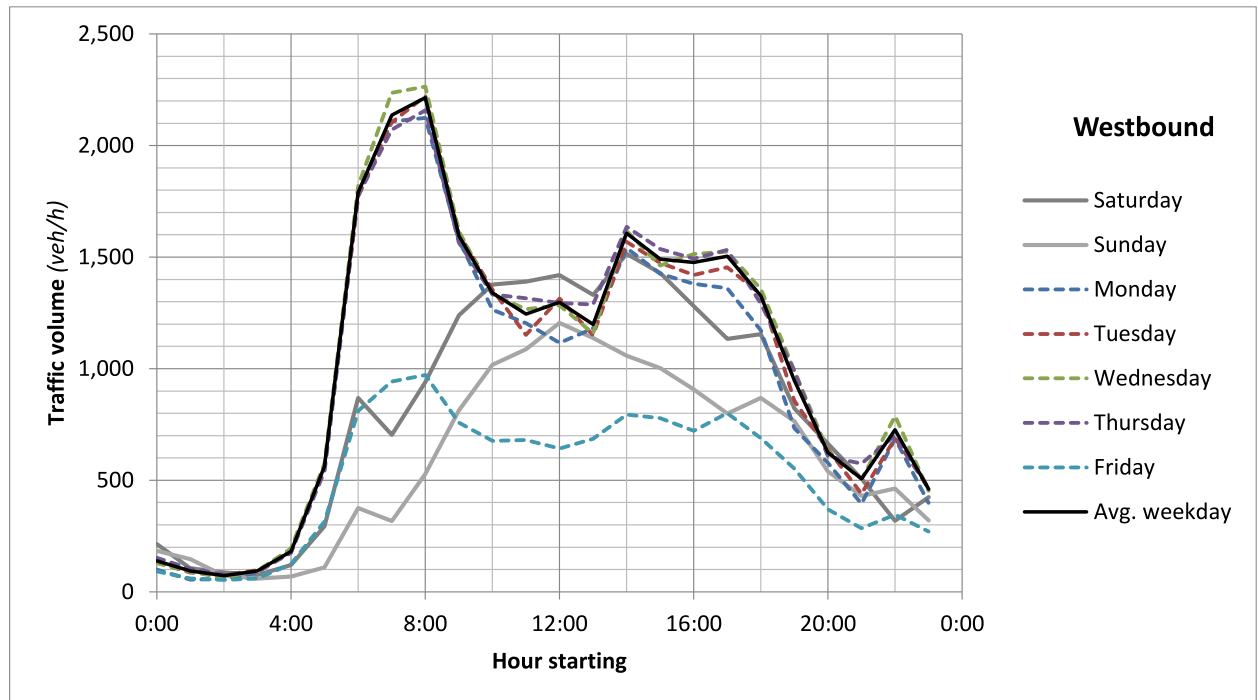
DATE: 05/09/2025

SOURCE: THE COUNTY OF ESSEX INTERACTIVE MAPPING (2020)

Appendix B

Road Traffic Data

E.C. Row Expressway West of Banwell Road



Banwell Road south of E.C. Row Expressway

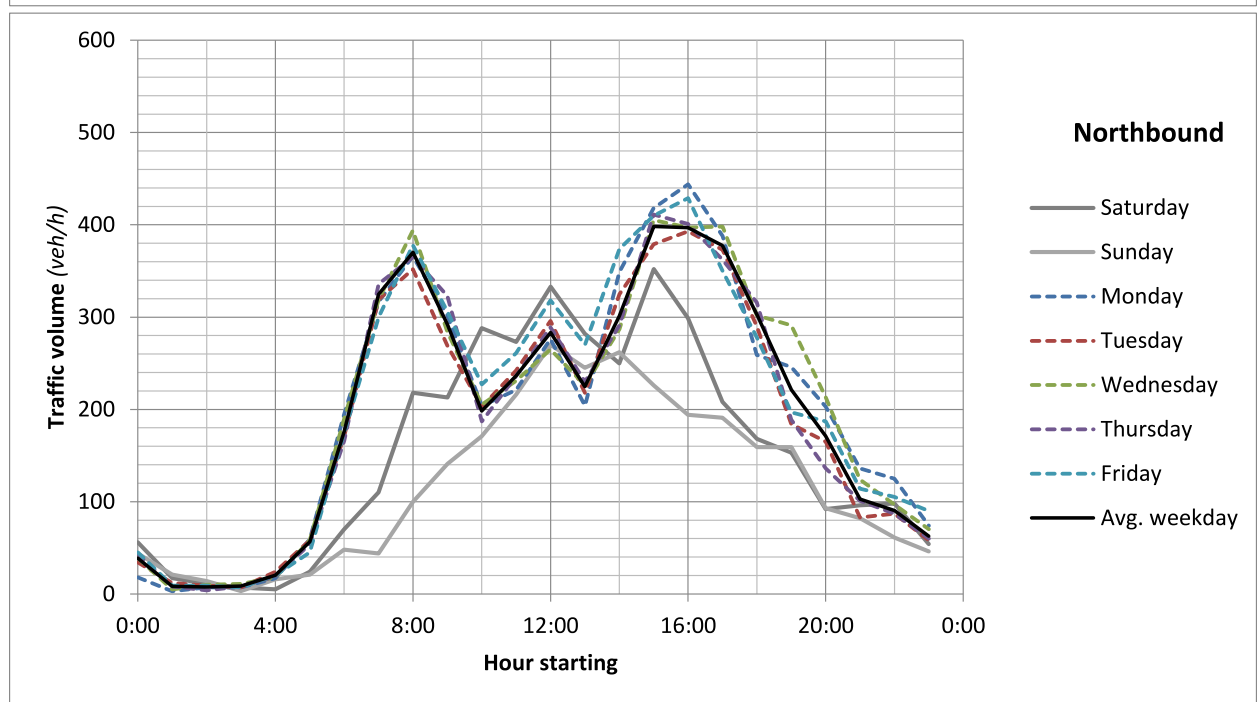
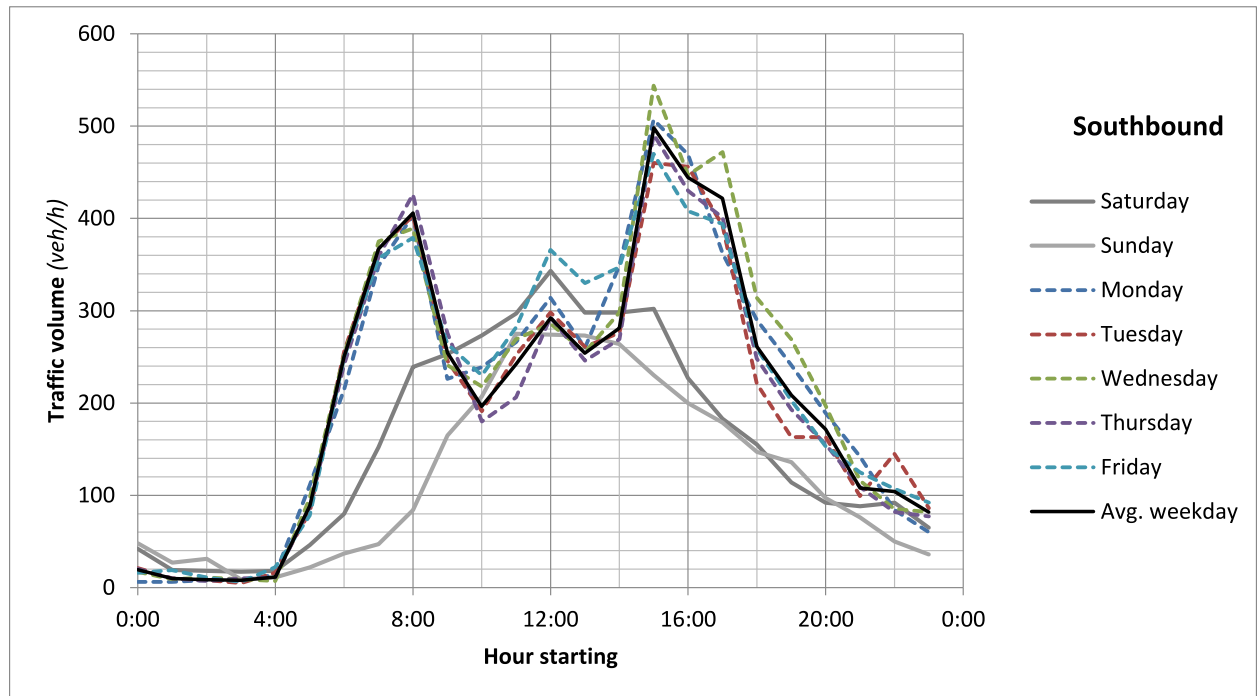
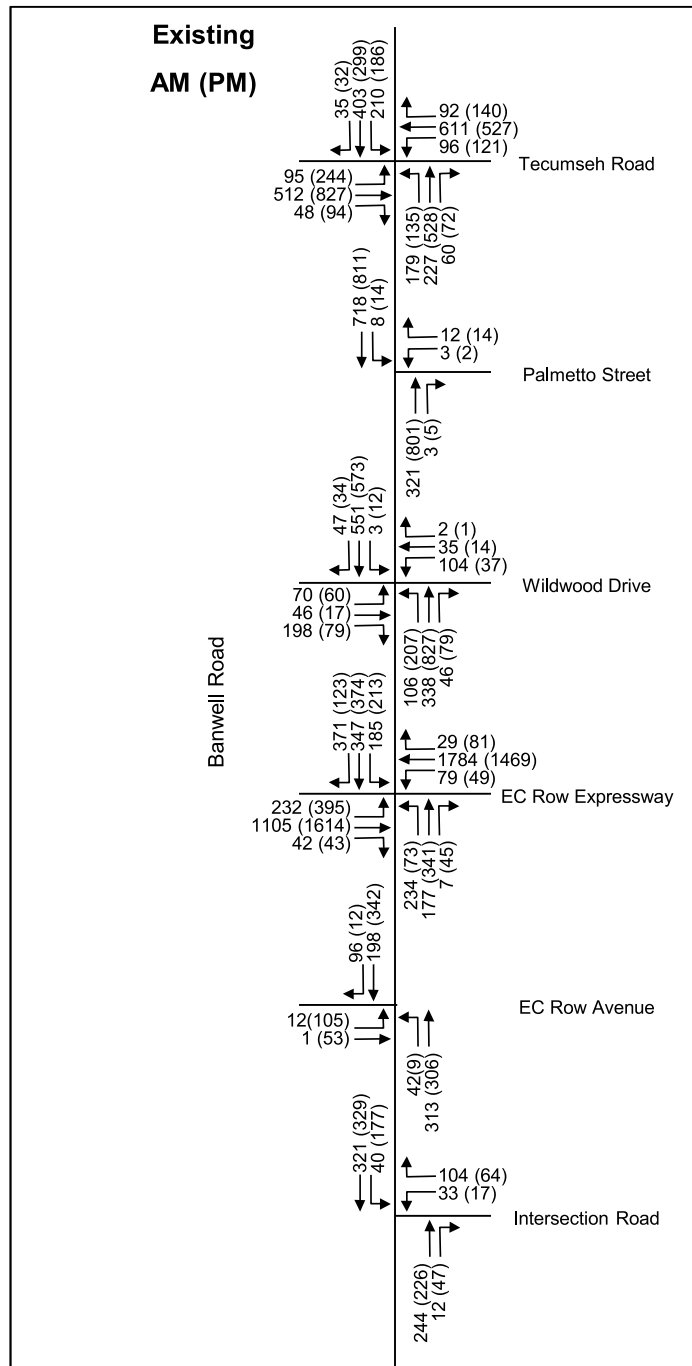


Exhibit 3-4: Existing 2014 Traffic Volumes



Appendix C

Warning Clauses

Warning Clauses

Type A: "Purchasers/tenants are advised that sound levels due to increasing road traffic (rail traffic) (air traffic) may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."

Type B: "Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic (rail traffic) (air traffic) may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."

Type C: "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."

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

Appendix D

STAMSON Modelling

Filename: littled.te Time Period: 1 hours
Description:

Road data, segment # 1: Banwell

Car traffic volume : 1629 veh/TimePeriod
Medium truck volume : 26 veh/TimePeriod
Heavy truck volume : 42 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Banwell

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 50.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 2: E.C Row

Car traffic volume : 3041 veh/TimePeriod
Medium truck volume : 40 veh/TimePeriod
Heavy truck volume : 120 veh/TimePeriod
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: E.C Row

Angle1 Angle2 : 0.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 320.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: Banwell

Source height = 1.25 m

ROAD (0.00 + 62.15 + 0.00) = 62.15 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	70.39	0.00	-5.23	-3.01	0.00	0.00	0.00	62.15

Segment Leq : 62.15 dBA

↑

Results segment # 2: E.C Row

Source height = 1.39 m

ROAD (0.00 + 59.33 + 0.00) = 59.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	45	0.00	78.64	0.00	-13.29	-6.02	0.00	0.00	0.00	59.33

Segment Leq : 59.33 dBA

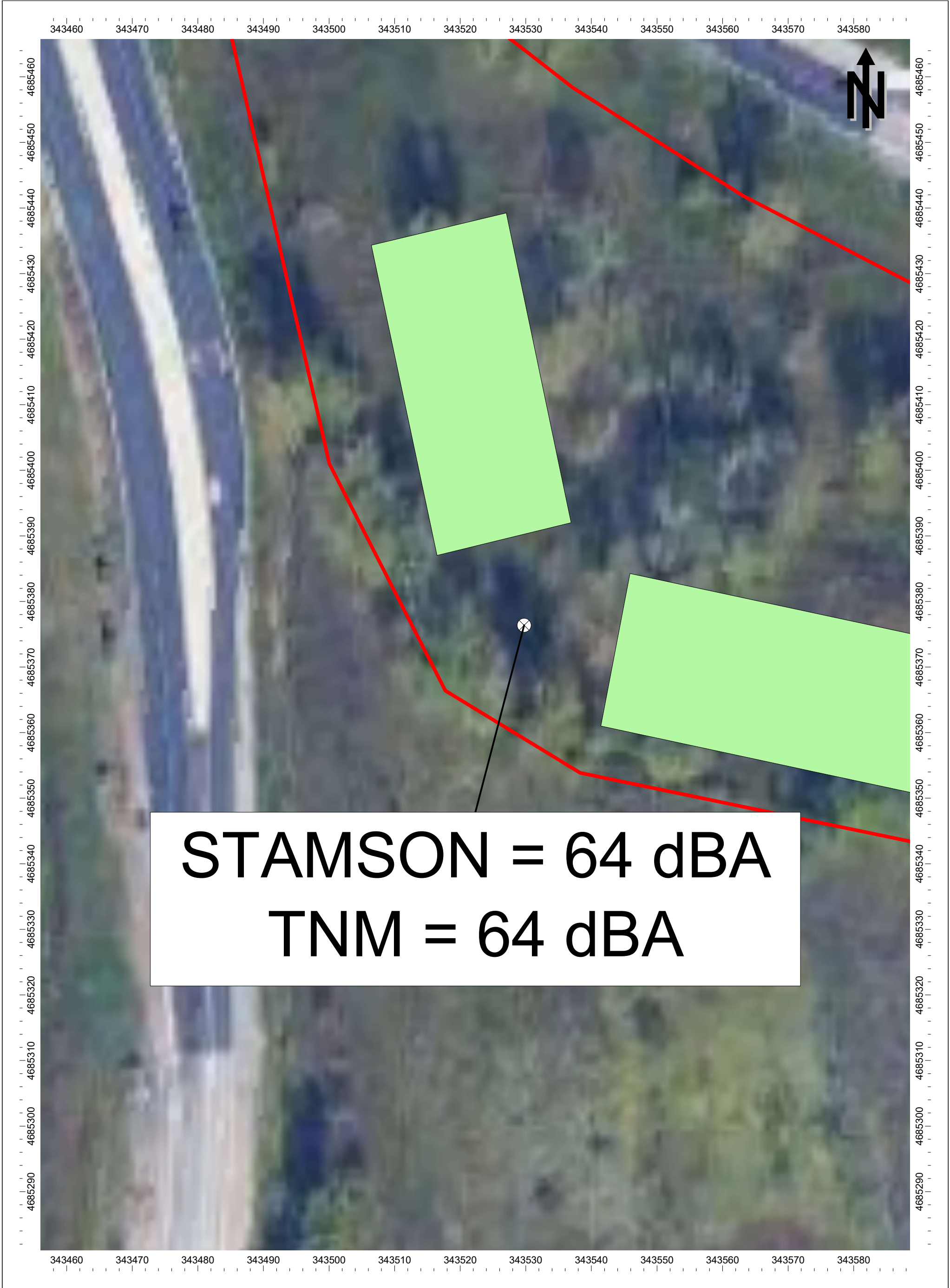
Total Leq All Segments: 63.98 dBA

↑

TOTAL Leq FROM ALL SOURCES: 63.98

↑

↑



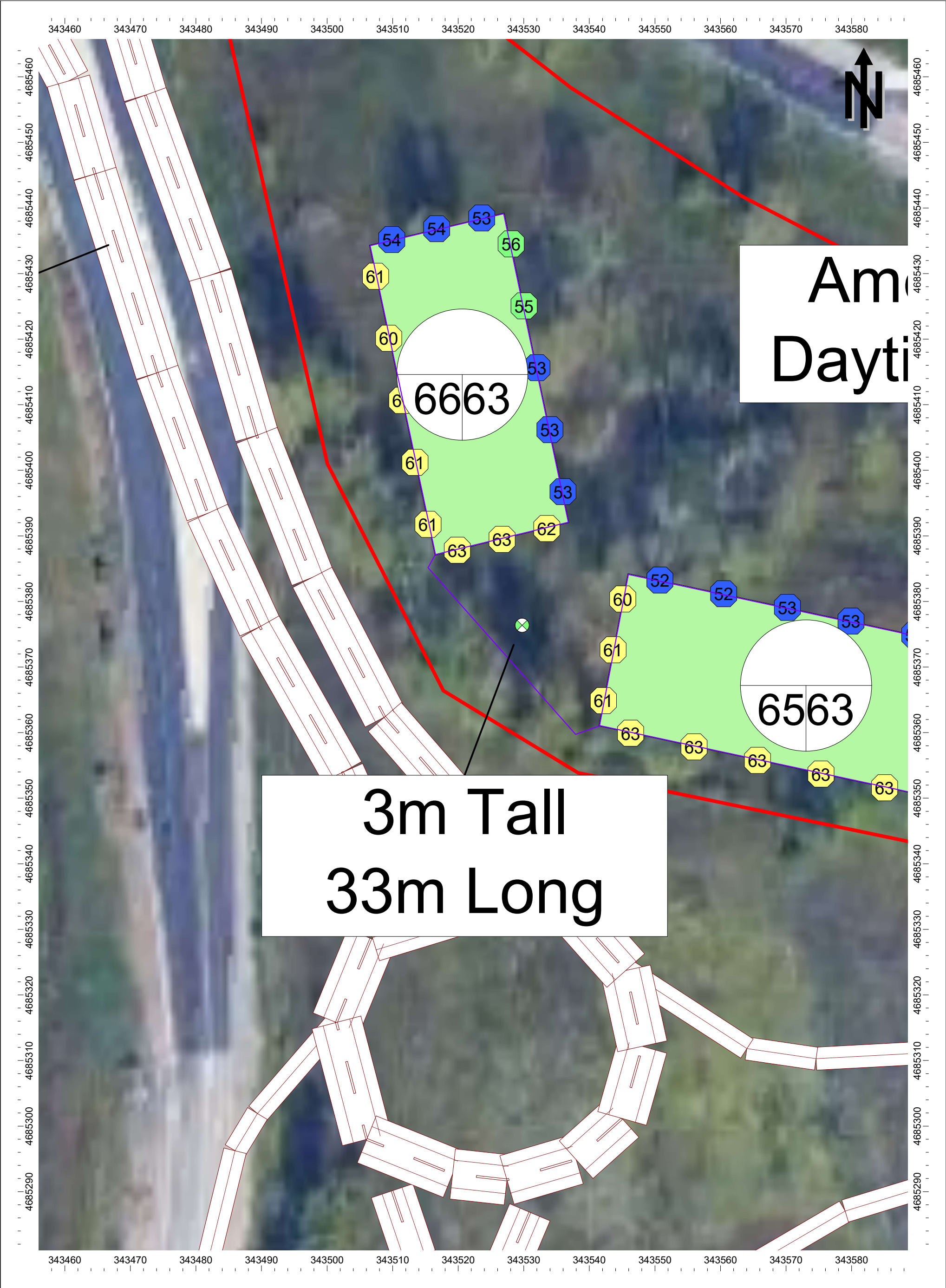
Appendix D	STAMSON and TNM Comparison 0 Mulberry Drive, Windsor, Ontario 
Project # 19-9073	
August 2026	

Appendix E

Building Component Analysis

Appendix F

Barrier Location and Specifications



Appendix F	Barrier Location and Specifications DILLON CONSULTING 0 Mulberry Drive, Windsor, Ontario
Project # 19-9073	
August 2026	

Appendix G

D-6 Classification Criteria

Category	Outputs	Scale	Process	Operations/Intensity	Possible Examples
Class I	• Noise: Sound not audible off property • Dust and/or Odour: Infrequent and not intense • Vibration: No ground borne vibration on plant property	• No outside storage • Small scale plant or scale is irrelevant in relation to all other criteria for this Class	• Self-contained plant or building which produces/stores a packaged product. Low probability of fugitive emissions	• Daytime operations only • Infrequent movement of products and/or heavy trucks	• Electronics manufacturing and repair • Furniture repair and refinishing • Beverages bottling • Auto parts supply • Packaging and crafting services • Distribution of dairy products • Laundry and linen supply
Class II	• Noise: Sound occasionally audible off property • Dust and/or Odour: Frequent and occasionally intense • Vibration: Possible groundborne vibration, but cannot be perceived off property	• Outside storage permitted • Medium level of production allowed	• Open process • Periodic outputs of minor annoyance • Low probability of fugitive emissions	• Shift operations permitted • Frequent movement of products and/or heavy trucks with the majority of movements during daytime hours	• Magazine printing • Paint spray booths • Metal command • Electrical production manufacturing • Manufacturing of dairy products • Dry cleaning services • Feed packing plant
Class III	• Noise: sound frequently audible off property • Dust and/or Odour: Persistent and/or intense • Vibration: Ground-borne vibration can frequently be perceived off property	• Outside storage of raw and finished products • Large production levels	• Open process • Frequent outputs of major annoyances • High probability of fugitive emissions	• Continuous movement of products and employees • Daily shift operations permitted	• Manufacturing of paint and varnish • Organic chemicals manufacturing • Breweries • Solvent recovery plants • Soaps and detergent manufacturing • Manufacturing of resins and costing • Metal manufacturing

Appendix H

Noise Source Sound Power Levels

Noise Source Summary Table			
Noise Source	Sound Power Level (dBA)	# of Sources	Sound Characteristics
5-ton HVAC unit	81.4	251	Steady
10-ton HVAC unit	88.3	9	Steady
12.5-ton HVAC unit	89.1	17	Steady
25-ton HVAC unit	92.5	7	Steady
Chiller	100.9	1	Steady

References

Ontario Ministry of Environment Publication NPC-300, Environmental Noise Guideline, Stationary and Transportation Sources- Approval and Planning, October 2013.

US FTA Transit Noise and Vibration Impact Assessment Manual, 2018

Ontario Ministry of Environment Publication D-6, Compatibility between Industrial Facilities, July 1995.

Guidelines for New Development in Proximity to Railway Operations, Railway Association of Canada and Federation of Canadian Municipalities, May 2013.

DILLON