DILLON CONSULTING

1495754 Ontario Inc.

Noise Study

0 Esplanade Drive, Windsor, Ontario

May 2024 – 23-7174

Table of Contents

1.0 Introduction

1.1 Purpose and Objectives

Dillon Consulting Limited (Dillon) was retained by 1495754 Ontario Inc. to complete a noise study for a proposed residential development (the Proposed Development) located at 0 Esplanade Drive in Windsor Ontario.

The Noise Study presented herein was prepared in accordance with the guidelines and requirements of the City of Windsor, the Ontario Ministry of the Environment, Conservation and Parks (MECP) noise publication NPC-300 and MECP's land-use compatibility guidelines (D-series). This assessment focuses on the potential noise impacts from nearby commercial operations on the Proposed Development.

1.2 The Project and Surrounding Areas

The Proposed Development is located at 0 Esplanade Drive in Windsor, Ontario. Per the City of Windsor's zoning by-law, the lands surrounding the Proposed Development include areas zoned as commercial, residential, and institutional.

The Proposed Development consists of a 4-storey multiple dwelling building with 54 units. The Proposed Development and surrounding lands are shown in Figure 1. The development's conceptual plan and relevant zoning maps are shown in Appendix A.

2.0 Stationary Noise Assessment

Dillon has completed a noise assessment to predict potential noise impacts from surrounding industrial and commercial land uses on the Proposed Development.

2.1 D-6 Guidelines

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 on the sensitive land use. The guidelines were designed to reduce potential complaints and protect sensitive land uses while upholding the ability of commercial and industrial properties to maintain compliance with MECP requirements.

The D-6 guideline separates industries into three classes based on the scale of the industry's operation. This involves considerations including, but not limited to: probability of fugitive emissions, schedule of operations, and production volume. The D-6 criteria for industry classification are shown in Appendix B. The guideline provides setback distances for each class representing potential influence areas and recommended minimum separation distances shown in Table 1.

Table 1: D-6 Influence Areas and Recommended Separation Distances

Industrial Class	Potential Influence Area	Recommended Minimum Separation Distance
Class I	70 m	20 m
Class II	300 m	70 m
Class III	1000 m	300 m

The D-6 guideline specifies that for site-specific plans, measurement shall be from the closest existing, committed, or proposed property/lot line of the industrial land use to the property/lot line of the closest existing, committed, or proposed sensitive land use. Areas designated for ancillary land uses that are not of a sensitive nature (such as a parking lot) may be included within the separation distance.

When considering vacant industrial land, determination of its potential influence area is based on a hypothetical "worst case scenario" for which the zoned area is committed.

2.2 Nearby Industries

Dillon reviewed the area surrounding the subject lands in order to classify the existing industrial and commercial lands using the MECP's D-Series framework, as well as to identify nearby vacant lands which are zoned to allow for commercial or industrial uses. Additionally, a site visit was conducted by Dillon personnel on April 22nd, 2024, to identify industrial or commercial operations with the potential influence areas that intersect the Proposed Development.

Industries were classified based on site visit observations, review of existing MECP approvals documents, and through publicly available information.

Within the study area, the only industry identified with potential for adverse effects on the Proposed Development was the Toyota and Lexus Dealership and service centre (auto centre) located in the Rafih Auto Mall at 9375 Tecumseh Road East and approximately 80 m north of the Proposed Development's property boundary. Based on observations made during the site visit, the auto centre is considered a Class II industry with the potential to have noise impacts on the Proposed Development.

As per the D-6 Guideline, the Proposed Development is located within the potential influence area of the auto centre. The following sections provide an assessment of the potential noise impacts from the auto centre on the Proposed Development.

2.2.1 Noise Sources

Dillon has identified the following potential noise sources associated with the servicing area of the auto centre:

- 9 Rooftop HVAC;
- 1 Rooftop upblast fan;
- 1 Rooftop exhaust fan; and
- Air tools used within the service centre while bay doors are open.

The locations of the noise sources are identified in Figure 2.

In a 1-hour period, it was assumed that the auto centre's air tools operate cumulatively for a total of 1 minute and have a quasi-steady impulsive sound characteristic.

Conservatively, it was assumed that the above identified noise sources operate simultaneously during the daytime period. It was assumed that rooftop HVAC units are the only operating noise source during the nighttime period.

Dillon utilized its in-house library to apply sound power levels to the identified noise sources. A penalty of +10 dBA was applied to the air tools due to the quasi-steady impulsive sound characteristic.

During the site visit, it was observed that the rooftop exhaust fan was the dominant noise source of the auto centre. Acoustic measurements of the rooftop exhaust fan were completed at the property line of the Proposed Development. The modelled sound power level of the rooftop exhaust fan was adjusted until the noise emissions corresponded with the on-site measurements.

2.2.2 Noise Criteria

NPC-300 defines sound level limits for noise impacts from stationary sources on noise sensitive land uses. A noise sensitive land use is defined as a property of a person that accommodates a dwelling, a noise sensitive commercial purpose, or a noise sensitive institutional purpose. This definition includes:

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

Points of reception (POR) for dwellings are located at the centre of any window on a noise sensitive space, with a first-storey height of 1.5 m and subsequent storeys separated by 3 m. A dwelling may have an outdoor point of reception located on its property within 30 m of its façade at a height of 1.5 m, typically in back or front yards, terraces, or patios.

In NPC-300, areas are divided into four classes based on their existing background acoustical environment:

- Class 1 – Urban Area;
- Class 2 – Semi-Urban/Semi-Rural Area;
- Class 3 – Rural Area; and
- Class 4 – Areas of Redevelopment and Infill;

The sound level limits for outdoor and plane-of-window PORs for continuous and impulsive noise are outlined in Table 2.

Table 2: Stationary Source Continuous Noise Exclusionary Limits

Assessment Location	Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
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
	Evening (19:00 - 23:00)	50 dBA	45 dBA	40 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.

Based on observations made during the site visit completed on April 22nd, 2024, the existing background acoustical environment of the Proposed Development's lands are considered Class 1 – Urban Area.

2.2.3 Noise Sensitive Points of Reception

Noise sensitive points of reception considered in this study included the façades of the residential dwellings of the Proposed Development. The balconies of the Proposed Development's units are less than 4 m in depth and are not considered outdoor points of reception as per NPC-300. No other common outdoor points of reception were identified within the Proposed Development.

2.2.4 Predicted Sound Levels

The noise analysis was completed using CADNA/A, an outdoor noise propagation model, based on ISO Standard 9613, Part 1: Calculation of the absorption of sound by the atmosphere, 1993 and Part 2: General method of calculation (ISO-9613-2:1996). The 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 source / sources. The ISO based 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 the source to the receiver.

The following assumptions were incorporated in the noise propagation modelling:

- A global ground absorption coefficient of 0.70, representing absorptive grounds of the area surrounding the Proposed Development. Localized ground absorptions of 0.30 were applied to the parking lots located between the sources and receptors.
- Second order reflection was incorporated in the noise model; and
- The ground within the study area is considered to be generally flat.

For the purposes of the stationary assessment, the Building Evaluation feature in Cadna/A was used to determine building facades impacts.

Impacts from the stationary noise sources were predicted through noise propagation modelling. Table 3 below summarizes the worst-case noise impacts on the façades of the Proposed Development for continuous noise.

Table 3: Noise Impact Summary Table

Point of Reception	Maximum Leq (1 hour) (dBA)		MECP Compliance
	Daytime / Evening (07:00-19:00)	Nighttime (23:00-07:00)	
Worst Case Impacts Façade of Proposed Development	50	44	Compliant with Class 1 Noise Criteria

The predicted noise impacts from the auto centre on the Proposed Development have been shown in Figure 2.

The results indicate that the potential noise impacts from the auto centre on the Proposed Development are predicted to be compliance with the MECP Class 1 exclusionary limits.

3.0 Conclusions

Dillon Consulting Limited (Dillon) was retained by 1495754 Ontario Inc. to complete a noise study for a proposed residential development (the Proposed Development) located at 0 Esplanade Drive in Windsor Ontario.

The noise study found that stationary noise impacts from the auto centre located north of the Proposed Development are predicted to be compliant with the applicable noise criteria.

4.0 Closure

This noise study has been prepared based on the information provided and/or approved by 1495754 Ontario Inc. This report is intended to provide a reasonable review of available information within an agreed work scope, schedule, and budget. This report was prepared by Dillon for the sole benefit of the 1495754 Ontario Inc. 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.

Respectfully Submitted:

DILLON CONSULTING LIMITED

Lucas Arnold, P.Eng.
Associate

Callum Heggart, P.Eng.

Attachments Attachment A: Development Conceptual Plan and Zoning
Attachment B: D-6 Classification Criteria

Figures

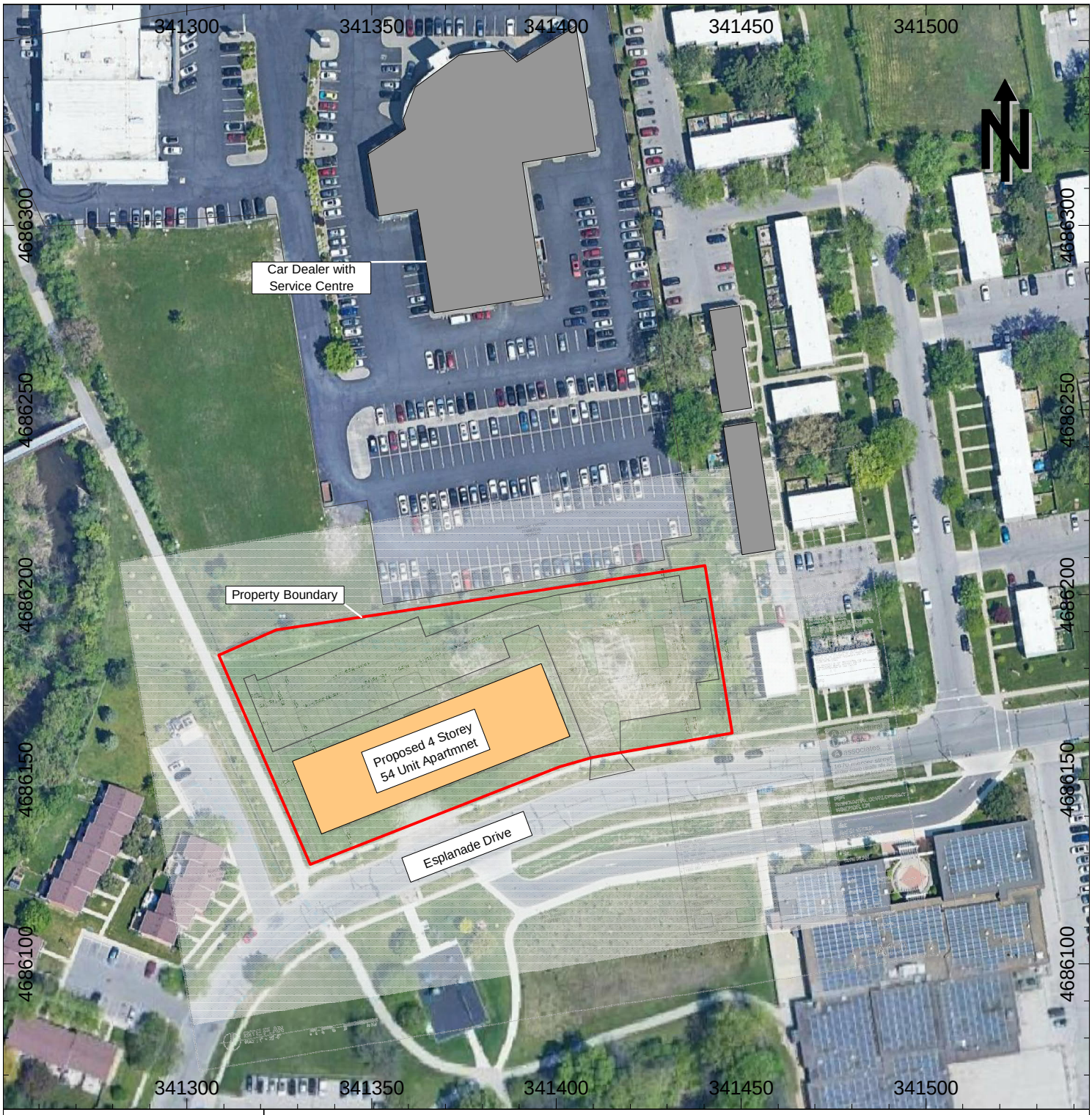


Figure 1

Site and Surrounding Area

Project # 23-7174

May 2024

0 Esplanade Drive, Windsor, Ontario

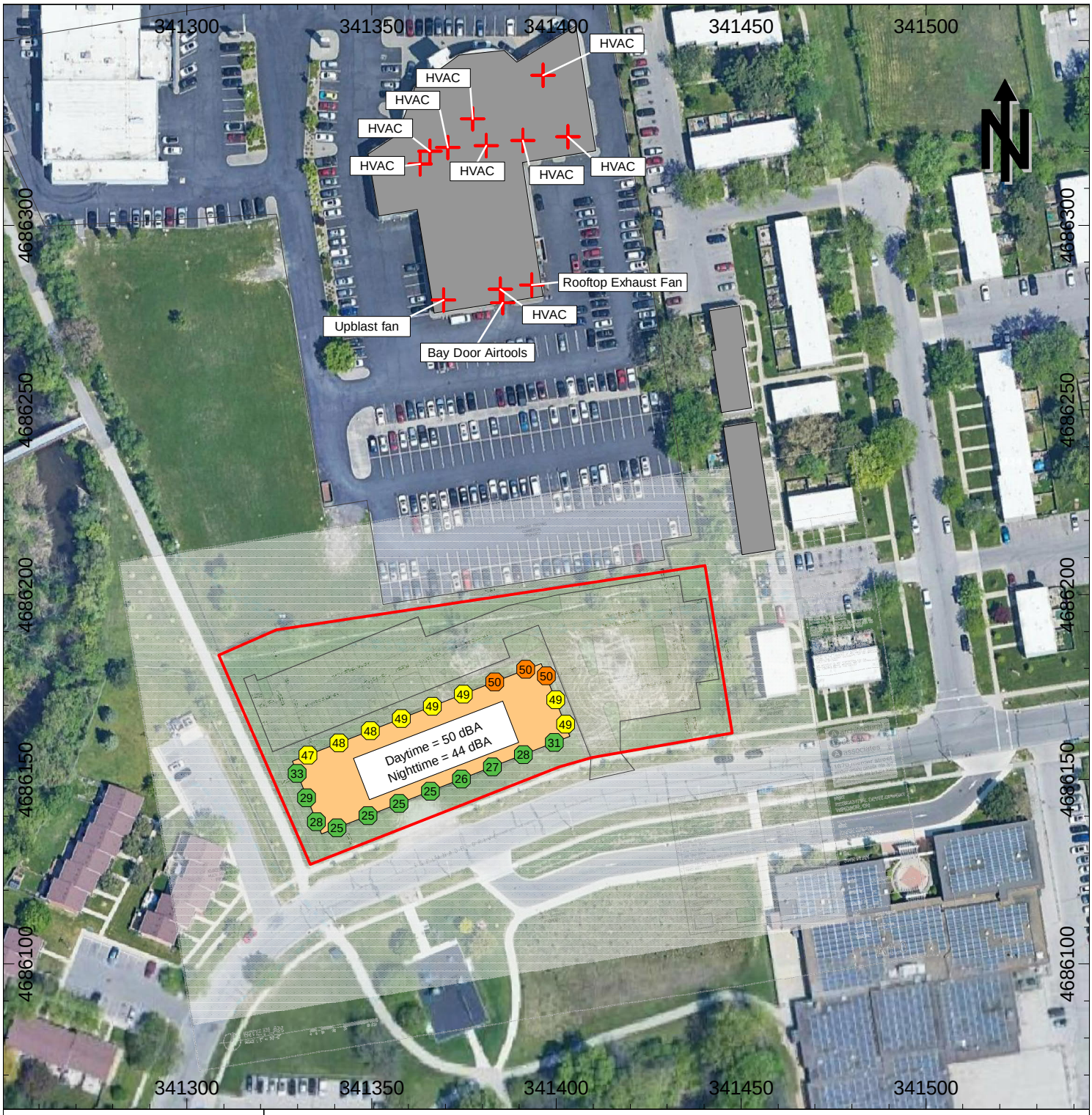


Figure 2

Noise Impacts

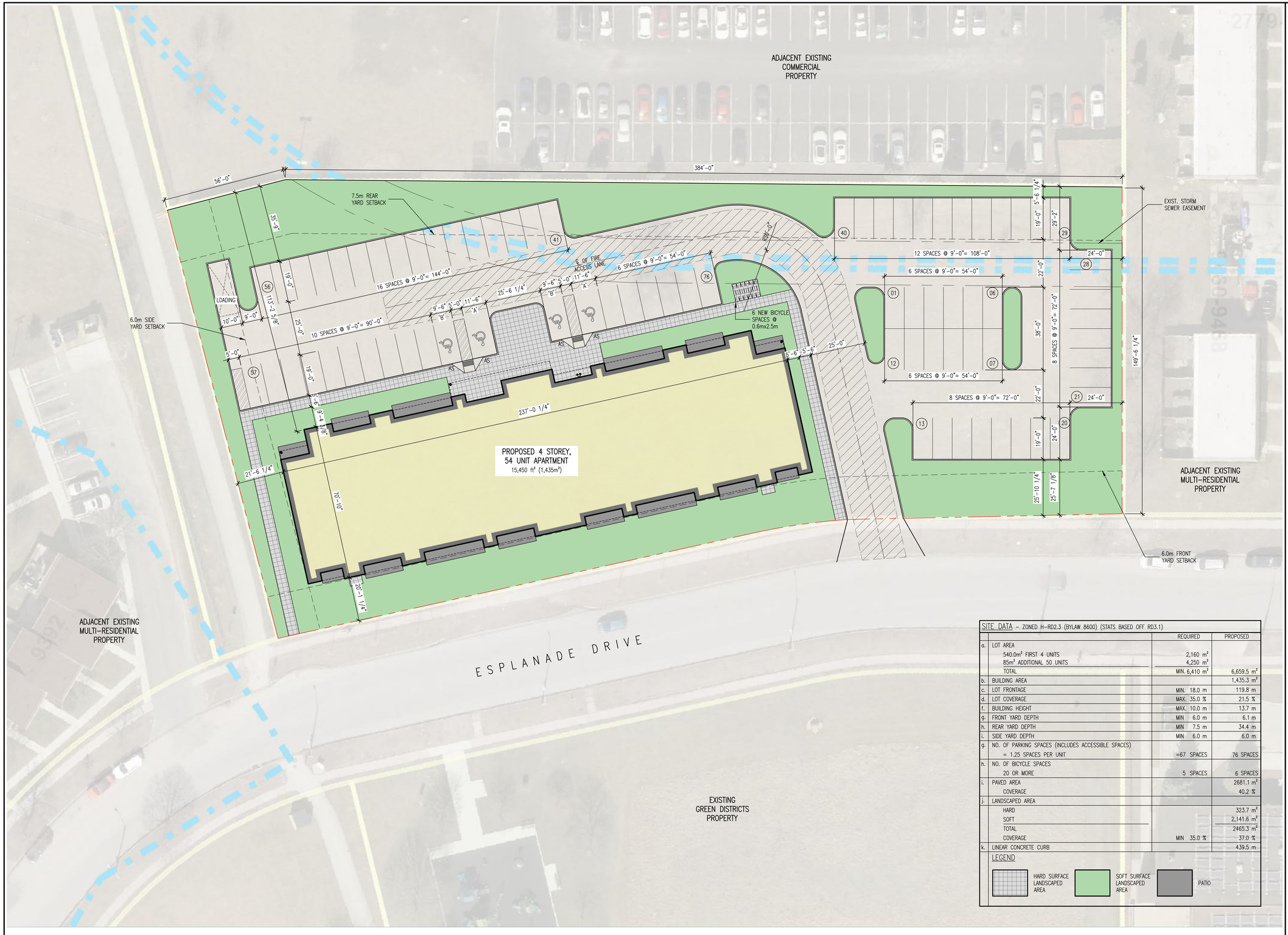
Project # 23-7174

May 2024

0 Esplanade Drive, Windsor, Ontario

Appendix A

Development Conceptual Plan and Zoning



SITE DATA – ZONED H-RD2.3 (BYLAW 8600) (STATS BASED OFF RD3.1)

		REQUIRED	PROPOSED
a.	LOT AREA		
	540.0m² FIRST 4 UNITS	2,160 m²	
	85m² ADDITIONAL 50 UNITS	4,250 m²	
	TOTAL	MIN. 6,410 m²	6,659.5 m²
b.	BUILDING AREA		1,435.3 m²
c.	LOT FRONTAGE	MIN. 18.0 m	119.8 m
d.	LOT COVERAGE	MAX. 35.0 %	21.5 %
f.	BUILDING HEIGHT	MAX. 10.0 m	13.7 m
g.	FRONT YARD DEPTH	MIN 6.0 m	6.1 m
h.	REAR YARD DEPTH	MIN 7.5 m	34.4 m
i.	SIDE YARD DEPTH	MIN 6.0 m	6.0 m
g.	NO. OF PARKING SPACES (INCLUDES ACCESSIBLE SPACES) = 1.25 SPACES PER UNIT	=67 SPACES	76 SPACES
h.	NO. OF BICYCLE SPACES 20 OR MORE	5 SPACES	6 SPACES
i.	PAVED AREA		2681.1 m²
	COVERAGE		40.2 %
j.	LANDSCAPED AREA		
	HARD		323.7 m²
	SOFT		2,141.6 m²
	TOTAL		2465.3 m²
	COVERAGE	MIN 35.0 %	37.0 %
k.	LINEAR CONCRETE CURB		439.5 m

LEGEND

HARD SURFACE LANDSCAPED AREA | SOFT SURFACE LANDSCAPED AREA | PATIO

SITE PLAN

SCALE : 1" = 20'-0"

0 5 10 20 30 60 FEET

2024/08/28	PRE-CONSULTATION
date (yyyy/mm/dd):	issued for:

general notes:

1. THIS PRINT IS AN INSTRUMENT OF SERVICE ONLY AND IS THE PROPERTY OF THE ARCHITECT.
2. DRAWINGS SHALL NOT BE SCALED.
3. CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THIS OFFICE MUST BE NOTIFIED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN BY THESE DRAWINGS.
4. ATTENTION IS DIRECTED TO PROVISIONS IN THE GENERAL CONDITIONS REGARDING CONTRACTOR'S RESPONSIBILITIES IN REGARD TO SUBMISSION OF SHOP DRAWINGS.
5. IN THE EVENT THE ARCHITECT IS RETAINED TO REVIEW SHOP DRAWINGS, SUCH REVIEW IS ONLY TO CHECK FOR CONFORMANCE WITH DESIGN CONCEPT AND WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS.
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client:
RAFIH GROUP
DEVELOPMENTS

title:
SITE PLAN

scale: AS SHOWN
drawn by: JT
checked by: JBK
date: 2023-09-12
comm. no.: 2023-088
sheet no.:

A1.0

Zoning District Map 15

LEGEND:

- Zone Boundary[1]
- Specific Zoning Exemptions[2]
- Specific Temporary Zoning Exemptions[3]
- Registered Plan Parcel Limits
- Ownership Parcel Limits
- Municipal Boundary Line
- Inland Watercourse Flood Prone Area[4]
- Detroit River/Lake St.Clair Flood Prone Area[4]
- Township of Sandwich South Zoning By-law 2002-55

NOTES:

1. Each Zoning District symbol corresponds to a zoning district set out in the text of By-law 8600 (i.e. CD1.1 - Commercial District 1.1.)

DRD 1._	- Development Reserve District	- See Section 8
GD1._	- Green District	- See Section 9
RD1._	- Residential Districts (Low Density)	- See Section 10
RD2._	- Residential Districts (Medium Density)	- See Section 11
RD3._	- Residential Districts (High Density)	- See Section 12
ID1._	- Institutional District	- See Section 13
CD1._	- Commercial Districts (Neighbourhood)	- See Section 14
CD2._	- Commercial Districts (General)	- See Section 15
CD3._	- Commercial Districts (Major)	- See Section 16
CD4._	- Commercial Districts (Highway/Restricted Use)	- See Section 17
MD1._	-Industrial District (Light/Business Park)	-See Section 18
MD2._	-Industrial District (Heavy)	-See Section 19

An H symbol preceding the zoning district symbol represents a hold on the issuance of a building permit until specific development preconditions have been satisfied. Subsection 5.4 specifies the uses permitted until such time as the H symbol is removed by an amending by-law approved by Council.

2. See Subsection 20(1) and the relevant clause for the specific special provisions.

3. See Subsection 20(2) and the relevant clause for the specific special provisions.

4. Represents the approximate limits of land subject of potential flooding along the Detroit River, Lake St. Clair and inland watercourses as determined by the Essex Region Conservation Authority (ERCA). Within these areas, buildings or structures are generally restricted and possibly prohibited. Application for building permits will be referred to ERCA for its review and the issuance of permits prior to the issuance of any building permit by the City of Windsor.

REVISIONS

DATE:	BY-LAW #	DATE:	BY-LAW #
02/11/04	379-2004	11/02/20	137-2019
30/11/04	379-2004	11/03/20	31-2020
29/06/04	331-2003	25/09/20	114-2020
27/01/05	388-2004	27/01/21	160-2020
01/02/05	399-2004	27/07/21	106-2021
10/08/05	150-2005	15/12/21	166-2021
17/08/05	191-2005	23/02/22	192-2021
05/09/05	196-2005	02/05/22	188-2021
17/10/05	226-2005	27/06/22	33-2021
24/04/06	44-2006	07/07/22	93-2022
27/04/06	46-2005	09/22/22	66-2022
28/04/06	34-2006	10/18/22	131-2022
REVISED:	OMB File 1695	05/18/23	41-2023
13/06/06	B/L# 327-2004	05/29/23	60-2023
25/05/06	65-2006	05/29/23	70-2023
25/05/06	69-2007		
01/10/07	124-2007		
22/10/07	129-2007		
26/11/07	136-2007		
24/06/08	104-2008		
10/10/08	150-2008		
23/01/09	63-2008		
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09/29/10	147-2010		
27/10/10	153-2010		
28/10/10	165-2010		
31/01/11	10-2011		
15/02/11	26-2011		
03/03/11	39-2011		
03/03/11	18-2011		
03/03/11	24-2011		
30/03/11	68-2011		
14/04/11	180-2010		
02/09/11	274-2003		
16/10/12	129-2012		
22/02/13	114-2012		
27/09/13	146-2013		
08/11/13	148-2005		
27/11/13	181-2013		
02/01/14	193-2013		
28/05/14	77-2014		
08/09/14	151-2014		
19/06/15	55-2015		
25/06/15	79-2015		
25/05/16	60-2016		
26/07/16	112-2016		
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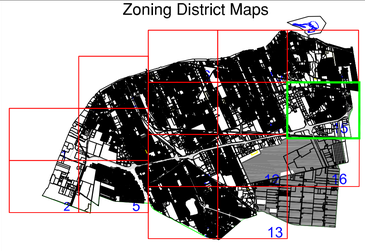
24/05/18	173-2015		
23/07/18	89-2018		
15/05/19	39-2019		

Zoning District Maps



This forms Part of Schedule 'A'.

City of Windsor Zoning By-law 8600

Scale 1:6000

Zoning District Map 15

Appendix B

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

References

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