Environmental Noise & Vibration Assessment

25 Hillcrest Avenue and 3154 Hurontario Street
Mississauga, ON

SLR Project No: 241.20172.00000
May 2022

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ENVIRONMENTAL NOISE AND VIBRATION ASSESSMENT

25 Hillcrest Avenue and 3154 Hurontario Street

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SLR Project No: 241.20172.00000

Version 1.1

Submitted by:

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1.0 INTRODUCTION

SLR Consulting (Canada) Ltd. was retained by 33HC TAS LP, 33HC Corp., 3168HS LP and 3168HS Corp. to conduct an Environmental Noise and Vibration study for the 25 Hillcrest Avenue and 3154 Hurontario Street development in Mississauga, Ontario. This study was completed in support of the Official Plan Amendment/Zoning Bylaw Amendment application for the project.

1.1 Focus of Report

In keeping with City of Mississauga requirements, this report examines the potential for:

- Impacts of the environment on the proposed development;
- Impacts of the proposed development on the environment; and
- Impacts of the proposed development on itself.

Impacts of the environment on the development are due to transportation (roadway, railway, LRT) and stationary noise sources (Cooksville GO Station, commercial buildings and a school).

Stationary noise sources from the development's site include the commercial building, and a community centre. These building mechanical systems have not been sufficiently designed at this stage. As a result, the mechanical system demands have not been determined and will be assessed at a future date.

1.2 Nature of the Subject Lands

The proposed development is located at the northwest corner of Hurontario Street and Hillcrest Avenue intersection in Mississauga, Ontario. The site is currently occupied by three commercial buildings, including a restaurant, LCBO, and Beer Store, as well as a parking lot.

The proposed development is comprised of the following residential buildings:

- Building A, mixed-use 43-storey tower + podium;
- Building B, mixed-use 43-storey tower + podium;
- Building C, 46-storey commercial podium + residential tower
- Building D, mixed use 39-storey tower + podium
- Building E, 34-storey residential tower + podium, including a community centre on levels 1 to 3 (basketball court, aquatics centre, and library).

Each building includes private common outdoor amenity areas, located on the 2nd floor of Building A, B and D, the 7th floor of Building C, as well as the 4th floor of Building E.

A copy of the site plan and floor plans are included in Appendix A.

1.3 Nature of the Surroundings

The lands surrounding the development are a combination of residential, institutional, and commercial lands. Immediately to the north is the Cooksville GO station, with a residential neighborhood located further north, beyond the station. Directly to the east across Hurontario are commercial lands, further east are mid-rise and high-rise residential buildings. Immediately to the south is a residential tower and a secondary school. Further to the south is a mix of residential and commercial uses. Directly to the west is a Cooksville GO station parking lot, with a group of residential towers located further to the west.

The Hurontario LRT project (formerly known as the Hurontario-Main LRT) is currently under construction, will include a light rail line running along Hurontario Street. This line is estimated to be in operation in 2024.

Noise sources with the potential to impact the proposed development include road traffic, LRT noise along Hurontario, Rail traffic along the Galt Subdivision rail line, Cooksville GO bus terminal, and noise from surrounding commercial buildings.

The surrounding topography is generally flat, with gradually downward slope to the south

A context plan is shown in Figure 1.

PART 1: IMPACTS OF THE ENVIRONMENT ON THE DEVELOPMENT

In assessing potential impacts of the environment on the proposed development, the focus of this report is to assess the potential for:

- Roadway, Railway and LRT noise impacts on the development; and
- Stationary noise impacts from the surrounding industries on the development.

The development is located outside of the Pearson NEF 25 noise contours. Therefore aircraft noise impacts have not been assessed.

2.0 TRANSPORTATION NOISE IMPACTS

2.1 Transportation Noise Sources

Transportation noise sources of interest with the potential to produce noise at the proposed development include:

- Hurontario Street;
- Confederation Parkway;
- Hillcrest Avenue;
- Hurontario LRT Line; and
- CP and Metrolinx GO rail traffic on the Galt Subdivision.

Sound exposure levels at the development have been predicted, and this information has been used to identify façade, ventilation and warning clause requirements.

2.2 Surface Transportation Noise Criteria

2.2.1 Ministry of the Environment Publication NPC-300

Noise Sensitive Developments

Ministry of the Environment, Conservation and Parks (MECP) Publication NPC-300 provides sound level criteria for noise sensitive developments. The applicable portions of NPC-300 are Part C – Land Use Planning and the associated definitions outlined in Part A – Background. Tables 1 to 4 below summarizes the applicable surface transportation (road and rail) criteria limits.

Location Specific Criteria

Table 1 summarizes criteria in terms of energy equivalent sound exposure (L_{eq}) levels for specific noise-sensitive locations. Both outdoor and indoor locations are identified, with the focus of outdoor areas being amenity spaces. Indoor criteria vary with sensitivity of the space. As a result, sleep areas have more stringent criteria than Living / Dining room space.

Table 1: MECP Publication NPC-300 Sound Level Criteria for Road and Rail Noise

Type of Space	Time Period	Equivalent Sound Exposure Level - L_{eq} (dBA)		Assessment Location
		Road	Rail [1]	
Outdoor Living Area (OLA)	Daytime (0700-2300h)	55	55	Outdoors [2]
Living / Dining Room [3]	Daytime (0700-2300h)	45	40	Indoors [4]
	Night-time (2300-0700h)	45	40	Indoors [4]
Sleeping Quarters	Daytime (0700-2300h)	45	40	Indoors [4]
	Night-time (2300-0700h)	40	35	Indoors [4]

Notes: [1] Whistle noise is excluded for OLA noise assessments, and included for Living / Dining Room and Sleeping Quarter assessments.
[2] Road and Rail noise impacts are to be combined for assessment of OLA impacts.
[3] Residence area Dens, Hospitals, Nursing Homes, Schools, Daycares are also included. During the night-time period, Schools and Daycares are excluded.
[4] An assessment of indoor noise levels is required only if the criteria in **Table 4** are exceeded.

Outdoor Amenity Areas

Table 2 summarizes the noise mitigation requirements for communal outdoor amenity areas ("Outdoor Living Areas" or "OLAs").

For the assessment of outdoor sound levels, the surface transportation noise impact is determined by combining road and rail traffic sound levels. Whistle noise due to railway trains is not included in the determination of levels.

Table 2: MECP Publication NPC-300 Outdoor Living Area Mitigation Requirements

Time Period	Equivalent Sound Level in Outdoor Living Area (dBA)	Ventilation Requirements
Daytime (0700-2300h)	≤ 55	• None
	55 to 60 incl.	• Noise barrier **OR** Warning Clause A
	> 60	• Noise barrier to reduce noise to 55 dBA **OR** • Noise barrier to reduce noise to 60 dBA and Warning Clause B

Ventilation and Warning Clauses

Table 3 summarizes requirements for ventilation where windows potentially would have to remain closed as a means of noise control. Despite implementation of ventilation measures where required, if sound exposure levels exceed the guideline limits in Tables 1, warning clauses advising future occupants of the potential excesses are required. Warning clauses also apply to OLAs.

Building Shell Requirements

Table 4 provides sound level thresholds which if exceeded, require the building shell and components (i.e., wall, windows) to be designed and selected accordingly to ensure that the Table 1 indoor sound criteria are met.

Table 3: MECP Publication NPC-300 Ventilation & Warning Clause Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - L_{eq} (dBA)		Ventilation and Warning Claus Requirements [2]
		Road	Rail [1]	
Outdoor Living Area	Daytime (0700-2300h)	56 to 60 incl.		Type A Warning Clause
Plane of Window	Daytime (0700-2300h)	≤ 55		None
		56 to 65 incl.		Forced Air Heating /provision to add air conditioning + Type C Warning Clause
		> 65		Central Air Conditioning + Type D Warning Clause
	Night-time (2300-0700h)	51 to 60 incl.		Forced Air Heating/ provision to add air conditioning + Type C Warning Clause
		> 60		Central Air Conditioning + Type D Warning Clause

Notes: [1] Rail whistle noise is excluded.
[2] Road and Rail noise is combined for determining Ventilation and Warning Clause requirements.

Table 4: MECP Publication NPC-300 Building Component Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - L_{eq} (dBA))		Component Requirements
		Road	Rail [1]	
Plane of Window	Daytime (0700-2300h)	> 65	> 60	Designed/ Selected to Meet Indoor Requirements [2]
	Night-time (2300-0700h)	> 60	> 55	

Notes: [1] Including whistle noise.
[2] Building component requirements are assessed separately for Road and Railway noise. The resultant sound isolation parameter is required to be combined to determine and overall acoustic parameter.

Guideline Summary

In summary, roadway noise impacts are to be predicted at the plane-of-window for the proposed development. Providing the plane-of-window sound levels exceed the daytime and nighttime sound levels indicated in **Table 4**, the determination of the building façade components is required for meeting the indoor sound level criteria outlined in **Table 1**. In addition, the ventilation requirements and warning clauses are determined, as outlined in **Table 3**, based on the plane-of-window noise levels.

As the LRT is an electric rail vehicle and does not include the significant low frequency noise component of diesel locomotives, impacts were assessed against roadway criteria.

2.2.2 Region of Peel

The Region of Peel guidelines include the General Guidelines for the Preparation of Acoustical Reports in the Region of Peel, dated November 2012 (ROP Guidelines). In general, the Region of Peel guidelines are consistent with the MECP NPC-300 guidelines. Therefore, the guidelines have not been re-iterated again.

2.3 Traffic Data and Future Projections

2.3.1 Roadway Traffic Data

Road traffic data was obtained from the City of Mississauga in the form of "Ultimate AADTs". Table 5 summarizes the road traffic volumes used in the analysis. A copy of the traffic data used can be found in Appendix B.

Table 5: Summary of Road Traffic Data Used in the Transportation Analysis

Roadway Link	Ultimate Traffic Volume (AADT)	% Day/ Night Volume Split		Commercial Traffic Breakdown		Vehicle Speed (km/h)
		Daytime	Night-time	% Medium Trucks	% Heavy Trucks	
Hurontario Street	46,100	90	10	2.8	2.3	50
Confederation Parkway	23,600	90	10	1.7	1.4	50
Hillcrest Avenue	28,400	90	10	1.7	1.4	50

Notes: - traffic data provided by City of Mississauga.

2.3.2 Rail Traffic Data

As rail traffic data is longer available from CP, historical rail traffic data for the Galt Subdivision rail line was applied. An annual growth rate of 2.5% was applied to the rail data to reach a 2032 future year. Forecasted GO rail traffic data was provided by Metrolinx. The rail traffic data used in the assessment is summarized in the Table 6 and included in Appendix B.

Table 6: Summary of Rail Traffic Data Used in the Analysis

Rail Line	Train Type	Typical No. of Engines/Train	No. of Cars/Train	No. of Trains		Maximum Speed (km/h)
				Daytime (7am to 11pm)	Night-time (11pm to 7am)	
Galt Subdivision	GO Passenger	1	12	38	6	105
Galt Subdivision	CP Freight	2	60	36	14	80.5

2.3.3 LRT Traffic Data

A Noise and Vibration study was previously completed for the Hurontatrio LRT line as a component of the Transportation Process Application Plan (TPAP) by J.E.Coulter Associates. The report is entitled "Noise and Vibration Impact Assessment, Hurontario-Main Light Rail Transit, City of Mississauga and City of Brampton", dated June 4, 2014 (LRT Noise and Vibration Study). Data from this report were applied in the assessment of LRT noise impacts.

The LRT vehicles have been conservatively modelled as three cars per train. Excerpts of the rail traffic data from the Noise and Vibration Assessment can be found in Appendix B. The following summarizes the light rail traffic volume used in the analysis.

Table 7: Summary of Light Rail Traffic Data Used in the Analysis

Train Type	Future Year 2032 No. of Trains		Typical No. of Cars (Consist)	Maximum Speed (km/h)
	Daytime	Night-time		
LRT Passenger [1]	280	44	3	50

Notes: [1] Based on data obtained from the 2014 Noise and Vibration Impact Assessment.

2.4 Projected Sound levels

Future road traffic sound levels at the proposed development were predicted using Cadna/A, a commercially available noise propagation modelling software. Roadways were modelled as line sources of sound, with sound emission rates calculated using ORNAMENT algorithms, the road traffic noise model of the MECP. These predictions were validated and are equivalent to those made using the MECP's ORNAMENT or STAMSON v5.04 road traffic noise models. A STAMSON validation file is included in Appendix B.

LRT and Railway noise levels were modelled as line sources of sound using the U.S. Federal Railway Administration/ Federal Transit Administration ("FTA/FRA") noise emission and propagation algorithms in Cadna/A. GO Trains were modelled using FTA reference sound levels were with diesel-electric locomotives and rail car reference levels, with FRA Locomotives were applied to Freight Trains. The LRT trains were conservatively modelled as three Conventional Commuter Rail Cars per train.

As the majority of surrounding ground is concrete/asphalt, a reflective ground type has been applied in the modelling.

Sound levels were predicted along the façades of the proposed development using the "building evaluation" feature of Cadna/A. This feature allows for noise levels to be predicted across the entire façade of a structure.

Changes in ground elevation contours for the surrounding area were included in the modelling using topography from the City of Mississauga Open Data files.

2.4.1 Façade Sound Levels

Predicted worst-case façade sound levels are presented in Table 8 for the roadway, railway, and LRT individually. The transportation façade sound levels of the development, showing the ranges of predicted daytime and night-time sound levels are shown in Figure 2, Figure 3, Figure 4 and Figure 5 for roadway, railway, LRT and combined impacts.

Table 8: Summary of Transportation Facade Sound Levels

Building Section	Façade	Roadway Sound Levels		Railway Sound Levels		LRT Sound Levels		Combined Sound Levels	
		L_{eq} Day (dBA)	L_{eq} Night (dBA)	L_{eq} Day (dBA)	L_{eq} Night (dBA)	L_{eq} Day (dBA)	L_{eq} Night (dBA)	L_{eq} Day (dBA)	L_{eq} Night (dBA)
Building A	North	54	48	63	61	44	39	64	62
	East	56	50	61	60	45	40	63	60
	South	56	50	55	54	44	39	59	55
	West	55	49	60	58	32	27	61	58
Building B	North	58	51	64	62	47	42	65	62
	East	58	52	62	60	48	43	63	61
	South	56	50	53	51	43	38	57	53
	West	54	48	61	59	43	38	61	59
Building C	North	62	55	64	62	51	46	66	63
	East	66	59	62	60	55	50	67	63
	South	63	57	54	52	51	46	64	57
	West	54	48	61	59	38	33	61	59
Building D	North	64	58	59	58	53	48	65	60
	East	69	62	59	57	56	51	69	64
	South	68	62	47	45	53	48	68	62
	West	68	62	59	57	56	51	69	63
Building E	North	57	51	55	53	42	37	59	55
	East	60	53	55	54	45	40	61	56
	South	65	59	47	45	44	39	65	59
	West	62	55	51	49	32	27	62	56

Notes: - The sound levels presented are for the worst-case exposed façade, in which totals may not correspond to the same location.

2.4.2 Outdoor Amenity Area Sounds Levels

The assessed outdoor living areas (OLA) of the proposed development include the 2nd floor private common outdoor amenity areas on the second floor of Buildings A, B and D, and the 4th floor of Building E. The predicted noise impacts from transportation sources is summarized in Table 9 and shown in Figure 6.

As the development includes a private common amenity space for the occupants in each building, private terraces are not considered to be the only outdoor amenity space available. Therefore, an assessment of private terraces was excluded based on the definitions outlined in NPC-300.

Sound levels are predicted to be at or below 60 dBA at all outdoor amenity spaces, therefore, physical noise control measures are not required.

Table 9: Summary of Transportation Noise Impacts – Outdoor Amenity

ID	Description	Transportation Impacts L_{eq} Day (dBA)	Applicable Guideline Limit L_{eq} Day (dBA)	Meets Criteria? (Yes/No)
OLA1	Building A 2nd floor	54	60	Yes
OLA2	Building B 2nd floor	55 -58	60	Yes
OLA3	Building C 7th floor	64	60	No
OLA4	Building D 2nd floor	57	60	Yes
OLA5	Building E 4th floor	54 -56	60	Yes

Notes: [1] Sound Levels up to 60 dBA are allowed with the use of a Type A Warning Clause

2.5 Façade Requirements

2.5.1 Glazing Assessment

Based on the sound levels shown in Table 8, façade sound levels were predicted to exceed the above criteria at multiple locations throughout the development. Therefore, an assessment of glazing requirements is necessary for meeting the indoor sound level requirements outlined in Table 1.

Indoor sound levels and required facade Sound Transmission Classes (STCs) were estimated using the procedures outlined in National Research Council Building Practice Note BPN-56.

Detailed floor plans were not available at the time of the assessment. For the analysis, generic bedrooms and living rooms have been considered based on the following assumptions:

- 60 % glazing was assumed for the living room and bedroom facades
- living/dining rooms were assumed to have a façade-to-floor area ratio of 40%;
- sleeping quarters were assumed to have a façade-to-floor area ratio of 100%
- a spandrel panel wall rating of STC 43 was assumed for all locations in the development.

The acoustic requirements are provided below in Tables 10, 11, 12, and 13, for Buildings A, B, D and E, respectively.

The combined glazing and frame assembly must be designed to ensure the overall sound isolation performance for the entire window unit meets the sound isolation requirements. It is recommended window manufacturers test data be reviewed to confirm acoustical performance is met.

The glazing requirements above are approximated, based on the generic room, façade and glazing dimensions. Once detailed floor plans and façade plans become available, the glazing requirements should be re-assessed and reviewed by an Acoustical Consultant.

Table 10: Summary of Glazing Composite STC Requirements – Building A

Building	Floors	Location	Glazing Requirements	
			Living Room (STC) [1]	Bedroom (STC) [1]
Building A	Podium	N Corner [1]	OBC	36
		N	OBC	33
		E	OBC	32
		S	OBC	OBC
		W	OBC	OBC
		S Corner [1]	OBC	35
	Tower	N Corner [1]	OBC	36
		N	OBC	33
		E	OBC	30
		S	OBC	OBC
		W	OBC	OBC
		S Corner [1]	OBC	33

Notes: OBC = Ontario Building Code, meeting a rating of STC 29
[1] Corners could include NE/NW and SE/SW locations

Table 11: Summary of Glazing Composite STC Requirements – Building B

Building	Floors	Location	Glazing Requirements	
			Living Room (STC) [1]	Bedroom (STC) [1]
Building B	Podium	N Corner [1]	OBC	37
		N	OBC	34
		E	OBC	32
		S	OBC	OBC
		W	OBC	OBC
		S Corner [1]	OBC	35
	Tower	N Corner [1]	OBC	36
		N	OBC	33
		E	OBC	30
		S	OBC	OBC
		W	OBC	OBC
		S Corner [1]	OBC	33

Notes: OBC = Ontario Building Code, meeting a rating of STC 29
[1] Corners could include NE/NW and SE/SW locations

Table 12: Summary of Glazing Composite STC Requirements – Building C

Building	Floors	Location	Glazing Requirements	
			Living Room (STC) [1]	Bedroom (STC) [1]
Building C	Tower	N Corner [1]	OBC	37
		N	OBC	34
		E	OBC	31
		S	OBC	OBC
		W	OBC	OBC
		S Corner [2]	OBC	34

Notes: OBC = Ontario Building Code, meeting a rating of STC 29
[1] Corners could include NE/NW and SE/SW locations
[2] Corner includes SE location only

Table 13: Summary of Glazing Composite STC Requirements – Building D

Building	Floors	Location	Glazing Requirements	
			Living Room (STC) [1]	Bedroom (STC) [1]
Building D	Podium	N Corner [2]	30	35
		N	OBC	30
		E	OBC	32
		S	OBC	OBC
		W	OBC	32
		S Corner [1]	30	35
	Tower	N Corner [2]	OBC	33
		N	OBC	OBC
		E	OBC	30
		S	OBC	OBC
		W	OBC	OBC
		S Corner [1]	OBC	33

Notes: OBC = Ontario Building Code, meeting a rating of STC 29
[1] Corners could include NE/NW and SE/SW locations
[2] Corner includes NE location only

Table 14: Summary of Glazing Composite STC Requirements – Building E

Building	Floors	Location	Glazing Requirements	
			Living Room (STC) [1]	Bedroom (STC) [1]
Building E	Podium	N Corner [1]	OBC	OBC
		N	OBC	OBC
		E	OBC	OBC
		S	OBC	OBC
		W	OBC	OBC
		S Corner [1]	OBC	30
	Tower	N Corner [1]	OBC	OBC
		N	OBC	OBC
		E	OBC	OBC
		S	OBC	OBC
		W	OBC	OBC
		S Corner [1]	OBC	OBC

Notes: OBC = Ontario Building Code, meeting a rating of STC 29
[1] Corners could include NE/NW and SE/SW locations

2.5.2 Ventilation and Warning Clauses

The requirements regarding warning clauses are summarized in Table 3. Based on the predicted façade sound levels, warning clauses are recommended to be included in agreements registered on Title for the residential units and included in all agreements of purchase and sale or lease, and all rental agreements.

Warning clause text can be found in Appendix D.

Central Air Conditioning and a Type D Warning Clause is recommended for all affected units with façade sound levels that are above 65 dBA during daytime hours and or 60 dBA during night-time hours. This includes all units listed below:

- Building A – podium and tower N façade units
- Building B – podium and tower N façade units;
- Building C – podium and tower N + E façade units; and
- Building D – podium E and S façade units, and tower E façade units.

Warning clause text can be found in Appendix D.

Forced air heating with provisions for future installation of central air conditioning, and a Type C warning clause, is recommended for all affected units with façade sound levels that are between 56 and 65 dBA during the daytime, or between 51 and 60 dBA during night-time hours. This includes all units not listed above.

A summary of the ventilation and warning clause requirements is included in Appendix C.

2.6 Outdoor Amenity Area Requirements

2.6.1 Acoustic Barriers

Based on the above OLA results, sound levels are in excess of 60 dBA within the 7th floor private common amenity area of Building C.

The following acoustic barrier is required for the Building C 7th floor private common amenity area.:

- L-shaped
- height = 1.2 m
- length = 36 m (9 m+27 m)
- minimum surface density of 20 kg/m^2 is required; and
- The barrier is required to be sealed with no gaps.

The location and extents of the acoustic barrier are included in **Appendix D**.

The barriers can be composed of solid walls and/or glass/plexiglass panels. The panels should be selected so that they have sufficient mass to adequately attenuate the noise (generally a minimum of 20 kg/m^2 face density). The panels and frames should be free of gaps and cracks on the sides and bottom. The system should also be designed to withstand any wind loading

With the inclusion of the above acoustic barrier, noise impacts within the Building C 7th floor private common outdoor amenity area is 60 dBA, as shown in **Figure 7**.

2.6.2 Warning Clauses

As the outdoor amenity area sound levels are above 55 dBA for Buildings B, D and E, and not physical mitigation is included, an MECP Type A Warning Clause is recommended for all units within these buildings.. The Type A warning clause is included in Appendix C.

A Type B warning clause is recommended for the Building C units, as physical mitigation measures are included to reduce sound levels to 60 dBA. The Type B warning clause is included in Appendix C.

3.0 STATIONARY SOURCE NOISE IMPACTS

3.1 Subject Site Visit and Noise Observations

A site visit was completed on March 14th, 2022, by SLR personnel to review the surrounding stationary noise sources. The acoustic environment is dominated by roadway noise along Hurontario Street.

Bus activity at the Cooksville bus station was observed by SLR personnel during the conducted site visit. Given the proximity of the station to the development, a detailed modeled was completed. The Cooksville bus stations includes eleven bus bays, with on-street bus connections.

No other facilities in the surrounding area were audible above ambient roadway noise during the time of the site visit.

As the surrounding area is primarily commercial/retail lands, the inclusion of stationary noise sources was determined based on the MECP Guideline D-6 Potential Influence Areas, a review of available aerial photography and site observations. Commercial/retail lands are considered to be Class I Industries, in which a 70 m influence area was applied for the inclusion of stationary noise sources. The commercial and school sources identified within the 70 m are of influence include a commercial plaza located at 3177 Hurontario Street, a Scotia Bank located across Hurontario Street, and TL Kennedy Secondary School across Hillcrest Ave.

3.2 Stationary Noise Sources

Based on the information obtained from our site visit, aerial images, and available Cooksville bus station information, the significant sources of noise in the area are as follows:

Cooksville Bus Station

Bus service begins at 6 am and ends at 2 am, and has the potential for 24 hour service in the future. HVAC equipment is assumed to operate during all times of day with reduced operation during nighttime hours.

- Rooftop HVAC units;
- Idling busses within the terminal platform;
- Idling cars within the passenger pick-up and drop off area; and
- On-site bus movements.

On-site bus routes include the MiWay Confederation (Route 28) MiWay Sherway Gardens (Route 4), MiWay Kennedy (Route 53), MiWay Creditview – Route 38), and the GO MI 21 – Milton route. The future bus volumes were provided by BA Group, the transportation consultants for the development. Future traffic data was provided by MiWay. Future GO bus volumes were unavailable and assumed to have a 15% increase by 2031. Based on the data provided, 18 buses/hr are expected to pass through the terminal during the daytime/evening periods, with 7 buses/hr during the overnight period.

Idling buses were assessed based on all 10 platforms in use during the daytime/evening periods and up to 3 platforms used during the overnight period.

Idling cars within the passenger pick-up/drop-off area was assumed to be at capacity during the daytime period (90 cars assumed). During the morning AM periods, 3 cars per lane were assumed to idle, as the majority of commuters would be travelling eastward into downtown Toronto.

As existing houses are located in close proximity to the Cooksville GO Station, noise emitted from the operations are expected to meet the MECP NPC-300 guideline limits at these noise sensitive buildings. Cooksville GO Station noise impacts (HVAC, bus idle, idling cars, bus pass-bys) were assessed on the development lands, based on compliance at the closest noise sensitive homes with the inclusion of the observed acoustic barriers on these properties. In addition, as the Cooksville GO Station parking structure is not enclosed, a 50% acoustical transparency was applied in the modelling to approximate the noise passing through the building.

Source sound level data and modelling parameters are summarized in Appendix D.

Sources Associated with Surrounding Commercial and School Buildings

HVAC equipment and exhaust fans are assumed to operate during all times of day with reduced operation during nighttime hours.

- Rooftop HVAC units; and
- Make Up Air Units;

Source sound level data and modelling parmeters are summarized in Appendix D.

Hurontario LRT

Stationary noise sources associated with the Hurontario LRT include:

- Traction Power Substations (TPSS) and
- Maintenance and Storage Facility (MSF).

The closest TPSS is understood to be located approximately 400 m to the south on the northeast corner of the Dundas and Hurontario intersection. The MSF is understood to be located near Highway 407 and Kennedy Road.

For each of the above sources, the MECP NPC-300 guideline limits are expected to be met at closer noise sensitive buildings. Therefore, noise impacts from the TPSS and MSF are not a concern for the development and a detailed assessment was not completed.

3.3 Noise Modelling

Noise emission rates for the equipment/activities were determined based on SLR's in-house database for similar types of equipment. All modelled stationary noise sources are shown in Figure 8. Sound level data and modelling parameters are summarized in Appendix D.

Noise impacts from stationary sources were modelled using Cadna/A, a software implementation of the internationally recognized ISO-9613-2 environmental noise propagation algorithms. The ISO 9613 equations account for:

- Source to receiver geometry;
- Distance attenuation;
- Atmospheric absorption;
- Reflections off of the ground and ground absorption;
- Reflections off of vertical walls; and
- Screening effects of buildings, terrain, and purpose-built noise barriers (noise walls, berms, etc.).

The following additional parameters were used in the modelling, which are consistent with providing a conservative (worst-case assessment of noise levels):

- Temperature: 10°C;
- Relative Humidity: 70%;
- Ground Absorption G: G=0.0 (reflective) as default global parameter;
- Reflection: An order of reflection of 1 was used (accounts for noise reflecting from walls);
- Wall Absorption Coefficients: Set to 0.21 for the development (21 % of energy is absorbed, 79% reflected) and 0.37 for surrounding buildings; and
- Terrain: per City of Mississauga Open Data.

3.3.1 Façade Sound Levels

The predicted facade noise levels are shown in Figure 9, from the surrounding stationary noise sources. Impacts compared to the NPC-300 guideline limits are shown in Table 14 below. An assessment on Building C was not completed, as uses are commercial and not noise sensitive.

Sound levels are predicted to meet the NPC-300 class 1 guideline limits on the subject site. Therefore, no additional noise mitigation measures are required for the surrounding facilities.

Table 15: Summary of Stationary Facade Sound Levels

Building Section	Façade	Stationary Sound Levels		Applicable Guideline Limits		Meets Criteria?	
		L_{eq} Day/Eve (dBA)	L_{eq} Night (dBA)	L_{eq} Day/Eve (dBA)	L_{eq} Night (dBA)	L_{eq} Day/Eve (Yes/No)	L_{eq} Night (Yes/No)
Building A	North	49	44	50	45	Yes	Yes
	East	47	42	50	45	Yes	Yes
	South	37	33	50	45	Yes	Yes
	West	41	37	50	45	Yes	Yes
Building B	North	50	44	50	45	Yes	Yes
	East	43	38	50	45	Yes	Yes
	South	43	39	50	45	Yes	Yes
	West	49	44	50	45	Yes	Yes
Building C	North	47	42	50	45	Yes	Yes
	East	44	41	50	45	Yes	Yes
	South	42	39	50	45	Yes	Yes
	West	45	41	50	45	Yes	Yes
Building D	North	44	41	50	45	Yes	Yes
	East	45	42	50	45	Yes	Yes
	South	37	35	50	45	Yes	Yes
	West	45	42	50	45	Yes	Yes
Building E	North	42	37	50	45	Yes	Yes
	East	41	37	50	45	Yes	Yes
	South	37	35	50	45	Yes	Yes
	West	38	34	50	45	Yes	Yes

Notes: - Sound levels are L_{eq} (1-hr) sound levels, in dBA

3.3.2 Outdoor Amenity Areas

An assessment of stationary noise impacts was completed for the 2nd floor private common outdoor amenity areas of Buildings A, B and D, the 7th floor of Building C, and the 4th floor of Building E, shown in Figure 10.

As the development includes a private common amenity space for the occupants in each building, private terraces are not considered to be the only outdoor amenity space available. Therefore, an assessment of private terraces was excluded based on the definitions outlined in NPC-300.

The predicted noise impacts from the surrounding stationary noise is summarized in Table 15 and shown in Figure 10. Sound levels are predicted to be at or below 60 dBA at all outdoor amenity spaces, therefore, physical noise control measures are not required.

Table 16: Summary of Stationary Noise Impacts – Outdoor Amenity

ID	Description	Stationary Impacts L_{eq} Day/Eve (dBA)	Applicable Guideline Limit L_{eq} Day (dBA)	Meets Criteria? (Y/N)
OLA1	Building A 2nd floor	35	50	Yes
OLA2	Building B 2nd floor	36 -40	50	Yes
OLA3	Building C 7th floor	44	50	Yes
OLA4	Building D 2nd floor	36	50	Yes
OLA5	Building E 4th floor	38 -40	50	Yes

3.4 Warning Clause Recommendations

As the surrounding industries have the potential to be audible at times, a warning clause should be included in the Agreement of Purchase and Sale or Lease and in the relevant Development Agreements. An MECP NPC-300 Type E warning clause is recommended for all suites within the development. See Appendix C for a summary of the warning clause details and recommended wording.

4.0 VIBRATION ASSESSMENT

4.1 Industrial (Stationary) Sources

There are no existing or proposed significant industrial vibration sources within their area of influence of the Project site, such as large stamping presses or forges. Under applicable MECP Publication NPC-207 guidelines, a detailed vibration assessment is not required. Adverse impacts from industrial vibration are not anticipated.

4.2 Transportation Sources

As the Galt Subdivision rail line is located greater than 75 m from the Project site, a detailed vibration assessment of freight and GO trains is not required. Adverse impacts from transportation vibration are not anticipated.

In the LRT Noise and Vibration Study, the MECP/TTC vibration criteria for residential buildings is expected to be met at a distance of 15 m from the centerline of the nearest track for LRT speeds of 50 km/h. For this section of the LRT, the trains are understood to operate at a 50 km/hr speed and the proposed development is located approximately 25 m from the closest LRT track. Therefore, the MECP/TTC vibration criteria are expected to be met with no vibration controls required for the development.

PART 2: IMPACTS OF THE DEVELOPMENT ON THE SURROUNDING AREA

5.0 IMPACTS ON SURROUNDING PROPERTIES

In terms of the noise environment of the area, it is expected that the project will have a negligible effect on the neighbouring properties. The traffic related to the proposed development will be negligible in relation to the traffic volumes within the area, and is not of concern with respect to noise impact.

Other possible sources of noise for the development with potentially adverse impacts on the surrounding neighbourhood are emergency generators and mechanical roof-top equipment. This equipment is required to meet MECP Publication NPC-300 requirements at the closest off-site noise sensitive receptors.

Given the high ambient sound levels in the area and the fact that the systems will be designed to ensure that the applicable noise guideline are met at on-site receptors, off-site impacts are not anticipated.

Regardless, potential impacts should be assessed as part of the final building design. The criteria can be met at all surrounding and on-site receptors by the appropriate selection of mechanical equipment, by locating equipment with sufficient setback from noise sensitive locations, and by incorporating control measures (e.g., silencers) into the design.

It is recommended the mechanical systems be reviewed by an Acoustical Consultant prior to final selection of equipment.

PART 3: IMPACTS OF THE DEVELOPMENT ON ITSELF

6.0 NOISE IMPACTS FROM THE DEVELOPMENT MECHANICAL SYSTEMS ON ITSELF

The building mechanical systems have not been designed at this time. Although no adverse impacts are expected, such equipment has the potential to result in noise impacts on residential spaces within the development. This equipment is required to meet MECP Publication NPC-300 requirements at the facades of the noise sensitive spaces within the development. Therefore, the potential impacts should be assessed as part of the final building design.

The criteria is expected to be met at all on-site receptors with the appropriate selection of mechanical equipment, by locating equipment to minimize noise impacts within the development, and by incorporating control measures (e.g., silencers) into the design.

It is recommended the mechanical systems be reviewed by an Acoustical Consultant prior to final selection of equipment.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The potential for noise impacts on and from the proposed development have been assessed. Impacts of the environment on the development, the development on the surrounding area and the development on itself have been considered. Based on the results of our studies, the following conclusions have been reached:

7.1 Transportation Noise

- An assessment of transportation noise impacts from surrounding roadways, railway and LRT line has been completed.
- Based on transportation façade sound levels, upgraded glazing is required to meet the MECP Publication NPC-300 Building Component Requirements on the development, as outlined in Section 2.5.
- Noise impacts within the outdoor amenity areas meet the MECP NPC-300 guideline limits for Building A, B, D, and E without physical noise mitigation measures. An acoustic barrier is required for the Building C 7th floor private common amenity area, as outlined in Section 2.6.1.
- Ventilation recommendations are outlined in Section 2.5.2. A combination of Provision for Future Installation of AC and Mandatory AC are recommended for the development, as summarized in Appendix C.
- Warning Clause recommendations are outlined in Section 2.5.2 and 2.6.2, and include a combination of MECP Type A, Type B, Type C and Type D warning clauses, including CP and Metrolinx warning clauses.

7.2 Transportation Vibration

- An assessment of Freight and GO Train vibration was not completed, as the development is located at distance greater than 75 m from the railway. Therefore, an assessment of Freight and GO Train vibration was not completed.
- Hurontario LRT vibration impacts are expected to meet the MECP/TTC residential vibration criteria at the proposed development, based on the separation distances outlined in the LRT Noise and Vibration Study. Therefore, vibration impacts are also not anticipated to be a concern at the proposed development.
- No significant industrial vibration sources (eg. automotive heavy metal stamping) were identified within the surrounding area. Therefore, an assessment of industrial vibration was not completed.

7.3 Stationary Noise

- "Stationary" noise from the surrounding facilities were assessed on the proposed development, as outlined in Section 3.
- Stationary noise impacts from the surrounding commercial noise are predicted to meet NPC-300 Class 1 guideline limits on all development buildings and outdoor amenity spaces without noise control measures.
- As the Cooksville GO Station will be audible within the development lands, an MECP Type E warning clause is recommended.

7.4 Overall Assessment

- Impacts of the environment on the proposed development are expected to meet the applicable guideline limits with upgraded glazing, an acoustic barrier, inclusion of ventilation and warning clause requirements, and without noise controls for surrounding stationary sources, detailed in Part 1 of this report.
- Impacts of the proposed development are expected to meet the applicable guideline limits, and can be adequately controlled by following the design guidance outlined Part 2 of this report.
- Impacts of the proposed development on itself can be adequately controlled by following the design guidance outlined in Part 3 of this report.
- As generic room dimensions were applied in the assessment, the final acoustical requirements should be reviewed by and Acoustical Consultant once detailed floor and façade plans are available.
- As the mechanical systems for the proposed development have not been designed at the time of this assessment, the acoustical requirements above should be confirmed by an Acoustical Consultant as part of the final building design.

8.0 REFERENCES

International Organization for Standardization, ISO 9613-2: Acoustics – Attenuation of Sound During Propagation Outdoors Part 2: General Method of Calculation, Geneva, Switzerland, 1996.

National Research Council, (NRC, 1985). Building Practice Note: Controlling Sound Transmission into Buildings, ISSN 0701-5216

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Ontario Ministry of the Environment, Conservation and Parks (MECP, 2013), Publication NPC-300: Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning

U.S. Federal Railroad Administration (FRA, 2005), High-Speed Ground Transportation Noise and Vibration Impact Assessment Manual

U.S. Federal Transit Administration (FTA, 2013), Transit Noise and Vibration Impact Assessment Manual

STATEMENT OF LIMITATIONS

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FIGURES

Environmental Noise & Vibration Assessment

3168 HS LP

25 Hillcrest Avenue and 3154 Hurontario Street

SLR Project No.: 241.20172.00000

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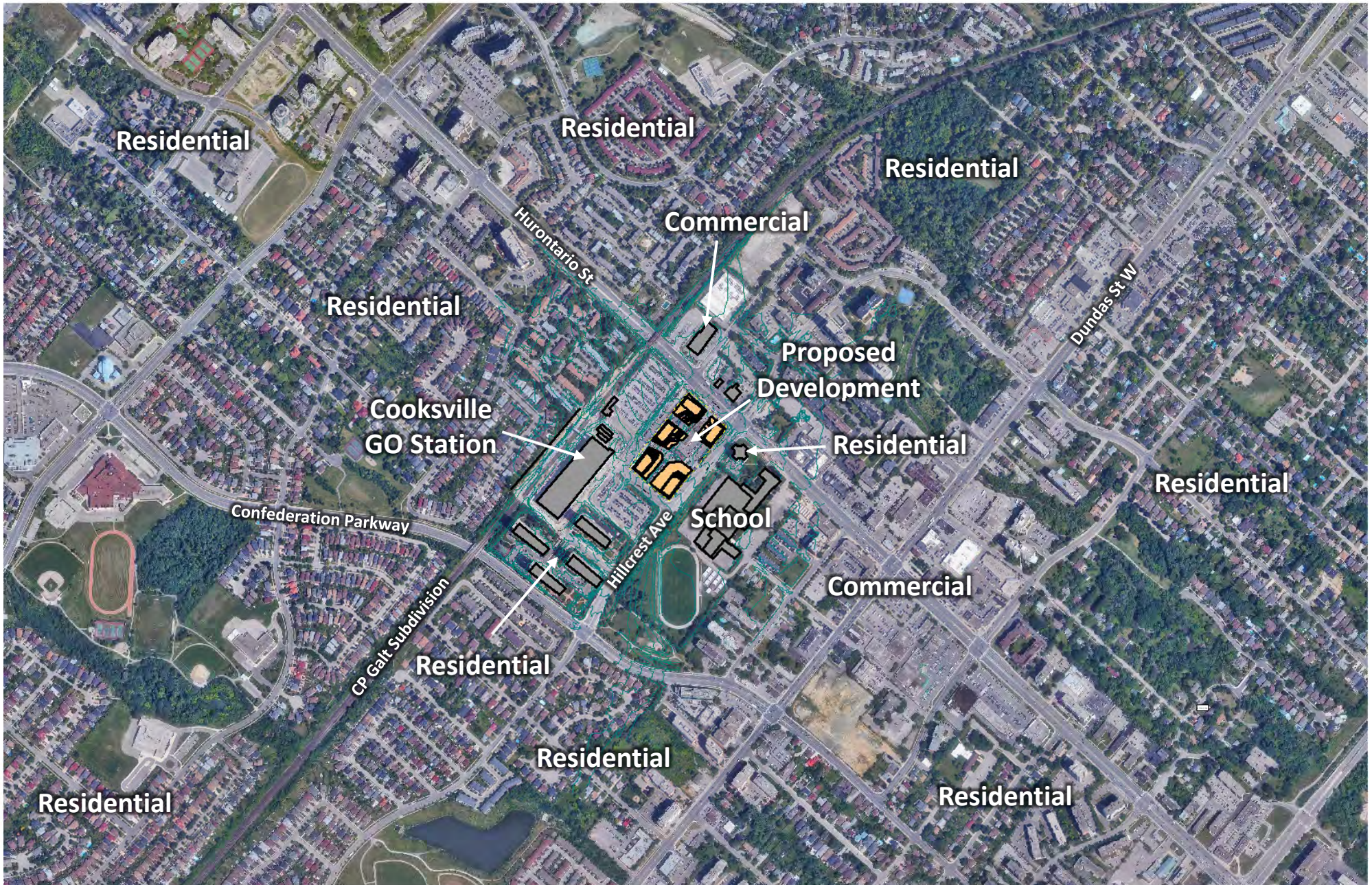

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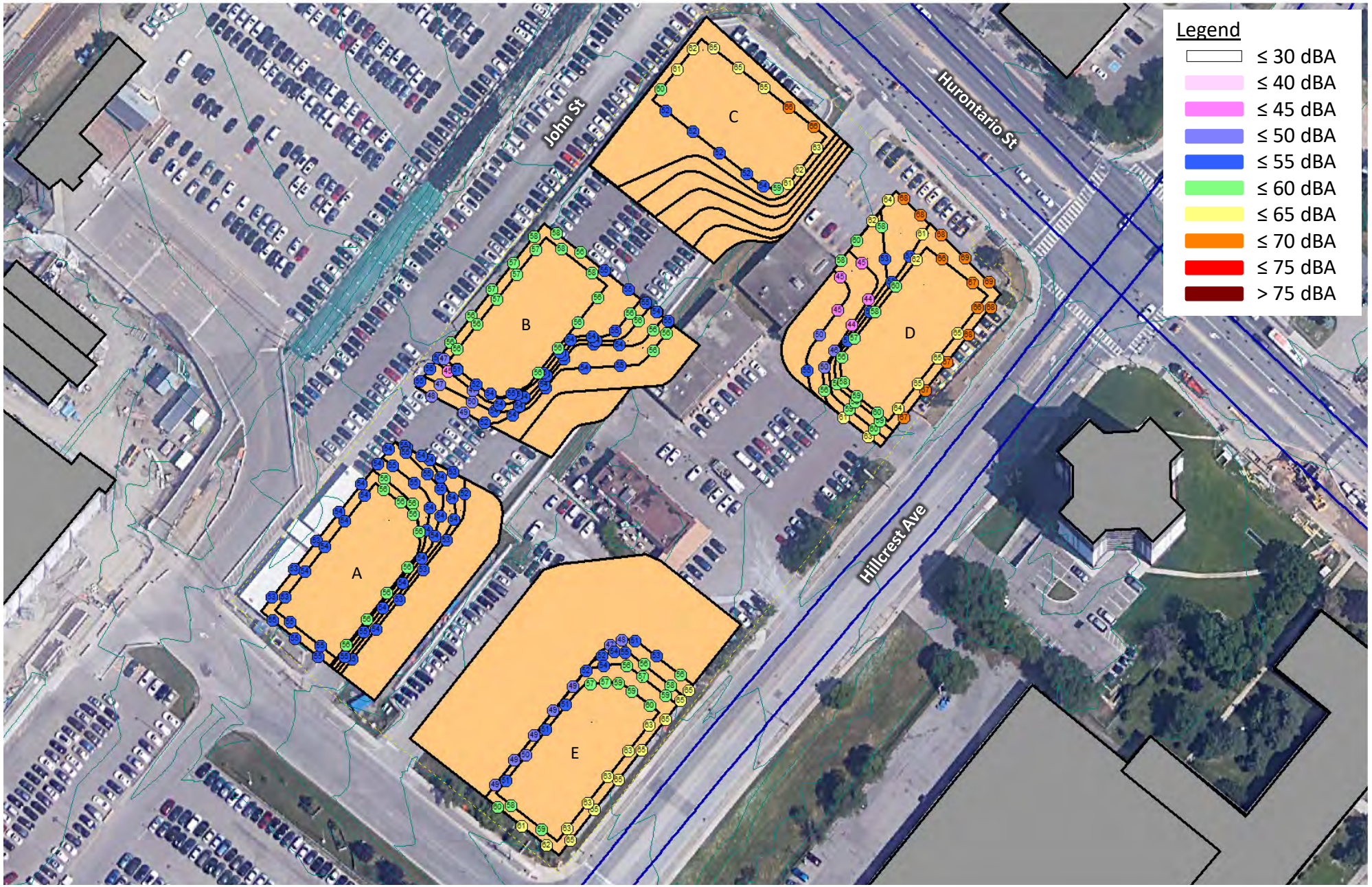
CONTEXT PLAN		Project No. 241.20172.00000		



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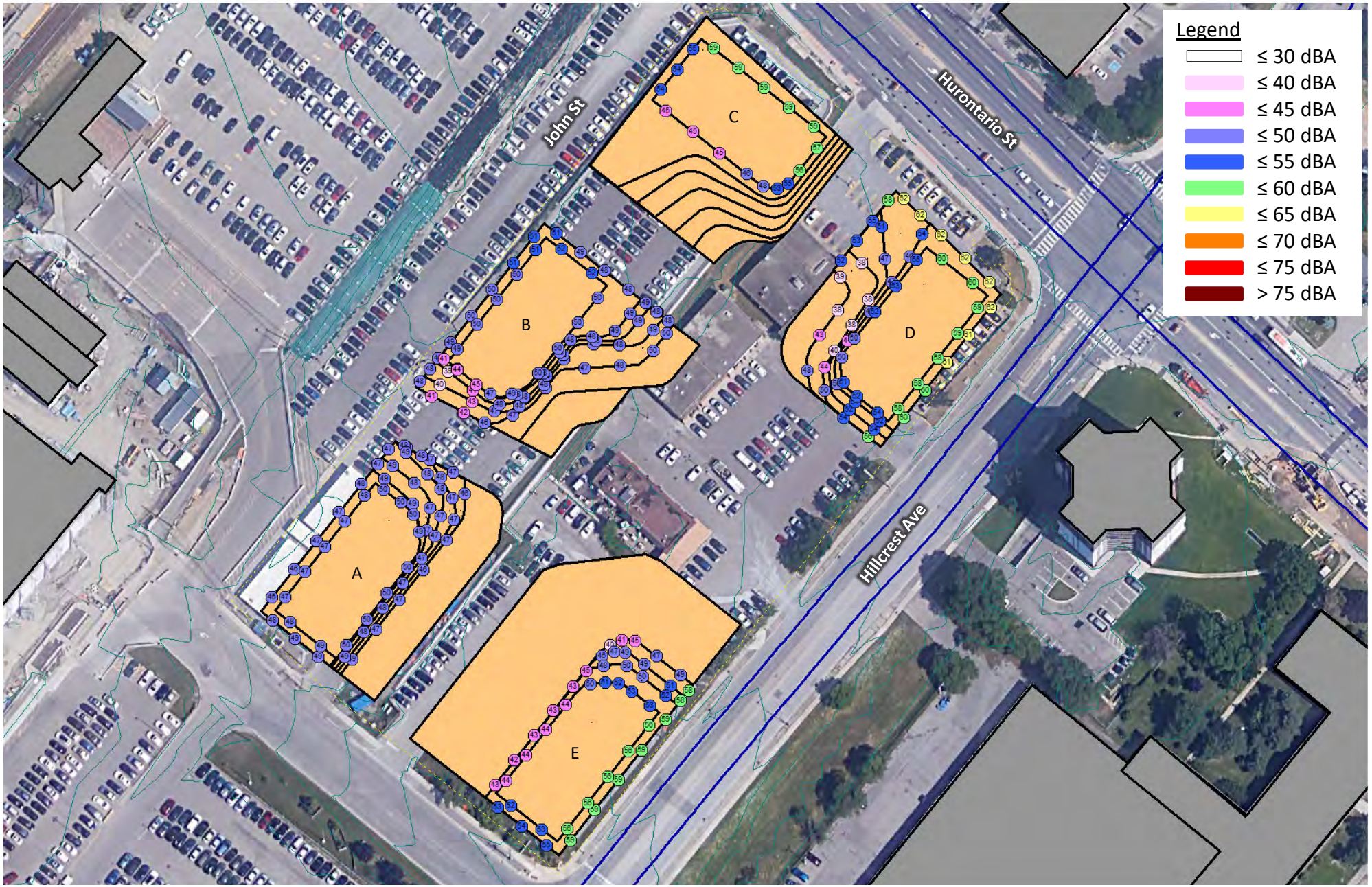
FAÇADE SOUND LEVELS, ROADWAY – DAYTIME		Project No. 241.20172.00000		



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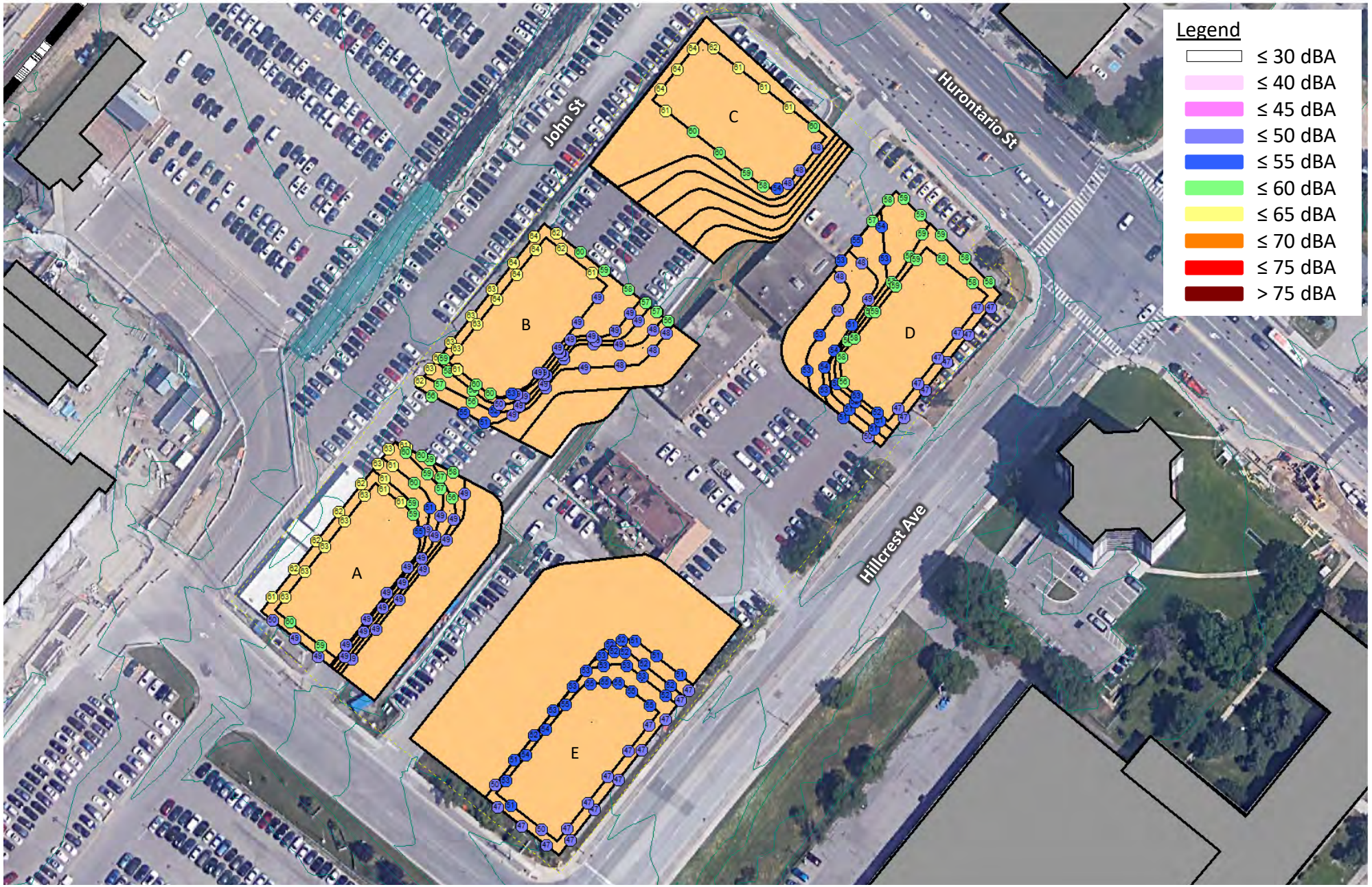

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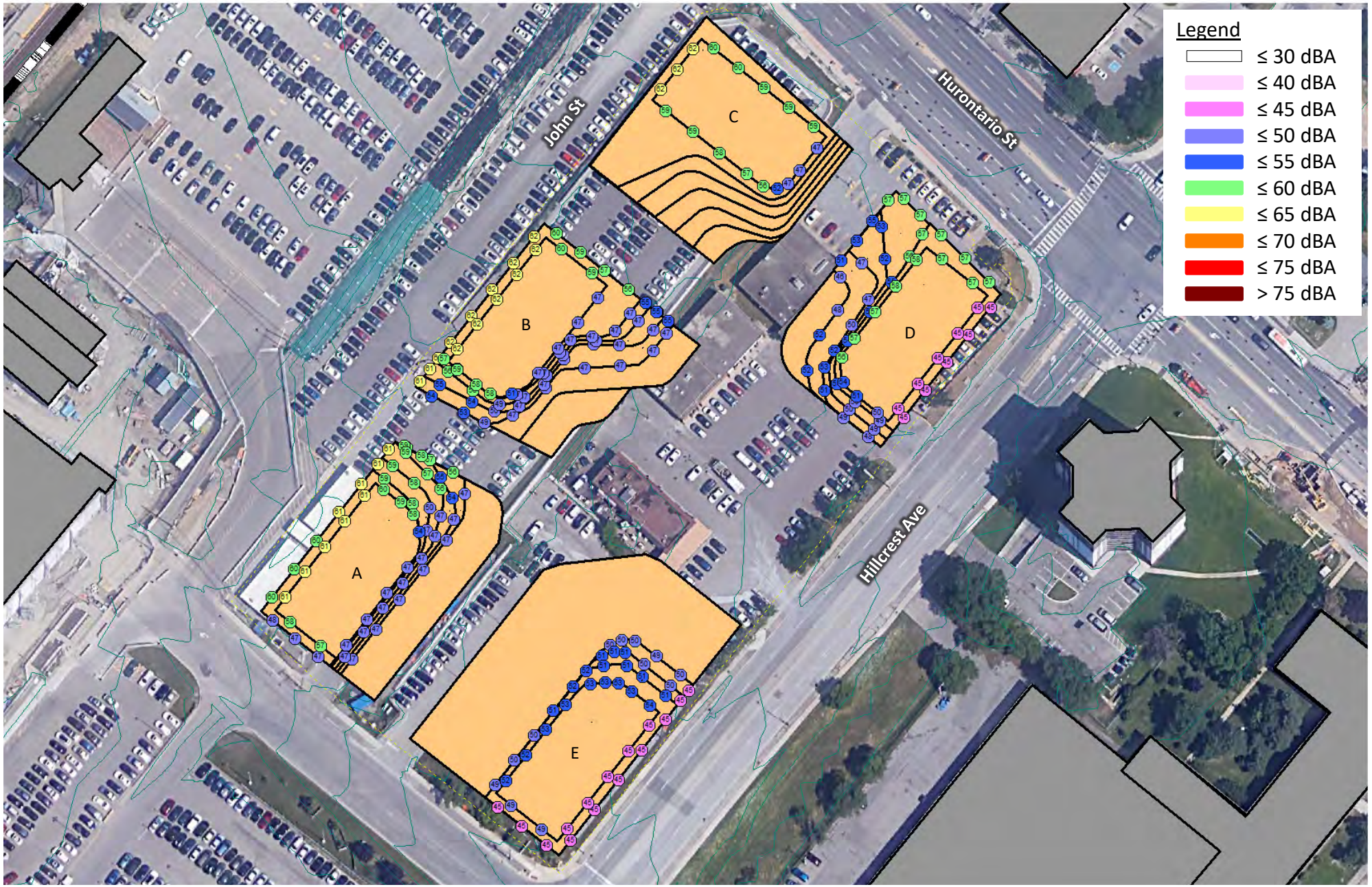

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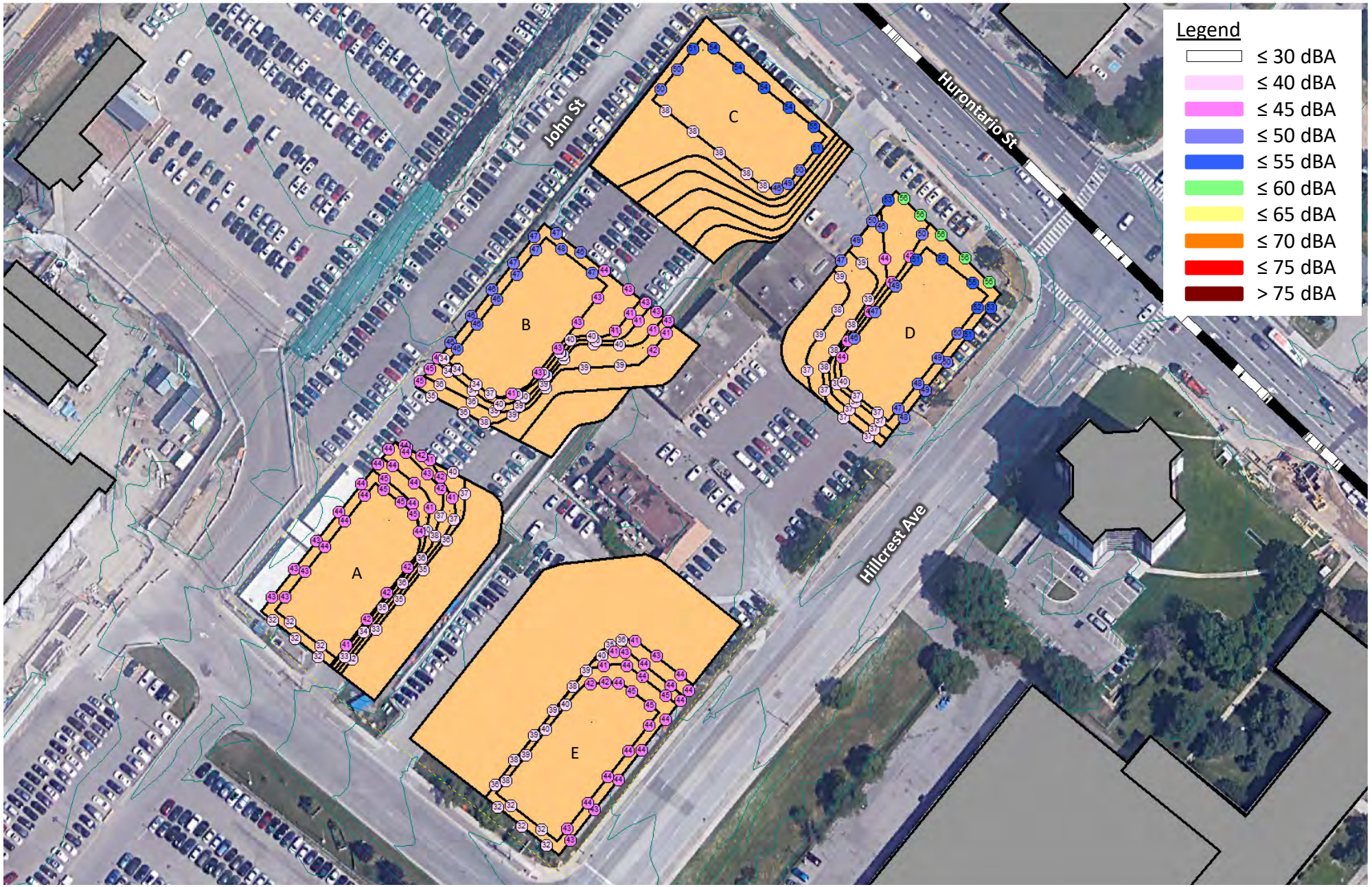

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FAÇADE SOUND LEVELS, LRT – DAYTIME		Project No. 241.20172.00000		

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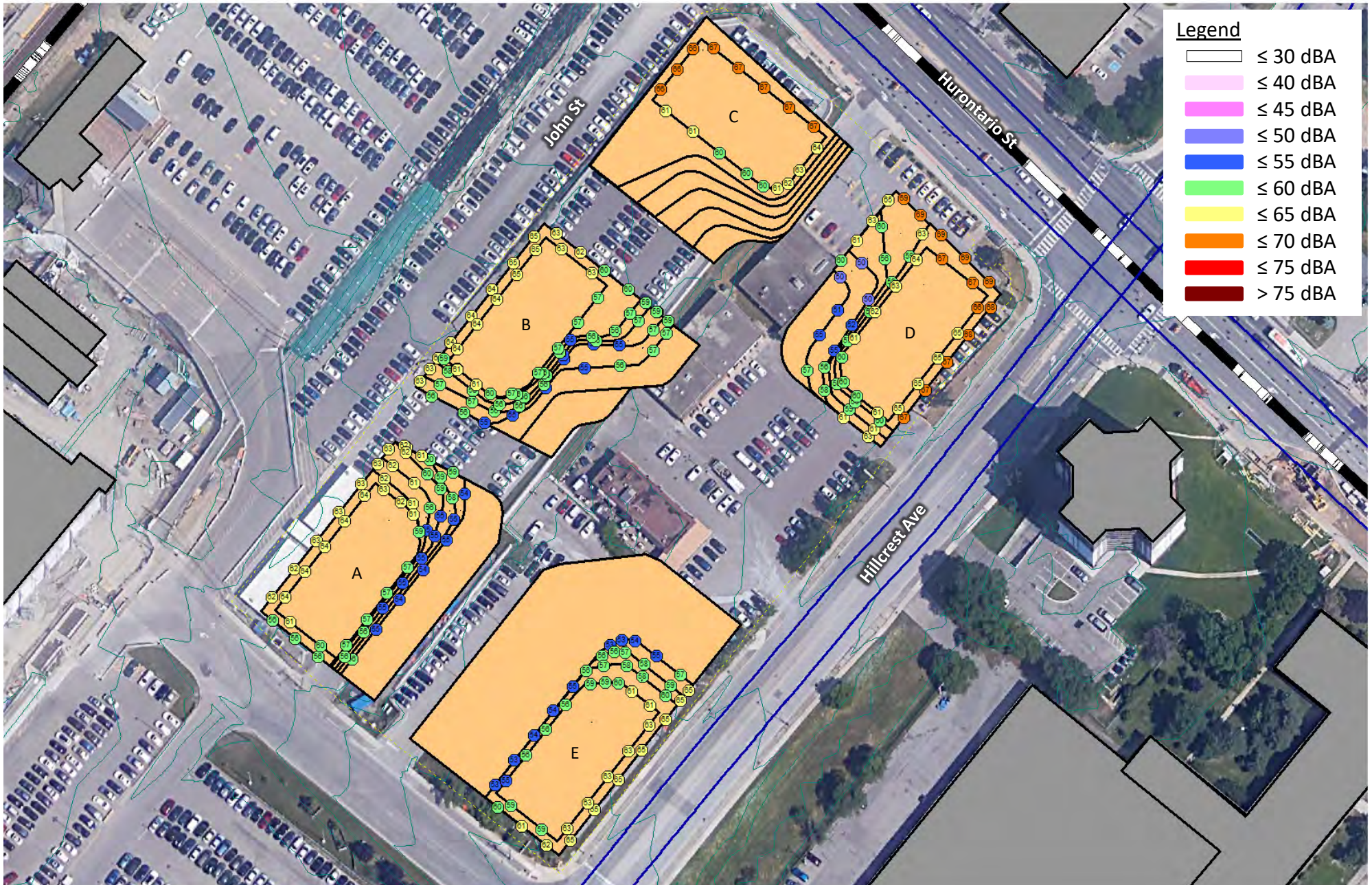

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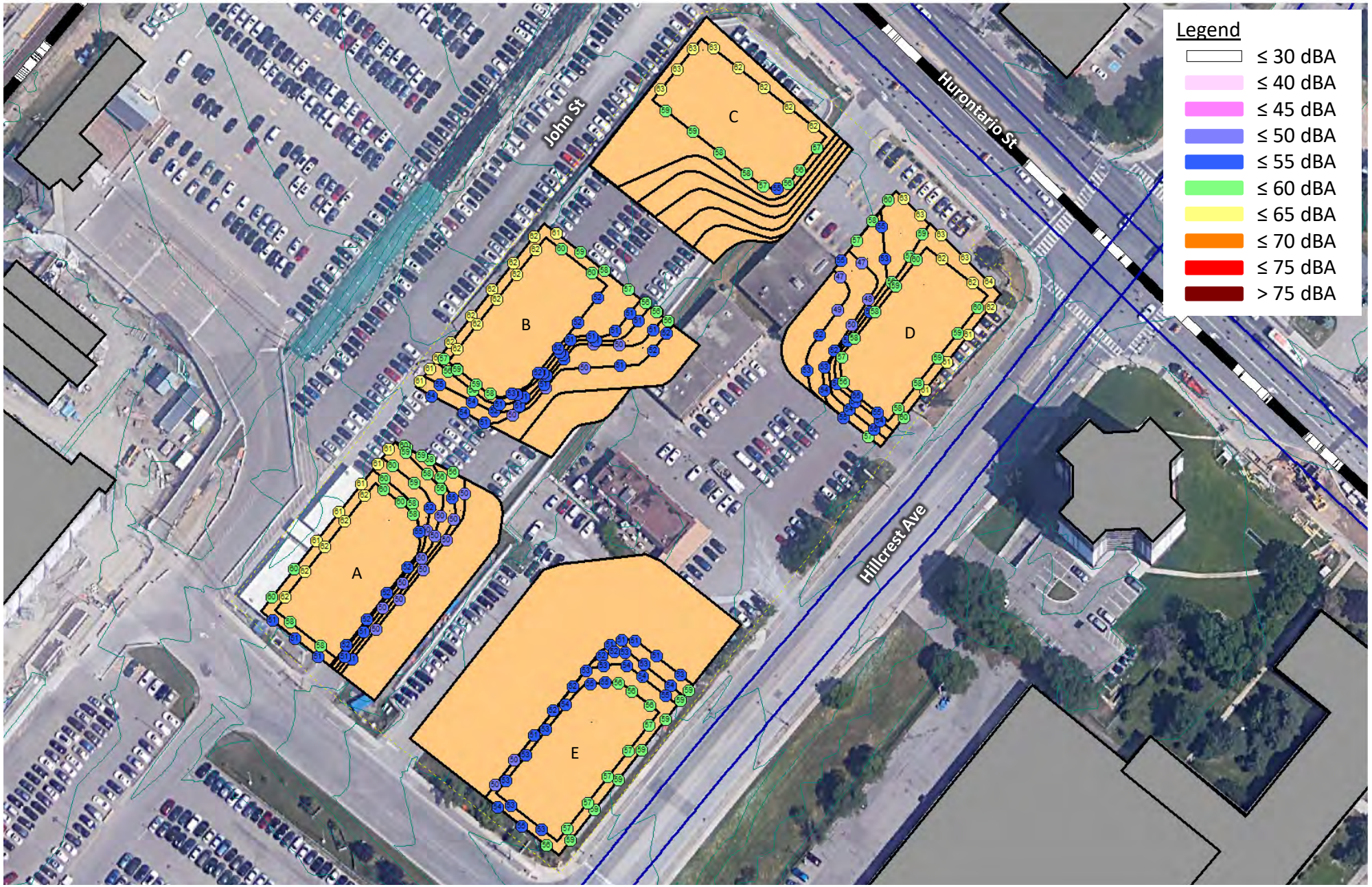
FAÇADE SOUND LEVELS, ROAD+RAIL+LRT – DAYTIME		Project No. 241.20172.00000		



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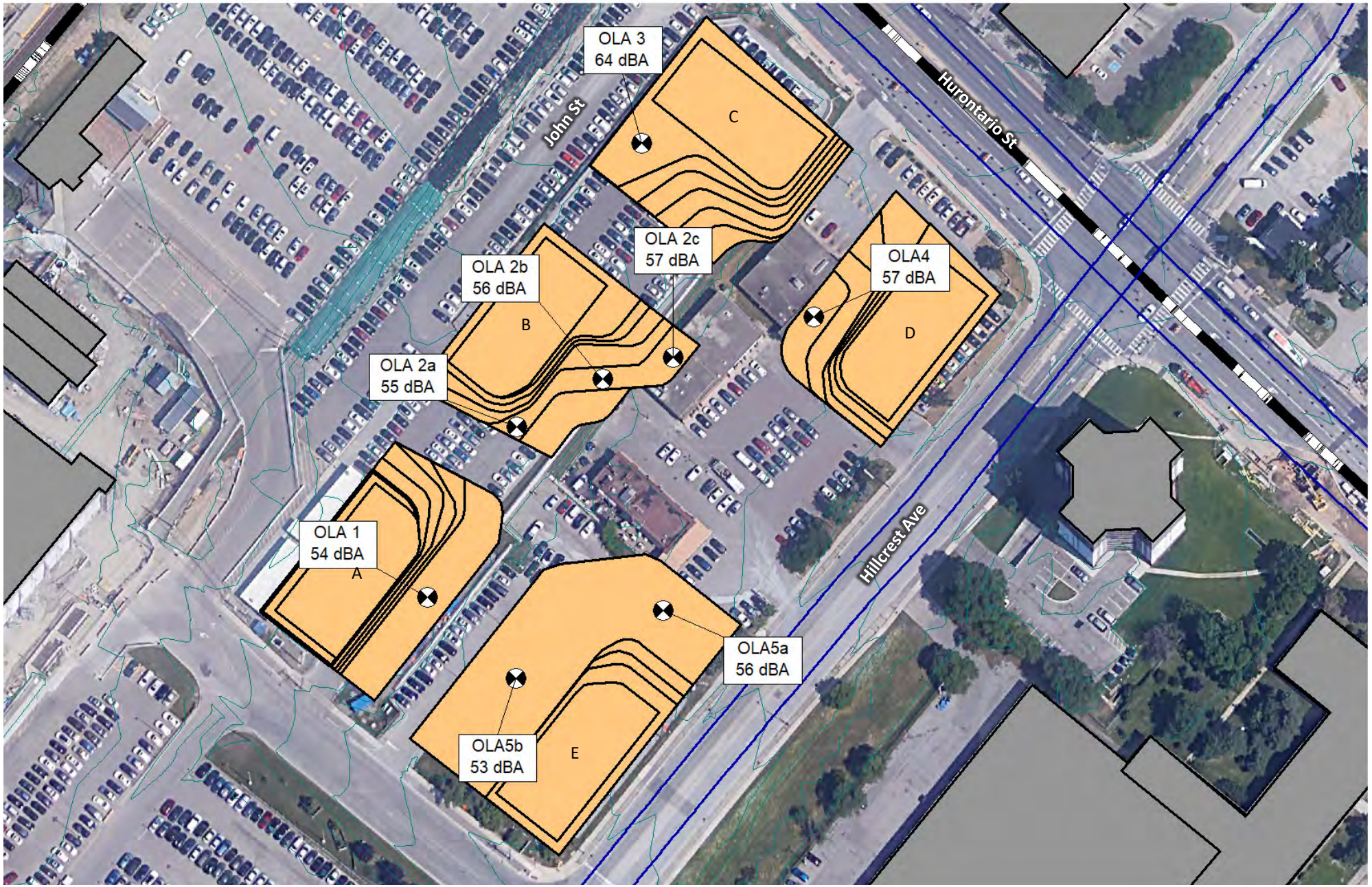

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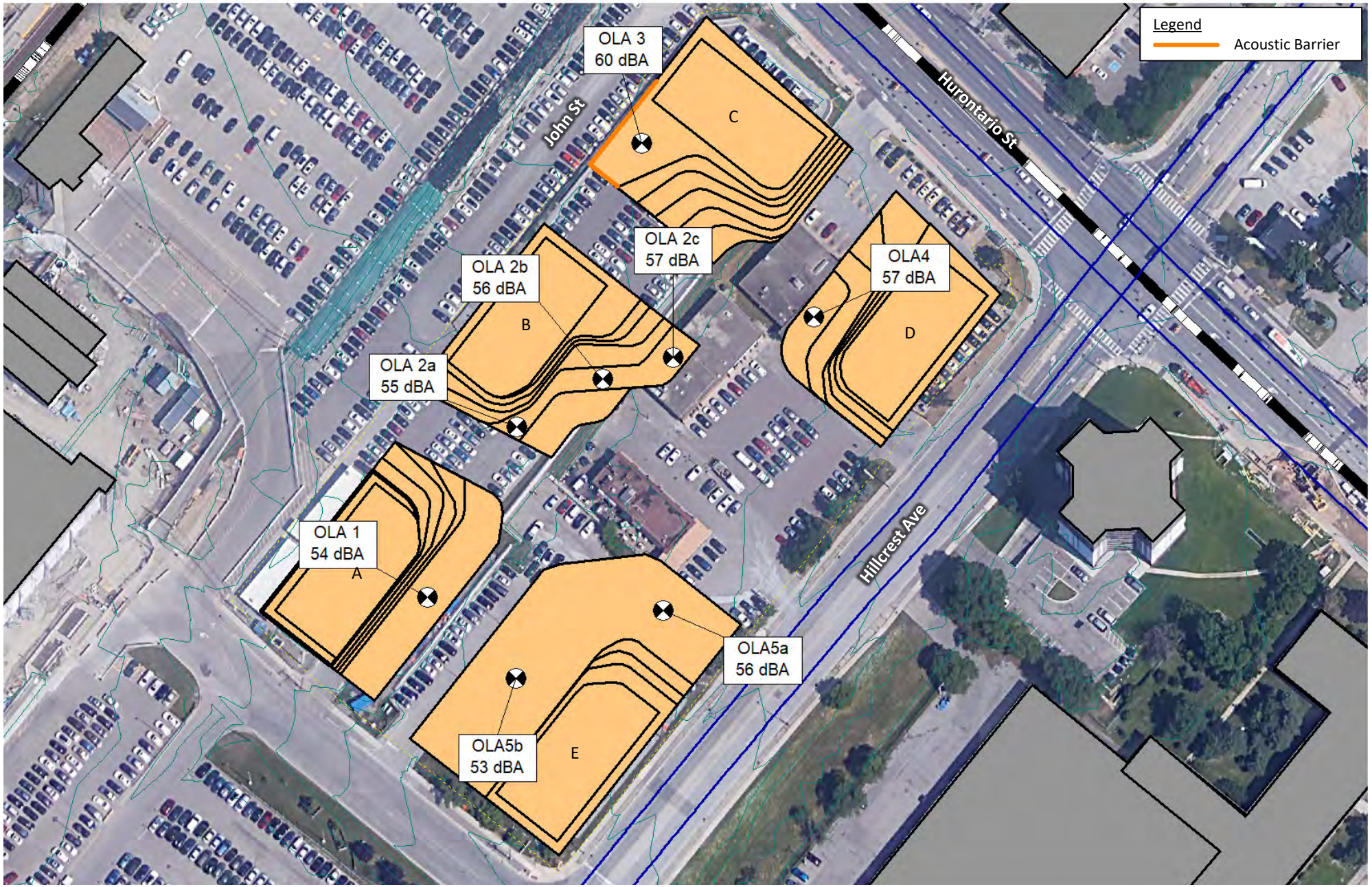
OUTDOOR AMENITY AREA SOUND LEVELS, ROAD+RAIL+LRT		Project No. 241.20172.00000		



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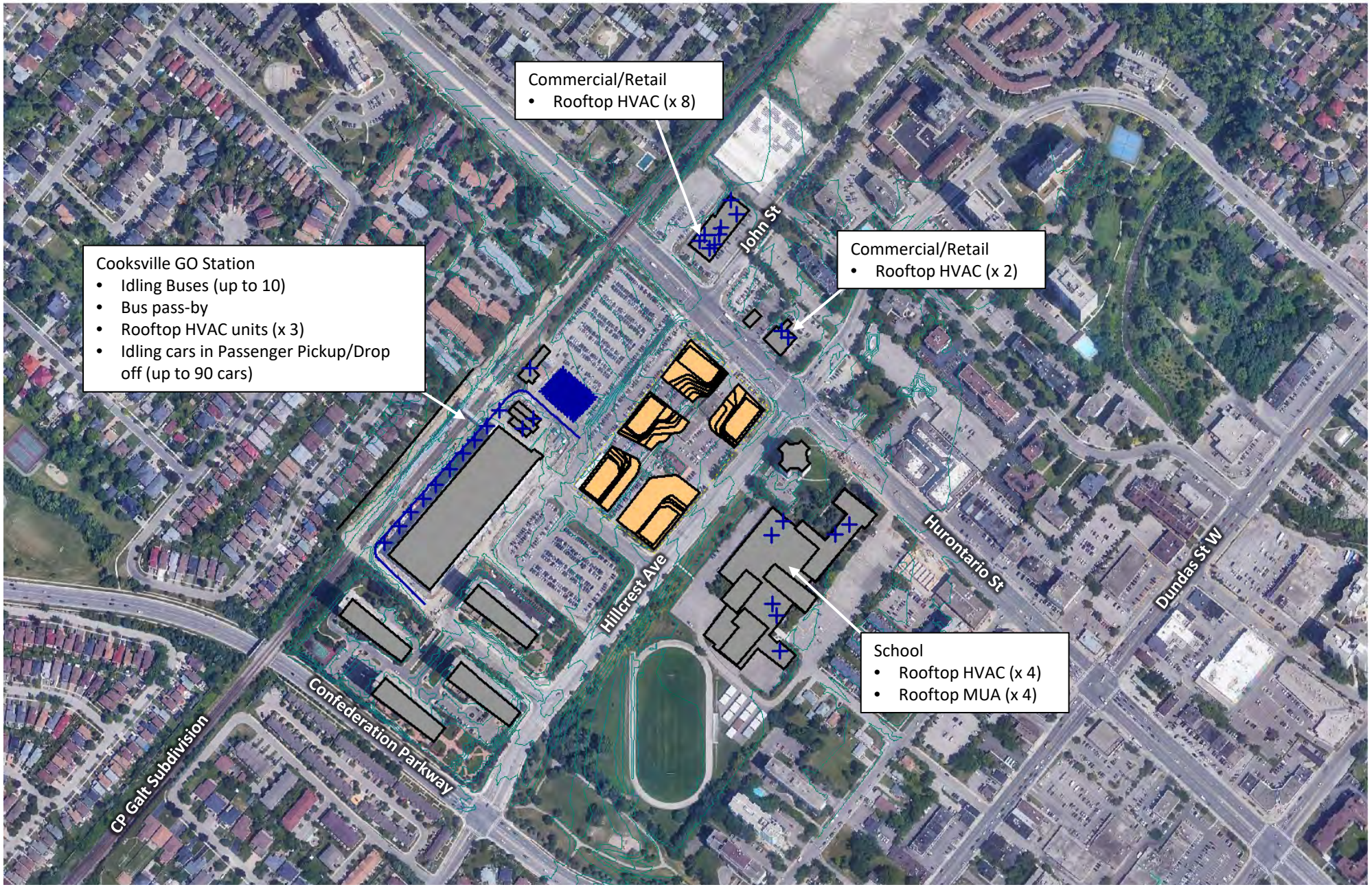
OUTDOOR AMENITY AREA SOUND LEVELS, ROAD+RAIL+LRT (MITIGATED)		Project No. 241.20172.00000		



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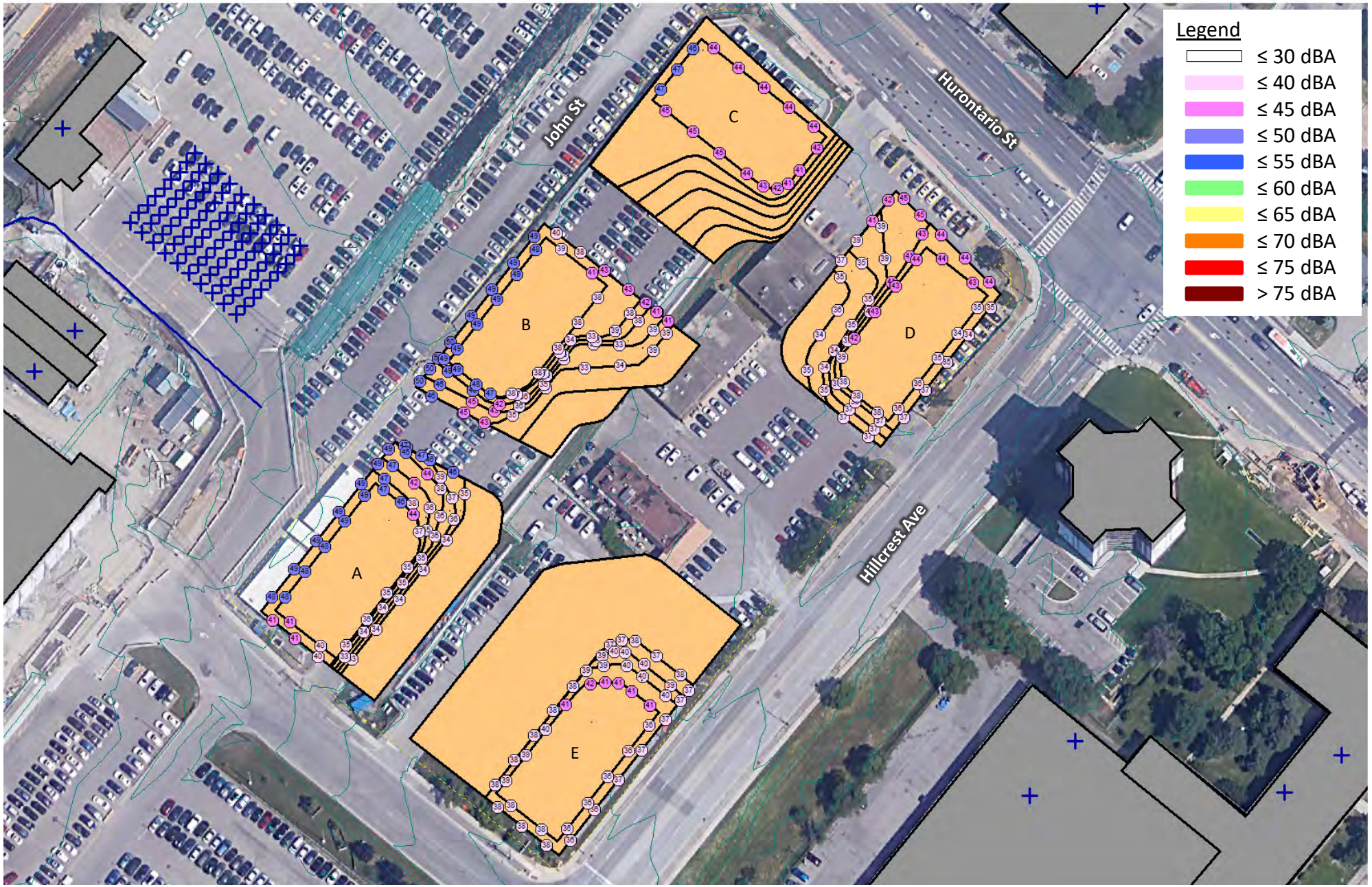
SURROUNDING STATIONARY NOISE SOURCE LOCATIONS		Project No. 241.20172.00000		



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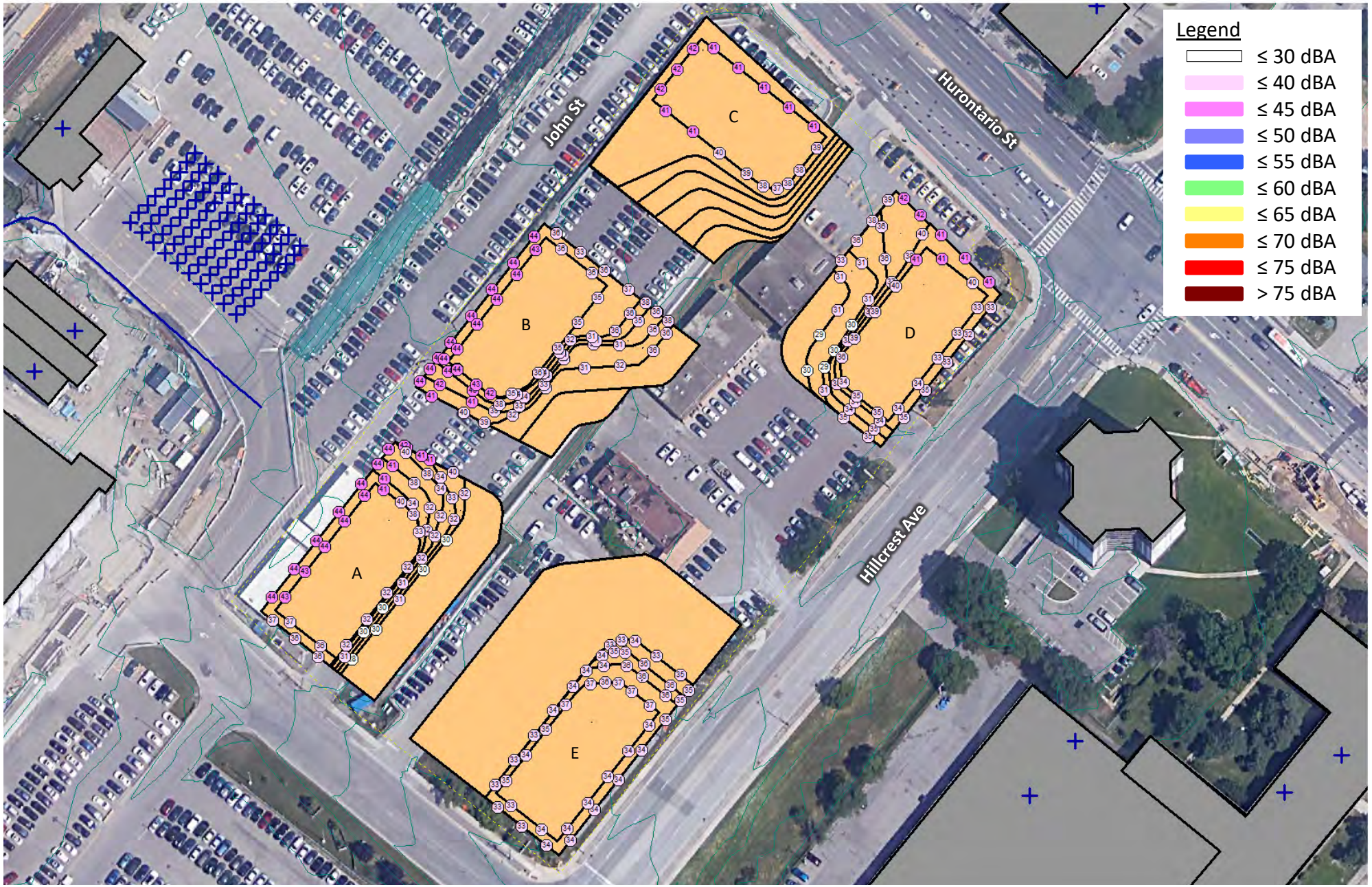

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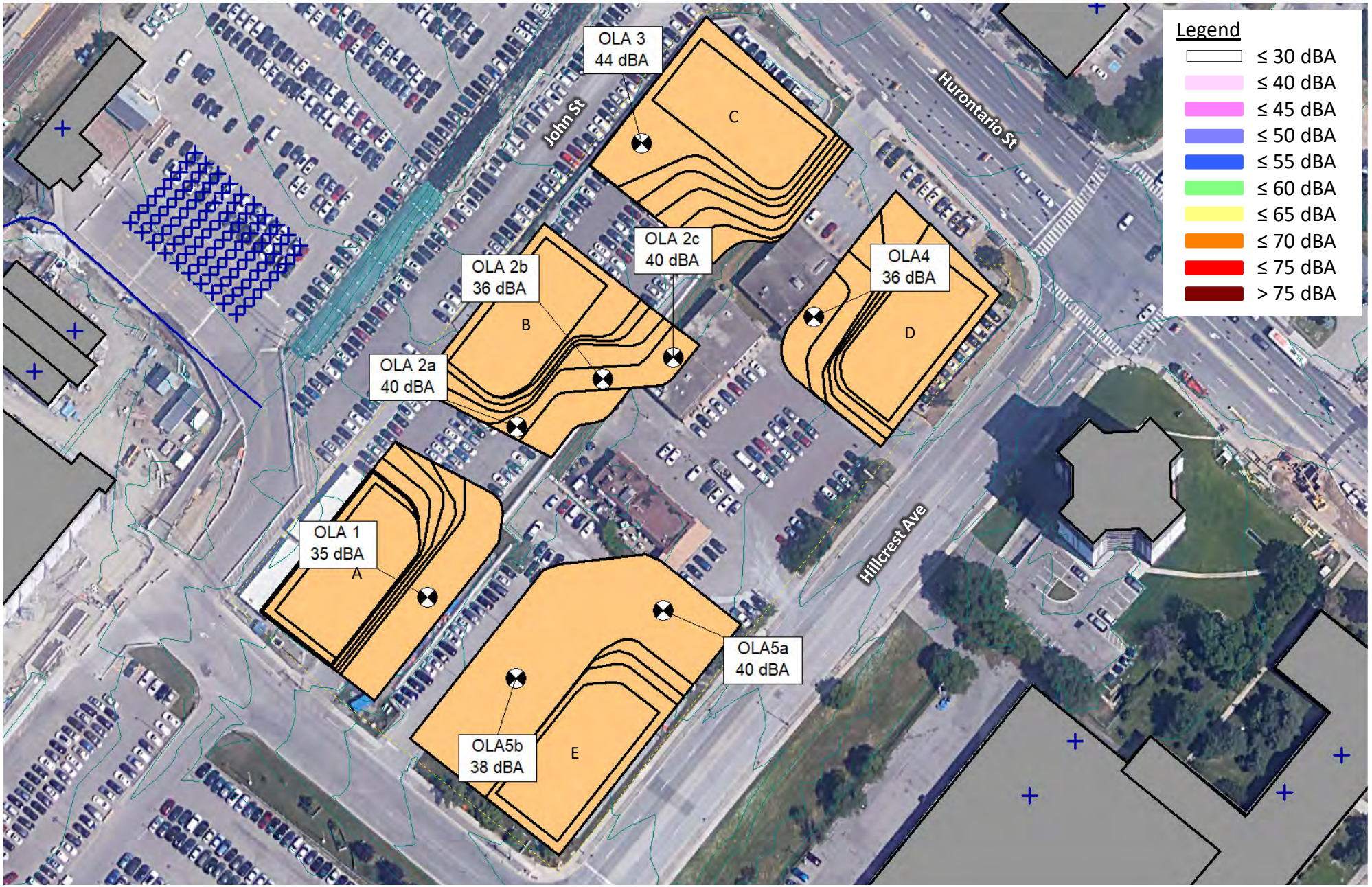

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OUTDOOR AMENITY AREA SOUND LEVELS, STATIONARY		Project No. 241.20172.00000	

SLR global environmental solutions

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Appendix A

Development Drawings

Environmental Noise & Vibration Assessment

3168 HS LP

25 Hillcrest Avenue and 3154 Hurontario Street

SLR Project No.: 241.20172.00000

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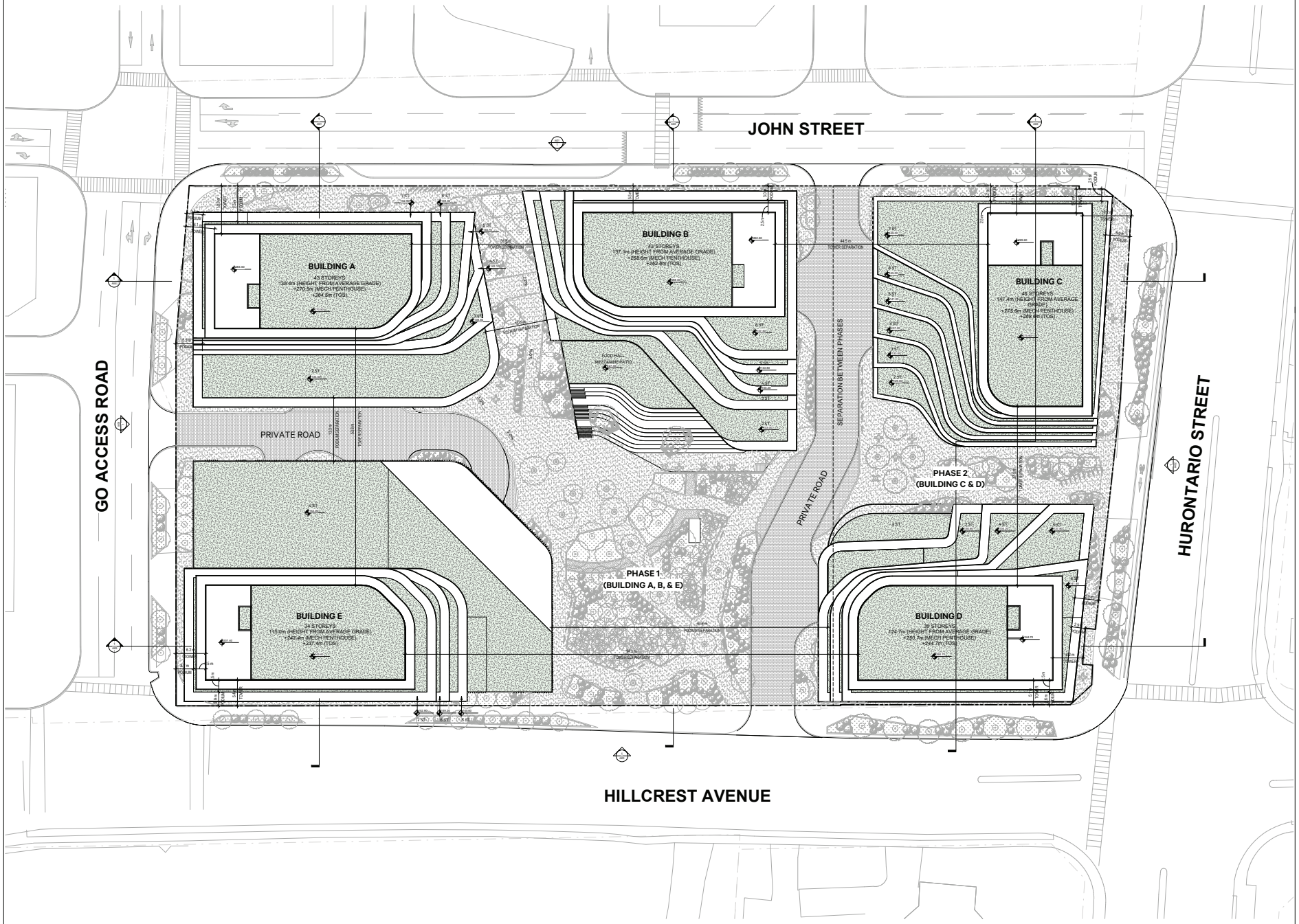

1 OVERALL SITE PLAN
A010 1 : 250

NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

NOTES

SvN
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CONNECTING COOKSVILLE
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

OVERALL SITE PLAN

PROJECT	42040	DRAWN	AN
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A010

NO.	DATE	REVISION/COMMENT
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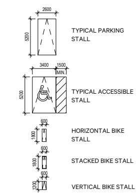

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CONNECTING COOKSVILLE
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

PLAN - P4 LEVEL

PROJECT	42040	DRAWN	AN
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A101

NO.	DATE	REVISION/COMMENT
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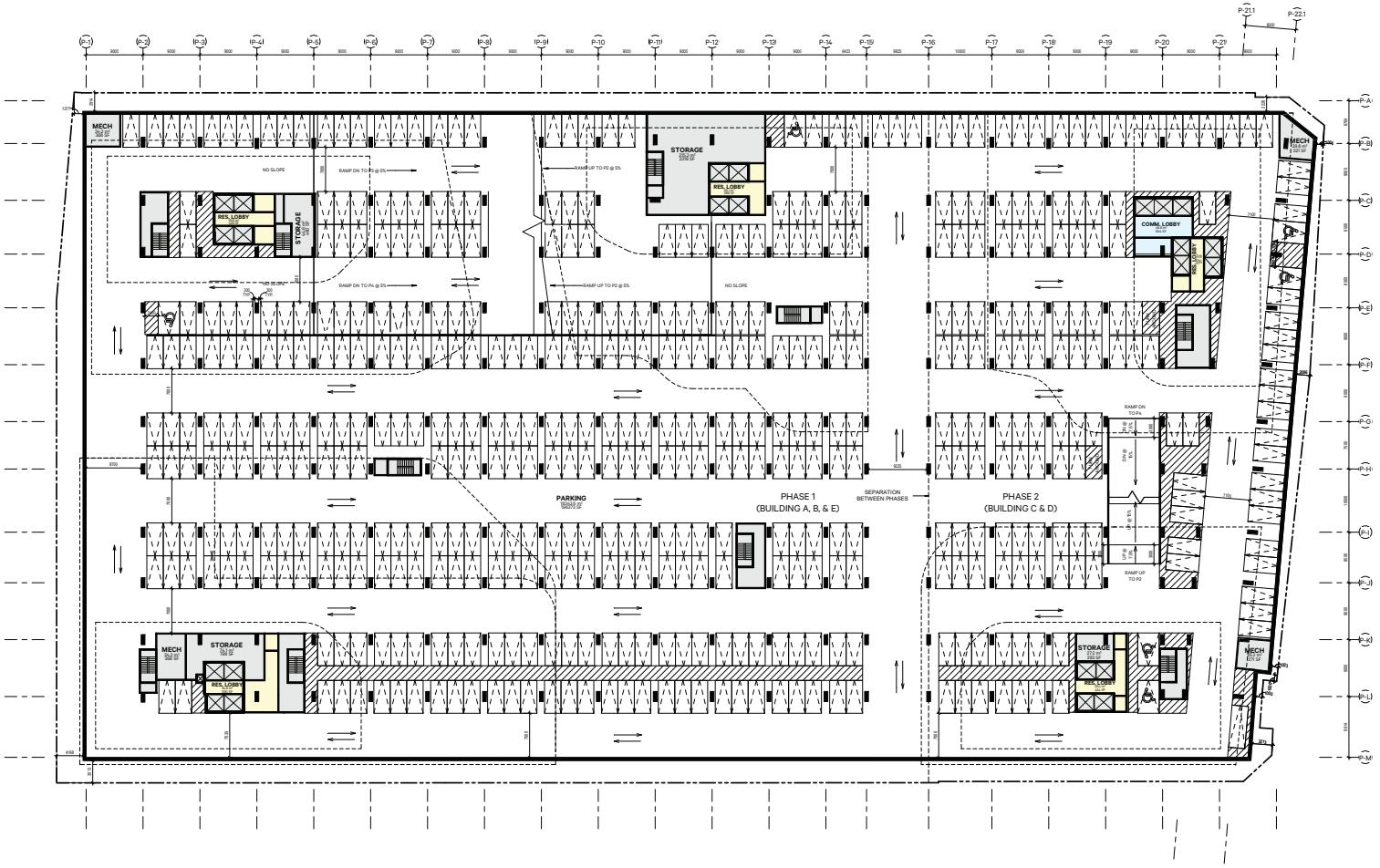

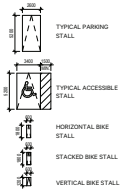

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TAS IMPACT

PLAN - P3 LEVEL

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A102

NO.	DATE	REVISION/COMMENT
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NOTES

TYPICAL PARKING STALL

TYPICAL ACCESSIBLE STALL

HORIZONTAL BIKE STALL

STACKED BIKE STALL

VERTICAL BIKE STALL

SvN ARCHITECTS + PLANNERS
110 Adelaide St. E.
Toronto, ON
M5C 1K9
info@svn-ap.com
416.593.6469

CONNECTING COOKSVILLE
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

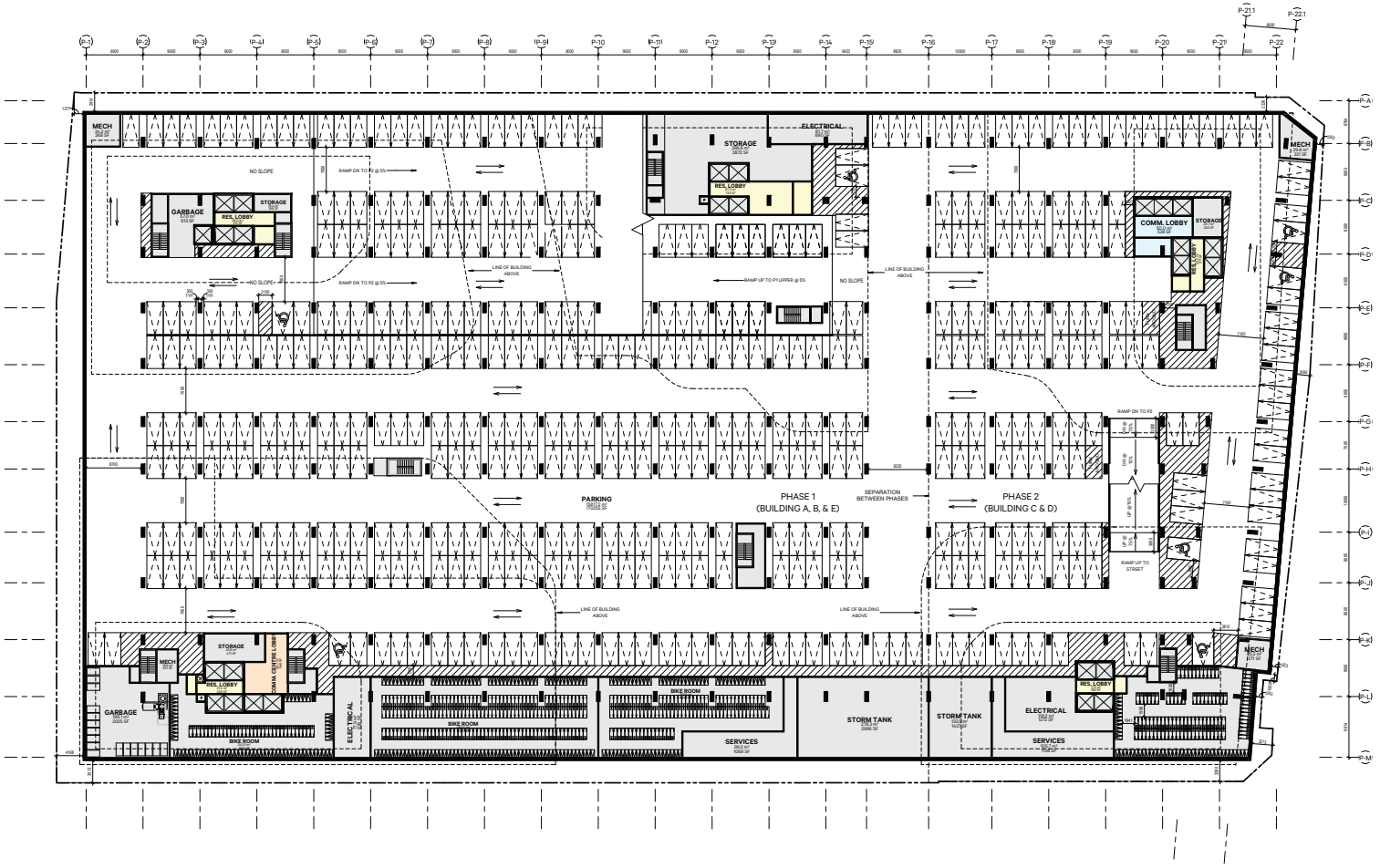
PLAN - P2 LEVEL

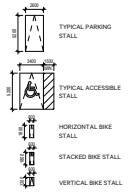
PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:40:35 PM		

A103

NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

NOTES





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33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

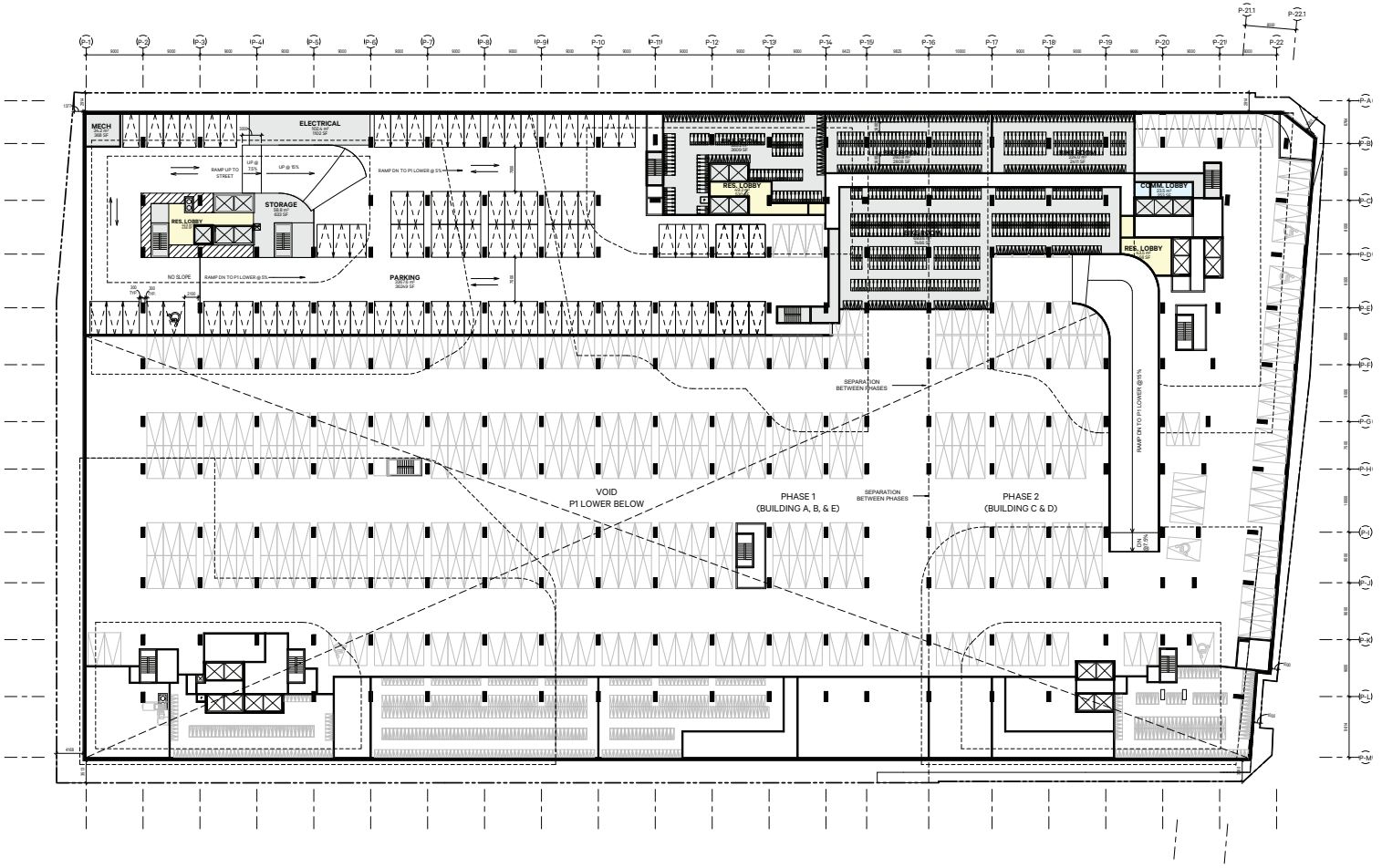
PLAN - P1 LOWER

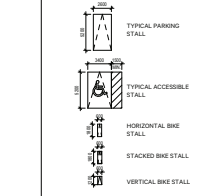
PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:43:30 PM		

A104

NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

NOTES





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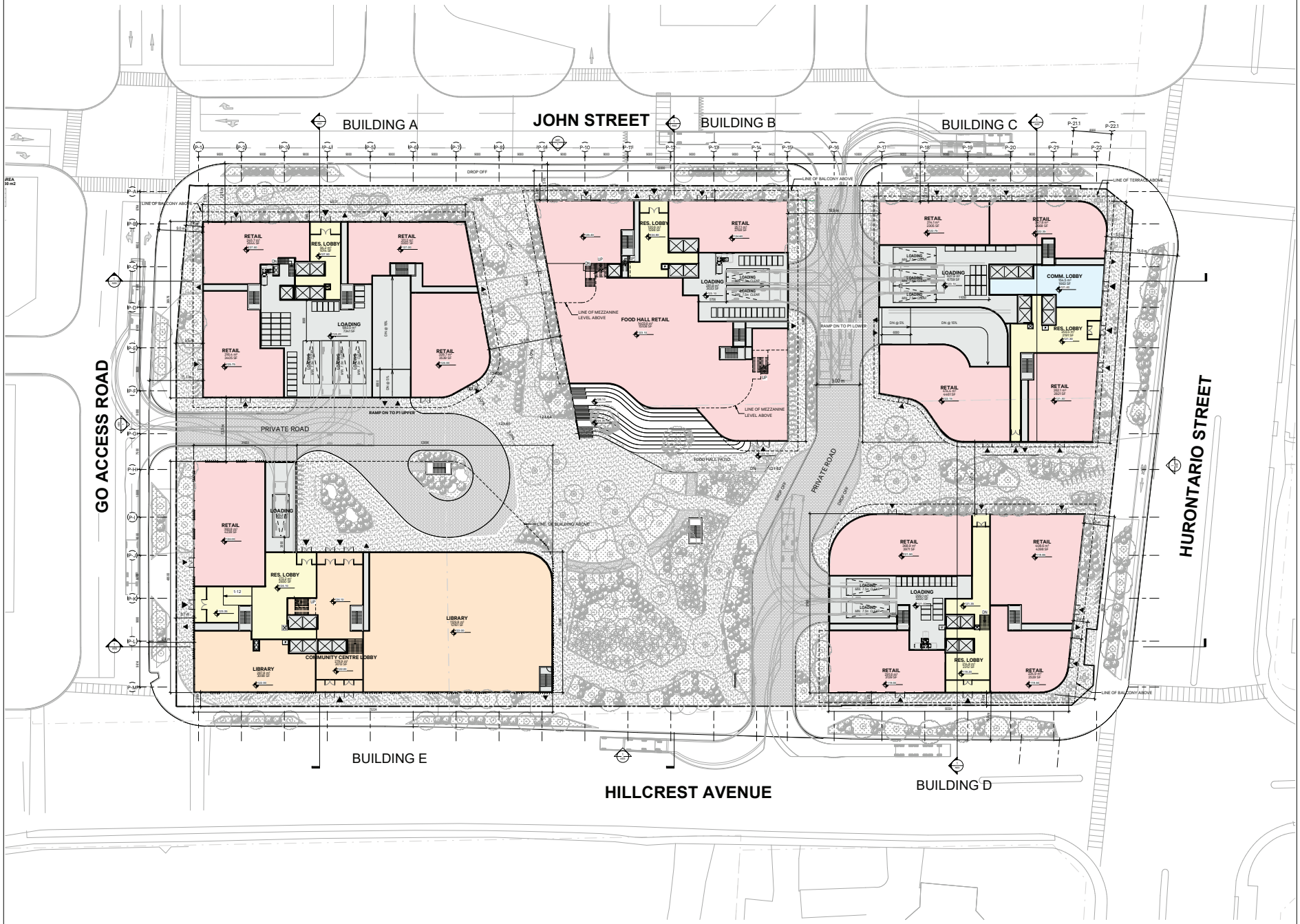
CONNECTING COOKSVILLE
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

PLAN - P1 UPPER

PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:40:27 PM		

A105



NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

NOTES

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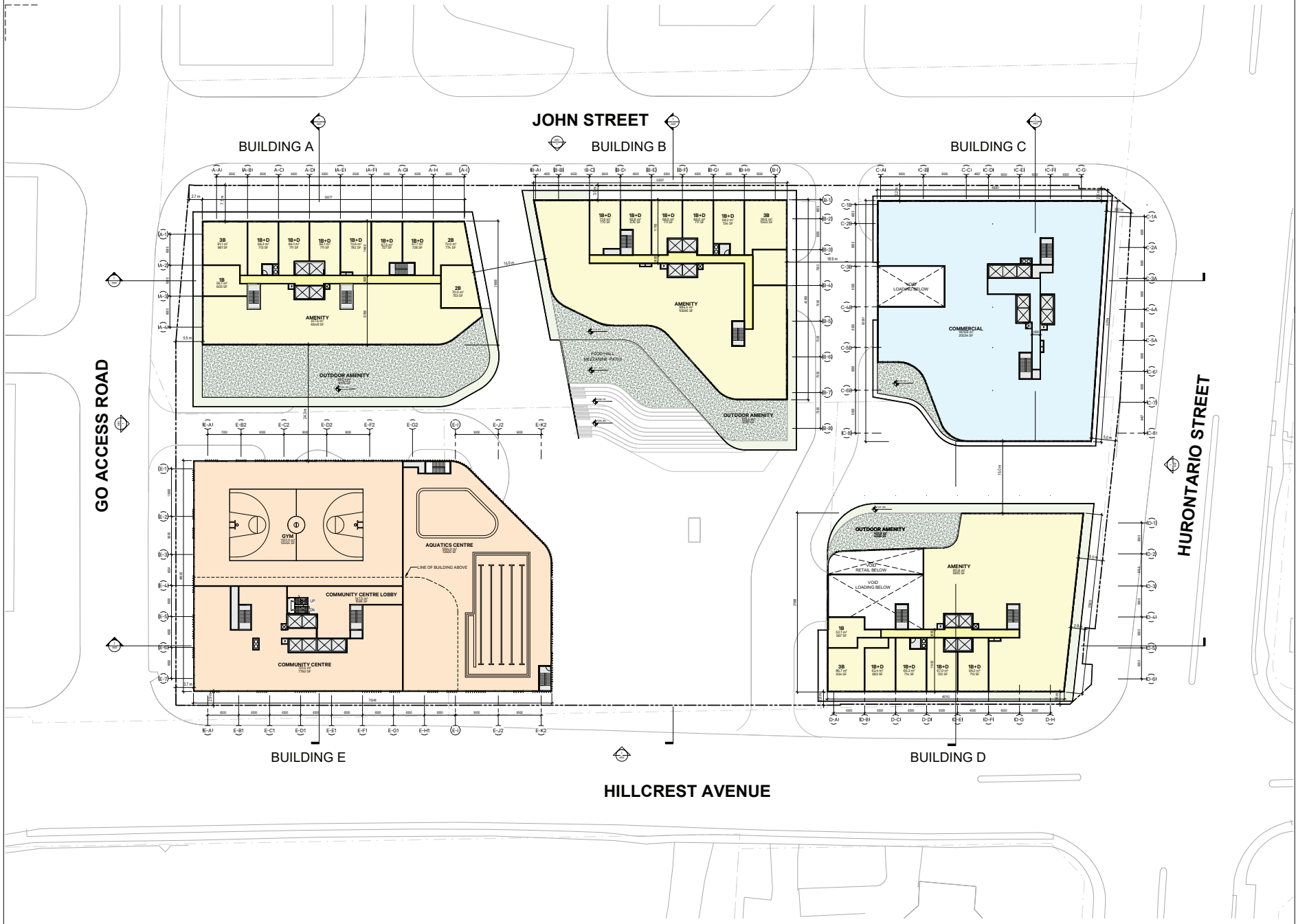
CONNECTING COOKSVILLE
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

PLAN - GROUND FLOOR

PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:40:07 PM		

A201



NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

NOTES

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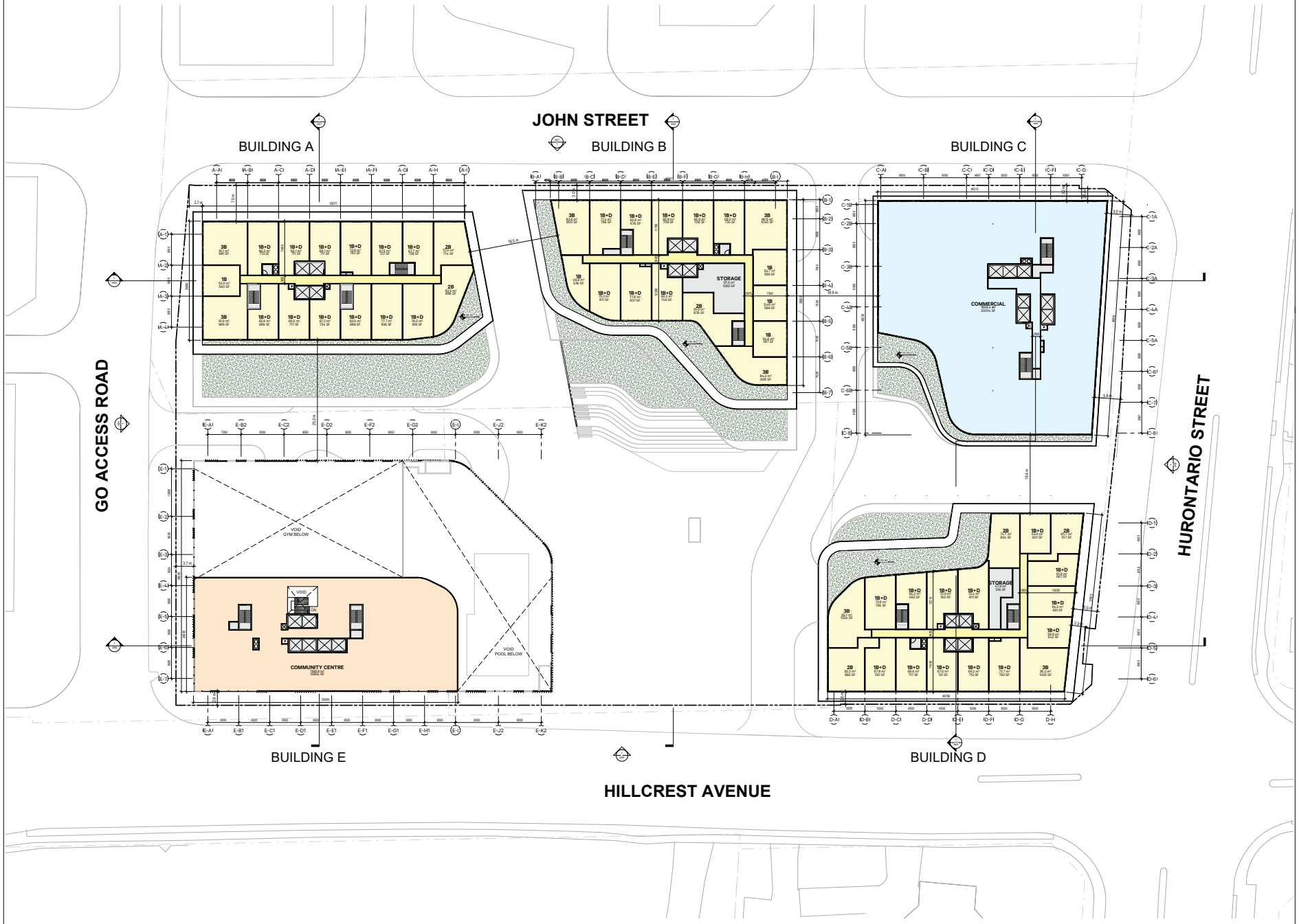
CONNECTING COOKSVILLE
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

PLAN - LEVEL 02

PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:44:50 PM		

A202



NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

NOTES

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CONNECTING COOKSVILLE
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

PLAN - LEVEL 03

PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:41:30 PM		

A203

1 PLAN - LEVEL 03
A203 1 : 250

NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

NOTES

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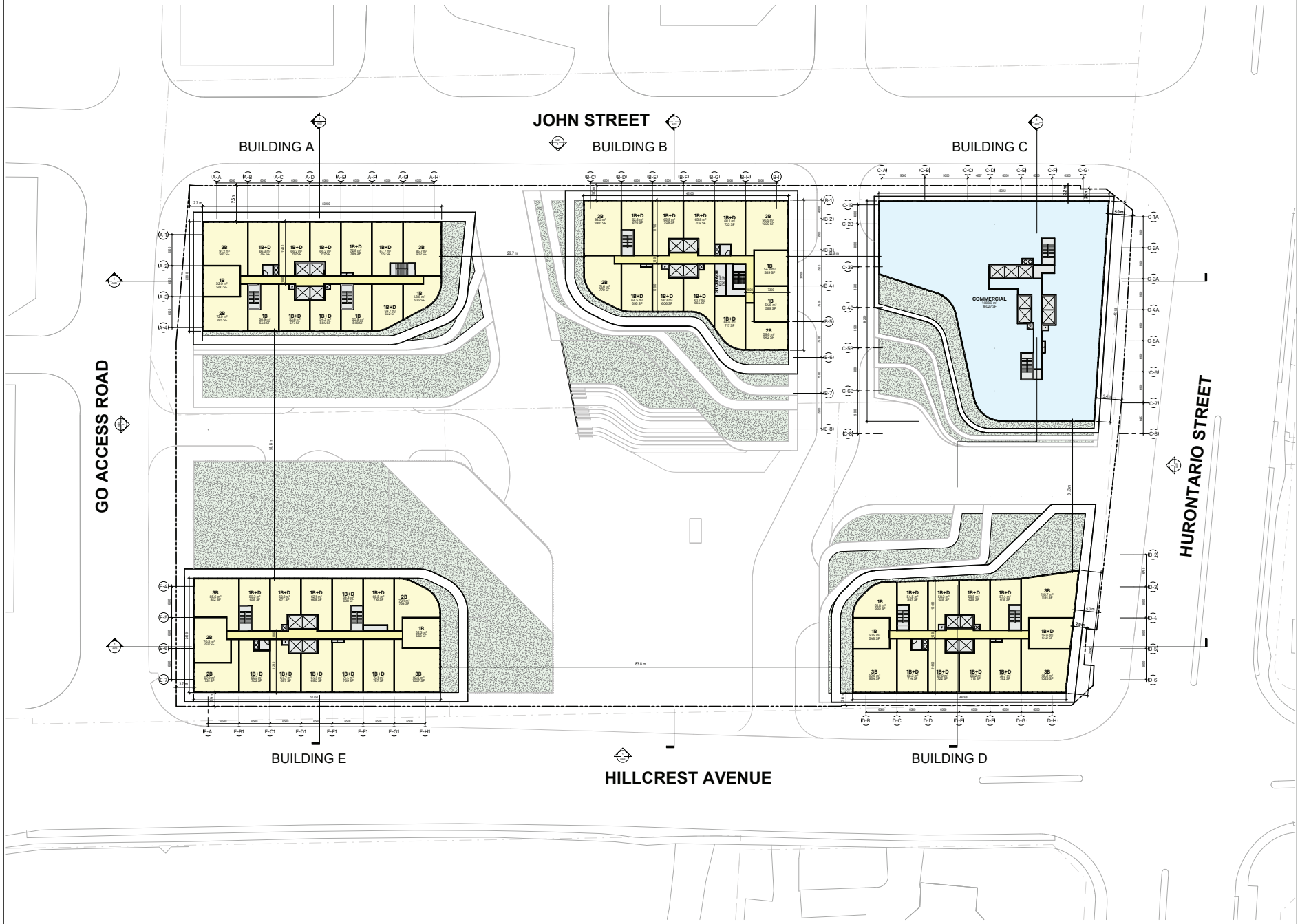
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

PLAN - LEVEL 04

PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:44:44 PM		

A204



NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

NOTES

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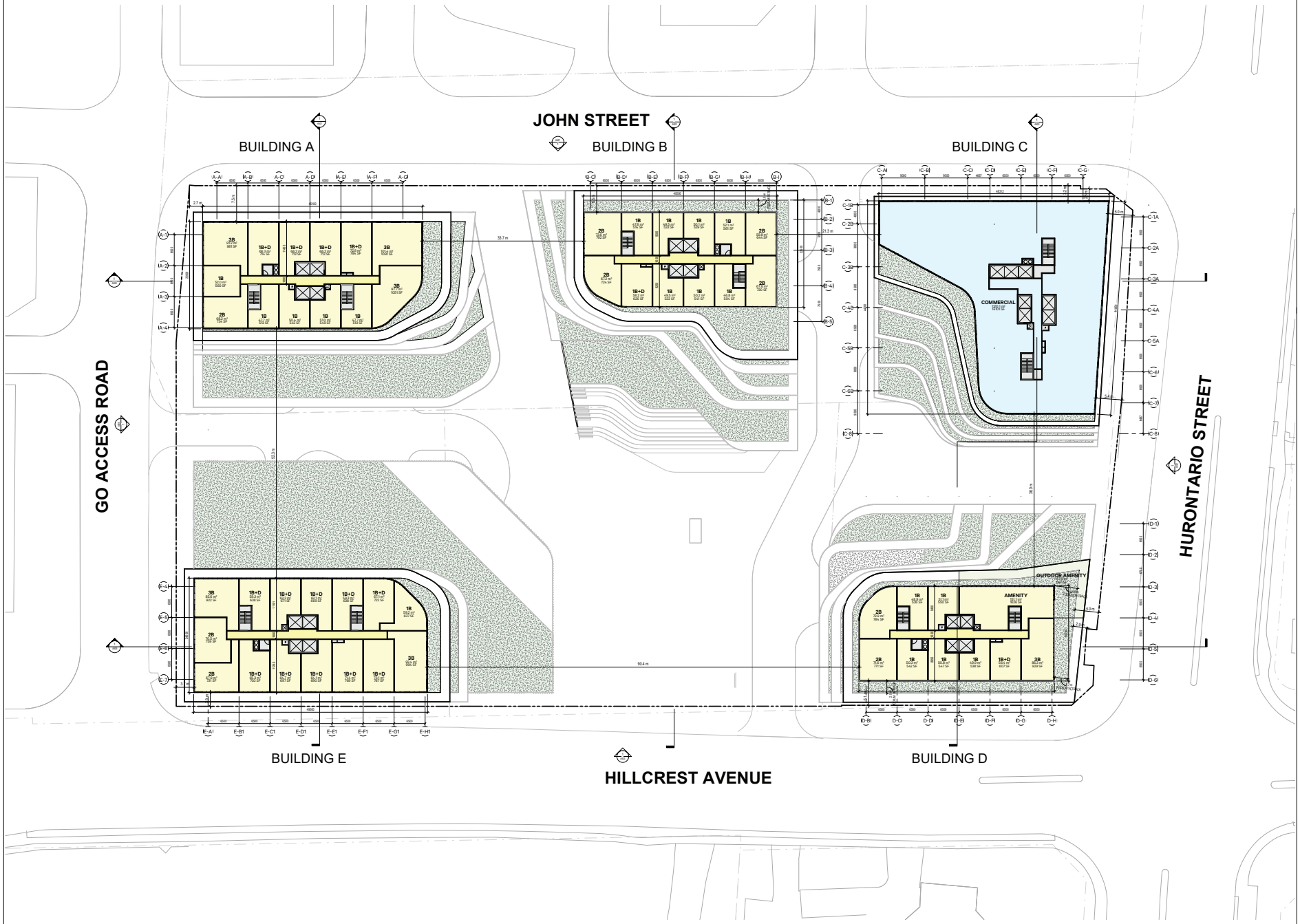
TAS IMPACT

PLAN - LEVEL 05

PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:42:04 PM		

A205



NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

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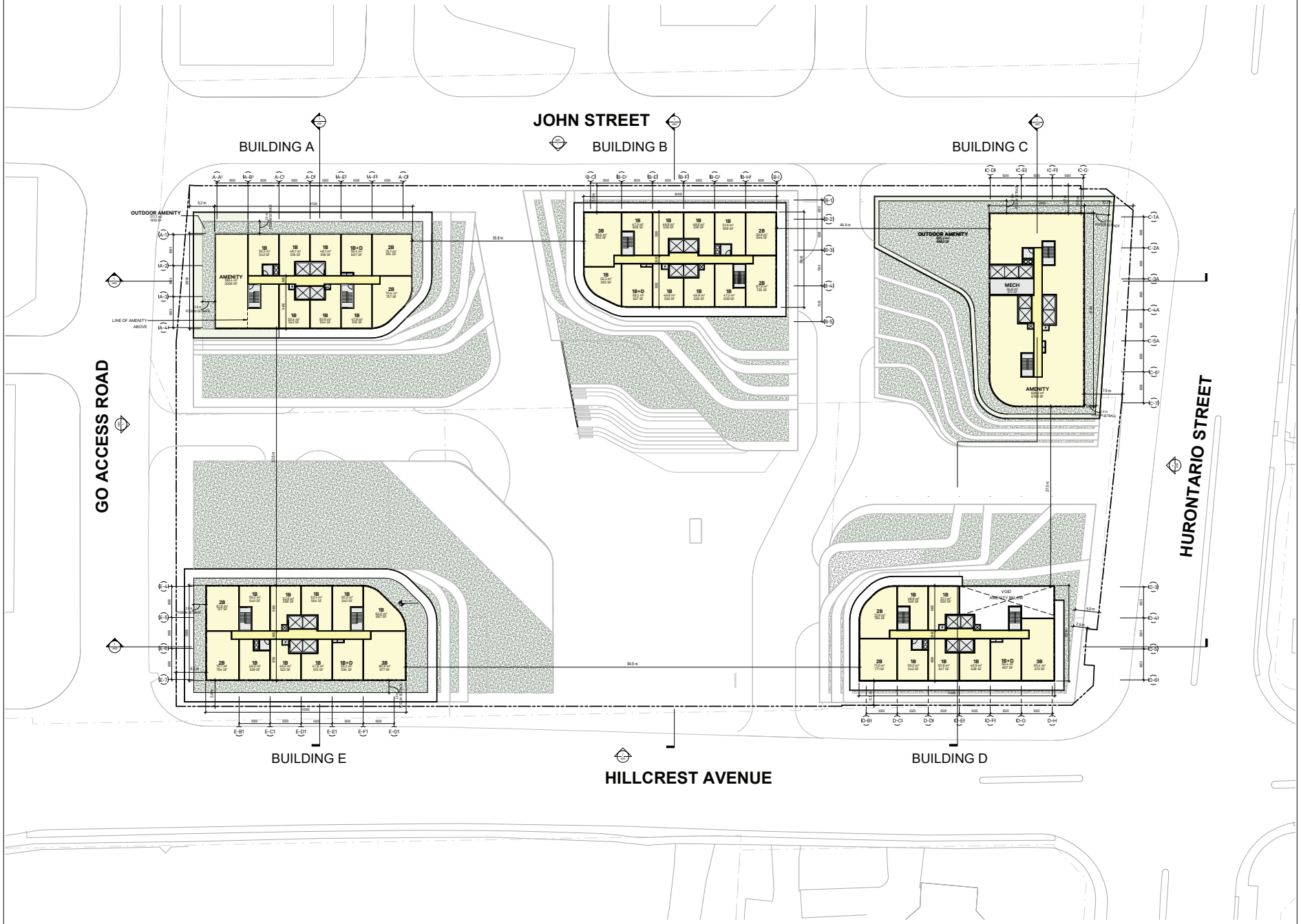
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

PLAN - LEVEL 06

PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:42:23 PM		

A206



NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

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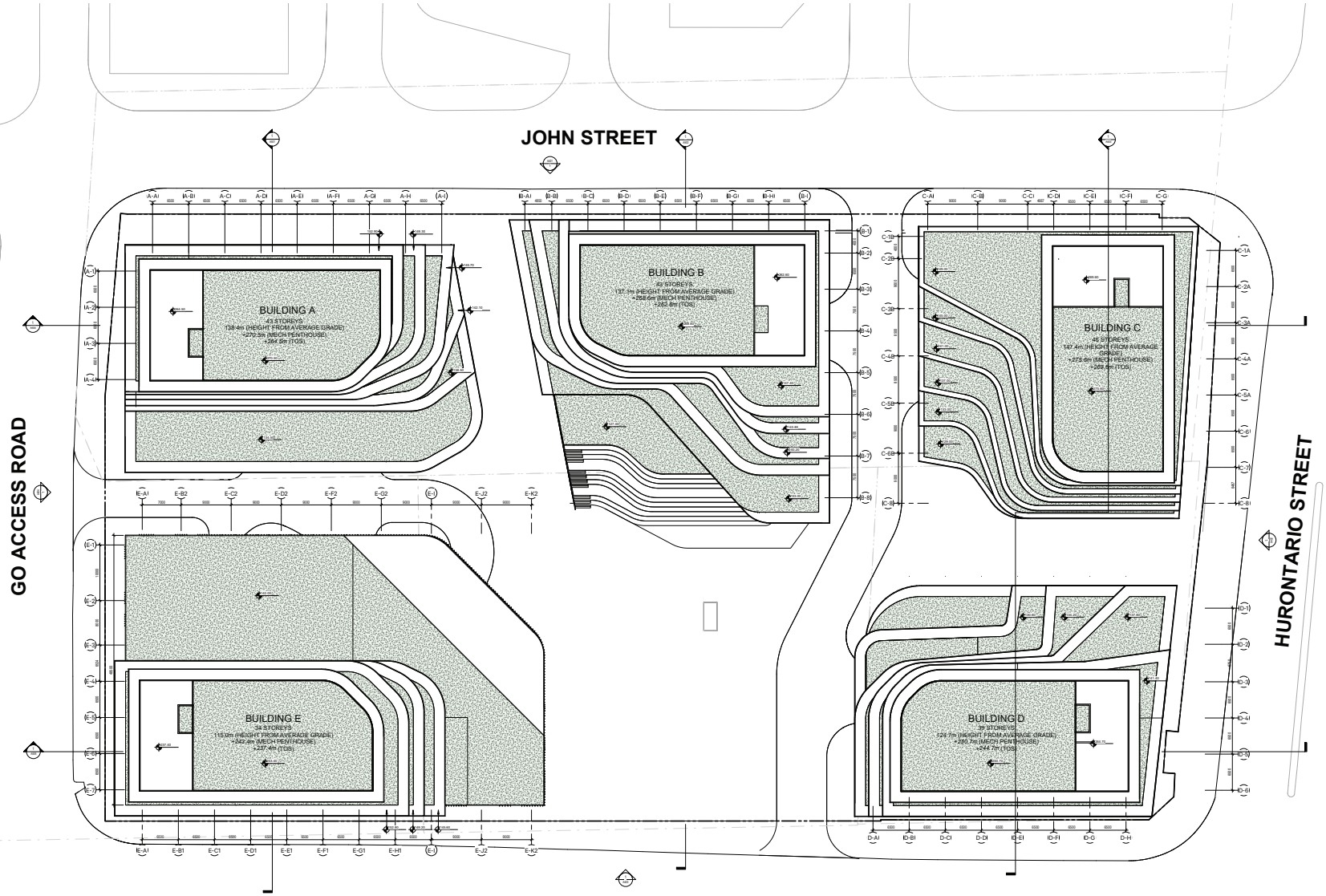
CONNECTING COOKSVILLE
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

PLAN - LEVEL 07

PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:42:44 PM		

A207



NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

NOTES

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CONNECTING COOKSVILLE
33 HILLCREST AVENUE & 3168
HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

PLAN - ROOF

PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:43:04 PM		

A213

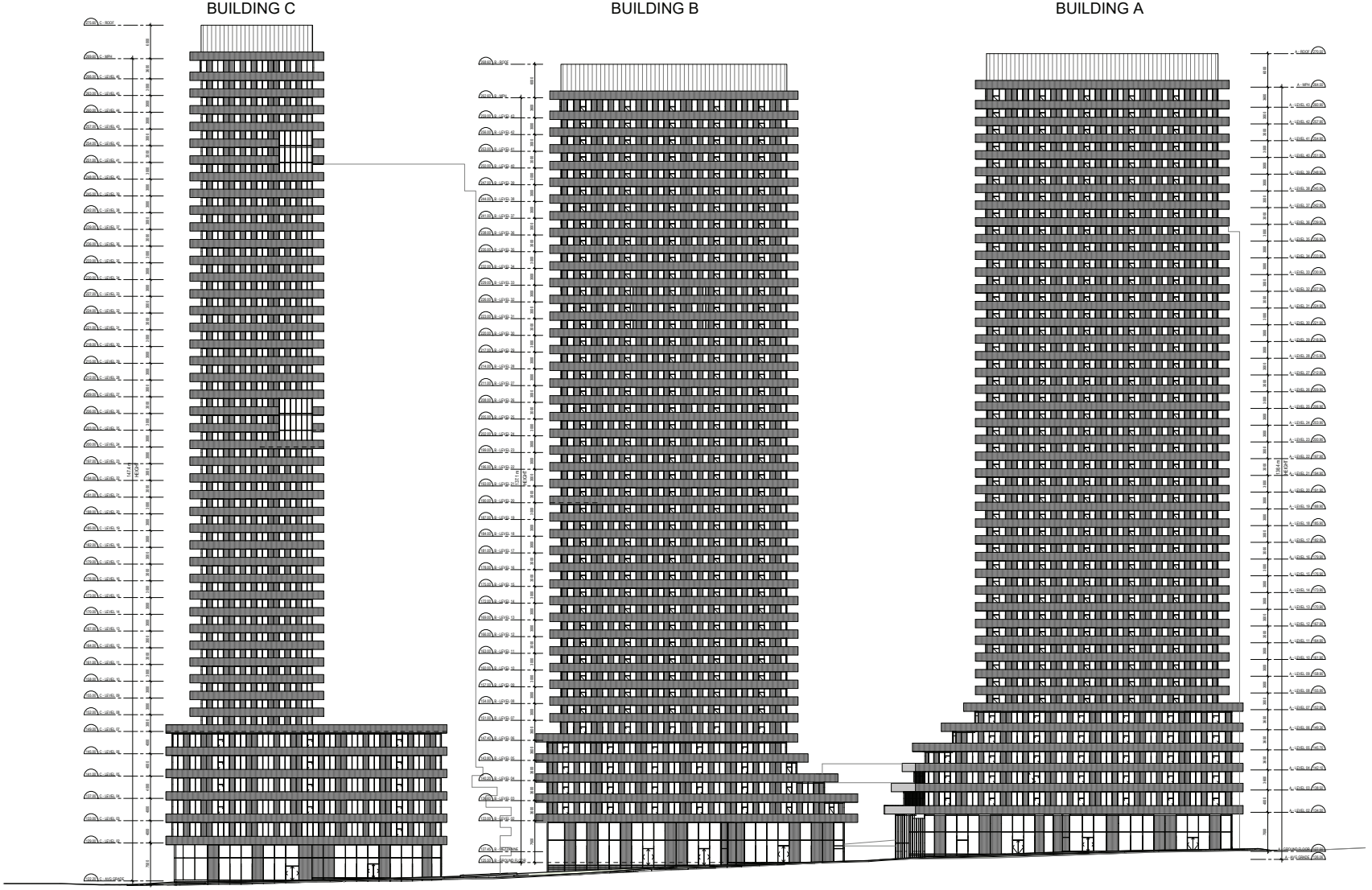
NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

NOTES

BUILDING C

BUILDING B

BUILDING A



SvN
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CONNECTING COOKSVILLE
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

ELEVATION - NORTH

PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:44:03 PM		

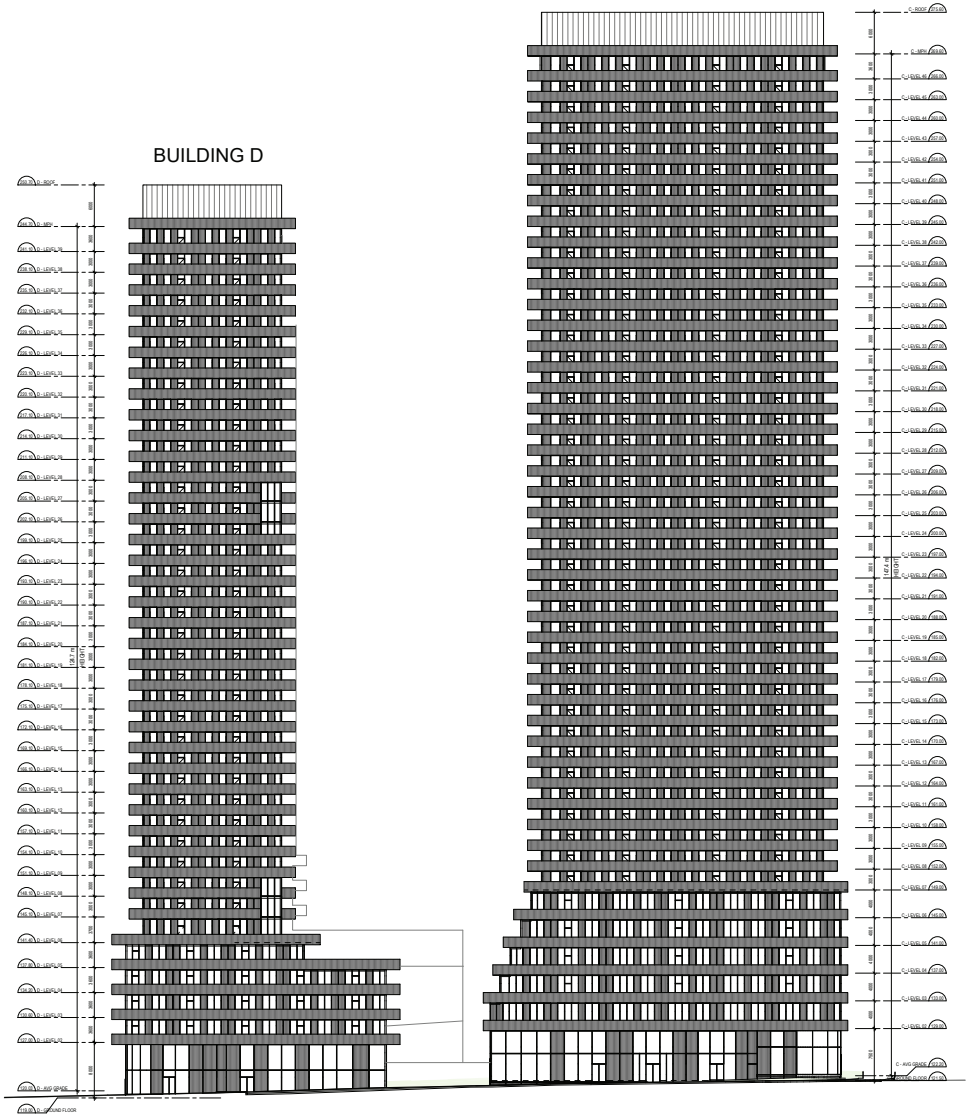
A401

NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

NOTES

BUILDING C

BUILDING D



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info@svn-ap.com
416.593.6469

CONNECTING COOKSVILLE
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

ELEVATION - EAST

PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:44:09 PM		

A402

NO.	DATE	REVISION/COMMENT
1	2022-06-22	ISSUED FOR ZBA/OPA SUBMISSION

NOTES

SvN
ARCHITECTS
150 Adelaide St. E. Toronto, ON M5C 1K9
info@svn-ap.com
416.593.6469

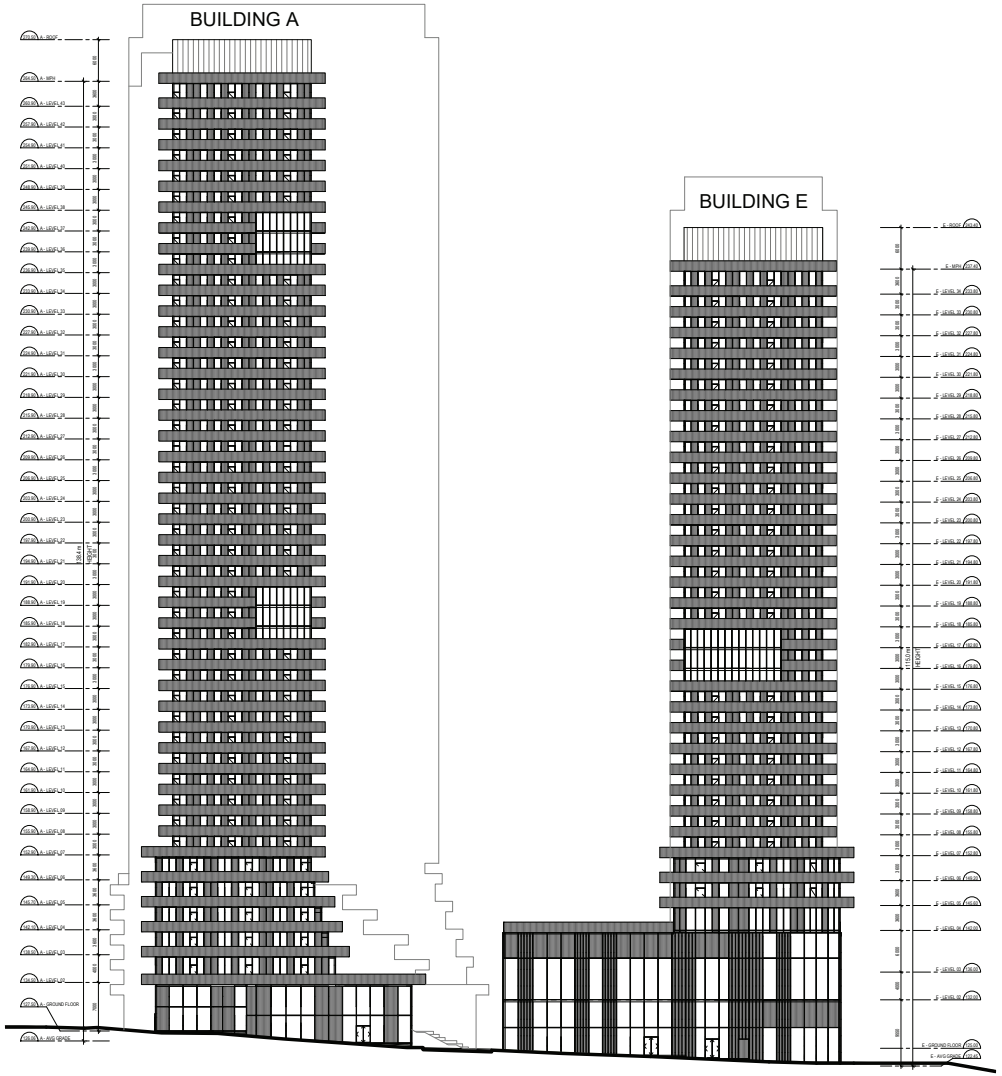
CONNECTING COOKSVILLE
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

ELEVATION - SOUTH

PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-06-22 9:44:17 PM		

A403



NO.	DATE	REVISION/COMMENT
1	2022-04-22	ISSUED FOR ZBA/OPA SUBMISSION

NOTES

SvN
ONTARIO ASSOCIATION OF ARCHITECTS
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info@svn-ap.com
416.593.6469

CONNECTING COOKSVILLE
33 HILLCREST AVENUE & 3168 HURONTARIO, MISSISSAUGA, ON

TAS IMPACT

ELEVATION - WEST

PROJECT	42040	DRAWN	AN
SCALE	1:250	CHECKED	DW
PLOT DATE	2022-04-22 9:44:23 PM		

A404

Appendix B

Traffic Data and Calculations

Environmental Noise & Vibration Assessment

3168 HS LP

25 Hillcrest Avenue and 3154 Hurontario Street

SLR Project No.: 241.20172.00000

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Date:	10-Feb-22

NOISE REPORT FOR PROPOSED DEVELOPMENT

REQUESTED BY:

Name:	Marcus Li, P.Eng.
Company:	SLR Consulting

PREPARED BY:

Nam	Steven Guan
Tel#:	905-615-3200 ext. 5933

MISSISSAUGA

Location: Hurontario Street - South of C.P.R. to Dundas Street
Confederation Parkway (1) - Central Parkway West to Hillcrest Avenue
Confederation Parkway (2) - Hillcrest Avenue to Dundas Street West
Hillcrest Avenue - Confederation Parkway to Hurontario Street

ID 536

ON SITE TRAFFIC DATA

Specific	*Street Names*				
	Hurontario St	Confederation Pkwy (1)	Confederation Pkwy (2)	Hillcrest Ave	
AADT:	46,100	23,600	19,700	28,400	
# of Lanes:	4 Lanes*	4 Lanes	4 Lanes	4 Lanes	
% Trucks:	5%	3%	3%	3%	
Medium/Heavy Trucks Ratio:	55/45	55/45	55/45	55/45	
Day/Night Split:	90/10	90/10	90/10	90/10	
Posted Speed Limit:	50 km/h	50 km/h	50 km/h	50 km/h	
Gradient Of Road:	<2%	<2%	<2%	<2%	
Ultimate R.O.W:	35 m	30 m	30 m	26 m	

Comments:

Ultimate street data only (2041).

*Note: the future lane configuration of Hurontario Street at this location will consist of 4 through lanes with 2 LRT lines along the center of the roadway.

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Real Estate and Facility Management
800 – 1290 Central Parkway West
Mississauga, ON, L5C 4R3
www.cpr.ca

September 14, 2016

Via e-mail: lucasa@novusenv.com

Luke Arnold, P.Eng.
Acoustics, Noise & Vibration Engineer
150 Research Lane
Suite 105
Guelph, ON N1G 4T2

Dear Luke:

Re: Rail Traffic Volumes, CP Mileage 20.67 Galt Subdivision
80 Thomas Street, Mississauga, ON

This is in reference to your request for rail traffic data for a noise study for the lands located at 80 Thomas Street in the vicinity of CP's Streetsville Station at mile 20.67 of our Galt Subdivision. This corridor is classified as a Principal Main Line.

The information requested is as follows:

1. Number of freight trains 0700 to 2300: 24
   Number of freight trains 2300 to 0700: 9
   Number of passenger trains (GO Transit*): 20
   **GO Transit passenger service runs weekdays between 0620 & 0845 and then between 1630 & 1930.*
2. Average number of cars per train freight: 60
   Maximum cars per train freight: 160
   Number of cars per train passenger: 13
3. Number of Locomotives per train: 2 (4 max) freight, 1 passenger
4. Maximum permissible speed: 50 mph (freight), 55 mph (passenger)
5. Whistle signal is prohibited approaching public grade crossings through the study area. However, the whistle may be sounded if deemed necessary by the train crew for safety reasons.
6. The subject site is located in the vicinity of CP's Streetsville Station which is a passenger rail station. GO Trains ring their bells when they approach and leave the station.

The information provided is based on rail traffic over the past month to date. Variations of the above may exist on a day-to-day basis. Specific measurements may also vary significantly depending on customer needs.

Yours truly,

Josie Tomei
Specialist Real Estate Sales
& Acquisitions – Ontario
905-803-3429. josie_tomei@cpr.ca

Real Estate and Facility Management
800 – 1290 Central Parkway West
Mississauga, ON, L5C 4R3
www.cpr.ca

September 14, 2016

Via e-mail: lucasa@novusenv.com

Luke Arnold, P.Eng.
Acoustics, Noise & Vibration Engineer
150 Research Lane
Suite 105
Guelph, ON N1G 4T2

Dear Luke:

Re: Rail Traffic Volumes, CP Mileage 20.67 Galt Subdivision
80 Thomas Street, Mississauga, ON

Further to your e-mail of September 1, 2016 requesting rail traffic data, CP has agreed to provide the data for our fee of $565.00 ($500.00 + HST).

Please accept this letter as a request for payment for providing the rail traffic report. Please make cheque payable to Canadian Pacific Railway and submit to my attention at:

Josie Tomei
Canadian Pacific Railway
1290 Central Parkway West
Suite 800
Mississauga, ON L5C 4R3

Thank you.
Yours truly,

Josie Tomei
Specialist Real Estate Sales
& Acquisitions – Ontario
905-803-3429. josie_tomei@cpr.ca

Marcus Li

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: February 16, 2022 1:14 PM
To: Marcus Li
Subject: RE: 31-33 Hillcrest, Mississauga - Noise Study Traffic Requests

Good afternoon Marcus,

Further to your request dated February 7, 2022, the subject lands (31-33 Hillcrest, Mississauga) are located within 300 metres of Cooksville GO Station and the CP Galt Subdivision (which carries Milton GO rail service).

It's anticipated that GO rail service on this Subdivision will be comprised of diesel trains. The GO rail fleet combination on this Subdivision will consist of up to 1 locomotive and 12 passenger cars. The typical GO rail weekday train volume forecast near the subject lands, including both revenue and equipment trips is in the order of 44 trains. The planned detailed trip breakdown is listed below:

	1 Diesel Locomotive		1 Diesel Locomotive
Day (0700-2300)	38	Night (2300-0700)	6

The current track design speed near the subject lands is 65 mph (105 km/h).

There are no *anti-whistling by-laws* in affect near the subject lands

Operational information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability and passenger demand.

It should be noted that this information only pertains to Metrolinx rail service. It would be prudent to contact other rail operators in the area directly for rail traffic information pertaining to non-Metrolinx rail service.

I trust this information is useful. Should you have any questions or concerns, please do not hesitate to contact me.

Best regards,
Harrison Rong
Project Coordinator, Third Party Projects Review
Metrolinx
20 Bay Street | Suite 600 | Toronto | Ontario | M5J 2W3

From: Marcus Li <mli@slrconsulting.com>
Sent: February 7, 2022 10:02 AM
To: Rail Data Requests <RailDataRequests@metrolinx.com>
Cc: Brandon Gaffoor <Brandon.Gaffoor@metrolinx.com>
Subject: 31-33 Hillcrest, Mississauga - Noise Study Traffic Requests

Route	Existing		2026		2031	
	Day	Night	Day	Night	Day	Night
MiWay Confederation - Route 28	28	3	78	34	78	34
MiWay Sherway Gardens - Route 4	35	8	39	17	48	24
MiWay Kennedy - Route 53	47	8	55	25	55	25
MiWay Creditview - Route 38	35	9	39	17	46	18
GO MI 21 - Milton	55	13	61	14	63	15

Notes:

Day - 7 AM to 11 PM

Night - 11 PM to 7 AM

Existing bus service may be reduced from typical conditions due to COVID-19.

Future MiWay bus volumes provided by City of Mississauga

Future peak periods assumed to be 6-10 AM, 4-8 PM, 24 hour operation

No future GO bus volumes available, assume 10% increase from existing to 2026, 15% from existing to 2031

33 Hillcrest
Future Bus Traffic Forecasts for Noise Analysis
15-Apr-22

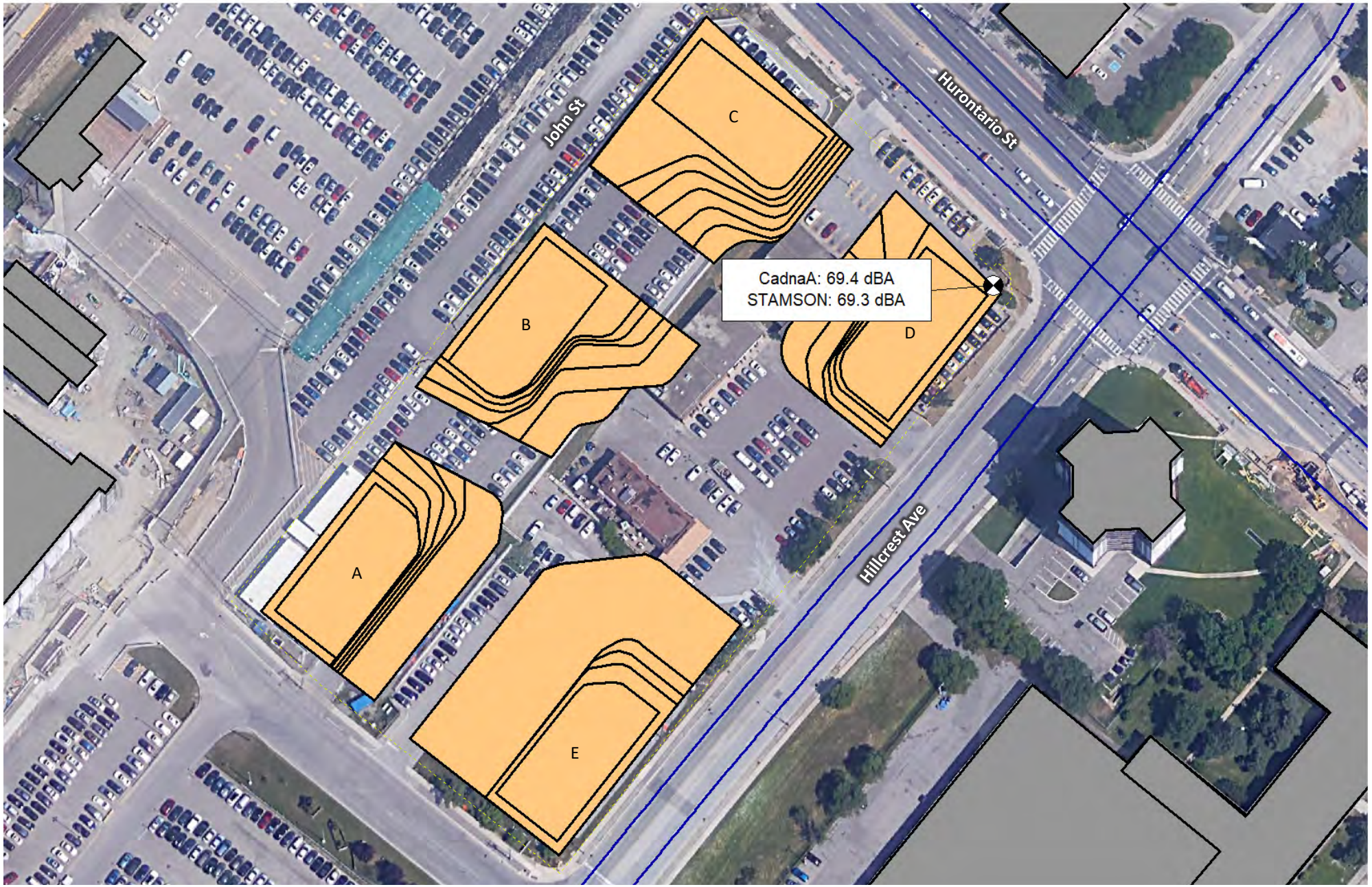
O R N A M E N T - Sound Power Emissions & Source Heights

Ontario Road Noise Analysis Method for Environment and Transportation

Road Segment ID	Roadway Name	Link Description	Speed (kph)	Period (h)	Total Traffic Volumes	Auto %	Med %	Hvy %	Auto	Med	Heavy
Hurontario_St_N	Hurontario St Northbound	Daytime_Northbound	50	16	20745	95.0%	2.8%	2.3%	19,708	570	467
Hurontario_St_N	Hurontario St Northbound	Nighttime_Northbound	50	8	2305	95.0%	2.8%	2.3%	2,190	63	52
Hurontario_St_S	Hurontario St Southbound	Daytime_Southbound	50	16	20745	95.0%	2.8%	2.3%	19,708	570	467
Hurontario_St_S	Hurontario St Southbound	Nighttime_Southbound	50	8	2305	95.0%	2.8%	2.3%	2,190	63	52
Confedertion_Pkwy_N	Confedertion Pkwy Northbound	Daytime_Eastbound	50	16	10620	97.0%	1.7%	1.4%	10,301	175	143
Confedertion_Pkwy_N	Confedertion Pkwy Northbound	Nighttime_Eastbound	50	8	1180	97.0%	1.7%	1.4%	1,145	19	16
Confedertion_Pkwy_S	Confedertion Pkwy Southbound	Daytime_Westbound	50	16	10620	97.0%	1.7%	1.4%	10,301	175	143
Confedertion_Pkwy_S	Confedertion Pkwy Southbound	Nighttime_Westbound	50	8	1180	97.0%	1.7%	1.4%	1,145	19	16
Hillcrest_E	Hillcrest Ave Eastbound	Daytime_Northbound	50	16	12780	97.0%	1.7%	1.4%	12,397	211	173
Hillcrest_E	Hillcrest Ave Eastbound	Nighttime_Northbound	50	8	1420	97.0%	1.7%	1.4%	1,377	23	19
Hillcrest_W	Hillcrest Ave Westbound	Daytime_Southbound	50	16	12780	97.0%	1.7%	1.4%	12,397	211	173
Hillcrest_W	Hillcrest Ave Westbound	Nighttime_Southbound	50	8	1420	97.0%	1.7%	1.4%	1,377	23	19

RAILWAY SOURCES

Name	ID	Result. PWL'		Train Type 1				
		Day (dBA)	Night (dBA)	Type	No.		Speed (km/h)	Throttle (1 to 8)
					Day	Night		
CP Loco	CP_Loco	70.6	69.5	FRA_CONV_FRE_LOC	82	32	105	0
CP Wheel	CP_Wheel	70.6	69.5	FTA_COMM_CAR	2460	960	105	0
GO Loco	Go_Loco	65.0	60.0	FTA_COMM_LOC_DE	38	6	105	8
GO Wheel	GO_Wheel	63.3	58.3	FTA_COMM_CAR	456	72	105	0
LRT	Hurontario_LRT	59.5	54.4	FTA_COMM_CAR	840	132	50	0



33HC TAS LP, 33HC CORP., 3168HS LP AND 3168HS CORP.	True North	Scale: 1:1,250	METRES	SLR global environmental solutions
5 HILLCREST AVENUE AND 3152 HURONTARIO STREET		Date: May 13, 2022 Rev 1.0	Figure No. **B.1**	
COMPARISON OF CADNAA TO STAMSON		Project No. 241.20172.00000		

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STAMSON 5.0 NORMAL REPORT Date: 03-05-2022 09:31:03
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: HilHur.te Time Period: 16 hours
Description: 1st floor, east facade

Road data, segment # 1: Huron_NB

Car traffic volume : 19708 veh/TimePeriod
Medium truck volume : 570 veh/TimePeriod
Heavy truck volume : 467 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Huron_NB

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 36.60 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Huron_NB

Car traffic volume : 19708 veh/TimePeriod
Medium truck volume : 570 veh/TimePeriod
Heavy truck volume : 467 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Huron_NB

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 21.20 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Hillcrest_EB

Car traffic volume : 12397 veh/TimePeriod
Medium truck volume : 211 veh/TimePeriod
Heavy truck volume : 173 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: Hillcrest_EB

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 : 27.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 4: Hillcrest_EB

Car traffic volume : 12397 veh/TimePeriod
Medium truck volume : 211 veh/TimePeriod
Heavy truck volume : 173 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 4: Hillcrest_EB

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 : 17.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Huron_NB

Source height = 1.22 m

ROAD (0.00 + 63.77 + 0.00) = 63.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.64	0.00	-3.87	0.00	0.00	0.00	0.00	63.77

Segment Leq : 63.77 dBA

Results segment # 2: Huron_NB

Source height = 1.22 m

ROAD (0.00 + 66.14 + 0.00) = 66.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.64	0.00	-1.50	0.00	0.00	0.00	0.00	66.14

Segment Leq : 66.14 dBA

Results segment # 3: Hillcrest_EB

Source height = 1.08 m

ROAD (0.00 + 58.70 + 0.00) = 58.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	64.26	0.00	-2.55	-3.01	0.00	0.00	0.00	58.70

Segment Leq : 58.70 dBA

Results segment # 4: Hillcrest_EB

Source height = 1.08 m

ROAD (0.00 + 60.71 + 0.00) = 60.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	64.26	0.00	-0.54	-3.01	0.00	0.00	0.00	60.71

Segment Leq : 60.71 dBA

Total Leq All Segments: 69.25 dBA

TOTAL Leq FROM ALL SOURCES: 69.25

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Appendix C

Ventilation, Warning Clause, and Acoustic Barrier Summary

Environmental Noise & Vibration Assessment

3168 HS LP

25 Hillcrest Avenue and 3154 Hurontario Street

SLR Project No.: 241.20172.00000

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Ventilation, Warning Clause and Barrier Summary

The following Warning Clauses are recommended for inclusion in agreements registered on Title for the residential units, and included in all agreements of purchase and sale or lease, and all rental agreements. A summary of the Warning Clause and Ventilation Requirements is included in Table C.1 below.

MECP Type A

"Purchasers/tenants are advised that sound levels, due to increasing road and rail 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."

MECP 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."

MECP Type C

"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."

MECP Type D

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

MECP Type E

"Purchasers/tenants are advised that due to the proximity of the Cooksville GO Station, noise from the station may at times be audible."

CP

"Purchasers are advised that Canadian Pacific Railway Company or its assigns or successors in interest has or have a right-of-way within 300 metres from the land the subject thereof. There may be alterations to or expansions of the rail facilities on such right-of-way in the future, including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). CPR will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid right-of-way."

Metrolinx

"Metrolinx, carrying on business as GO Transit, and its assigns and successors in interest are the owners of lands within 300 metres from the land which is the subject hereof. In addition to the current use of the lands owned by Metrolinx, there may be alterations to or expansions of the rail and other facilities on such lands in the future including the possibility that GO Transit or any railway entering into an agreement with GO Transit to use the Metrolinx lands or Metrolinx and their respective assigns or successors as aforesaid may expand their operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwellings. Metrolinx will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under its lands."

Table C.1: Summary of Ventilation and Warning Clause Requirements

Building	Floors	Facade	Barrier Required	Air Conditioning Requirement	Warning Clause
Building A	Podium	N	N	AC	Type D, Type E, CP and Metrolinx
		E, S, W	N	Provision for AC	Type C, Type E, CP and Metrolinx
	Tower	N	N	AC	Type D, Type E, CP and Metrolinx
		E, S, W	N	Provision for AC	Type C, Type E, CP and Metrolinx
Building B	Podium	N	N	AC	Type A, Type D, Type E, CP and Metrolinx
		E, S, W	N	Provision for AC	Type A, Type C, Type E, CP and Metrolinx
	Tower	N	N	AC	Type A, Type D, Type E, CP and Metrolinx
		E, S, W	N	Provision for AC	Type A, Type C, Type E, CP and Metrolinx
Building C	Tower	N, E	Y	AC	Type B, Type D, Type E, CP and Metrolinx
		S, W	Y	Provision for AC	Type B, Type C, Type E, CP and Metrolinx
Building D	Podium	E, S	N	AC	Type A, Type D, Type E, CP and Metrolinx
		N, W	N	Provision for AC	Type A, Type C, Type E, CP and Metrolinx
	Tower	E	N	AC	Type A, Type D, Type E, CP and Metrolinx
		N, S, W	N	Provision for AC	Type A, Type C, Type E, CP and Metrolinx
Building E	Podium	All	N	Provision for AC	Type A, Type C, Type E, CP and Metrolinx
	Tower	All	N	Provision for AC	Type A, Type C, Type E, CP and Metrolinx

Notes: [1] AC = Central Air conditioning required, Provision for AC = forced air heating with a provision for installation of central air conditioning
[2] Mandatory AC and MECP Type F Waning Clause is required, providing a Class 4 Area Designation is granted.

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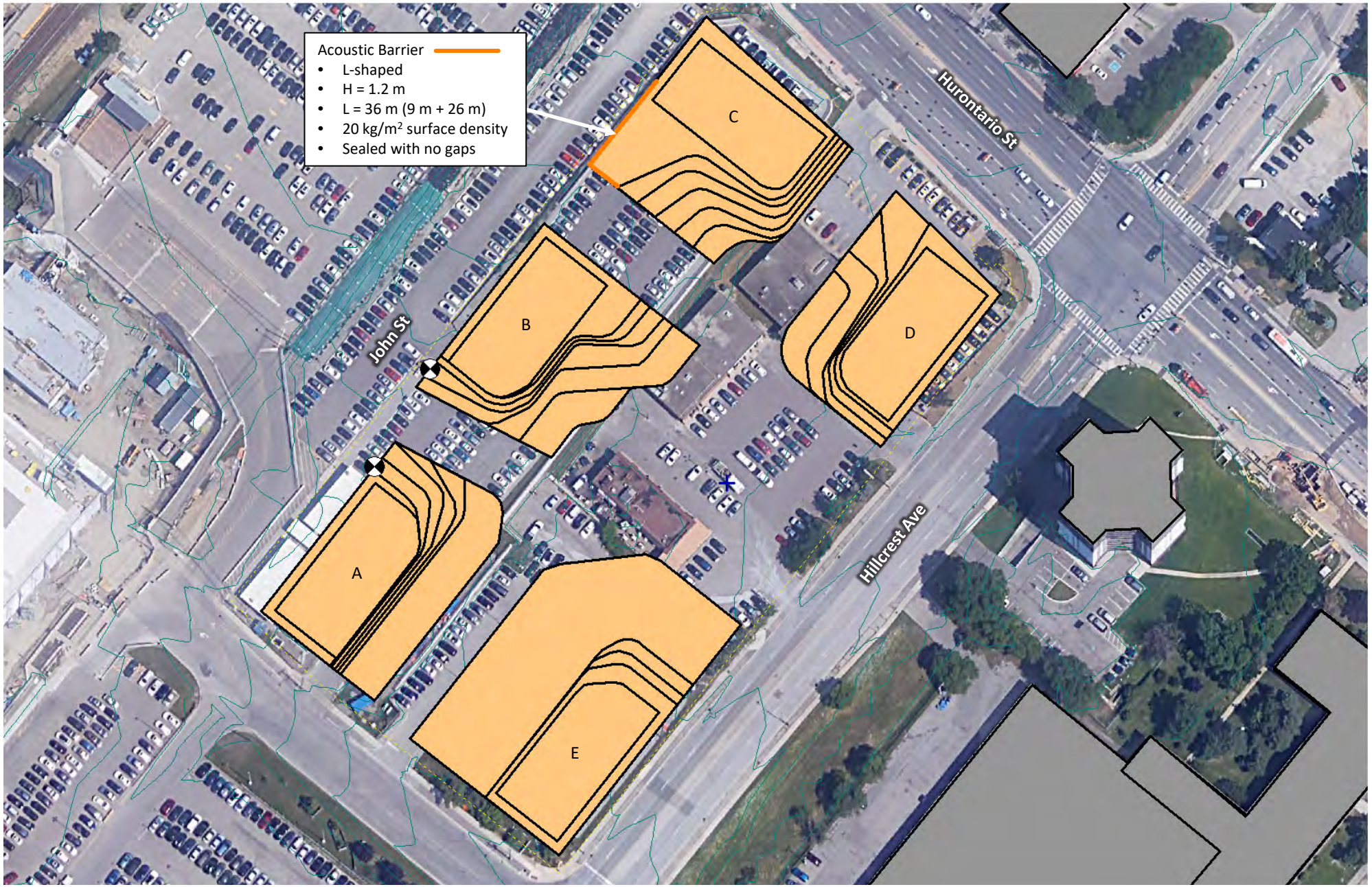

33HC TAS LP, 33HC CORP., 3168HS LP AND 3168HS CORP.	True North	Scale: 1:1,250	METRES	SLR global environmental solutions
5 HILLCREST AVENUE AND 3152 HURONTARIO STREET		Date: May 13, 2022 Rev 1.0	Figure No. **C.1**	
ACOUSTIC BARRIER REQUIREMENTS		Project No. 241.20172.00000		

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Appendix D

Stationary Source Sound Level Data

Environmental Noise & Vibration Assessment

3168 HS LP

25 Hillcrest Avenue and 3154 Hurontario Street

SLR Project No.: 241.20172.00000

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POINT SOURCES

Name	ID	Result. PWL Day (dBA)	Result. PWL Evening (dBA)	Result. PWL Night (dBA)	Operating Time Day (min)	Operating Time Special (min)	Operating Time Night (min)	Directivity Pattern	Directivity Vector X	Directivity Vector Y	Directivity Vector Z	Height (m)
Commercial 10-ton HVAC	Commercial_HVAC_cont	86	86	86	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
Commercial 10-ton HVAC	Commercial_HVAC_cont	86	86	86	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
Commercial 5-ton HVAC	Commercial_HVAC_cont	83	83	83	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
Commercial 5-ton HVAC	Commercial_HVAC_cont	83	83	83	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
Commercial 5-ton HVAC	Commercial_HVAC_cont	83	83	83	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
Commercial 5-ton HVAC	Commercial_HVAC_cont	83	83	83	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
Commercial 5-ton HVAC	Commercial_HVAC_cont	83	83	83	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
Commercial 5-ton HVAC	Commercial_HVAC_cont	83	83	83	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
Commercial 5-ton HVAC	Commercial_HVAC_cont	83	83	83	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
Commercial 10-ton HVAC	Commercial_HVAC_cont	86	86	86	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
School HVAC	School_HVAC_cont	83	83	83	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
School HVAC	School_HVAC_cont	83	83	83	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
School HVAC	School_HVAC_cont	83	83	83	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
School MUA	School_MUA_cont	75	75	75	60	60	60	(none)	0.00	0.00	0.00	1.0 m Above Roof
School MUA	School_MUA_cont	75	75	75	60	60	60	(none)	0.00	0.00	0.00	1.0 m Above Roof
School MUA	School_MUA_cont	75	75	75	60	60	60	(none)	0.00	0.00	0.00	1.0 m Above Roof
School MUA	School_MUA_cont	75	75	75	60	60	60	(none)	0.00	0.00	0.00	1.0 m Above Roof
Bus terminal 10-ton HVAC	Bus_HVAC_cont	86	86	86	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
Bus terminal 10-ton HVAC	Bus_HVAC_cont	86	86	86	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
Bus terminal 10-ton HVAC	Bus_HVAC_cont	86	86	86	60	60	30	(none)	0.00	0.00	0.00	1.5 m Above Roof
Idling Bus	Bus_Idle_cont	89	89	89	20	20	0	(none)	0.00	0.00	0.00	2.0 m Relative to Ground
Idling Bus	Bus_Idle_cont	89	89	89	20	20	20	(none)	0.00	0.00	0.00	2.0 m Relative to Ground
Idling Bus	Bus_Idle_cont	89	89	89	20	20	0	(none)	0.00	0.00	0.00	2.0 m Relative to Ground
Idling Bus	Bus_Idle_cont	89	89	89	20	20	0	(none)	0.00	0.00	0.00	2.0 m Relative to Ground
Idling Bus	Bus_Idle_cont	89	89	89	20	20	0	(none)	0.00	0.00	0.00	2.0 m Relative to Ground
Idling Bus	Bus_Idle_cont	89	89	89	20	20	20	(none)	0.00	0.00	0.00	2.0 m Relative to Ground
Idling Bus	Bus_Idle_cont	89	89	89	20	20	0	(none)	0.00	0.00	0.00	2.0 m Relative to Ground
Idling Bus	Bus_Idle_cont	89	89	89	20	20	0	(none)	0.00	0.00	0.00	2.0 m Relative to Ground
Idling Bus	Bus_Idle_cont	89	89	89	20	20	20	(none)	0.00	0.00	0.00	2.0 m Relative to Ground
Idling Bus	Bus_Idle_cont	89	89	89	20	20	0	(none)	0.00	0.00	0.00	2.0 m Relative to Ground
Lane1	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane1	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane1	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane1	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane1	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane1	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane1	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane1	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane1	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane1	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane2	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground

Name	ID	Result. PWL Day (dBA)	Result. PWL Evening (dBA)	Result. PWL Night (dBA)	Operating Time Day (min)	Operating Time Special (min)	Operating Time Night (min)	Directivity Pattern	Directivity Vector X	Directivity Vector Y	Directivity Vector Z	Height (m)
Lane2	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane2	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane2	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane2	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane2	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane2	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane2	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane2	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane2	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane3	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane3	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane3	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane3	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane3	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane3	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane3	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane3	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane3	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane3	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane4	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane4	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane4	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane4	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane4	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane4	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane4	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane4	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane4	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane4	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane5	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane5	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane5	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane5	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane5	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane5	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane5	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane5	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane5	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane5	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane6	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane6	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane6	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground

Name	ID	Result. PWL			Operating Time			Directivity Pattern	Directivity Vector			Height
		Day (dBA)	Evening (dBA)	Night (dBA)	Day (min)	Special (min)	Night (min)		X	Y	Z	(m)
Lane6	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane6	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane6	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane6	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane6	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane6	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane6	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane7	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane7	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane7	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane7	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane7	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane7	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane7	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane7	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane7	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane7	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane8	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane8	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane8	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane8	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane8	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane8	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane8	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane8	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane8	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane8	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane9	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane9	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane9	Car_idle_cont	76	76	76	60	60	60	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane9	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane9	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane9	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane9	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane9	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane9	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground
Lane9	Car_idle_cont	76	76	76	60	0	0	car_idle	-0.75	0.66	0.00	0.8 m Relative to Ground

LINE SOURCES

Name	ID	Result. PWL			Result. PWL'			Moving Pt. Src Number			Speed
		Day (dBA)	Evening (dBA)	Night (dBA)	Day (dBA)	Evening (dBA)	Night (dBA)	Day	Evening	Night	(km/h)
Cooksville Station Bus (MiWay and GO future)	Bus_Loop_cont	90	90	85	64	64	60	18	18	7	15