Howe Gastmeier Chapnik Limited
2000 Argentia Road, Plaza One, Suite 203
Mississauga, Ontario, Canada L5N 1P7
t: 905.826.4044

Noise Feasibility Study
Proposed Residential Development
3575 Kaneff Crescent
Mississauga, ON

Prepared for:

Kaneff Properties Limited
8501 Mississauga Road
Brampton, ON
L6Y 5G8

Prepared by

Harry Cai, BEng, EIT

Reviewed by

Sheeba Paul, MEng, PEng

May 20, 2020

HGC Project No: 01900761

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1 Introduction and Summary

HGC Engineering was retained by Kaneff Properties Limited to conduct a noise feasibility study for a proposed high-rise residential development located at 3575 Kaneff Crescent in Mississauga, Ontario. The residential development will consist of a 29-storey residential building. The study is required by the City of Mississauga and the Region of Peel as part of the planning and approvals process.

The primary sources of noise were determined to be road traffic on Hurontario Street, Burnhamthorpe Road, Central Parkway East, Mississauga Valley Blvd, and Kaneff Crescent. Road traffic data was obtained from the City of Mississauga and was used to predict future traffic sound levels at the proposed building façades and outdoor living areas. The predicted sound levels were compared to the guidelines of the Ministry of Environment, Conservation and Parks (MECP), the Region of Peel, and the City of Mississauga to develop noise control recommendations.

The results of the study indicate that future daytime and nighttime sound levels will exceed MECP guideline sound levels and will require noise control measures. An alternative means of ventilation to open windows will be required for the residential building. The installation of central air conditioning will meet and exceed ventilation requirements. Noise warning clauses are also required to inform future occupants of the traffic noise impacts and to address sound level excesses. For all dwelling units, building constructions meeting the minimum requirement of the Ontario Building Code will provide sufficient acoustical insulation for the indoor spaces.

2 Site Description and Noise Sources

Figure 1 is a key plan indicating the location of the proposed site and project north arrow for reference. The site is located at the south side of Kaneff Crescent and west of Mississauga Valley Boulevard. Figure 2 shows the typical floor plan. taken from the Draft Rezoning Set by Turner Fleischer Architects Inc., dated January 17, 2020. The proposed development will consist of a 29-storey residential building with an outdoor amenity area on the fifth floor.

HGC Engineering personnel visited the site on February 4, 2020 to make observations of the acoustical environment. During the site visit, it was noted that the primary source of noise impacting

the site was road traffic noise on Kaneff Crescent and Mississauga Valley Boulevard due to their close proximity to the site area, along with contribution from Hurontario Street, Burnhamthrope Road, and Central Parkway which are further away from the site. The site is currently occupied by an outdoor parking lot, which will be removed for the construction of the proposed high-rise building. Areas around the site area are flat and mostly residential. Existing high-rise residential buildings surround the site area immediately to the north and east. A commercial plaza exists to the southeast of the site area. Although sound emissions from the commercial plaza were not discernible at the site area, it is recommended that a noise warning clause to identify that such commercial uses may be audible at times be included in the property and tenancy agreements.

There is a proposed future Light Rail transit (LRT) system along the centre of Hurontario Street. Information regarding the Huontario-Main LRT line was obtained from the report prepared for SNC-Lavalin Inc. in support of the Transit Project Assessment Project (TRAP) by J.E. Coulter Associates Ltd. The report states that the LRT line will run along the Hurontario Street corridor, beginning at the Port Credit GO Station and ending at the Brampton GO Transit Station. The findings of the report prepared by J.E. Coulter Associates Limited for the future Hurontario-Main Street LRT indicate that there will be no noticeable change in the sound levels along most parts of the corridor and that the contribution of the LRT in relation to the overall sound level from road traffic is negligible. Supporting documents from the report are attached in Appendix B.

3 Noise Level Criteria

3.1 Road Traffic Noise

Guidelines for acceptable levels of road traffic noise impacting residential developments are given in the MECP publication NPC-300, “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning”, release date October 21, 2013, and are listed in Table I below. The values in Table I are energy equivalent (average) sound levels [L_{EQ}] in units of A-weighted decibels [dBA].

Table I: MECP Road Traffic Noise Criteria (dBA)

Area	Daytime $L_{EQ\ (16\ hour)}$ Road	Nighttime $L_{EQ\ (8\ hour)}$ Road
Outdoor Living Area	55 dBA	--
Inside Living/Dining Rooms	45 dBA	45 dBA
Inside Bedrooms	45 dBA	40 dBA

Daytime refers to the period between 07:00 and 23:00. Nighttime refers to the time period between 23:00 and 07:00. The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace, or other area where passive recreation is expected to occur. Small balconies are not considered OLAs for the purposes of assessment. Terraces greater than 4 m in depth (measured perpendicular to the building façade) are considered to be OLAs. Generally, common outdoor amenity terraces are the only outdoor spaces that require consideration in multi-family buildings.

The guidelines in the MECP publication allow the daytime sound levels in an Outdoor Living Area to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and rental agreements to the property. Where OLA sound levels exceed 60 dBA, physical mitigation is required to reduce the OLA sound level to below 60 dBA and as close to 55 dBA as technically, economically, and administratively practical.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom or living/dining room windows exceed 60 dBA or greater for the Region of Peel or daytime sound levels outside bedroom or living/dining room windows exceed 65 dBA. Forced-air ventilation with ducts sized to accommodate the future installation of air conditioning is required when nighttime sound levels at bedroom or living/dining room windows are in the range of 51 to 59 dBA or when daytime sound levels at bedroom or living/dining room windows are in the range of 56 to 65 dBA.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of window nighttime sound level is greater than 60 dBA or the daytime sound level is greater than 65 dBA due to road traffic noise.

Warning clauses to notify future residents of possible noise excesses are also required when nighttime sound levels exceed 50 dBA at the plane of the bedroom or living/dining room window and daytime sound levels exceed 55 dBA in the outdoor living area and at the plane of the bedroom or living/dining room window due to road traffic.

4 Traffic Sound Level Assessment

4.1 Road Traffic Data

Traffic data for all roads were obtained from the City of Mississauga in the form of ultimate Average Annual Daily Traffic (AADT) traffic values

For Hurontario Street, an ultimate volume of 40 700 vehicles per day at an operating speed limit of 60 km/h was applied for the analysis. A commercial vehicle percentage of 2.75% for medium trucks and 2.25% for heavy trucks was applied. A day/night split of 90% /10% was used.

For Burnhamthorpe Road, an ultimate volume of 47 800 vehicles per day at an operating speed limit of 60 km/h was applied for the analysis. A commercial vehicle percentage of 2.75% for medium trucks and 2.25% for heavy trucks was applied. A day/night split of 90% / 10% was used.

For Central Parkway East, an ultimate volume of 17 700 vehicles per day at an operating speed limit of 50 km/h was applied for the analysis. A commercial vehicle percentage of 2.2% for medium trucks and 1.8% for heavy trucks was applied. A day/night split of 90% / 10% was used.

For Mississauga Valley Boulevard, an ultimate volume of 5 000 vehicles per day at an operating speed limit of 40 m/h was applied for the analysis. A commercial vehicle percentage of 1.65% for medium trucks and 1.35% for heavy trucks was applied. A day/night split of 90% / 10% was used.

For Kaneff Crescent, an ultimate volume of 5 000 vehicles per day at an operating speed limit of 40 km/h was applied for the analysis. A commercial vehicle percentage of 1.1% for medium trucks and 0.9% for heavy trucks was applied. A day/night split of 90% / 10% was used.

Road traffic data is provided in Appendix A and is summarized below in Table II.

Table II: Ultimate Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Hurontario Street	Daytime	34 799	1 007	824	36 630
	Nighttime	3 867	112	92	4 070
	Total	**38 665**	**1 119**	**916**	**40 700**
Burnhamthorpe Road East	Daytime	40 869	1 183	968	43 020
	Nighttime	4 541	131	108	4 780
	Total	**45 410**	**1 314**	**1 076**	**47 800**
Central Parkway East	Daytime	15 293	350	287	15 930
	Nighttime	1 699	39	32	1 770
	Total	**16 992**	**389**	**319**	**17 700**
Mississauga Valley Boulevard	Daytime	4 365	74	61	4 500
	Nighttime	485	8	7	500
	Total	**4 850**	**83**	**68**	**5 000**
Kaneff Crescent	Daytime	4 410	50	41	4 500
	Nighttime	490	6	5	500
	Total	**4 900**	**55**	**45**	**5 000**

4.2 Road Traffic Noise Predictions

To assess the levels of road traffic noise which will impact the study area in the future, sound level predictions were made using a numerical computer modelling package *(Cadna-A version 2020 build 177.5010)*. The model is based on methods from ISO Standard 9613-2.2, "Acoustics – Attenuation of Sound During Propagation Outdoors", which accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation, and acoustical shielding by intervening structures.

The road noise sources have been included in the model using basic road element included in Cadna/A, which follows the German guideline RLS-90 for road traffic noise predictions. Our experience suggest that road sound levels predicted by RLS-90 are reasonably accurate. The model road traffic values have been qualified on similar projects to be within 1-2 dBA of those predicted in STAMSON 5.04, a computer algorithm developed by the MECP.

Predictions of the traffic sound levels were chosen around the proposed residential building to obtain an appropriate representation of future sound levels at various façades. Sound levels were predicted

at the bedroom and/or living/dining room windows on all floors during daytime and nighttime hours to investigate ventilation and façade construction requirements. Sound levels were also predicted in possible OLA's to investigate the need for noise barriers. The results of these predictions are summarized in Table III, and shown in Figures 3 and 4.

Table III: Predicted Road Traffic Sound Levels [dBA], Without Mitigation

Description	Daytime – at the Façade $L_{EQ\text{-}16\ hr}$	Nighttime – at the Facade $L_{EQ\text{-}8\ hr}$
Façade facing Hurontario Street	58	52
Façade facing Kaneff Crescent	63	56
Façade facing Mississauga Valley Boulevard	61	55
Façade facing Central Parkway	58	51
3rd floor outdoor terrace+	55+	--
5th floor outdoor amenity area+	55+	--

Note: + 1.07 m high parapet wall included in the analysis

5 Discussions and Recommendations

The sound level predictions indicate that the future traffic sound levels will exceed MECP guidelines at the proposed development. The following discussion outlines the recommendations for acoustic barrier requirements, ventilation requirements, upgraded building façade construction, and warning clauses to achieve the noise criteria stated in Table I.

5.1 Outdoor Living Areas

There is a proposed outdoor terrace on the 3rd floor that exceeds 4 m in depth, and a larger outdoor amenity area on the 5th floor. These areas are considered to be OLAs. The predicted daytime sound levels of the 3rd floor and 5th floor OLA will be up to 55 dBA, which is within the MECP sound level limit of 55 dBA. No physical noise mitigation is required.

The dwelling units in the proposed residential building have balconies that are less than 4 m in depth. These areas are not considered to be outdoor living areas under the MECP guidelines, and therefore are exempt from traffic noise assessment.

5.2 Indoor Living Areas and Ventilation Requirements

Provision for Air Conditioning

The predicted future sound levels outside all facades will be between 56 and 65 dBA during the daytime hours and/or between 51 to 60 dBA during the nighttime hours. To address these excesses, these dwelling units require provision for the future installation of central air conditioning systems so that windows may be kept closed. It is likely that the building or individual suites will include air conditioning. In general, window or through-the-wall air conditioning units are not recommended because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall sound insulating properties of the envelope. Acceptable units are those that are housed in their own closet with an access door for maintenance. Any outdoor air conditioning unit or rooftop mechanical units should be located, installed, and selected with an appropriate sound emission rating to comply with MECP guidelines NPC-300.

5.3 Building Façade Constructions

The predicted sound levels at all façades of the building will not exceed 65 dBA daytime and 60 dBA nighttime, thus will not require detailed building envelope design to conform to noise criteria. Any exterior wall and double-glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for the interior spaces.

6 Warning Clauses

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements and offers of purchase and sale for all units with anticipated traffic sound level excesses. The following noise warning clauses are required for specific dwellings as indicated in Table IV.

Suggested wording for future dwellings which have sound levels in excess of MECP criteria is given below.

Type A:

> Purchasers/tenants are advised that sound levels due to increasing road 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, Conservation and Parks.

Suggested wording for future dwellings which include central air conditioning is given below.

Type B:

> 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 City and the Ministry of Environment, Conservation and Parks.

Suggested wording for future dwelling units in close proximity to commercial buildings is given below.

Type C:

> Purchasers are advised that due to the proximity of the existing commercial buildings, sound levels from the facilities may be at times be audible.

These sample clauses are provided by the MECP as examples, and can be modified by the Municipality as required.

7 Impact of the Development on Itself

Section 5.9.1 of the Ontario Building Code (OBC) specifies the minimum required sound insulation characteristics for demising partitions, in terms of Sound Transmission Class (STC) values. In order to maintain adequate acoustical privacy between separate suites in a multi-tenant building, inter-suite walls must meet or exceed STC-50. Walls separating a suite from a noisy space such as a refuse chute, or elevator shaft, must meet or exceed STC-55. In addition, it is recommended that the floor/ceiling constructions separating suites from any amenity or commercial spaces also meet or exceed STC-55. Tables 1 and 2 in Section SB-3 of the Supplementary Guideline to the OBC provide a comprehensive list of constructions that will meet the above requirements.

Tarion's Builder Bulletin B19R requires the internal design of condominium projects to integrate suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of the buildings on its residents. If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and

mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself is maintained within acceptable levels.

8 Impact of the Development on the Environment

It is expected that any increase in local traffic associated with the development will not be substantial enough to affect noise levels significantly.

Sound levels from stationary (non-traffic) sources of noise such as rooftop air-conditioners, cooling towers, exhaust fans, etc. should not exceed the minimum one-hour L_{EQ} ambient (background) sound level from road traffic, at any potentially impacted residential point of reception, to avoid complaints. Based on the levels observed during our site visit, the typical minimum ambient sound levels in the area are expected to be 50 dBA or more during the day and 45 dBA or more at night. Thus, any electro-mechanical equipment associated with this development (e.g. emergency generator testing, fresh-air handling equipment, etc.) should be designed with these targets in mind such that they do not result in noise impact beyond these ranges.

9 Summary and Recommendations

The following list and Table IV summarize the recommendations made in this report. The reader is referred the previous sections of the report where these recommendations are applied and discussed in more detail.

1. An alternative means of ventilation to open windows will be required for the building. It is likely that the building will include central air conditioning and this will meet and exceed this requirement.

2. The use of warning clauses in the property and tenancy agreements is recommended to inform future residents of traffic noise issues.

Table IV: Summary of Noise Control Requirements and Noise Warning Clauses

Description	Acoustic Barrier	Ventilation Requirements*	Type of Warning Clause	Building Construction Requirements
All residential units	--	Alternative means of ventilation to open windows	A, B, C	OBC

Notes:
* The installation of central air conditioning will meet and exceed ventilation requirements. The location, installation and sound rating of the air conditioning condensers must be compliant with MECP Guideline NPC-300, as applicable.
OBC – Ontario Building Code

9.1 Implementation

To ensure that the noise control recommendations outlined above are properly implemented, it is recommended that:

1. Prior to the issuance of occupancy permits for this development, the Municipality's building inspector or a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should certify that the noise control measures have been properly incorporated, installed, and constructed.

Figure 1: Key Plan

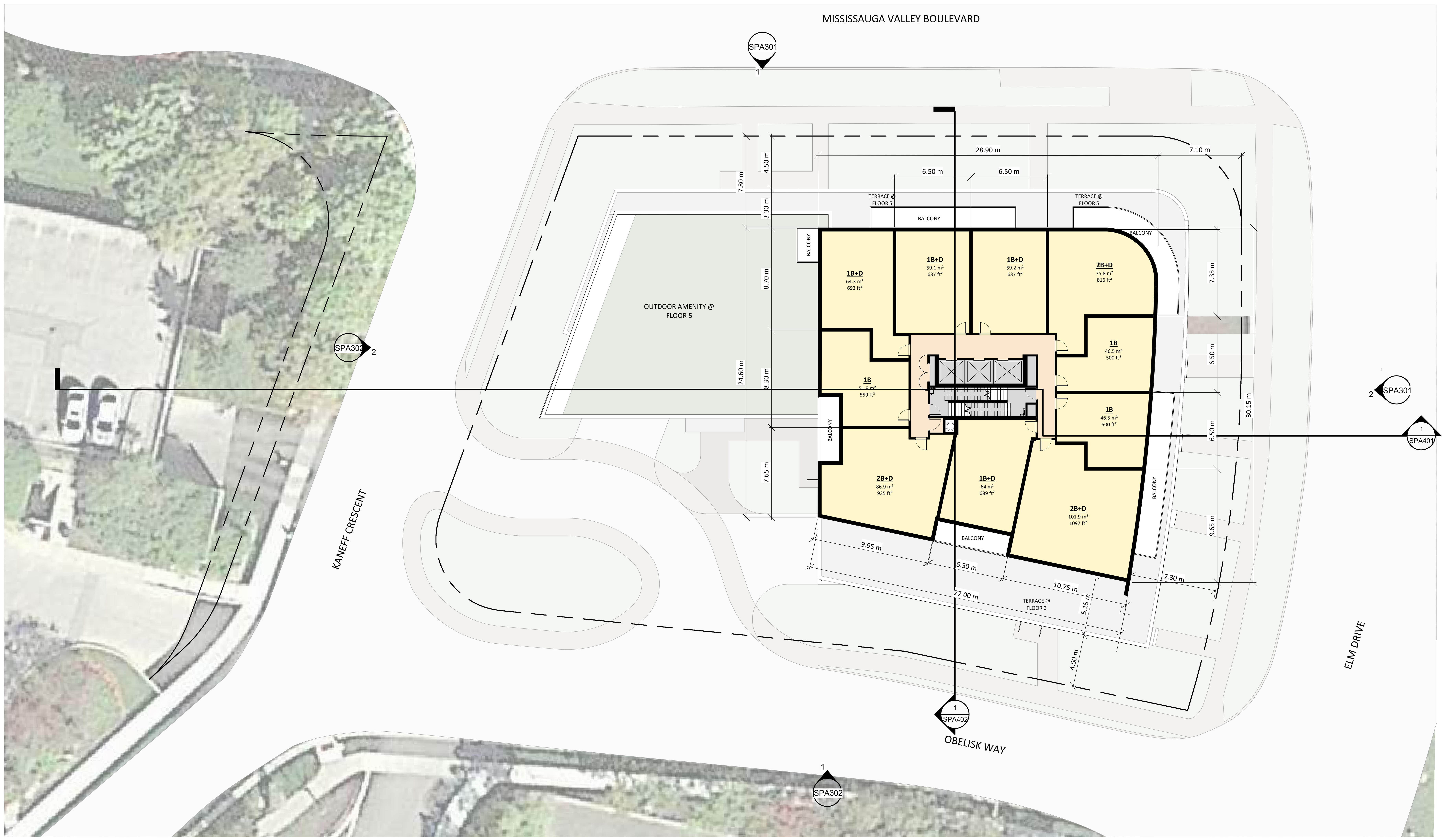

Figure 2: Typical Floor Plan

TURNER FLEISCHER

Turner Fleischer Architects Inc.

67 Lesmill Road
Toronto, ON, M3B 2T8
T 416 425 2222
turnerfleischer.com

#	DATE	DESCRIPTION	BY

PROJECT
KANEFF CRESCENT
MISSISSAUGA, ON

DRAWING
TYPICAL TOWER FLOOR

PROJECT NO. 16.286
PROJECT DATE 2018-04-20
DRAWN BY MPA
CHECKED BY RMM
SCALE 1 : 200

DRAWING NO. SPA109

2020-05-06 4:07:36 PM

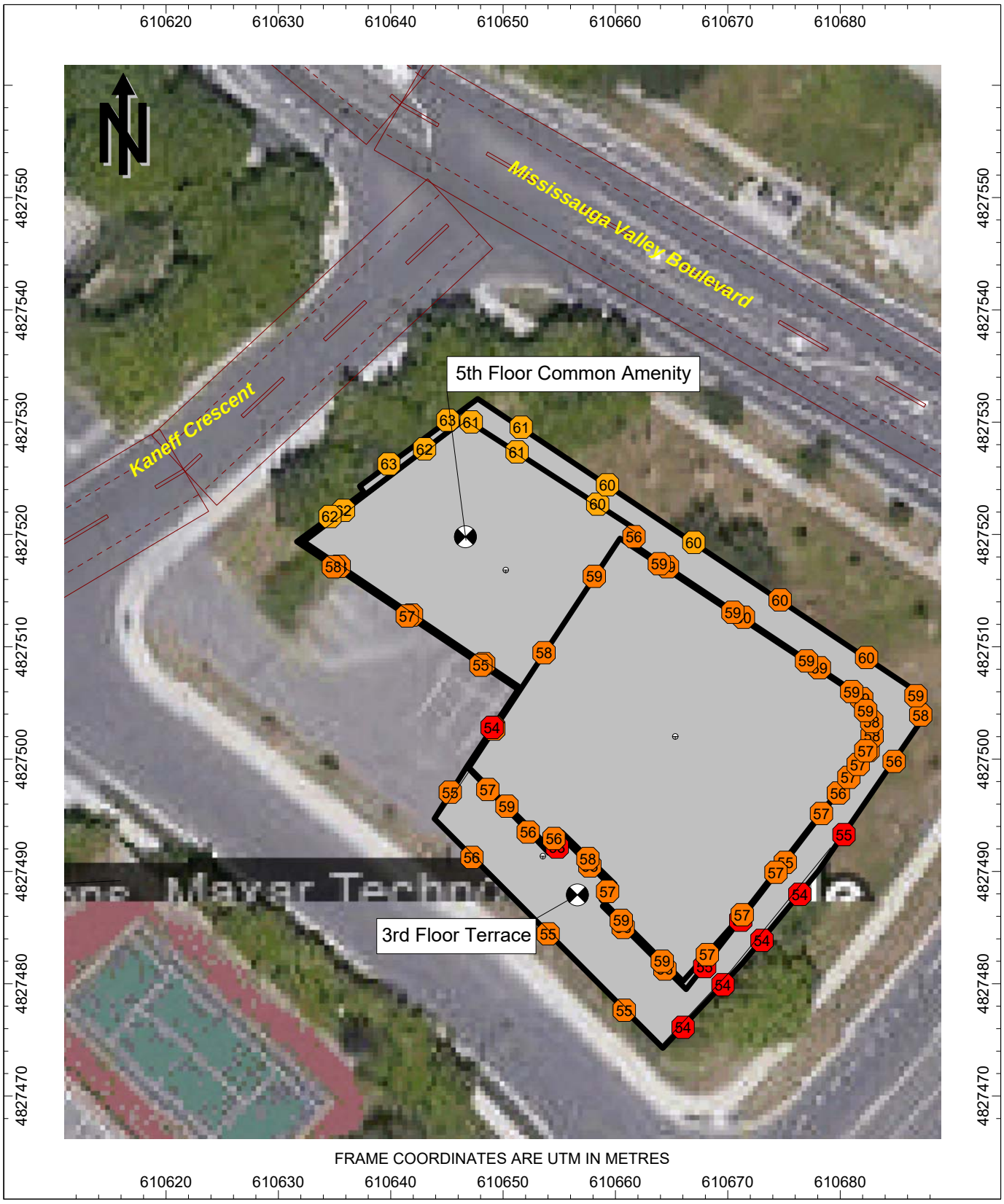

Figure 3: Predicted Daytime (07:00 - 23:00) Sound Levels, Leq [dBA]

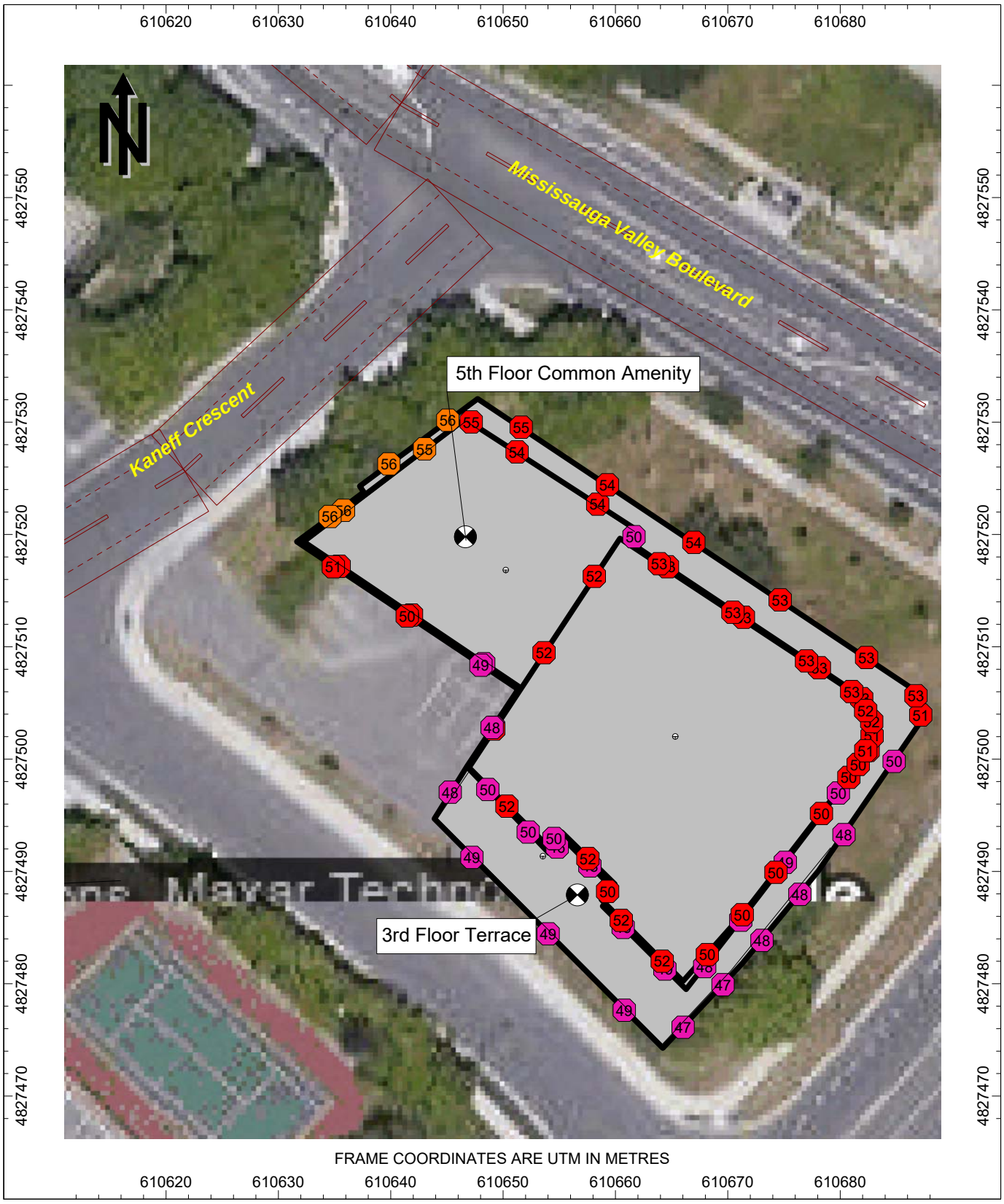

Figure 4: Predicted Nighttime (23:00 - 07:00) Sound Levels, Leq [dBA]

Appendix A

Road Traffic Information

NOISE REPORT FOR PROPOSED DEVELOPMENT

Date:	10-Jan-20

REQUESTED BY:

Name:	Sheeba Paul
Company:	HGC Engineering

PREPARED BY:

Name	Bertuen Mickle
Tel#:	(905) 615-3200

MISSISSAUGA

Location:
Miss. Valley Blvd - Arista Way to Central Pky E
Kaneff Cre - Arista Way to Miss. Valley Blvd
Hurontario Street - Burnhamthorpe Rd to Central Pky E
Burnhamthorpe Rd E - Hurontario St to Arista Way
Central Pky - Hurontario St to Miss. Valley Blvd

ID# 452

ON SITE TRAFFIC DATA

Specific	*Street Names*				
[redacted]	Mississauga Valley Blvd	Keneff Crescent	Hurontario Street	Burnhamthorpe Road E	Central Parkway E
AADT:	5,000	5,000	40,700	47,800	17,700
# of Lanes:	2 Lanes	2 lanes	4 Lanes	6 Lanes	4 Lanes
% Trucks:	3%	2%	5%	5%	4%
Medium/Heavy Trucks Ratio:	55/45	55/45	55/45	55/45	55/45
Day/Night Split:	90/10	90/10	90/10	90/10	90/10
Posted Speed Limit:	40 km/h	40 km/h	60 km/h	60 km/h	50 km/h
Gradient Of Road:	<2%	<2%	<2%	<2%	<2%
Ultimate R.O.W:	27m	15m	50m	60m	35m

Comments:

- Ultimate Traffic Data Only
-There is a proposed LRT line along Hurontario St. existing lanes may be converted from 6 lanes to 4 lanes with 2 LRT lines in the middle.
-Please contact Farhad Shala @(905) 615-3200 ext. 3377 or farhad.shala@mississauga.ca for more information regarding LRT.

Appendix B

Supporting Documents

Table 1: Generic Corridor Description

From	To	Length[1]	Track Position	Land Uses[2]	Distance to Closest Sensitive Receptor[3]	Speed (km/h.)[8]	POR[4]
Park St.	Inglewood Dr.	370m	West	East Side = R, West = C	18m	40	1
Inglewood Dr.	QEW	1,400m	Centre	R +C	22m	50	2
QEW	Queensway West	900m	Centre	East Side = R West Side =C	29m	50	-
Queensway West	King St.	740m	Centre	R +C	24m	50	3
King St.	Agnes St.	380m	Centre	C	-	50	-
Agnes St.	CP Rail Galt Sub	560m	Centre	West Side = R + C + E, East Side = C	27m	50	-
CP Rail Galt Sub	Central Parkway	750m	Centre	R + C	22m	50	4
Central Parkway	Burnhamthorpe Rd.	970m	Centre	R + C	26m	60	5
Burnhamthorpe Rd.[5]	Highway 403	1,300m	Centre	R + C	35m	60	-
Hurontario St.[5]	Duke of York Blvd.	800m	Centre	R + C	31m	60	6
Burnhamthorpe Rd.[5]	Rathburn Rd.	800m	East	C + E	-	60	-
Duke of York Blvd.[5]	Hurontario Street	800m	North	C	-	60	-
Highway 403	Ceremonial Drive	1,200m	Centre	R + C	28m	60	7
Ceremonial Drive	Matheson Blvd.	1,600m	Centre	R + C	31m	60	8
Matheson Blvd.	Highway 401	1,600m	Centre	C + I	-	80	-
Highway 401	Ray Lawson Blvd.	4,500m	Centre	C + I	38m	80	9[6]
Ray Lawson Blvd.	Steeles Ave.	1,100m	Centre	R + C	26m	60	10
Steeles Ave.	Nanwood Dr.	1,600m	Centre	R + C	26m	60	11
Nanwood Dr.	Wellington St.	1,300m	Centre	R + C + E	16m	50	12
Wellington St.	GO Kitchener Rail	450m	Side/Split	2nd Storey R + C + E	5m	50	13[7]
Main Street	Brampton GO Station	270m	North	North Side = R	20m	40	14

Notes:
1. Lengths are approximate only
2. Land uses: C-Commercial, I-Industrial, R-Residential, E-Institutional
3. Distance is measured from the centreline of the closest set of tracks
4. Point of Reception within the segment of the LRT
5. These segments are within the Downtown Mississauga loop, where the LRT splits around Mississauga's City Centre
6. Though commercial, a motel/hotel has been selected for review, as it is a place where people may reside
7. Downtown Brampton includes an area where there are 1st-floor commercial and 2nd-/3rd-floor residential components.
8. Speed of LRT and traffic based on posted speed limits.

Table 5: Expected LRT Sound Levels and Impacts

POR	No Project Sound Levels (dBA)		With Project Sound Levels (dBA)						Impact (dB)	
			Daytime (16 hr L_{eq})			Night-time (8 hr L_{eq})				
	Daytime (16 hr L_{eq})	Night-time (8 hr L_{eq})	Traffic Only	LRT Only	TOTAL	Traffic Only	LRT Only	TOTAL	Daytime	Night-time
1	67	60	66	56	66	60	51	61	-1	1
2	67	61	67	59	68	60	54	61	1	0
3	67	61	65	59	66	58	54	59	-1	-2
4	68	62	67	59	68	61	54	62	0	0
5	68	62	67	59	68	60	54	61	0	-1
6	66	59	65	59	66	58	53	59	0	0
7	70	63	68	59	69	62	54	63	-1	0
8	68	61	66	59	67	59	54	60	-1	-1
9	70	63	68	60	69	62	55	63	-1	0
10	69	62	68	59	69	61	54	62	0	0
11	68	62	66	60	67	59	55	60	-1	-2
12	67	60	64	61	66	57	56	60	-1	0
13	68	61	62	63	66	56	58	60	-2	-1
14	55	50	53	58	59	46	53	54	4	4

Notes: The "With Project" sound levels have been divided into Traffic Only and LRT Only sound levels to show the relative significance of each. They are then added together to obtain the TOTAL sound level, which is used to determine the potential impact.