HGC ENGINEERING

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Noise Feasibility Study
Proposed Residential Development
86 Thomas Street
City of Mississauga, Ontario

Prepared for:

Rexell Developments Inc.
4101 Steels Avenue, Unit 201
Toronto, Ontario
M3N 1V7

Prepared by

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Project No. 01900058

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1 Introduction & Summary

HGC Engineering was retained by Rexell Developments Inc. to conduct a noise feasibility study for a proposed townhouse development to be located at 86 Thomas Street, northeast of Hillside Drive, in Mississauga, Ontario. The proposed development will consist of two blocks of townhouse units and associated parking spaces. Lands surrounding the subject site are primarily existing residential and commercial uses to the further northeast. The study is required by the City of Mississauga as part of the planning and approvals process.

The primary source of noise impacting the site was determined to be road traffic on Thomas Street. Secondary sources of noise include Joymar Drive and rail traffic on the Canadian Pacific (CP) railway approximately 325 m to the east. Ultimate average annual daily traffic (AADT) data was obtained from the City of Mississauga. Rail traffic data was obtained from GO Transit/Metrolinx. Relevant traffic data was used to predict future traffic sound levels at the locations of the proposed residential dwelling facades. The predicted sound levels were compared to the guidelines of the Ministry of the Environment, Conservation and Parks (MECP) and the Municipality to develop noise control recommendations.

The sound level predictions indicate that noise control measures need to be incorporated into the building envelope design such that indoor sound levels comply with the MECP noise criteria. The recommended noise control measures include appropriate exterior wall, window glazing assemblies, and air-conditioning of residential units so that windows can be kept closed. Warning clauses are also recommended to inform future occupants about the traffic noise impacts and the presence of nearby commercial/retail facilities. When detailed floor plans and building elevations are available, the glazing STC should be refined based on actual window to floor area ratios.

2 Site Description & Noise Sources

The proposed residential development is located north of Thomas Street and west of Joymar Drive, specifically at 86 Thomas Street, in the City of Mississauga, Ontario. Figure 1 shows a key plan of the subject site. A site plan prepared by WES SURDYKA Architect Inc. dated April 14, 2020 (Option G) is shown in Figure 2. The proposed development will consist of two blocks of two storey townhouse units for a total of ten dwelling units and associated parking areas.

A site visit was made by HGC Engineering personnel in January 2020 to make observations of the acoustic environment, and to identify the significant noise sources in the vicinity. The acoustical environment surrounding the site is urban in nature. There are existing residences to the west, south and north. The site is currently vacant. Road traffic on Thomas Street was confirmed to be the primary source of sound impacting the site. Rail traffic on the Canadian Pacific (CP) railway and road traffic on Joymar Drive were confirmed to be the secondary sources of sound impacting the site. Thomas Street consists of two lanes in each direction, and Joymar Drive consists of one lane in each direction. The railway right of way is to be located approximately 325 m to the east of the closest proposed residential building façade.

A commercial plaza including several auto repair shops is located on the east side of Joymar Drive. It should be noted that there will be future residences closer to these commercial uses than the proposed residential development. Noise from these commercial uses were not audible at the time of the site visit, nonetheless, a noise warning clause is recommended in Section 5.4 to inform future occupants of the presence of nearby commercial uses and that sounds may be times be audible. Streetsville Secondary School is located to the further north. There are no other significant sources of stationary noise within 500 m of the subject site.

3 Noise Level Criteria

3.1 Road and Rail Traffic Noise

Guidelines for acceptable levels of road and rail traffic noise applicable to 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 and Rail Traffic Noise Criteria [dBA]

Space	Daytime L_{EQ} (16 hour) Road/Rail	Nighttime L_{EQ}(8 hour) Road/Rail
Outdoor Living Areas	55 dBA	--
Inside Living/Dining Rooms	45 dBA / 40 dBA	45 dBA / 40 dBA
Inside Bedrooms	45 dBA / 40 dBA	40 dBA / 35 dBA

Daytime refers to the period between 07:00 and 23:00, while nighttime refers to the 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. Balconies that are less than 4 m in depth are not considered to be outdoor living areas under MECP guidelines.

The guidelines in the MECP publication allow the sound level in an OLA 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 feasible.

Indoor guidelines for rail noise are 5 dBA more stringent than for road noise, to account for the low frequency (rumbling) character of locomotive sound, and its greater potential to transmit through exterior wall/window assemblies.

A central air conditioning system as an alternative means of ventilation to open windows is required for all dwellings where nighttime sound levels outside bedroom or living/dining room windows

exceed 60 dBA 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 60 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 bedroom or living/dining room window sound level is greater than 55 dBA during nighttime and greater than 60 dBA during the daytime hours due to rail traffic noise.

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

4 Traffic Noise Assessment

4.1 Road Traffic Data

Road traffic information for Thomas Street was obtained from the City of Mississauga, in the form of ultimate AADT values, and is provided in Appendix B. An ultimate AADT of 21 500 vehicles per day, along with a speed limit of 50 km/h, was applied to Thomas Street. A commercial vehicle percentage of 3.0% was used in the analysis and was further split into 1.65% and 1.35% for medium and heavy trucks, respectively.

An ultimate AADT of 5 000 vehicles per day, along with a speed limit of 40 km/h, was applied to Joymar Drive. A commercial vehicle percentage of 2.0% was used in the analysis and was further split into 1.1% and 0.9% for medium and heavy trucks, respectively. Table II summarizes the traffic volume data used in this study.

Table II: Ultimate Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Thomas Street	Daytime	18 770	319	261	19 350
	Nighttime	2 086	35	29	2 150
	Total	**20 856**	**354**	**290**	**21 500**
Joymar Drive	Daytime	4 410	50	40	4 500
	Nighttime	490	5	5	500
	Total	**4900**	**55**	**45**	**5 000**

4.2 Rail Traffic

Rail traffic data for the Canadian Pacific (CP) Railway was obtained from Canadian Pacific and GO Transit/Metrolinx personnel and is provided in Appendix A in the form of ten-year projected values. This rail line is used for both passenger trains and freight trains. The maximum train speed for passenger trains and freight trains are both 80 kph (50 mph). The data was projected to the year 2030 using a 2.5% per year growth rate. The maximum allowable speed input in STAMSON 5.04, a computer algorithm developed by the MECP, is 80 kph and was used in the analysis. In conformance with GO Transit and Canadian Pacific Railway assessment requirements, the maximum speeds, maximum number of cars and locomotives per train were used in the traffic noise analysis to yield a worst case estimate of train noise. Table III summarises the rail traffic data used in the analysis.

Table III: Rail Traffic Data Projected to Year 2030

Type of Train	Number of Trains Day/ Night	Number of locomotives	Number of cars	Max Speed (KPH)
CP (Diesel)	7.7 / 9.0	4	163	80
GO (Diesel)	24.3 / 1.3	1	12	80

4.3 Traffic Noise Predictions

To assess the levels of road and rail traffic noise which will impact the study area in the future, sound level predictions were made using STAMSON version 5.04. A sample STAMSON output is included in Appendix C.

Sound levels were predicted at the plane of the top storey bedroom and/or living/dining room windows during daytime and nighttime hours to investigate ventilation and glazing requirements. Prediction locations were chosen around the residential site to obtain a representation of the future sound levels at various dwellings as shown in Figure 2. The results of these predictions are summarized in Tables IV and V.

The distance setback of the dwellings indicated on the site plan were used in the analysis along with the distance to the roadways and railway. The acoustic recommendations may be subject to modifications if the site plan is changed significantly.

Table IV: Daytime Predicted Future Sound Levels [dBA], Without Mitigation

Prediction Location	Description	Daytime - at Façade $L_{EQ(16)}$		Daytime - at Façade Total $L_{EQ(16)}$	Daytime – OLA Total $L_{EQ(16)}$
		Road	Rail		
A	Dwelling unit adjacent to Thomas Street and with some flanking exposure to railway	66	59	67	*
B	Dwelling unit adjacent to Thomas Street	65	58	66	*
C	Dwelling unit exposed to Joymar Drive and with flanking exposure to railway	62	58	63	<55
D	Dwelling unit with some exposure to Thomas Street	62	58	63	*

Note: *These dwellings do not have yards, patios or terraces larger than 4 m in depth.

Table V: Nighttime Predicted Future Sound Levels [dBA], Without Mitigation

Prediction Location	Description	Nighttime - at Façade $L_{EQ(8)}$		Nighttime - at Façade Total $L_{EQ(8)}$
		Road	Rail	
A	Dwelling unit adjacent to Thomas Street and with some flanking exposure to railway	60	62	64
B	Dwelling unit adjacent to Thomas Street	59	61	63
C	Dwelling unit exposed to Joymar Drive and with flanking exposure to railway	55	61	62
D	Dwelling unit with some exposure to Thomas Street	55	60	62

5 Traffic Noise Recommendations

The predictions indicate that the future traffic sound levels from Thomas Street, Joymar Drive and the railway will exceed MECP guidelines at all of the proposed townhouse units. The following discussion outlines recommendations for ventilation requirements, upgraded building façade constructions and warning clauses to achieve the noise criteria stated in Table I.

5.1 Outdoor Living Areas

The townhouse units may have balconies that are less than 4 metres in depth and front patios (which are exempt from the definition of OLA under MECP guidelines). The townhouse blocks adjacent to Thomas Street are fronting onto the roadway. The amenity space for the townhouses are located on the balcony above the garage on the shielded side of the buildings away from traffic noise.

The townhouse unit labelled as prediction [C] includes a large rear yard. The predicted sound level in the rear yard will be less than 55 since the building itself provides shielding from road traffic noise. Physical mitigation in the form of an acoustic barrier is not required.

5.2 Indoor Living Areas & Ventilation Requirements

Central Air Conditioning

The predicted sound levels outside the second storey windows of all the dwelling units will be greater than 65 dBA during the daytime hours or greater than 60 dBA during nighttime hours due to road and rail traffic. Central air conditioning systems are required for all the dwelling units in the

proposed development so that windows may remain closed. The location, installation and sound ratings of the outdoor air conditioning devices should minimize noise impacts and comply with criteria of MECP publication NPC-300, as applicable.

5.3 Building Façade Constructions

Future sound levels at the facades of all the proposed dwelling units will exceed 60 dBA during daytime hours and 55 dBA during nighttime hours due to rail traffic. MECP guidelines recommend that the windows, walls and doors be designed so that the indoor sound levels comply with MECP noise criteria.

The required building components are selected based on the Acoustical Insulation Factor (AIF) value for road traffic. To do so, calculations were performed to determine the acoustical insulation factors to maintain indoor sound levels within MECP guidelines. The calculation methods were developed by the National Research Council (NRC). They are based on the predicted future sound levels at the building façades, and the anticipated area ratios of the façade components (windows and walls) and the floor area of the adjacent room.

Exterior Wall Construction

Any exterior wall construction meeting the Ontario Building Code (OBC) will be acceptable for all dwelling units within the development. Any insulated metal exterior door meeting OBC requirements will be sufficient to provide noise insulation. If sliding patio doors are to be used in the dwellings, they must be included in the window area.

Glazing Construction

The minimum necessary specification for the building envelope is AIF-27 and AIF 29 for living/dining rooms and bedrooms respectively for dwelling units 1-5, based on the possibility of sound entering the buildings through windows and walls. The minimum necessary specification for the building envelope is AIF-23 and AIF 27 for living/dining rooms and bedroom respectively for dwelling units 6-10. Any well sealed thermopane unit having a Sound Transmission Class (STC) rating of 30, that is two 3 mm panes and a 13 mm inter-pane gap will provide sufficient noise insulation as long as the window to floor area ratio is less than 50% for living/dining rooms.

Further Analysis

When detailed floor plans and building elevations are available, an acoustical consultant should review the plans and provide window requirements based on actual window to floor area ratios.

5.4 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 townhouse units. The following noise warning clauses are required for specific units as indicated in Table VI.

Suggested wording for future dwellings with sound levels exceeding the MECP criteria is given below:
Type A:

> 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 and rail traffic may on occasion 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.

A suitable wording for future dwellings requiring central air conditioning systems 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 Municipality and the Ministry of Environment, Conservation and Parks.

Suggested wording for dwelling units near existing commercial facilities is as follows:

Type C:

> Purchasers/tenants are advised that due to the proximity of the nearby existing commercial uses, noise from these facilities at times be audible.

6 Summary & Recommendations

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

1. Central air conditioning is required for all the townhouse units in the proposed development. The location, installation and sound rating of the outdoor condensing units must be compliant with MECP Guideline NPC-300, as applicable.

2. Upgraded glazing constructions will be required for all the dwelling units in the development. When detailed floor plans and building elevations are available, the glazing construction should be refined based on actual window to floor area ratios.

3. Noise warning clauses to inform the occupants of the sound level excesses should be placed in the property and tenancy agreements and offers of purchase and sale. The affected townhouse units and appropriate warning clauses are shown in Table VII.

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

Prediction Location	Unit No.	Acoustic Barrier	Ventilation Requirements *	Type of Warning Clause	Building Façade Constructions (AIF requirements) +
A, B	1, 2, 3, 4, 5	--	Central Air	A, B, C	LR/DR: AIF-27 BR: AIF-29
C, D	6, 7, 8, 9, 10	--	Central Air	A, B, C	LR/DR: AIF-23 BR: AIF-27

Notes: (All units not included in the able have no specific acoustic requirements).
* The location, installation and sound rating of the air conditioning condensers must be compliant with MOECP Guideline NPC-300, as applicable.
+ When detailed floor plans and elevations are available, an acoustical consultant should provide revised glazing constructions based on actual window to floor area ratios.
LR/DR – Living Room/Dining Room
BR – Bedroom

6.1 Implementation

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

1. Prior to the issuance of building 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

SITE STATISTICS

ZONING REGULATIONS					
ZONE RM-10 (BACK TO BACK AND STACKED TOWNHOUSES)			REXTON DEVELOPMENT	DUNPAR DEVELOPMENT	
1.	**REGULATIONS**	**REQUIRED**	**PROPOSED**	**REQUIRED**	**APPROVED**
2.	MAXIMUM BUILDING HEIGHT				
3.	Measured to the peak of the sloped roof.	15.0 m. 3 Storeys.	12.66 m. 4 Storeys.		9.54 m. 3 Storeys.
4.	MINIMUM FRONT YARD	7.50 m.	3.79 m (North)		8.22 m (North)
5.			3.78 m (South)		3.27 m (South)
7.	MINIMUM INTERIOR SIDE YARD	4.5 m.	8.72 m (West)		1.67 m (West)
8.			1.20 m (East)		N/A
9.	MINIMUM EXTERIOR SIDE YARD	4.5 m.	N/A		N/A
10.			N/A		3.05 m (East)
11.	MINIMUM PARKING SPACES				
12.	Bylaw RM-10 makes reference to Part 3 of Bylaw 0225-2007. With exclusive use garage and driveway: 2.0 resident spaces per unit.	22 spaces	21 spaces	1.3 spaces / Unit for 2 bedroom units. 1.4 Spaces / Unit for 3 bedroom units.	261 spaces
13.	MINIMUM VISITOR PARKING SPACES				
14.	Bylaw RM-10 makes reference to Part 3 of Bylaw 0225-2007. With exclusive use garage and driveway: 0.25 visitor spaces per unit.	3 spaces	1 space	0.2 visitor spaces per unit	40 spaces
15.	MINIMUM BARRIER FREE PARKING SPACES				
16.	Bylaw 0225-2007: accessible parking spaces shall apply only to the total number of visitor parking spaces required.	1 space	1 space	1.6 spaces	2 spaces
17.	PARKING AREAS SETBACKS				
18.	Minimum setback between a parking space and an interior side lot line and/or rear lot line.	3.0 metres	1.63 metres		1.67 metres
19.	MINIMUM LANDSCAPE AREA	40 % of lot area.	30.64 % (503.52 m²)		33.17% (8,203.19 m²)
20.	MINIMUM REQUIRED LANDSCAPED SOFT AREA	50 % of landscaped area	73.15 % (368.35 m²)		66.57% (5,461.15 m²)
21.	MINIMUM LANDSCAPED BUFFER ABUTTING ANY SIDE AND REAR LOT LINE	3.0 metres	1.20 metres		1.67 metres
22.	MINIMUM CONTIGUOUS PRIVATE OUTDOOR SPACE PER UNIT.	6.0 m²	16.65 m²		0 m²

SITE STATISTICS

ZONING:
Proposed: **RM10** (Back to back & stacked townhouse)
Current: **D**

LOT AREA 1,643.35 m² (17,689 Ft²) (0.406 ac)

BUILDING COVERAGE:
PERMITTED: N/A
PROPOSED: 885.48 m² (9,531 Ft²) 53.88 %

LOT AREA PER DWELLING UNIT:
MINIMUM PERMITTED: 200 m²
PROPOSED: 164.34 m²
(per 10 Back to Back Townhouses)

DWELLING UNIT WIDTH:
MINIMUM PERMITTED: 5.0 m
PROPOSED: 5.73 m

LOT FRONTAGE:
REQUIRED (MIN.): 30 m
PROPOSED: 39.04 m

BUILDING G.F.A.:

FIRST FLOOR AREA	311.58 m² (3,353.82 Ft²)
SECOND FLOOR AREA	882.42 m² (9,498.29 Ft²)
THIRD FLOOR AREA	882.42 m² (9,498.29 Ft²)
FOURTH FLOOR AREA	882.42 m² (9,498.29 Ft²)
TOTAL GROSS AREA	**2,958.84 m²** (31,848.69 Ft²)

SETBACKS

	REQUIRED	PROVIDED
Front Yard (South)	4.5 m	3.78 m
Rear Yard (North)	7.5 m	3.79 m
Interior Side Yard (East)	2.5 m	1.20 m
Interior Side Yard (West)	2.5 m	8.72 m
PARKING SETBACKS:		
East (to a Residential Zone)	4.5 m	1.63 m

BUILDING HEIGHT: MAXIMUM PERMITTED 15.0 m 3 Storeys
PROVIDED: 4 Storeys 12.66 m (41.54 Ft)

PARKING:
REQUIRED:
Comparable to Dunpar Developments' next door; based on a parking justification study.
PROVIDED: 21 spaces
Including
1 Accessible space

LANDSCAPE AREA
MINIMUM REQUIRED 40 %
PROPOSED 30.64 % (503.52 m²)

SNOW STORAGE
REQUIRED MIN.: 32.87 m² (2.00 % of Lot Area)
PROVIDED: 33.04 m² (2.01% of Lot Area)

LEGAL DESCRIPTION

PART OF Lot 4
Concession 5, West of Hurontario Street
City of Mississauga
Regional Municipality of Peel

General Note:

i. I hereby certify that this drawing confirms in all respects to the site development plans Architect or Engineer's Signature (if applicable) and Professional seal

ii. The City of Mississauga requires that all working drawings submitted to the Building Division as part of an application for the issuance of a building permit shall be certified by the architect or engineer as being in conformity with the site development plan as approved by the City of Mississauga.

iii. All exterior lighting will be directed onto the site and will not infringe upon the adjacent properties.

iv. All rooftop mechanical units shall be screened from view by the applicant.

v. Parking spaces reserved for people with disabilities must be identified by a sign, installed at the applicant's expense, in accordance with the By-law Requirements and Building Code Requirements.

vi. The applicant will be responsible for ensuring that all plans confirm to Transport Canada's restrictions.

vii. Grades will be met with a 33% maximum slope at the property lines and within the site.

viii. All damaged areas are to be reinstated with topsoil and sod prior to the release of securities.

ix. Signage shown on the site development plans is for information purposes only. All signs will be subject to the provisions of Sign by-law 0054-2002, as amended, and a separate sign application will be required through the Building Division.

x. Any fencing adjacent to municipal lands is to be located 15 cm (6.0 in.) inside the property line.

xi. Only "shielded" lighting fixtures are permitted for all development, except for detached and semi-detached dwellings within 60 m (196.8 ft.) of a residentially zoned property and must confirm to the Engineer Certified Lighting Plan.

xii. The Engineer Certified Lighting Plan must be signed by the consulting Engineer.

xiii. The Owner covenants and agrees to construct and install "shielded" lighting fixtures on the subject lands, in conformity with the Site Plan and Engineer Certified Lighting Plan to the satisfaction of the City of Mississauga.

xiv. The applicant will be responsible for ensuring that all plans confirm to Transport Canada's restrictions.

xv. Where planting is to be located in landscaped areas on top of an underground parking structure, it is the responsibility of the applicant to arrange the coordination of the design of the underground parking structure with the Landscape Architect and the Consulting Engineering. Underground parking structures with landscaping area to be capable of supporting the following loads:

- 15 cm of drainage gravel plus 40 cm topsoil for sod
- 15 cm of drainage gravel plus 60 cm topsoil for shrubs
- 15 cm of drainage gravel plus 90 cm for trees

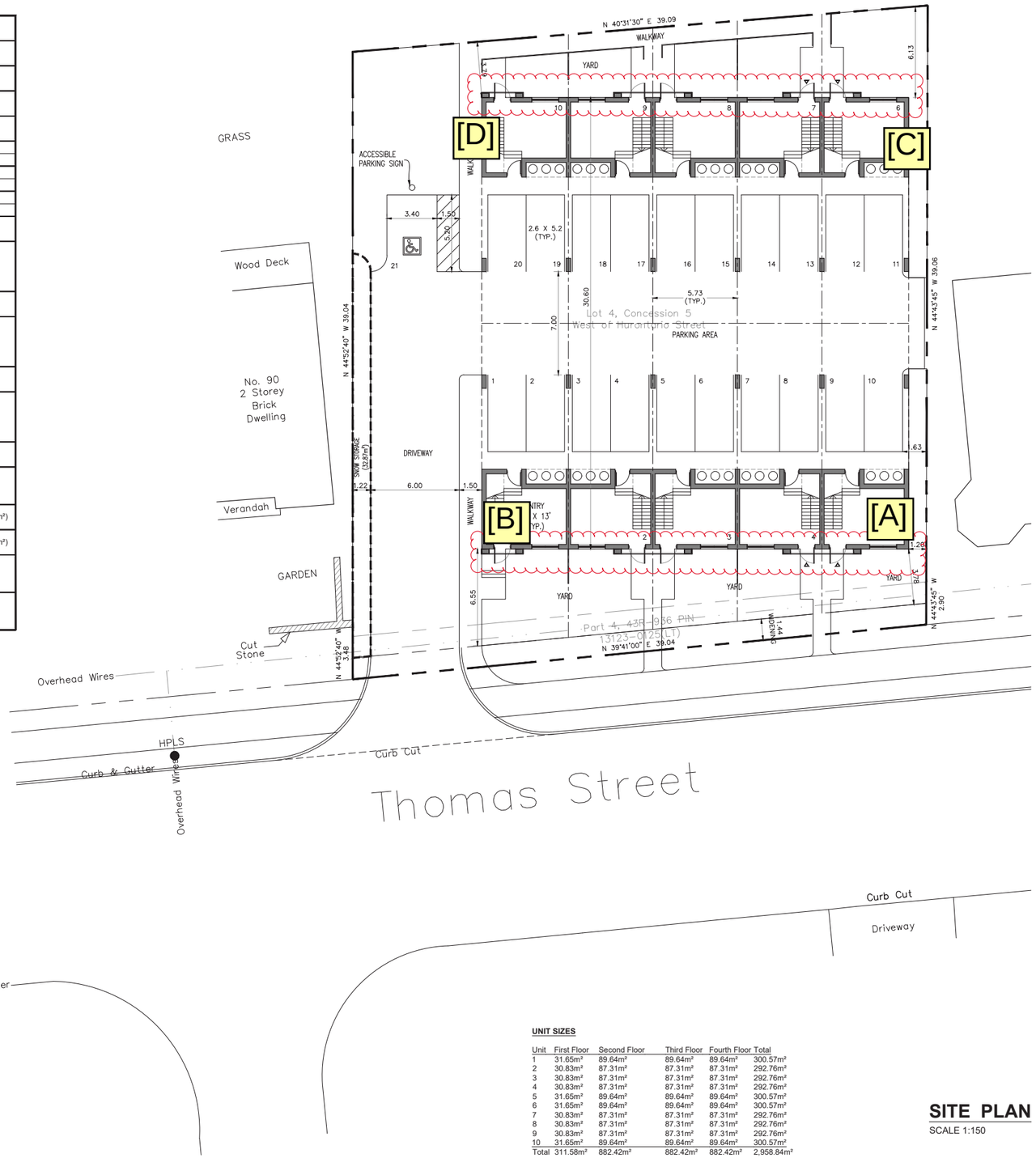
Or

- Prefabricated sheet drain system* with a compressive strength of 1003 Kpa plus 40 cm topsoil for sod
- Prefabricated sheet drain system* with a compressive strength of 1003 Kpa plus 60 cm topsoil for shrubs
- Prefabricated sheet drain system* with a compressive strength of 1003 Kpa plus 90 cm topsoil for trees
- * Terradrain 900 or approved equal

xvi. The structural design of any retaining wall over 0.6 m in height or any retaining wall located on a property line is to be shown on the Site Grading plan for this project and is to be approved by the Consulting Engineer for the project.

xvii. Continuous 15 cm high barrier type poured concrete curbing will be provided between all asphalt and landscaped areas throughout the site.

xviii. All utility companies will be notified for locates prior to the installation of the hoarding that lies within the site and within the limited of the City boulevard area.



UNIT SIZES

Unit	First Floor	Second Floor	Third Floor	Fourth Floor	Total
1	31.65m²	89.64m²	89.64m²	89.64m²	300.57m²
2	30.83m²	87.31m²	87.31m²	87.31m²	292.76m²
3	30.83m²	87.31m²	87.31m²	87.31m²	292.76m²
4	30.83m²	87.31m²	87.31m²	87.31m²	292.76m²
5	31.65m²	89.64m²	89.64m²	89.64m²	300.57m²
6	31.65m²	89.64m²	89.64m²	89.64m²	300.57m²
7	30.83m²	87.31m²	87.31m²	87.31m²	292.76m²
8	30.83m²	87.31m²	87.31m²	87.31m²	292.76m²
9	30.83m²	87.31m²	87.31m²	87.31m²	292.76m²
10	31.65m²	89.64m²	89.64m²	89.64m²	300.57m²
Total	311.58m²	882.42m²	882.42m²	882.42m²	2,958.84m²

SITE PLAN
SCALE 1:150

Figure 2: Proposed Site Plan Showing Prediction Locations

KEY PLAN
N.T.S.

NO.	DATE	REVISION/ISSUED FOR	BY
2	APR 14 2020	SITE PLAN APPROVAL	
1	MAR 21 2019	PRE-APPLICATION CONSULTATION	

PROJECT NAME
PROPOSED
RESIDENTIAL DEVELOPMENT
86 THOMAS ST.
MISSISSAUGA, ON

CONSTRUCTION NORTH

WES SURDYKA architect inc
3645 KEELE STREET, 2nd FLOOR, STE 108
TORONTO ONTARIO M3J 1M8
TEL (416) 630-2254 FAX (416) 630-5741
E-mail: surdykaarchitect@bellnet.ca

DRAWING TITLE
SITE PLAN
OPTION G

DRAWN BY	
PLOTTED	APR. 17, 2020
SCALE	AS SHOWN
START DATE	MAR 2019
PROJECT NO.	18-12

DRAWING NO.
A1.0
OF

APPENDIX A

Rail Guidelines and Traffic Data

CANADIAN PACIFIC RAILWAY

PRINCIPAL MAIN LINE REQUIREMENTS

1. Berm, or combination berm and noise attenuation fence, having extensions or returns at the ends, to be erected on adjoining property, parallel to the railway right-of-way with construction according to the following:

   a) Minimum total height 5.5 metres above top-of-rail;
   b) Berm minimum height 2.5 metres and side slopes not steeper than 2.5 to 1.
   c) Fence, or wall, to be constructed without openings and of a durable material weighing not less than 20 kg. per square metre (4 lb/sq.ft.) of surface area.

   No part of the berm/noise barrier is to be constructed on railway property.

   A clause should be inserted in all offers of purchase and sale or lease, and be registered on title or included in the lease for each dwelling affected by any noise and vibration attenuation measures, advising that any berm, fencing, or vibration isolation features implemented are not to be tampered with or altered, and further that the owner shall have the sole responsibility for and shall maintain these features.

   Dwellings must be constructed such that the interior noise levels meet the criteria of the appropriate Ministry. A noise study should be carried out by a professional noise consultant to determine what impact, if any, railway noise would have on residents of proposed subdivisions and to recommend mitigation measures, if required. The Railway may consider other measures recommended by the study.

2. Setback of dwellings from the railway right-of-way to be a minimum of 30 metres. While no dwelling should be closer to the right-of-way than the specified setback, an unoccupied building, such as a garage, may be built closer. The 2.5 metre high earth berm adjacent to the right-of-way must be provided in all instances.

3. Ground vibration transmission to be estimated through site tests. If in excess of the acceptable levels, all dwellings within 75 metres of the nearest track should be protected. The measures employed may be:

   a) Support the building on rubber pads between the foundation and the occupied structure so that the maximum vertical natural frequency of the structure on the pads is 12 Hz;
   b) Insulate the building from the vibration originating at the railway tracks by an intervening discontinuity or by installing adequate insulation outside the building, protected from the compaction that would reduce its effectiveness so that vibration in the building became unacceptable; or
   c) Other suitable measures that will retain their effectiveness over time.

4. A clause should be inserted in all offers of purchase and sale or lease and in the title deed or lease of each dwelling within 300m of the railway right-of-way, warning prospective purchasers or tenants of the existence of the Railway's operating right-of-way; the possibility of alterations including the possibility that the Railway may expand its operations, which expansion may affect the living environment of the residents notwithstanding the inclusion of noise and vibration attenuating measures in the design of the subdivision and individual units, and that the Railway will not be responsible for complaints or claims arising from the use of its facilities and/or operations.

5. Any proposed alterations to the existing drainage pattern affecting railway property must receive prior concurrence from the Railway, and be substantiated by a drainage report to be reviewed by the Railway.

6. A 1.83 metre high chain link security fence be constructed and maintained along the common property line of the Railway and the development by the developer at his expense, and the developer is made aware of the necessity of including a covenant running with the lands, in all deeds, obliging the purchasers of the land to maintain the fence in a satisfactory condition at their expense.

7. Any proposed utilities under or over railway property to serve the development must be approved prior to their installation and be covered by the Railway's standard agreement.

Sheeba Paul

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: March-07-19 12:23 PM
To: Sheeba Paul
Subject: RE: rail data request/verification

Hello Sheeba,

Further to your request dated March 5, 2019 (attached below), the subject site (on Barbertown Road, Mississauga) is located within 300 metres of CPR's Galt Subdivision, which carries Milton GO Train service.

It's anticipated that GO service on this corridor will be comprised of diesel trains within (at least) a 10-year time horizon. The combined preliminary midterm weekday train volume forecast at this location, including both revenue and equipment trips is in the order of 20 trains (19 day, 1 night). Trains will be comprised of a single locomotive and up to 12 passenger cars.

The maximum design speed on this corridor is 50 mph (80 km/h).

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 CPR operates trains in this area and it would be prudent to contact them directly for rail traffic information.

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

Best Regards,

IVAN CHEUNG, M.Sc, B.URPl
Intern | Third Party Projects Review
Pre-Construction Services | Capital Projects Group
Metrolinx
20 Bay Street, Suite 600 | Toronto | Ontario | M5J 2W3
T: 416-202-5920

METROLINX

From: Sheeba Paul [mailto:spaul@hgcengineering.com]
Sent: March-05-19 10:28 AM
To: Rail Data Requests
Cc: Adam Snow; Brandon Gaffoor
Subject: RE: rail data request/verification

Hello

Are you able to verify if the rail traffic data attached is still valid?

We are performing a noise study for a development north of Barbertown Road and south of the CP railway line in Mississauga.
A google map is provided in the link below.

https://www.google.com/maps/place/Barbertown+Rd,+Mississauga,+ON/@43.5747056,-79.6901811,15.37z/data=!4m5!3m4!1s0x882b41754d211307:0x4598313eb48b7b6!8m2!3d43.5737906!4d-79.6940632

We are requesting rail data or verification of the attached data for the railway line.

- Rail data including number of trains per day/night, speed, number of cars and locomotives

Thank you.

Ms. Sheeba Paul, MEng, PEng
Senior Associate

HGC Engineering **NOISE | VIBRATION | ACOUSTICS**
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2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7
t: 905.826.4044 **e**: spaul@hgcengineering.com
Visit our website – www.hgcengineering.com **Follow Us** – LinkedIn | Twitter | YouTube

Sheeba Paul

From: Josie Tomei <Josie_Tomei@cpr.ca>
Sent: March-05-19 11:00 AM
To: Sheeba Paul
Subject: RE: rail data request/verification

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Sheba,
Please use the following data prepared for HGC in January 2019 for this area of the Galt Subdivision, all information is applicable include speed and track information.

Josie Tomei SR/WA
Specialist Real Estate Sales & Acquisitions
905-803-3429
800-1290 Central Parkway West
Mississauga, ON L5C 4R3

1. Number of freight trains between 0700 & 2300: 6
   Number of freight trains between 2300 & 0700: 7
2. Maximum cars per train freight: 163
3. Number of locomotives per train: 2 (4 max.)
4. Maximum permissible train speed: 50 mph
5. The 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 at any time.
6. There are 2 mainline tracks with continuously welded rail at this location along with a cross connection. Train noise may increase as trains pass through the connections.
7. Please note, the information provided is for freight trains only. Metrolinx operates GO passenger service through this location. Passenger data should be obtained directly from Metrolinx.

From: Sheeba Paul <spaul@hgcengineering.com>
Sent: Tuesday, March 5, 2019 10:16 AM
To: Josie Tomei <Josie_Tomei@cpr.ca>
Subject: RE: rail data request/verification

Hi Josie,

Are you able to verify if the rail traffic data attached is still valid?

We are performing a noise study for a development north of Barbertown Road and south of the CP railway line in Mississauga.
A google map is provided in the link below.

https://www.google.com/maps/place/Barbertown+Rd,+Mississauga,+ON/@43.5747056,-79.6901811,15.37z/data=!4m5!3m4!1s0x882b41754d211307:0x4598313eb48b7b6!8m2!3d43.5737906!4d-79.6940632

We are requesting rail data or verification of the attached data for the railway line.

- Rail data including number of trains per day/night, speed, number of cars and locomotives
- classification of the railway line (spur, mainline, secondary mainline etc).
- whistle on or off

Thank you.

Ms. Sheeba Paul, MEng, PEng
Senior Associate

HGC Engineering **NOISE | VIBRATION | ACOUSTICS**
Howe Gastmeier Chapnik Limited
2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7
t: 905.826.4044 **e**: spaul@hgcengineering.com
Visit our website – www.hgcengineering.com **Follow Us** – LinkedIn | Twitter | YouTube

APPENDIX B

Road Traffic Data

Date:	29-Jan-20

NOISE REPORT FOR PROPOSED DEVELOPMENT

REQUESTED BY:	
Name:	Sheeba Paul
Company:	HGC Engineering

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

Location:	Thomas Street - Between McFarren Blvd and Joymar Drive Joymar Drive - Between Thomas Street and Tannery Street
ID#:	453

ON SITE TRAFFIC DATA

Specific	***Street Names***				
	Thomas Street	Joymar Drive			
AADT:	21,500	5,000			
# of Lanes:	4 Lanes	2 Lanes			
% Trucks:	3%	2%			
Medium/Heavy Trucks Ratio:	55/45	55/45			
Day/Night Traffic Split:	90/10	90/10			
Posted Speed Limit:	50 km/h	40 km/h			
Gradient of Road:	<2%	<2%			
Ultimate R O W:	26m	20m			

Comments:	- Ultimate Traffic data Only

APPENDIX C

Sample Stamson 5.04 Output

Location: A

```
STAMSON 5.0        NORMAL REPORT        Date: 31-01-2020 11:09:59
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename:                       Time Period: Day/Night 16/8 hours
Description:


Rail data, segment # 1: CP Rail (day/night)
-------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1. CP          !   7.7/9.0   !  80.0 !  4.0 !163.0 !Diesel!  No
* 2. GO          !  24.3/1.3   !  80.0 !  1.0 ! 12.0 !Diesel!  No

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1. CP             !   6.0/7.0   !    2.50  !   10.00  !
  2. GO             !  19.0/1.0   !    2.50  !   10.00  !

Data for Segment # 1: CP Rail (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 325.00 / 325.00 m
Receiver height           :   8.50 / 8.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00
```

Results segment # 1: CP Rail (day)

LOCOMOTIVE (0.00 + 57.40 + 0.00) = 57.40 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	73.76	-13.36	-3.01	0.00	0.00	0.00	57.40

WHEEL (0.00 + 53.42 + 0.00) = 53.42 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	69.79	-13.36	-3.01	0.00	0.00	0.00	53.42

Segment Leq : 58.86 dBA

Total Leq All Segments: 58.86 dBA

Results segment # 1: CP Rail (night)

LOCOMOTIVE (0.00 + 60.03 + 0.00) = 60.03 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	76.40	-13.36	-3.01	0.00	0.00	0.00	60.03

WHEEL (0.00 + 56.20 + 0.00) = 56.20 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	72.57	-13.36	-3.01	0.00	0.00	0.00	56.20

Segment Leq : 61.53 dBA

Total Leq All Segments: 61.53 dBA

Road data, segment # 1: Thomas St (day/night)

Car traffic volume : 18770/2086 veh/TimePeriod *
Medium truck volume : 319/35 veh/TimePeriod *
Heavy truck volume : 261/29 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 2 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 21500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.65
Heavy Truck % of Total Volume : 1.35
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Thomas St (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 16.80 / 16.80 m
Receiver height : 8.50 / 8.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Joymar Dr (day/night)

Car traffic volume : 4410/490 veh/TimePeriod *
Medium truck volume : 50/6 veh/TimePeriod *
Heavy truck volume : 41/5 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 2 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 5000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.10
Heavy Truck % of Total Volume : 0.90
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Joymar Dr (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 115.00 / 115.00 m
Receiver height : 8.50 / 8.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Thomas St (day)

Source height = 1.08 m

ROAD (0.00 + 65.99 + 0.00) = 65.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	66.48	0.00	-0.49	0.00	0.00	0.00	0.00	65.99

Segment Leq : 65.99 dBA

Results segment # 2: Joymar Dr (day)

Source height = 0.98 m

ROAD (0.00 + 45.28 + 0.00) = 45.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	57.14	0.00	-8.85	-3.01	0.00	0.00	0.00	45.28

Segment Leq : 45.28 dBA

Total Leq All Segments: 66.03 dBA

Results segment # 1: Thomas St (night)

Source height = 1.08 m

ROAD (0.00 + 59.45 + 0.00) = 59.45 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	59.94	0.00	-0.49	0.00	0.00	0.00	0.00	59.45

Segment Leq : 59.45 dBA

Results segment # 2: Joymar Dr (night)

Source height = 1.00 m

ROAD (0.00 + 38.97 + 0.00) = 38.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	50.82	0.00	-8.85	-3.01	0.00	0.00	0.00	38.97

Segment Leq : 38.97 dBA

Total Leq All Segments: 59.49 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.79
(NIGHT): 63.64