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ENVIRONMENTAL NOISE STUDY

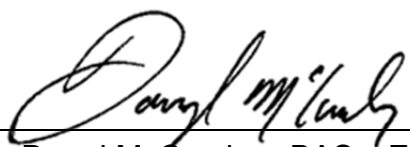
67 / 71 Marquette

Ottawa, Ontario

Prepared for:

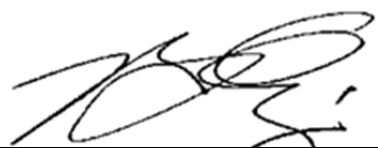
Capital View Development Inc.
132 Putman Ave
Ottawa, Ontario
K1M 1Z7

Prepared by



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December 6, 2013

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ACOUSTICS



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1 INTRODUCTION AND SUMMARY

Howe Gastmeier Chapnik Limited (HGC Engineering) was retained by Capital View Development Inc. to complete an Environmental Noise Study for the proposed development located at 67/71 Marquette Avenue, in Ottawa. This study is based on drawings provided by Christopher Simmonds Architect.

The subject property is located on Marquette Avenue, just east of the intersection of Marquette Avenue and Genest Street, as shown in Figure 1. The new development is shown to consist of a 3-storey building, above a raised basement level. Each floor, including the raised basement level, includes rental suites. The development includes parking at the rear of the building, partially below grade. The ground and third floor are shown to include private decks and a common deck is located on the ground floor.

Marquette Avenue and Jolliet Avenue are the main sources of transportation noise in this area, but such noise is anticipated to be minimal. Standard building components are anticipated to be sufficient to mitigate impacts from these sources.

Rockcliffe Airport is located north-east of the site. Noise contours for this airport were not available as this airport is mainly used by the Rockcliffe Flying Club. Occasional sounds from the airport may at times be audible, but are not anticipated to be of concern.

In conclusion, with standard building envelope components and assemblies, the proposed development is anticipated to meet MOE guidelines and acceptable standards from the perspective of traffic noise. Details of the assessment leading to this conclusion are provided herein.

2 SITE DESCRIPTION AND NOISE SOURCES

The subject site is located on the north side of Marquette Avenue, just east of Genest Street, with Jolliet Avenue to the north. Road traffic on Marquette Avenue and Jolliet Avenue are the main sources of traffic noise in the area. The nearby land uses primarily consist of low-rise residential buildings. A key plan is shown in Figure 1.



Preliminary drawings from Christopher Simmonds Architect, dated November 8, 2013 (site plan) and August 20, 2013 (floor plans and elevations), indicate that the development will consist of a single 3-storey building above a basement level. Partially below grade parking will be located at the rear (north side) of the building. Each floor, including the basement level, will include rental apartments. Private decks are shown on the ground and third floor, a common deck is also shown on the ground floor. The site plan is shown as Figure 2.

Rockcliffe Airport is located approximately 2.5 km north-east of the site. An Ottawa Fire Station (OFS No. 57) is located west of the site (approximately 150 m), with road access onto Beechwood Avenue.

Optimiste Park is located across the street from the development, and includes outdoor recreational facilities (basketball courts, public pools, etc.). Sounds from typical use of the park are not anticipated to be an issue.

3 SOUND LEVEL CRITERIA

3.1 Road Traffic Noise

Criteria for acceptable levels of noise are contained in the Ontario Ministry of Environment (MOE) publication NPC-300, "Stationary and Transportation Sources – Approval and Planning". Sound level limits from road traffic sources are summarized in Table I below.

Table I: MOE Road Traffic Noise Criteria (dBA)

Area	Daytime L_{EQ} (16 hour)	Night-time L_{EQ} (8 hour)
Outdoor Living Area	55	--
Living or dining areas of residences	45	45
Sleeping Quarters (bedrooms)	45	40



Daytime refers to the period between 07:00 and 23:00. Night-time refers to the period between 23:00 and 07:00. Living areas include dining rooms, dens, studies, etc. Kitchens and washrooms are usually not considered to be noise-sensitive areas.

The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace, a playground or other area where passive outdoor recreation is expected to occur. Balconies with a depth of less than 4 metres (measured perpendicular to the building façade) are not considered OLAs under MOE guidelines, and accordingly the noise criteria are not applicable there. Balconies with a usable depth greater than 4 metres are considered to be OLAs and are subject to the outdoor noise guideline of 55 dBA.

In cases where a minor excess (up to 5 dB) over the sound level limit in an OLA is anticipated, MOE guidelines allow the excess to be addressed by including a warning clause in the titles, deeds or tenancy agreements for the affected dwellings. Where OLA sound levels exceed 60 dBA, physical noise control measures, such as an acoustical barrier, are required.

Where the noise from road traffic results in outdoor façade sound levels exceeding 60 dBA at night-time or 65 dBA during the daytime, building components must be designed to achieve the specified indoor sound level criteria, and central air conditioning is required so that windows can remain closed against the noise.

3.2 Air Traffic Noise

Guidelines for acceptable levels of sound from air traffic impacting indoor spaces are also given in MOE publication NPC-300. These criteria are listed in Table II below.

Table II : Air Traffic Indoor Sound Level Criteria

Type of Space	Air Traffic
	Indoor NEF (24-hour)
Living/dining areas of residences	5
Sleeping quarters of residences	0

The living/dining/family rooms, dens and bedrooms of the proposed dwelling units are the sensitive receptor locations. Typically, washrooms and kitchens are considered noise insensitive areas. There are no outdoor noise criteria for aircraft noise because there is no effective means of mitigation.

For residential dwellings located between the NEF 25 and 30, the MOE requires that the dwelling be designed with the provision for central air conditioning. This requirement usually implies forced air heating systems with the ducts sized for future installation of central air conditioning (if central air conditioning is not provided by the developer); for residential dwellings located between the NEF 30 and 35 contours, the MOE suggests that central air conditioning is mandatory. In addition, building components including windows, doors, walls and ceiling/roof must be designed to achieve the indoor sound level criteria. A warning clause is also required in property and tenancy agreements.

4 TRAFFIC NOISE ASSESSMENT

4.1 Road Traffic Data

Road traffic volumes for Jolliet Avenue and Marquette Avenue were unavailable. In order to assess traffic noise from these roadways, estimated ultimate traffic volumes for similar road types (2 lane collector roads) were used as a conservative assumption, based on information obtained from another municipality (see Appendix A).

Traffic on Jolliet and Marquette Avenue was assumed to be similar to that of a 2 lane collector road (maximum 6,000 vehicles AADT). To determine day and night traffic flows, a 90% day / 10% night split was assumed for both of these roadways. It was conservatively assumed that 5% of the traffic are heavy vehicles, and 3% are medium vehicles.



4.2 Road Traffic Noise Predictions

To assess the levels of traffic noise which will impact the site in the future, predictions were made using a computer modelling package (*Stamson version 5.04*). The model is based on the methods from the Ministry of the Environment publication entitled, “Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT)”. This method provides reference sound levels for the sources and accounts for reduction in sound level with distance due to geometrical spreading, ground attenuation, and acoustical shielding by intervening structures. Sample calculation results are included in Appendix B.

Predictions of overall sound levels from all transportation sources were made at representative locations on the building façades. These predictions indicate that sound levels will peak at approximately 63 dBA during the daytime hours and 57 dBA during the nighttime hours along the south side of the property (façade fronting onto Marquette).

4.3 Transportation Noise - Recommendations

The following discussion outlines preliminary recommendations for building façade constructions and ventilation requirements, to achieve the noise criteria stated in Table I. Warning clauses are further discussed under Section 7.

4.3.1 Ventilation Requirements

The maximum predicted sound level at the building façade is 57 dBA during the night and 63 dBA during the day. It is our understanding that each of the suites will include air conditioning, but the system has not been specified yet. No additional considerations are required.

4.3.2 Building Facade Constructions

Preliminary floor plans and elevations indicate window-to-floor areas of approximately 70%. Since nighttime sound levels at the façade are less than 60 dBA, any standard double glazed window construction is anticipated to provide adequate sound insulation for the units, and meet MOE target indoor sound levels (45 dBA daytime, 40 dBA nighttime). Typical assemblies would include any glass panes 4 mm thick or greater, with an intervening airspace of 10 mm or greater.



4.3.3 Outdoor Living Areas

The preliminary building plans show a number of decks on the ground and third floors of the building. The common deck and the majority of the private decks are less than 4 m in depth and are not subject to MOE criteria outlined in Table 1. However, the two larger private terraces located in the north-east and north-west corners of the building are larger than 4 m in depth.

Predicted sound levels at each of these decks are less than 60 dBA. Therefore no additional physical mitigation is required.

5 EMERGENCY SERVICES

OFS No. 57 is located approximately 150 m west of the proposed site. The only sources of significant noise from this facility are anticipated to be those sounds associated with the emergency response vehicles as they depart from the site. That is, only emergency sounds are of significance. The MOE specifically excludes auditory warning signals from consideration in its guidelines. A clear warning clause is recommended to advise of the proximity of this facility to the proposed development.

6 ROCKCLIFFE AIRPORT

Rockcliffe Airport is located approximately 2.5 km north-east of the site. The airport is currently operated by the Rockcliffe Flying Club. Noise Exposure Forecast (NEF) contours for the airport were unavailable, and thus no detailed assessment could be conducted. To get some idea of the potential impact, NEF contours for an airport of similar size (Buttonville Airport in Toronto) were superimposed over Rockcliffe Airport. The results suggest that the development is located well outside of the NEF-25 contour, as seen in Figure 3.

Regardless, Transport Canada recommends that a warning clause is recommended to advise occupants of the proximity of the airport to the proposed development.



7 WARNING CLAUSES

MOE guidelines recommend that appropriate warning clauses be included in the development agreements registered on property titles, and in purchase and sale agreements or tenancy agreements of properties where anticipated traffic sound level excesses are identified. The actual wording of the warning clause depends on the nature of the excess, and may be altered as necessary to suit the City's requirements, or as recommended by the owner's legal advisors. For this site, several clauses are recommended as follows:

- (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 traffic may on occasion interfere with some activities of the dwelling occupants as the sound levels exceed the Municipality's and the Ministry of the Environment's noise criteria. 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 Ministry of Environment's noise criteria.
- (b) Purchasers/tenants are advised that due to the proximity of this development to a nearby fire hall (Ottawa Fire Station No. 57), sound from emergency vehicles exiting the building may at times be audible.
- (c) Purchasers/tenants are advised that due to the proximity of this development to the nearby Rockcliffe Airport, sound levels from the facility may at times be audible.

8 CONCLUSIONS

Modelling has been undertaken to assess the potential noise impact of surrounding sources on the proposed residential development at 67/71 Marquette Avenue in Ottawa.

Road traffic generates moderate levels of noise, which can be addressed with standard building components. Central air conditioning systems will be supplied so that windows may remain closed.

Warning clauses should be included in all property and tenancy agreements and offers of purchase and sale, to inform future residents of the traffic noise issues, and to identify the possibility of audible noise from Ottawa Fire Station No. 57 and Rockcliffe Airport.





Figure 1: Key Plan

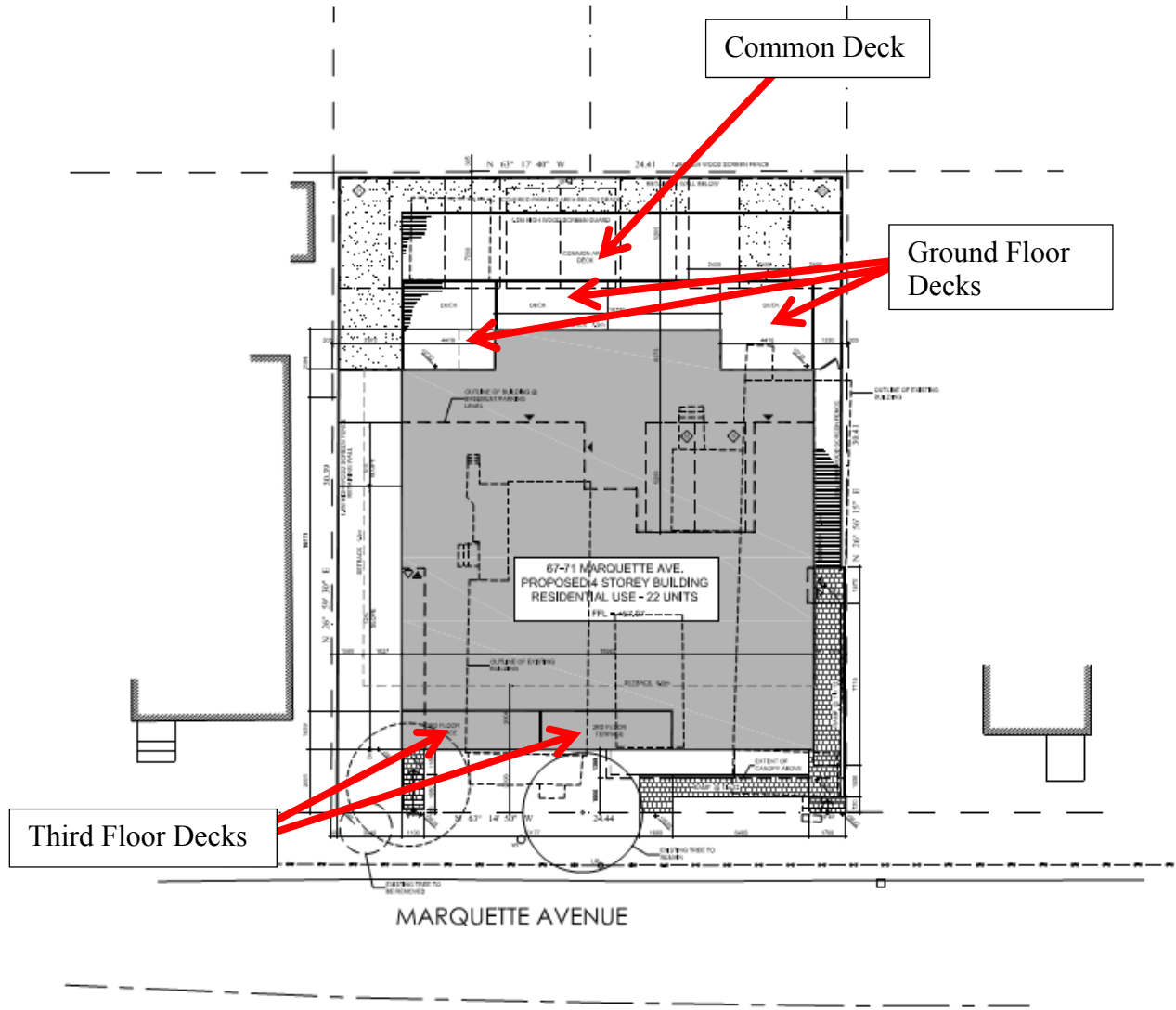


Figure 2: Site Plan

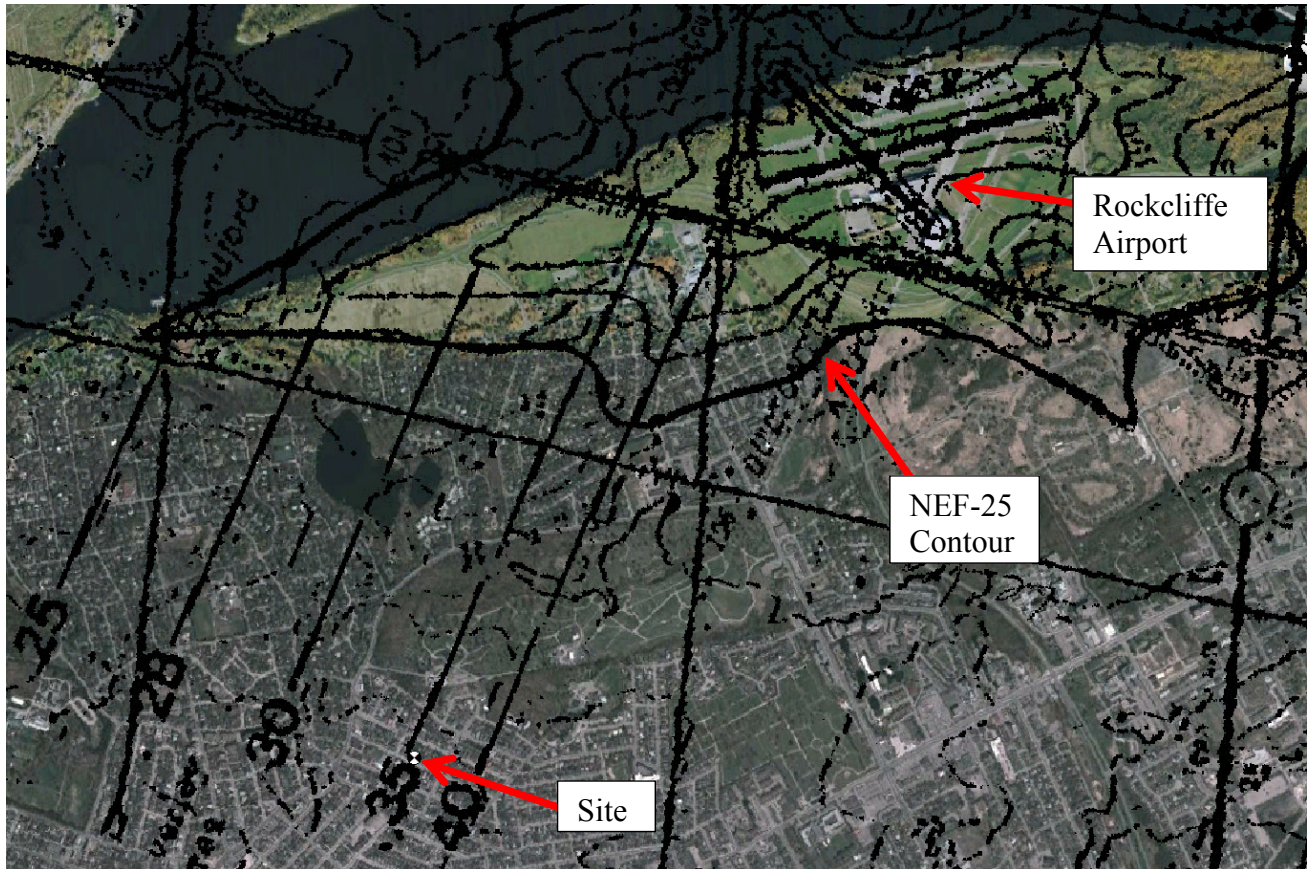


Figure 3: NEF Contour Overlay

APPENDIX A: ROAD TRAFFIC DATA



ACOUSTICS



NOISE



VIBRATION

FAXED
99-01-03

CITY OF VAUGHAN
ENGINEERING DEPARTMENT
RECEIVED
JAN 05 1999

REFER TO:	NOTED:
Telephone: (905) 832-3535 ext. 4244	
Facsimile: (905) 832-6144	
E-mail: engineering@cityofvaughan.ca	
ME	MC
MD	MT
FILE NAME: 19T-95092	

January 4, 1999

Mr. Header Merza
S.S. Wilson and Associates
9011 Leslie Street, Suite 307
Richmond Hill, Ontario
L4B 3B6

RE: Langstaff Road/Martin Grove Road
Noise Impact Assessment

Dear Mr. Merza:

As requested, please find below the traffic/road design assumptions to be incorporated into the subject noise assessment. These are generic assumptions utilized by the City for the ultimate conditions on the roadway. Engineering judgement should be utilized to determine if they are applicable in this case.

Ultimate Traffic Volumes

Included below is a summary of estimated ultimate traffic volumes for various roadways:

Ultimate Traffic Volumes		
Number of Lanes	Road Type	ADT
2 Lanes	Arterial	13,500
4 Lanes	Arterial	27,000
6 Lanes	Arterial	40,000
2 Lanes	Collector	6,000
4 Lanes	Collector	12,000

Speed Limit

It is assumed that under the ultimate scenario that Martin Grove Road and Langstaff Road will have posted speeds of 50 km/h and 60 km/h, respectively.

Heavy Vehicle Percentages

The City has assumed that 8% heavy vehicles (5% heavy, 3% medium) should be utilized for design purposes and the subject noise impact assessment.

APPENDIX B: STAMSON CALCULATIONS



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Filename: marquette.te Time Period: Day/Night 16/8 hours
 Description:

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

 Car traffic volume : 4968/552 veh/TimePeriod
 Medium truck volume : 162/18 veh/TimePeriod
 Heavy truck volume : 270/30 veh/TimePeriod
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Jolliet (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 60.00 / 40.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

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

 Car traffic volume : 4968/552 veh/TimePeriod
 Medium truck volume : 162/18 veh/TimePeriod
 Heavy truck volume : 270/30 veh/TimePeriod
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Marquette (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 15.00 / 15.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Jolliet (day)

 Source height = 1.50 m

ROAD (0.00 + 51.56 + 0.00) = 51.56 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 -90 90 0.66 63.91 0.00 -9.99 -1.46 0.00 -0.90 0.00 51.56

Segment Leq : 51.56 dBA



Results segment # 2: Marquette (day)

Source height = 1.50 m

ROAD (0.00 + 62.45 + 0.00) = 62.45 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.66 63.91 0.00 0.00 -1.46 0.00 0.00 0.00 62.45

Segment Leq : 62.45 dBA

Total Leq All Segments: 62.79 dBA

Results segment # 1: Jolliet (night)

Source height = 1.50 m

ROAD (0.00 + 48.85 + 0.00) = 48.85 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.66 57.37 0.00 -7.07 -1.46 0.00 0.00 0.00 48.85

Segment Leq : 48.85 dBA

Results segment # 2: Marquette (night)

Source height = 1.50 m

ROAD (0.00 + 55.92 + 0.00) = 55.92 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.66 57.37 0.00 0.00 -1.46 0.00 0.00 0.00 55.92

Segment Leq : 55.92 dBA

Total Leq All Segments: 56.70 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.79
(NIGHT): 56.70

